

TRAFFIC IMPACT ANALYSIS

FOR

BELL FARM PROPERTY

Prepared by:

LENHART TRAFFIC CONSULTING, INC.

TRAFFIC ENGINEERING & TRANSPORTATION PLANNING

January 29, 2025



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Section 1 Introduction

1.1 Project Description

This Traffic Impact Analysis (TIA) was prepared for the development of the Bell Farm Property located in New Market, Maryland. A site location map is provided on **Exhibit 1**.

The Bell Farm Property is proposed to be developed with up to 248 senior multifamily units. Access to the site will be provided with a single full movement access point along Yeagerstown Road. A concept site plan has been provided in Appendix A.

1.2 Scope of Study

This Traffic Impact Study has been prepared in accordance with Frederick County's Adequate Public Facilities Ordinance (APFO) and SHA Guidelines. Scoping documents and correspondence have been included in Appendix A detailing the scope of work for the development.

Study Intersections:

1. Yaegertown Road & Boyers Mill Road
2. Yaegertown Road & Site Access
3. MD 144 (Old National Pike) & Meadow Road
4. MD 144 (Old National Pike) & Eaglehead Drive
5. MD 144 (Old National Pike) & Yeagertown Road
6. MD 144 (Old National Pike) & Boyers Mill Road



Traffic Impact Analysis

Site Location
Map

**Exhibit
1**



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SEVERNA PARK, MD 21146



- Location of Site

Section 2 Existing Conditions

2.1 Description of Road Network

The key roads in the study area are:

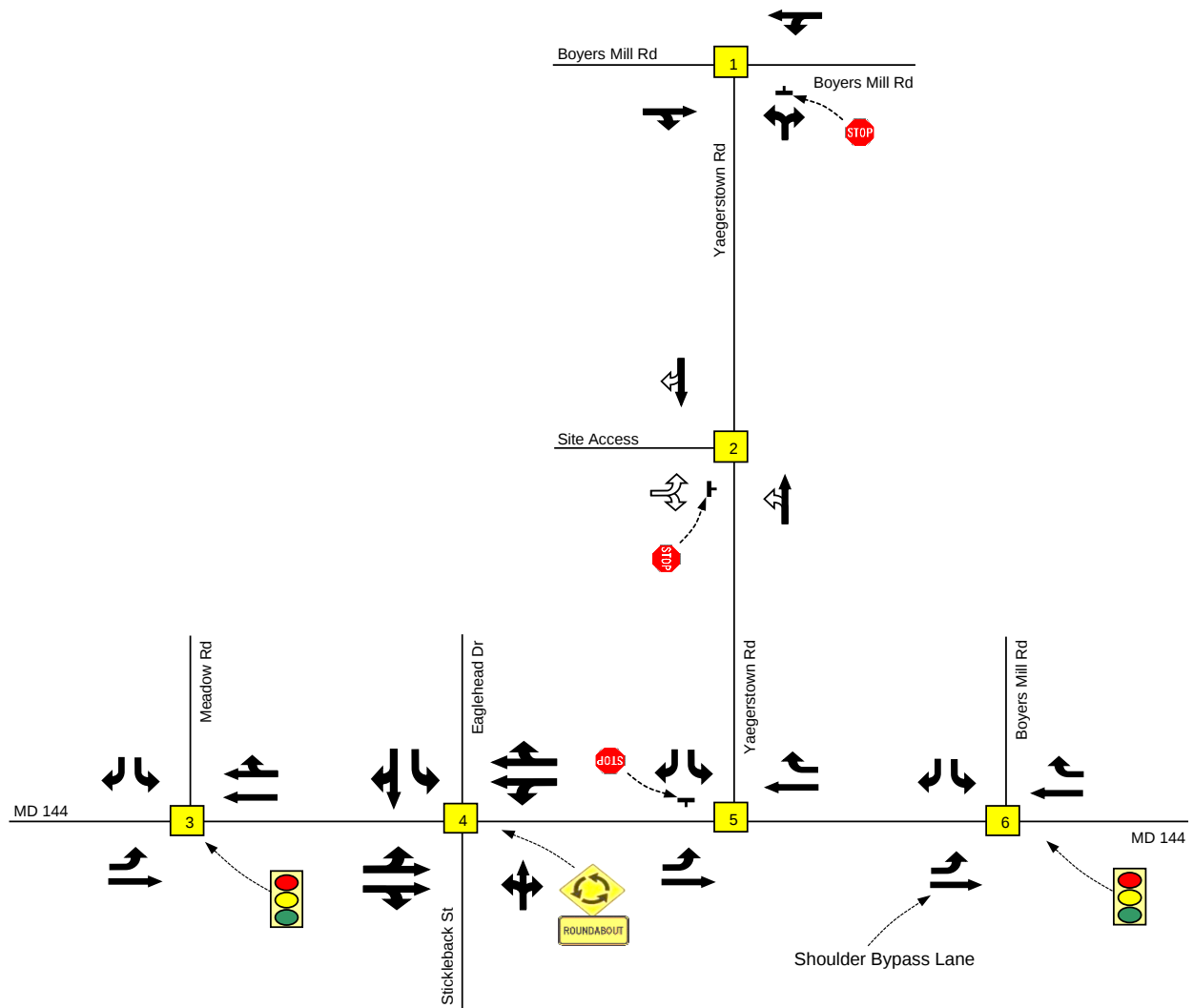
- Yeagerstown Road is a two-lane roadway (one in each direction) with a north-south orientation and is classified as a local road. The posted speed limit is 25 MPH within the vicinity of the site.
- MD 144 is a two-lane roadway (one in each direction) with an east-west orientation. MD 144 is classified as a major collector. The posted speed limit is 45 MPH.

2.2 Lane Configurations

The Lane Use & Traffic Control Devices are shown on **Exhibit 2**.

2.3 Existing Traffic Counts

Peak hour traffic counts were collected and the resulting existing peak hour traffic volumes are shown on **Exhibit 3**.

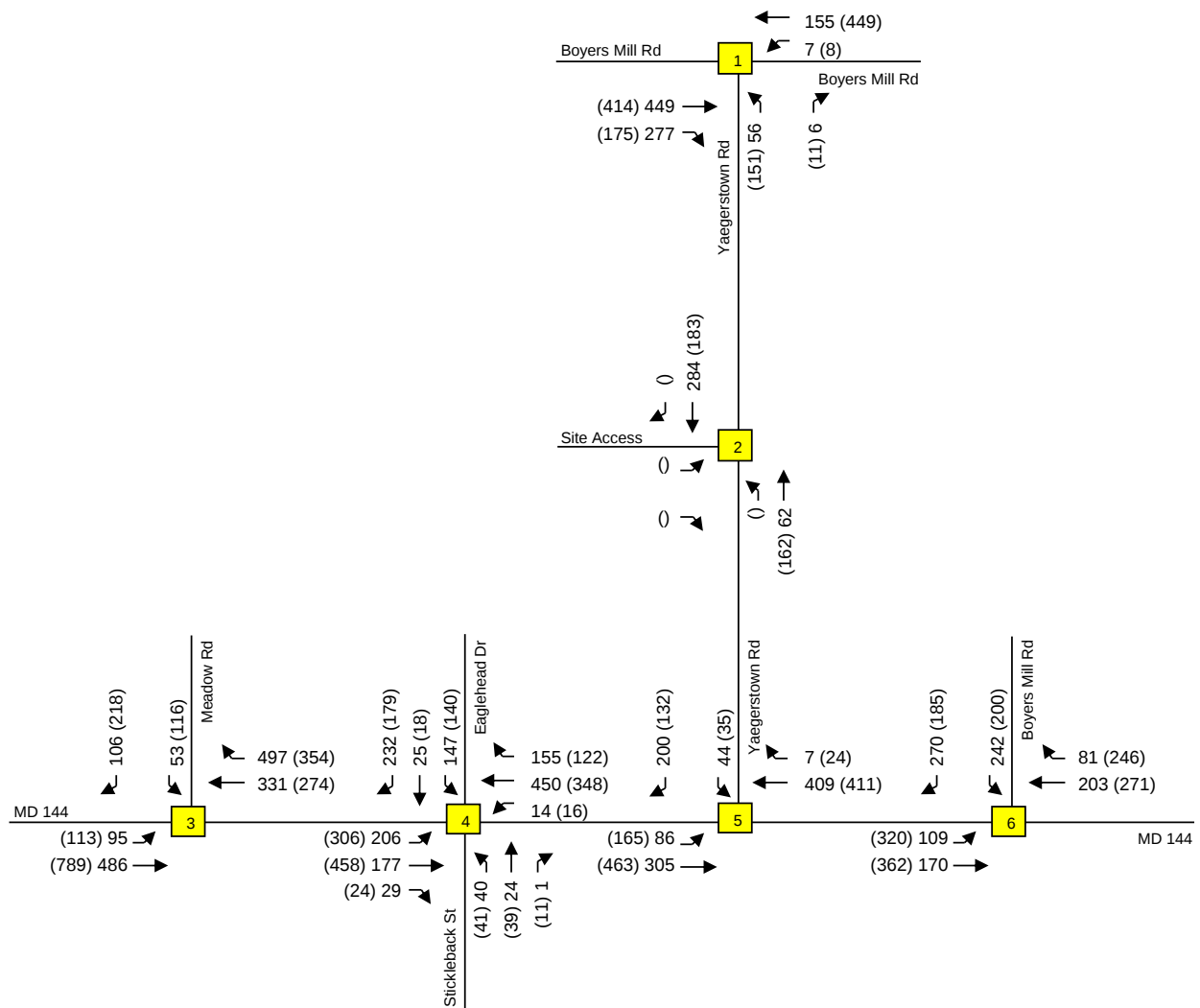


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Lane Use &
Traffic Control Devices

Exhibit
2



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Existing Peak Hour Volumes

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
3**

Section 3 Background Conditions

3.1 Annual Growth

Per the scoping agreement, a 1% growth was applied for 8 years in order to account for growth in the vicinity of the site. The resulting volumes are shown on **Exhibit 4**.

3.2 Approved Background Developments

The following background developments were included, per the scoping agreement:

- Eaglehead
- Oakdale Village
- Aubudon Terrace
- Meadows
- Pinehurst
- Westwinds (Woodlands Preserve)
- New Market Retail Center
- Intercoastal
- Marley Commons
- Preston/Mains
- 105/113 West Main
- Calumet
- Cromwell

Individual background development trip generation and assignments are included in Appendix C. The combined trips associated with the background developments are shown on **Exhibit 5**.

In addition to the above background developments, the following CIP/CTP or other traffic improvements have been included in the analyses:

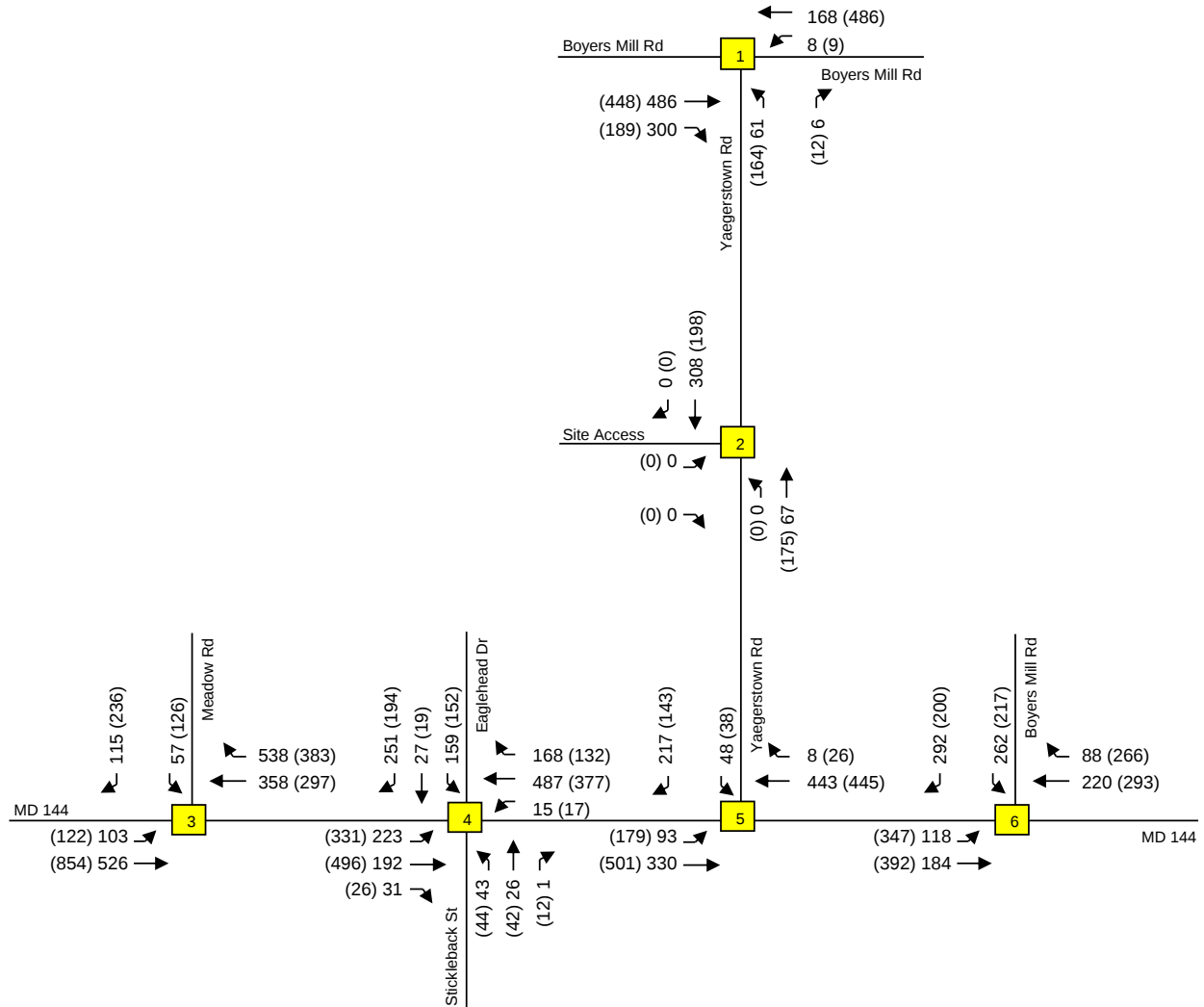
- Lake Linganore Boulevard from LTC Town Center to Meadow Road Interchange
- Boyers Mill Road Widening from Lake Linganore Bridge to Finn Drive
- Right turn lane from EB Gas House Pike onto SB Boyers Mill Road
- Traffic Signal at Finn Drive and Boyers Mill Road
- Double left turn lane NB on Mussetter Road from Old National Pike
- New Market Bypass from Boyers Mill Road to MD 75

Diversions due to the Lake Linganore Boulevard extension are shown on **Exhibit 6a** and diversions due to the New Market Bypass are shown on **Exhibit 6b**.

