# TRAFFIC IMPACT REPORT

*July 12, 2023*

*20233551.0001*

# AVERILL ROAD HOUSING

## VILLAGE OF COOPERSTOWN, NY

**PREPARED FOR:**
Village of Cooperstown
P.O. Box 346, 22 Main Street
Cooperstown, NY 13326

242 West Main Street, Suite 100 | Rochester, NY 14614 | 585.325.1000 | www.passero.com
PASSERO engineering architecture

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# 1.0 EXECUTIVE SUMMARY

The purpose of this report is to evaluate the potential traffic impacts related to the proposed Averill Road Housing project to be located at 5138 Averill Road in the Village of Cooperstown, NY. Within this report, the operating characteristics of the proposed access points and impacts to the adjacent roadway network are evaluated, and mitigating measures are identified (if needed) to minimize operational concerns.

To define traffic impact, this analysis establishes existing baseline traffic conditions, projects background traffic flow including area growth, and determines the traffic operations that would result from the proposed project.

***Project Location and Description***

The proposed project is to be located at 5138 Averill Road in the Village of Cooperstown, Otsego County, NY. The project site is bounded by forested land to the north, east, and south, and Averill Road to the west. The project site is currently undeveloped. Land uses in the vicinity of the project site include residential, cemetery, warehouse, and office.

The proposed project will construct a 24-unit apartment building and 12 townhome units for a total of 36 multifamily units. Under the proposed action, two driveways will be constructed along Averill Road.

***Study Area***

To ensure a comprehensive analysis of potential traffic impacts, the following intersections define the study area, as determined via scoping with the Village of Cooperstown. **Figure 1** illustrates the project site location and study area (all figures are included at the end of this report).

- Glen Avenue (NY-28/NY-80) at Main Street
- Averill Road at Main Street
- Averill Road at Beech Street
- Main Street at Grove Street

***Existing and Background Conditions***

Passero Associates collected turning movement traffic counts on Thursday, March 30, 2023. This study conducted traffic counts between 7:00 to 9:00 AM and 4:00 to 6:00 PM to determine peak hour traffic volumes at each study intersection. Given the functional characteristics of the corridors, adjacent land uses, and the proposed land use for the project site, the peak hours selected for analysis are the weekday commuter AM and PM peak periods. The combination of site traffic and adjacent street traffic produces the greatest demand during these time periods.

Overall, the following existing conditions were noted:

- All movements at the study intersections operate at a highly acceptable level of service "A" during both weekday peak hours.
- Given the rolling terrain of the study area, drivers appeared to be traveling slower than the Village's areawide 30 mph posted speed limit.
- Pavement conditions are generally fair with noticeable signs of distress.
- Pavement widths typically range from 16 feet to 18 feet.

Construction of the proposed project is anticipated to reach full completion within approximately two years depending on market conditions. The existing traffic volumes were grown to account for anticipated increases in background traffic for the build-out period. This growth was determined using historical traffic volume trends obtained from the New York State Department of Transportation (NYSDOT). The Village of Cooperstown did not identify any projects, aside from the proposed action, which would specifically increase traffic volumes within the study area.

***Conclusions and Recommendations***

The results of this comprehensive study determined that the existing transportation network can adequately accommodate the projected traffic volumes and resulting minor impacts to study area intersections. The following sets forth the conclusions and recommendations based upon the results of the analyses:

1. The proposed project is expected to generate approximately eight entering/27 exiting vehicle trips during the AM peak hour and 23 entering/14 exiting vehicle trips during the PM peak hour.

2. All movements operate at level of service "A" under existing and projected background conditions during the AM and PM peak hours. No changes in level of service are projected with the construction of the proposed project.

3. The combination of southbound traffic volumes turning left onto Main Street from Glen Avenue and the design speed of Glen Avenue indicate that a left-turn treatment is not warranted during either peak hour.

4. The roadside barriers along Main Street should remain and be maintained and/or replaced when necessary.

5. The study area roadways are considered very low-volume roadways, notably Averill Road which carries less than 40 vehicles per day.

6. Although there have been no reported issues to date, the Village should consider widening Averill Road to 18 feet considering roadside features, right of way width, and drainage implications during routine maintenance or a capital improvement project.

7. This study considered a new sidewalk along Averill Road between Beech Street and the project site, but was dismissed for several reasons: a vertical drop along the western side; narrow roadside width between the edge of pavement and existing trees; potential utility locations; proximity between the edge of road and Irish Hill Cemetery south of Beech Street; potential right of way impacts; likely high construction cost; and maintenance responsibility being placed on the abutting property owners.

8. In lieu of new sidewalks, advisory shoulders may be considered as a treatment to create space for pedestrians on Averill Road. It should be noted that the FHWA currently is not considering new requests to experiment with this treatment; however, that is not to say a municipality cannot implement this treatment along local roadways.

9. A sidewalk between the Main Street curve and the intersection of Main Street/Averill Road may be considered; however, there are tradeoffs relative to roadside conditions, construction cost, and maintenance responsibility.

10. Based on the intersection alternatives at Main Street and Grove Street, as shown in **Figure 8**, the preferred alternative is Alternative 1 given the lack of offset Alternative 2 creates and the potential cost for relocation of the existing utility pole.

11. There are no significant adverse traffic impacts because of full development of the proposed project.

# 2.0 INTRODUCTION

## 2.1 Study Purpose and Objectives

The purpose of this report is to evaluate the potential traffic impacts related to the proposed Averill Road Housing project to be located at 5138 Averill Road in the Village of Cooperstown, NY. Within this report, the operating characteristics of the proposed access points and impacts to the adjacent roadway network are evaluated, and mitigating measures are identified (if needed) to minimize operational concerns.

To define traffic impact, this analysis establishes existing baseline traffic conditions, projects background traffic flow including area growth, and determines the traffic operations that would result from the proposed project. All supporting calculations are included in the Appendices of this report.

## 2.2 Project Location

The proposed project is to be located at 5138 Averill Road in the Village of Cooperstown, Otsego County, NY. The project site is bounded by forested land to the north, east, and south, and Averill Road to the west. The project site is currently undeveloped. Land uses in the vicinity of the project site include residential, cemetery, warehouse, and office. The proposed site plan is included at the end of the report.

## 2.3 Study Area

To ensure a comprehensive analysis of potential traffic impacts, the following intersections define the study area, as determined via scoping with the Village of Cooperstown. **Figure 1** illustrates the project site location and study area (all figures are included at the end of this report).

- Glen Avenue (NY-28/NY-80) at Main Street
- Averill Road at Main Street
- Averill Road at Beech Street
- Main Street at Grove Street

# 3.0 TRANSPORTATION SETTING

## 3.1 Description of Study Area Roadways

The information outlined in **Table 1** provides a description of the existing roadway network within the study area. **Figure 2** illustrates the lane geometry and traffic controls at each of the study intersections and the Annual Average Daily Traffic (AADT) volumes on the study roadways. The AADTs, in vehicles per day (vpd), reflect the most recently collected data obtained from the NYSDOT. Where recent data is not available, traffic data is shown as an extrapolation of turning movement counts collected by Passero Associates. Functional classification of roadways is determined by the NYSDOT and the Federal Highway Administration (FHWA). The village wide speed limit is 30 mph.

**Table 1:** *Existing Highway System*

| ROADWAY | CLASS[1] | AGENCY[2] | SPEED LIMIT | TYPICAL CROSS SECTION[3] | AADT (vpd) |
|---|---|---|---|---|---|
| Glen Avenue (NY-28/NY-80) | 6 | NYSDOT | 30 mph | 2-lane undivided | 5,028 NYSDOT (2016) |
| Main Street | 9 | Village | 30 mph | 2-lane undivided | 190-400 Passero (2023) |
| Averill Road | 9 | Village | 30 mph | 2-lane undivided | 35 Passero (2023) |
| Beech Street | 9 | Village | 30 mph | 2-lane undivided | 30 Passero (2023) |
| Grove Street | 9 | Village | 30 mph | 2-lane undivided | 375 Passero (2023) |

Notes:
1. State functional classification of roadway:
2. Jurisdictional agency of roadway.
3. Excludes turning/auxiliary lanes developed at intersections.

Class 6: Rural Minor Arterial — According to the FHWA, this class of roadway "link cities and larger towns (and other major destinations capable of attracting travel over long distances) and form an integrated network providing interstate and inter-county service." These roads "provide service to corridors with trip lengths and travel density greater than those served by rural collectors and local roads and with relatively high travel speeds and minimum interference to through movement."

Class 9: Rural Local — According to the FHWA, this class of roadway "serve primarily to provide access to adjacent land." These roads "are not intended for use in long distance travel, except at the origin or destination end of the trip, due to their provision of direct access to abutting land. Bus routes generally do not run on Local Roads. They are often designed to discourage through traffic. As public roads, they should be accessible for public use throughout the year."

Because the local roadways carry less than 400 vehicles per day, they are classified as very low-volume local roads by AASHTO. As published in *Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT ≤ 400)*, the fundamental characteristics of these roads which are distinguished from other types of roadways are:

- Traffic volumes, less than or equal to 400 vehicles per day.
- Motorists using these roads are familiar with its features due to frequent use and design features that might surprise an unfamiliar driver will be known by a familiar driver.
- Design guidelines for very low-volume local roads can be less stringent than higher-volume roads with unfamiliar drivers.

Averill Road and Beech Street can be subclassified as rural minor access roads. These roads are:

- Predominately used by familiar drivers.
- Generally, are cul-de-sacs, loops roads, or dead-end streets.
- Service residential land use.
- Speeds are low for the local environment due to the purpose of roadway and trip lengths.

- Frequently narrow, may function as one-lane roads.
- Trucks and heavy vehicles are rare, but need to be accessible to school buses, maintenance vehicles, fire trucks, and other emergency vehicles.

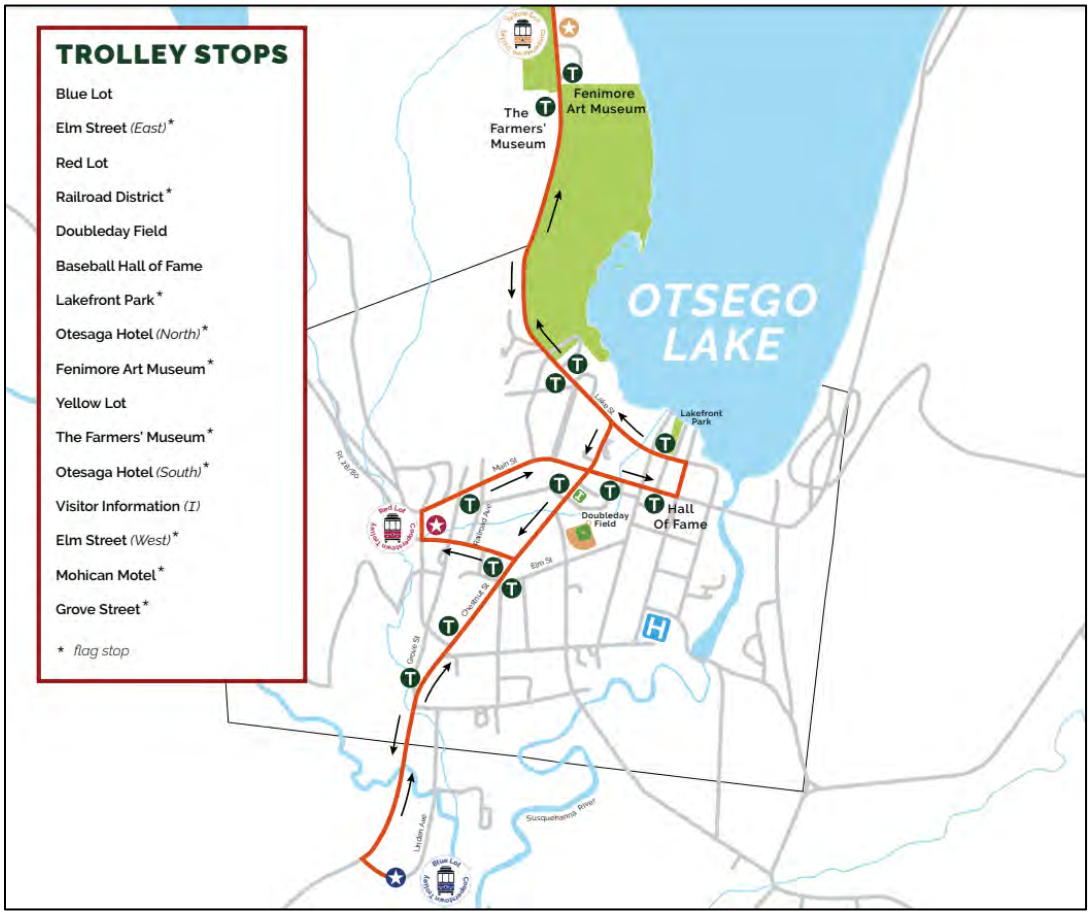
Main Street may be a rural major access road with many of the same features as a minor access road; however, it serves abutting properties and provides access between other local roads or higher facility types. For example, Main Street connects Glen Avenue to other local streets, small businesses, and travels into the business district.

## 3.2 Description of Multimodal Network

**Table 2** summarizes the traffic controls, pedestrian, bicycle, and transit accommodations within the study area.

**Table 2:** *Multimodal Network*

| ROADWAY/ INTERSECTION | TRAFFIC CONTROL | PEDESTRIAN | BICYCLE | TRANSIT |
|---|---|---|---|---|
| Glen Avenue at Main Street | Unsignalized | There are no crosswalks nor sidewalks at the intersection. | There are no bicycle facilities at this intersection. Cyclists are permitted to share the road on all approaches. | There are no transit stops at the intersection. |
| Main Street at Averill Road | Unsignalized | There are no crosswalks nor sidewalks at the intersection. There is sidewalk south of this intersection extending to Grove Street. | There are no bicycle facilities at this intersection. Cyclists are permitted to share the road on all approaches. | There are no transit stops at the intersection. |
| Averill Road at Beech Street | Unsignalized | There are no crosswalks nor sidewalks at the intersection. There are sidewalks east of this intersection extending to Hill Street and just beyond. | There are no bicycle facilities at this intersection. Cyclists are permitted to share the road on all approaches. | There are no transit stops at the intersection. |
| Main Street at Grove Street | Unsignalized | There are sidewalks along the south side of Main Street and the west side of Grove Street north of Main Street. | There are no bicycle facilities at this intersection. Cyclists are permitted to share the road on all approaches. | There are no transit stops at the intersection. The Cooperstown Trolley has a stop at the adjacent Red Lot. |




*Cooperstown Trolley Map*

According to the Village, during trolley season (Memorial through Labor Day) there can be two trips per hour to the Red Lot. The trolleys enter from Glen Avenue and exit onto Main, turning right (east).

## 3.3 Planned/Programmed Highway Improvements

Grove Street is planned to undergo a paving project in Spring 2023 with sidewalks along the west side.

# 4.0 EXISTING CONDITIONS ANALYSIS

## 4.1 Peak Intervals for Analysis

Given the functional characteristics of the corridors, adjacent land uses, and the proposed land use for the project site, the peak hours selected for analysis are the weekday commuter AM and PM peak periods. The combination of site traffic and adjacent street traffic produces the greatest demand during these time periods.

## 4.2 Existing Traffic Volume Data

Passero Associates collected turning movement traffic counts on Thursday, March 30, 2023. This study conducted traffic counts between 7:00 to 9:00 AM and 4:00 to 6:00 PM to determine peak hour traffic volumes at each study intersection. All turning movement count data was collected on a typical weekday while local schools were in session. No adverse weather conditions impacted the traffic counts. The traffic volumes were reviewed for seasonality and to confirm the accuracy and relative balance of the collective traffic counts. This study applied a seasonality factor to the collected volumes due to the classification of the roadways as "non-commuter dominated" routes. Any differences in traffic volumes can be attributed to temporal variations in traffic volumes as well as activity related to driveways located in the segments between the study intersections. **Figure 3** illustrates the existing base peak hour traffic volumes used for this analysis.

## 4.3 Existing Crash Evaluation

The purpose of this crash analysis is to identify inherent safety issues by studying and quantifying historical crashes at the study intersections and identifying potential crash patterns and clusters. A crash cluster is defined as an abnormal occurrence of similar crash types occurring at approximately the same location or involving the same geometric features. The severity of the crashes should also be considered. A history of crashes is an indication that further analysis is required to determine the cause(s) of the crash(es) and to identify what actions, if any, could be taken to mitigate the crashes.

This study conducted a crash investigation within the study area to assess the safety history from July 31, 2017, through July 31, 2022. The data was provided by the New York State Department of Motor Vehicles through a Freedom of Information (FOIL) request. This study calculated actual crash rates for the study intersections and compared them with NYSDOT average crash rates for similar intersections, as summarized in **Table 3**. Intersection rates are listed as crashes per million entering vehicle (CR/MEV).

**Table 3:** *Intersection Crash Rate Analysis*

| INTERSECTION | CRASH FREQUENCY | ENTERING VEHICLE VOLUME | ACTUAL CRASH RATE | STATEWIDE AVERAGE CRASH RATE |
|---|---|---|---|---|
| Glen Avenue at Main Street | 1 | 5,432 vpd | 0.10 | 0.17 |
| Main Street at Averill Road | 0 | 295 vpd | 0.00 | 0.17 |
| Averill Road at Beech Street | 0 | 95 vpd | 0.00 | 0.17 |
| Main Street at Grove Street | 0 | 905 vpd | 0.00 | 0.35 |

The single crash involved a southbound driver slipping off Glen Avenue into a roadside ditch. No other crashes were reported within the study area.

## 4.4 Roadway Characteristics and Roadside Conditions

This study documented roadway characteristics within the study area and included road widths, pavement conditions, shoulder conditions (if available), gutter widths, crown, grades, roadside conditions, and sidewalk presence. The aerial on the following page illustrates road widths, sidewalks, grades, and gutter widths. Pavement quality is rated using NYSDOT's surface ratings scale: under construction, poor, fair, good, and excellent. No roadways within the neighborhood have centerline striping.

Main Street

The segment between Glen Avenue and Averill Road is approximately 17 feet wide with an upward grade from Glen Avenue. Pavement quality is generally fair with clearly visible signs of distress. There is an older guiderail on the western side of the road with advanced rust degradation. Towards Glen Avenue, the guiderail is bent and laying over from an apparent incident an undetermined time ago. There is little to no space from the edge of roadway due to topography. Southbound traffic is advised to travel 15 mph and other signage indicates hilly terrain and horizontal curves. There is an indication of a road crown.

The segment between Averill Road and Grove Street is approximately 17 to 18 feet wide with a downward grade from Averill Road. Pavement quality is generally fair with some portions with more severe distress. The segment of road closest to Irish Hill Cemetery leaves no space between the edge of roadway. There is a small grassy buffer between the back of gutter and sidewalk. There is an indication of a road crown.

Averill Road

Averill Road is generally 16 to 18 feet wide with an upward grade from Main Street. Pavement quality is generally fair from Main Street to the water tank. Beyond this point, the pavement quality is generally poor with severe distress in places. Grades are relatively flat between the water tank and the end of Averill Road. There are open shoulders on both sides. There is an indication of a road crown.

Beech Street

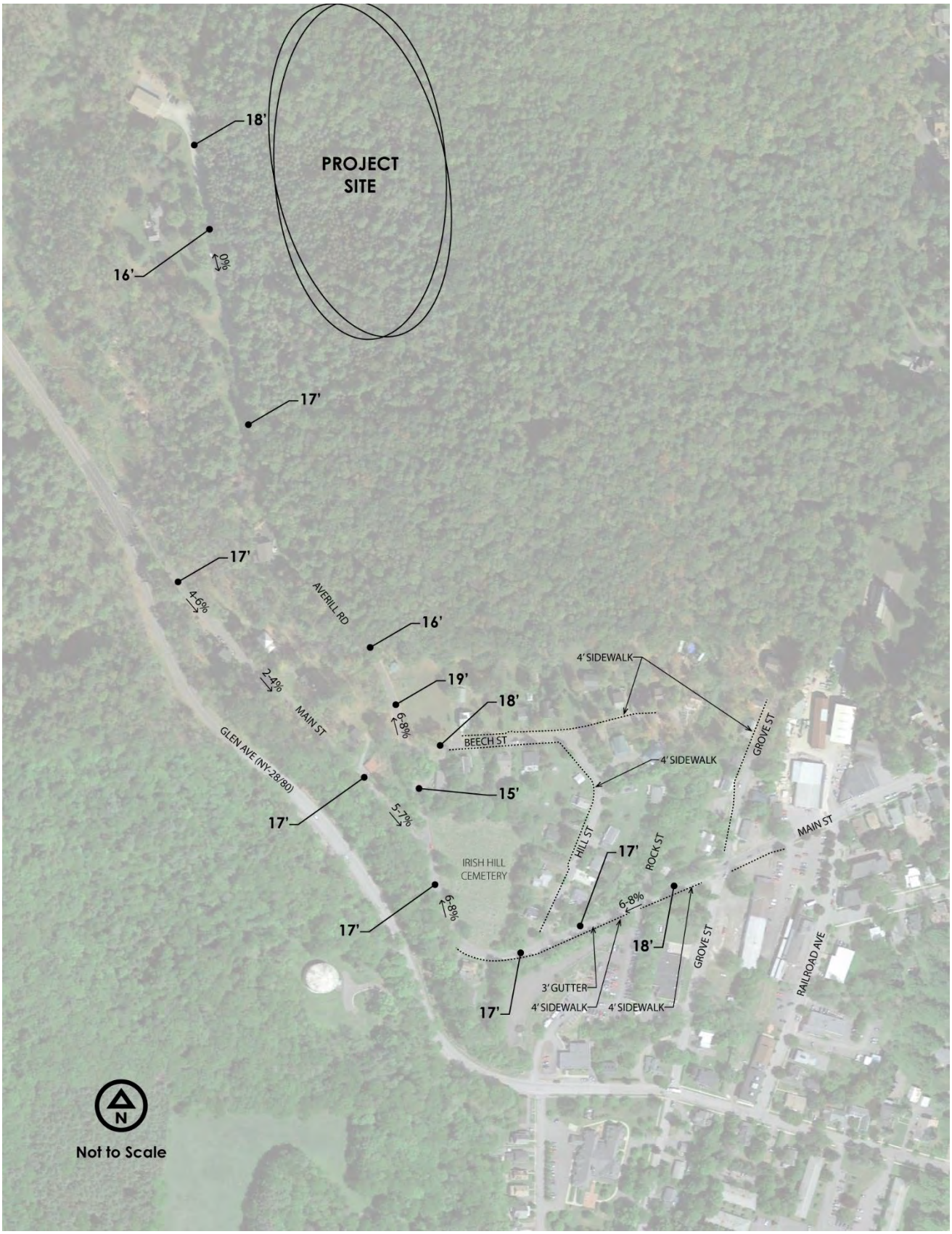
Beech Street is approximately 18 feet wide with a downward grade from Averill Road. Pavement quality is generally fair. There is a grassy buffer between the edge of the roadway and sidewalk along the northerly side. The southerly sidewalk directly abuts the roadway. There is a slight indication of a road crown.

Grove Street

Grove Street south of Main Street is approximately 24 feet wide. Pavement quality is poor with severe distress in places. There are open shoulders on both sides. There is an indication of a road crown. Grove Street north of Main Street is a dead-end street with an upward grade from Main Street. The pavement quality is generally fair.

Glen Avenue

Glen Avenue is approximately 30 to 32 feet wide with 11-foot travel lanes and variable shoulder widths. Pavement quality is good with minimal distress.


PROJECT SITE
18'
16'
0%
17'
17'
4.6%
AVERILL RD
16'
2.4%
MAIN ST
GLEN AVE (NY-28/80)
19'
6-8%
18'
BEECH ST
4' SIDEWALK
4' SIDEWALK
GROVE ST
15'
17'
5.7%
IRISH HILL CEMETERY
HILL ST
17'
ROCK ST
MAIN ST
17'
6-8%
6-8%
18'
GROVE ST
RAILROAD AVE
3' GUTTER
4' SIDEWALK
4' SIDEWALK
17'
N
Not to Scale

## 4.5 Sight Distance Evaluation

This study investigated available sight distances at the study intersections and proposed site access locations. Sight distance is provided at intersections to allow drivers to perceive the presence of potentially conflicting vehicles. This should occur in sufficient time for a motorist to stop or adjust their speed, as appropriate, to avoid a collision at the intersection.

Sight distance is also provided at intersections to allow the drivers of stopped vehicles a sufficient view of the intersecting highway to anticipate and avoid potential incidents. If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate Stopping Sight Distance (SSD) for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. To enhance traffic operations, Intersection Sight Distances (ISD) that exceed SSD are desirable along the major road.

*A Policy on Geometric Design of Highways and Streets* published by the American Association of State Highway and Transportation Officials (AASHTO) is used as a reference to establish the required SSD and desirable ISD. The required SSD and desirable ISD for a left turn from a stop are based on the design speed (posted plus 5 mph) for a given section of roadway. **Table 4** depicts the results. Sight distance that meets or exceeds the values are noted as adequate. Those that do not are noted with a reason.

**Table 4:** *Sight Distance Evaluation*

| INTERSECTION | POSTED SPEED | DESIGN SPEED | REQUIRED SSD | DESIRABLE ISD | AVAILABLE SIGHT DISTANCE TO THE: | |
|---|---|---|---|---|---|---|
| | | | | | LEFT | RIGHT |
| Glen Avenue at Main Street | 30 mph | 35 mph | 250′ | 390′ | SSD: Adequate<br>ISD: Adequate | SSD: Adequate<br>ISD: Adequate |
| Main Street at Averill Road<br>(Main Street from Glen Avenue) | 30 mph | 35 mph | 250′ | 390′ | SSD: Adequate<br>ISD: Adequate | SSD: Adequate<br>ISD: Short (Curve) |
| Main Street at Averill Road<br>(Averill Road traffic) | 30 mph | 35 mph | 250′ | 390′ | SSD: Adequate<br>ISD: Short (Curve) | SSD: Adequate<br>ISD: Short (Skew) |
| Averill Road at Beech Street | 30 mph | 35 mph | 250′ | 390′ | SSD: Adequate<br>ISD: Adequate | SSD: Adequate<br>ISD: Short (Curve) |
| Main Street at Grove Street | 30 mph | 35 mph | 250′ | 390′ | SSD: Adequate<br>ISD: Adequate | SSD: Adequate<br>ISD: Adequate |
| Averill Road at<br>Proposed Southerly Driveway | 30 mph | 35 mph | 250′ | 390′ | SSD: Adequate<br>ISD: Adequate | SSD: Adequate<br>ISD: Adequate |
| Averill Road at<br>Proposed Northerly Driveway | 30 mph | 35 mph | 250′ | 390′ | SSD: Adequate<br>ISD: Adequate | No access to right |

As indicated, four intersections have adequate sight distance conditions. Notably the two proposed driveway locations meet the requirements. For the proposed northerly driveway, no access is available to the north. Averill Road at Beech Street has inadequate ISD to the right (north) because of the curve. As noted, however, the required SSD is adequate. Main Street at Averill Road has ISD conflicts due to the intersection skew and the curve to the south. As noted, the required SSD is adequate. For Main Street traffic approaching Averill Road from the south, the required SSD is adequate, but the ISD is short due to the curve.

While taking these surveys, observed traffic speeds appeared to be slower than the village's posted 30 mph speed limit. Notably, Main Street between Glen Avenue and Averill Road for southbound traffic, an advisory 15 mph speed plaque is posted. The SSD and ISD requirements are less for slower vehicle speeds. This study found no crashes attributed to sight distance issues. Vegetation, where applicable, should be maintained to ensure sight distance is not impacted the study intersections. Intersection warning signage should be installed for southbound drivers along Main Street approaching Averill Road. The *Manual on Uniform Traffic Control Devices* (MUTCD) defines this signage as W2-3 and be installed to match the intersection configuration approximately 250' in advance of the intersection and not in conflict with existing signage.

# 5.0 BACKGROUND (NO BUILD) CONDITIONS

Construction of the proposed project is anticipated to reach full completion within approximately two years depending on market conditions. The widely accepted methodology for preparing traffic impact studies requires that any projects in the study area that are currently approved and/or under construction must be considered in the traffic analysis. Projects that are contemplated but not yet approved are not included in a traffic analysis. Local municipal personnel were contacted to discuss any other specific projects that are currently approved or under construction that would generate additional traffic in the study area. Municipal personnel did not identify any projects, aside from the proposed action.

A review of available historical NYSDOT traffic volume data in the vicinity of the site indicates that traffic has fluctuated between 2010 and 2023. To account for normal increases in background traffic growth, including any unforeseen developments in the study area, a growth rate of 1.0% was applied to the existing traffic volumes. **Figure 4** depicts the background traffic volumes.

# 6.0 PROPOSED DEVELOPMENT CONDITIONS

## 6.1 Project Description

The proposed project will construct a 24-unit apartment building and 12 townhome units for a total of 36 multifamily units. Under the proposed action, two driveways will be constructed along Averill Road.

## 6.2 On-site Circulation and Parking

Sidewalks are planned throughout the site to connect the buildings to the parking lots, provide connections between one another, and provide access out to Averill Road. Each access driveway will be two-way. A total of 81 parking spaces are planned. Village code requires one space per unit with one bedroom or fewer and two spaces per unit with two bedrooms or more.

## 6.3 Proposed Traffic Generation

The volume of traffic generated by a site is dependent on the intended land use and size of the development. Trip generation is an estimate of the number of trips generated by a specific building or land use. These trips represent the volume of traffic entering and exiting the development. The *Trip Generation Manual* (11$^{th}$ Edition) published by the Institute of Transportation Engineers (ITE) is used as a reference for this information. The trip rate for the peak hour of the generator may or may not coincide in time or volume with the trip rate for the peak hour of adjacent street traffic. Volumes generated during the peak hour of the adjacent street traffic and proposed land use, in this case, the weekday commuter AM and PM peak hours, represent a more critical volume when analyzing the capacity of the system; those

intervals will provide the basis of this analysis. **Table 5** shows the estimated site generated trips that will be added to the existing roadway system under full project development.

**Table 5:** *Site Generated Trips*

| DESCRIPTION | SIZE | AM PEAK HOUR | | PM PEAK HOUR | |
|---|---|---|---|---|---|
| | | ENTER | EXIT | ENTER | EXIT |
| Single-Family Attached (ITE 215) | 12 units | 1 | 4 | 4 | 3 |
| Multifamily Housing (ITE 220) | 24 units | 7 | 23 | 19 | 11 |
| **Total Trip Generation** | | **8** | **27** | **23** | **14** |

The proposed project is expected to generate approximately eight entering/27 exiting vehicle trips during the AM peak hour and 23 entering/14 exiting vehicle trips during the PM peak hour.

## 6.4 Trip Distribution

The cumulative effect of site-generated traffic on the transportation network is dependent on the origins and destinations of that traffic and the location of the access drives serving the site. The proposed arrival/departure distribution of traffic generated by the proposed project is considered a function of several parameters, including:

- Employment centers using US Census data.
- Commercial centers in the greater area.
- Proximity and access to the village's business district.
- Surrounding roadway network.
- Site layout and driveway locations.
- Existing traffic patterns.
- Existing traffic conditions and controls.

**Figure 5** shows the anticipated trip distribution pattern percentages for the project. **Figure 6** illustrates the total peak hour project site-generated traffic based on those percentages.

## 6.5 Full Development Volumes

The proposed design hour traffic volumes are developed for the peak hours by combining the background traffic conditions (**Figure 4**) and the new site-generated traffic volumes (**Figure 6**) to yield the traffic volumes under full development conditions. **Figure 7** illustrates the total peak hour volumes anticipated for the proposed project under full build-out conditions.

# 7.0 TRAFFIC OPERATIONS AND ANALYSIS

## 7.1 Left-Turn Warrant Investigation

This study used Transportation Research Board's (TRB) *NCHRP Report 279 Intersection Channelization Design Guide* to evaluate the volume warrants for a left-turn treatment at the Glen Avenue/Main Street intersection. Provisions for left-turn lane facilities should be established where traffic volumes are high enough and safety considerations are sufficient to warrant the additional lane. This investigation analyzed warrants during the weekday AM and PM peak hours for the intersection under full development conditions. The warrants are based on the design speed of the major roadway.

The combination of southbound traffic volumes turning left onto Main Street from Glen Avenue and the design speed of Glen Avenue indicate that a left-turn treatment is not warranted during either peak hour.

## 7.2 Description of Capacity Analysis

Capacity analysis is a technique used for determining a measure of effectiveness for a section of roadway and/or intersection based on the number of vehicles during a specific time period. The measure of effectiveness used for the capacity analysis is referred to as a Level of Service (LOS). Levels of service are calculated to provide an indication of the amount of delay that a motorist experiences while traveling along a roadway or through an intersection. Since the most amount of delay to motorists usually occurs at intersections, capacity analysis focuses on intersections, as opposed to highway segments.

The standard procedure for capacity analysis of signalized and unsignalized intersections is outlined in the *Highway Capacity Manual* (HCM) 7th Edition published by the TRB. Traffic analysis software, Synchro 11, which is based on procedures and methodologies contained in the HCM, was used to analyze operating conditions at study area intersections. The procedure yields a level of service based on the HCM as an indicator of how well intersections operate.

Six levels of service are defined for analysis purposes. They are assigned letter designations, from "A" to "F", with LOS "A" representing the conditions with little to no delay, and LOS "F" conditions with very long delays. LOS "C" or better is desirable, but LOS "D" for signalized locations and LOS "E" for unsignalized locations are generally thresholds of acceptable operation during peak periods so long as the volume to capacity ratio (v/c) is below 1.0. **Table 6** depicts level of service criteria for both signalized and unsignalized intersections.

**Table 6:** *Level of Service Criteria*

| LEVEL OF SERVICE | SIGNALIZED CONTROL DELAY PER VEHICLE (seconds) | STOP CONTROL DELAY PER VEHICLE (seconds) |
|---|---|---|
| A | < 10 | < 10 |
| B | 10 – 20 | 10 – 15 |
| C | 20 – 35 | 15 – 25 |
| D | 35 – 55 | 25 – 35 |
| E | 55 – 80 | 35 – 50 |
| F | > 80 | > 50 |

LOS for signalized intersections is defined in terms of delay specifically, average total delay per vehicle for a 15-minute analysis period. LOS for unsignalized intersections, however, are different from a signalized intersection. The primary reason for this is driver expectation that a signalized intersection is designed to carry higher volumes than an

unsignalized intersection. Unsignalized intersections are also associated with more uncertainty for users, as delays are less predictable than they are at signals.

The v/c ratio, also referred to as degree of saturation, represents the sufficiency of an intersection to accommodate the vehicular demand. A v/c ratio less than 0.85 generally indicates that adequate capacity is available, and vehicles are not expected to experience significant queues and delays. As the v/c ratio approaches 1.0, traffic flow may become unstable, and delay and queuing conditions may occur.

This report performed traffic simulation modeling using an extension of Synchro called SimTraffic. During simulation modeling, vehicles are individually tracked, and statistics are recorded on a second-by-second basis to determine the delays each vehicle experiences. Since SimTraffic simulation modeling is microscopic and stochastic, meaning car movement parameters vary randomly within a set distribution based on an initial seed number, the same traffic volume may result in slightly different results depending on the random seed used. Therefore, simulation results are reported based on an average value of multiple simulation runs to reduce the variability in results.

The intersection of Main Street/Averill Road is unique given the approach angles and stop-controlled Averill Road approach. Additionally, the HCM is unable to calculate delays for the intersection of Glen Avenue/Main Street given the one yield-controlled approach. Given these conditions, the results for these intersections are determined via SimTraffic.

## 7.3 Capacity Analysis Results

Existing and background operating conditions during the peak study periods are evaluated to determine a basis for comparison with the projected future conditions. Future traffic conditions generated by the project are analyzed to assess the operation of the study area intersections. **Table 7** describes the capacity results for existing, background, and full development conditions. The discussion following the table summarizes capacity conditions.

| INTERSECTION | 2023 EXISTING BASE CONDITIONS | | | | 2025 BACKGROUND CONDITIONS | | | | 2025 FULL BUILD CONDITIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AM | | PM | | AM | | PM | | AM | | PM | |
| **1. Glen Ave/Main St (U)** | | | | | | | | | | | | |
| WB - Main St | A | 0.3 | A | 2.2 | A | 0.2 | A | 2.2 | A | 0.8 | A | 1.9 |
| NB - Glen Ave | A | 0.3 | A | 0.6 | A | 0.3 | A | 0.7 | A | 0.3 | A | 0.7 |
| SB - Glen Ave | A | 0.5 | A | 0.2 | A | 0.5 | A | 0.2 | A | 0.6 | A | 0.4 |
| **2. Main St/Averill Rd (U)** | | | | | | | | | | | | |
| SEB - Main St | A | 0.1 | A | 0.0 | A | 0.4 | A | 0.0 | A | 0.1 | A | 0.2 |
| NB - Main St | A | 2.9 | A | 0.1 | A | 0.1 | A | 0.1 | A | 0.0 | A | 0.0 |
| SB - Averill Rd | A | 2.9 | A | 5.6 | A | 2.8 | A | 6.0 | A | 3.4 | A | 3.9 |
| **3. Main St/Grove St (U)** | | | | | | | | | | | | |
| EB - Main St | A | 0.0 | A | 0.0 | A | 0.0 | A | 0.0 | A | 0.0 | A | 0.0 |
| WB - Main St | A | 7.3 | A | 7.3 | A | 7.3 | A | 7.3 | A | 7.4 | A | 7.3 |
| NB - Grove St | A | 8.9 | A | 8.7 | A | 8.9 | A | 8.8 | A | 9.1 | A | 9.1 |
| SB - Grove St | A | 9.4 | A | 9.5 | A | 9.4 | A | 9.5 | A | 9.5 | A | 9.6 |
| **4. Averill Rd/Beech St (U)** | | | | | | | | | | | | |
| WB - Beech St | A | 8.6 | A | 0.0 | A | 8.6 | A | 0.0 | A | 9.0 | A | 0.0 |
| SB - Averill Rd | A | 0.0 | A | 0.0 | A | 0.0 | A | 0.0 | A | 0.0 | A | 0.0 |
| **5. Averill Rd/Proposed Southerly Dwy (U)** | | | | | | | | | | | | |
| WB - Proposed Southerly Dwy | NA | | NA | | NA | | NA | | A | 8.7 | A | 8.7 |
| SB - Averill Rd | | | | | | | | | A | 0.0 | A | 0.0 |
| **5. Averill Rd/Proposed Northerly Dwy (U)** | | | | | | | | | | | | |
| WB - Proposed Northerly Dwy | NA | | NA | | NA | | NA | | A | 8.6 | A | 8.6 |
| SB - Averill Rd | | | | | | | | | A | 0.0 | A | 0.0 |

**1. Glen Avenue/Main Street**

All movements operate at LOS "A" under existing and projected background conditions. No changes in level of service are projected with the construction of the proposed project. The project is estimated to constitute less than 1.5% of total intersection volumes during either peak hour. Based on these conditions, no capacity improvements are warranted nor recommended at this location.

**2. Main Street/Averill Road**

All movements operate at LOS "A" under existing and projected background conditions. No changes in level of service are projected with the construction of the proposed project. Based on these conditions, no capacity improvements are warranted nor recommended at this location.

As noted, the required stopping sight distances are met for all approaches to the intersection. Southbound Averill Road is the only stop-controlled approach. This study considered the merits of all-way stop-controls (AWSC). The *Manual on Uniform Traffic Control Devices* (MUTCD) provides guidance on the establishment of AWSC. Such criteria to consider are crashes within a 12-month period, minimum vehicular volumes, approach speeds, left-turn conflicts, and sight distances.