3.3 Background Traffic Volumes

The background peak hour volumes are shown on **Exhibit 7** and combine the base peak hour volumes with the trips generated by the background developments and diversions due to planned roadway improvements.

1%	Growth Rate
8	Years of Growth
1.083	Total Growth



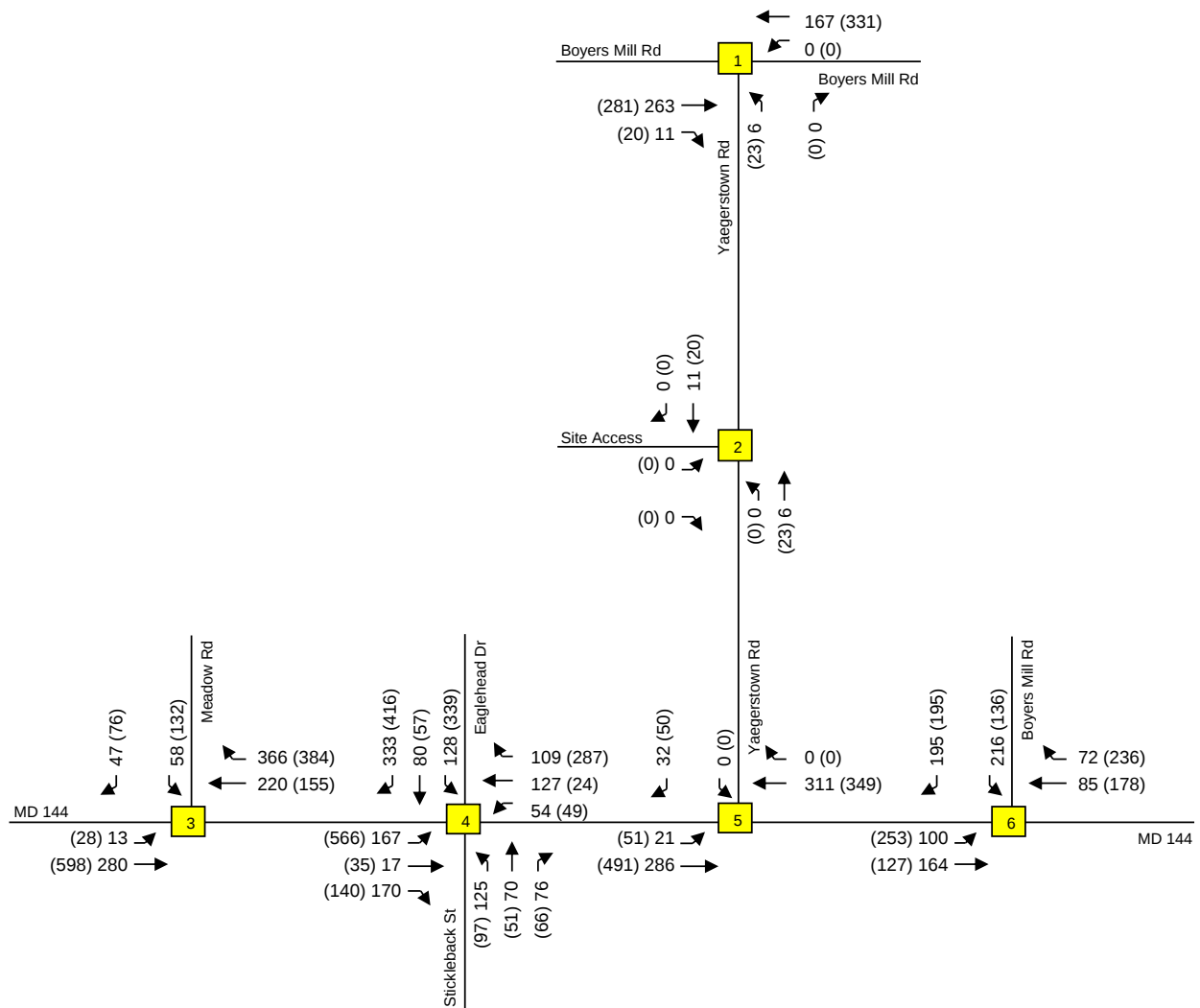
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Base Peak Hour Volumes

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
4**



Traffic Impact Analysis

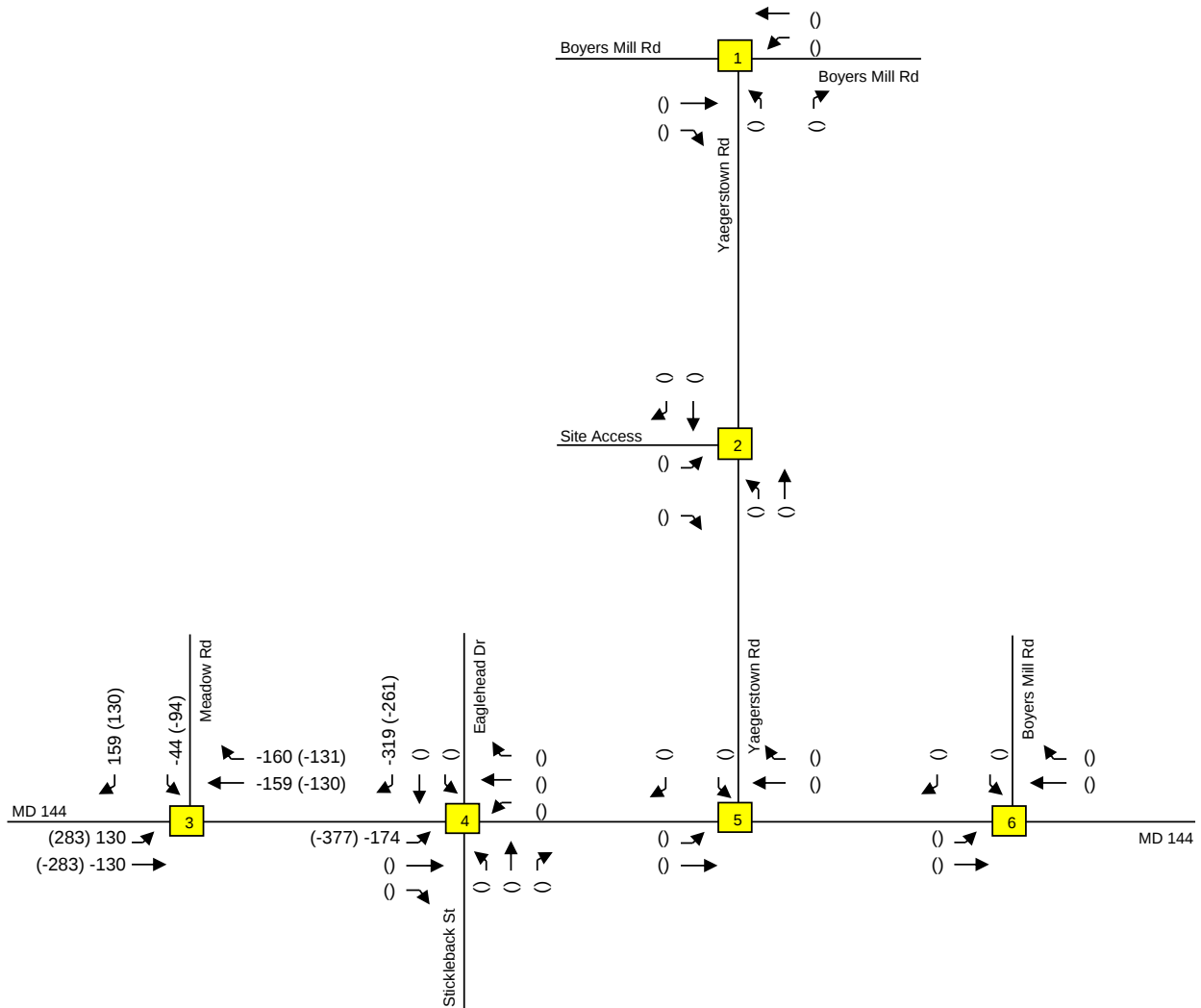
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Combined Background Development Trips

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
5**

Note: Diversions due to the completion of the Lake Linganore Boulevard Extension were obtained from the December 2022 Gordon Mill TIA.



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Diversions Due to Lake Linganore Blvd Extension

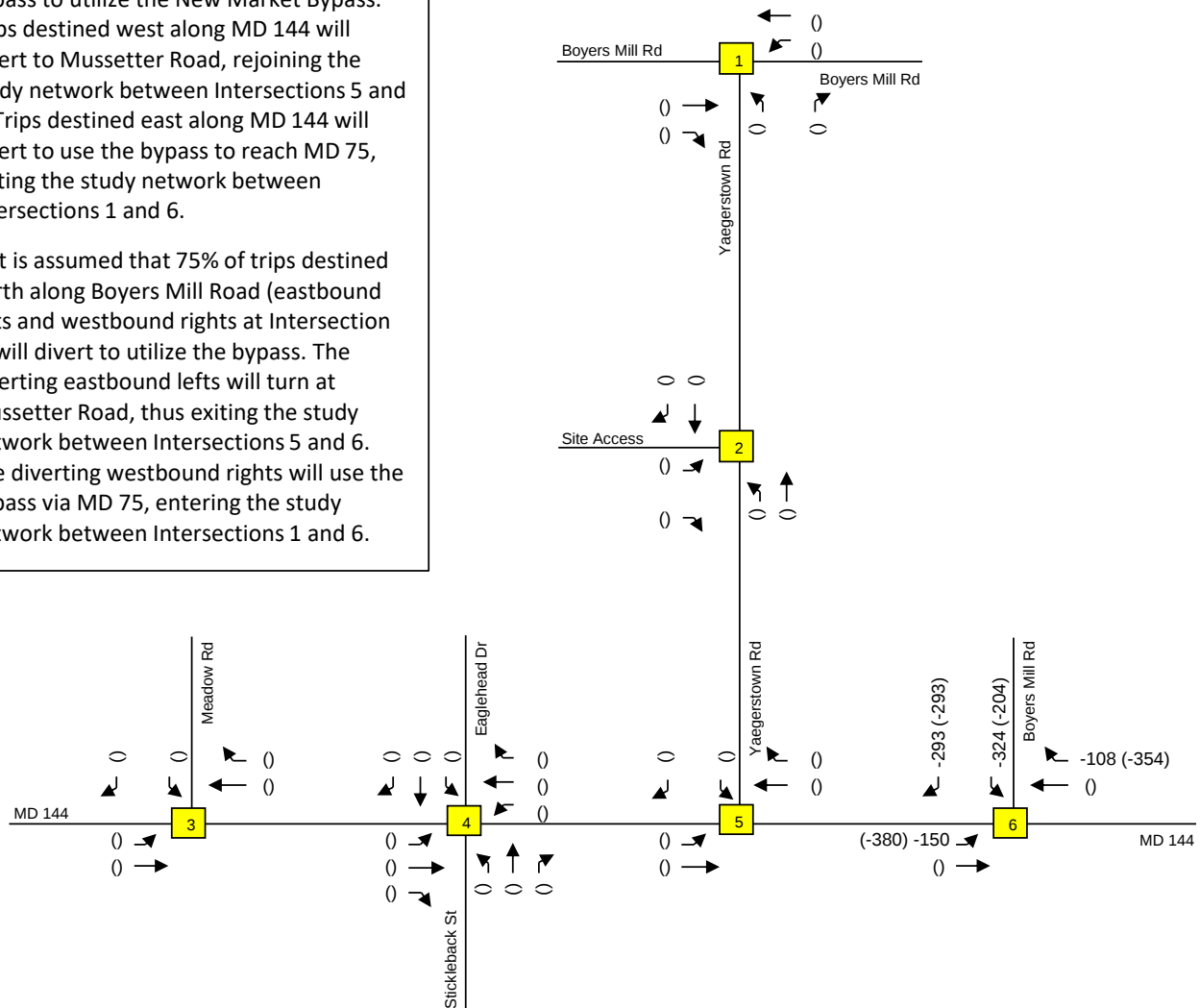
Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
6a**

Notes: The following diversions were applied to the base peak hour volumes (Exhibit 4) and the trips associated with the background developments (Exhibit 5a)

1. It is assumed that 75% of southbound volume at MD 144 & Boyers Mill Road will bypass to utilize the New Market Bypass. Trips destined west along MD 144 will divert to Mussetter Road, rejoining the study network between Intersections 5 and 6. Trips destined east along MD 144 will divert to use the bypass to reach MD 75, exiting the study network between Intersections 1 and 6.

2. It is assumed that 75% of trips destined north along Boyers Mill Road (eastbound lefts and westbound rights at Intersection 6) will divert to utilize the bypass. The diverting eastbound lefts will turn at Mussetter Road, thus exiting the study network between Intersections 5 and 6. The diverting westbound rights will use the bypass via MD 75, entering the study network between Intersections 1 and 6.