Traffic controls, such as AWSC or signals, have pros and cons. One such benefit of AWSC is that all traffic is required to stop and visualize the other approaches before continuing their movements. Locations with heavy pedestrian volumes are also benefitted by AWSC. However, if unwarranted AWSC can contribute to increased speeds if drivers do not see the need for it.

The intersection did not have any reported crashes over a five-year period. Speeds are generally slower than the Village's posted speed limit of 30 mph. Given that the study area and proposed project is generally residential in nature and are very low-volume, drivers are more apt to be familiar with local traffic conditions. An AWSC is not currently recommended. An intersection warning sign for southbound Main Street traffic is recommended to alert these drivers that traffic is possibly approaching from Averill Road to the left.

**3. Main Street/Grove Street**

All movements operate at LOS "A" under existing and projected background conditions. No changes in level of service are projected with the construction of the proposed project. Based on these conditions, no capacity improvements are warranted nor recommended at this location.

**4. Averill Road/Beech Street**

All movements operate at LOS "A" under existing and projected background conditions. No changes in level of service are projected with the construction of the proposed project. Based on these conditions, no capacity improvements are warranted nor recommended at this location.

**5. Averill Road/Proposed Driveways**

All movements are projected to operate at LOS "A" during both peak hours. No capacity improvements are warranted nor recommended at the proposed driveways.

# 8.0 OTHER CONSIDERATIONS

## 8.1 Road Widths and Circulation

The Village identified several items to address within this report, some of which were discussed earlier. Relative to the noted road widths, the NYSDOT *Highway Design Manual* (HDM) Chapter 2 Design Criteria provides standard values for the critical design elements for each functional classification of arterials, collectors, and local roads for urban and rural conditions.

Aside from Glen Avenue, all study area roads are local rural roadways with an ADT less than 400 vpd. Given this, NYSDOT's criteria states that travel lane widths should be nine feet minimum with two-foot shoulders. The maximum grade for level terrain is 7% and 10% for rolling terrain. The AASHTO guide on very low-volume roadways states that total roadway width, including width of both traveled way and shoulders, is 18 feet. Although there have been no reported issues to date, the Village should consider widening Averill Road to 18 feet considering roadside features, right of way width, and drainage implications during routine maintenance or a capital improvement project.

This analysis considered designating one or more of the study streets as one-way. However, there are emergency access, residential access, and traffic operation implications with this consideration. Averill Road requires two-way travel as it is a dead-end road. Despite the roadway geometry within the study area and noting the lack of reported crashes relative to geometric features, no change in circulation patterns is currently recommended.

## 8.2 Roadside Barriers

Although there are no nationally adopted warrants for installing roadside barriers, they are used to prevent incidents with roadside hazards after a review of localized conditions considering speeds, curve, type of hazard, traffic volumes, crash history, and grades. Barriers can be helpful in reducing severe injury from crashes but can be aesthetically and environmentally detrimental if unnecessary. Guidance on roadside barrier use is contained in *Barrier Guide for Low Volume and Low Speed Roads* published by the FHWA. Currently, Main Street features barriers along its westerly side due to a vertical drop from the edge of roadway. These barriers should be kept in place and maintained and/or replaced when necessary. The following images show the location of the guardrail at the curve of Main Street.

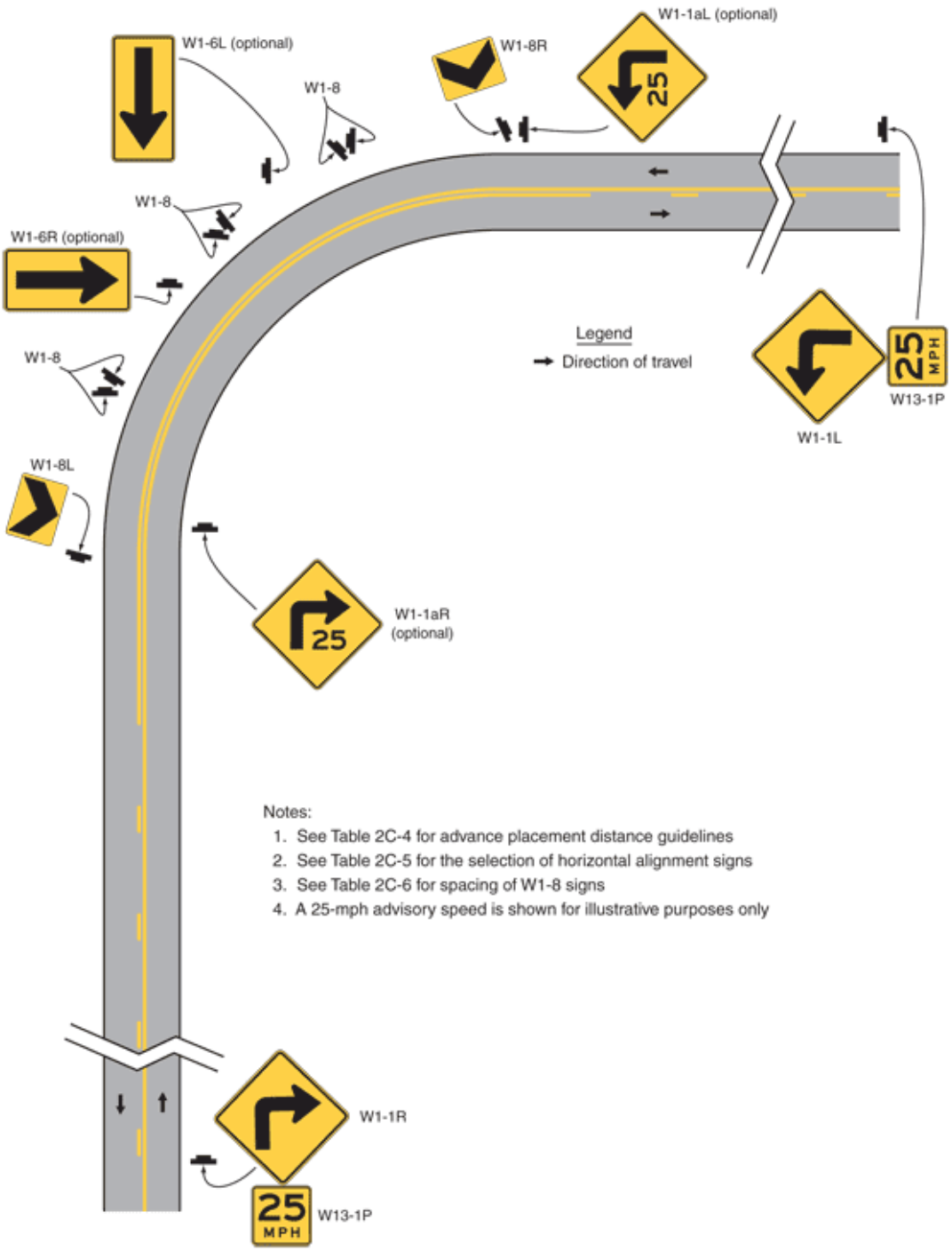
*Main Street looking south*


*Main Street at the curve traveling north*

An additional guardrail could be helpful as a preventive measure. Impacts to the existing vegetative screening for the property owner and ROW for constructing the treatment should be considered. In lieu of additional guardrail, horizontal

turn warning signs may also be considered as a cost-effective measure to visually highlight the curve during daytime and nighttime conditions. This can be supplemented with an advisory speed plaque advising drivers to maintain a slower speed through the curve. An example of warning signs for a turn from the MUTCD is shown below.

**Figure 2C-2. Example of Warning Signs for a Turn**



## 8.3 Averill Road at Main Street Pavement Friction

It has been noted that drivers may experience slippery conditions while approaching the intersection from the north along Averill Road, although there were no reported crashes. These are typically reported during associated weather events (e.g., rain, snow, ice) and can contribute to drivers sliding through the intersection. The downward grade is approximately 5-7 degrees. This assessment did not measure pavement friction as it is outside the scope of the study. A friction test is performed with specialized equipment.

In winter weather conditions, the approach should be adequately maintained to reduce snow and ice accumulation. Additionally, the Village may consider pavement friction management treatments, such as a high friction surface treatment (HFST) in this spot location, as described by the FHWA in their *Proven Safety Countermeasures initiative* (PSCi). HFST applications work best in locations with downward grades seeking to improve safety and are applied over existing pavement.

## 8.4 Main Street at Grove Street Intersection Alternatives

This report considered two alternative intersection designs for the existing intersection. Currently, pedestrians traveling along Main Street and crossing Grove Street must walk around or on top of the channelized island. This may be difficult for those with sight challenges and mobility challenges. Two alternatives are proposed for consideration which seek to improve the pedestrian experience without adversely impacting operations and are shown in **Figure 8**.

Alternative 1 provides a pedestrian refuge within the existing island and new curb ramps at the ends of the new crosswalk. The total crossing distance remains approximately 82 feet. Alternative 2 proposes realigning the northbound approach by decreasing the size of the radius along the easterly side. This plan shortens the crossing distance from 82 feet to approximately 52 feet. Upon review by the Village, the preferred alternative is Alternative 1, which keeps the channelized island yet improves pedestrian conditions with consideration for stormwater impacts. Considerations for this are the lack of offset Alternative 2 creates and the potential cost for relocation of the existing utility pole.

## 8.5 Conceptual Sidewalk Project

The graphic on the following page illustrates the locations of a new sidewalk for potential installation by the Village prepared by Keplinger Freeman Associates. Throughout the scoping process for this project, the Village expressed a desire to review pedestrian connectivity between the project site and the existing sidewalk network. It is noted that the existing pavement width in the stretch of Averill Road between Beech Street and the project boundary is generally 16 to 17 feet. The following photos depict the existing condition of this segment.


*From Beech Street looking north*

*Looking south*

*Looking north*

*Looking south*

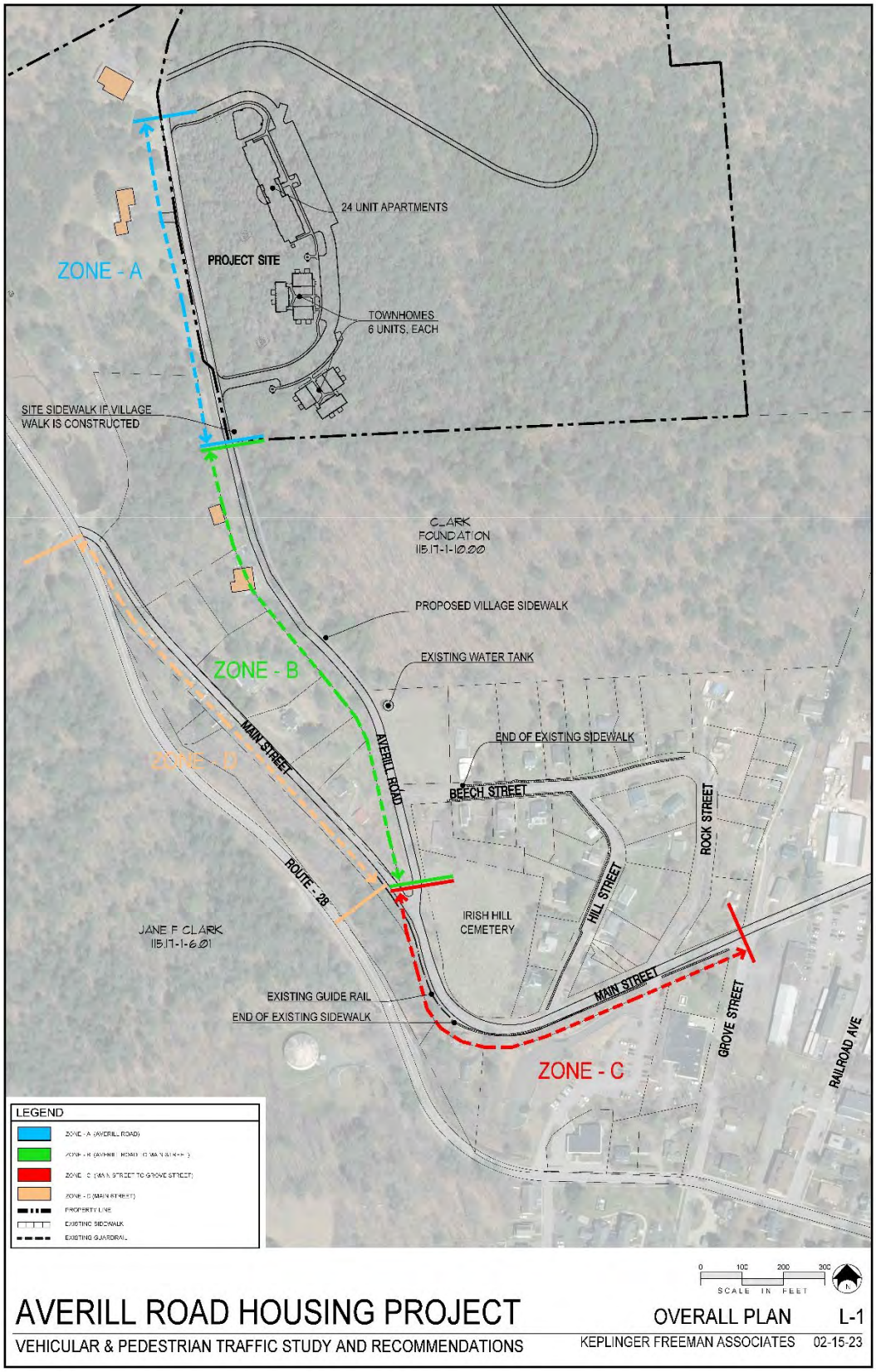
Roadside conditions in this segment vary, consisting of a vertical drop along the western side, narrow roadside width between the edge of pavement and existing trees, potential utility locations, proximity between the edge of road and Irish Hill Cemetery south of Beech Street, and other existing grades.

Typically, new sidewalks should be five feet wide and no less than three feet in constrained locations with the opportunity for passing zones of five feet in width every 200 feet. Along certain roadway types, a planting strip is highly beneficial to provide more separation between a pedestrian and motor vehicle. Drainage should be considered throughout the design and construction process as curbed or sections without curb will impact sidewalk conditions.

In this case, construction of a new sidewalk is impacted by the aforementioned factors, potential right of way impacts, likely high construction cost, and maintenance responsibility being placed on the abutting property owners. Therefore, new sidewalks are not recommended in this segment.

The segment between Main Street and Averill Road to the existing sidewalk along the south side of Main Street adjacent to Irish Hill Cemetery has an abrupt grade change between the edge of roadway and the cemetery on the north side. Along the south and west sides, there is a vertical drop behind the existing guardrail. A utility pole is located on this side at the curve. A new sidewalk in this short segment, as was mentioned above, needs to consider these unique factors. Given the limited roadside width, sidewalk placement may be based on the current sidewalk located along Hill Street, as shown in the following image depending on drainage patterns.


*Hill Street at Main Street*


24 UNIT APARTMENTS
PROJECT SITE
ZONE - A
TOWNHOMES
6 UNITS, EACH
SITE SIDEWALK IF VILLAGE
WALK IS CONSTRUCTED
CLARK
FOUNDATION
115.17-1-10.00
PROPOSED VILLAGE SIDEWALK
EXISTING WATER TANK
ZONE - B
ZONE - D
MAIN STREET
AVERILL ROAD
END OF EXISTING SIDEWALK
BEECH STREET
ROCK STREET
HILL STREET
ROUTE - 28
IRISH HILL
CEMETERY
JANE F CLARK
115.17-1-6.01
EXISTING GUIDE RAIL
END OF EXISTING SIDEWALK
MAIN STREET
GROVE STREET
RAILROAD AVE
ZONE - C
LEGEND
PROPERTY LINE
EXISTING SIDEWALK
EXISTING GUARDRAIL
0 100 200 300
SCALE IN FEET
AVERILL ROAD HOUSING PROJECT
OVERALL PLAN
L-1
VEHICULAR & PEDESTRIAN TRAFFIC STUDY AND RECOMMENDATIONS
KEPLINGER FREEMAN ASSOCIATES
02-15-23

## 8.6 Advisory Shoulder Consideration

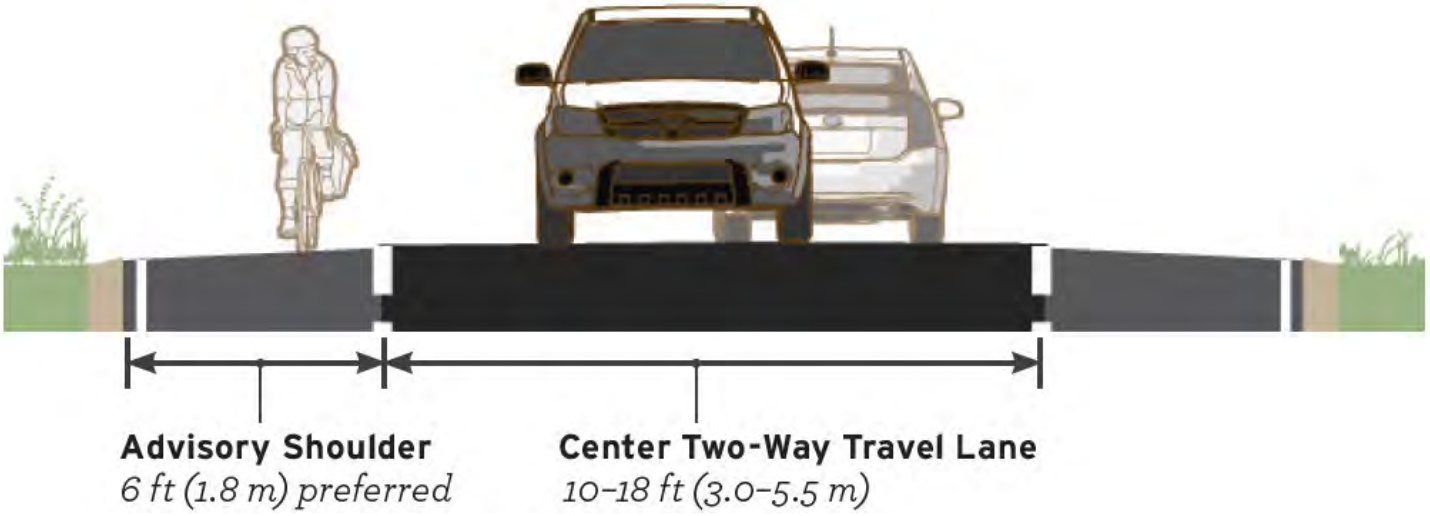
In lieu of new sidewalks, advisory shoulders may be considered as a treatment to create space for pedestrians on Averill Road. It should be noted that the FHWA currently is not considering new requests to experiment with this treatment; however, that is not to say a municipality cannot implement this treatment along local roadways. *Small Town and Rural Multimodal Networks*, published by the FHWA, provides a description of this treatment.

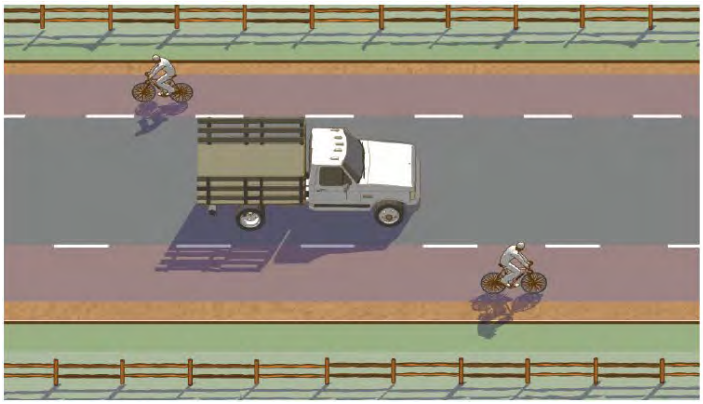
Advisory shoulders, primarily installed for bicyclists, "create usable shoulders for bicyclists on a roadway that is otherwise too narrow to accommodate one. Motorists may only enter the shoulder when no bicyclists are present and must overtake these users with caution due to potential oncoming traffic," according to the FHWA. Accessibility guidelines should be met if used by pedestrians. These treatments are in place in communities throughout the United States, such as Ohio, South Dakota, Illinois, New Hampshire, Vermont, Minnesota, and Indiana. In Hanover, New Hampshire, a planning study indicated that pedestrian and bicycle connections were desired along Valley Road. The outcome of the study resulted in a public works project which restriped the roadway for pedestrian and bicycle use. Valley Road is a low-volume, low-speed, residential road. The following images show two examples of advisory shoulders along low-volume, low-speed roads.

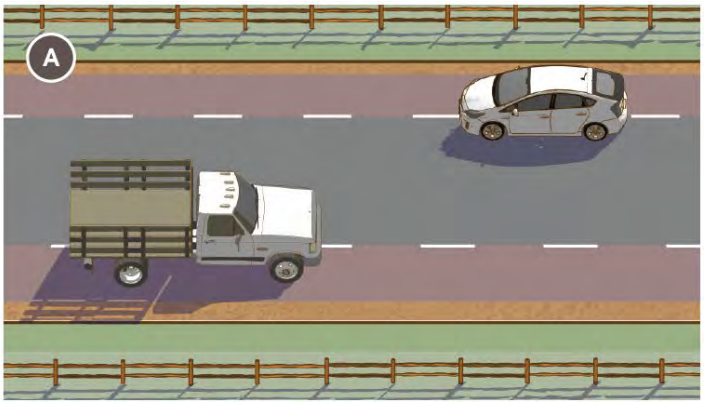
*Valley Road, New Hampshire (FHWA)*


*Morton Road, Maine (advisorybikelanes.com)*

The following illustrations show the general cross section and procedure for how motorists use the roadway (*Small Town and Rural Multimodal Networks,* FHWA).






General design considerations are:

- Absolute minimum shoulder space is four feet wide with no curb and gutter.
- The practical minimum width of center lane is 10 feet.
- Signage should be used to clarify roadway use.
- The advisory shoulder should be discontinued 50 feet in advance of a stop-controlled intersection approach.

# 9.0 CONCLUSIONS AND RECOMMENDATIONS

The results of this comprehensive study determined that the existing transportation network can adequately accommodate the projected traffic volumes and resulting minor impacts to study area intersections. The following sets forth the conclusions and recommendations based upon the results of the analyses:

1. The proposed project is expected to generate approximately eight entering/27 exiting vehicle trips during the AM peak hour and 23 entering/14 exiting vehicle trips during the PM peak hour.

2. All movements operate at level of service "A" under existing and projected background conditions during the AM and PM peak hours. No changes in level of service are projected with the construction of the proposed project.

3. The combination of southbound traffic volumes turning left onto Main Street from Glen Avenue and the design speed of Glen Avenue indicate that a left-turn treatment is not warranted during either peak hour.

4. The roadside barriers along Main Street should remain and be maintained and/or replaced when necessary.

5. The study area roadways are considered very low-volume roadways, notably Averill Road which carries less than 40 vehicles per day.

6. Although there have been no reported issues to date, the Village should consider widening Averill Road to 18 feet considering roadside features, right of way width, and drainage implications during routine maintenance or a capital improvement project.

7. This study considered a new sidewalk along Averill Road between Beech Street and the project site, but was dismissed for several reasons: a vertical drop along the western side; narrow roadside width between the edge of pavement and existing trees; potential utility locations; proximity between the edge of road and Irish Hill Cemetery south of Beech Street; potential right of way impacts; likely high construction cost; and maintenance responsibility being placed on the abutting property owners.

8. In lieu of new sidewalks, advisory shoulders may be considered as a treatment to create space for pedestrians on Averill Road. It should be noted that the FHWA currently is not considering new requests to experiment with this treatment; however, that is not to say a municipality cannot implement this treatment along local roadways.

9. A sidewalk between the Main Street curve and the intersection of Main Street/Averill Road may be considered; however, there are tradeoffs relative to roadside conditions, construction cost, and maintenance responsibility.

10. Based on the intersection alternatives at Main Street and Grove Street, as shown in **Figure 8**, the preferred alternative is Alternative 1 given the lack of offset Alternative 2 creates and the potential cost for relocation of the existing utility pole.

11. There are no significant adverse traffic impacts because of full development of the proposed project.

# 10.0 REFERENCES


- Synchro 11 Software. Cubic ITS.
- Highway Capacity Manual (7h Edition). Transportation Research Board (TRB). Washington, DC. 2022.
- Highway Functional Classification Concepts, Criteria, and Procedures. FHWA. 2013.
- A Policy on Geometric Design of Highways and Streets. The American Association of State Highway and Transportation Officials (AASHTO). 2011.
- OnTheMap. US Census Bureau. 2023.
- Traffic Data Viewer. New York State Department of Transportation (NYSDOT). 2023.
- Manual on Uniform Traffic Control Devices (MUTCD). Federal Highway Administration. 2009.
- NCHRP Report 279 Intersection Channelization Design Guide. TRB. 1985.
- Highway Design Manual. NYSDOT. Latest Revisions.
- Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT ≤ 400). AASHTO. 2001.
- Barrier Guide for Low Volume and Low Speed Roads. FHWA. 2005.
- Proven Safety Countermeasures Initiative. FHWA. 2023.
- Small Town and Rural Multimodal Networks. FHWA. 2016.


# 11.0 FIGURES

Figures 1 through 9 are included on the following pages.


5138
AVERILL ROAD

1 L0.0 ADDRESS SIGNAGE

0 50 100 150
SCALE IN FEET

in ARCHITECTS
239 E. Water Street - 2nd Fl.
Syracuse, New York 13202
www.in-ARCHITECTS.com



(PRELIMINARY DRAWING SET)
# AVERILL ROAD HOUSING
AVERILL ROAD
COOPERSTOWN, NEW YORK

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AT THE SITE AND PROMPTLY NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES.

| REVISIONS | | |
|---|---|---|
| NO. | DESCRIPTION | DATE |
| 1 | PB SUBMISSION | 12/06/22 |

OVERALL SITE PLAN - NORTH

| | |
|---|---|
| Project Status | PROGRESS |
| Date | 01/03/2023 |
| Project Number | 42074 |
| Drawn By | ALS |
| Checked By | SLF |

L0.0

**Figure 1**

PASSERO
engineering architecture


**Averill Road Housing Project** | Village of Cooperstown, Otsego County, NY

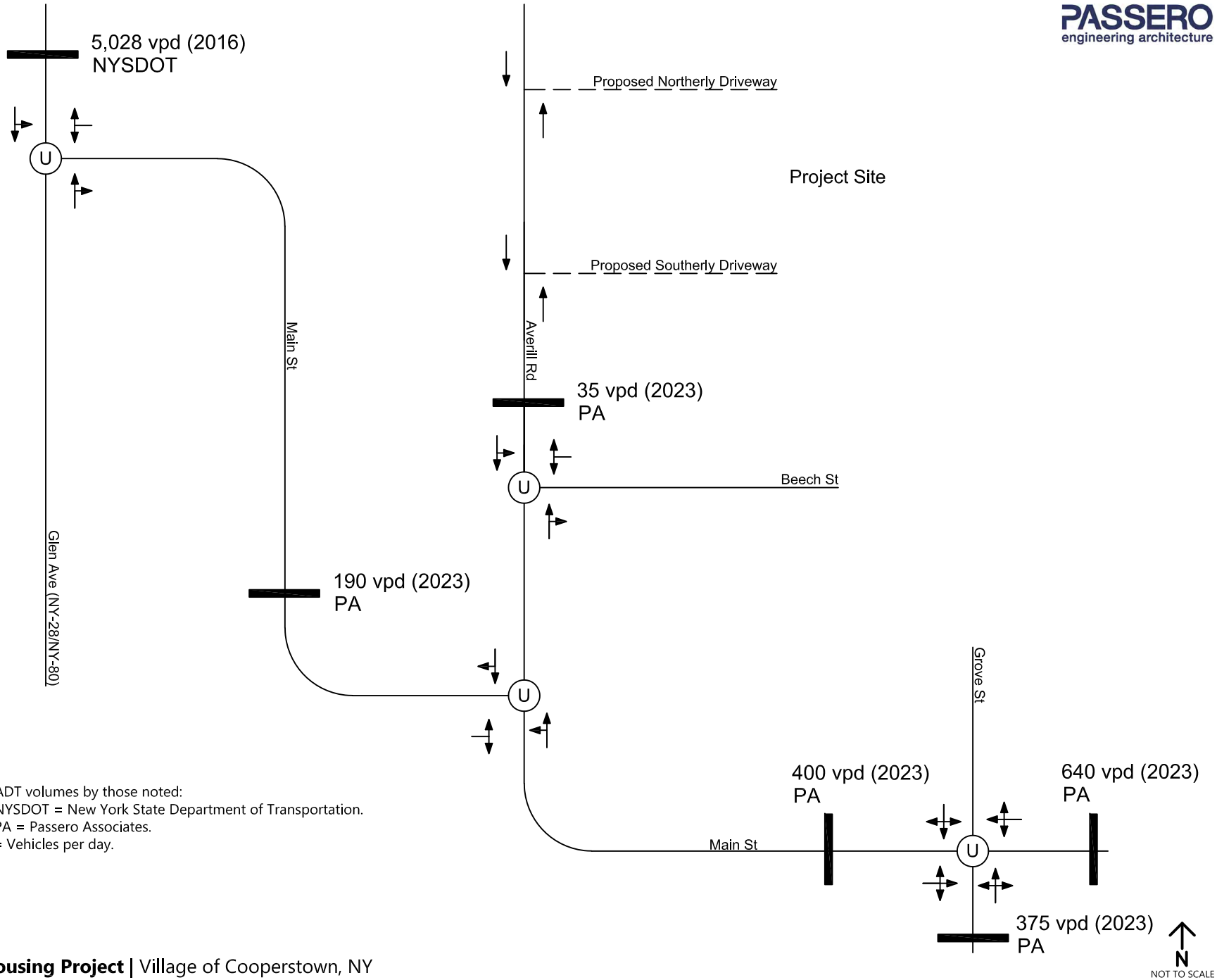
**Site Location and Study Area**

Key:
- # Study Intersection
- # Proposed Intersection
- Study Area

*Project Number: 20233551.0001*

**Figure 2**

PASSERO engineering architecture




Notes:
1. All AADT volumes by those noted:
   1.1. NYSDOT = New York State Department of Transportation.
   1.2. PA = Passero Associates.
2. vpd = Vehicles per day.

**Averill Road Housing Project** | Village of Cooperstown, NY

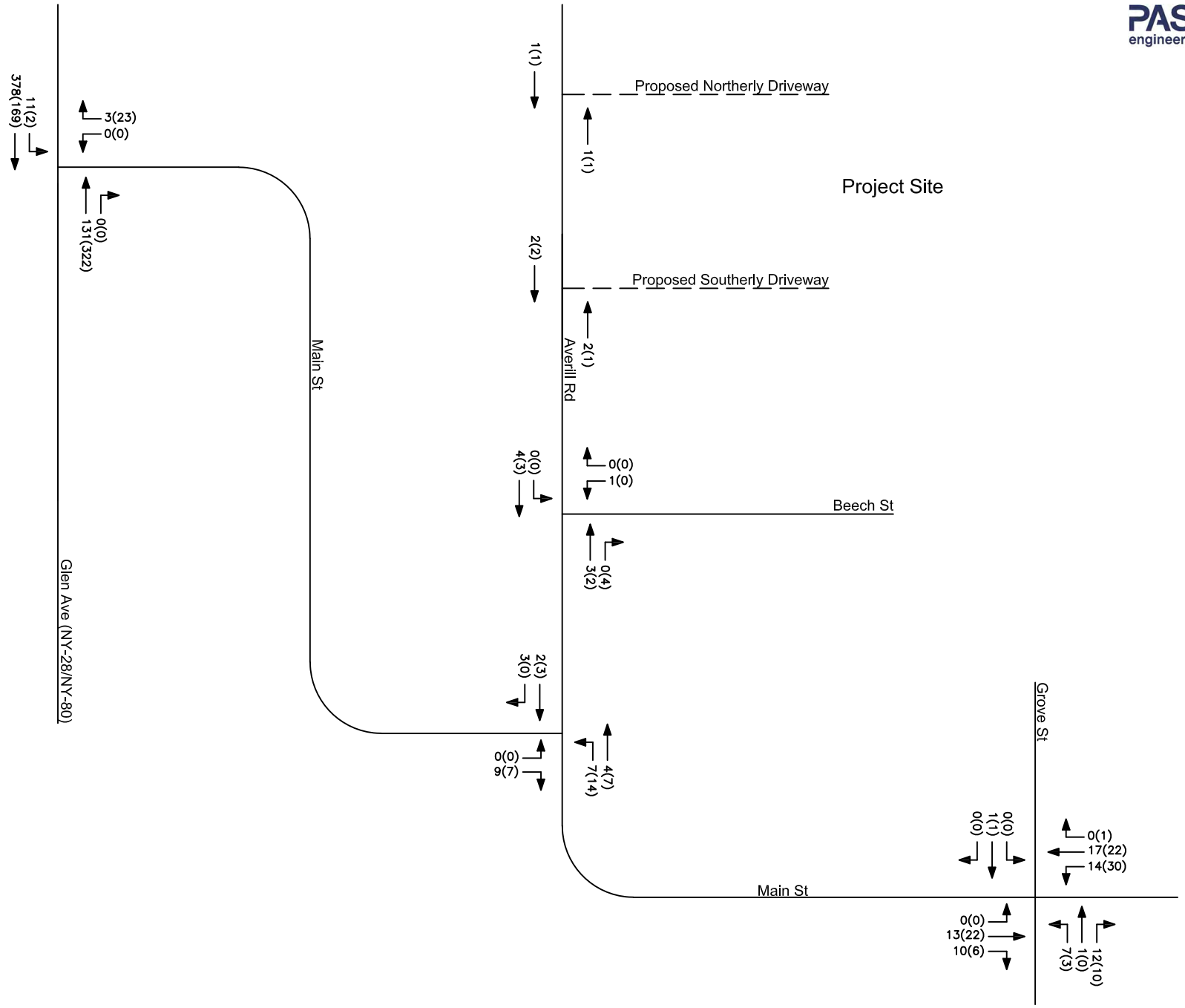
**Lane Geometry and Average Daily Traffic**

KEY:
– – – Proposed Access
U = Unsignalized

*Project Number: 20233551.0001*

**Figure 3**

PASSERO engineering architecture




**Averill Road Housing Project** | Village of Cooperstown, NY

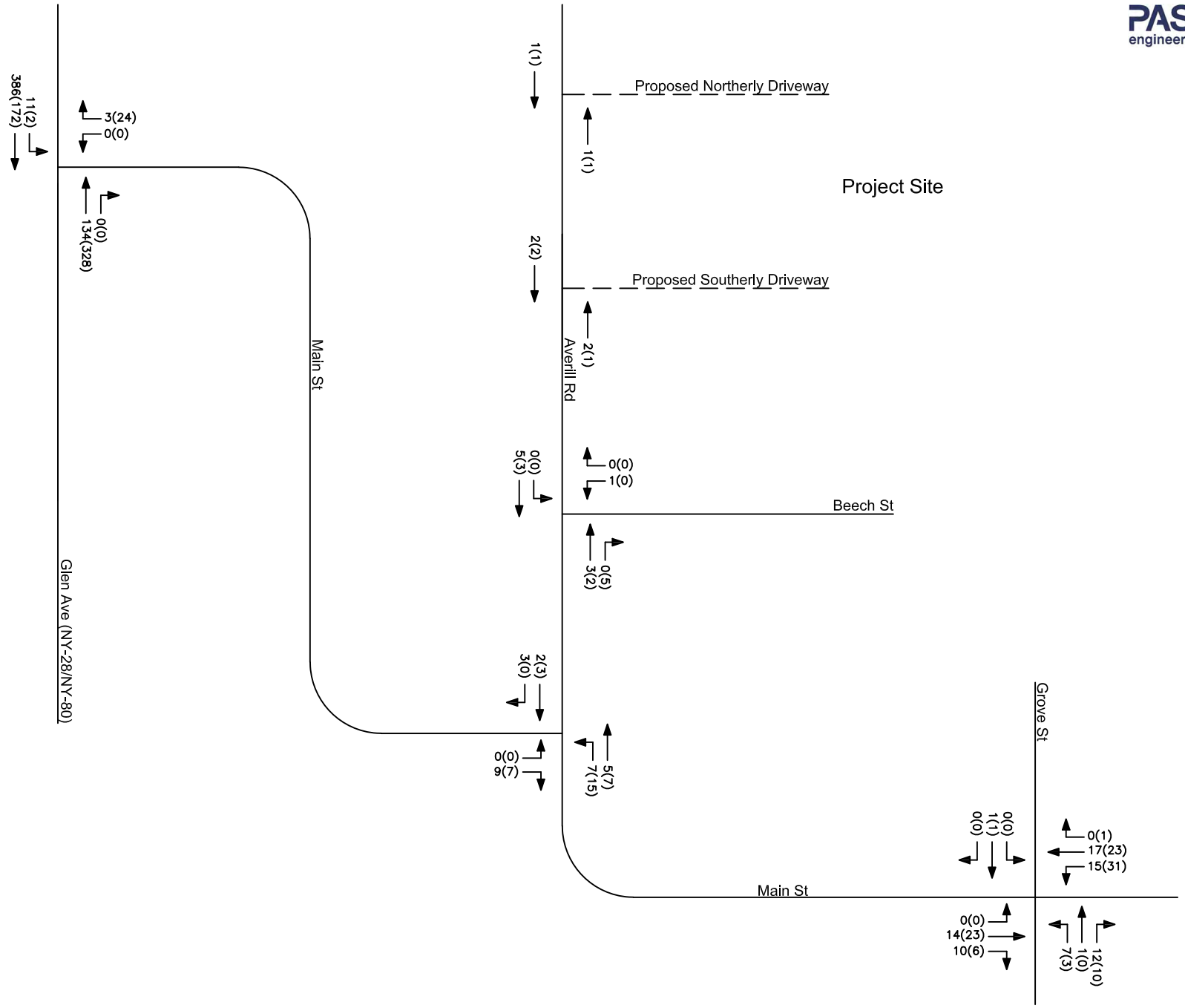
**Peak Hour Volumes**
**2023 Existing Conditions**