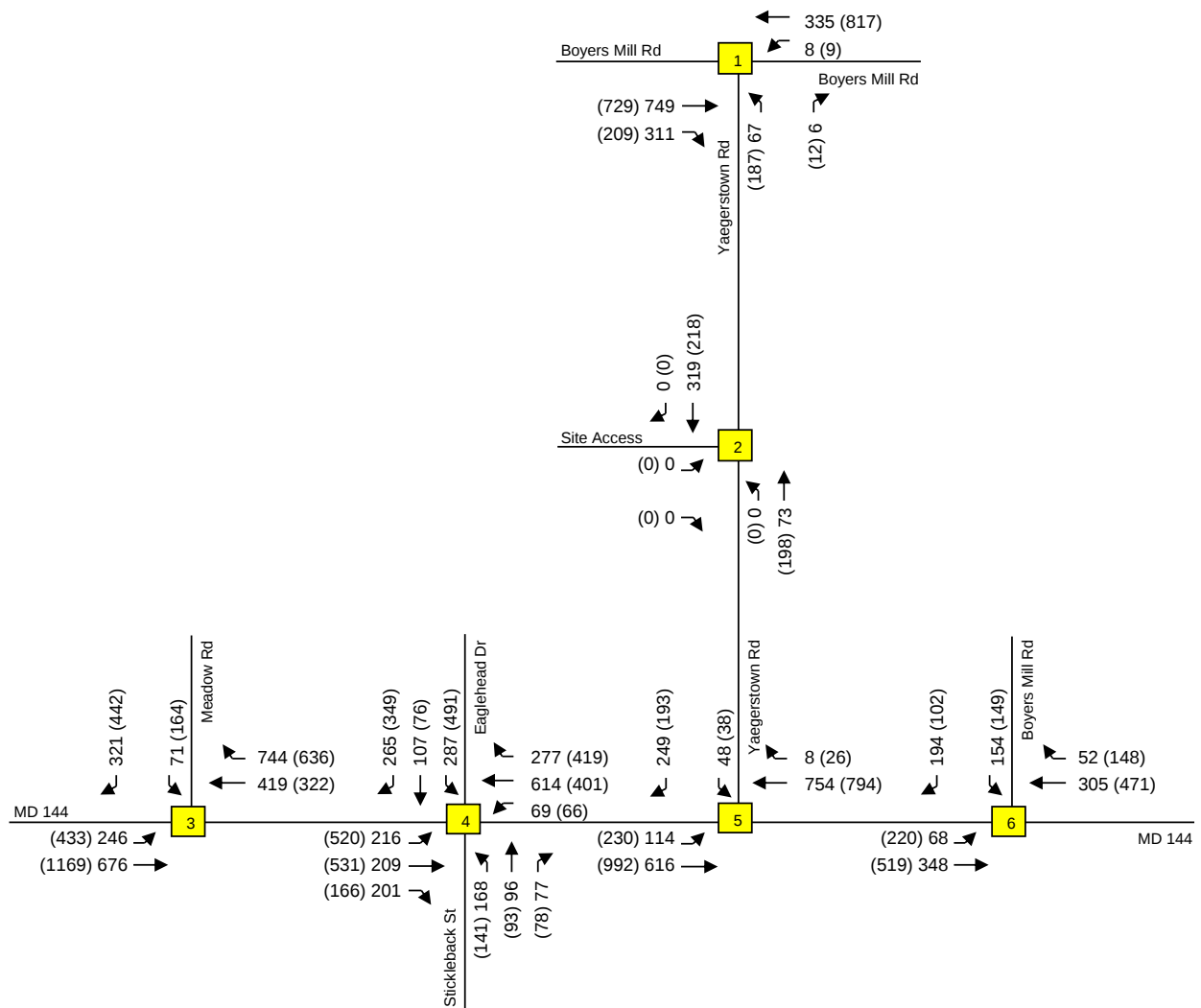
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Diversions Due to New Market Bypass

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
6b**



Traffic Impact Analysis

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Background Peak Hour Volumes

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

Exhibit
7

Section 4 Projected Conditions with Site

4.1 Site Trip Generation

The Bell Farm Property is proposed to be developed with up to 248 senior multifamily units.

Exhibit 8 shows the trip generation for the site. The trip generation rates were obtained from the ITE Trip Generation Manual, 11th Edition.

4.2 Site Trip Distribution & Trip Assignment

The trip distribution and assignment for the site is shown on **Exhibit 9**.

4.3 Total Traffic Volumes

The Total Peak Hour Volumes are shown on **Exhibit 10**.

4.4 Projected Level of Service

The total traffic volumes were evaluated using the HCM methodology as required in the scoping agreement. The results of the HCM analyses are shown on **Exhibit 11a**. The study intersections were also evaluated using the CLV methodology, with the results shown on **Exhibit 11b**.

Based on the results of the HCM and CLV evaluations, each study intersection will meet the APFO requirements of Frederick County and TIS requirements of MDOT SHA, with the exception of MD 144 & Eaglehead Drive:

- The intersections with movements exceeding LOS “D” using the HCM methodology, the intersections of Boyers Mill Road & Yeagerstown Road and MD 144 & Yeagerstown Road are stop-controlled intersections in which the minor, stop-controlled approach exceeds LOS “D” while the mainline uncontrolled movements operate with LOS “A”. The proposed development adds fewer than 30 peak hour trips to the stop-controlled movements at these intersections. The Frederick County APFO states that “where the site generated volume on a stop-controlled approach would be 30 vehicles per hour or less, any LOS problem that may exist is considered to be negligible and an adequacy finding and mitigation would not normally be required.” As such, mitigation should not be required for these intersections.
- Each study intersection operates with LOS “D” or better when analyzed using the CLV methodology, thereby meeting the requirements of MDOT SHA.
- The intersection of MD 144 & Eaglehead Drive/Stickleback Street was

analyzed using Sidra software as required in the Frederick County APFO. The results of the analysis indicate that while the northbound approach operates in excess of 1.0 during the evening peak hour, the development adds very little traffic through the intersection, and no volume, specifically, to the northbound approach. The v/c ratio of this approach increases by only 0.01 from background to total conditions, and by only 0.01 at each of the other legs of the intersection. Under background conditions, 3,331 vehicles enter the roundabout during the evening peak hour. The proposed development adds only 28 additional vehicles, or an increase of 0.8%. This should be considered a negligible impact on the operation of the intersection and therefore mitigation should not be required.

In general, the proposed development increases volume on the road network by a negligible amount compared to the background conditions, which include the existing traffic volumes and trips associated with all the nearby approved developments. Due to the large quantity of approved background development trips (shown on Exhibit 5), the level of service for several movements at the study intersections degrade significantly from existing to background conditions. Relative to the degradation in level of service from existing to background conditions, the degradation from background conditions to total conditions (the impact of the proposed development on the study network) is minimal. This indicates that the proposed development has little impact on the study intersections, and that any excessive delays are due to the large quantity of background development volume, rather than the proposed development.

SimTraffic simulation software (and Sidra for the roundabout intersection of MD 144 & Eaglehead Drive/Stickleback Street) was used to evaluate the 95th percentile queues at each study intersection. The results of the queuing analyses are shown on **Exhibit 12**. The results of the queuing analyses show that 95th percentile queues at each intersection do not impact adjacent intersections, and that the proposed development has minimal impact on the queue lengths.

4.5 Other Considerations

Per the scoping agreement, Frederick County Staff requested the following additional analyses:

- crash history at Yeagerstown Road & Boyers Mill Road
- safety review of Yeagerstown Road between MD 144 & Boyers Mill Road
- sight distance evaluation of the following intersections:
 - Yeagerstown Road & Site Access
 - Boyers Mill Road & Yeagerstown Road

Crash History at Boyers Mill Road & Yeagerstown Road

Crash data at this intersection was provided by MDOT SHA for the previous three years. The crash data shows that only three total crashes have occurred at the intersection over the previous three years, and there is no discernible pattern to the crashes. The crash data is provided in Appendix A.

Safety Review of Yeagerstown Road

As discussed in Section 2, Yeagerstown Road is a two-lane roadway designated as a local road, providing local connections to MD 144 and Boyers Mill Road.

The typical section of Yeagerstown Road is a paved width of 20 feet, with one 10-foot travel lane in each direction. Due to the environmental constraints along the roadway (steep grades along the road edges and dense vegetation) no shoulders are provided along the length of Yeagerstown Road. However, guard rails and reduced speed warnings at horizontal curves are provided at various locations to improve safety along the roadway. These safety features are shown on **Exhibit 13**, which provides a line diagram of Yeagerstown Road.

Crash data along Yeagerstown was provided by MDOT SHA for the previous three years. The crash data shows that only seven total crashes have occurred along the roadway over the previous three years. There is no discernible pattern to the crashes as they all occur at different locations along the roadway. The crash data is provided in Appendix A.

Sight Distance Evaluation of Yeagerstown Road & Site Access

The location of the proposed site access along Yeagerstown Road is shown on Exhibit 1 and the concept site plan included in Appendix A. Yeagerstown Road has a 25 MPH posted speed limit within the vicinity of the proposed site access location. The *AASHTO Green Book (A Policy on Geometric Design of Highways and Streets)* provides the standards for intersection sight distance. For a roadway with a 25 MPH posted speed limit, the required intersection sight distance for a left-turn from stop is 280 feet. For a right-turn from stop, the required intersection sight distance is 240 feet. It should be noted that AASHTO Green Book contains guidance on intersection sight distance in Chapter 9.5.1, and states that, “*If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions.*” Given this discussion, AASHTO

recommends that intersection stopping sight distance should meet or exceed the stopping sight distance requirements so that drivers have sufficient sight distance to anticipate and avoid collisions. Based on the roadway geometry of Yeagerstown Road at the proposed site access location, the site access can be designed such that the intersection sight distance exceeds the stopping sight distance of Yeagerstown Road and can therefore operate safely in regard to sight distance. To achieve this sight distance, it may be necessary for the development to clear vegetation and cut earth along the property frontage.

Sight Distance Evaluation of Boyers Mill Road & Yeagerstown Road

Boyers Mill Road has a 35 MPH posted speed limit within the vicinity of the intersection with Yeagerstown Road. The *AASHTO Green Book (A Policy on Geometric Design of Highways and Streets)* provides the standards for intersection sight distance. For a roadway with a 35 MPH posted speed limit, the intersection sight distance requirement for a left-turn from stop is 390 feet. For a right-turn from stop, the required intersection sight distance is 335 feet. Sight distance to the north along Boyers Mill Road (looking left from Yeagerstown Road) is measured in excess of 400 feet to the horizontal curve, thus exceeding the intersection sight distance requirement. Sight distance to the south along Boyers Mill Road (looking right from Yeagerstown Road) is measured at approximately 290 feet. It should be noted that the stopping sight distance requirement for a roadway with a 35 MPH speed limit is 250 feet. The sight distance to the south along Boyers Mill Road exceeds the stopping sight distance requirement and, based on the guidance of the *AASHTO Green Book*, therefore allows drivers sufficient sight distance to anticipate and avoid collisions.

This intersection is part of Frederick County's Boyers Mill Road Improvement Project, which focuses on improving the safety of the road corridor to meet the increasing traffic demands in the area. With the improvements proposed at the intersection of Boyers Mill Road & Yeagerstown Road as part of this project, which includes increasing the paved width of Boyers Mill Road, the vehicular safety of this intersection should be improved upon the existing conditions.

Trip Generation Rates

Senior Adult Housing - Multifamily (ITE-252, Units)

Morning Trips = 0.20 x Units

Evening Trips = 0.25 x Units

Trip Distribution (In/Out)

34/66

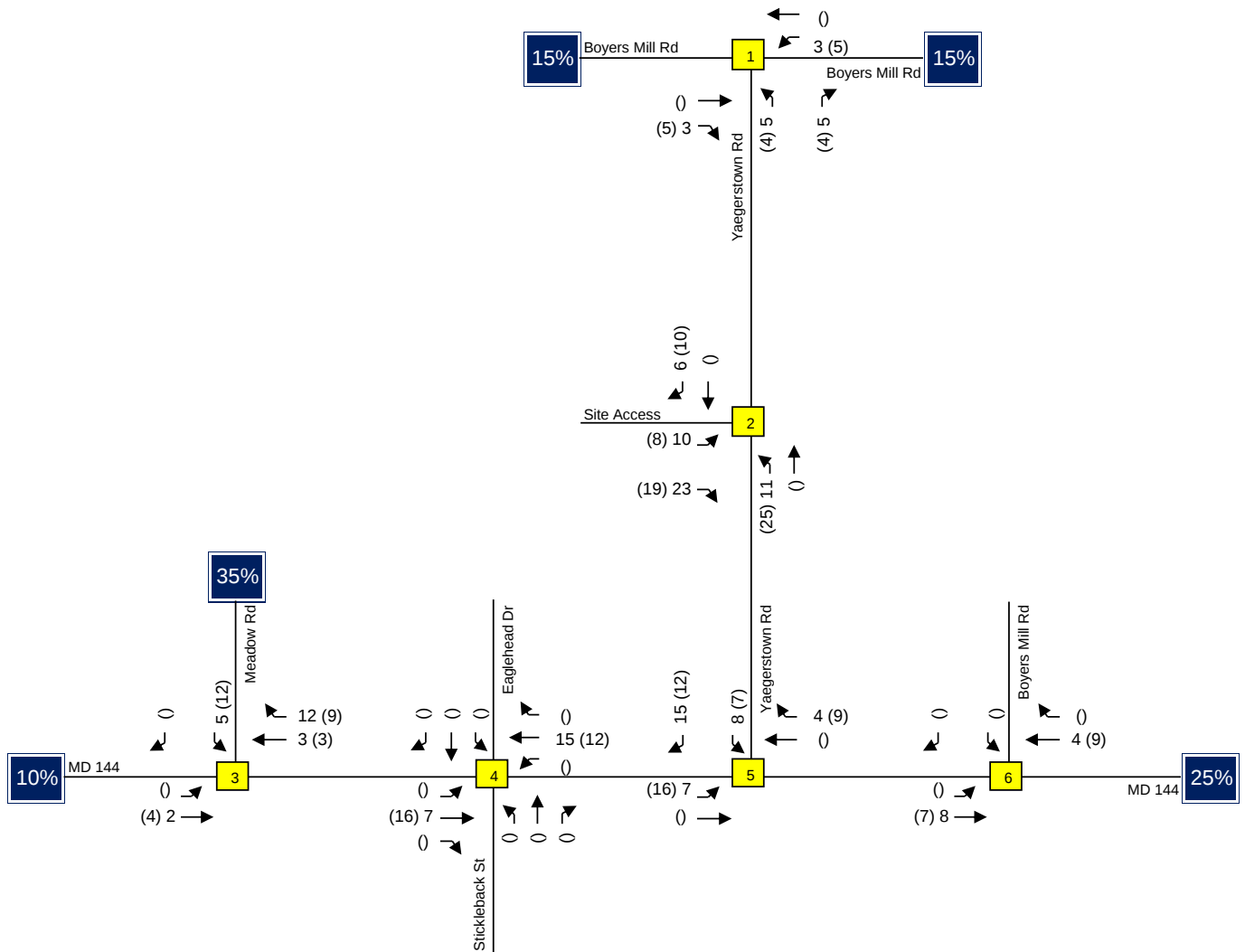
56/44

Trip Generation Totals

		AM Peak			PM Peak		
		In	Out	Total	In	Out	Total
Senior Adult Housing - Multifamily (ITE-252, Units)	248 units	17	33	50	35	27	62

NOTE: Trip Generation Rates obtained from the ITE Trip Generation Manual, 11th Edition

Traffic Impact Analysis	Trip Generation for Site	Exhibit 8
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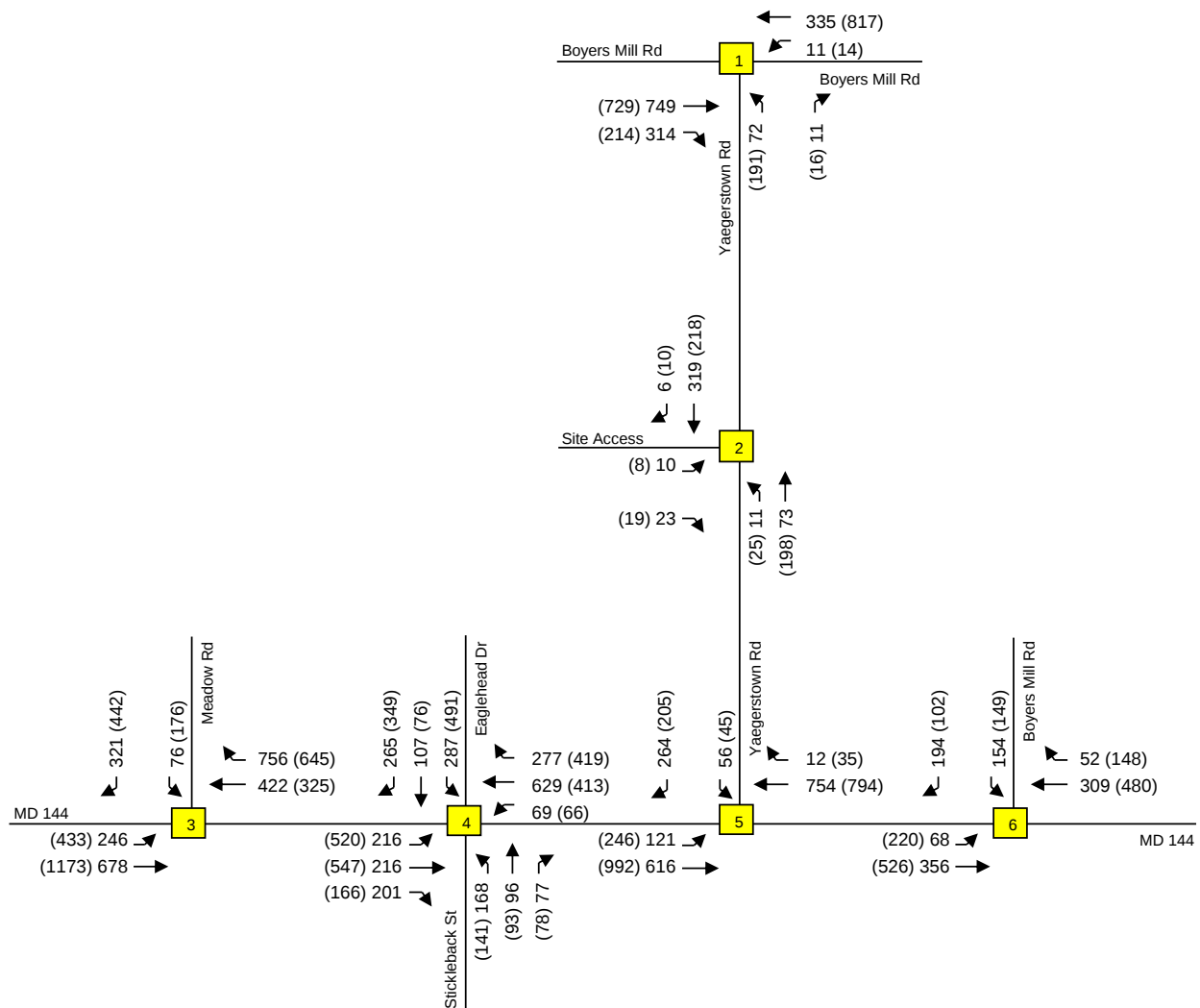
Traffic Impact Analysis

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Trip Assignment for Site

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
9**



Traffic Impact Analysis

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Total Peak Hour Volumes

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
10**

Highway Capacity Manual (HCM) Level-of-Service Results

Morning Peak Hour	Existing Delay	Background Delay	Total Delay
1). Yeagertown Road & Boyers Mill Road Westbound Approach Northbound Approach	A / 1.3 A / 0.5 C / 17.7	A / 2.4 A / 0.5 E / 45.0	A / 2.8 A / 0.6 E / 48.6
2). Yeagertown Road & Site Access Eastbound Approach Northbound Approach	N/A N/A	N/A N/A	A / 1.0 B / 10.9 A / 1.1
3). MD 144 & Meadow Road Eastbound Approach Westbound Approach Southbound Approach	A / 8.4 A / 4.9 B / 10.8 A / 9.2	B / 12.3 A / 6.2 B / 16.8 B / 13.1	B / 12.5 A / 6.3 B / 17.0 B / 13.4
4). MD 144 & Eaglehead Drive (v/c ratio) Eastbound Approach Westbound Approach Northbound Approach Southbound Approach	A / 0.33 A / 0.21 A / 0.33 A / 0.09 A / 0.30	B / 0.66 A / 0.39 B / 0.62 B / 0.52 B / 0.66	B / 0.71 A / 0.41 B / 0.63 B / 0.53 C / 0.71
5). MD 144 & Yeagertown Road Eastbound Approach Southbound Approach	A / 4.3 A / 1.9 C / 15.5	B / 9.1 A / 1.6 F / 51.1	B / 12.1 A / 1.7 F / 65.2
6). MD 144 & Boyers Mill Road Eastbound Approach Westbound Approach Southbound Approach	A / 7.5 A / 7.6 A / 7.5 A / 7.3	A / 7.7 A / 7.8 A / 7.4 A / 8.0	A / 7.8 A / 7.9 A / 7.4 A / 8.0
Evening Peak Hour	Existing Delay	Background Delay	Total Delay
1). Yeagertown Road & Boyers Mill Road Westbound Approach Northbound Approach	B / 6.0 A / 0.3 E / 44.3	F / 76.4 A / 0.4 F / >200	F / 85.3 A / 0.6 F / >200
2). Yeagertown Road & Site Access Eastbound Approach Northbound Approach	N/A N/A	N/A N/A	A / 1.1 B / 10.5 A / 1.0
3). MD 144 & Meadow Road Eastbound Approach Westbound Approach Southbound Approach	B / 10.3 A / 9.1 B / 11.9 B / 10.7	C / 20.9 C / 22.9 B / 17.8 C / 20.4	C / 21.5 C / 23.7 B / 18.0 C / 21.5
4). MD 144 & Eaglehead Drive (v/c ratio) Eastbound Approach Westbound Approach Northbound Approach Southbound Approach	A / 0.38 A / 0.38 A / 0.29 A / 0.17 A / 0.21	E / 1.07 E / 0.92 C / 0.75 F / 1.07 C / 0.79	E / 1.08 E / 0.93 C / 0.76 F / 1.08 C / 0.80
5). MD 144 & Yeagertown Road Eastbound Approach Southbound Approach	A / 3.6 A / 2.4 C / 18.0	F / 64.9 A / 2.3 F / >200	F / 101 A / 2.5 F / >200
6). MD 144 & Boyers Mill Road Eastbound Approach Westbound Approach Southbound Approach	A / 8.9 A / 8.8 A / 6.4 B / 12.2	A / 8.1 A / 7.9 A / 5.8 B / 14.0	A / 8.2 A / 7.9 A / 6.4 B / 13.7

Notes: 1. The intersection of MD 144 & Eaglehead Drive is a roundabout and as such the LOS (based on average delay) and v/c ratio are reported.

2. It is assumed that due to the large quantity of background traffic volume and major roadway improvements (Lake Linganore Blvd Extension and New Market Bypass), the traffic signal timings at the signalized intersections will be modified. The analysis of the background and total conditions at the signalized intersections uses modified signal timings to better accommodate the significant changes in traffic.

Traffic Impact Analysis



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**Results of HCM
Level-of-Service Analyses**

**Exhibit
11a**

Critical Lane Volume (CLV) Level-of-Service Results

Morning Peak Hour	Existing CLV	Background CLV	Total CLV
1). Yeagertown Road & Boyers Mill Road	A / 795	B / 1141	C / 1157
2). Yeagertown Road & Site Access	N/A	N/A	A / 369
3). MD 144 & Meadow Road	A / 603	A / 961	A / 970
4). MD 144 & Eaglehead Drive	N/A	N/A	N/A
5). MD 144 & Yeagertown Road	A / 609	B / 1003	B / 1018
6). MD 144 & Boyers Mill Road	A / 507	A / 527	A / 531
Evening Peak Hour	Existing CLV	Background CLV	Total CLV
1). Yeagertown Road & Boyers Mill Road	A / 759	B / 1146	C / 1164
2). Yeagertown Road & Site Access	N/A	N/A	A / 280
3). MD 144 & Meadow Road	A / 905	D / 1333	D / 1349
4). MD 144 & Eaglehead Drive	N/A	N/A	N/A
5). MD 144 & Yeagertown Road	A / 611	B / 1062	B / 1085
6). MD 144 & Boyers Mill Road	A / 804	A / 840	A / 849

Traffic Impact Analysis

Results of CLV
Level-of-Service Analyses

**Exhibit
11a**



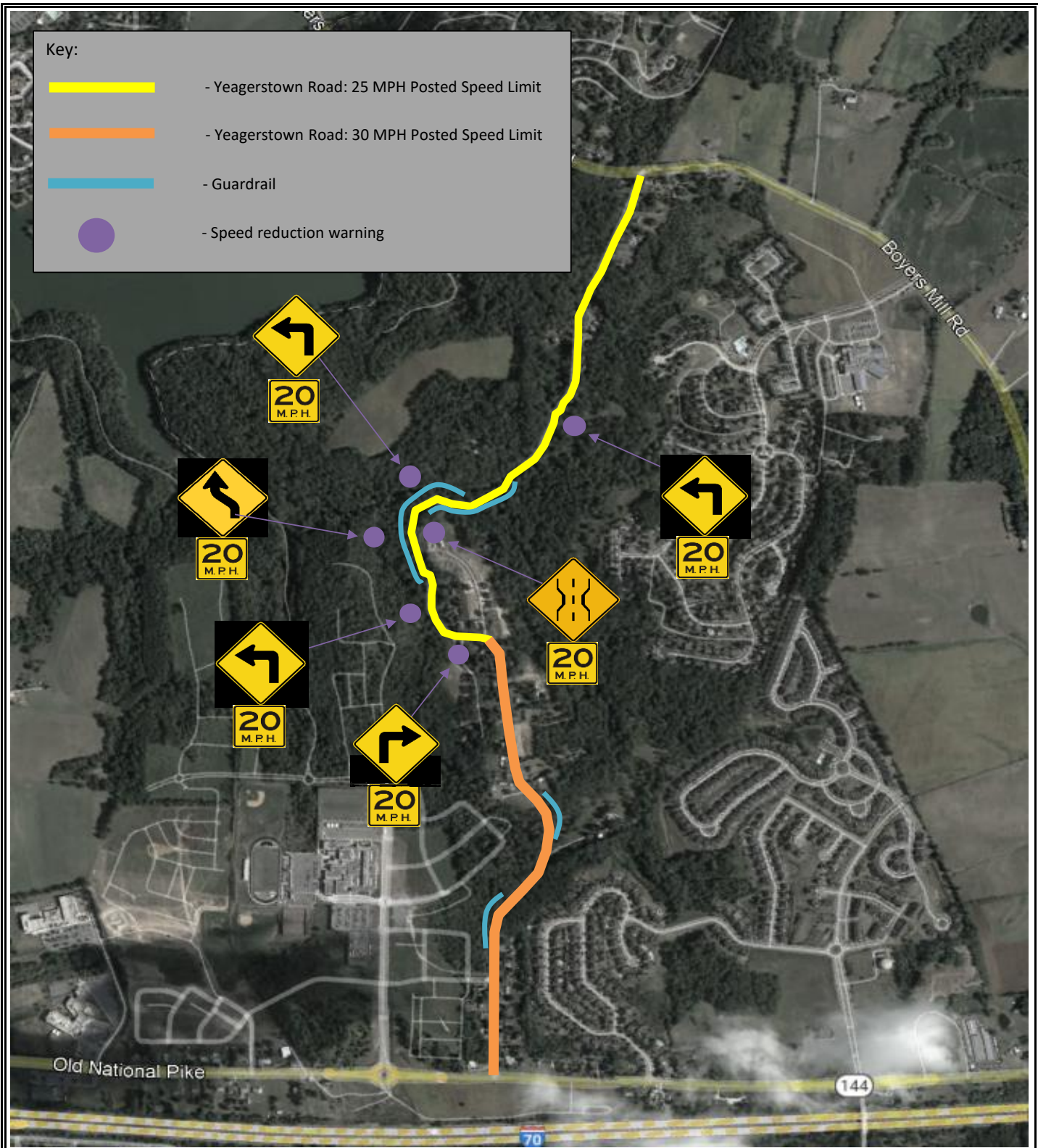
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SimTraffic 95th Percentile Queuing Analysis Results

Morning Peak Hour	Available Storage	Background Queue	Total Queue
1). Yeagertown Road & Boyers Mill Road Westbound Left/Through Northbound Left/Right		195 feet 131 feet	123 feet 165 feet
2). Yeagertown Road & Site Access Eastbound Left/Right Northbound Left/Through		N/A	44 feet 22 feet
3). MD 144 & Meadow Road Eastbound Left Eastbound Through Westbound Through/Right Southbound Left Southbound Right		125 feet 187 feet 234 feet 86 feet 194 feet	125 feet 184 feet 272 feet 92 feet 199 feet
4). MD 144 & Eaglehead Drive Eastbound Approach Westbound Approach Northbound Approach Southbound Approach		49 feet 146 feet 81 feet 120 feet	53 feet 152 feet 84 feet 141 feet
5). MD 144 & Yeagertown Road Eastbound Left Southbound Left/Right	250 feet	75 feet 213 feet	80 feet 360 feet
6). MD 144 & Boyers Mill Road Eastbound Left Southbound Left/Right	125 feet	68 feet 104 feet	63 feet 91 feet
Evening Peak Hour	Available Storage	Background Queue	Total Queue
1). Yeagertown Road & Boyers Mill Road Westbound Left/Through Northbound Left/Right		192 feet 539 feet	271 feet 551 feet
2). Yeagertown Road & Site Access Eastbound Left/Right Northbound Left/Through		N/A	43 feet 36 feet
3). MD 144 & Meadow Road Eastbound Left Eastbound Through Westbound Through/Right Southbound Left Southbound Right		386 feet 499 feet 196 feet 162 feet 287 feet	331 feet 445 feet 205 feet 161 feet 286 feet
4). MD 144 & Eaglehead Drive Eastbound Approach Westbound Approach Northbound Approach Southbound Approach		468 feet 185 feet 420 feet 263 feet	500 feet 192 feet 447 feet 269 feet
5). MD 144 & Yeagertown Road Eastbound Left Southbound Left/Right	250 feet	137 feet 444 feet	167 feet 374 feet
6). MD 144 & Boyers Mill Road Eastbound Left Southbound Left/Right	125 feet	125 feet 139 feet	125 feet 147 feet

Note: For approaches with multiple lanes, the longest queue is reported.