KEY:
00(00) = AM(PM)
Entering Trip
Exiting Trip
Proposed Access

*Project Number: 20233551.0001*

**Figure 4**

PASSERO engineering architecture




**Averill Road Housing Project** | Village of Cooperstown, NY

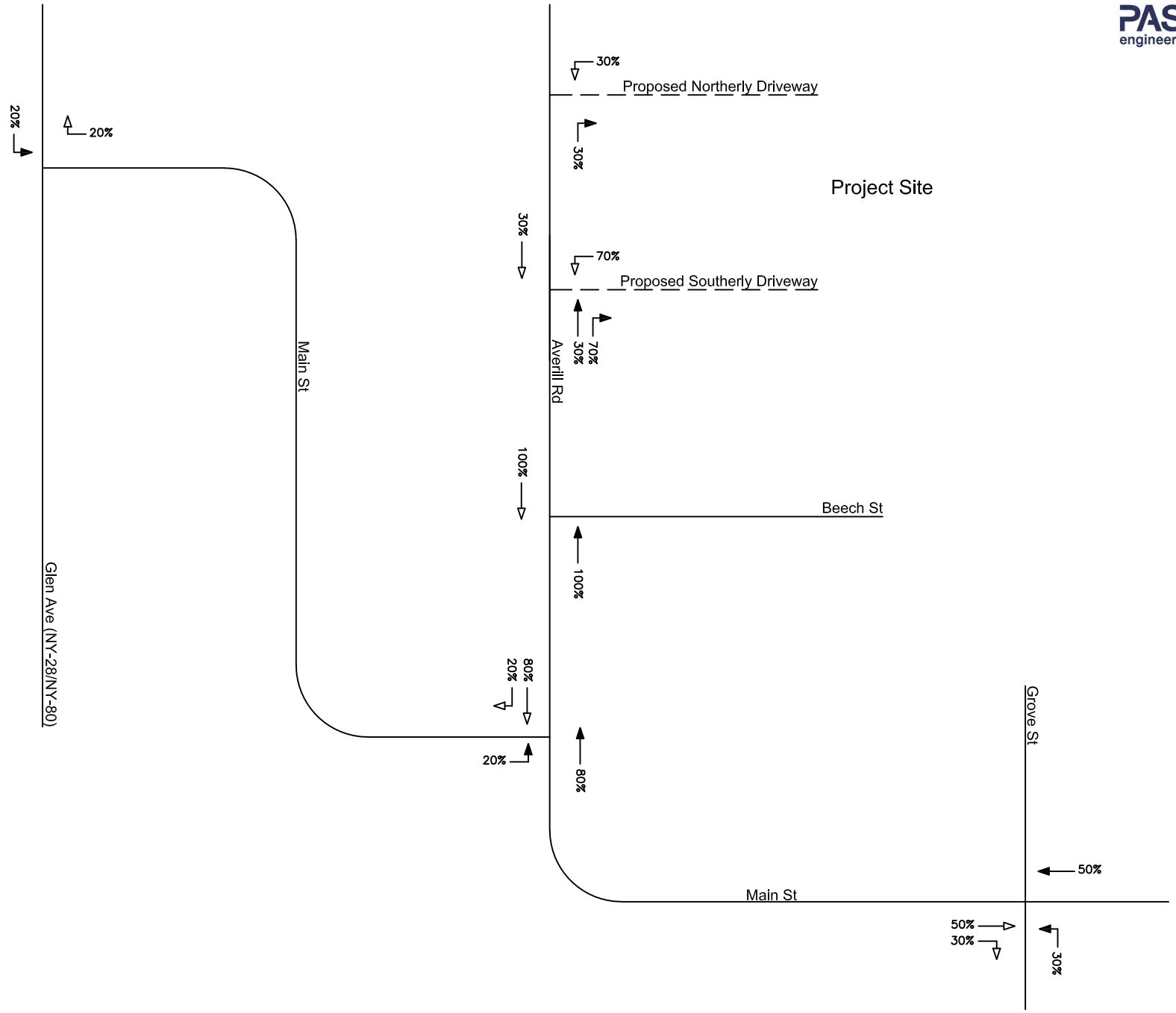
**Peak Hour Volumes**
**2025 Background Conditions**

KEY:
00(00) = AM(PM)
Entering Trip
Exiting Trip
Proposed Access

*Project Number: 20233551.0001*

**Figure 6**

PASSERO engineering architecture




**Averill Road Housing Project** | Village of Cooperstown, NY

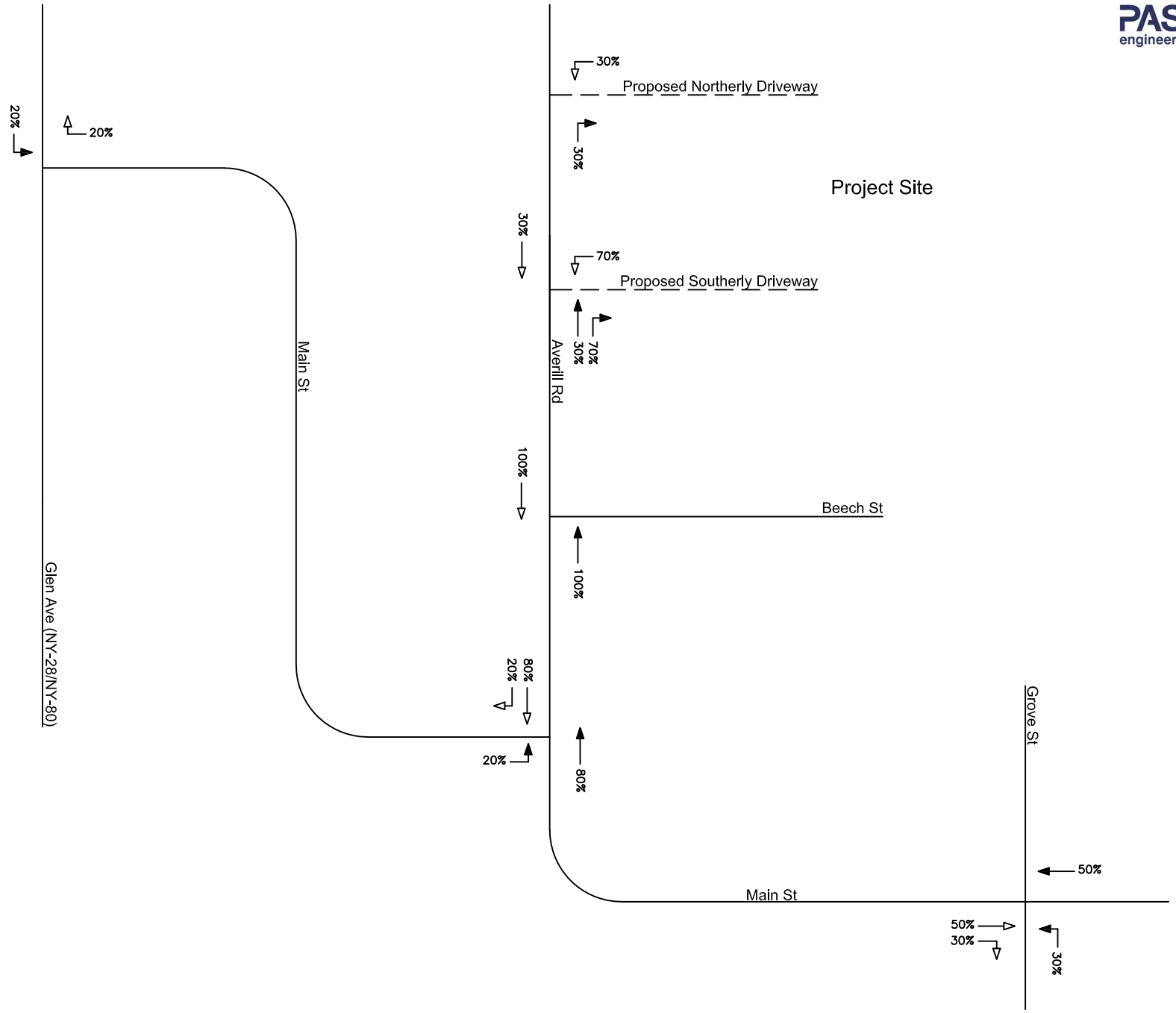
## Trip Distribution

KEY:
00(00) = AM(PM)
Entering Trip
Exiting Trip
Proposed Access

*Project Number: 20233551.0001*

**Figure 5**

PASSERO engineering architecture




**Averill Road Housing Project** | Village of Cooperstown, NY

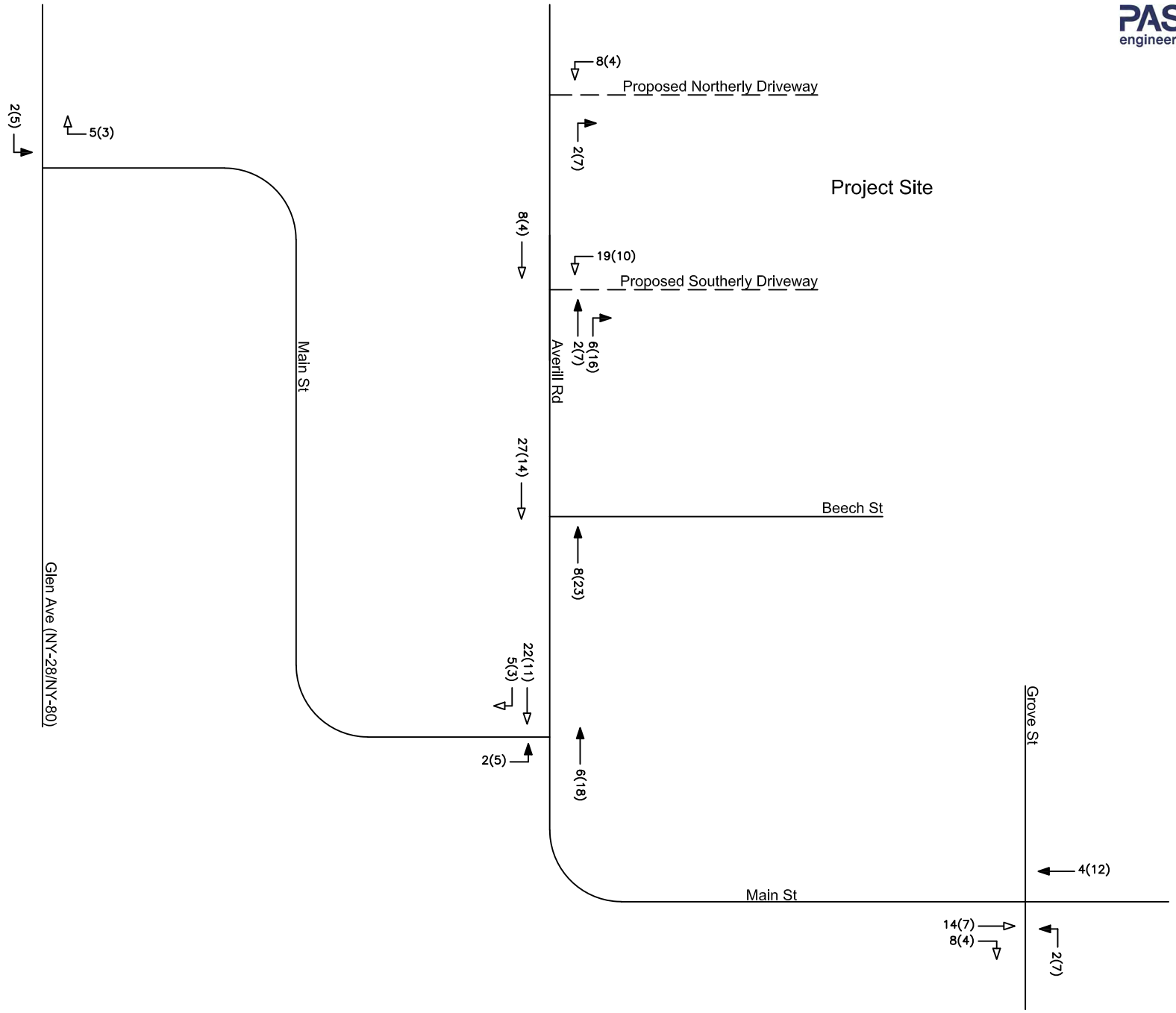
## Trip Distribution

KEY:
00(00) = AM(PM)
Entering Trip
Exiting Trip
Proposed Access

*Project Number: 20233551.0001*

**Figure 6**

PASSERO engineering architecture




**Averill Road Housing Project** | Village of Cooperstown, NY

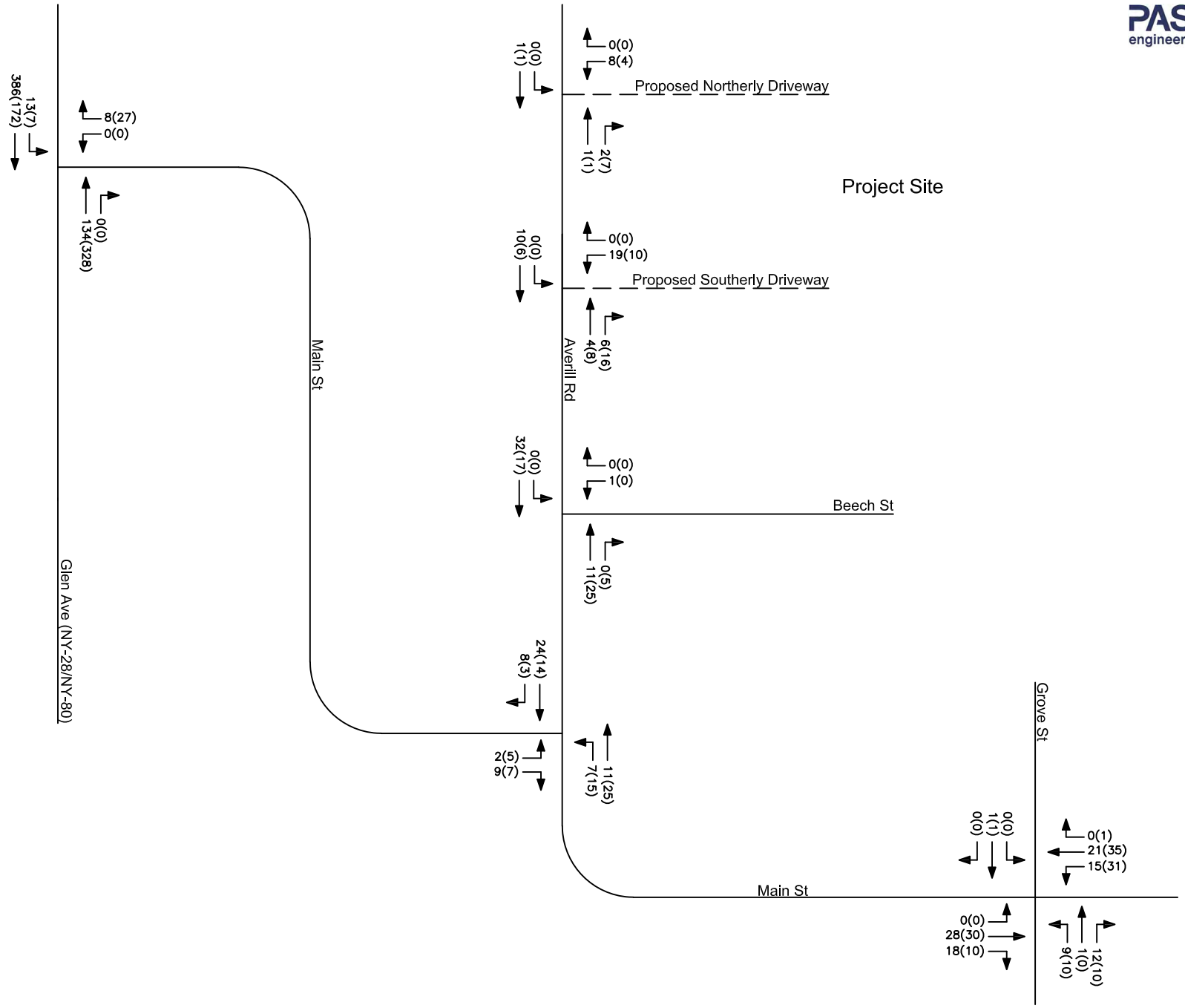
**Site Generated Trips**

KEY:
00(00) = AM(PM)
Entering Trip
Exiting Trip
Proposed Access

*Project Number: 20233551.0001*

**Figure 7**

PASSERO engineering architecture



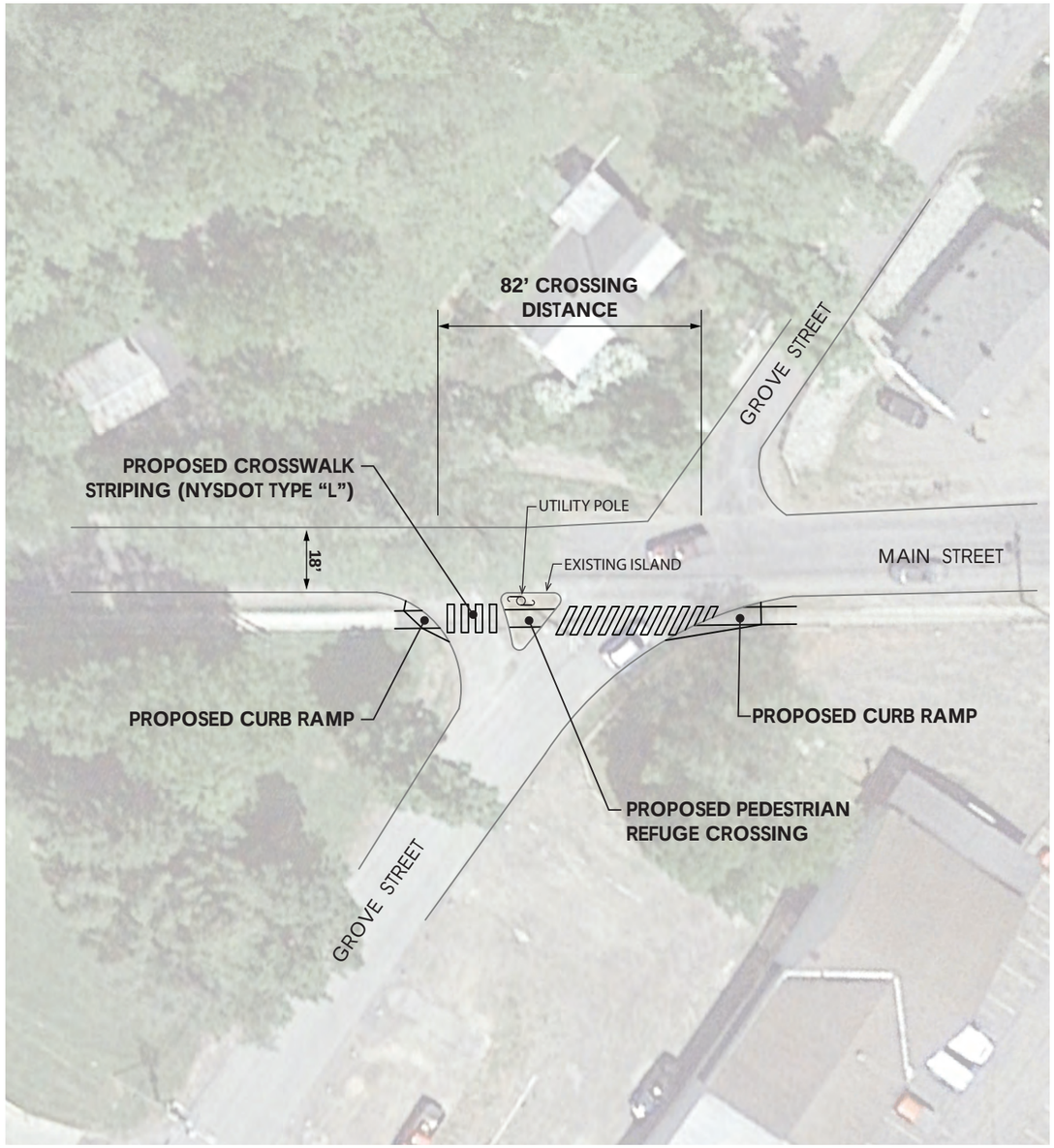

**Averill Road Housing Project** | Village of Cooperstown, NY

**Peak Hour Volumes**
**Full Development Conditions**

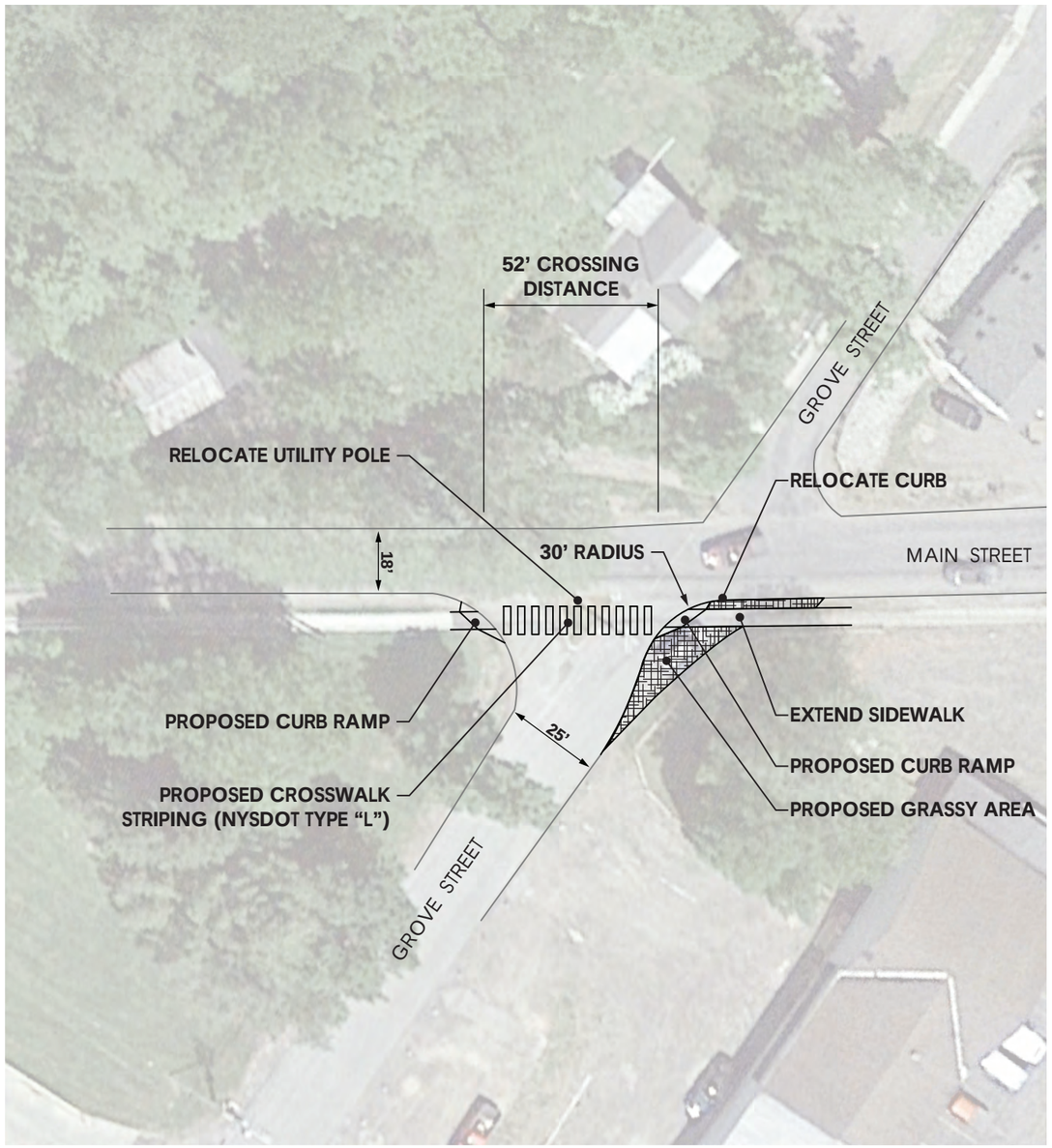
KEY:
00(00) = AM(PM)
Entering Trip
Exiting Trip
Proposed Access

*Project Number: 20233551.0001*

## ALTERNATIVE 1




## ALTERNATIVE 2




0’ 50’
1” = 50’

N

# APPENDICES

# **APPENDIX A:** EXISTING TRAFFIC COUNT DATA

Cooperstown, NY

Tuesday, Apri 18, 2023
Location: 42.702977, -74.939205

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338

Count Name: Passero # 11269
Site Code: Cooperstown
Start Date: 04/18/2023
Page No: 1

# Turning Movement Data

| Start Time | Main St Westbound | | | | | NY 28 Northbound | | | | | NY 28 Southbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Right | U-Turn | Peds | App. Total | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | U-Turn | Peds | App. Total | Int. Total |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 21 | 3 | 49 | 0 | 0 | 52 | 73 |
| 7:15 AM | 0 | 1 | 0 | 0 | 1 | 22 | 0 | 0 | 0 | 22 | 4 | 78 | 0 | 0 | 82 | 105 |
| 7:30 AM | 0 | 1 | 0 | 0 | 1 | 34 | 0 | 0 | 0 | 34 | 4 | 96 | 0 | 0 | 100 | 135 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 31 | 3 | 87 | 0 | 0 | 90 | 121 |
| Hourly Total | 0 | 2 | 0 | 0 | 2 | 108 | 0 | 0 | 0 | 108 | 14 | 310 | 0 | 0 | 324 | 434 |
| 8:00 AM | 0 | 1 | 0 | 0 | 1 | 19 | 0 | 0 | 0 | 19 | 1 | 72 | 0 | 0 | 73 | 93 |
| 8:15 AM | 0 | 1 | 0 | 0 | 1 | 34 | 0 | 0 | 0 | 34 | 2 | 86 | 0 | 0 | 88 | 123 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 10 | 0 | 46 | 0 | 0 | 46 | 56 |
| 8:45 AM | 0 | 3 | 0 | 0 | 3 | 29 | 0 | 0 | 0 | 29 | 1 | 49 | 0 | 0 | 50 | 82 |
| Hourly Total | 0 | 5 | 0 | 0 | 5 | 92 | 0 | 0 | 0 | 92 | 4 | 253 | 0 | 0 | 257 | 354 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4:00 PM | 0 | 7 | 0 | 0 | 7 | 74 | 0 | 0 | 0 | 74 | 1 | 41 | 0 | 0 | 42 | 123 |
| 4:15 PM | 0 | 4 | 0 | 0 | 4 | 61 | 0 | 0 | 0 | 61 | 0 | 43 | 0 | 0 | 43 | 108 |
| 4:30 PM | 0 | 9 | 0 | 0 | 9 | 99 | 0 | 0 | 0 | 99 | 1 | 36 | 0 | 0 | 37 | 145 |
| 4:45 PM | 0 | 1 | 0 | 0 | 1 | 56 | 0 | 0 | 0 | 56 | 0 | 32 | 0 | 0 | 32 | 89 |
| Hourly Total | 0 | 21 | 0 | 0 | 21 | 290 | 0 | 0 | 0 | 290 | 2 | 152 | 0 | 0 | 154 | 465 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 60 | 0 | 0 | 0 | 60 | 0 | 44 | 0 | 0 | 44 | 104 |
| 5:15 PM | 0 | 1 | 0 | 0 | 1 | 56 | 0 | 0 | 0 | 56 | 0 | 28 | 0 | 0 | 28 | 85 |
| 5:30 PM | 0 | 3 | 0 | 0 | 3 | 43 | 0 | 0 | 0 | 43 | 0 | 20 | 0 | 0 | 20 | 66 |
| 5:45 PM | 0 | 3 | 0 | 0 | 3 | 39 | 0 | 0 | 0 | 39 | 0 | 17 | 0 | 0 | 17 | 59 |
| Hourly Total | 0 | 7 | 0 | 0 | 7 | 198 | 0 | 0 | 0 | 198 | 0 | 109 | 0 | 0 | 109 | 314 |
| 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grand Total | 0 | 35 | 0 | 0 | 35 | 688 | 0 | 0 | 0 | 688 | 20 | 824 | 0 | 0 | 844 | 1567 |
| Approach % | 0.0 | 100.0 | 0.0 | - | - | 100.0 | 0.0 | 0.0 | - | - | 2.4 | 97.6 | 0.0 | - | - | - |
| Total % | 0.0 | 2.2 | 0.0 | - | 2.2 | 43.9 | 0.0 | 0.0 | - | 43.9 | 1.3 | 52.6 | 0.0 | - | 53.9 | - |
| Motorcycles | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | - | 0.0 | - | - | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 0 | 35 | 0 | - | 35 | 670 | 0 | 0 | - | 670 | 20 | 808 | 0 | - | 828 | 1533 |
| % Cars & Light Goods | - | 100.0 | - | - | 100.0 | 97.4 | - | - | - | 97.4 | 100.0 | 98.1 | - | - | 98.1 | 97.8 |
| Other Vehicles | 0 | 0 | 0 | - | 0 | 18 | 0 | 0 | - | 18 | 0 | 16 | 0 | - | 16 | 34 |
| % Other Vehicles | - | 0.0 | - | - | 0.0 | 2.6 | - | - | - | 2.6 | 0.0 | 1.9 | - | - | 1.9 | 2.2 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

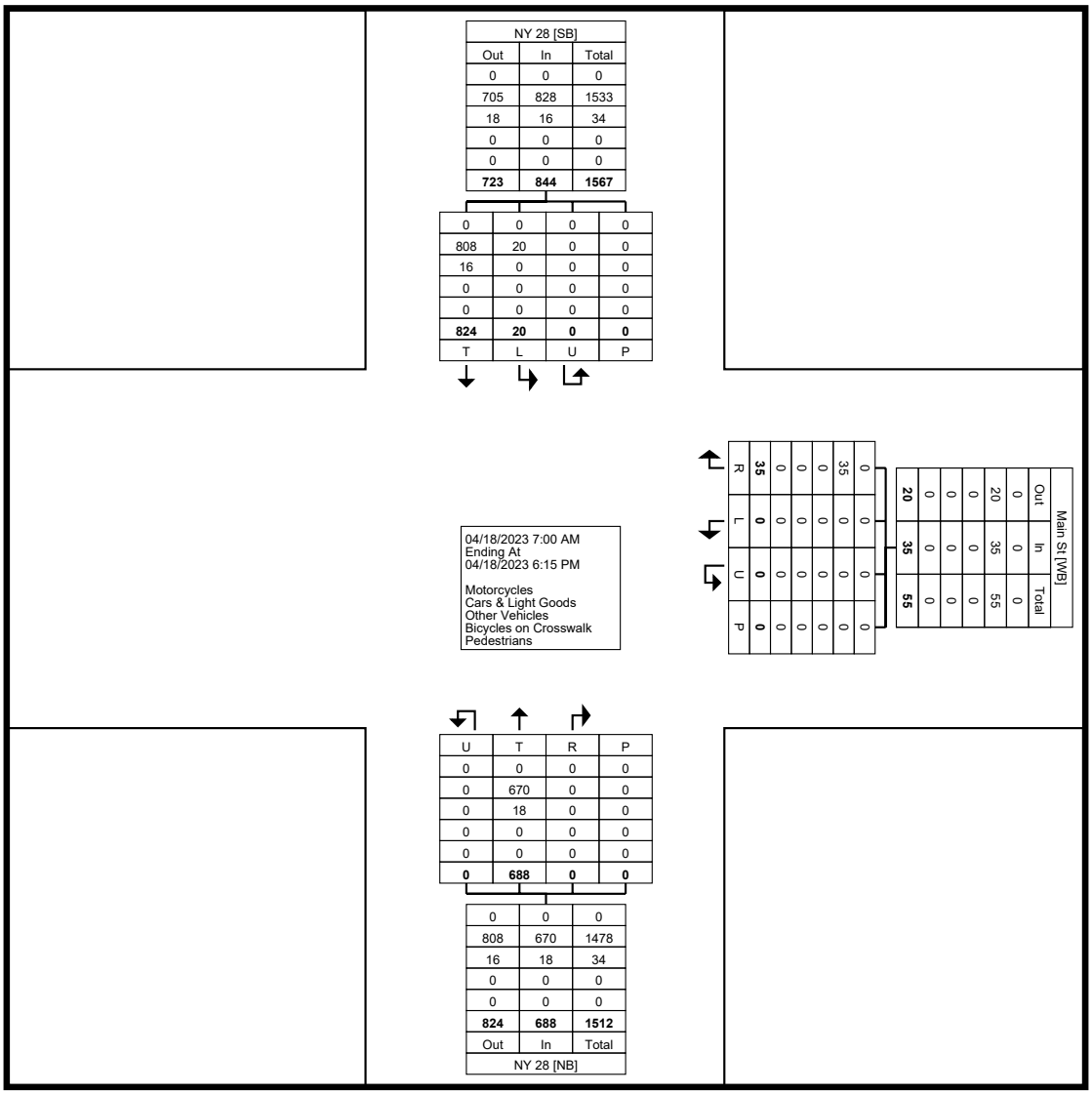
Cooperstown, NY

Tuesday, Apri 18, 2023
Location: 42.702977, -74.939205

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338

Count Name: Passero # 11269
Site Code: Cooperstown
Start Date: 04/18/2023


Turning Movement Data Plot

Cooperstown, NY

Tuesday, Apri 18, 2023
Location: 42.702977, -74.939205

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338



# Turning Movement Peak Hour Data (7:30 AM)

| Start Time | Main St Westbound | | | | | NY 28 Northbound | | | | | NY 28 Southbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Right | U-Turn | Peds | App. Total | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | U-Turn | Peds | App. Total | Int. Total |
| 7:30 AM | 0 | 1 | 0 | 0 | 1 | 34 | 0 | 0 | 0 | 34 | 4 | 96 | 0 | 0 | 100 | 135 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 31 | 3 | 87 | 0 | 0 | 90 | 121 |
| 8:00 AM | 0 | 1 | 0 | 0 | 1 | 19 | 0 | 0 | 0 | 19 | 1 | 72 | 0 | 0 | 73 | 93 |
| 8:15 AM | 0 | 1 | 0 | 0 | 1 | 34 | 0 | 0 | 0 | 34 | 2 | 86 | 0 | 0 | 88 | 123 |
| Total | 0 | 3 | 0 | 0 | 3 | 118 | 0 | 0 | 0 | 118 | 10 | 341 | 0 | 0 | 351 | 472 |
| Approach % | 0.0 | 100.0 | 0.0 | - | - | 100.0 | 0.0 | 0.0 | - | - | 2.8 | 97.2 | 0.0 | - | - | - |
| Total % | 0.0 | 0.6 | 0.0 | - | 0.6 | 25.0 | 0.0 | 0.0 | - | 25.0 | 2.1 | 72.2 | 0.0 | - | 74.4 | - |
| PHF | 0.000 | 0.750 | 0.000 | - | 0.750 | 0.868 | 0.000 | 0.000 | - | 0.868 | 0.625 | 0.888 | 0.000 | - | 0.878 | 0.874 |
| Motorcycles | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | - | 0.0 | - | - | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 0 | 3 | 0 | - | 3 | 113 | 0 | 0 | - | 113 | 10 | 333 | 0 | - | 343 | 459 |
| % Cars & Light Goods | - | 100.0 | - | - | 100.0 | 95.8 | - | - | - | 95.8 | 100.0 | 97.7 | - | - | 97.7 | 97.2 |
| Other Vehicles | 0 | 0 | 0 | - | 0 | 5 | 0 | 0 | - | 5 | 0 | 8 | 0 | - | 8 | 13 |
| % Other Vehicles | - | 0.0 | - | - | 0.0 | 4.2 | - | - | - | 4.2 | 0.0 | 2.3 | - | - | 2.3 | 2.8 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

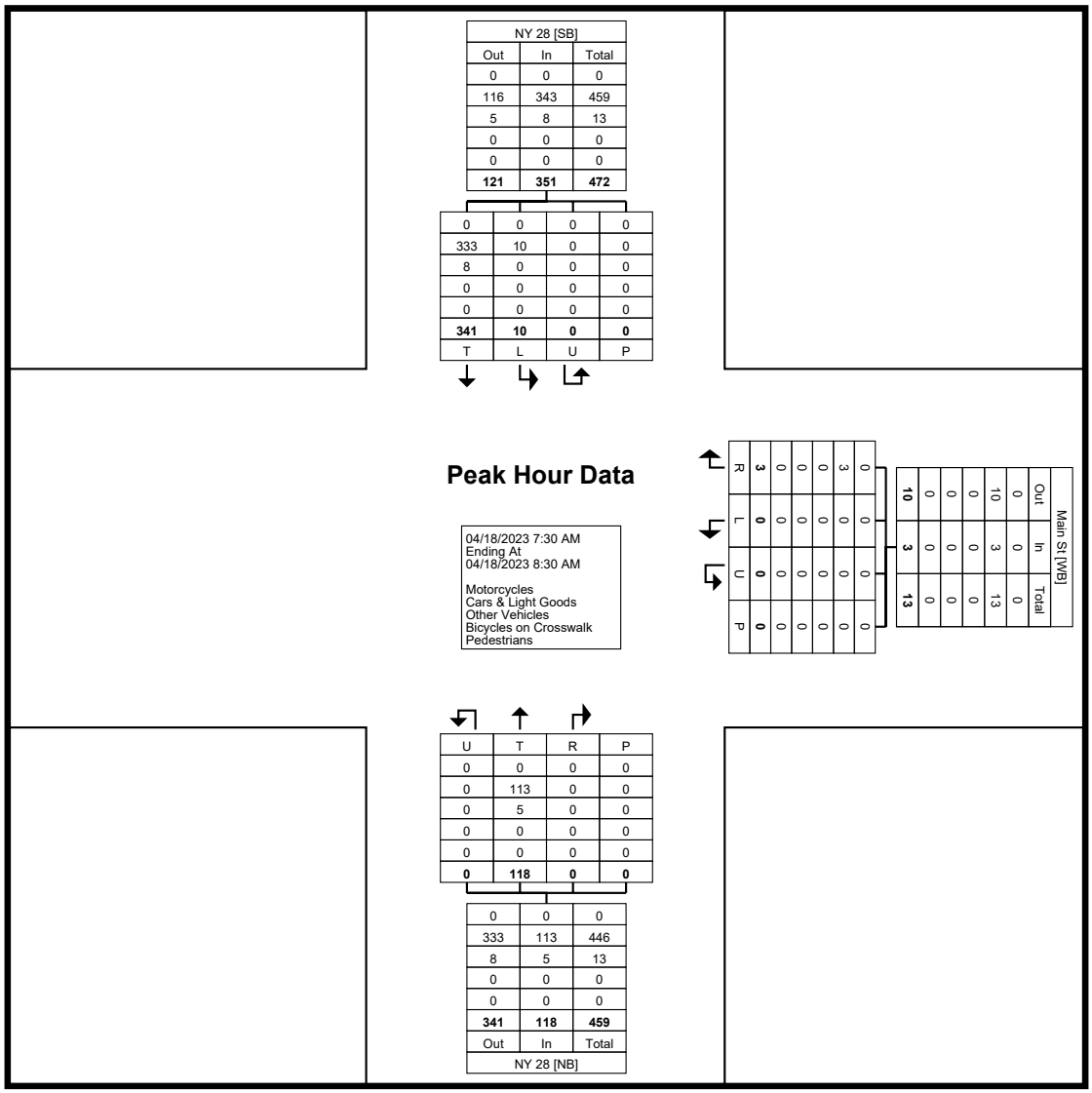
Cooperstown, NY

Tuesday, Apri 18, 2023
Location: 42.702977, -74.939205

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338

Count Name: Passero # 11269
Site Code: Cooperstown
Start Date: 04/18/2023


Turning Movement Peak Hour Data Plot (7:30 AM)

Cooperstown, NY

Tuesday, Apri 18, 2023
Location: 42.702977, -74.939205

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338



# Turning Movement Peak Hour Data (4:00 PM)

| Start Time | Main St Westbound | | | | | NY 28 Northbound | | | | | NY 28 Southbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Right | U-Turn | Peds | App. Total | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | U-Turn | Peds | App. Total | Int. Total |
| 4:00 PM | 0 | 7 | 0 | 0 | 7 | 74 | 0 | 0 | 0 | 74 | 1 | 41 | 0 | 0 | 42 | 123 |
| 4:15 PM | 0 | 4 | 0 | 0 | 4 | 61 | 0 | 0 | 0 | 61 | 0 | 43 | 0 | 0 | 43 | 108 |
| 4:30 PM | 0 | 9 | 0 | 0 | 9 | 99 | 0 | 0 | 0 | 99 | 1 | 36 | 0 | 0 | 37 | 145 |
| 4:45 PM | 0 | 1 | 0 | 0 | 1 | 56 | 0 | 0 | 0 | 56 | 0 | 32 | 0 | 0 | 32 | 89 |
| Total | 0 | 21 | 0 | 0 | 21 | 290 | 0 | 0 | 0 | 290 | 2 | 152 | 0 | 0 | 154 | 465 |
| Approach % | 0.0 | 100.0 | 0.0 | - | - | 100.0 | 0.0 | 0.0 | - | - | 1.3 | 98.7 | 0.0 | - | - | - |
| Total % | 0.0 | 4.5 | 0.0 | - | 4.5 | 62.4 | 0.0 | 0.0 | - | 62.4 | 0.4 | 32.7 | 0.0 | - | 33.1 | - |
| PHF | 0.000 | 0.583 | 0.000 | - | 0.583 | 0.732 | 0.000 | 0.000 | - | 0.732 | 0.500 | 0.884 | 0.000 | - | 0.895 | 0.802 |
| Motorcycles | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | - | 0.0 | - | - | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 0 | 21 | 0 | - | 21 | 285 | 0 | 0 | - | 285 | 2 | 148 | 0 | - | 150 | 456 |
| % Cars & Light Goods | - | 100.0 | - | - | 100.0 | 98.3 | - | - | - | 98.3 | 100.0 | 97.4 | - | - | 97.4 | 98.1 |
| Other Vehicles | 0 | 0 | 0 | - | 0 | 5 | 0 | 0 | - | 5 | 0 | 4 | 0 | - | 4 | 9 |
| % Other Vehicles | - | 0.0 | - | - | 0.0 | 1.7 | - | - | - | 1.7 | 0.0 | 2.6 | - | - | 2.6 | 1.9 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

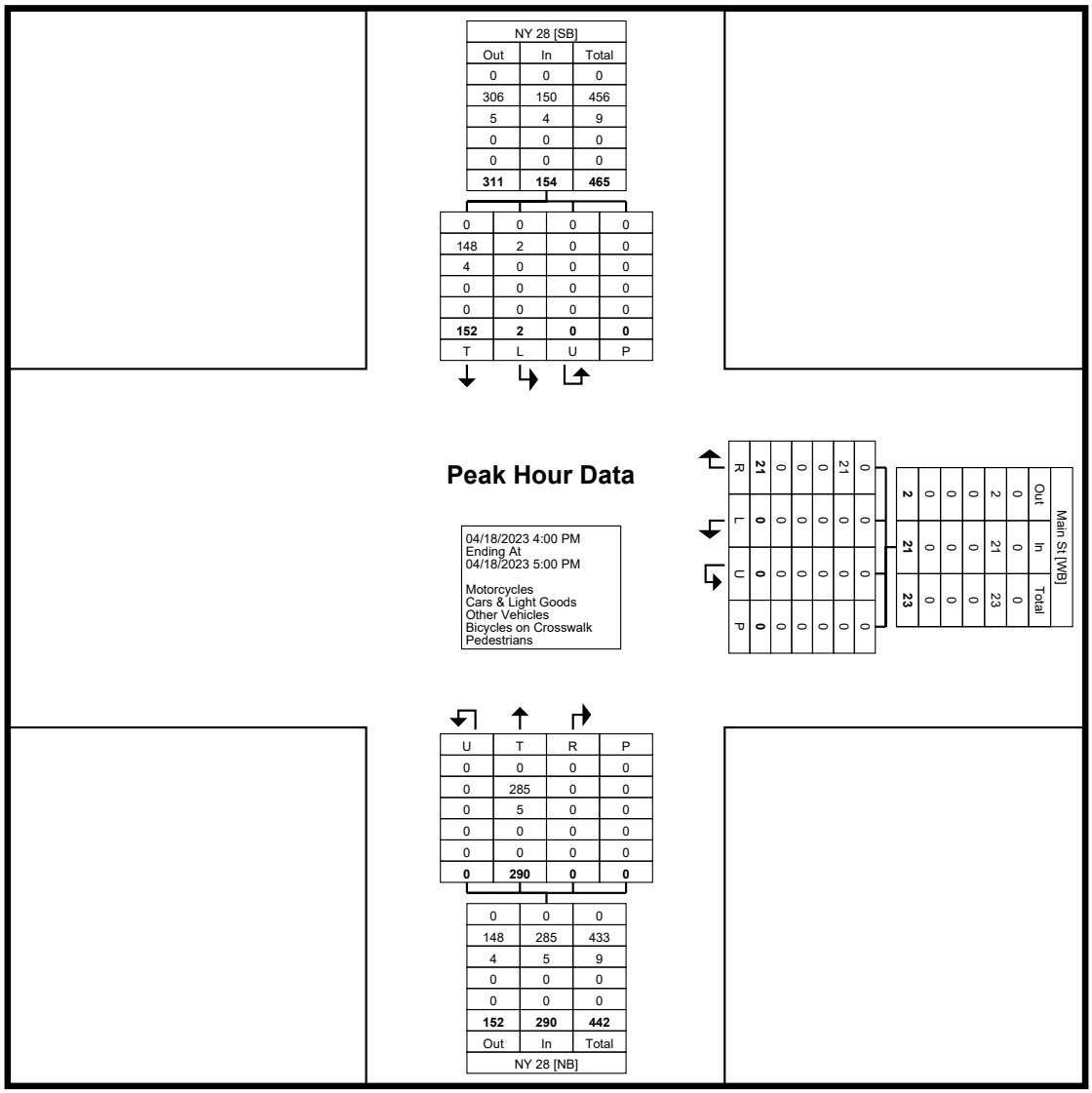
Cooperstown, NY

Tuesday, Apri 18, 2023
Location: 42.702977, -74.939205

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States  19320
610-517-2338






Turning Movement Peak Hour Data Plot (4:00 PM)

Cooperstown, NY

Thursday, March 30, 2023
Location: 42.700228, -74.936001

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338

Count Name: 2. Main St & Averill Rd
Site Code: Cooperstown, New York
Start Date: 03/30/2023


# Turning Movement Data

| Start Time | Main St Eastbound | | | | | Main St Northbound | | | | | Averill Rd Southbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Right | U-Turn | Peds | App. Total | Left | Thru | U-Turn | Peds | App. Total | Thru | Right | U-Turn | Peds | App. Total | Int. Total |
| 7:00 AM | 0 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 4 |
| 7:15 AM | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 |
| 7:30 AM | 0 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 4 |
| 7:45 AM | 0 | 2 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 0 | 1 | 8 |
| Hourly Total | 1 | 7 | 0 | 0 | 8 | 10 | 0 | 0 | 0 | 10 | 1 | 0 | 0 | 0 | 1 | 19 |
| 8:00 AM | 0 | 2 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 4 |
| 8:15 AM | 0 | 3 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 |
| 8:30 AM | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 2 | 1 | 3 | 0 | 0 | 4 | 7 |
| 8:45 AM | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 2 | 5 |
| Hourly Total | 0 | 7 | 0 | 0 | 7 | 3 | 4 | 0 | 0 | 7 | 3 | 3 | 0 | 0 | 6 | 20 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4:00 PM | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 |
| 4:15 PM | 0 | 3 | 0 | 0 | 3 | 4 | 3 | 0 | 0 | 7 | 1 | 0 | 0 | 0 | 1 | 11 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 6 | 2 | 0 | 0 | 8 | 2 | 0 | 0 | 0 | 2 | 10 |
| 4:45 PM | 0 | 2 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 5 |
| Hourly Total | 0 | 6 | 0 | 0 | 6 | 13 | 6 | 0 | 0 | 19 | 3 | 0 | 0 | 0 | 3 | 28 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| 5:15 PM | 2 | 2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 5:30 PM | 0 | 2 | 0 | 0 | 2 | 4 | 1 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 7 |
| 5:45 PM | 0 | 2 | 0 | 0 | 2 | 4 | 1 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 7 |
| Hourly Total | 2 | 6 | 0 | 0 | 8 | 10 | 2 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 20 |
| 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grand Total | 3 | 26 | 0 | 0 | 29 | 36 | 12 | 0 | 0 | 48 | 7 | 3 | 0 | 0 | 10 | 87 |
| Approach % | 10.3 | 89.7 | 0.0 | - | - | 75.0 | 25.0 | 0.0 | - | - | 70.0 | 30.0 | 0.0 | - | - | - |
| Total % | 3.4 | 29.9 | 0.0 | - | 33.3 | 41.4 | 13.8 | 0.0 | - | 55.2 | 8.0 | 3.4 | 0.0 | - | 11.5 | - |
| Motorcycles | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 3 | 26 | 0 | - | 29 | 34 | 12 | 0 | - | 46 | 7 | 3 | 0 | - | 10 | 85 |
| % Cars & Light Goods | 100.0 | 100.0 | - | - | 100.0 | 94.4 | 100.0 | - | - | 95.8 | 100.0 | 100.0 | - | - | 100.0 | 97.7 |
| Other Vehicles | 0 | 0 | 0 | - | 0 | 2 | 0 | 0 | - | 2 | 0 | 0 | 0 | - | 0 | 2 |
| % Other Vehicles | 0.0 | 0.0 | - | - | 0.0 | 5.6 | 0.0 | - | - | 4.2 | 0.0 | 0.0 | - | - | 0.0 | 2.3 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

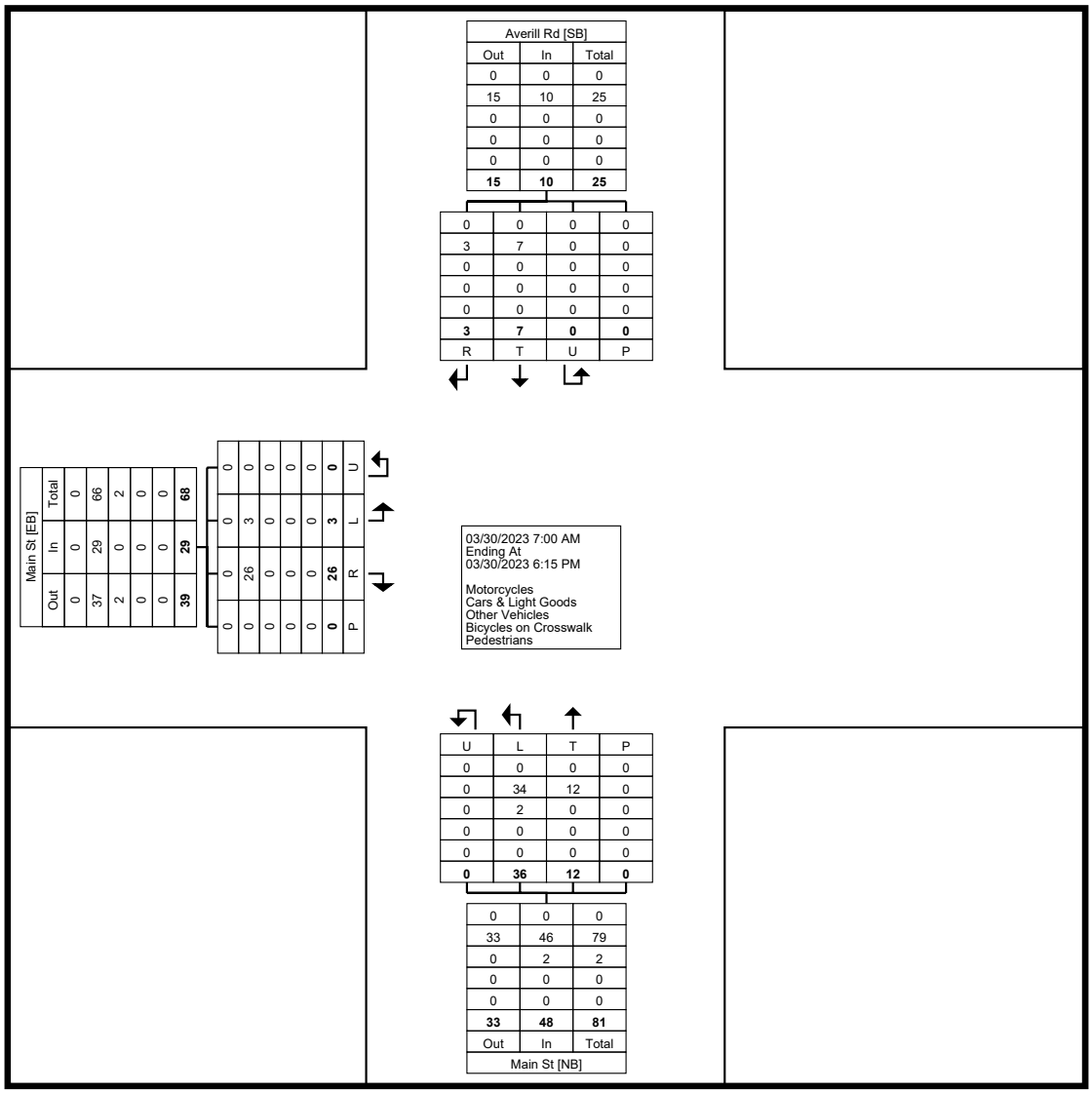
Cooperstown, NY

Thursday, March 30, 2023
Location: 42.700228, -74.936001

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338

Count Name: 2. Main St & Averill Rd
Site Code: Cooperstown, New York
Start Date: 03/30/2023


Turning Movement Data Plot

Cooperstown, NY

Thursday, March 30, 2023
Location: 42.700228, -74.936001

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338

Count Name: 2. Main St & Averill Rd
Site Code: Cooperstown, New York
Start Date: 03/30/2023

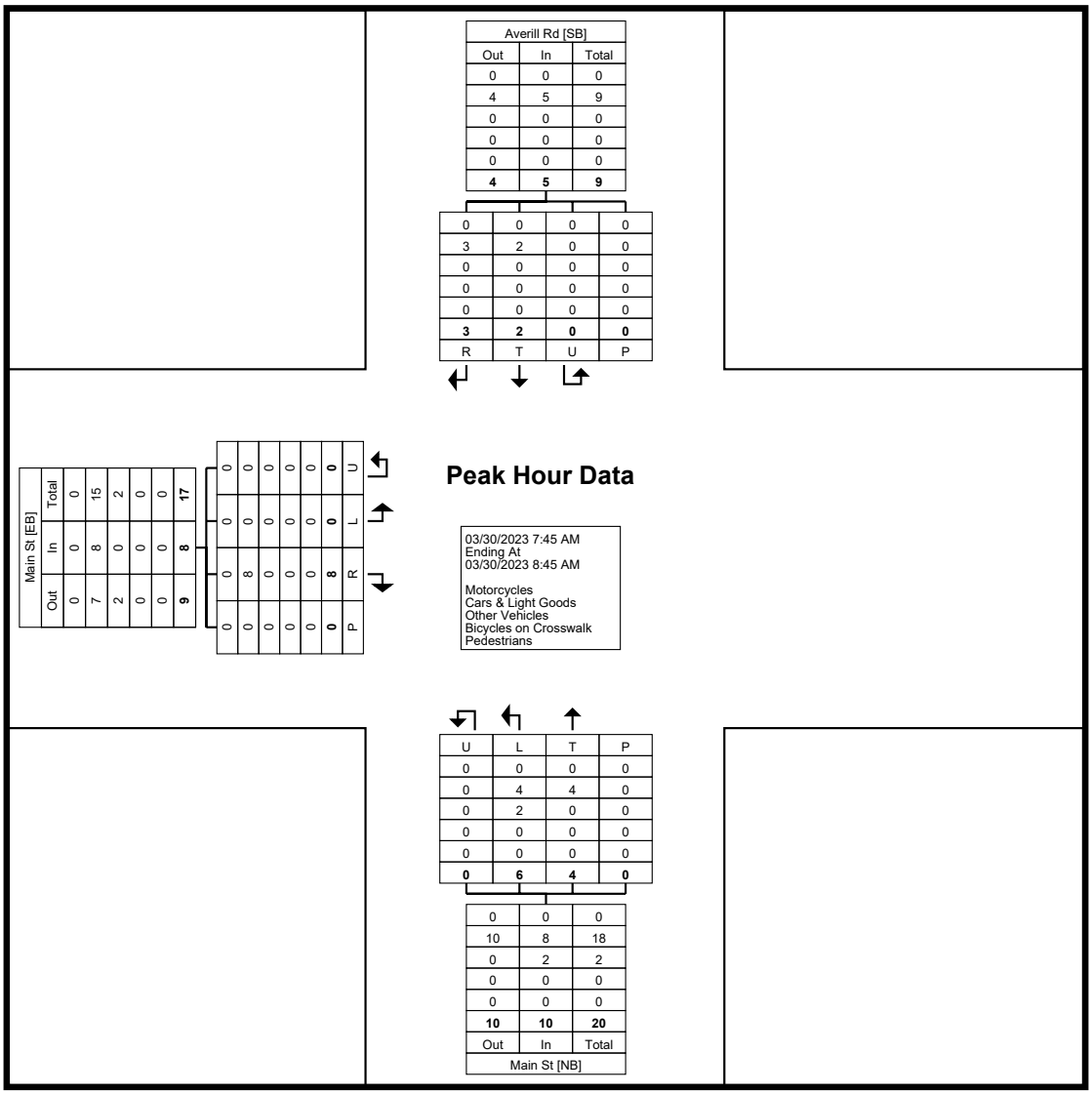

# Turning Movement Peak Hour Data (7:45 AM)

| Start Time | Main St Eastbound | | | | | Main St Northbound | | | | | Averill Rd Southbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Right | U-Turn | Peds | App. Total | Left | Thru | U-Turn | Peds | App. Total | Thru | Right | U-Turn | Peds | App. Total | Int. Total |
| 7:45 AM | 0 | 2 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 0 | 1 | 8 |
| 8:00 AM | 0 | 2 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 4 |
| 8:15 AM | 0 | 3 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 |
| 8:30 AM | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 2 | 1 | 3 | 0 | 0 | 4 | 7 |
| Total | 0 | 8 | 0 | 0 | 8 | 6 | 4 | 0 | 0 | 10 | 2 | 3 | 0 | 0 | 5 | 23 |
| Approach % | 0.0 | 100.0 | 0.0 | - | - | 60.0 | 40.0 | 0.0 | - | - | 40.0 | 60.0 | 0.0 | - | - | - |
| Total % | 0.0 | 34.8 | 0.0 | - | 34.8 | 26.1 | 17.4 | 0.0 | - | 43.5 | 8.7 | 13.0 | 0.0 | - | 21.7 | - |
| PHF | 0.000 | 0.667 | 0.000 | - | 0.667 | 0.300 | 0.500 | 0.000 | - | 0.500 | 0.500 | 0.250 | 0.000 | - | 0.313 | 0.719 |
| Motorcycles | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | - | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 0 | 8 | 0 | - | 8 | 4 | 4 | 0 | - | 8 | 2 | 3 | 0 | - | 5 | 21 |
| % Cars & Light Goods | - | 100.0 | - | - | 100.0 | 66.7 | 100.0 | - | - | 80.0 | 100.0 | 100.0 | - | - | 100.0 | 91.3 |
| Other Vehicles | 0 | 0 | 0 | - | 0 | 2 | 0 | 0 | - | 2 | 0 | 0 | 0 | - | 0 | 2 |
| % Other Vehicles | - | 0.0 | - | - | 0.0 | 33.3 | 0.0 | - | - | 20.0 | 0.0 | 0.0 | - | - | 0.0 | 8.7 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338






Turning Movement Peak Hour Data Plot (7:45 AM)

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338



# Turning Movement Peak Hour Data (4:00 PM)

| Start Time | Main St Eastbound | | | | | Main St Northbound | | | | | Averill Rd Southbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Right | U-Turn | Peds | App. Total | Left | Thru | U-Turn | Peds | App. Total | Thru | Right | U-Turn | Peds | App. Total | Int. Total |
| 4:00 PM | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 |
| 4:15 PM | 0 | 3 | 0 | 0 | 3 | 4 | 3 | 0 | 0 | 7 | 1 | 0 | 0 | 0 | 1 | 11 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 6 | 2 | 0 | 0 | 8 | 2 | 0 | 0 | 0 | 2 | 10 |
| 4:45 PM | 0 | 2 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 5 |
| Total | 0 | 6 | 0 | 0 | 6 | 13 | 6 | 0 | 0 | 19 | 3 | 0 | 0 | 0 | 3 | 28 |
| Approach % | 0.0 | 100.0 | 0.0 | - | - | 68.4 | 31.6 | 0.0 | - | - | 100.0 | 0.0 | 0.0 | - | - | - |
| Total % | 0.0 | 21.4 | 0.0 | - | 21.4 | 46.4 | 21.4 | 0.0 | - | 67.9 | 10.7 | 0.0 | 0.0 | - | 10.7 | - |
| PHF | 0.000 | 0.500 | 0.000 | - | 0.500 | 0.542 | 0.500 | 0.000 | - | 0.594 | 0.375 | 0.000 | 0.000 | - | 0.375 | 0.636 |
| Motorcycles | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | - | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 0 | 6 | 0 | - | 6 | 13 | 6 | 0 | - | 19 | 3 | 0 | 0 | - | 3 | 28 |
| % Cars & Light Goods | - | 100.0 | - | - | 100.0 | 100.0 | 100.0 | - | - | 100.0 | 100.0 | - | - | - | 100.0 | 100.0 |
| Other Vehicles | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Other Vehicles | - | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

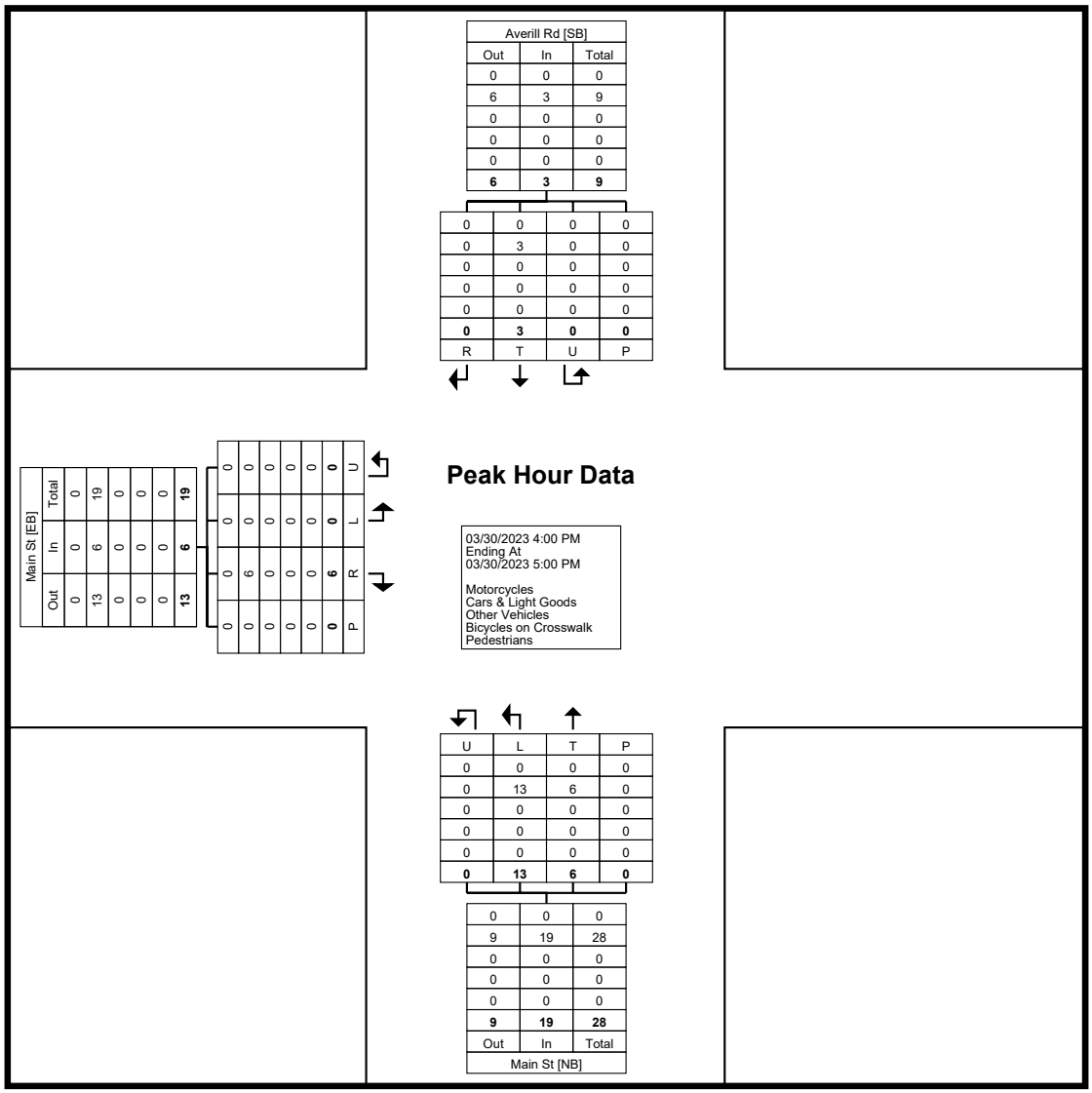
Cooperstown, NY

Thursday, March 30, 2023
Location: 42.700228, -74.936001

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338






Turning Movement Peak Hour Data Plot (4:00 PM)

Cooperstown, NY

Thursday, March 30, 2023
Location: 42.701143, -74.936238

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338

Count Name: 3. Averill Rd & Beech St
Site Code: Cooperstown, New York
Start Date: 03/30/2023
Page No: 1

# Turning Movement Data

| Start Time | Beech St Westbound | | | | | Averill Rd Northbound | | | | | Averill Rd Southbound | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Right | U-Turn | Peds | App. Total | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | U-Turn | Peds | App. Total | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:30 AM | 0 | 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 | 1 | 0 | 0 | 1 | 1 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 2 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 8:30 AM | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 4 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 2 |
| Hourly Total | 1 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 3 | 0 | 4 | 0 | 0 | 4 | 8 |
| 9:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 1 | 4 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 2 | 4 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 0 | 0 | 6 | 0 | 3 | 0 | 0 | 3 | 9 |
| 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 | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 3 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 1 | 5 |
| 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grand Total | 1 | 0 | 0 | 0 | 1 | 6 | 8 | 0 | 0 | 14 | 1 | 8 | 0 | 0 | 9 | 24 |
| Approach % | 100.0 | 0.0 | 0.0 | - | - | 42.9 | 57.1 | 0.0 | - | - | 11.1 | 88.9 | 0.0 | - | - | - |
| Total % | 4.2 | 0.0 | 0.0 | - | 4.2 | 25.0 | 33.3 | 0.0 | - | 58.3 | 4.2 | 33.3 | 0.0 | - | 37.5 | - |
| Motorcycles | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 1 | 0 | 0 | - | 1 | 6 | 8 | 0 | - | 14 | 1 | 8 | 0 | - | 9 | 24 |
| % Cars & Light Goods | 100.0 | - | - | - | 100.0 | 100.0 | 100.0 | - | - | 100.0 | 100.0 | 100.0 | - | - | 100.0 | 100.0 |
| Other Vehicles | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Other Vehicles | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

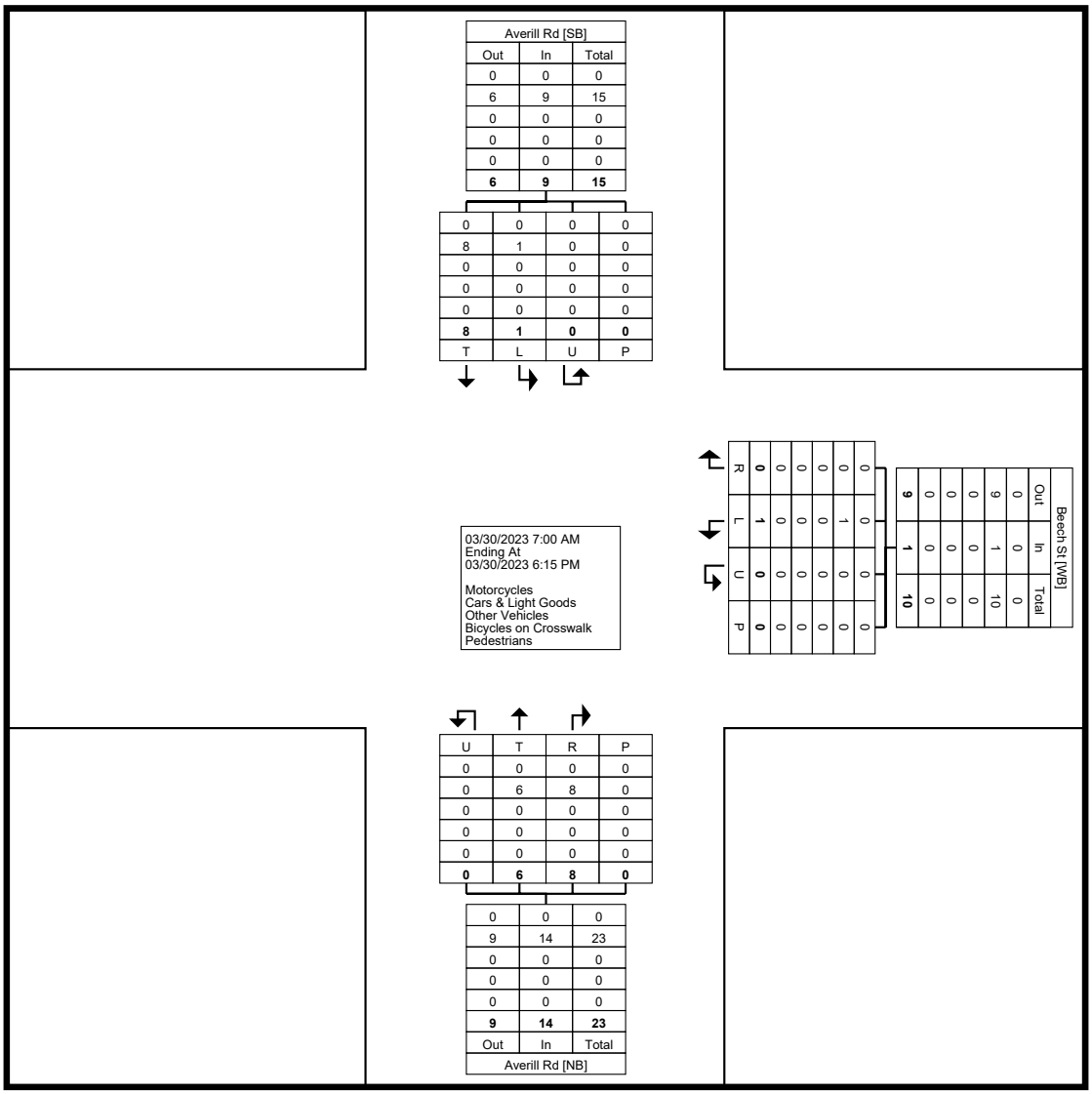
Cooperstown, NY

Thursday, March 30, 2023
Location: 42.701143, -74.936238

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338






Turning Movement Data Plot

Cooperstown, NY

Thursday, March 30, 2023
Location: 42.701143, -74.936238

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338

Count Name: 3. Averill Rd & Beech St
Site Code: Cooperstown, New York
Start Date: 03/30/2023
Page No: 3

# Turning Movement Peak Hour Data (8:00 AM)

| Start Time | Beech St Westbound | | | | | Averill Rd Northbound | | | | | Averill Rd Southbound | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Right | U-Turn | Peds | App. Total | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | U-Turn | Peds | App. Total | |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 8:30 AM | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 4 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 2 |
| Total | 1 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 3 | 0 | 4 | 0 | 0 | 4 | 8 |
| Approach % | 100.0 | 0.0 | 0.0 | - | - | 100.0 | 0.0 | 0.0 | - | - | 0.0 | 100.0 | 0.0 | - | - | - |
| Total % | 12.5 | 0.0 | 0.0 | - | 12.5 | 37.5 | 0.0 | 0.0 | - | 37.5 | 0.0 | 50.0 | 0.0 | - | 50.0 | - |
| PHF | 0.250 | 0.000 | 0.000 | - | 0.250 | 0.750 | 0.000 | 0.000 | - | 0.750 | 0.000 | 0.500 | 0.000 | - | 0.500 | 0.500 |
| Motorcycles | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | 0.0 | - | - | - | 0.0 | 0.0 | - | - | - | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 1 | 0 | 0 | - | 1 | 3 | 0 | 0 | - | 3 | 0 | 4 | 0 | - | 4 | 8 |
| % Cars & Light Goods | 100.0 | - | - | - | 100.0 | 100.0 | - | - | - | 100.0 | - | 100.0 | - | - | 100.0 | 100.0 |
| Other Vehicles | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Other Vehicles | 0.0 | - | - | - | 0.0 | 0.0 | - | - | - | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

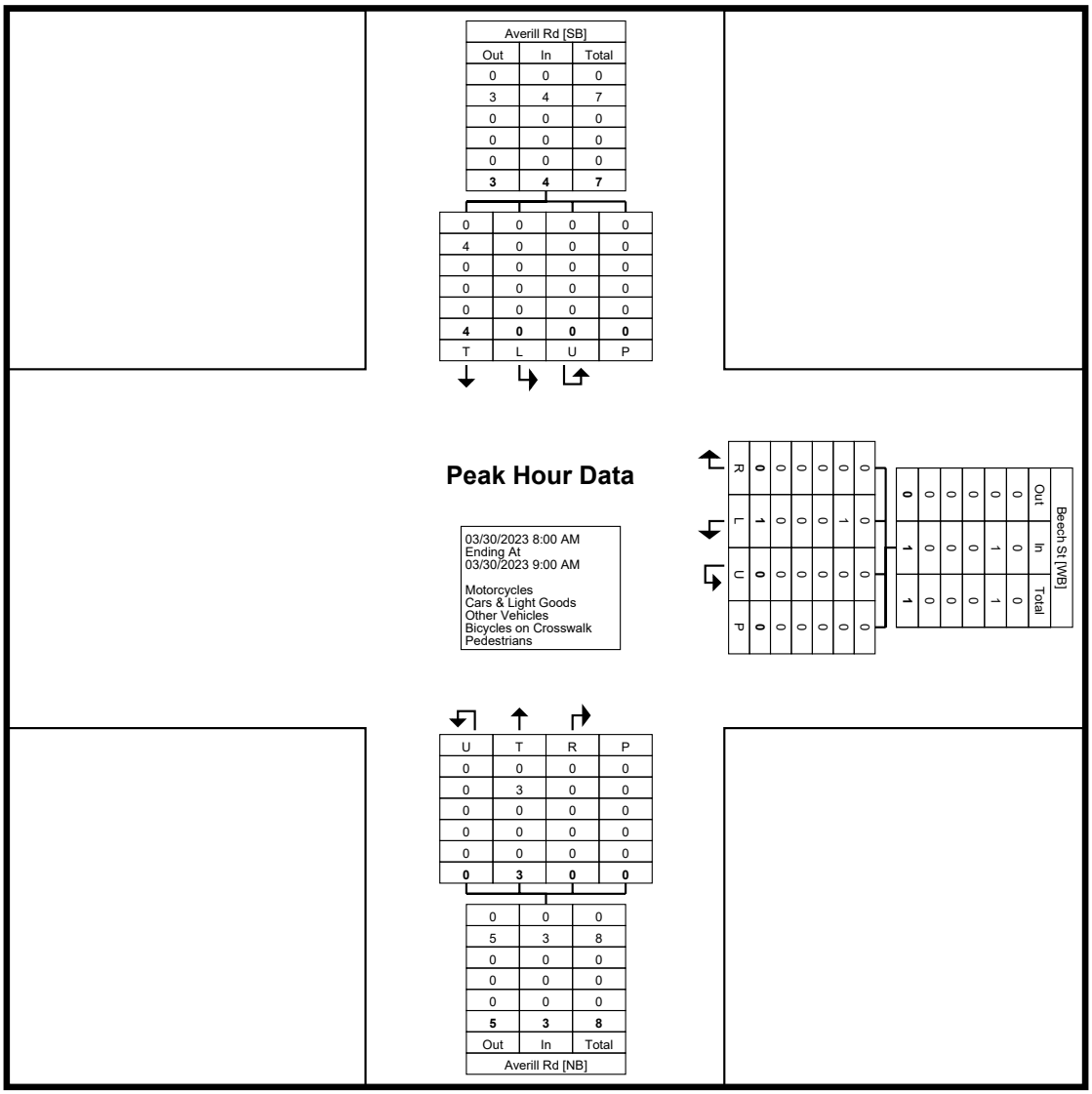
Cooperstown, NY

Thursday, March 30, 2023
Location: 42.701143, -74.936238

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338






Turning Movement Peak Hour Data Plot (8:00 AM)

Cooperstown, NY

Thursday, March 30, 2023
Location: 42.701143, -74.936238

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338

Count Name: 3. Averill Rd & Beech St
Site Code: Cooperstown, New York
Start Date: 03/30/2023
Page No: 5

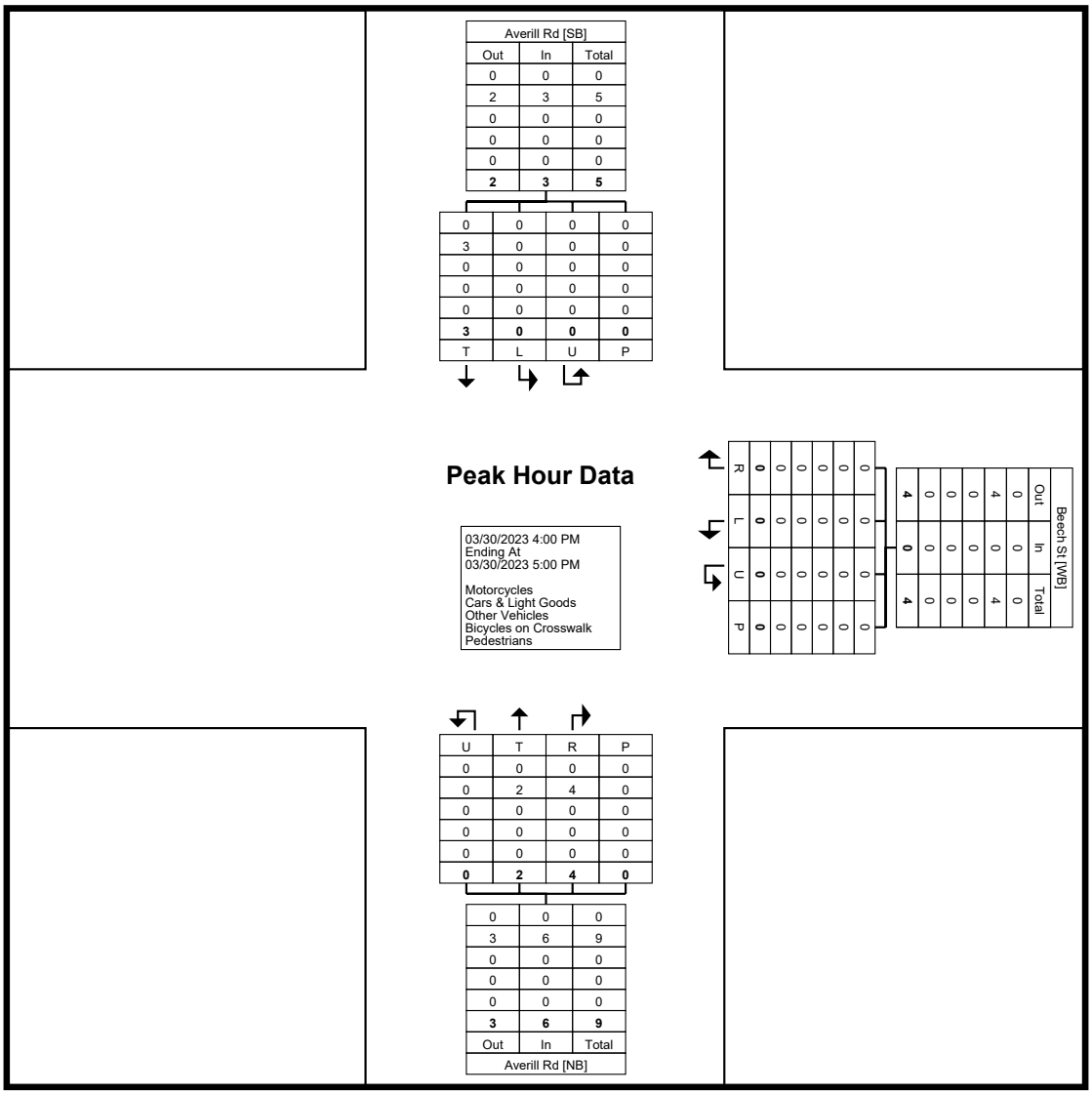
# Turning Movement Peak Hour Data (4:00 PM)

| Start Time | Beech St Westbound | | | | | Averill Rd Northbound | | | | | Averill Rd Southbound | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Right | U-Turn | Peds | App. Total | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | U-Turn | Peds | App. Total | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 1 | 4 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 2 | 4 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 0 | 0 | 6 | 0 | 3 | 0 | 0 | 3 | 9 |
| Approach % | 0.0 | 0.0 | 0.0 | - | - | 33.3 | 66.7 | 0.0 | - | - | 0.0 | 100.0 | 0.0 | - | - | - |
| Total % | 0.0 | 0.0 | 0.0 | - | 0.0 | 22.2 | 44.4 | 0.0 | - | 66.7 | 0.0 | 33.3 | 0.0 | - | 33.3 | - |
| PHF | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.500 | 0.500 | 0.000 | - | 0.500 | 0.000 | 0.375 | 0.000 | - | 0.375 | 0.563 |
| Motorcycles | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | - | - | - | - | - | 0.0 | 0.0 | - | - | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 0 | 0 | 0 | - | 0 | 2 | 4 | 0 | - | 6 | 0 | 3 | 0 | - | 3 | 9 |
| % Cars & Light Goods | - | - | - | - | - | 100.0 | 100.0 | - | - | 100.0 | - | 100.0 | - | - | 100.0 | 100.0 |
| Other Vehicles | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Other Vehicles | - | - | - | - | - | 0.0 | 0.0 | - | - | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338