Traffic Impact Analysis	Results of SimTraffic 95th Percentile Queuing Analyses	Exhibit 12
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Traffic Impact Analysis	Yeagerstown Road Line Diagram		Exhibit 13
Lenhart Traffic Consulting, Inc. Traffic Engineering & Transportation Planning			

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

Section 5 Conclusions / Recommendations

5.1 Results of Analysis

This Traffic Impact Analysis (TIA) was prepared for the development of the Bell Farm Property located in New Market, Maryland. The Bell Farm Property is proposed to be developed with up to 248 senior multifamily units. Access to the site will be provided with a single full movement access point along Yeagerstown Road.

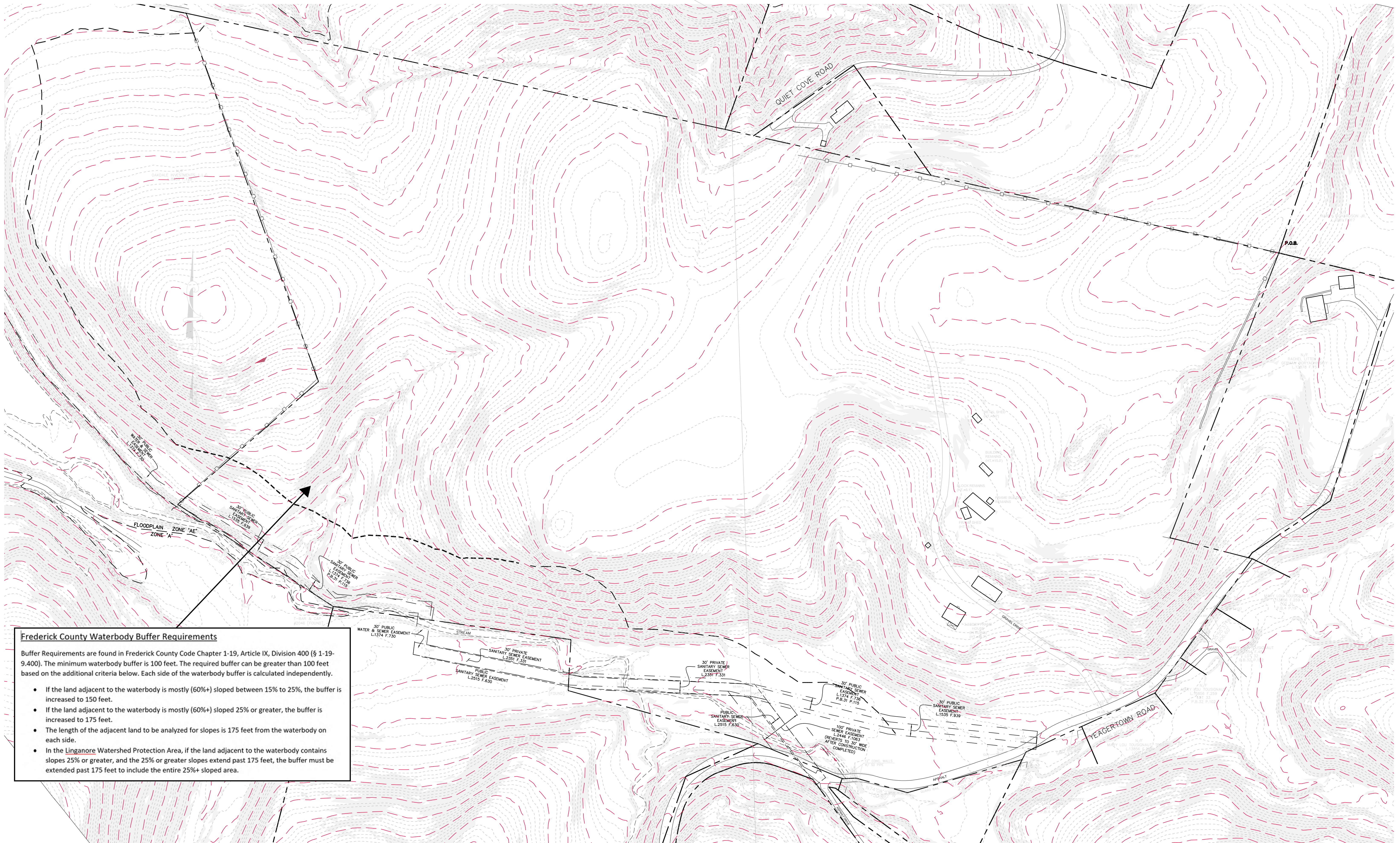
Based on the analyses contained in this report:

- The results of the HCM analyses indicate that each study intersection will operate with LOS “D” or better with the exception of the intersections of Boyers Mill Road & Yeagerstown Road and MD 144 & Yeagerstown Road. However, the proposed development adds fewer than 30 peak hour trips to the stop-controlled movements at these intersections and is therefore considered a negligible impact, satisfying the requirements of the Frederick County APFO.
- The results of the CLV analyses indicate that each study intersection will operate with LOS “D” or better, thereby meeting the TIS requirements of MDOT SHA.
- The intersection of MD 144 & Eaglehead Drive was analyzed using Sidra roundabout software to determine the v/c ratio, as required in the Frederick County APFO. The results indicate that while the roundabout does not operate with an adequate v/c ratio during the evening peak hour, the proposed development has very little impact on the roundabout and mitigation should not be required.
 - The proposed development does not add any traffic volume to the northbound approach, the approach with the greatest v/c ratio. The v/c ratio increases by only 0.01 from background to total conditions.
 - The proposed development increases the volume entering the roundabout by only 0.8% from background to total conditions.
- The results of the 95th percentile queuing analyses indicate that the 95th percentile queues at each of the study intersections will not impact adjacent intersections and that the proposed development has minimal impact on queuing in the road network.

In conclusion, based on the information contained in the report, the site will satisfy Frederick County and MDOT SHA Guidelines and will have minimal impact on the study intersections.

Appendix A

Supplemental Information
Turning Movement Counts



Frederick County
Division of Planning and Permitting
Department of Development Review

**TIA Final Scoping Proposal
Bell Farm Development
(N275774)**

- 1) LOCATION: 6218 Yeagertown Road, South side of Quite Cove Road
- 2) EXISTING USE: Vacant, agricultural
- 3) PROPOSED USE:
 - Up to 260 Senior Adult Housing - Multifamily (ITE LUC 252)
- 4) TRIP REDUCTION: Not Applicable
- 5) CIP/CTP ASSUMED IMPROVEMENTS:
 - Lake Linganore Boulevard from LTC Town Center to Meadow Road interchange
 - Boyers Mill Road Widening from Lake Linganore Bridge to Finn Drive
 - Right turn lane from EB Gas House Pike onto SB Boyers Mill Road
- 6) OTHER IMPROVEMENTS:
 - Traffic Signal at Finn Drive and Boyers Mill Road
 - Double left turn lane NB on Mussetter Road from ONP
 - New Market Bypass from Boyers Mill Road to MD 75
- 7) EXISTING TRAFFIC: Collecting 13-hours turning movement counts on a typical weekday at each of the study intersections to establish current traffic levels. Traffic counts less than two years old may be used or older counts can be factored with 3% annual growth.
- 8) CRASH HISTORY: A summary of historical crash data for the following study intersection:
 - Yeagertown at Boyers Mill Road

Crash data shall be obtained from Maryland State Highway Administration (SHA) records and relevant database. Crash rates shall be calculated and intersections with crash rate higher than or equal to 1 crash/MEV shall be identified as a priority for safety improvement and mitigation.
- 9) BACKGROUND GROWTH & DEVELOPMENT: Approval of adequate public facilities per County guidelines for 260 residential units is 8 years per code section (1-20-8). Assume 1% through traffic growth per year or as otherwise justified based on a review of 10 years of historic growth. The pipeline Development shall be as follows:
 - Eaglehead (Alpine, Hamptons West, Hamptons East, Town Center, Westridge, Woodridge, Eaglestream, Nightingale, Aspen)
 - Oakdale Village – remaining commercial lot (4000 SF daycare)

- Audubon Terrace – 21 TH
- Meadows – 32 DU
- Pinehurst – 157 DU
- Westwinds (Woodlands Preserve) - 73 SFA
- New Market Retail Center - Unbuilt Commercial Retail
- Intercoastal – Revised numbers as used in New Market Retail
- Marley Commons – 11 SFH (likely to be constructed in the next year or two)
- Preston/Mains – 76 SFD & 74 SFA
- 105/113 West Main – 27 TH, 7,375 SF restaurant, 1,540 SF office/professional use
- Calumet - 455 SFHs and 470 TH (start construction next year with a projected build out by 3032)
- Cromwell – 488 age-restricted residential units (pending approval)

Note: Pipeline development may be phased with project phases. Use approved Gordon Mill 2022 TIA for background trip distribution.

10) TRIP GENERATION: Apply 11th edition ITE Trip Generation Manual to proposed uses identified above. The site will generate 52 AM and 65 PM peak hour trips.

11) TRIP DISTRIBUTION:

- I-70 west of Meadow Road – 35%
- MD 144 west of Meadow – 10%
- I-70 east of MD 75 – 20%
- Old National Pike east of MD 75 – 5%
- Boyers Mill Road east of Yeagertown Road – 15%
- Boyers Mill Road west of Yeagertown Road – 15%

12) ANALYSIS: Applying the Highway Capacity Manual 6th edition methodology for the weekday AM and PM peak hour scenarios using Synchro software with providing the developed Synchro reports and models.

- Study intersections:
 - Yeagertown Road & Boyers Mill Road
 - Yeagertown Road & Site Access
 - MD 144 (Old National Pike) & Yeagertown Road
 - MD 144 (Old National Pike) & Eaglehead Drive
 - MD 144 (Old National Pike) & Meadow Road
 - MD 144 (Old National Pike) & Boyers Mills Road
- Queuing Analysis per SHA procedures and supplemented by SimTraffic results.

13) Safety Considerations

- Provide a safety review including but not limited to (grades, roadway section, width, adequacy, traffic barrier, crash analysis)
 - Yeagertown Road from ONP to Boyers Mill Road

- Provide intersection sight distance review for:
 - i. Sight access at Yeagertown Road
 - ii. Yeagertown Road at Boyers Mill Road

*Escrow contributions may extend beyond study area

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Time:	Weekday Morning Peak Hour (6:30 am - 9:30 am)																				Total
	Yeagertown Road Northbound					N/A Southbound					Boyers Mill Road Eastbound					Boyers Mill Road Westbound					
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	
6:30-6:45	0	3		0	0	0				0	0		92	31	0	0	0	13		0	139
6:45-7:00	0	2		0	0	0				0	0		95	39	0	0	0	20		0	156
7:00-7:15	0	8		0	0	0				0	0		98	98	0	0	3	21		0	228
7:15-7:30	0	14		1	0	0				0	0		104	82	0	0	0	30		0	231
7:30-7:45	0	19		1	0	0				0	0		124	39	0	0	3	46		0	232
7:45-8:00	0	15		4	0	0				0	0		123	58	0	0	1	58		0	259
8:00-8:15	0	21		1	0	0				0	0		98	24	0	0	2	44		0	190
8:15-8:30	0	19		4	0	0				0	0		115	44	0	0	1	46		0	229
8:30-8:45	0	19		6	0	0				0	0		122	29	0	0	6	71		0	253
8:45-9:00	0	20		3	0	0				0	0		48	16	0	0	4	65		0	156
9:00-9:15	0	22		3	0	0				0	0		79	25	0	0	2	45		0	176
9:15-9:30	0	10		1	0	0				0	0		61	21	0	0	1	31		0	125

Hourly Totals																					
6:30-7:30	0	27	0	1	0	0	0	0	0	0	0	0	389	250	0	0	3	84	0	0	754
6:45-7:45	0	43	0	2	0	0	0	0	0	0	0	0	421	258	0	0	6	117	0	0	847
7:00-8:00	0	56	0	6	0	0	0	0	0	0	0	0	449	277	0	0	7	155	0	0	950
7:15-8:15	0	69	0	7	0	0	0	0	0	0	0	0	449	203	0	0	6	178	0	0	912
7:30-8:30	0	74	0	10	0	0	0	0	0	0	0	0	460	165	0	0	7	194	0	0	910
7:45-8:45	0	74	0	15	0	0	0	0	0	0	0	0	458	155	0	0	10	219	0	0	931
8:00-9:00	0	79	0	14	0	0	0	0	0	0	0	0	383	113	0	0	13	226	0	0	828
8:15-9:15	0	80	0	16	0	0	0	0	0	0	0	0	364	114	0	0	13	227	0	0	814
8:30-9:30	0	71	0	13	0	0	0	0	0	0	0	0	310	91	0	0	13	212	0	0	710
AM		Northbound				Southbound				Eastbound				Westbound							
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
7:00-8:00	0	56	0	6	0	0	0	0	0	0	0	0	449	277	0	0	7	155	0	0	950

	Weekday Evening Peak Hour (4 pm - 7 pm)																				
	Yeagertown Road Northbound					N/A Southbound					Boyers Mill Road Eastbound					Boyers Mill Road Westbound					
Time:	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
4:00-4:15	0	31		3	0	0				0	0		78	48	0	0	2	108		0	270
4:15-4:30	0	37		5	0	0				0	0		48	41	0	0	2	104		0	237
4:30-4:45	0	35		5	0	0				0	0		66	31	0	0	3	101		0	241
4:45-5:00	0	36		5	0	0				0	0		111	47	0	0	2	97		0	298
5:00-5:15	0	42		1	0	0				0	0		117	43	0	0	2	105		0	310
5:15-5:30	0	36		3	0	0				0	0		103	34	0	0	3	131		0	310
5:30-5:45	0	37		2	0	0				0	0		83	51	0	0	1	116		0	290
5:45-6:00	0	40		2	0	0				0	0		52	34	0	0	1	103		0	232
6:00-6:15	0	37		2	0	1				0	0		57	32	0	0	1	89		0	219
6:15-6:30	0	28		1	0	0				0	0		52	36	0	0	2	69		0	188
6:30-6:45	0	32		3	0	0				0	0		52	38	0	0	2	108		0	235
6:45-7:00	0	34		2	0	0				0	0		50	28	0	0	2	99		0	215