Turning Movement Peak Hour Data Plot (4:00 PM)

Cooperstown, NY

Thursday, March 30, 2023
Location: 42.700128, -74.933271

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338

Count Name: 4. Main St & Grove St
Site Code: Cooperstown, New York
Start Date: 03/30/2023
Page No: 1

# Turning Movement Data

| Start Time | Main St Eastbound | | | | | | Main St Westbound | | | | | | Grove St Northbound | | | | | | Grove St / Dead End Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 7:00 AM | 0 | 3 | 0 | 0 | 0 | 3 | 2 | 2 | 0 | 0 | 1 | 4 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 7:15 AM | 0 | 3 | 2 | 0 | 0 | 5 | 1 | 2 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 7:30 AM | 0 | 2 | 3 | 0 | 0 | 5 | 7 | 3 | 0 | 0 | 0 | 10 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 18 |
| 7:45 AM | 0 | 3 | 4 | 0 | 0 | 7 | 3 | 9 | 0 | 0 | 0 | 12 | 4 | 0 | 2 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| Hourly Total | 0 | 11 | 9 | 0 | 0 | 20 | 13 | 16 | 0 | 0 | 1 | 29 | 4 | 1 | 8 | 0 | 1 | 13 | 0 | 1 | 0 | 0 | 0 | 1 | 63 |
| 8:00 AM | 0 | 3 | 1 | 0 | 0 | 4 | 1 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 5 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 8:15 AM | 0 | 4 | 1 | 0 | 0 | 5 | 2 | 2 | 0 | 0 | 0 | 4 | 1 | 0 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 8:30 AM | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 2 | 0 | 0 | 0 | 3 | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 8:45 AM | 0 | 4 | 1 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 2 | 7 | 0 | 0 | 4 | 0 | 0 | 4 | 2 | 0 | 0 | 0 | 0 | 2 | 18 |
| Hourly Total | 0 | 12 | 4 | 0 | 0 | 16 | 9 | 7 | 0 | 0 | 2 | 16 | 3 | 0 | 13 | 0 | 0 | 16 | 2 | 0 | 0 | 0 | 0 | 2 | 50 |
| 9:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:00 PM | 0 | 2 | 3 | 0 | 0 | 5 | 6 | 2 | 1 | 0 | 0 | 9 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 16 |
| 4:15 PM | 0 | 8 | 0 | 0 | 0 | 8 | 6 | 6 | 0 | 0 | 0 | 12 | 3 | 0 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 4:30 PM | 0 | 5 | 2 | 0 | 0 | 7 | 7 | 7 | 0 | 0 | 0 | 14 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 4:45 PM | 0 | 5 | 0 | 0 | 0 | 5 | 8 | 5 | 0 | 0 | 0 | 13 | 0 | 0 | 4 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| Hourly Total | 0 | 20 | 5 | 0 | 0 | 25 | 27 | 20 | 1 | 0 | 0 | 48 | 3 | 0 | 9 | 0 | 1 | 12 | 0 | 1 | 0 | 0 | 0 | 1 | 86 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 0 | 0 | 1 | 6 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 5:15 PM | 0 | 4 | 0 | 0 | 0 | 4 | 7 | 0 | 2 | 0 | 0 | 9 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| 5:30 PM | 0 | 4 | 0 | 0 | 0 | 4 | 3 | 9 | 1 | 0 | 0 | 13 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 20 |
| 5:45 PM | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 4 | 0 | 0 | 0 | 5 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| Hourly Total | 0 | 9 | 1 | 0 | 0 | 10 | 15 | 15 | 3 | 0 | 1 | 33 | 1 | 1 | 4 | 0 | 0 | 6 | 0 | 1 | 0 | 0 | 0 | 1 | 50 |
| 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grand Total | 0 | 52 | 19 | 0 | 0 | 71 | 64 | 58 | 4 | 0 | 4 | 126 | 11 | 2 | 34 | 0 | 2 | 47 | 2 | 3 | 0 | 0 | 0 | 5 | 249 |
| Approach % | 0.0 | 73.2 | 26.8 | 0.0 | - | - | 50.8 | 46.0 | 3.2 | 0.0 | - | - | 23.4 | 4.3 | 72.3 | 0.0 | - | - | 40.0 | 60.0 | 0.0 | 0.0 | - | - | - |
| Total % | 0.0 | 20.9 | 7.6 | 0.0 | - | 28.5 | 25.7 | 23.3 | 1.6 | 0.0 | - | 50.6 | 4.4 | 0.8 | 13.7 | 0.0 | - | 18.9 | 0.8 | 1.2 | 0.0 | 0.0 | - | 2.0 | - |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 0 | 52 | 19 | 0 | - | 71 | 64 | 56 | 4 | 0 | - | 124 | 11 | 2 | 31 | 0 | - | 44 | 2 | 3 | 0 | 0 | - | 5 | 244 |
| % Cars & Light Goods | - | 100.0 | 100.0 | - | - | 100.0 | 100.0 | 96.6 | 100.0 | - | - | 98.4 | 100.0 | 100.0 | 91.2 | - | - | 93.6 | 100.0 | 100.0 | - | - | - | 100.0 | 98.0 |
| Other Vehicles | 0 | 0 | 0 | 0 | - | 0 | 0 | 2 | 0 | 0 | - | 2 | 0 | 0 | 3 | 0 | - | 3 | 0 | 0 | 0 | 0 | - | 0 | 5 |
| % Other Vehicles | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 3.4 | 0.0 | - | - | 1.6 | 0.0 | 0.0 | 8.8 | - | - | 6.4 | 0.0 | 0.0 | - | - | - | 0.0 | 2.0 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 4 | - | - | - | - | - | 2 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | - | - | - |

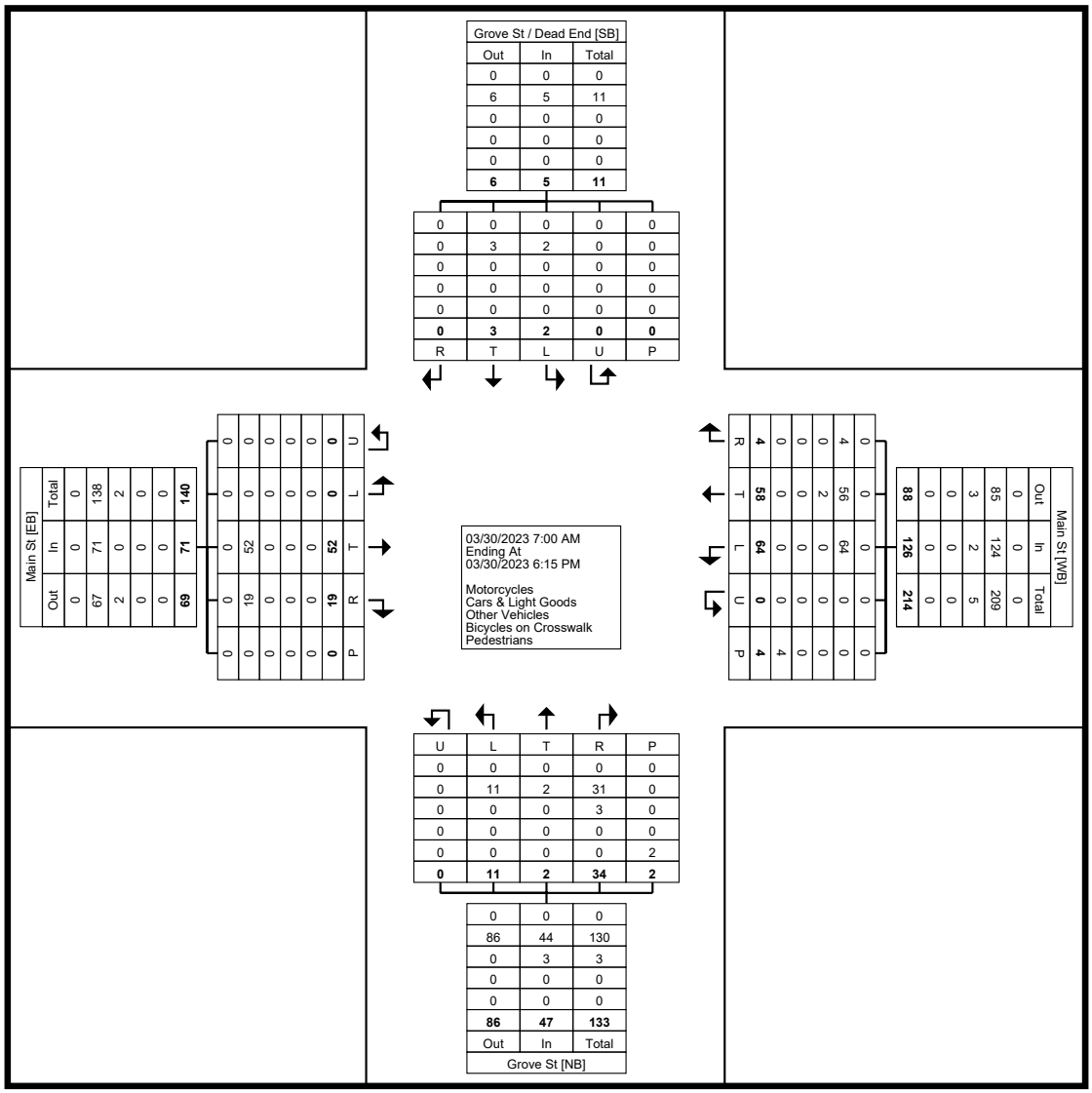
Cooperstown, NY

Thursday, March 30, 2023
Location: 42.700128, -74.933271

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338

Count Name: 4. Main St & Grove St
Site Code: Cooperstown, New York
Start Date: 03/30/2023


Turning Movement Data Plot

Cooperstown, NY

Thursday, March 30, 2023
Location: 42.700128, -74.933271

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338

Count Name: 4. Main St & Grove St
Site Code: Cooperstown, New York
Start Date: 03/30/2023


# Turning Movement Peak Hour Data (7:30 AM)

| Start Time | Main St Eastbound | | | | | | Main St Westbound | | | | | | Grove St Northbound | | | | | | Grove St / Dead End Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 7:30 AM | 0 | 2 | 3 | 0 | 0 | 5 | 7 | 3 | 0 | 0 | 0 | 10 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 18 |
| 7:45 AM | 0 | 3 | 4 | 0 | 0 | 7 | 3 | 9 | 0 | 0 | 0 | 12 | 4 | 0 | 2 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| 8:00 AM | 0 | 3 | 1 | 0 | 0 | 4 | 1 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 5 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 8:15 AM | 0 | 4 | 1 | 0 | 0 | 5 | 2 | 2 | 0 | 0 | 0 | 4 | 1 | 0 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| Total | 0 | 12 | 9 | 0 | 0 | 21 | 13 | 15 | 0 | 0 | 0 | 28 | 6 | 1 | 11 | 0 | 1 | 18 | 0 | 1 | 0 | 0 | 0 | 1 | 68 |
| Approach % | 0.0 | 57.1 | 42.9 | 0.0 | - | - | 46.4 | 53.6 | 0.0 | 0.0 | - | - | 33.3 | 5.6 | 61.1 | 0.0 | - | - | 0.0 | 100.0 | 0.0 | 0.0 | - | - | - |
| Total % | 0.0 | 17.6 | 13.2 | 0.0 | - | 30.9 | 19.1 | 22.1 | 0.0 | 0.0 | - | 41.2 | 8.8 | 1.5 | 16.2 | 0.0 | - | 26.5 | 0.0 | 1.5 | 0.0 | 0.0 | - | 1.5 | - |
| PHF | 0.000 | 0.750 | 0.563 | 0.000 | - | 0.750 | 0.464 | 0.417 | 0.000 | 0.000 | - | 0.583 | 0.375 | 0.250 | 0.550 | 0.000 | - | 0.750 | 0.000 | 0.250 | 0.000 | 0.000 | - | 0.250 | 0.680 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | - | 0.0 | - | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 0 | 12 | 9 | 0 | - | 21 | 13 | 13 | 0 | 0 | - | 26 | 6 | 1 | 10 | 0 | - | 17 | 0 | 1 | 0 | 0 | - | 1 | 65 |
| % Cars & Light Goods | - | 100.0 | 100.0 | - | - | 100.0 | 100.0 | 86.7 | - | - | - | 92.9 | 100.0 | 100.0 | 90.9 | - | - | 94.4 | - | 100.0 | - | - | - | 100.0 | 95.6 |
| Other Vehicles | 0 | 0 | 0 | 0 | - | 0 | 0 | 2 | 0 | 0 | - | 2 | 0 | 0 | 1 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 3 |
| % Other Vehicles | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 13.3 | - | - | - | 7.1 | 0.0 | 0.0 | 9.1 | - | - | 5.6 | - | 0.0 | - | - | - | 0.0 | 4.4 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - | - | - | - | - | - | - |

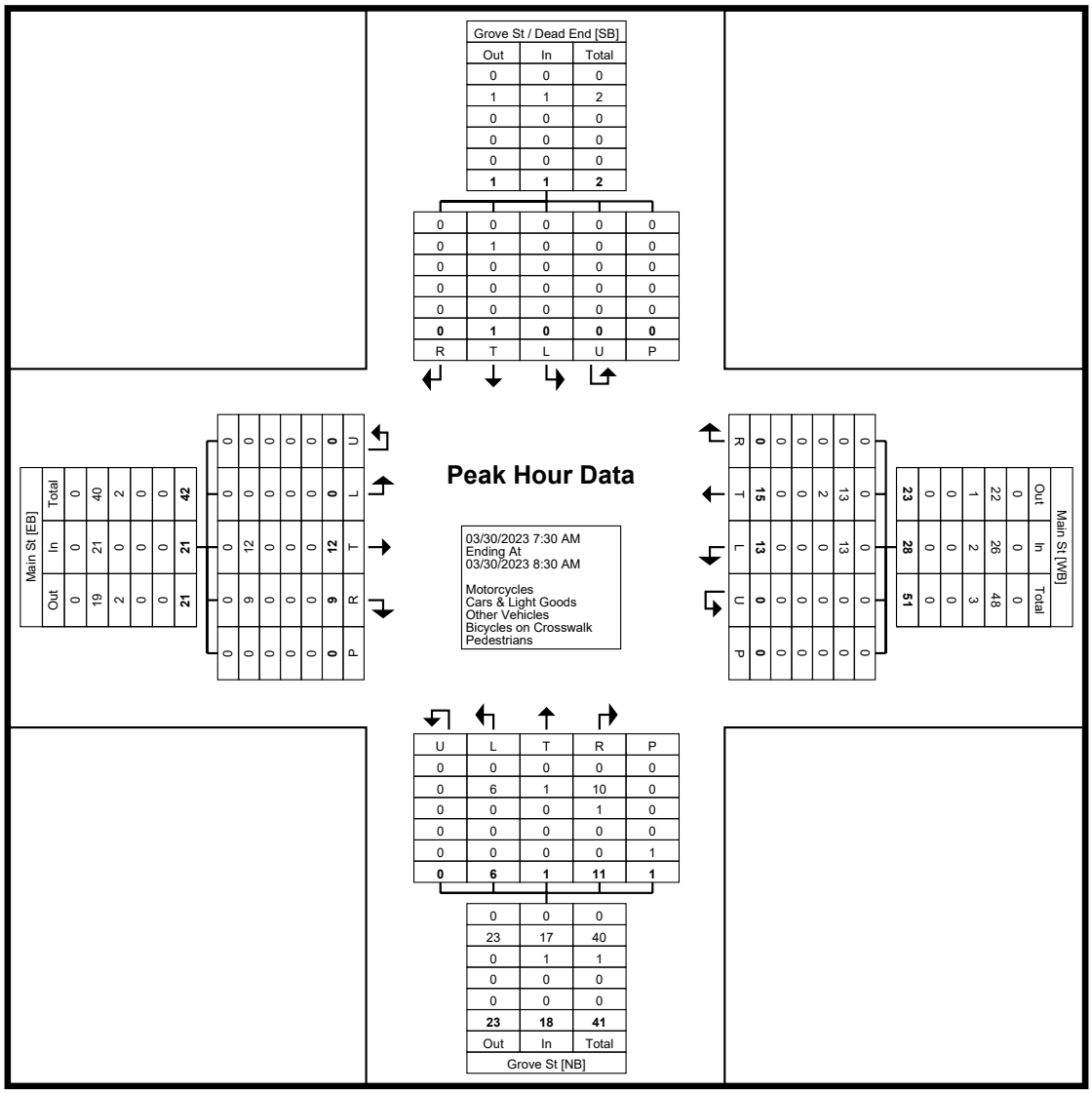
Cooperstown, NY

Thursday, March 30, 2023
Location: 42.700128, -74.933271

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338






Turning Movement Peak Hour Data Plot (7:30 AM)

Cooperstown, NY

Thursday, March 30, 2023
Location: 42.700128, -74.933271

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338

Count Name: 4. Main St & Grove St
Site Code: Cooperstown, New York
Start Date: 03/30/2023


# Turning Movement Peak Hour Data (4:00 PM)

| Start Time | Main St Eastbound | | | | | | Main St Westbound | | | | | | Grove St Northbound | | | | | | Grove St / Dead End Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 4:00 PM | 0 | 2 | 3 | 0 | 0 | 5 | 6 | 2 | 1 | 0 | 0 | 9 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 16 |
| 4:15 PM | 0 | 8 | 0 | 0 | 0 | 8 | 6 | 6 | 0 | 0 | 0 | 12 | 3 | 0 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 4:30 PM | 0 | 5 | 2 | 0 | 0 | 7 | 7 | 7 | 0 | 0 | 0 | 14 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 4:45 PM | 0 | 5 | 0 | 0 | 0 | 5 | 8 | 5 | 0 | 0 | 0 | 13 | 0 | 0 | 4 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| Total | 0 | 20 | 5 | 0 | 0 | 25 | 27 | 20 | 1 | 0 | 0 | 48 | 3 | 0 | 9 | 0 | 1 | 12 | 0 | 1 | 0 | 0 | 0 | 1 | 86 |
| Approach % | 0.0 | 80.0 | 20.0 | 0.0 | - | - | 56.3 | 41.7 | 2.1 | 0.0 | - | - | 25.0 | 0.0 | 75.0 | 0.0 | - | - | 0.0 | 100.0 | 0.0 | 0.0 | - | - | - |
| Total % | 0.0 | 23.3 | 5.8 | 0.0 | - | 29.1 | 31.4 | 23.3 | 1.2 | 0.0 | - | 55.8 | 3.5 | 0.0 | 10.5 | 0.0 | - | 14.0 | 0.0 | 1.2 | 0.0 | 0.0 | - | 1.2 | - |
| PHF | 0.000 | 0.625 | 0.417 | 0.000 | - | 0.781 | 0.844 | 0.714 | 0.250 | 0.000 | - | 0.857 | 0.250 | 0.000 | 0.563 | 0.000 | - | 0.750 | 0.000 | 0.250 | 0.000 | 0.000 | - | 0.250 | 0.896 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | - | 0.0 | - | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 0 | 20 | 5 | 0 | - | 25 | 27 | 20 | 1 | 0 | - | 48 | 3 | 0 | 8 | 0 | - | 11 | 0 | 1 | 0 | 0 | - | 1 | 85 |
| % Cars & Light Goods | - | 100.0 | 100.0 | - | - | 100.0 | 100.0 | 100.0 | 100.0 | - | - | 100.0 | 100.0 | - | 88.9 | - | - | 91.7 | - | 100.0 | - | - | - | 100.0 | 98.8 |
| Other Vehicles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 1 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 1 |
| % Other Vehicles | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | - | 11.1 | - | - | 8.3 | - | 0.0 | - | - | - | 0.0 | 1.2 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - | - | - | - | - | - | - |

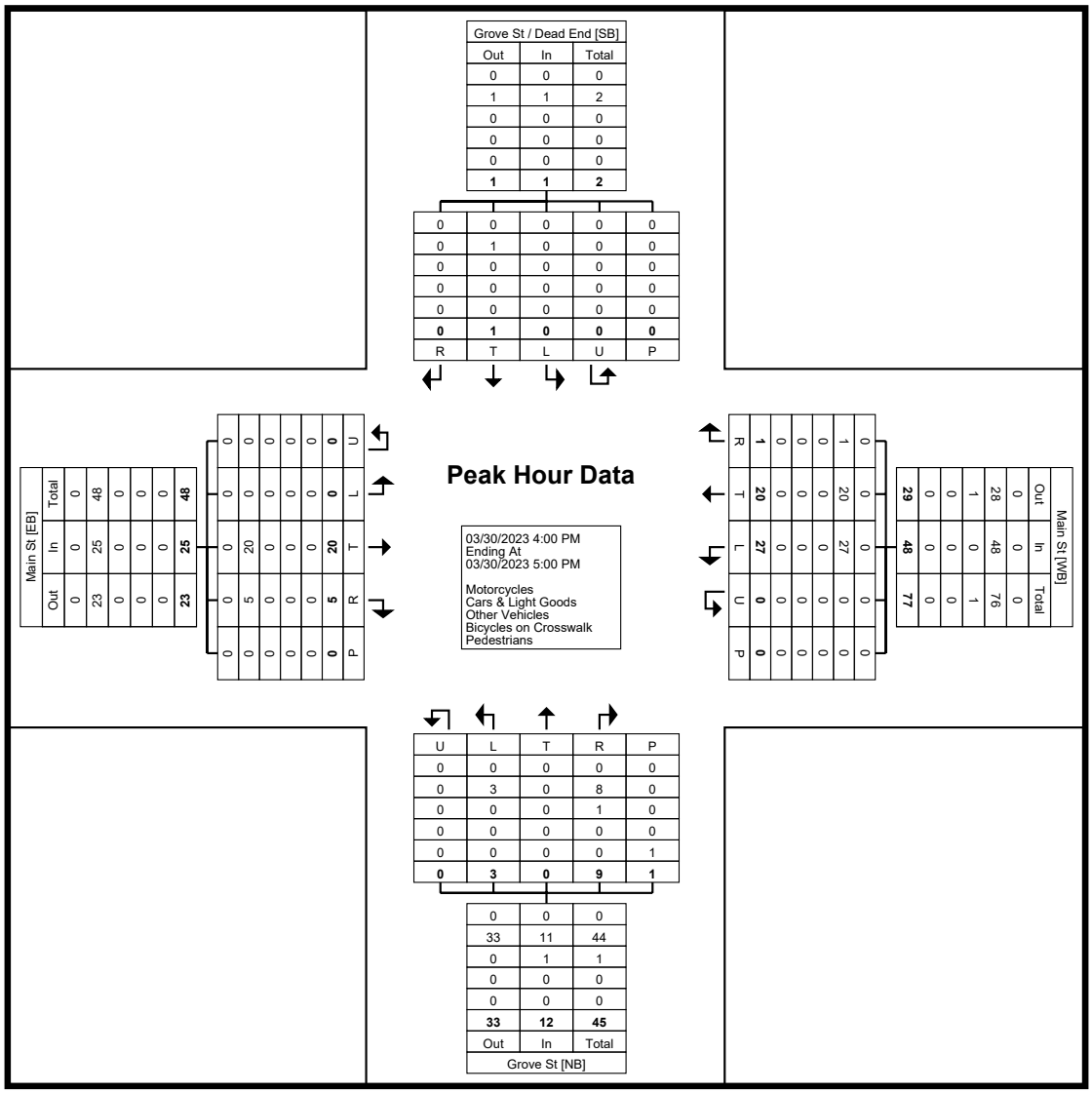
Cooperstown, NY

Thursday, March 30, 2023
Location: 42.700128, -74.933271

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338

Count Name: 4. Main St & Grove St
Site Code: Cooperstown, New York
Start Date: 03/30/2023


Turning Movement Peak Hour Data Plot (4:00 PM)

# **APPENDIX B:** MISCELLANEOUS CALCULATIONS

## Averill Road Housing Project, Village of Cooperstown, Otsego County, NY

Documentation of Ambient Traffic Volume Growth

| Roadway | Segment starts at | Segment end at | 2010 | 2013 | 2016 | 2023 | Annual Growth |
|---|---|---|---|---|---|---|---|
| Glen Ave | Chestnut Street | Fly Creek | 5,068 | 5,747 | 5,028 | 5,400 | 0.49% |

PASSERO

**Intersection Crash Rate Calculations**

**Averill Road Housing Project**

**Intersection #1:** Glen Ave at Main St
**Date of Count:** Tuesday, April 18, 2023

**Number of Crashes:** 1
**Number of Injuries:** 1
**Number of Fatalities:** 0
**Entering Vehicles (PM):** 516
**ADT:** 5432
**Start Date:** July 31, 2017
**End Date:** July 31, 2022
**Number of Years:** 5

**Intersection Type:** 3 Legged
**Area Type:** Rural
**Control Type:** Sign All Lanes

$$\text{crash rate} = \frac{\text{Number of Crashes} \times 1\text{ Million}}{\text{ADT} \times 365\text{ Days per Year} \times \text{Number of Years}}$$

$$\text{crash rate} = \frac{1 \times 1{,}000{,}000}{5432 \times 365 \times 5}$$

| | Crash Rate | | Fatality Rate | Injury Rate |
|---|---|---|---|---|
| **Study Intersection** | **0.10** | **cr/mve** | **0%** | **100%** |
| **Statewide Average*** | **0.17** | **cr/mve** | | |

ADT = Average Daily Total vehicles entering intersection
cr/mve = crashes per million entering vehicles
* Most recent available 2019 Average Crash Rates for State Highways by Facility Type

| | Direction | | | | | |
|---|---|---|---|---|---|---|
| Type | Northbound | Southbound | Eastbound | Westbound | Unknown | Totals |
| Left turn | | | | | | 0 |
| Rear-end | | | | | | 0 |
| Overtaking | | | | | | 0 |
| Right Angle | | | | | | 0 |
| Right Turn | | | | | | 0 |
| Head On | | | | | | 0 |
| Side-swipe | | | | | | 0 |
| Fixed Object | | 1 | | | | 1 |
| Backing | | | | | | 0 |
| Other | | | | | | 0 |
| Bike/Ped | | | | | | 0 |
| Animal | | | | | | 0 |
| Totals | 0 | 1 | 0 | 0 | 0 | 1 |

| | |
|---|---|
| PDO | |
| Injury | 1 |
| Injury + PDO | |
| Fatal | |
| NR | |
| Total | 1 |

**Intersection Crash Rate Calculations**

**Averill Road Housing Project**

**Intersection #2:** Main St at Averill Rd
**Date of Count:** Tuesday, April 18, 2023

**Number of Crashes:** 0
**Number of Injuries:** 0
**Number of Fatalities:** 0
**Entering Vehicles (PM):** 28
**ADT:** 295
**Start Date:** July 31, 2017
**End Date:** July 31, 2022
**Number of Years:** 5

**Intersection Type:** 3 Legged
**Area Type:** Rural
**Control Type:** Sign All Lanes

$$\text{crash rate} = \frac{\text{Number of Crashes} \times 1\text{ Million}}{\text{ADT} \times 365\text{ Days per Year} \times \text{Number of Years}}$$

$$\text{crash rate} = \frac{0 \times 1{,}000{,}000}{295 \times 365 \times 5}$$

| | Crash Rate | | Fatality Rate | Injury Rate |
|---|---|---|---|---|
| **Study Intersection** | **0.00** | **cr/mve** | **#DIV/0!** | **#DIV/0!** |
| **Statewide Average*** | **0.17** | **cr/mve** | | |

ADT = Average Daily Total vehicles entering intersection
cr/mve = crashes per million entering vehicles
* Most recent available 2019 Average Crash Rates for State Highways by Facility Type

| | Direction | | | | | |
|---|---|---|---|---|---|---|
| Type | Northbound | Southbound | Eastbound | Westbound | Unknown | Totals |
| Left turn | | | | | | 0 |
| Rear-end | | | | | | 0 |
| Overtaking | | | | | | 0 |
| Right Angle | | | | | | 0 |
| Right Turn | | | | | | 0 |
| Head On | | | | | | 0 |
| Side-swipe | | | | | | 0 |
| Fixed Object | | | | | | 0 |
| Backing | | | | | | 0 |
| Other | | | | | | 0 |
| Bike/Ped | | | | | | 0 |
| Animal | | | | | | 0 |
| Totals | 0 | 0 | 0 | 0 | 0 | 0 |

| | |
|---|---|
| PDO | |
| Injury | |
| Injury + PDO | |
| Fatal | |
| NR | |
| Total | 0 |

PASSERO

**Intersection Crash Rate Calculations**

**Averill Road Housing Project**

**Intersection #3:** Main St at Grove St
**Date of Count:** Tuesday, April 18, 2023

**Number of Crashes:** 0
**Number of Injuries:** 0
**Number of Fatalities:** 0
**Entering Vehicles (PM):** 86
**ADT:** 905
**Start Date:** July 31, 2017
**End Date:** July 31, 2022
**Number of Years:** 5

**Intersection Type:** 4 Legged
**Area Type:** Rural
**Control Type:** Sign All Lanes

crash rate = Number of Crashes x 1 Million / ADT x 365 Days per Year x Number of Years

crash rate = 0 x 1,000,000 / 905 x 365 x 5

| | Crash Rate | | Fatality Rate | Injury Rate |
|---|---|---|---|---|
| **Study Intersection** | **0.00** | **cr/mve** | **#DIV/0!** | **#DIV/0!** |
| **Statewide Average*** | **0.35** | **cr/mve** | | |

ADT = Average Daily Total vehicles entering intersection
cr/mve = crashes per million entering vehicles
* Most recent available 2019 Average Crash Rates for State Highways by Facility Type

| | Direction | | | | | |
|---|---|---|---|---|---|---|
| Type | Northbound | Southbound | Eastbound | Westbound | Unknown | Totals |
| Left turn | | | | | | 0 |
| Rear-end | | | | | | 0 |
| Overtaking | | | | | | 0 |
| Right Angle | | | | | | 0 |
| Right Turn | | | | | | 0 |
| Head On | | | | | | 0 |
| Side-swipe | | | | | | 0 |
| Fixed Object | | | | | | 0 |
| Backing | | | | | | 0 |
| Other | | | | | | 0 |
| Bike/Ped | | | | | | 0 |
| Animal | | | | | | 0 |
| Totals | 0 | 0 | 0 | 0 | 0 | 0 |

| | |
|---|---|
| PDO | |
| Injury | |
| Injury + PDO | |
| Fatal | |
| NR | |
| Total | 0 |

**Intersection Crash Rate Calculations**

**Averill Road Housing Project**

**Intersection #4:** Averill Rd at Beech St
**Date of Count:** Tuesday, April 18, 2023

**Number of Crashes:** 0
**Number of Injuries:** 0
**Number of Fatalities:** 0
**Entering Vehicles (PM):** 9
**ADT:** 95
**Start Date:** July 31, 2017
**End Date:** July 31, 2022
**Number of Years:** 5

**Intersection Type:** 3 Legged
**Area Type:** Rural
**Control Type:** Sign All Lanes

crash rate = Number of Crashes x 1 Million / ADT x 365 Days per Year x Number of Years

crash rate = 0 x 1,000,000 / 95 x 365 x 5

| | Crash Rate | | Fatality Rate | Injury Rate |
|---|---|---|---|---|
| **Study Intersection** | **0.00** | **cr/mve** | **#DIV/0!** | **#DIV/0!** |
| **Statewide Average*** | **0.17** | **cr/mve** | | |

ADT = Average Daily Total vehicles entering intersection
cr/mve = crashes per million entering vehicles
* Most recent available 2019 Average Crash Rates for State Highways by Facility Type

| | Direction | | | | | |
|---|---|---|---|---|---|---|
| Type | Northbound | Southbound | Eastbound | Westbound | Unknown | Totals |
| Left turn | | | | | | 0 |
| Rear-end | | | | | | 0 |
| Overtaking | | | | | | 0 |
| Right Angle | | | | | | 0 |
| Right Turn | | | | | | 0 |
| Head On | | | | | | 0 |
| Side-swipe | | | | | | 0 |
| Fixed Object | | | | | | 0 |
| Backing | | | | | | 0 |
| Other | | | | | | 0 |
| Bike/Ped | | | | | | 0 |
| Animal | | | | | | 0 |
| Totals | 0 | 0 | 0 | 0 | 0 | 0 |

| | |
|---|---|
| PDO | |
| Injury | |
| Injury + PDO | |
| Fatal | |
| NR | |
| Total | 0 |

PASSERO
engineering architecture

**PROJECT:** Averill Road Housing Project
**LOCATION:** Village of Cooperstown, New York
**PEAK HOUR:** AM Peak

| | | | | Num of yrs 2 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| LOCATION NUMBER | INTERSECTION DESCRIPTION | 2023 Existing Volumes | Season Adjustment | Bkgd Volumes 1.0% | Averill Road Housing Project Enter Dist. % | Exit Dist. % | Trips IN 8 | Trips OUT 27 | Total Site Trips | Full Build Volumes |
| 1 | Glen Ave/ Main St | | | | | | | | | |
| | SR | | | | | | | | | |
| | ST | 341 | 378 | 386 | | | | | | 386 |
| | SL | 10 | 11 | 11 | 20% | | 2 | | 2 | 13 |
| | WR | 3 | 3 | 3 | | 20% | | 5 | 5 | 8 |
| | WT | | | | | | | | | |
| | WL | | | | | | | | | |
| | NR | | | | | | | | | |
| | NT | 118 | 131 | 134 | | | | | | 134 |
| | NL | | | | | | | | | |
| | ER | | | | | | | | | |
| | ET | | | | | | | | | |
| | EL | | | | | | | | | |
| 2 | Main St/ Averill Rd | | | | | | | | | |
| | SR | 3 | 3 | 3 | | 20% | | 5 | 5 | 8 |
| | ST | 2 | 2 | 2 | | 80% | | 22 | 22 | 24 |
| | SL | | | | | | | | | |
| | WR | | | | | | | | | |
| | WT | | | | | | | | | |
| | WL | | | | | | | | | |
| | NR | | | | | | | | | |
| | NT | 4 | 4 | 5 | 80% | | 6 | | 6 | 11 |
| | NL | 6 | 7 | 7 | | | | | | 7 |
| | ER | 8 | 9 | 9 | | | | | | 9 |
| | ET | | | | | | | | | |
| | EL | | | | 20% | | 2 | | 2 | 2 |
| 3 | Main St/ Grove St | | | | | | | | | |
| | SR | | | | | | | | | |
| | ST | 1 | 1 | 1 | | | | | | 1 |
| | SL | | | | | | | | | |
| | WR | | | | | | | | | |
| | WT | 15 | 17 | 17 | 50% | | 4 | | 4 | 21 |
| | WL | 13 | 14 | 15 | | | | | | 15 |
| | NR | 11 | 12 | 12 | | | | | | 12 |
| | NT | 1 | 1 | 1 | | | | | | 1 |
| | NL | 6 | 7 | 7 | 30% | | 2 | | 2 | 9 |
| | ER | 9 | 10 | 10 | | 30% | | 8 | 8 | 18 |
| | ET | 12 | 13 | 14 | | 50% | | 14 | 14 | 28 |
| | EL | | | | | | | | | |
| 4 | Averill Rd/ Beech St | | | | | | | | | |
| | SR | | | | | | | | | |
| | ST | 4 | 4 | 5 | | 100% | | 27 | 27 | 32 |
| | SL | | | | | | | | | |
| | WR | | | | | | | | | |
| | WT | | | | | | | | | |
| | WL | 1 | 1 | 1 | | | | | | 1 |
| | NR | | | | | | | | | |
| | NT | 3 | 3 | 3 | 100% | | 8 | | 8 | 11 |
| | NL | | | | | | | | | |
| | ER | | | | | | | | | |
| | ET | | | | | | | | | |
| | EL | | | | | | | | | |

PASSERO
engineering architecture

**PROJECT:** Averill Road Housing Project
**LOCATION:** Village of Cooperstown, New York
**PEAK HOUR:** AM Peak

| | | | | Num of yrs 2 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **LOCATION NUMBER** | **INTERSECTION DESCRIPTION** | **2023 Existing Volumes** | **Season Adjustment** | **Bkgd Volumes** 1.0% | **Averill Road Housing Project** Enter Dist. % | Exit Dist. % | Trips IN 8 | Trips OUT 27 | **Total Site Trips** | **Full Build Volumes** |
| **5** | Averill Rd/<br>Proposed Southerly Driveway | | | | | | | | | |
| | SR<br>ST<br>SL | 2 | 2 | 2 | | 30% | | 8 | 8 | 10 |
| | WR<br>WT<br>WL | | | | | 70% | | 19 | 19 | 19 |
| | NR<br>NT<br>NL | 2 | 2 | 2 | 70%<br>30% | | 6<br>2 | | 6<br>2 | 6<br>4 |
| | ER<br>ET<br>EL | | | | | | | | | |
| **6** | Averill Rd/<br>Proposed Northerly Driveway | | | | | | | | | |
| | SR<br>ST<br>SL | 1 | 1 | 1 | | | | | | 1 |
| | WR<br>WT<br>WL | | | | | 30% | | 8 | 8 | 8 |
| | NR<br>NT<br>NL | 1 | 1 | 1 | 30% | | 2 | | 2 | 2<br>1 |
| | ER<br>ET<br>EL | | | | | | | | | |