Hourly Totals																								
4:00-5:00	0	139	0	18	0	0	0	0	0	0	0	0	303	167	0	0	9	410	0	0	1046			
4:15-5:15	0	150	0	16	0	0	0	0	0	0	0	0	342	162	0	0	9	407	0	0	1086			
4:30-5:30	0	149	0	14	0	0	0	0	0	0	0	0	397	155	0	0	10	434	0	0	1159			
4:45-5:45	0	151	0	11	0	0	0	0	0	0	0	0	414	175	0	0	8	449	0	0	1208			
5:00-6:00	0	155	0	8	0	0	0	0	0	0	0	0	355	162	0	0	7	455	0	0	1142			
5:15-6:15	0	150	0	9	0	1	0	0	0	0	0	0	295	151	0	0	6	439	0	0	1051			
5:30-6:30	0	142	0	7	0	1	0	0	0	0	0	0	244	153	0	0	5	377	0	0	929			
5:45-6:45	0	137	0	8	0	1	0	0	0	0	0	0	213	140	0	0	6	369	0	0	874			
6:00-7:00	0	131	0	8	0	1	0	0	0	0	0	0	211	134	0	0	7	365	0	0	857			
PM		Northbound				Southbound				Eastbound				Westbound										
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total			
4:45-5:45	0	151	0	11	0	0	0	0	0	0	0	0	414	175	0	0	8	449	0	0	1208			

Peak Hour
Turning Movement Count



Intersection: Boyers Mill Road & Yeagertown Road

Weather: Clear

Count by: CountCAM - DSS

Count Day/Date: Wednesday, September 27, 2023

County: Frederick

	Weekday Morning Peak Hour (6:30 am - 9:30 am)																				
	N/A Northbound					Meadow Road Southbound					MD 144 Eastbound					MD 144 Westbound					
Time:	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
6:30-6:45	0				0	0	8		22	0	0	4	48		0	0		39	60	0	181
6:45-7:00	0				0	0	11		8	0	0	14	82		0	0		40	64	0	219
7:00-7:15	0				0	0	25		19	0	0	13	153		0	0		71	76	0	357
7:15-7:30	0				0	0	19		28	0	0	19	160		0	0		91	131	0	448
7:30-7:45	0				0	0	11		21	0	0	19	96		0	0		67	124	0	338
7:45-8:00	0				0	0	10		26	0	0	33	134		0	0		94	126	0	423
8:00-8:15	0				0	0	13		31	0	0	24	96		0	0		79	116	0	359
8:15-8:30	0				0	0	10		29	0	0	24	116		0	0		54	92	0	325
8:30-8:45	0				0	0	11		31	0	0	29	104		0	0		63	93	0	331
8:45-9:00	0				0	0	15		29	0	0	20	102		0	0		109	103	0	378
9:00-9:15	0				0	0	7		14	0	0	18	92		0	0		81	84	0	296
9:15-9:30	0				0	0	9		18	0	0	13	76		0	0		61	73	0	250

Hourly Totals																					
6:30-7:30	0	0	0	0	0	0	63	0	77	0	0	50	443	0	0	0	0	241	331	0	1205
6:45-7:45	0	0	0	0	0	0	66	0	76	0	0	65	491	0	0	0	0	269	395	0	1362
7:00-8:00	0	0	0	0	0	0	65	0	94	0	0	84	543	0	0	0	0	323	457	0	1566
7:15-8:15	0	0	0	0	0	0	53	0	106	0	0	95	486	0	0	0	0	331	497	0	1568
7:30-8:30	0	0	0	0	0	0	44	0	107	0	0	100	442	0	0	0	0	294	458	0	1445
7:45-8:45	0	0	0	0	0	0	44	0	117	0	0	110	450	0	0	0	0	290	427	0	1438
8:00-9:00	0	0	0	0	0	0	49	0	120	0	0	97	418	0	0	0	0	305	404	0	1393
8:15-9:15	0	0	0	0	0	0	43	0	103	0	0	91	414	0	0	0	0	307	372	0	1330
8:30-9:30	0	0	0	0	0	0	42	0	92	0	0	80	374	0	0	0	0	314	353	0	1255
AM		Northbound				Southbound				Eastbound				Westbound							
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
7:15-8:15	0	0	0	0	0	0	53	0	106	0	0	95	486	0	0	0	0	331	497	0	1568

Time:	Weekday Evening Peak Hour (4 pm - 7 pm)																			Total	
	N/A Northbound					Meadow Road Southbound					MD 144 Eastbound					MD 144 Westbound					
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right		Peds
4:00-4:15	0				0	0	25		49	0	0	27	149		0	0		93	85	0	428
4:15-4:30	0				0	0	22		54	0	0	33	167		0	0		89	118	0	483
4:30-4:45	0				0	0	26		42	0	0	30	174		0	0		85	93	0	450
4:45-5:00	0				0	0	29		56	0	0	27	202		0	0		76	79	0	469
5:00-5:15	0				0	0	30		51	0	0	31	200		0	0		57	89	0	458
5:15-5:30	0				0	0	31		69	0	0	25	213		0	0		56	93	0	487
5:30-5:45	0				0	0	41		43	0	0	20	170		0	0		69	79	0	422
5:45-6:00	0				0	0	27		51	0	0	19	176		0	0		74	94	0	441
6:00-6:15	0				0	1	28		48	0	0	20	143		0	0		59	90	0	389
6:15-6:30	0				0	0	28		46	0	0	11	159		0	0		37	90	0	371
6:30-6:45	0				0	0	22		39	0	0	13	141		0	0		60	97	0	372
6:45-7:00	0				0	0	19		28	0	0	15	123		0	0		82	76	0	343

Hourly Totals																					
4:00-5:00	0	0	0	0	0	0	102	0	201	0	0	117	692	0	0	0	0	343	375	0	1830
4:15-5:15	0	0	0	0	0	0	107	0	203	0	0	121	743	0	0	0	0	307	379	0	1860
4:30-5:30	0	0	0	0	0	0	116	0	218	0	0	113	789	0	0	0	0	274	354	0	1864
4:45-5:45	0	0	0	0	0	0	131	0	219	0	0	103	785	0	0	0	0	258	340	0	1836
5:00-6:00	0	0	0	0	0	0	129	0	214	0	0	95	759	0	0	0	0	256	355	0	1808
5:15-6:15	0	0	0	0	0	1	127	0	211	0	0	84	702	0	0	0	0	258	356	0	1739
5:30-6:30	0	0	0	0	0	1	124	0	188	0	0	70	648	0	0	0	0	239	353	0	1623
5:45-6:45	0	0	0	0	0	1	105	0	184	0	0	63	619	0	0	0	0	230	371	0	1573
6:00-7:00	0	0	0	0	0	1	97	0	161	0	0	59	566	0	0	0	0	238	353	0	1475
PM	Northbound					Southbound					Eastbound					Westbound					
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
4:30-5:30	0	0	0	0	0	0	116	0	218	0	0	113	789	0	0	0	0	274	354	0	1864

Peak Hour
Turning Movement Count



Intersection: MD 144 & Meadow Road

Weather: Clear

Count by: CountCAM - DSS

Count Day/Date: Wednesday, September 27, 2023

County: Frederick

	Weekday Morning Peak Hour (6:30 am - 9:30 am)																				
	Silerside Street Northbound					Eaglehead Road Southbound					MD 144 Eastbound					MD 144 Westbound					
Time:	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
6:30-6:45	0	8	4	3	0	0	13	1	33	0	0	27	17	7	0	0	3	59	4	0	179
6:45-7:00	0	16	6	0	0	0	15	3	21	0	0	46	23	4	0	0	4	56	24	0	218
7:00-7:15	0	6	7	0	0	0	41	12	47	0	0	93	20	10	0	0	4	78	71	0	389
7:15-7:30	0	8	12	0	0	0	56	5	99	0	0	75	56	6	0	0	4	104	69	0	494
7:30-7:45	0	12	0	0	0	0	21	3	46	0	0	15	50	4	0	0	3	127	4	1	285
7:45-8:00	0	14	5	1	0	0	29	5	40	0	0	23	51	9	0	0	3	141	11	0	332
8:00-8:15	0	13	3	1	0	0	26	6	38	0	0	26	59	12	0	0	3	123	10	0	320
8:15-8:30	0	8	2	1	0	0	24	2	38	1	0	27	72	7	0	0	1	89	12	0	283
8:30-8:45	0	6	2	2	0	0	18	3	39	0	0	16	61	7	0	0	1	122	18	0	295
8:45-9:00	0	12	7	5	0	0	26	4	43	1	0	40	57	15	0	0	2	93	18	0	322
9:00-9:15	0	11	3	0	0	0	25	6	28	0	0	53	51	6	0	0	1	81	9	0	274
9:15-9:30	0	13	2	1	0	0	11	4	35	0	0	25	46	11	1	0	3	72	11	3	234

Hourly Totals																										
6:30-7:30	0	38	29	3	0	0	125	21	200	0	0	241	116	27	0	0	15	297	168	0	1280					
6:45-7:45	0	42	25	0	0	0	133	23	213	0	0	229	149	24	0	0	15	365	168	1	1387					
7:00-8:00	0	40	24	1	0	0	147	25	232	0	0	206	177	29	0	0	14	450	155	1	1501					
7:15-8:15	0	47	20	2	0	0	132	19	223	0	0	139	216	31	0	0	13	495	94	1	1432					
7:30-8:30	0	47	10	3	0	0	100	16	162	1	0	91	232	32	0	0	10	480	37	1	1222					
7:45-8:45	0	41	12	5	0	0	97	16	155	1	0	92	243	35	0	0	8	475	51	0	1231					
8:00-9:00	0	39	14	9	0	0	94	15	158	2	0	109	249	41	0	0	7	427	58	0	1222					
8:15-9:15	0	37	14	8	0	0	93	15	148	2	0	136	241	35	0	0	5	385	57	0	1176					
8:30-9:30	0	42	14	8	0	0	80	17	145	1	0	134	215	39	1	0	7	368	56	3	1130					
AM						Northbound					Southbound					Eastbound					Westbound					
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total					
7:00-8:00	0	40	24	1	0	0	147	25	232	0	0	206	177	29	0	0	14	450	155	0	1501					

Time:	Weekday Evening Peak Hour (4 pm - 7 pm)																				Total
	Silerside Street Northbound					Eaglehead Road Southbound					MD 144 Eastbound					MD 144 Westbound					
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	
4:00-4:15	0	8	7	0	0	0	34	5	43	0	0	47	108	9	0	0	0	89	17	0	367
4:15-4:30	0	6	9	1	2	0	39	5	48	0	0	59	107	6	0	0	3	98	22	3	403
4:30-4:45	0	11	8	3	4	0	42	2	49	0	0	65	103	6	0	0	3	78	24	0	394
4:45-5:00	0	10	13	0	0	0	36	6	44	0	0	88	110	3	0	0	2	83	30	2	425
5:00-5:15	0	11	7	3	0	0	41	4	52	0	0	78	125	4	0	0	8	90	32	0	455
5:15-5:30	0	9	11	5	0	0	21	6	34	0	0	75	120	11	0	0	3	97	36	3	428
5:30-5:45	0	9	7	1	0	0	22	4	32	1	0	65	107	6	0	0	4	96	38	2	391
5:45-6:00	0	4	6	1	0	0	34	5	53	0	0	83	101	4	0	0	3	92	31	1	417
6:00-6:15	0	7	8	0	0	1	18	5	55	4	0	70	68	9	0	0	2	80	30	7	353
6:15-6:30	0	8	5	2	0	0	17	2	42	0	0	68	73	6	0	0	4	72	32	7	331
6:30-6:45	0	4	4	0	0	0	39	3	76	0	0	78	92	4	0	0	4	65	29	6	398
6:45-7:00	0	7	9	1	0	0	24	3	58	0	0	57	61	7	0	0	5	58	31	1	321

Hourly Totals																					
4:00-5:00	0	35	37	4	6	0	151	18	184	0	0	259	428	24	0	0	8	348	93	5	1600
4:15-5:15	0	38	37	7	6	0	158	17	193	0	0	290	445	19	0	0	16	349	108	5	1688
4:30-5:30	0	41	39	11	4	0	140	18	179	0	0	306	458	24	0	0	16	348	122	5	1711
4:45-5:45	0	39	38	9	0	0	120	20	162	1	0	306	462	24	0	0	17	366	136	7	1707
5:00-6:00	0	33	31	10	0	0	118	19	171	1	0	301	453	25	0	0	18	375	137	6	1698
5:15-6:15	0	29	32	7	0	1	95	20	174	5	0	293	396	30	0	0	12	365	135	13	1607
5:30-6:30	0	28	26	4	0	1	91	16	182	5	0	286	349	25	0	0	13	340	131	17	1514
5:45-6:45	0	23	23	3	0	1	108	15	226	4	0	299	334	23	0	0	13	309	122	21	1524
6:00-7:00	0	26	26	3	0	1	98	13	231	4	0	273	294	26	0	0	15	275	122	21	1428
PM		Northbound				Southbound					Eastbound					Westbound					
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
4:30-5:30	0	41	39	11	4	0	140	18	179	0	0	306	458	24	0	0	16	348	122	0	1711