PASSERO
engineering architecture

**PROJECT:** Averill Road Housing Project
**LOCATION:** Village of Cooperstown, New York
**PEAK HOUR:** PM Peak

| | | | | Num of yrs 2 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| LOCATION NUMBER | INTERSECTION DESCRIPTION | 2023 Existing Volumes | Season Adjustment | Bkgd Volumes 1.0% | Averill Road Housing Project | | | | Total Site Trips | Full Build Volumes |
| | | | | | Enter Dist. % | Exit Dist. % | Trips IN 23 | Trips OUT 14 | | |
| 1 | Glen Ave/ Main St | | | | | | | | | |
| | SR | | | | | | | | | |
| | ST | 152 | 169 | 172 | | | | | | 172 |
| | SL | 2 | 2 | 2 | 20% | | 5 | | 5 | 7 |
| | WR | 21 | 23 | 24 | | 20% | | 3 | 3 | 27 |
| | WT | | | | | | | | | |
| | WL | | | | | | | | | |
| | NR | | | | | | | | | |
| | NT | 290 | 322 | 328 | | | | | | 328 |
| | NL | | | | | | | | | |
| | ER | | | | | | | | | |
| | ET | | | | | | | | | |
| | EL | | | | | | | | | |
| 2 | Main St/ Averill Rd | | | | | | | | | |
| | SR | | | | | 20% | | 3 | 3 | 3 |
| | ST | 3 | 3 | 3 | | 80% | | 11 | 11 | 14 |
| | SL | | | | | | | | | |
| | WR | | | | | | | | | |
| | WT | | | | | | | | | |
| | WL | | | | | | | | | |
| | NR | | | | | | | | | |
| | NT | 6 | 7 | 7 | 80% | | 18 | | 18 | 25 |
| | NL | 13 | 14 | 15 | | | | | | 15 |
| | ER | 6 | 7 | 7 | | | | | | 7 |
| | ET | | | | | | | | | |
| | EL | | | | 20% | | 5 | | 5 | 5 |
| 3 | Main St/ Grove St | | | | | | | | | |
| | SR | | | | | | | | | |
| | ST | 1 | 1 | 1 | | | | | | 1 |
| | SL | | | | | | | | | |
| | WR | 1 | 1 | 1 | | | | | | 1 |
| | WT | 20 | 22 | 23 | 50% | | 12 | | 12 | 35 |
| | WL | 27 | 30 | 31 | | | | | | 31 |
| | NR | 9 | 10 | 10 | | | | | | 10 |
| | NT | | | | | | | | | |
| | NL | 3 | 3 | 3 | 30% | | 7 | | 7 | 10 |
| | ER | 5 | 6 | 6 | | 30% | | 4 | 4 | 10 |
| | ET | 20 | 22 | 23 | | 50% | | 7 | 7 | 30 |
| | EL | | | | | | | | | |
| 4 | Averill Rd/ Beech St | | | | | | | | | |
| | SR | | | | | | | | | |
| | ST | 3 | 3 | 3 | | 100% | | 14 | 14 | 17 |
| | SL | | | | | | | | | |
| | WR | | | | | | | | | |
| | WT | | | | | | | | | |
| | WL | | | | | | | | | |
| | NR | 4 | 4 | 5 | | | | | | 5 |
| | NT | 2 | 2 | 2 | 100% | | 23 | | 23 | 25 |
| | NL | | | | | | | | | |
| | ER | | | | | | | | | |
| | ET | | | | | | | | | |
| | EL | | | | | | | | | |

PASSERO
engineering architecture

**PROJECT:** **Averill Road Housing Project**
**LOCATION:** **Village of Cooperstown, New York**
**PEAK HOUR:** **PM Peak**

| | | | | Num of yrs 2 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **LOCATION NUMBER** | **INTERSECTION DESCRIPTION** | **2023 Existing Volumes** | **Season Adjustment** | **Bkgd Volumes** 1.0% | **Averill Road Housing Project** Enter Dist. % | Exit Dist. % | Trips IN 23 | Trips OUT 14 | **Total Site Trips** | **Full Build Volumes** |
| **5** | Averill Rd/<br>Proposed Southerly Driveway | | | | | | | | | |
| | SR<br>ST<br>SL | 2 | 2 | 2 | | 30% | | 4 | 4 | 6 |
| | WR<br>WT<br>WL | | | | | 70% | | 10 | 10 | 10 |
| | NR<br>NT<br>NL | 1 | 1 | 1 | 70%<br>30% | | 16<br>7 | | 16<br>7 | 16<br>8 |
| | ER<br>ET<br>EL | | | | | | | | | |
| **6** | Averill Rd/<br>Proposed Northerly Driveway | | | | | | | | | |
| | SR<br>ST<br>SL | 1 | 1 | 1 | | | | | | 1 |
| | WR<br>WT<br>WL | | | | | 30% | | 4 | 4 | 4 |
| | NR<br>NT<br>NL | 1 | 1 | 1 | 30% | | 7 | | 7 | 7<br>1 |
| | ER<br>ET<br>EL | | | | | | | | | |

# SEASONAL ADJUSTMENT FACTORS 2021

Based on Continuous Count Site Data 2021

## *FULL WEEK*

| FACTOR GROUP | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Commuter Dominated—30** | 0.842 | 0.847 | 0.965 | 1.003 | 1.054 | 1.089 | 1.066 | 1.065 | 1.069 | 1.061 | 0.992 | 0.958 |
| **Non-Commuter Dominated—40** | 0.759 | 0.776 | 0.887 | 0.950 | 1.053 | 1.150 | 1.212 | 1.209 | 1.120 | 1.057 | 0.942 | 0.874 |
| **Recreational—60** | 0.609 | 0.660 | 0.718 | 0.771 | 1.047 | 1.345 | 1.607 | 1.610 | 1.275 | 1.092 | 0.748 | 0.677 |

## *WORK WEEK*

| FACTOR GROUP | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Commuter Dominated—30** | 0.901 | 0.879 | 1.009 | 1.047 | 1.102 | 1.128 | 1.112 | 1.113 | 1.103 | 1.107 | 1.039 | 1.026 |
| **Non-Commuter Dominated—40** | 0.792 | 0.781 | 0.901 | 0.964 | 1.055 | 1.127 | 1.191 | 1.184 | 1.091 | 1.058 | 0.957 | 0.927 |
| **Recreational—60** | 0.610 | 0.638 | 0.694 | 0.733 | 0.965 | 1.242 | 1.542 | 1.500 | 1.153 | 1.020 | 0.740 | 0.713 |

## *WEEKEND*

| FACTOR GROUP | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Commuter Dominated—30** | 0.692 | 0.725 | 0.826 | 0.863 | 0.911 | 0.962 | 0.916 | 0.916 | 0.941 | 0.906 | 0.858 | 0.761 |
| **Non-Commuter Dominated—40** | 0.654 | 0.709 | 0.795 | 0.861 | 0.984 | 1.128 | 1.176 | 1.191 | 1.100 | 0.982 | 0.881 | 0.725 |
| **Recreational—60** | 0.571 | 0.653 | 0.682 | 0.728 | 1.061 | 1.460 | 1.756 | 1.739 | 1.423 | 1.111 | 0.707 | 0.559 |

New York State Department of Transportation
Highway Data Services Bureau
MO-TrafficDataViewer@dot.ny.gov
(518) 457-1965

NYSDOT uses the Work Week factors when processing data from short term traffic counts.

MAY 2022

## Guideline for determining left-turn Lane at a two-way stop-controlled intersection

**TWO LANE ROADWAY**

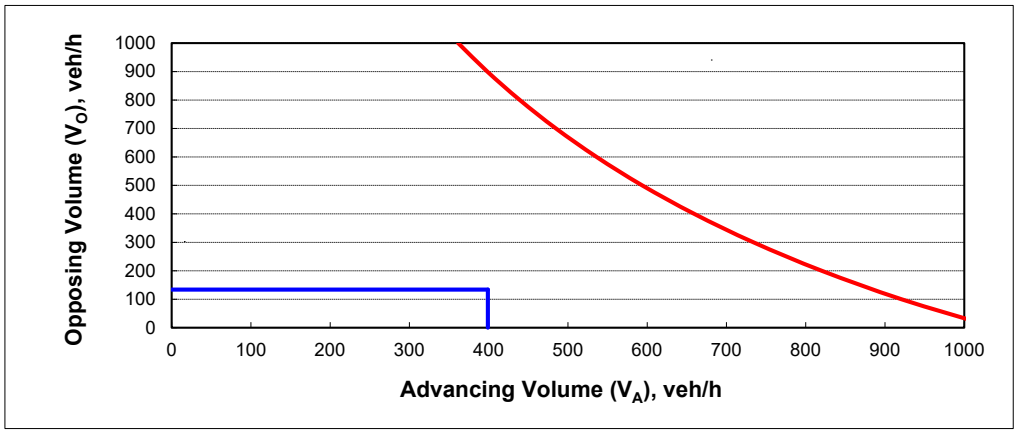
INPUT

| Variable | Value |
|---|---|
| Major Approach | Glen Avenue @ Main Street |
| Approach | Southbound (AM Peak) |
| Design Speed Limit - MPH | 35 |
| Percent of left-turns in advancing volume ($V_A$), %: | 3% |
| Advancing volume ($V_A$), veh/h: | 399 |
| Opposing volume ($V_O$), veh/h: | 134 |

CALIBRATION CONSTANTS

| Variable | Value |
|---|---|
| Average time for making left-turn, s: | 3.0 |
| Critical headway, s: | 5.0 |
| Average time for left-turn vehicle to clear the advancing lane, s: | 1.9 |

| PLOT - LINE 1 | | PLOT - LINE 2 | |
|---|---|---|---|
| 0 | 134 | 399 | 0 |
| 399 | 134 | 399 | 134 |




OUTPUT

| Variable | Value |
|---|---|
| Limiting advancing volume ($V_A$), veh/h: | 885 |
| **Guidance for determining the need for a major-road left-turn bay:** | |
| **Southbound (AM Peak) Left-turn treatment NOT warranted at Glen Avenue @ Main Street Intersections** | |

| | | |
|---|---|---|
| ρ | 0.0225 | |
| f = | 0.79 | |
| Wait Time | 0.496 | s |
| Service Rate | 1095 | veh/h |
| Arrival Rate | 885 | veh/h |

| Vo | Time_tw |
|---|---|
| 0 | 0.0 |
| 100 | 0.4 |
| 200 | 0.8 |
| 300 | 1.2 |
| 400 | 1.7 |
| 500 | 2.2 |
| 600 | 2.8 |
| 700 | 3.5 |
| 800 | 4.2 |
| 900 | 5.0 |
| 1000 | 5.8 |

| Vo | Serv_rate |
|---|---|
| 0 | 1200 |
| 100 | 1121 |
| 200 | 1046 |
| 300 | 976 |
| 400 | 910 |
| 500 | 848 |
| 600 | 789 |
| 700 | 735 |
| 800 | 683 |
| 900 | 635 |
| 1000 | 590 |

| % LT veh. | 3% | 10% | 15% | 20% | 40% |
|---|---|---|---|---|---|
| Vo | $V_A$ | $V_A$ | $V_A$ | $V_A$ | $V_A$ |
| 0 | 1040 | 616 | 517 | 462 | 377 |
| 100 | 921 | 545 | 458 | 409 | 334 |
| 200 | 820 | 485 | 408 | 364 | 297 |
| 300 | 734 | 434 | 365 | 326 | 266 |
| 400 | 659 | 390 | 328 | 293 | 239 |
| 500 | 594 | 351 | 295 | 264 | 215 |
| 600 | 536 | 317 | 267 | 238 | 194 |
| 700 | 485 | 287 | 241 | 215 | 176 |
| 800 | 439 | 260 | 218 | 195 | 159 |
| 900 | 398 | 236 | 198 | 177 | 144 |
| 1000 | 362 | 214 | 180 | 160 | 131 |

## Guideline for determining left-turn Lane at a two-way stop-controlled intersection

**TWO LANE ROADWAY**

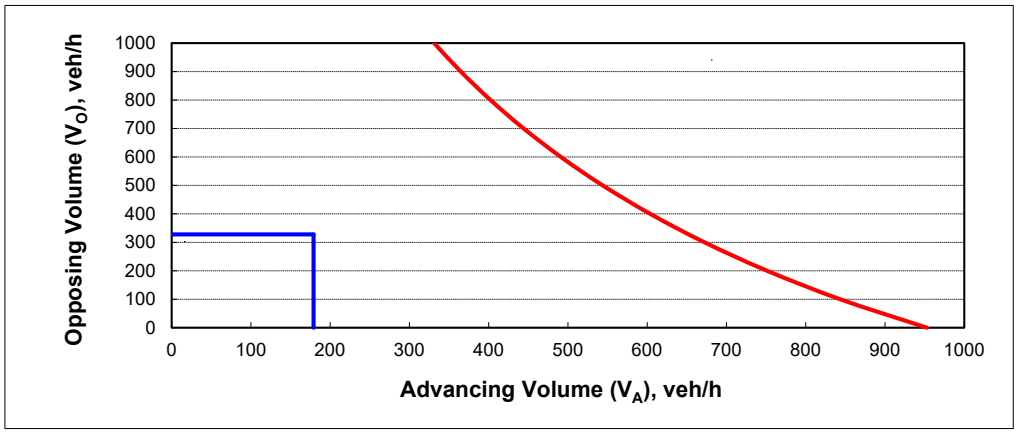
INPUT

| Variable | Value |
|---|---|
| Major Approach | Glen Avenue @ Main Street |
| Approach | Southbound (PM Peak) |
| Design Speed Limit - MPH | 35 |
| Percent of left-turns in advancing volume ($V_A$), %: | 4% |
| Advancing volume ($V_A$), veh/h: | 179 |
| Opposing volume ($V_O$), veh/h: | 328 |

CALIBRATION CONSTANTS

| Variable | Value |
|---|---|
| Average time for making left-turn, s: | 3.0 |
| Critical headway, s: | 5.0 |
| Average time for left-turn vehicle to clear the advancing lane, s: | 1.9 |

| PLOT - LINE 1 | | PLOT - LINE 2 | |
|---|---|---|---|
| 0 | 328 | 179 | 0 |
| 179 | 328 | 179 | 328 |




OUTPUT

| Variable | Value |
|---|---|
| Limiting advancing volume ($V_A$), veh/h: | 652 |
| **Guidance for determining the need for a major-road left-turn bay:** | |
| **Southbound (PM Peak) Left-turn treatment NOT warranted at Glen Avenue @ Main Street Intersections** | |

| | | |
|---|---|---|
| ρ | 0.0225 | |
| f = | 0.79 | |
| Wait Time | 1.333 | s |
| Service Rate | 957 | veh/h |
| Arrival Rate | 652 | veh/h |

| Vo | Time_tw |
|---|---|
| 0 | 0.0 |
| 100 | 0.4 |
| 200 | 0.8 |
| 300 | 1.2 |
| 400 | 1.7 |
| 500 | 2.2 |
| 600 | 2.8 |
| 700 | 3.5 |
| 800 | 4.2 |
| 900 | 5.0 |
| 1000 | 5.8 |

| Vo | Serv_rate |
|---|---|
| 0 | 1200 |
| 100 | 1121 |
| 200 | 1046 |
| 300 | 976 |
| 400 | 910 |
| 500 | 848 |
| 600 | 789 |
| 700 | 735 |
| 800 | 683 |
| 900 | 635 |
| 1000 | 590 |

| % LT veh. | 4% | 10% | 15% | 20% | 40% |
|---|---|---|---|---|---|
| Vo | $V_A$ | $V_A$ | $V_A$ | $V_A$ | $V_A$ |
| 0 | 953 | 616 | 517 | 462 | 377 |
| 100 | 843 | 545 | 458 | 409 | 334 |
| 200 | 751 | 485 | 408 | 364 | 297 |
| 300 | 672 | 434 | 365 | 326 | 266 |
| 400 | 604 | 390 | 328 | 293 | 239 |
| 500 | 544 | 351 | 295 | 264 | 215 |
| 600 | 491 | 317 | 267 | 238 | 194 |
| 700 | 444 | 287 | 241 | 215 | 176 |
| 800 | 402 | 260 | 218 | 195 | 159 |
| 900 | 365 | 236 | 198 | 177 | 144 |
| 1000 | 331 | 214 | 180 | 160 | 131 |

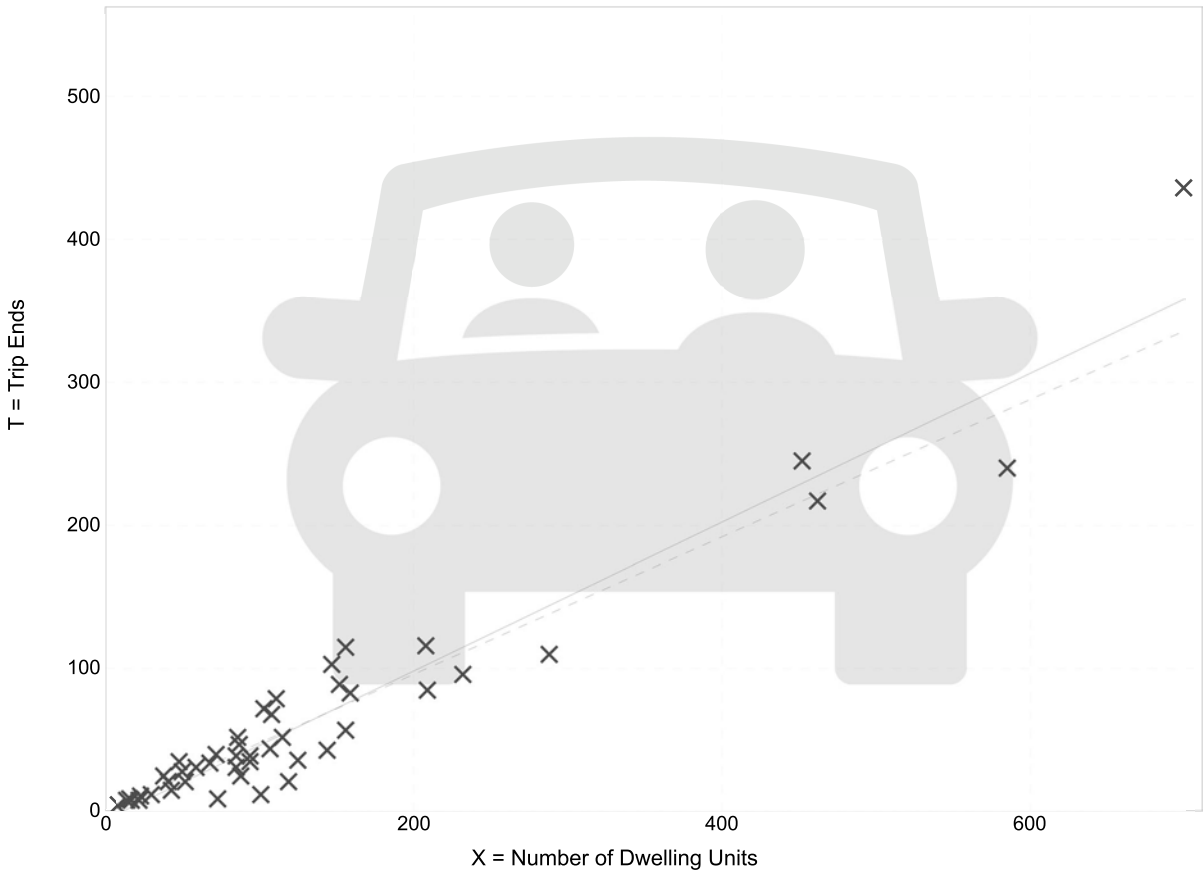
# Single-Family Attached Housing
(215)

| | |
|---|---|
| **Vehicle Trip Ends vs:** | **Dwelling Units** |
| **On a:** | **Weekday,** |
| | **Peak Hour of Adjacent Street Traffic,** |
| | **One Hour Between 7 and 9 a.m.** |
| **Setting/Location:** | **General Urban/Suburban** |
| Number of Studies: | 46 |
| Avg. Num. of Dwelling Units: | 135 |
| Directional Distribution: | 31% entering, 69% exiting |

## Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 0.48 | 0.12 - 0.74 | 0.14 |

## Data Plot and Equation




**Fitted Curve Equation: T = 0.52(X) - 5.70**

**$R^2$= 0.92**

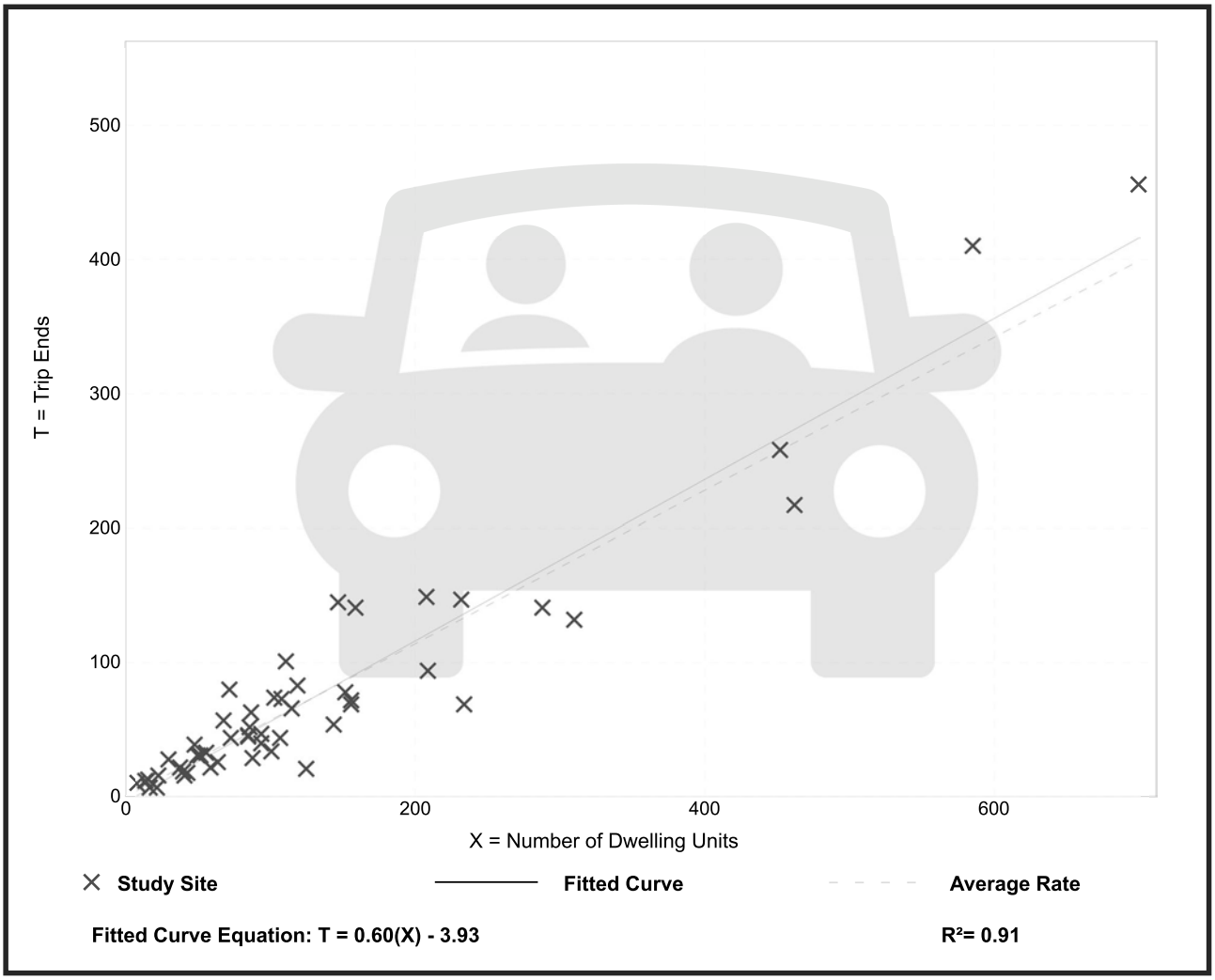
# Single-Family Attached Housing
(215)

**Vehicle Trip Ends vs:** **Dwelling Units**
**On a:** **Weekday,**
**Peak Hour of Adjacent Street Traffic,**
**One Hour Between 4 and 6 p.m.**
**Setting/Location:** **General Urban/Suburban**
Number of Studies: 51
Avg. Num. of Dwelling Units: 136
Directional Distribution: 57% entering, 43% exiting

## Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 0.57 | 0.17 - 1.25 | 0.18 |

## Data Plot and Equation



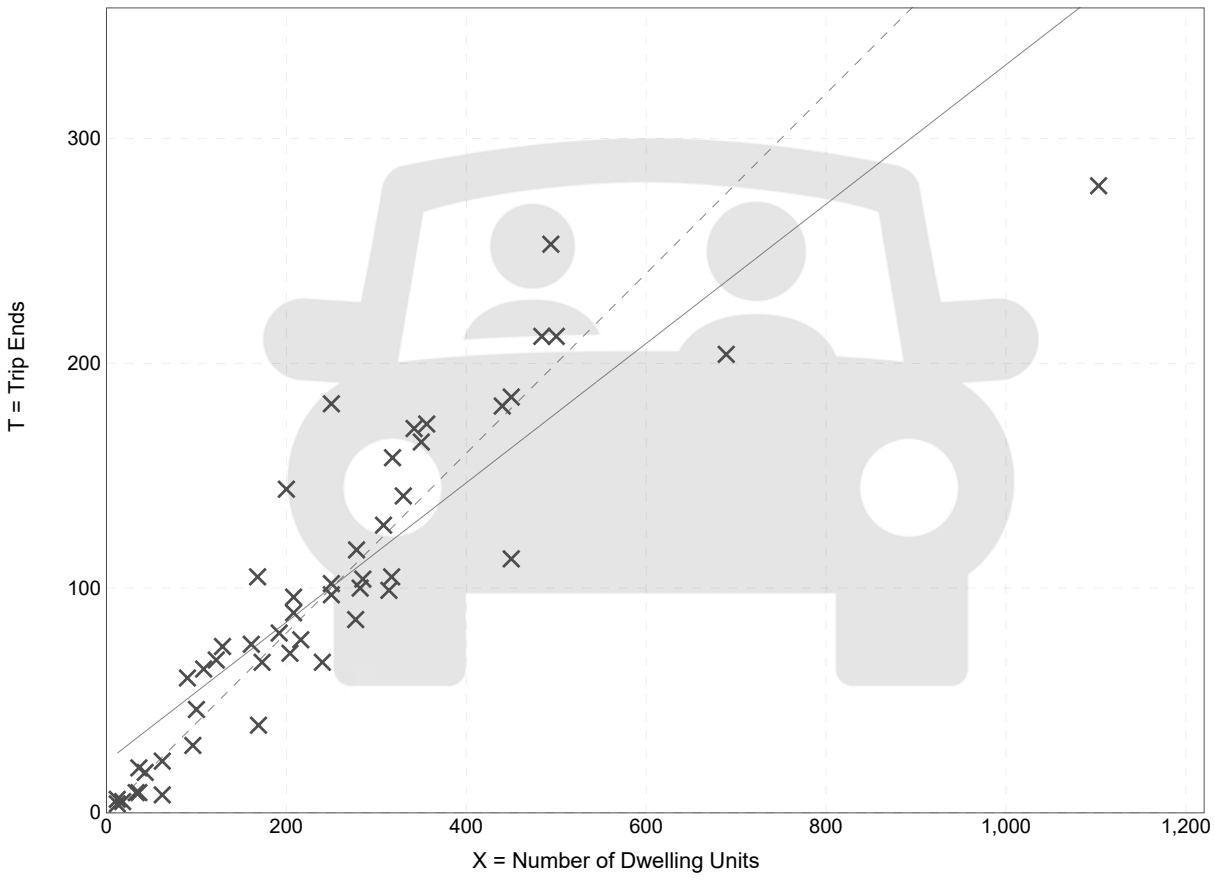
# Multifamily Housing (Low-Rise)
## Not Close to Rail Transit (220)

**Vehicle Trip Ends vs:** **Dwelling Units**
**On a:** **Weekday,**
**Peak Hour of Adjacent Street Traffic,**
**One Hour Between 7 and 9 a.m.**
**Setting/Location:** **General Urban/Suburban**
Number of Studies: 49
Avg. Num. of Dwelling Units: 249
Directional Distribution: 24% entering, 76% exiting

## Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 0.40 | 0.13 - 0.73 | 0.12 |

## Data Plot and Equation




**Fitted Curve Equation: T = 0.31(X) + 22.85**

**$R^2$= 0.79**

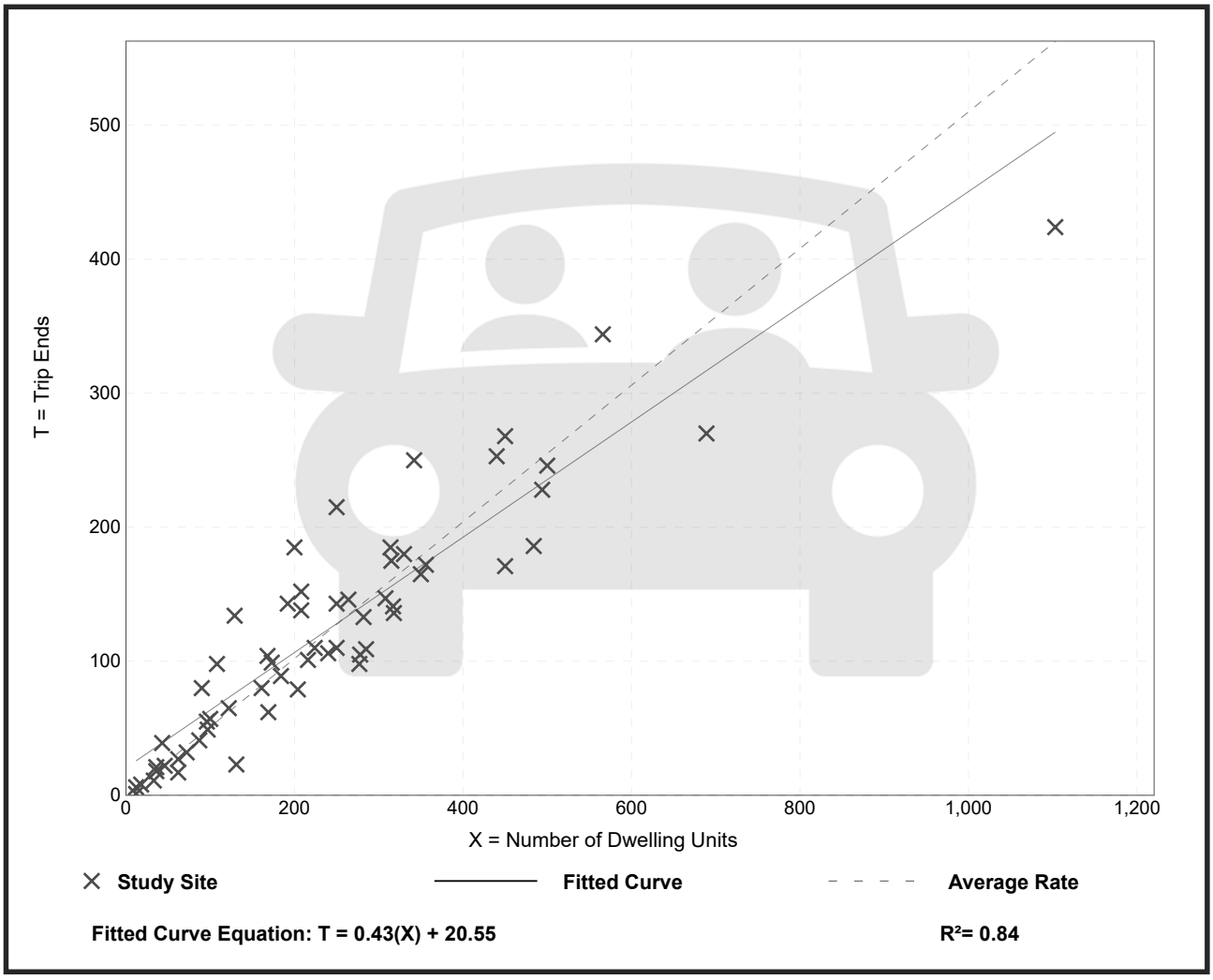
# Multifamily Housing (Low-Rise)
## Not Close to Rail Transit (220)

**Vehicle Trip Ends vs:** **Dwelling Units**
**On a:** **Weekday,**
**Peak Hour of Adjacent Street Traffic,**
**One Hour Between 4 and 6 p.m.**
**Setting/Location:** **General Urban/Suburban**
Number of Studies: 59
Avg. Num. of Dwelling Units: 241
Directional Distribution: 63% entering, 37% exiting

## Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 0.51 | 0.08 - 1.04 | 0.15 |

## Data Plot and Equation




**Fitted Curve Equation: T = 0.43(X) + 20.55**

**$R^2$= 0.84**

U.S. Department of Transportation
Federal Highway Administration



## Safety Benefits:

**HFST can reduce crashes up to:**

**63%**
for injury crashes at ramps.[2]

**48%**
for injury crashes at horizontal curves.[2]

**20%**
for total crashes at intersections.[3]

Automated application of HFST.
Source: FHWA

**For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/safety/rwd/keep-vehicles-road/pavement-friction/hfst.**

FHWA-SA-21-052

# Pavement Friction Management

Friction is a critical characteristic of a pavement that affects how vehicles interact with the roadway, including the frequency of crashes. Measuring, monitoring, and maintaining pavement friction—especially at locations where vehicles are frequently turning, slowing, and stopping—can prevent many roadway departure, intersection, and pedestrian-related crashes.

Pavement friction treatments, such as High Friction Surface Treatment (HFST), can be better targeted and result in more efficient and effective installations when using continuous pavement friction data along with crash and roadway data.

### Continuous Pavement Friction Measurement

Friction data for safety performance is best measured with Continuous Pavement Friction Measurement (CPFM) equipment. Spot friction measurement devices, like locked-wheel skid trailers, cannot safely and accurately collect friction data in curves or intersections, where the pavement polishes more quickly and adequate friction is so much more critical. Without CPFM equipment, agencies will assume the same friction over a mile or more.

CPFM technology measures friction continuously at highway speeds and provides both network and segment level data. Practitioners can analyze the friction, crash, and roadway data to better understand and predict where friction-related crashes will occur to better target locations and more effectively install treatments.[1]

### High Friction Surface Treatment

HFST consists of a layer of durable, anti-abrasion, and polish-resistant aggregate over a thermosetting polymer resin binder that locks the aggregate in place to restore or enhance friction and skid resistance. Calcined bauxite is the aggregate shown to yield the best results and should be used with HFST applications.

### Applications

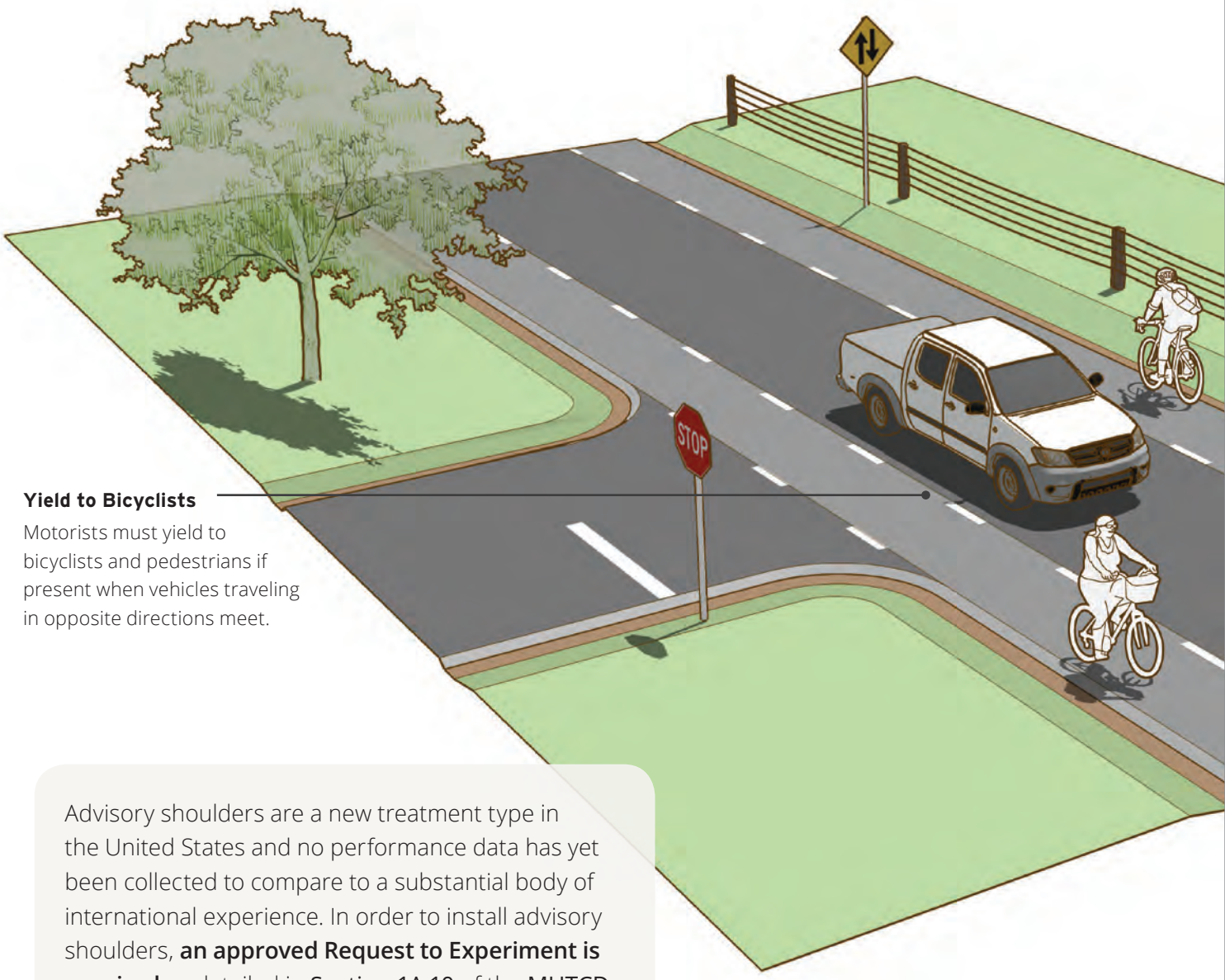
HFST should be applied in locations with increased friction demand, including:

- Horizontal curves.
- Interchange ramps.
- Intersection approaches.
  - Higher-speed signalized and stop-controlled intersections.
  - Steep downward grades.
- Locations with a history of rear-end, failure to yield, wet-weather, or red-light-running crashes.
- Crosswalk approaches.

### Considerations

- HFST is applied on existing pavement, so no new pavement is added.
- If the underlying pavement structure is unstable, then the HFST life cycle may be shortened, resulting in pre-mature failure.
- The automated installation method is preferred as it minimizes issues often associated with manual installation: human error due to fatigue, inadequate binder mixing, improper and uneven binder thickness, delayed aggregate placement, and inadequate aggregate coverage.
- The cost can be reduced when bundling installations at multiple locations.

1 Izeppi et al. Continuous Friction Measurement Equipment as a Tool for Improving Crash Rate Prediction: A Pilot Study. Virginia Department of Transportation, (2016).
2 (CMF ID: 10342, 10333) Merritt et al. Development of Crash Modification Factors for High Friction Surface Treatments. FHWA, (2020).
3 (CMF ID: 2259) NCHRP Report 617: Accident Modification Factors for Traffic Engineering and ITS Improvements, (2008).



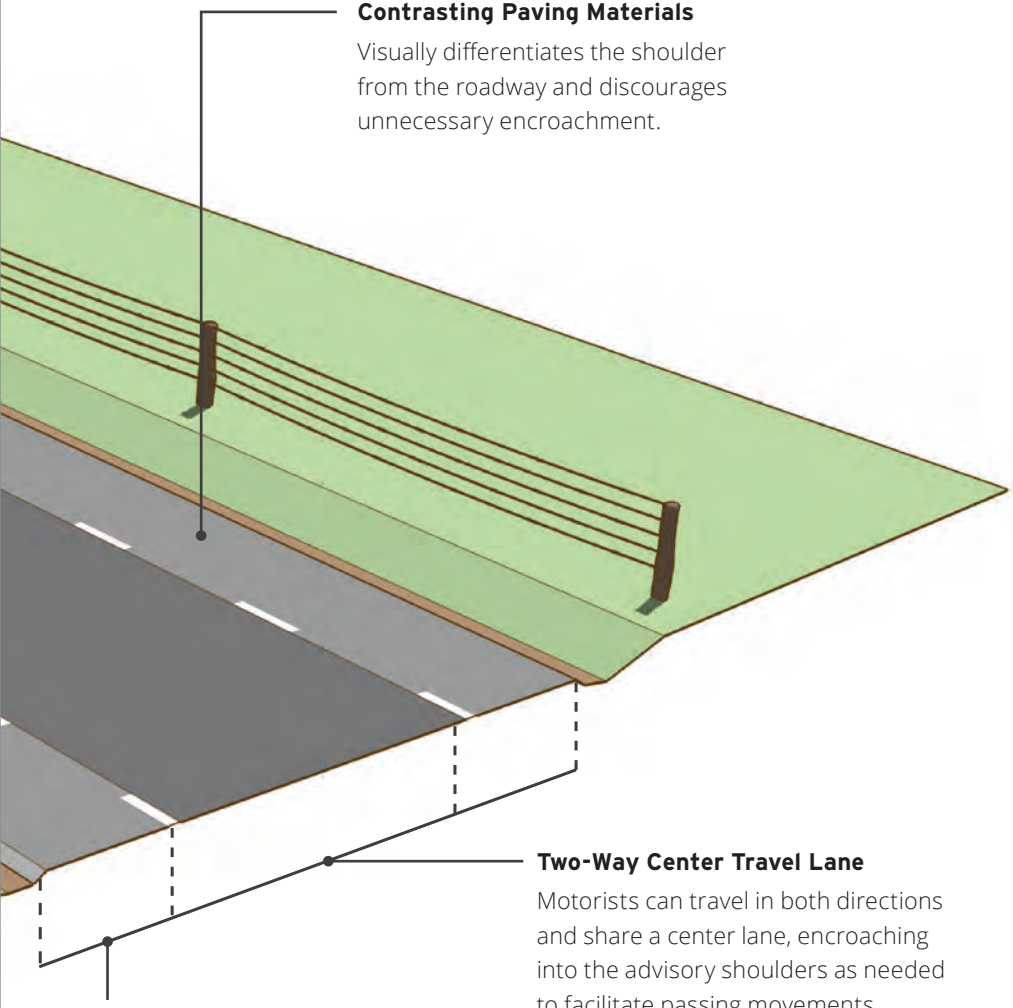

**Yield to Bicyclists**

Motorists must yield to bicyclists and pedestrians if present when vehicles traveling in opposite directions meet.

Advisory shoulders are a new treatment type in the United States and no performance data has yet been collected to compare to a substantial body of international experience. In order to install advisory shoulders, **an approved Request to Experiment is required** as detailed in Section 1A.10 of the MUTCD. FHWA is also accepting requests for experimentation with a similar treatment called "dashed bicycle lanes."

# Advisory Shoulder

*Advisory shoulders create usable shoulders for bicyclists on a roadway that is otherwise too narrow to accommodate one. The shoulder is delineated by pavement marking and optional pavement color. Motorists may only enter the shoulder when no bicyclists are present and must overtake these users with caution due to potential oncoming traffic.*



**Contrasting Paving Materials**

Visually differentiates the shoulder from the roadway and discourages unnecessary encroachment.

**Two-Way Center Travel Lane**

Motorists can travel in both directions and share a center lane, encroaching into the advisory shoulders as needed to facilitate passing movements.

**Advisory Shoulder**

Prioritizes shared space for bicyclists and occasional pedestrian travel.

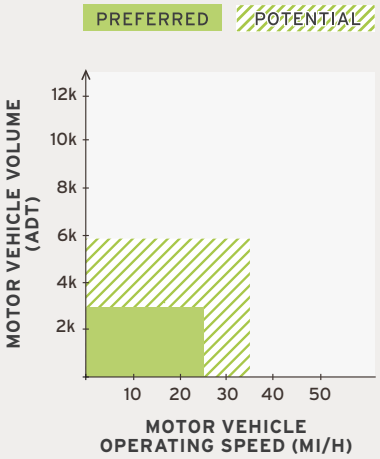
## BENEFITS

- Provides a delineated but nonexclusive space available for biking on a roadway otherwise too narrow for dedicated shoulders.
- May reduce some types of crashes due to reduced motor vehicle travel speeds.[i]
- Minimizes potential impacts to visual or natural resources through efficient use of existing space.
- Functions well within a rural and small town traffic and land use context.
- Increases predictability and clarifies desired lateral positioning between people bicycling or walking and people driving in a narrow roadway.
- May function as an interim measure where plans include shoulder widening in the future.
- Supports the natural environment through reduced paved surface requirements.

## APPLICATION

### Speed and Volume

*Most appropriate on streets with low to moderate volumes and moderate speed motor vehicles.* [ii]




### Network

*Applies to constrained connections between built-up areas.*


### Land Use

*For use outside, between, and within built-up areas with bicycle and pedestrian demand and limited available paved roadway surface.*

# Advisory Shoulder

Roads with advisory shoulders accommodate low to moderate volumes of two-way motor vehicle traffic and provide a prioritized space for bicyclists with little or no widening of the paved roadway surface.

**A** When vehicles traveling in opposite directions meet, motorists may need to enter the advisory shoulder for clear passage.

**An approved Request to Experiment is required** to implement Advisory Shoulders, called "dashed bicycle lanes" in the FHWA experimentation process. For more information on the experimentation process, visit http://mutcd.fhwa.dot.gov/condexper.htm.

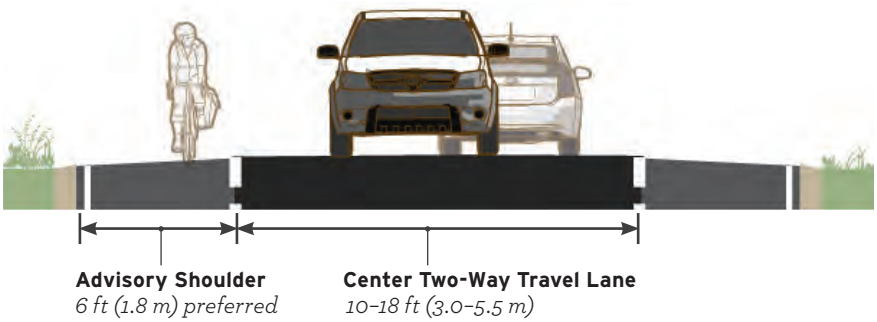



***Figure 2-9.*** *Advisory shoulders clarify positioning and yield priority on roads too narrow to provide exclusive travel space. When pedestrians or bicyclists are present, motorists may need to yield to users present in the advisory shoulder before passing.*

## GEOMETRIC DESIGN

Unlike a conventional shoulder, an advisory shoulder is a part of the traveled way, and it is expected that vehicles will regularly encounter meeting or passing situations where driving in the advisory shoulder is necessary and safe, as illustrated in Figure 2-9.

### ADVISORY SHOULDER

The advisory shoulder space is a visually distinct area on the edge of the roadway, offering a prioritized space for people to bicycle and walk.

- The preferred width of the advisory shoulder space is 6 ft (2.0 m). Absolute minimum width is 4 ft (1.2 m) when no curb and gutter is present.
- Consider using contrasting paving materials between the advisory shoulder and center travel lane to differentiate the advisory shoulder from the center two-way travel lane in order to minimize unnecessary encroachment and reduce regular straddling of the advisory shoulder striping.

### TWO-WAY CENTER TRAVEL LANE

The two-way center travel lane is created from the remaining paved roadway space after the advisory shoulder has been accounted for.

- Preferred two-way center travel lane width is 13.5–16 ft (4.1–4.9 m) although may function with widths of 10–18 ft (3.0–5.5 m). Table 2-2 describes the impacts of various center lane widths on roadway operations.

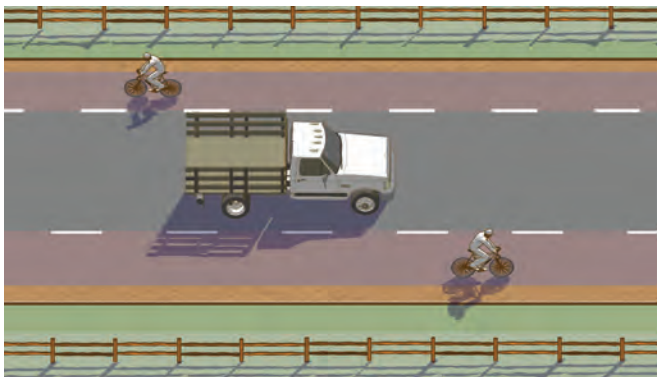


***Figure 2-10.*** *Motorists travel in the center two-way travel lane. When passing a bicyclist, no lane change is necessary.*

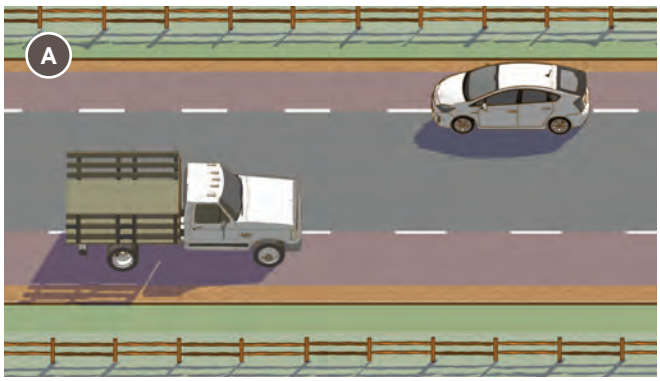



***Figure 2-11.*** *When two motor vehicles meet, motorists may need to encroach into the advisory shoulder space.*

# Advisory Shoulder

***Table 2-2.*** *Interactions when vehicles traveling in opposite directions meet by two-way center turn lane width.*

| | Two-Way Center Travel Lane Width | Impact on Advisory Shoulder Encroachment When Vehicles Traveling in Opposite Directions Meet |
|---|---|---|
| B Practical minimum width | 10 ft (3.0 m) | Requires vehicle encroachment into the advisory shoulder space when vehicles traveling in opposite directions meet. |
| C Preferred minimum width | 13.5 ft (4.5 m) | Two passenger cars are physically able to meet each other within the center lane at very low speed. In practice, vehicles will encroach into the advisory shoulder. |
| Preferred maximum width | 16 ft (4.9 m) | Permits two passenger cars to pass within the center lane at modest speeds without encroaching into the advisory shoulder. |
| D Absolute maximum width | 18 ft (5.5 m) | This width is equivalent to two 9 ft (2.7 m) travel lanes and regular encroachment into the advisory shoulder space may not be necessary. |

*Implementing agencies should be advised that the above dimensional guidance is intended to facilitate implementation on common roadway widths in the U.S. As with most treatments, more overall width is preferable to constrained circumstances.*

**10 ft (3.0 m) Center Travel Lane** **13.5 ft (4.5 m) Center Travel Lane** **18 ft (15.5 m) Center Travel Lane**

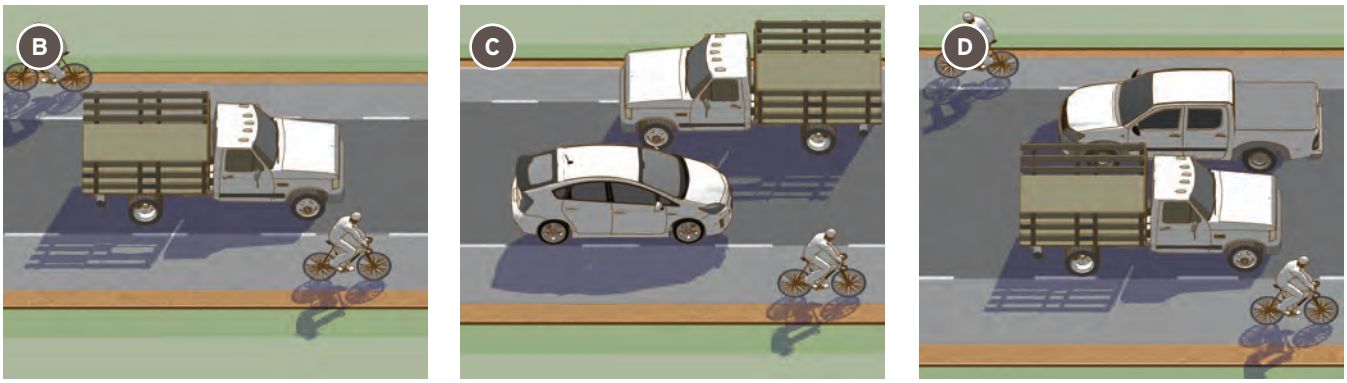



***Figure 2-12.*** *Total roadway width affects the number of road users that can meet and pass simultaneously. Wider roadways allow for more simultaneous interactions and can support higher volumes of motor vehicles.*

## MARKINGS

- A broken lane line used to delineate the advisory shoulder should consist of 3 ft (1.0 m) line segments and 6 ft (2.0 m) gaps.[iii]
- Where additional edge definition is desired, stripe a normal solid white edge line in addition to the broken advisory shoulder line.
- In general, do not mark a center line on the roadway. Short sections may be marked with center line pavement markings to separate opposing traffic flows at specific locations, such as around curves, over hills, on approaches to at-grade crossings, and at bridges.

  At these locations, widen the paved roadway surface to provide space for paved bicycle-accessible shoulders and conventional width travel lanes. See Table 2-3 for sight distance requirements.

***Table 2-3.*** *Minimum Passing Sight Distances for No-Passing Zone Markings. Adapted from MUTCD Table 3B-1.*

| 85th-Percentile or Posted or Statutory Speed Limit | Minimum Passing Sight Distance |
|---|---|
| 25 mi/h | 450 ft (137 m) |
| 30 mi/h | 500 ft (152 m) |
| 35 mi/h | 550 ft (167 m) |
| 40 mi/h | 600 ft (182 m) |
| 45 mi/h | 700 ft (213 m) |
| 50 mi/h | 800 ft (243 m) |
| 55 mi/h | 900 ft (274 m) |

# Advisory Shoulder

## SIGNS

Use signs to warn road users of the special characteristics of the street. Potential signs for use with advisory shoulders include:

- As illustrated in **Figure 2-12**. Use an unmodified Two-Way Traffic warning sign (W6-3) to clarify two-way operation of the road.
- Use a NO CENTER LINE warning sign (W8-12) to help clarify the unique striping pattern.
- Use a NO PARKING ON PAVEMENT (R8-1) to discourage parking within the advisory shoulder.

***Figure 2-13.*** *The W6-3 two-Way traffic warning sign can clarify undivided two-way operation of the advisory shoulder configuration.*

**An approved Request to Experiment** is required to implement Advisory Shoulders, called "dashed bicycle lanes" in the FHWA experimentation process. For more information on the experimentation process, visit **http://mutcd.fhwa.dot.gov/condexper.htm**.

**Hanover, NH**–Pop 11,250

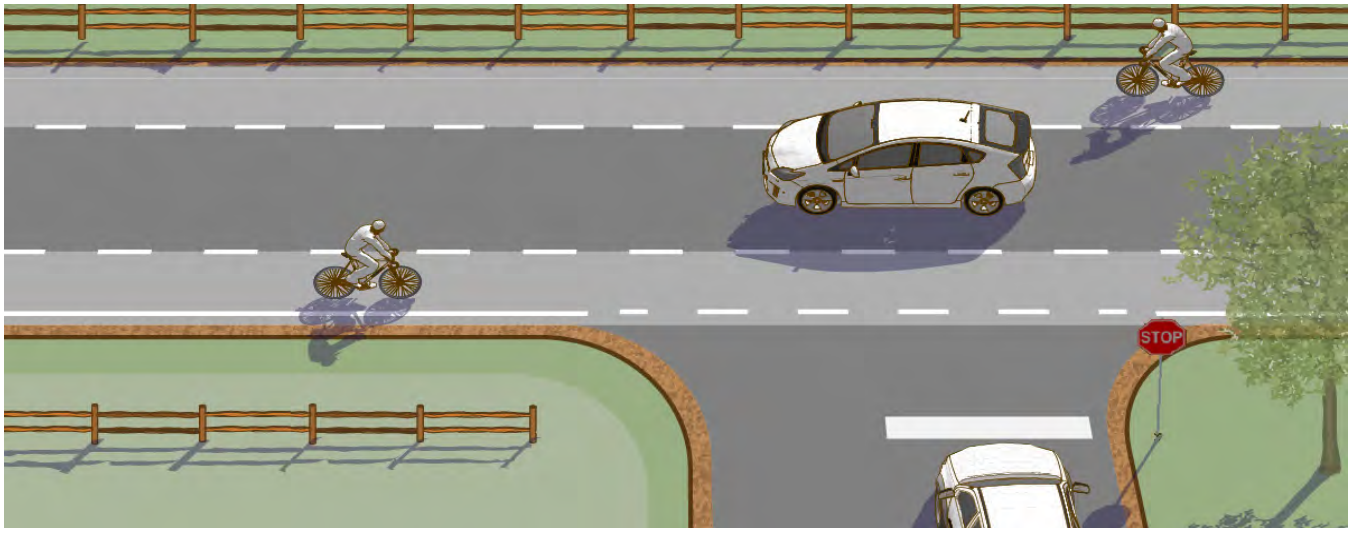



***Figure 2-14.*** *At crossings of minor intersections and driveways, maintain the striping and construction material (if used) of the advisory shoulder.*

# Advisory Shoulder

## INTERSECTIONS

Advisory shoulder designs work best on road segments without frequent stop or signal controlled intersections that require vehicles to stop within the roadway. The designer should strive to maintain the visual definition of the advisory shoulder through all driveways and street crossings, and provide a conventional shoulder at controlled intersections.

- At minor street crossings, use a dotted line extension on both sides of the advisory shoulder to maintain delineation of the advisory shoulder space (Figure 2-14).
- If contrasting pavement material is used, maintain the material through driveway crossings and minor intersections.
- Where the road is controlled by a stop sign or traffic signal, discontinue the advisory shoulder 50 ft (15 m) in advance of the intersection.
- At these locations, provide a bicycle accessible paved shoulder outside of the travel lanes or design for operation as a shared roadway.


**Edina, MN**–Population 49,300

## IMPLEMENTATION

In order to install advisory shoulders, an approved Request to Experiment is required as detailed in the MUTCD 2009, Sec. 1A.10. FHWA is also accepting requests for experimentation with a similar treatment called "dashed bicycle lanes."[iv]

## ACCESSIBILITY

Advisory shoulders as described here are not intended for use by pedestrians. When advisory shoulders are intended for use by pedestrians, they must meet accessibility guidelines.

CASE STUDY | ADVISORY SHOULDERS

# Hanover, New Hampshire

## PROJECT DESCRIPTION

In 2012, Hanover completed a bicycle and pedestrian planning effort. This plan identified Valley Road as a local bicycle connection in the overall network. In 2013, Hanover completed a Safe Routes to School (SRTS) Plan, which introduced the idea of using advisory shoulders (called advisory bike lanes for this project) on Valley Road. Hanover's Bicycle and Pedestrian Committee (HBPC) advocated to use Valley Road as a pilot project for advisory shoulders. The HBPC surveyed the Valley Road neighbors and built support for a pilot project. While there was some resistance, the neighborhood was generally supportive of the idea. Hanover's Department of Public Works was open to the idea and it was presented to the town select board who approved installation of advisory shoulders unit on Valley Rd. The advisory shoulders were painted on about 400 meters of Valley road in the summer of 2014. In 2016 an evaluation report was produced with traffic counts and results from a follow up survey. Based on the success of the Valley Road advisory shoulders, Hanover is currently evaluating adding advisory shoulders to another important bicycle and pedestrian connection between schools and neighborhoods.

Factors in the success of the advisory shoulders were the leadership of the HBPC, support from the adjacent neighbors, the willingness to pilot them by the Department of Public Works and inclusion of Valley Road and advisory shoulders in both the SRTS and Bicycle and Pedestrian Plans.

## DETAILS

### COMMUNITY CONTEXT

Hanover, NH, is a town of approximately 11,000 with 8,000 living in the town center. Hanover is home to Dartmouth College with a student population of 6,300. Hanover is located on the Connecticut River and has a dense built-up area surrounded by small suburban neighborhoods that transition quickly to a very rural setting.

### KEY DESIGN ELEMENTS

The advisory shoulders project was built on a low-volume, low-speed, residential road. Implementation included pavement markings and signs.

### ROLE IN THE NETWORK

Valley Road is a local bicycle connection between neighborhoods with schools, the downtown, and the Dartmouth College campus. Sidewalks were removed due to root damage and were not replaced because the neighborhood preferred the rural look of streets without sidewalks. Advisory shoulders use existing pavement to provide space prioritized for bicycles and pedestrians at very low cost.

### FUNDING

The Hanover Bicycle and Pedestrian Plan and the advisory shoulders project were both accomplished with funding from the HBPC, which is funded by a $5 local fee on vehicle registration that was passed by the select board to support alternative transportation and generates approximately $30,000 annually.

For more information, refer to the City of Hanover Public Works Department: http://www.hanovernh.org/public-works

# Advisory Shoulder

**Bloomington, IN**–Population 82,000


## FOOTNOTES

i Trials conducted by Transport for London (TfL) show a statistically significant speed reduction effect of 5.4mi/h–8.6 mi/h as a result of removing center line markings on the roadway **(TfL 2014)**.

A four-year study from Wiltshire County (England) showed a 35 percent drop in motor vehicle crashes along 30 mi/h roadways where the center line was removed **(Wiltshire County Council 2014)**.

ii Volume criteria listed here are based on FHWA guidance on center line provision. The **FHWA MUTCD** recommends center lines on roadways with motor vehicle traffic volumes above 3,000 ADT, and requires them on streets above 6,000 ADT **(2009, Sec. 3B.01)**.

Installations in England have functioned well on streets with volumes as high as 10,000 ADT, and an existing installation carries nearly 14,000 ADT according to Department for Transport estimates **(Cardiff Council 2011)**.

iii **FHWA MTUCD** application of broken line markings is to indicate a permissive conditions (Sec. 3A.06). The MUTCD allows use of "dimensions in a similar ratio of line segments to gaps as appropriate for traffic speeds and need for delineation." **(2009, p. 348)**.

iv The FHWA is conducting experimentation with dashed bicycle lane treatments in at least 5 locations across the US. Guidance related to experimentation is available from the FHWA online resource **Bicycle Facilities and the Manual on Uniform Traffic Control Devices 2015.**

## WORKS CITED

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Wiltshire County Council. *White Line Carriageway Markings*. April 2014.

## PHOTO CREDIT

Page 2-21. Western Transportation Institute

Page 2-22. Alta Planning + Design

Page 2-23. Western Transportation Institute

Page 2-24. City of Bloomington Planning and Transportation Department

# **APPENDIX C:** LOS CALCULATIONS – EXISTING CONDITIONS

| Intersection | |
|---|---|
| Int Delay, s/veh | 0 |

| Movement | NBL | NBT | SBT | SBR | SEL | SER |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 7 | 4 | 2 | 3 | 0 | 9 |
| Future Vol, veh/h | 7 | 4 | 2 | 3 | 0 | 9 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Stop | Stop | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 5 | -5 | - | 5 | - |
| Peak Hour Factor | 72 | 72 | 72 | 72 | 72 | 72 |
| Heavy Vehicles, % | 33 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 10 | 6 | 3 | 4 | 0 | 13 |

| Major/Minor | Major1 | | Minor2 | |
|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 26 | 0 |
| Stage 1 | - | - | 0 | - |
| Stage 2 | - | - | 26 | - |
| Critical Hdwy | 4.43 | - | 5.5 | 5.7 |
| Critical Hdwy Stg 1 | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | 4.5 | - |
| Follow-up Hdwy | 2.497 | - | 4 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 878 | - |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | 884 | - |
| Platoon blocked, % | | - | | |
| Mov Cap-1 Maneuver | - | - | 0 | - |
| Mov Cap-2 Maneuver | - | - | 0 | - |
| Stage 1 | - | - | 0 | - |
| Stage 2 | - | - | 0 | - |

| Approach | NB | SB |
|---|---|---|
| HCM Control Delay, s | | |
| HCM LOS | | - |

| Minor Lane/Major Mvmt | NBL | NBT | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | - |
| HCM Lane V/C Ratio | - | - | - |
| HCM Control Delay (s) | - | - | - |
| HCM Lane LOS | - | - | - |
| HCM 95th %tile Q(veh) | - | - | - |





| Intersection | |
|---|---|
| Int Delay, s/veh | 3.9 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 13 | 10 | 14 | 17 | 0 | 7 | 1 | 12 | 0 | 1 | 0 |
| Future Vol, veh/h | 0 | 13 | 10 | 14 | 17 | 0 | 7 | 1 | 12 | 0 | 1 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 1 | 1 | 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 | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | -5 | - | - | 0 | - | - | 0 | - | - | -10 | - |
| Peak Hour Factor | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 9 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 19 | 15 | 21 | 25 | 0 | 10 | 1 | 18 | 0 | 1 | 0 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 25 | 0 | 0 | 35 | 0 | 0 | 96 | 95 | 28 | 103 | 102 | 25 |
| Stage 1 | - | - | - | - | - | - | 28 | 28 | - | 67 | 67 | - |
| Stage 2 | - | - | - | - | - | - | 68 | 67 | - | 36 | 35 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.1 | 6.5 | 6.29 | 5.1 | 4.5 | 5.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.5 | - | 4.1 | 3.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.5 | - | 4.1 | 3.5 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4 | 3.381 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | 1603 | - | - | 1589 | - | - | 891 | 799 | 1027 | 934 | 838 | 1064 |
| Stage 1 | - | - | - | - | - | - | 994 | 876 | - | 984 | 875 | - |
| Stage 2 | - | - | - | - | - | - | 947 | 843 | - | 1005 | 887 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1603 | - | - | 1588 | - | - | 880 | 788 | 1026 | 908 | 826 | 1064 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 880 | 788 | - | 908 | 826 | - |
| Stage 1 | - | - | - | - | - | - | 993 | 875 | - | 984 | 864 | - |
| Stage 2 | - | - | - | - | - | - | 933 | 832 | - | 986 | 886 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 3.3 | 8.9 | 9.4 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 956 | 1603 | - | - | 1588 | - | - | 826 |
| HCM Lane V/C Ratio | 0.031 | - | - | - | 0.013 | - | - | 0.002 |
| HCM Control Delay (s) | 8.9 | 0 | - | - | 7.3 | 0 | - | 9.4 |
| HCM Lane LOS | A | A | - | - | A | A | - | A |
| HCM 95th %tile Q(veh) | 0.1 | 0 | - | - | 0 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.1 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 1 | 0 | 3 | 0 | 0 | 4 |
| Future Vol, veh/h | 1 | 0 | 3 | 0 | 0 | 4 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 5 | - | 5 | - | - | -5 |
| Peak Hour Factor | 50 | 50 | 50 | 50 | 50 | 50 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 2 | 0 | 6 | 0 | 0 | 8 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 14 | 6 | 0 | 0 | 6 | 0 |
| Stage 1 | 6 | - | - | - | - | - |
| Stage 2 | 8 | - | - | - | - | - |
| Critical Hdwy | 7.4 | 6.7 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 6.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 1006 | 1082 | - | - | 1628 | - |
| Stage 1 | 1021 | - | - | - | - | - |
| Stage 2 | 1018 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 1006 | 1082 | - | - | 1628 | - |
| Mov Cap-2 Maneuver | 1006 | - | - | - | - | - |
| Stage 1 | 1021 | - | - | - | - | - |
| Stage 2 | 1018 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 8.6 | 0 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 1006 | 1628 | - |
| HCM Lane V/C Ratio | - | - | 0.002 | - | - |
| HCM Control Delay (s) | - | - | 8.6 | 0 | - |
| HCM Lane LOS | - | - | A | A | - |
| HCM 95th %tile Q(veh) | - | - | 0 | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0 |

| Movement | NBL | NBT | SBT | SBR | SEL | SER |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 14 | 7 | 3 | 0 | 0 | 7 |
| Future Vol, veh/h | 14 | 7 | 3 | 0 | 0 | 7 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Stop | Stop | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 5 | -5 | - | 5 | - |
| Peak Hour Factor | 64 | 64 | 64 | 64 | 64 | 64 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 22 | 11 | 5 | 0 | 0 | 11 |

| Major/Minor | Major1 | | Minor2 | |
|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 55 | 0 |
| Stage 1 | - | - | 0 | - |
| Stage 2 | - | - | 55 | - |
| Critical Hdwy | 4.1 | - | 5.5 | 5.7 |
| Critical Hdwy Stg 1 | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | 4.5 | - |
| Follow-up Hdwy | 2.2 | - | 4 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 853 | - |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | 866 | - |
| Platoon blocked, % | | - | | |
| Mov Cap-1 Maneuver | - | - | 0 | - |
| Mov Cap-2 Maneuver | - | - | 0 | - |
| Stage 1 | - | - | 0 | - |
| Stage 2 | - | - | 0 | - |

| Approach | NB | SB |
|---|---|---|
| HCM Control Delay, s | | |
| HCM LOS | | - |

| Minor Lane/Major Mvmt | NBL | NBT | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | - |
| HCM Lane V/C Ratio | - | - | - |
| HCM Control Delay (s) | - | - | - |
| HCM Lane LOS | - | - | - |
| HCM 95th %tile Q(veh) | - | - | - |





| Intersection | |
|---|---|
| Int Delay, s/veh | 3.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 22 | 6 | 30 | 22 | 1 | 3 | 0 | 10 | 0 | 1 | 0 |
| Future Vol, veh/h | 0 | 22 | 6 | 30 | 22 | 1 | 3 | 0 | 10 | 0 | 1 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 1 | 1 | 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 | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | -5 | - | - | 0 | - | - | 0 | - | - | -10 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 9 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 24 | 7 | 33 | 24 | 1 | 3 | 0 | 11 | 0 | 1 | 0 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 25 | 0 | 0 | 32 | 0 | 0 | 120 | 120 | 29 | 124 | 123 | 25 |
| Stage 1 | - | - | - | - | - | - | 29 | 29 | - | 91 | 91 | - |
| Stage 2 | - | - | - | - | - | - | 91 | 91 | - | 33 | 32 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.1 | 6.5 | 6.29 | 5.1 | 4.5 | 5.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.5 | - | 4.1 | 3.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.5 | - | 4.1 | 3.5 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4 | 3.381 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | 1603 | - | - | 1593 | - | - | 860 | 774 | 1026 | 916 | 826 | 1064 |
| Stage 1 | - | - | - | - | - | - | 993 | 875 | - | 969 | 866 | - |
| Stage 2 | - | - | - | - | - | - | 921 | 823 | - | 1007 | 888 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1603 | - | - | 1592 | - | - | 845 | 757 | 1025 | 891 | 808 | 1064 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 845 | 757 | - | 891 | 808 | - |
| Stage 1 | - | - | - | - | - | - | 992 | 874 | - | 969 | 848 | - |
| Stage 2 | - | - | - | - | - | - | 900 | 806 | - | 996 | 887 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 4.1 | 8.7 | 9.5 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 977 | 1603 | - | - | 1592 | - | - | 808 |
| HCM Lane V/C Ratio | 0.015 | - | - | - | 0.021 | - | - | 0.001 |
| HCM Control Delay (s) | 8.7 | 0 | - | - | 7.3 | 0 | - | 9.5 |
| HCM Lane LOS | A | A | - | - | A | A | - | A |
| HCM 95th %tile Q(veh) | 0 | 0 | - | - | 0.1 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 2 | 4 | 0 | 3 |
| Future Vol, veh/h | 0 | 0 | 2 | 4 | 0 | 3 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 5 | - | 5 | - | - | -5 |
| Peak Hour Factor | 56 | 56 | 56 | 56 | 56 | 56 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 0 | 4 | 7 | 0 | 5 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 13 | 8 | 0 | 0 | 11 | 0 |
| Stage 1 | 8 | - | - | - | - | - |
| Stage 2 | 5 | - | - | - | - | - |
| Critical Hdwy | 7.4 | 6.7 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 6.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 1008 | 1079 | - | - | 1621 | - |
| Stage 1 | 1018 | - | - | - | - | - |
| Stage 2 | 1022 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 1008 | 1079 | - | - | 1621 | - |
| Mov Cap-2 Maneuver | 1008 | - | - | - | - | - |
| Stage 1 | 1018 | - | - | - | - | - |
| Stage 2 | 1022 | - | - | - | - | - |

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

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | - | 1621 | - |
| HCM Lane V/C Ratio | - | - | - | - | - |
| HCM Control Delay (s) | - | - | 0 | 0 | - |
| HCM Lane LOS | - | - | A | A | - |
| HCM 95th %tile Q(veh) | - | - | - | 0 | - |

## 1: Glen Avenue & Main Street Performance by lane

| Lane | WB | NB | SB | All |
|---|---|---|---|---|
| Movements Served | LR | TR | LT | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.3 |
| Total Delay (hr) | 0.0 | 0.0 | 0.1 | 0.1 |
| Total Del/Veh (s) | 0.3 | 0.3 | 0.5 | 0.5 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.2 | 0.0 | 0.0 | 0.0 |

## 2: Main Street & Averill Road Performance by lane

| Lane | NB | SB | SE | All |
|---|---|---|---|---|
| Movements Served | LT | TR | LR | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.0 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 0.0 | 3.1 | 0.4 | 0.5 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.0 | 2.4 | 0.1 | 0.3 |

## 3: Grove Street & Main Street Performance by lane

| Lane | EB | WB | NB | SB | All |
|---|---|---|---|---|---|
| Movements Served | LTR | LTR | LTR | LTR | |
| Denied Delay (hr) | | | | | 0.0 |
| Denied Del/Veh (s) | | | | | 0.1 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 0.1 | 0.7 | 2.8 | 3.7 | 1.1 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.0 | 0.0 | 2.7 | 2.0 | 0.7 |

## 4: Averill Road & Beech Street Performance by lane

| Lane | WB | NB | SB | All |
|---|---|---|---|---|
| Movements Served | LR | TR | LT | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.0 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 3.9 | 0.0 | 0.0 | 1.1 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 2.4 | 0.0 | 0.0 | 0.7 |





## Total Network Performance

| | |
|---|---|
| Denied Delay (hr) | 0.0 |
| Denied Del/Veh (s) | 0.3 |
| Total Delay (hr) | 0.2 |
| Total Del/Veh (s) | 1.3 |
| Stop Delay (hr) | 0.0 |
| Stop Del/Veh (s) | 0.1 |

## Intersection: 1: Glen Avenue & Main Street

| Movement | WB | SB |
|---|---|---|
| Directions Served | LR | LT |
| Maximum Queue (ft) | 18 | 38 |
| Average Queue (ft) | 1 | 2 |
| 95th Queue (ft) | 8 | 17 |
| Link Distance (ft) | 1144 | 766 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Intersection: 2: Main Street & Averill Road

| Movement | SB |
|---|---|
| Directions Served | TR |
| Maximum Queue (ft) | 31 |
| Average Queue (ft) | 5 |
| 95th Queue (ft) | 22 |
| Link Distance (ft) | 198 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Intersection: 3: Grove Street & Main Street

| Movement | WB | NB | SB |
|---|---|---|---|
| Directions Served | LTR | LTR | LTR |
| Maximum Queue (ft) | 10 | 31 | 7 |
| Average Queue (ft) | 0 | 7 | 0 |
| 95th Queue (ft) | 5 | 21 | 4 |
| Link Distance (ft) | 958 | 540 | 394 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |





## Intersection: 4: Averill Road & Beech Street

| Movement | WB |
|---|---|
| Directions Served | LR |
| Maximum Queue (ft) | 29 |
| Average Queue (ft) | 2 |
| 95th Queue (ft) | 13 |
| Link Distance (ft) | 456 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Network Summary

Network wide Queuing Penalty: 0

## 1: Glen Avenue & Main Street Performance by lane

| Lane | WB | NB | SB | All |
|---|---|---|---|---|
| Movements Served | LR | TR | LT | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.2 |
| Total Delay (hr) | 0.0 | 0.1 | 0.0 | 0.1 |
| Total Del/Veh (s) | 2.2 | 0.6 | 0.2 | 0.6 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 1.7 | 0.0 | 0.0 | 0.1 |

## 2: Main Street & Averill Road Performance by lane

| Lane | NB | SB | SE | All |
|---|---|---|---|---|
| Movements Served | LT | TR | LR | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.0 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 0.1 | 5.6 | 0.0 | 0.4 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.0 | 3.3 | 0.0 | 0.2 |

## 3: Grove Street & Main Street Performance by lane

| Lane | EB | WB | NB | SB | All |
|---|---|---|---|---|---|
| Movements Served | LTR | LTR | LTR | LTR | |
| Denied Delay (hr) | | | | | 0.0 |
| Denied Del/Veh (s) | | | | | 0.1 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 0.1 | 1.1 | 2.4 | 3.7 | 0.9 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.0 | 0.1 | 2.5 | 2.1 | 0.4 |

## 4: Averill Road & Beech Street Performance by lane

| Lane | NB | SB | All |
|---|---|---|---|
| Movements Served | TR | LT | |
| Denied Delay (hr) | | | 0.0 |
| Denied Del/Veh (s) | | | 0.0 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 0.0 | 0.0 | 0.0 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.0 | 0.0 | 0.0 |





## Total Network Performance

| | |
|---|---|
| Denied Delay (hr) | 0.0 |
| Denied Del/Veh (s) | 0.2 |
| Total Delay (hr) | 0.2 |
| Total Del/Veh (s) | 1.2 |
| Stop Delay (hr) | 0.0 |
| Stop Del/Veh (s) | 0.1 |

## Intersection: 1: Glen Avenue & Main Street

| Movement | WB |
|---|---|
| Directions Served | LR |
| Maximum Queue (ft) | 44 |
| Average Queue (ft) | 9 |
| 95th Queue (ft) | 33 |
| Link Distance (ft) | 1144 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Intersection: 2: Main Street & Averill Road

| Movement | SB |
|---|---|
| Directions Served | TR |
| Maximum Queue (ft) | 24 |
| Average Queue (ft) | 3 |
| 95th Queue (ft) | 16 |
| Link Distance (ft) | 198 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Intersection: 3: Grove Street & Main Street

| Movement | WB | NB | SB |
|---|---|---|---|
| Directions Served | LTR | LTR | LTR |
| Maximum Queue (ft) | 15 | 18 | 5 |
| Average Queue (ft) | 2 | 5 | 0 |
| 95th Queue (ft) | 12 | 15 | 3 |
| Link Distance (ft) | 958 | 540 | 394 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |





## Intersection: 4: Averill Road & Beech Street

| Movement |
|---|
| Directions Served |
| Maximum Queue (ft) |
| Average Queue (ft) |
| 95th Queue (ft) |
| Link Distance (ft) |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%) |
| Queuing Penalty (veh) |