Peak Hour
Turning Movement Count



Intersection: MD 144 & Eaglehead Road

Weather: Clear

Count by: CountCAM - DSS

Count Day/Date: Wednesday, September 27, 2023

County: Frederick

	Weekday Morning Peak Hour (6:30 am - 9:30 am)																			Total		
	N/A Northbound					Boyers Mill Road Southbound					MD 144 Eastbound					MD 144 Westbound						
	Time:	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru		Right	Peds
6:30-6:45	0	0	0	0	0	0	0	42	0	53	0	0	12	23	0	0	0	0	26	6	0	162
6:45-7:00	0	0	0	0	0	0	0	60	0	60	0	0	8	18	0	0	0	0	32	5	0	183
7:00-7:15	0	0	1	0	0	0	0	60	0	71	0	0	20	22	0	0	0	0	32	2	0	208
7:15-7:30	0	0	0	0	0	0	0	60	0	62	0	0	27	43	0	0	0	0	46	10	0	248
7:30-7:45	0	0	1	1	0	0	0	61	0	64	0	0	29	43	0	0	0	0	60	22	0	281
7:45-8:00	0	0	0	0	0	0	0	70	0	77	0	0	30	44	0	0	0	0	44	22	0	287
8:00-8:15	0	0	0	0	0	0	0	51	0	67	0	0	23	40	0	0	0	0	53	27	0	261
8:15-8:30	0	0	0	0	0	0	0	46	0	53	0	0	39	38	0	0	0	0	35	22	0	233
8:30-8:45	0	0	0	0	0	0	0	60	0	62	0	0	32	54	0	0	0	0	51	29	0	288
8:45-9:00	0	0	0	0	0	0	0	43	0	53	0	0	31	33	0	0	0	0	43	26	0	229
9:00-9:15	0	0	0	0	0	0	0	27	0	47	0	0	18	38	0	0	0	0	34	14	0	178
9:15-9:30	0	0	0	0	0	0	0	41	0	36	0	0	17	34	0	0	0	0	28	10	0	166

Hourly Totals																					
6:30-7:30	0	0	1	0	0	0	222	0	246	0	0	67	106	0	0	0	0	136	23	0	801
6:45-7:45	0	0	2	1	0	0	241	0	257	0	0	84	126	0	0	0	0	170	39	0	920
7:00-8:00	0	0	2	1	0	0	251	0	274	0	0	106	152	0	0	0	0	182	56	0	1024
7:15-8:15	0	0	1	1	0	0	242	0	270	0	0	109	170	0	0	0	0	203	81	0	1077
7:30-8:30	0	0	1	1	0	0	228	0	261	0	0	121	165	0	0	0	0	192	93	0	1062
7:45-8:45	0	0	0	0	0	0	227	0	259	0	0	124	176	0	0	0	0	183	100	0	1069
8:00-9:00	0	0	0	0	0	0	200	0	235	0	0	125	165	0	0	0	0	182	104	0	1011
8:15-9:15	0	0	0	0	0	0	176	0	215	0	0	120	163	0	0	0	0	163	91	0	928
8:30-9:30	0	0	0	0	0	0	171	0	198	0	0	98	159	0	0	0	0	156	79	0	861
AM		Northbound				Southbound					Eastbound					Westbound					
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
7:15-8:15	0	0	1	1	0	0	242	0	270	0	0	109	170	0	0	0	0	203	81	0	1077

Time:	Weekday Evening Peak Hour (4 pm - 7 pm)																			Total	
	N/A Northbound					Boyers Mill Road Southbound					MD 144 Eastbound					MD 144 Westbound					
	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right		Peds
4:00-4:15	0	0	0	0	0	0	43	0	34	0	0	67	47	0	0	0	0	53	44	0	288
4:15-4:30	0	0	0	0	0	0	35	0	37	0	0	81	75	0	0	0	1	51	49	0	329
4:30-4:45	0	0	0	0	0	0	45	0	41	0	0	44	74	0	0	0	0	73	57	0	334
4:45-5:00	0	0	0	0	0	0	52	0	42	0	0	93	75	0	0	0	0	52	48	0	362
5:00-5:15	0	0	0	0	0	0	53	0	55	0	0	78	94	0	0	0	0	73	53	0	406
5:15-5:30	0	0	0	0	0	0	68	0	45	0	0	81	112	0	0	0	0	70	80	0	456
5:30-5:45	0	0	0	0	0	0	27	0	43	0	0	68	81	0	0	0	0	76	65	0	360
5:45-6:00	0	0	0	0	0	0	37	0	38	0	0	61	69	0	0	0	0	75	54	0	334
6:00-6:15	0	0	0	0	0	1	31	0	42	0	0	49	68	0	0	0	0	45	54	0	290
6:15-6:30	0	0	0	0	0	0	35	0	34	0	0	53	51	0	0	0	0	46	49	0	268
6:30-6:45	0	0	0	0	0	0	38	0	27	0	0	66	54	0	0	0	0	55	63	0	303
6:45-7:00	0	0	0	0	0	0	31	0	32	0	0	56	54	0	0	0	0	54	58	0	285

Hourly Totals																					
4:00-5:00	0	0	0	0	0	0	175	0	154	0	0	285	271	0	0	0	1	229	198	0	1313
4:15-5:15	0	0	0	0	0	0	185	0	175	0	0	296	318	0	0	0	1	249	207	0	1431
4:30-5:30	0	0	0	0	0	0	218	0	183	0	0	296	355	0	0	0	0	268	238	0	1558
4:45-5:45	0	0	0	0	0	0	200	0	185	0	0	320	362	0	0	0	0	271	246	0	1584
5:00-6:00	0	0	0	0	0	0	185	0	181	0	0	288	356	0	0	0	0	294	252	0	1556
5:15-6:15	0	0	0	0	0	1	163	0	168	0	0	259	330	0	0	0	0	266	253	0	1440
5:30-6:30	0	0	0	0	0	1	130	0	157	0	0	231	269	0	0	0	0	242	222	0	1252
5:45-6:45	0	0	0	0	0	1	141	0	141	0	0	229	242	0	0	0	0	221	220	0	1195
6:00-7:00	0	0	0	0	0	1	135	0	135	0	0	224	227	0	0	0	0	200	224	0	1146
PM	Northbound					Southbound					Eastbound					Westbound					
Peak Hour	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	U-Turn	Left	Thru	Right	Peds	Total
4:45-5:45	0	0	0	0	0	0	200	0	185	0	0	320	362	0	0	0	0	271	246	0	1584

Peak Hour
Turning Movement Count



Intersection: MD 144 & Boyers Mill Road

Weather: Clear

Count by: CountCAM - DSS

Count Day/Date: Wednesday, September 27, 2023

County: Frederick

Office of Traffic and Safety Traffic Development & Support Division

Consultant Accident Data/Analysis Request Form

Request Date: December 6, 2023

Note: date set automatically

Location:

County: Frederick
Route: Boyers Mill Road (CO 412)
☒ at Yeagerstown Road (CO 455)
☐ from

Town/Place: New Market
Log Mile: N/A
to

Purpose Needed:

- | | | |
|--|---|---|
| ☐ Signal Study | ☐ Surface Evaluation | ☐ Pavement Marking Study |
| ☐ Sign Study | ☐ Lighting Study | ☒ General Traffic Study |
| ☐ Other (Explain) | | |

Originally Requested By: Mark Mishler (Frederick County)

When Needed: As soon as possible

Work Requested:

- | | | |
|--|---|---|
| ☒ Accident Summary | ☐ Accident History | ☐ Accident Rates |
| ☐ Study Worksheet | ☒ Intersection/Line Diagram | ☐ Other (Explain in Remarks) |
| ☐ One Year | ☐ Two Years | |
| ☒ Three Years | ☐ Combined Years | |
| ☐ Specific Date(s) | to | |

Additional Instructions or Remarks:

Requested by: Robert Engel
Consultant Firm: Lenhart Traffic Consulting
Street Address: 645 B&A Blvd, #214
City: : Severna Park State: MD Zip: 21146

Title: Traffic Engineer
Phone: 410-216-3333
Cell Phone:
Fax: 443-782-2288 Email:
rengel@lenharttraffic.com
Phone:

Consultant Subcontractor:

Please indicate map coordinates of location to be studied.

GIS 39.243329, 77.174568 MD General Hwy. Grid Map C10A

Purpose/Need: Support to Traffic Impact Study being conducted in Frederick County.

Send to: Traffic Development & Support Division,
7491 Connelley Drive Hanover, Maryland 21076
Phone: (410) 787-5844 Fax: (410) 582-9469 Email: wmacleod@sha.state.md.us



Traffic Impact Analysis

Crash Data
Map

**Exhibit
1**

LENHART TRAFFIC CONSULTING, INC.
 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
 SEVERNA PARK, MD 21146
www.lenharttraffic.com



Location: BOYERS MILL RD @ YEAGERSTOWN RD

Logmiles: 1.94 At 0 Radius: 250 ft.

County: Frederick, D7

Period: January 01, 2020 To December 31, 2022

Note:

YEAR >>	2020	2021	2022	Total
Fatal	0	0	0	0
No. Killed	0	0	0	0
Injury	0	0	0	0
No. Injured	0	0	0	0
Prop. Damage	2	0	1	3
Total Crashes	2	0	1	3
Severity Index	2	0	1	Avg 1
Opposite Dir.	0	0	0	0
Rear End	1	0	0	1
Sideswipe	0	0	0	0
Left Turn	0	0	0	0
Angle	0	0	1	1
Pedestrian	0	0	0	0
Parked Veh.	0	0	0	0
Fixed Object	0	0	0	0
Other	1	0	0	1
U-Turn	0	0	0	0
Backing	0	0	0	0
Animal	0	0	0	0
Railroad	0	0	0	0
Fire / Expl.	0	0	0	0
Overturn	0	0	0	0
Truck Related	0	0	0	0
Night Time	1	0	0	1
Wet Surface	1	0	0	1
Alcohol	0	0	0	0
Intersection	2	0	1	3
Total Vehicles	3	0	2	5
Total Trucks	0	0	0	0
Truck %	0.0	0.0	0.0	0.0
Comments:				
40 of 124				

Location: BOYERS MILL RD @ YEAGERSTOWN RD

Logmiles: 1.94 At 0 Radius: 250 ft.

County: Frederick, D7

Period: January 1, 2020 To December 31, 2022

Note:

SEVERITY				FATAL	INJURY	P-DAMAGE				TOTAL				DAY OF THE WEEK									
Accidents					0	3				3				SUN	MON	TUE	WED	THU	FRI	SAT	UNK		
Veh Occ														21									
Pedestrian						AVG Severity Index: 1																	
MONTH OF THE YEAR														CONDITION				DRIVER		PED			
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	Normal:	4									
11														Alcohol:									
														Other:	1								
TIME	12	01	02	03	04	05	06	07	08	09	10	11	UNK	VEHICLES INVOLVED PER ACCIDENT									
AM:														1	2	3	4	5	6+	UNK	TOTAL		
PM:	11													1	2	5							
VEHICLE TYPE						SURFACE		MOVEMENTS															
Motorcycle/Moped		Tractor Trailer				1 Wet		NORTH			SOUTH			EAST			WEST						
4 Passenger Vehicle		Passenger Bus				2 Dry		LF	ST	RT	LF	ST	RT	LF	ST	RT	LF	ST	RT				
1 Sport Utility Veh		School Bus				Sno/Ice		2						1			11						
Pick-Up Truck		Emergency Veh				Mud		OTHER MOVEMENTS															
Trucks (2+3 axles)		1 Other Types				Other																	
PROBABLE CAUSES										COLLISION TYPES				FATAL	INJURY	PROP	TOTAL						
Influence of Drugs						Improper Lane Change				Opposite Dir		Related:											
Influence of Alcohol						Improper Backing						UnRelated:											
Influence of Medication						Improper Passing				Rear End		Related:		1		1							
Influence of Combined Subst.						Improper Signal						UnRelated:											
Physical/Mental Difficulty						Improper Parking				Sideswipe		Related:											
Fell Asleep/Fainted, etc.						Passenger Interfere/Obstruct.						UnRelated:											
2 Fail to give full Attention						Illegally in Roadway				Left Turn		Related:											
Lic. Restr. Non-compliance						Bicycle Violation						UnRelated:											
Fail to Drive in Single Lane						Clothing Not Visible				Angle		Related:		1		1							
Improper Right Turn on Red						Sleet, Hail, Freezing Rain						UnRelated:											
Fail to Yield Right-of-way						Severe Crosswinds				Pedestrian		Related:											
Fail to Obey Stop Sign						Rain, Snow						UnRelated:											
1 Fail to Obey Traffic Signal						Animal				Parked Vehicle		Related:											
Fail to Obey Other Control						Vision Obstruction						UnRelated:											
Fail to Keep Right of Center						Vehicle Defect				Other Collision		Related:		1		1							
Fail to Stop for School Bus						Wet						UnRelated:											
Wrong Way on One Way						Icy or Snow Covered				F	Bridge	01											
Exceeded Speed Limit						Debris or Obstruction				I	Building	02											
Operator Using Cell Phone						Ruts, Holes or Bumps				X	Culvert/Ditch	03											
Stopping in Lane Roadway						Road Under Construction				E	Curb	04											
Too Fast for Conditions						Traffic Control Device Inop.				D	Guardrail/Barrier	05											
Followed too Closely						Shoulders Low, Soft or High					Embankment	06											
Improper Turn						Other or Unknown				O	Fence	07											
										B	Light Pole	08											
										J	Sign Pole	09											
										E	Other Pole	10											
										C	Tree/Shrubbery	11											
										T	Contr. Barrier	12											
										S	Crash Attenuator	13											
											Other Fixed Object												
WEATHER				ILLUMINATION				TOTALS															
2 Clear / Cloudy				2 Day				20-22				3											
Foggy				Dawn/Dusk																			
1 Raining				Dark - Lights On																			
Snow / Sleet				1 Dark - No Lights																			
Other				Other								41 of 124											

Location: BOYERS MILL RD @ YEAGERSTOWN RD

Logmiles: 1.94 At 0 Radius: 250 ft.