## Network Summary

Network wide Queuing Penalty: 0

# **APPENDIX D:** LOS CALCULATIONS – BACKGROUND CONDITIONS

| Intersection | |
|---|---|
| Int Delay, s/veh | 0 |

| Movement | NBL | NBT | SBT | SBR | SEL | SER |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 7 | 5 | 2 | 3 | 0 | 9 |
| Future Vol, veh/h | 7 | 5 | 2 | 3 | 0 | 9 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Stop | Stop | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 5 | -5 | - | 5 | - |
| Peak Hour Factor | 72 | 72 | 72 | 72 | 72 | 72 |
| Heavy Vehicles, % | 33 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 10 | 7 | 3 | 4 | 0 | 13 |

| Major/Minor | Major1 | | Minor2 | |
|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 27 | 0 |
| Stage 1 | - | - | 0 | - |
| Stage 2 | - | - | 27 | - |
| Critical Hdwy | 4.43 | - | 5.5 | 5.7 |
| Critical Hdwy Stg 1 | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | 4.5 | - |
| Follow-up Hdwy | 2.497 | - | 4 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 877 | - |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | 883 | - |
| Platoon blocked, % | | - | | |
| Mov Cap-1 Maneuver | - | - | 0 | - |
| Mov Cap-2 Maneuver | - | - | 0 | - |
| Stage 1 | - | - | 0 | - |
| Stage 2 | - | - | 0 | - |

| Approach | NB | SB |
|---|---|---|
| HCM Control Delay, s | | |
| HCM LOS | | - |

| Minor Lane/Major Mvmt | NBL | NBT | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | - |
| HCM Lane V/C Ratio | - | - | - |
| HCM Control Delay (s) | - | - | - |
| HCM Lane LOS | - | - | - |
| HCM 95th %tile Q(veh) | - | - | - |





| Intersection | |
|---|---|
| Int Delay, s/veh | 3.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 14 | 10 | 15 | 17 | 0 | 7 | 1 | 12 | 0 | 1 | 0 |
| Future Vol, veh/h | 0 | 14 | 10 | 15 | 17 | 0 | 7 | 1 | 12 | 0 | 1 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 1 | 1 | 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 | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | -5 | - | - | 0 | - | - | 0 | - | - | -10 | - |
| Peak Hour Factor | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 9 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 21 | 15 | 22 | 25 | 0 | 10 | 1 | 18 | 0 | 1 | 0 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 25 | 0 | 0 | 37 | 0 | 0 | 100 | 99 | 30 | 107 | 106 | 25 |
| Stage 1 | - | - | - | - | - | - | 30 | 30 | - | 69 | 69 | - |
| Stage 2 | - | - | - | - | - | - | 70 | 69 | - | 38 | 37 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.1 | 6.5 | 6.29 | 5.1 | 4.5 | 5.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.5 | - | 4.1 | 3.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.5 | - | 4.1 | 3.5 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4 | 3.381 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | 1603 | - | - | 1587 | - | - | 886 | 795 | 1025 | 931 | 836 | 1064 |
| Stage 1 | - | - | - | - | - | - | 992 | 874 | - | 983 | 874 | - |
| Stage 2 | - | - | - | - | - | - | 945 | 841 | - | 1003 | 886 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1603 | - | - | 1586 | - | - | 874 | 783 | 1024 | 904 | 823 | 1064 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 874 | 783 | - | 904 | 823 | - |
| Stage 1 | - | - | - | - | - | - | 991 | 873 | - | 983 | 862 | - |
| Stage 2 | - | - | - | - | - | - | 930 | 829 | - | 984 | 885 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 3.4 | 8.9 | 9.4 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 952 | 1603 | - | - | 1586 | - | - | 823 |
| HCM Lane V/C Ratio | 0.031 | - | - | - | 0.014 | - | - | 0.002 |
| HCM Control Delay (s) | 8.9 | 0 | - | - | 7.3 | 0 | - | 9.4 |
| HCM Lane LOS | A | A | - | - | A | A | - | A |
| HCM 95th %tile Q(veh) | 0.1 | 0 | - | - | 0 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 1 | 0 | 3 | 0 | 0 | 5 |
| Future Vol, veh/h | 1 | 0 | 3 | 0 | 0 | 5 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 5 | - | 5 | - | - | -5 |
| Peak Hour Factor | 50 | 50 | 50 | 50 | 50 | 50 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 2 | 0 | 6 | 0 | 0 | 10 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 16 | 6 | 0 | 0 | 6 | 0 |
| Stage 1 | 6 | - | - | - | - | - |
| Stage 2 | 10 | - | - | - | - | - |
| Critical Hdwy | 7.4 | 6.7 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 6.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 1003 | 1082 | - | - | 1628 | - |
| Stage 1 | 1021 | - | - | - | - | - |
| Stage 2 | 1015 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 1003 | 1082 | - | - | 1628 | - |
| Mov Cap-2 Maneuver | 1003 | - | - | - | - | - |
| Stage 1 | 1021 | - | - | - | - | - |
| Stage 2 | 1015 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 8.6 | 0 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 1003 | 1628 | - |
| HCM Lane V/C Ratio | - | - | 0.002 | - | - |
| HCM Control Delay (s) | - | - | 8.6 | 0 | - |
| HCM Lane LOS | - | - | A | A | - |
| HCM 95th %tile Q(veh) | - | - | 0 | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0 |

| Movement | NBL | NBT | SBT | SBR | SEL | SER |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 15 | 7 | 3 | 0 | 0 | 7 |
| Future Vol, veh/h | 15 | 7 | 3 | 0 | 0 | 7 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Stop | Stop | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 5 | -5 | - | 5 | - |
| Peak Hour Factor | 64 | 64 | 64 | 64 | 64 | 64 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 23 | 11 | 5 | 0 | 0 | 11 |

| Major/Minor | Major1 | | Minor2 | |
|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 57 | 0 |
| Stage 1 | - | - | 0 | - |
| Stage 2 | - | - | 57 | - |
| Critical Hdwy | 4.1 | - | 5.5 | 5.7 |
| Critical Hdwy Stg 1 | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | 4.5 | - |
| Follow-up Hdwy | 2.2 | - | 4 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 851 | - |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | 865 | - |
| Platoon blocked, % | | - | | |
| Mov Cap-1 Maneuver | - | - | 0 | - |
| Mov Cap-2 Maneuver | - | - | 0 | - |
| Stage 1 | - | - | 0 | - |
| Stage 2 | - | - | 0 | - |

| Approach | NB | SB |
|---|---|---|
| HCM Control Delay, s | | |
| HCM LOS | | - |

| Minor Lane/Major Mvmt | NBL | NBT | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | - |
| HCM Lane V/C Ratio | - | - | - |
| HCM Control Delay (s) | - | - | - |
| HCM Lane LOS | - | - | - |
| HCM 95th %tile Q(veh) | - | - | - |





| Intersection | |
|---|---|
| Int Delay, s/veh | 3.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 23 | 6 | 31 | 23 | 1 | 3 | 0 | 10 | 0 | 1 | 0 |
| Future Vol, veh/h | 0 | 23 | 6 | 31 | 23 | 1 | 3 | 0 | 10 | 0 | 1 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 1 | 1 | 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 | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | -5 | - | - | 0 | - | - | 0 | - | - | -10 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 9 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 26 | 7 | 34 | 26 | 1 | 3 | 0 | 11 | 0 | 1 | 0 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 27 | 0 | 0 | 34 | 0 | 0 | 126 | 126 | 31 | 130 | 129 | 27 |
| Stage 1 | - | - | - | - | - | - | 31 | 31 | - | 95 | 95 | - |
| Stage 2 | - | - | - | - | - | - | 95 | 95 | - | 35 | 34 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.1 | 6.5 | 6.29 | 5.1 | 4.5 | 5.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.5 | - | 4.1 | 3.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.5 | - | 4.1 | 3.5 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4 | 3.381 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | 1600 | - | - | 1591 | - | - | 852 | 768 | 1023 | 911 | 822 | 1062 |
| Stage 1 | - | - | - | - | - | - | 991 | 873 | - | 966 | 865 | - |
| Stage 2 | - | - | - | - | - | - | 917 | 820 | - | 1005 | 887 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1600 | - | - | 1590 | - | - | 836 | 750 | 1022 | 886 | 803 | 1062 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 836 | 750 | - | 886 | 803 | - |
| Stage 1 | - | - | - | - | - | - | 990 | 872 | - | 966 | 846 | - |
| Stage 2 | - | - | - | - | - | - | 896 | 802 | - | 994 | 886 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 4.1 | 8.8 | 9.5 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 972 | 1600 | - | - | 1590 | - | - | 803 |
| HCM Lane V/C Ratio | 0.015 | - | - | - | 0.022 | - | - | 0.001 |
| HCM Control Delay (s) | 8.8 | 0 | - | - | 7.3 | 0 | - | 9.5 |
| HCM Lane LOS | A | A | - | - | A | A | - | A |
| HCM 95th %tile Q(veh) | 0 | 0 | - | - | 0.1 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 2 | 5 | 0 | 3 |
| Future Vol, veh/h | 0 | 0 | 2 | 5 | 0 | 3 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 5 | - | 5 | - | - | -5 |
| Peak Hour Factor | 56 | 56 | 56 | 56 | 56 | 56 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 0 | 4 | 9 | 0 | 5 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 14 | 9 | 0 | 0 | 13 | 0 |
| Stage 1 | 9 | - | - | - | - | - |
| Stage 2 | 5 | - | - | - | - | - |
| Critical Hdwy | 7.4 | 6.7 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 6.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 1006 | 1077 | - | - | 1619 | - |
| Stage 1 | 1017 | - | - | - | - | - |
| Stage 2 | 1022 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 1006 | 1077 | - | - | 1619 | - |
| Mov Cap-2 Maneuver | 1006 | - | - | - | - | - |
| Stage 1 | 1017 | - | - | - | - | - |
| Stage 2 | 1022 | - | - | - | - | - |

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

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | - | 1619 | - |
| HCM Lane V/C Ratio | - | - | - | - | - |
| HCM Control Delay (s) | - | - | 0 | 0 | - |
| HCM Lane LOS | - | - | A | A | - |
| HCM 95th %tile Q(veh) | - | - | - | 0 | - |

## 1: Glen Avenue & Main Street Performance by lane

| Lane | WB | NB | SB | All |
|---|---|---|---|---|
| Movements Served | LR | TR | LT | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.3 |
| Total Delay (hr) | 0.0 | 0.0 | 0.1 | 0.1 |
| Total Del/Veh (s) | 0.2 | 0.3 | 0.5 | 0.5 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.2 | 0.0 | 0.0 | 0.0 |

## 2: Main Street & Averill Road Performance by lane

| Lane | NB | SB | SE | All |
|---|---|---|---|---|
| Movements Served | LT | TR | LR | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.0 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 0.1 | 2.8 | 0.4 | 0.5 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.0 | 2.3 | 0.1 | 0.3 |

## 3: Grove Street & Main Street Performance by lane

| Lane | EB | WB | NB | SB | All |
|---|---|---|---|---|---|
| Movements Served | LTR | LTR | LTR | LTR | |
| Denied Delay (hr) | | | | | 0.0 |
| Denied Del/Veh (s) | | | | | 0.1 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 0.1 | 0.6 | 2.7 | 4.7 | 1.1 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.0 | 0.0 | 2.6 | 2.5 | 0.7 |

## 4: Averill Road & Beech Street Performance by lane

| Lane | WB | NB | SB | All |
|---|---|---|---|---|
| Movements Served | LR | TR | LT | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.0 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 5.3 | 0.0 | 0.0 | 0.7 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 3.5 | 0.0 | 0.0 | 0.4 |



SimTraffic Performance Report
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## Total Network Performance

| | |
|---|---|
| Denied Delay (hr) | 0.0 |
| Denied Del/Veh (s) | 0.3 |
| Total Delay (hr) | 0.2 |
| Total Del/Veh (s) | 1.3 |
| Stop Delay (hr) | 0.0 |
| Stop Del/Veh (s) | 0.1 |

## Intersection: 1: Glen Avenue & Main Street

| Movement | WB | SB |
|---|---|---|
| Directions Served | LR | LT |
| Maximum Queue (ft) | 18 | 29 |
| Average Queue (ft) | 1 | 2 |
| 95th Queue (ft) | 8 | 16 |
| Link Distance (ft) | 1144 | 766 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Intersection: 2: Main Street & Averill Road

| Movement | SB |
|---|---|
| Directions Served | TR |
| Maximum Queue (ft) | 31 |
| Average Queue (ft) | 4 |
| 95th Queue (ft) | 22 |
| Link Distance (ft) | 198 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Intersection: 3: Grove Street & Main Street

| Movement | NB | SB |
|---|---|---|
| Directions Served | LTR | LTR |
| Maximum Queue (ft) | 23 | 7 |
| Average Queue (ft) | 6 | 0 |
| 95th Queue (ft) | 20 | 4 |
| Link Distance (ft) | 540 | 394 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |





## Intersection: 4: Averill Road & Beech Street

| Movement | WB |
|---|---|
| Directions Served | LR |
| Maximum Queue (ft) | 28 |
| Average Queue (ft) | 1 |
| 95th Queue (ft) | 12 |
| Link Distance (ft) | 456 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Network Summary

Network wide Queuing Penalty: 0

## 1: Glen Avenue & Main Street Performance by lane

| Lane | WB | NB | SB | All |
|---|---|---|---|---|
| Movements Served | LR | TR | LT | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.2 |
| Total Delay (hr) | 0.0 | 0.1 | 0.0 | 0.1 |
| Total Del/Veh (s) | 2.2 | 0.7 | 0.2 | 0.6 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 1.7 | 0.0 | 0.0 | 0.1 |

## 2: Main Street & Averill Road Performance by lane

| Lane | NB | SB | SE | All |
|---|---|---|---|---|
| Movements Served | LT | TR | LR | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.0 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 0.1 | 6.0 | 0.0 | 0.4 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.0 | 3.6 | 0.0 | 0.2 |

## 3: Grove Street & Main Street Performance by lane

| Lane | EB | WB | NB | SB | All |
|---|---|---|---|---|---|
| Movements Served | LTR | LTR | LTR | LTR | |
| Denied Delay (hr) | | | | | 0.0 |
| Denied Del/Veh (s) | | | | | 0.1 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 0.1 | 1.1 | 2.6 | 5.3 | 1.0 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.0 | 0.1 | 2.7 | 3.2 | 0.3 |

## 4: Averill Road & Beech Street Performance by lane

| Lane | NB | SB | All |
|---|---|---|---|
| Movements Served | TR | LT | |
| Denied Delay (hr) | | | 0.0 |
| Denied Del/Veh (s) | | | 0.0 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 0.0 | 0.0 | 0.0 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.0 | 0.0 | 0.0 |





## Total Network Performance

| | |
|---|---|
| Denied Delay (hr) | 0.0 |
| Denied Del/Veh (s) | 0.2 |
| Total Delay (hr) | 0.2 |
| Total Del/Veh (s) | 1.2 |
| Stop Delay (hr) | 0.0 |
| Stop Del/Veh (s) | 0.1 |

## Intersection: 1: Glen Avenue & Main Street

| Movement | WB |
|---|---|
| Directions Served | LR |
| Maximum Queue (ft) | 45 |
| Average Queue (ft) | 9 |
| 95th Queue (ft) | 35 |
| Link Distance (ft) | 1144 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Intersection: 2: Main Street & Averill Road

| Movement | SB |
|---|---|
| Directions Served | TR |
| Maximum Queue (ft) | 24 |
| Average Queue (ft) | 3 |
| 95th Queue (ft) | 16 |
| Link Distance (ft) | 198 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Intersection: 3: Grove Street & Main Street

| Movement | WB | NB | SB |
|---|---|---|---|
| Directions Served | LTR | LTR | LTR |
| Maximum Queue (ft) | 15 | 27 | 8 |
| Average Queue (ft) | 1 | 5 | 0 |
| 95th Queue (ft) | 10 | 17 | 4 |
| Link Distance (ft) | 958 | 540 | 394 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |





## Intersection: 4: Averill Road & Beech Street

| Movement |
|---|
| Directions Served |
| Maximum Queue (ft) |
| Average Queue (ft) |
| 95th Queue (ft) |
| Link Distance (ft) |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%) |
| Queuing Penalty (veh) |

## Network Summary

Network wide Queuing Penalty: 0

# **APPENDIX E:** LOS CALCULATIONS – FULL BUILD CONDITIONS

| Intersection | |
|---|---|
| Int Delay, s/veh | 0 |

| Movement | NBL | NBT | SBT | SBR | SEL | SER |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 7 | 11 | 24 | 8 | 2 | 9 |
| Future Vol, veh/h | 7 | 11 | 24 | 8 | 2 | 9 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Stop | Stop | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 5 | -5 | - | 5 | - |
| Peak Hour Factor | 72 | 72 | 72 | 72 | 72 | 72 |
| Heavy Vehicles, % | 33 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 10 | 15 | 33 | 11 | 3 | 13 |

| Major/Minor | Major1 | | Minor2 | |
|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 35 | 0 |
| Stage 1 | - | - | 0 | - |
| Stage 2 | - | - | 35 | - |
| Critical Hdwy | 4.43 | - | 5.5 | 5.7 |
| Critical Hdwy Stg 1 | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | 4.5 | - |
| Follow-up Hdwy | 2.497 | - | 4 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 870 | - |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | 878 | - |
| Platoon blocked, % | | - | | |
| Mov Cap-1 Maneuver | - | - | 0 | - |
| Mov Cap-2 Maneuver | - | - | 0 | - |
| Stage 1 | - | - | 0 | - |
| Stage 2 | - | - | 0 | - |

| Approach | NB | SB |
|---|---|---|
| HCM Control Delay, s | | |
| HCM LOS | | - |

| Minor Lane/Major Mvmt | NBL | NBT | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | - |
| HCM Lane V/C Ratio | - | - | - |
| HCM Control Delay (s) | - | - | - |
| HCM Lane LOS | - | - | - |
| HCM 95th %tile Q(veh) | - | - | - |





| Intersection | |
|---|---|
| Int Delay, s/veh | 3.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 28 | 18 | 15 | 21 | 0 | 9 | 1 | 12 | 0 | 1 | 0 |
| Future Vol, veh/h | 0 | 28 | 18 | 15 | 21 | 0 | 9 | 1 | 12 | 0 | 1 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 1 | 1 | 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 | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | -5 | - | - | 0 | - | - | 0 | - | - | -10 | - |
| Peak Hour Factor | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 9 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 41 | 26 | 22 | 31 | 0 | 13 | 1 | 18 | 0 | 1 | 0 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 31 | 0 | 0 | 68 | 0 | 0 | 131 | 130 | 55 | 139 | 143 | 31 |
| Stage 1 | - | - | - | - | - | - | 55 | 55 | - | 75 | 75 | - |
| Stage 2 | - | - | - | - | - | - | 76 | 75 | - | 64 | 68 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.1 | 6.5 | 6.29 | 5.1 | 4.5 | 5.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.5 | - | 4.1 | 3.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.5 | - | 4.1 | 3.5 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4 | 3.381 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | 1595 | - | - | 1546 | - | - | 846 | 764 | 992 | 903 | 814 | 1058 |
| Stage 1 | - | - | - | - | - | - | 962 | 853 | - | 979 | 872 | - |
| Stage 2 | - | - | - | - | - | - | 938 | 836 | - | 986 | 875 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1595 | - | - | 1545 | - | - | 835 | 753 | 991 | 876 | 802 | 1058 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 835 | 753 | - | 876 | 802 | - |
| Stage 1 | - | - | - | - | - | - | 961 | 852 | - | 979 | 860 | - |
| Stage 2 | - | - | - | - | - | - | 923 | 824 | - | 967 | 874 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 3.1 | 9.1 | 9.5 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 909 | 1595 | - | - | 1545 | - | - | 802 |
| HCM Lane V/C Ratio | 0.036 | - | - | - | 0.014 | - | - | 0.002 |
| HCM Control Delay (s) | 9.1 | 0 | - | - | 7.4 | 0 | - | 9.5 |
| HCM Lane LOS | A | A | - | - | A | A | - | A |
| HCM 95th %tile Q(veh) | 0.1 | 0 | - | - | 0 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.2 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 1 | 0 | 11 | 0 | 0 | 32 |
| Future Vol, veh/h | 1 | 0 | 11 | 0 | 0 | 32 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 5 | - | 5 | - | - | -5 |
| Peak Hour Factor | 50 | 50 | 50 | 50 | 50 | 50 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 2 | 0 | 22 | 0 | 0 | 64 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 86 | 22 | 0 | 0 | 22 | 0 |
| Stage 1 | 22 | - | - | - | - | - |
| Stage 2 | 64 | - | - | - | - | - |
| Critical Hdwy | 7.4 | 6.7 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 6.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 898 | 1058 | - | - | 1607 | - |
| Stage 1 | 1000 | - | - | - | - | - |
| Stage 2 | 947 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 898 | 1058 | - | - | 1607 | - |
| Mov Cap-2 Maneuver | 898 | - | - | - | - | - |
| Stage 1 | 1000 | - | - | - | - | - |
| Stage 2 | 947 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 9 | 0 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 898 | 1607 | - |
| HCM Lane V/C Ratio | - | - | 0.002 | - | - |
| HCM Control Delay (s) | - | - | 9 | 0 | - |
| HCM Lane LOS | - | - | A | A | - |
| HCM 95th %tile Q(veh) | - | - | 0 | 0 | - |





| Intersection | |
|---|---|
| Int Delay, s/veh | 4.2 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 19 | 0 | 4 | 6 | 0 | 10 |
| Future Vol, veh/h | 19 | 0 | 4 | 6 | 0 | 10 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 75 | 75 | 75 | 75 | 75 | 75 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 25 | 0 | 5 | 8 | 0 | 13 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 22 | 9 | 0 | 0 | 13 | 0 |
| Stage 1 | 9 | - | - | - | - | - |
| Stage 2 | 13 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 1000 | 1079 | - | - | 1619 | - |
| Stage 1 | 1019 | - | - | - | - | - |
| Stage 2 | 1015 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 1000 | 1079 | - | - | 1619 | - |
| Mov Cap-2 Maneuver | 1000 | - | - | - | - | - |
| Stage 1 | 1019 | - | - | - | - | - |
| Stage 2 | 1015 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 8.7 | 0 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 1000 | 1619 | - |
| HCM Lane V/C Ratio | - | - | 0.025 | - | - |
| HCM Control Delay (s) | - | - | 8.7 | 0 | - |
| HCM Lane LOS | - | - | A | A | - |
| HCM 95th %tile Q(veh) | - | - | 0.1 | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 5.7 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 8 | 0 | 1 | 2 | 0 | 1 |
| Future Vol, veh/h | 8 | 0 | 1 | 2 | 0 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 75 | 75 | 75 | 75 | 75 | 75 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 11 | 0 | 1 | 3 | 0 | 1 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 4 | 3 | 0 | 0 | 4 | 0 |
| Stage 1 | 3 | - | - | - | - | - |
| Stage 2 | 1 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 1023 | 1087 | - | - | 1631 | - |
| Stage 1 | 1025 | - | - | - | - | - |
| Stage 2 | 1028 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 1023 | 1087 | - | - | 1631 | - |
| Mov Cap-2 Maneuver | 1023 | - | - | - | - | - |
| Stage 1 | 1025 | - | - | - | - | - |
| Stage 2 | 1028 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 8.6 | 0 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 1023 | 1631 | - |
| HCM Lane V/C Ratio | - | - | 0.01 | - | - |
| HCM Control Delay (s) | - | - | 8.6 | 0 | - |
| HCM Lane LOS | - | - | A | A | - |
| HCM 95th %tile Q(veh) | - | - | 0 | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0 |

| Movement | NBL | NBT | SBT | SBR | SEL | SER |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 15 | 25 | 14 | 3 | 5 | 7 |
| Future Vol, veh/h | 15 | 25 | 14 | 3 | 5 | 7 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Stop | Stop | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 5 | -5 | - | 5 | - |
| Peak Hour Factor | 64 | 64 | 64 | 64 | 64 | 64 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 23 | 39 | 22 | 5 | 8 | 11 |

| Major/Minor | Major1 | | Minor2 | |
|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 85 | 0 |
| Stage 1 | - | - | 0 | - |
| Stage 2 | - | - | 85 | - |
| Critical Hdwy | 4.1 | - | 5.5 | 5.7 |
| Critical Hdwy Stg 1 | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | 4.5 | - |
| Follow-up Hdwy | 2.2 | - | 4 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 828 | - |
| Stage 1 | - | - | - | - |
| Stage 2 | - | - | 848 | - |
| Platoon blocked, % | | - | | |
| Mov Cap-1 Maneuver | - | - | 0 | - |
| Mov Cap-2 Maneuver | - | - | 0 | - |
| Stage 1 | - | - | 0 | - |
| Stage 2 | - | - | 0 | - |

| Approach | NB | SB |
|---|---|---|
| HCM Control Delay, s | | |
| HCM LOS | | - |

| Minor Lane/Major Mvmt | NBL | NBT | SBLn1 |
|---|---|---|---|
| Capacity (veh/h) | - | - | - |
| HCM Lane V/C Ratio | - | - | - |
| HCM Control Delay (s) | - | - | - |
| HCM Lane LOS | - | - | - |
| HCM 95th %tile Q(veh) | - | - | - |





| Intersection | |
|---|---|
| Int Delay, s/veh | 3.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 0 | 30 | 10 | 31 | 35 | 1 | 10 | 0 | 10 | 0 | 1 | 0 |
| Future Vol, veh/h | 0 | 30 | 10 | 31 | 35 | 1 | 10 | 0 | 10 | 0 | 1 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 1 | 1 | 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 | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | -5 | - | - | 0 | - | - | 0 | - | - | -10 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 9 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 33 | 11 | 34 | 39 | 1 | 11 | 0 | 11 | 0 | 1 | 0 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 40 | 0 | 0 | 45 | 0 | 0 | 148 | 148 | 40 | 152 | 153 | 40 |
| Stage 1 | - | - | - | - | - | - | 40 | 40 | - | 108 | 108 | - |
| Stage 2 | - | - | - | - | - | - | 108 | 108 | - | 44 | 45 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.1 | 6.5 | 6.29 | 5.1 | 4.5 | 5.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.5 | - | 4.1 | 3.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.5 | - | 4.1 | 3.5 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4 | 3.381 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | 1583 | - | - | 1576 | - | - | 825 | 747 | 1012 | 892 | 808 | 1049 |
| Stage 1 | - | - | - | - | - | - | 980 | 866 | - | 958 | 860 | - |
| Stage 2 | - | - | - | - | - | - | 902 | 810 | - | 999 | 883 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1583 | - | - | 1575 | - | - | 809 | 730 | 1011 | 867 | 789 | 1049 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 809 | 730 | - | 867 | 789 | - |
| Stage 1 | - | - | - | - | - | - | 979 | 865 | - | 958 | 841 | - |
| Stage 2 | - | - | - | - | - | - | 881 | 792 | - | 988 | 882 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 3.4 | 9.1 | 9.6 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 899 | 1583 | - | - | 1575 | - | - | 789 |
| HCM Lane V/C Ratio | 0.025 | - | - | - | 0.022 | - | - | 0.001 |
| HCM Control Delay (s) | 9.1 | 0 | - | - | 7.3 | 0 | - | 9.6 |
| HCM Lane LOS | A | A | - | - | A | A | - | A |
| HCM 95th %tile Q(veh) | 0.1 | 0 | - | - | 0.1 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 25 | 5 | 0 | 17 |
| Future Vol, veh/h | 0 | 0 | 25 | 5 | 0 | 17 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 5 | - | 5 | - | - | -5 |
| Peak Hour Factor | 56 | 56 | 56 | 56 | 56 | 56 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 0 | 0 | 45 | 9 | 0 | 30 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 80 | 50 | 0 | 0 | 54 | 0 |
| Stage 1 | 50 | - | - | - | - | - |
| Stage 2 | 30 | - | - | - | - | - |
| Critical Hdwy | 7.4 | 6.7 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 6.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 907 | 1017 | - | - | 1564 | - |
| Stage 1 | 964 | - | - | - | - | - |
| Stage 2 | 989 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 907 | 1017 | - | - | 1564 | - |
| Mov Cap-2 Maneuver | 907 | - | - | - | - | - |
| Stage 1 | 964 | - | - | - | - | - |
| Stage 2 | 989 | - | - | - | - | - |

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

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | - | 1564 | - |
| HCM Lane V/C Ratio | - | - | - | - | - |
| HCM Control Delay (s) | - | - | 0 | 0 | - |
| HCM Lane LOS | - | - | A | A | - |
| HCM 95th %tile Q(veh) | - | - | - | 0 | - |





| Intersection | |
|---|---|
| Int Delay, s/veh | 2.2 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 10 | 0 | 8 | 16 | 0 | 6 |
| Future Vol, veh/h | 10 | 0 | 8 | 16 | 0 | 6 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 75 | 75 | 75 | 75 | 75 | 75 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 13 | 0 | 11 | 21 | 0 | 8 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 30 | 22 | 0 | 0 | 32 | 0 |
| Stage 1 | 22 | - | - | - | - | - |
| Stage 2 | 8 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 989 | 1061 | - | - | 1593 | - |
| Stage 1 | 1006 | - | - | - | - | - |
| Stage 2 | 1020 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 989 | 1061 | - | - | 1593 | - |
| Mov Cap-2 Maneuver | 989 | - | - | - | - | - |
| Stage 1 | 1006 | - | - | - | - | - |
| Stage 2 | 1020 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 8.7 | 0 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 989 | 1593 | - |
| HCM Lane V/C Ratio | - | - | 0.013 | - | - |
| HCM Control Delay (s) | - | - | 8.7 | 0 | - |
| HCM Lane LOS | - | - | A | A | - |
| HCM 95th %tile Q(veh) | - | - | 0 | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.6 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 4 | 0 | 1 | 7 | 0 | 1 |
| Future Vol, veh/h | 4 | 0 | 1 | 7 | 0 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 75 | 75 | 75 | 75 | 75 | 75 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 5 | 0 | 1 | 9 | 0 | 1 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 7 | 6 | 0 | 0 | 10 | 0 |
| Stage 1 | 6 | - | - | - | - | - |
| Stage 2 | 1 | - | - | - | - | - |
| Critical Hdwy | 6.4 | 6.2 | - | - | 4.1 | - |
| Critical Hdwy Stg 1 | 5.4 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.4 | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 3.3 | - | - | 2.2 | - |
| Pot Cap-1 Maneuver | 1019 | 1083 | - | - | 1623 | - |
| Stage 1 | 1022 | - | - | - | - | - |
| Stage 2 | 1028 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 1019 | 1083 | - | - | 1623 | - |
| Mov Cap-2 Maneuver | 1019 | - | - | - | - | - |
| Stage 1 | 1022 | - | - | - | - | - |
| Stage 2 | 1028 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 8.6 | 0 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 1019 | 1623 | - |
| HCM Lane V/C Ratio | - | - | 0.005 | - | - |
| HCM Control Delay (s) | - | - | 8.6 | 0 | - |
| HCM Lane LOS | - | - | A | A | - |
| HCM 95th %tile Q(veh) | - | - | 0 | 0 | - |

## 1: Glen Avenue & Main Street Performance by lane

| Lane | WB | NB | SB | All |
|---|---|---|---|---|
| Movements Served | LR | TR | LT | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.3 |
| Total Delay (hr) | 0.0 | 0.0 | 0.1 | 0.1 |
| Total Del/Veh (s) | 0.8 | 0.3 | 0.6 | 0.5 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.7 | 0.0 | 0.0 | 0.0 |

## 2: Main Street & Averill Road Performance by lane

| Lane | NB | SB | SE | All |
|---|---|---|---|---|
| Movements Served | LT | TR | LR | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.0 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 0.0 | 3.4 | 0.1 | 1.5 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.0 | 2.0 | 0.1 | 0.9 |

## 3: Grove Street & Main Street Performance by lane

| Lane | EB | WB | NB | SB | All |
|---|---|---|---|---|---|
| Movements Served | LTR | LTR | LTR | LTR | |
| Denied Delay (hr) | | | | | 0.0 |
| Denied Del/Veh (s) | | | | | 0.1 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 0.1 | 0.7 | 3.0 | 6.6 | 1.0 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.0 | 0.0 | 2.7 | 3.5 | 0.6 |

## 4: Averill Road & Beech Street Performance by lane

| Lane | WB | NB | SB | All |
|---|---|---|---|---|
| Movements Served | LR | TR | LT | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.0 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 4.3 | 0.0 | 1.0 | 0.7 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 2.9 | 0.0 | 0.1 | 0.1 |



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## 5: Proposed Southerly Driveway Performance by lane

| Lane | WB | NB | SB | All |
|---|---|---|---|---|
| Movements Served | LR | TR | LT | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.1 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 5.9 | 0.0 | 1.9 | 3.2 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 2.6 | 0.0 | 0.2 | 1.3 |

## 6: Proposed Northerly Driveway Performance by lane

| Lane | WB | NB | SB | All |
|---|---|---|---|---|
| Movements Served | LR | TR | LT | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.1 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 5.5 | 0.0 | | 3.5 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 2.4 | 0.0 | | 1.5 |

## Total Network Performance

| | |
|---|---|
| Denied Delay (hr) | 0.0 |
| Denied Del/Veh (s) | 0.2 |
| Total Delay (hr) | 0.3 |
| Total Del/Veh (s) | 1.8 |
| Stop Delay (hr) | 0.1 |
| Stop Del/Veh (s) | 0.4 |

## Intersection: 1: Glen Avenue & Main Street

| Movement | WB | SB |
|---|---|---|
| Directions Served | LR | LT |
| Maximum Queue (ft) | 31 | 29 |
| Average Queue (ft) | 2 | 2 |
| 95th Queue (ft) | 15 | 14 |
| Link Distance (ft) | 1144 | 766 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Intersection: 2: Main Street & Averill Road

| Movement | SB |
|---|---|
| Directions Served | TR |
| Maximum Queue (ft) | 46 |
| Average Queue (ft) | 20 |
| 95th Queue (ft) | 46 |
| Link Distance (ft) | 198 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Intersection: 3: Grove Street & Main Street

| Movement | WB | NB | SB |
|---|---|---|---|
| Directions Served | LTR | LTR | LTR |
| Maximum Queue (ft) | 10 | 30 | 10 |
| Average Queue (ft) | 0 | 8 | 1 |
| 95th Queue (ft) | 5 | 20 | 5 |
| Link Distance (ft) | 958 | 540 | 394 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |





## Intersection: 4: Averill Road & Beech Street

| Movement | WB |
|---|---|
| Directions Served | LR |
| Maximum Queue (ft) | 21 |
| Average Queue (ft) | 1 |
| 95th Queue (ft) | 10 |
| Link Distance (ft) | 456 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Intersection: 5: Proposed Southerly Driveway

| Movement | WB |
|---|---|
| Directions Served | LR |
| Maximum Queue (ft) | 40 |
| Average Queue (ft) | 13 |
| 95th Queue (ft) | 38 |
| Link Distance (ft) | 424 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Intersection: 6: Proposed Northerly Driveway

| Movement | WB |
|---|---|
| Directions Served | LR |
| Maximum Queue (ft) | 30 |
| Average Queue (ft) | 6 |
| 95th Queue (ft) | 25 |
| Link Distance (ft) | 419 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Network Summary

Network wide Queuing Penalty: 0

## 1: Glen Avenue & Main Street Performance by lane

| Lane | WB | NB | SB | All |
|---|---|---|---|---|
| Movements Served | LR | TR | LT | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.2 |
| Total Delay (hr) | 0.0 | 0.1 | 0.0 | 0.1 |
| Total Del/Veh (s) | 1.9 | 0.7 | 0.4 | 0.6 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 1.7 | 0.0 | 0.1 | 0.1 |

## 2: Main Street & Averill Road Performance by lane

| Lane | NB | SB | SE | All |
|---|---|---|---|---|
| Movements Served | LT | TR | LR | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.0 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 0.0 | 3.9 | 0.2 | 0.9 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.0 | 2.3 | 0.1 | 0.5 |

## 3: Grove Street & Main Street Performance by lane

| Lane | EB | WB | NB | SB | All |
|---|---|---|---|---|---|
| Movements Served | LTR | LTR | LTR | LTR | |
| Denied Delay (hr) | | | | | 0.0 |
| Denied Del/Veh (s) | | | | | 0.1 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 0.1 | 0.9 | 2.6 | 3.5 | 1.0 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.0 | 0.1 | 2.5 | 2.1 | 0.5 |

## 4: Averill Road & Beech Street Performance by lane

| Lane | NB | SB | All |
|---|---|---|---|
| Movements Served | TR | LT | |
| Denied Delay (hr) | | | 0.0 |
| Denied Del/Veh (s) | | | 0.0 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 0.1 | 0.3 | 0.2 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 0.0 | 0.1 | 0.0 |





## 5: Proposed Southerly Driveway Performance by lane

| Lane | WB | NB | SB | All |
|---|---|---|---|---|
| Movements Served | LR | TR | LT | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.0 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 4.2 | 0.2 | 0.5 | 1.1 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 2.4 | 0.0 | 0.1 | 0.6 |

## 6: Proposed Northerly Driveway Performance by lane

| Lane | WB | NB | SB | All |
|---|---|---|---|---|
| Movements Served | LR | TR | LT | |
| Denied Delay (hr) | | | | 0.0 |
| Denied Del/Veh (s) | | | | 0.1 |
| Total Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 4.1 | 0.0 | 0.0 | 1.8 |
| Stop Delay (hr) | 0.0 | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s) | 2.3 | 0.0 | 0.0 | 1.0 |

## Total Network Performance

| | |
|---|---|
| Denied Delay (hr) | 0.0 |
| Denied Del/Veh (s) | 0.2 |
| Total Delay (hr) | 0.3 |
| Total Del/Veh (s) | 1.5 |
| Stop Delay (hr) | 0.1 |
| Stop Del/Veh (s) | 0.3 |

## Intersection: 1: Glen Avenue & Main Street

| Movement | WB | SB |
|---|---|---|
| Directions Served | LR | LT |
| Maximum Queue (ft) | 53 | 34 |
| Average Queue (ft) | 10 | 3 |
| 95th Queue (ft) | 35 | 19 |
| Link Distance (ft) | 1144 | 766 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Intersection: 2: Main Street & Averill Road

| Movement | SB |
|---|---|
| Directions Served | TR |
| Maximum Queue (ft) | 35 |
| Average Queue (ft) | 13 |
| 95th Queue (ft) | 38 |
| Link Distance (ft) | 198 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Intersection: 3: Grove Street & Main Street

| Movement | EB | WB | NB | SB |
|---|---|---|---|---|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (ft) | 3 | 24 | 33 | 5 |
| Average Queue (ft) | 0 | 1 | 8 | 0 |
| 95th Queue (ft) | 2 | 10 | 23 | 4 |
| Link Distance (ft) | 395 | 958 | 540 | 394 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |





## Intersection: 4: Averill Road & Beech Street

| Movement |
|---|
| Directions Served |
| Maximum Queue (ft) |
| Average Queue (ft) |
| 95th Queue (ft) |
| Link Distance (ft) |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%) |
| Queuing Penalty (veh) |

## Intersection: 5: Proposed Southerly Driveway

| Movement | WB |
|---|---|
| Directions Served | LR |
| Maximum Queue (ft) | 31 |
| Average Queue (ft) | 9 |
| 95th Queue (ft) | 31 |
| Link Distance (ft) | 424 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Intersection: 6: Proposed Northerly Driveway

| Movement | WB |
|---|---|
| Directions Served | LR |
| Maximum Queue (ft) | 30 |
| Average Queue (ft) | 5 |
| 95th Queue (ft) | 23 |
| Link Distance (ft) | 419 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Network Summary

Network wide Queuing Penalty: 0