County: Frederick, D7

Period: January 01, 2020 To December 31, 2022

Note:

										Movement		
MilePt	Int Rel	Date	Severity	Time	Light	Surface	Alc Rel	FixObj	Collision	V1	V2	Probable Cause
CO412												
1.940	☐	02112020	Property	07A	Day	Wet			RREND	WS	WL	Fail to give full attention
1.940	☐	08032022	Property	05P	Day	Dry			ANGLE	NS	ES	Fail to obey traffic signal
CO455												
0.000	☐	12222020	Property	10P	Night	Dry			OTHER	NS	--	Fail to give full attention



Office of Traffic & Safety
Traffic Development & Support Division
Crash Analysis Safety Team

Location: Boyers Mill Rd @ Yeagerstown Rd
County: FREDERICK
Study Period: 01/01/2020 to 12/31/2022
Analyst: Robert L. Booker, Jr. Date: 12/12/2023



BOYERS MILL RD

(D)
12/22/20-P-10P-D

02/11/20-P-7A-W

08/03/22-P-5P-D

BOYERS MILL RD

YEAGERSTOWN RD

DATE SEVERITY TIME SURFACE
NIGHT
ALCOHOL X
DRUGS X

SEVERITY

F - Fatalities
I - Injured
P - Property Damage
Only

SURFACE

D - Dry Surface
W - Wet Surface
I - Icy Surface
S - Snowy Surface

00 - Not Applicable
01 - Bridge or Overpass
02 - Building
03 - Culvert or Ditch
04 - Curb
05 - Guardrail or Barrier
06 - Embankment
07 - Fence

08 - Light Support Pole
09 - Sign Support Pole
10 - Other Pole
11 - Tree Shrubbery
12 - Construction Barrier
13 - Crash Attenuator
88 - Other
99 - Unknown

B - Bicycle
P - Other Pedalcycle
C - Other Conveyance
T - Railway Train
A - Animal
O - Other Object
S - Spilled Cargo
J - Jackknife

U - Units Separated
N - Other Non collision
D - Off Road
R - Downhill Runaway
F - Explosion or Fire
? - Unknown

template 06-27-06

U - TURN
BACKING
OVERTURN
Parked Vehicle
Pedestrian



Office of Traffic and Safety Traffic Development & Support Division

STATE HIGHWAY ADMINISTRATION

Consultant Accident Data/Analysis Request Form

Request Date: December 6, 2023

Note: date set automatically

Location:

County: Frederick
Route: Yeagerstown Road (CO 455)
☐ at
☒ from Boyers Mill Road (CO 412)

Town/Place: New Market Log
Mile: N/A
to Old National Pike (CO 1317)

Purpose Needed:

- | | | |
|--|---|---|
| ☐ Signal Study | ☐ Surface Evaluation | ☐ Pavement Marking Study |
| ☐ Sign Study | ☐ Lighting Study | ☒ General Traffic Study |
| ☐ Other (Explain) | | |

Originally Requested By: Mark Mishler (Frederick County)

When Needed: As soon as possible

Work Requested:

- | | | |
|--|--|---|
| ☒ Accident Summary | ☐ Accident History | ☐ Accident Rates |
| ☐ Study Worksheet | ☐ Intersection/Line Diagram | ☐ Other (Explain in Remarks) |
| ☐ One Year | ☐ Two Years | |
| ☒ Three Years | ☐ Combined Years | |
| ☐ Specific Date(s) | to | |

Additional Instructions or Remarks:

Requested by: Robert Engel
Consultant Firm: Lenhart Traffic Consulting
Street Address: 645 B&A Blvd, #214
City: : Severna Park State: MD Zip: 21146

Title: Traffic Engineer
Phone: 410-216-3333
Cell Phone:
Fax: 443-782-2288 Email:
rengel@lenharttraffic.com
Phone:

Consultant Subcontractor:

Please indicate map coordinates of location to be studied.

GIS 39.243329, 77.174568

MD General Hwy. Grid Map C10A and C10C

Purpose/Need: Support to Traffic Impact Study being conducted in Frederick County.

Send to: Traffic Development & Support Division,
7491 Connelley Drive Hanover, Maryland 21076
Phone: (410) 787-5844 Fax: (410) 582-9469 Email: wmacleod@sha.state.md.us



Traffic Impact Analysis	Crash Data Map	Exhibit 1
 LENHART TRAFFIC CONSULTING, INC. 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214 SEVERNA PARK, MD 21146 www.lenharttraffic.com		

Location: YEAGERSTOWN~BOYERSMILL~OLDNATIONALPIKE

Logmiles: From 0 To 1.82 Length: 1.82

County: Frederick, D7 Period: January 01, 2020 To December 31, 2022

Note:

YEAR >>	2020	2021	2022	Total
Fatal	0	0	0	0
No. Killed	0	0	0	0
Injury	0	0	1	1
No. Injured	0	0	1	1
Prop. Damage	1	3	2	6
Total Crashes	1	3	3	7
Severity Index	1	3	6	Avg 3
Opposite Dir.	0	0	0	0
Rear End	0	0	0	0
Sideswipe	0	0	0	0
Left Turn	0	0	0	0
Angle	0	0	1	1
Pedestrian	0	0	0	0
Parked Veh.	0	0	0	0
Fixed Object	0	0	0	0
Other	1	3	2	6
U-Turn	0	0	0	0
Backing	0	0	0	0
Animal	0	0	0	0
Railroad	0	0	0	0
Fire / Expl.	0	0	0	0
Overturn	0	1	1	2
Truck Related	0	1	0	1
Night Time	1	0	0	1
Wet Surface	0	0	1	1
Alcohol	0	0	0	0
Intersection	1	0	1	2
Total Vehicles	1	3	4	8
Total Trucks	0	1	0	1
Truck %	0.0	33.3	0.0	12.5
Comments:				
46 of 124				

Location: YEAGERSTOWN~BOYERSMILL-OLDNATIONALPIKE

Logmiles: From 0 To 1.82 Length: 1.82

County: Frederick, D7

Period: January 1, 2020 To December 31, 2022

Note:

SEVERITY												FATAL		INJURY		P-DAMAGE		TOTAL		DAY OF THE WEEK																							
Accidents														1		6		7		SUN		MON		TUE		WED		THU		FRI		SAT		UNK									
Veh Occ														1								1		2		1		2		1													
Pedestrian																																											
MONTH OF THE YEAR																																											
JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP		OCT		NOV		DEC		UNK		CONDITION		DRIVER		PED													
		1				2						1		1				1		1						Normal:		6															
TIME		12		01		02		03		04		05		06		07		08		09		10		11		UNK		VEHICLES INVOLVED PER ACCIDENT															
AM:														3		2						1						1		2		3		4		5		6+		UNK		TOTAL	
PM:																				1								6		1										8			
VEHICLE TYPE												SURFACE				MOVEMENTS																											
Motorcycle/Moped				Tractor Trailer				1 Wet				NORTH				SOUTH				EAST				WEST																			
6 Passenger Vehicle				Passenger Bus				3 Dry				LF		ST		RT		LF		ST		RT		LF		ST		RT		LF		ST		RT									
Sport Utility Veh				School Bus				1 Sno/Ice				1		1		1		1		1		1		1		1		1		1		1											
1 Pick-Up Truck				Emergency Veh				Mud				OTHER MOVEMENTS																5															
1 Trucks (2+3 axles)				6 Other Types				2 Other																																			
PROBABLE CAUSES												COLLISION TYPES										FATAL		INJURY		PROP		TOTAL															
Influence of Drugs				Improper Lane Change				Opposite Dir										Related:																									
Influence of Alcohol				Improper Backing														UnRelated:																									
Influence of Medication				Improper Passing				Rear End										Related:																									
Influence of Combined Subst.				Improper Signal														UnRelated:																									
Physical/Mental Difficulty				Improper Parking				Sideswipe										Related:																									
Fell Asleep/Fainted, etc.				Passenger Interfere/Obstruct.														UnRelated:																									
2 Fail to give full Attention				Illegally in Roadway				Left Turn										Related:																									
Lic. Restr. Non-compliance				Bicycle Violation														UnRelated:																									
1 Fail to Drive in Single Lane				Clothing Not Visible				Angle										Related:				1		1																			
Improper Right Turn on Red				Sleet, Hail, Freezing Rain														UnRelated:																									
1 Fail to Yield Right-of-way				Severe Crosswinds				Pedestrian										Related:																									
Fail to Obey Stop Sign				Rain, Snow														UnRelated:																									
Fail to Obey Traffic Signal				Animal				Parked Vehicle										Related:																									
Fail to Obey Other Control				Vision Obstruction														UnRelated:																									
Fail to Keep Right of Center				Vehicle Defect				Other Collision										Related:				1		1																			
Fail to Stop for School Bus				Wet														UnRelated:				1		4		5																	
Wrong Way on One Way				Icy or Snow Covered				F										Bridge		01																							
Exceeded Speed Limit				Debris or Obstruction				I										Building		02																							
Operator Using Cell Phone				Ruts, Holes or Bumps				X										Culvert/Ditch		03																							
Stopping in Lane Roadway				Road Under Construction				E										Curb		04																							
2 Too Fast for Conditions				Traffic Control Device Inop.				D										Guardrail/Barrier		05																							
Followed too Closely				Shoulders Low, Soft or High														Embankment		06																							
Improper Turn				1 Other or Unknown				O										Fence		07																							
								B										Light Pole		08																							
								J										Sign Pole		09																							
								E										Other Pole		10																							
								C										Tree/Shrubbery		11																							
								T										Contr. Barrier		12																							
								S										Crash Attenuator		13																							
																		Other Fixed Object																									
WEATHER						ILLUMINATION						TOTALS																															
5 Clear / Cloudy						5 Day						20-22						7																									
Foggy						Dawn/Dusk																																					
1 Raining						Dark - Lights On																																					
Snow / Sleet						1 Dark - No Lights																																					
1 Other						1 Other						47 of 124																															

Location: YEAGERSTOWN~BOYERSMILL~OLDNATIONALPIKE

Logmiles: From 0 To 1.82 Length: 1.82

County: Frederick, D7

Period: January 01, 2020 To December 31, 2022

Note:

										Movement		
MilePt	Int Rel	Date	Severity	Time	Light	Surface	Alc Rel	FixObj	Collision	V1	V2	Probable Cause
CO455												
0.000	☐	12222020	Property	10P	Night	Dry			OTHER	NS	--	Fail to give full attention
0.000		11292021	Property	10A	Day	Dry			OTHER	SS	--	Too fast for conditions
0.020		09192022	Property	06A					OTHER	SS	--	Other or Unknown
0.820		02142021	Property	07A	Day	Ice			OTHER	SS	--	Too fast for conditions
1.000		04212021	Property	06A	Day	Dry			OTHER	Nu	--	Fail to give full attention
1.000		08122022	1 Injured	07A	Day				OTHER	SS	--	Fail to drive in single lane
1.820	☐	04062022	Property	06A	Day	Wet			ANGLE	ER	SS	Fail to yield right-of-way

Fixed Object: 01 = Bridge 02 = Building 03 = Culvert/Ditch 04 = Curb 05 = Guardrail/Barrier 06 = Embankment 07 = Fence
08 = Light Pole 09 = Sign Post 10 = Other Pole 11 = Tree/Shrubbery 12 = Construction Barrier 13 = Crash Attenuator



Office of Traffic & Safety
Traffic Development & Support Division
Crash Analysis Safety Team

Location: Yeagerstown Rd ~ Boyers Mill Rd to Old National Pike
County: FREDERICK
Study Period: 01/01/2020 to 12/31/2022
Analyst: Robert L. Booker, Jr. Date: 12/12/2023

LM .00 CO 412 BOYERS MILL RD

LM .00-OFFRD-11/29/2021-P-10A-D

LM .00-OFFRD-12/22/2020-P-10P-D-N

LM .02-OFFRD-09/19/2022-P-6A-U

LM .65 UU STRUC #F0906 STREAM

LM .82-OFFRD-02/14/2021-P-7A-I

LM 1.00-OT-08/12/2022-11-7A-O

LM 1.00-OT-04/21/2021-P-6A-D

LM 1.82 CO 1317 OLD NATIONAL PIKE

LM 1.82-ANG-04/06/2022-P-6A-W



KEY: Log Mile - Collision Type (Fixed Object Struck) - Date - Severity - Time - Surface - Illumination - Alcohol

template 06-27-06

F - Fatalities	SS - Sideswipe	FO - Fixed Object	OFFRD - Off Road	00 - Not Applicable	08 - Light Support Pole	N - Night
I - Injury	PARKD - Parked Vehicle	O OBJ - Other Object	RUNWY - Downhill Runaway	01 - Bridge or Overpass	09 - Sign Support Pole	X - Alcohol
P - Property Damage	PED - Pedestrian	OT - Overturn	FIRE - Explosion Fire	02 - Building	10 - Other Pole	D - Dry Surface
OD - Opposite Direction	BIKE - Bicycle	SPILL - Spilled Cargo	BCKNG - Backing	03 - Culvert or Ditch	11 - Tree Shrubbery	W - Wet Surface
LT - Left Turn	PEDAL - Other Pedalcycle	JCKKNF - Jackknife	UTURN - U-Turn	04 - Curb	12 - Construction Barrier	I - Icy Surface
RE - Rear End	CONVY - Other Conveyance	SPRTD - Units Separated	OTHR - Other	05 - Guardrail or Barrier	13 - Crash Attenuator	S - Snowy Surface
ANG - Angle	ANIML - Animal	NCOLL - Other Non Collision	UNK - Unknown	06 - Embankment	88 - Other	
				07 - Fence	99 - Unknown	

Appendix B

Level of Service (LOS) Worksheets

HCM Unsignalized Intersection Capacity Analysis

1: Yeagertown Road & Boyers Mill Road

Bell Farm Property
AM Existing

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	449	277	7	155	56	6
Future Volume (Veh/h)	449	277	7	155	56	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	488	301	8	168	61	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			789		822	638
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			789		822	638
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		82	99
cM capacity (veh/h)			831		340	476
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	789	176	68			
Volume Left	0	8	61			
Volume Right	301	0	7			
cSH	1700	831	350			
Volume to Capacity	0.46	0.01	0.19			
Queue Length 95th (ft)	0	1	18			
Control Delay (s)	0.0	0.5	17.7			
Lane LOS		A	C			
Approach Delay (s)	0.0	0.5	17.7			
Approach LOS			C			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			50.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: Yeagertown Road & Site Access

Bell Farm Property
AM Existing

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	62	284	0
Future Volume (Veh/h)	0	0	0	62	284	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	67	309	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	376	309	309			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	376	309	309			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	625	731	1252			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	67	309			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1252	1700			
Volume to Capacity	0.00	0.00	0.18			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.0				
Intersection Capacity Utilization		18.3%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

3: MD 144 & Meadow Road

Bell Farm Property
AM Existing



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	95	486	331	497	53	106
Future Volume (vph)	95	486	331	497	53	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	1.00	0.91		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	3221		1770	1583
Flt Permitted	0.22	1.00	1.00		0.95	1.00
Satd. Flow (perm)	409	1863	3221		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	528	360	540	58	115
RTOR Reduction (vph)	0	0	355	0	0	65
Lane Group Flow (vph)	103	528	545	0	58	50
Turn Type	pm+pt	NA	NA		Prot	pt+ov
Protected Phases	7	4	8		6	6 7
Permitted Phases	4					
Actuated Green, G (s)	23.9	23.9	13.7		7.1	17.3
Effective Green, g (s)	23.9	23.9	13.7		7.1	17.3
Actuated g/C Ratio	0.60	0.60	0.34		0.18	0.43
Clearance Time (s)	4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	438	1113	1103		314	684
v/s Ratio Prot	0.03	c0.28	0.17		c0.03	0.03
v/s Ratio Perm	0.11					
v/c Ratio	0.24	0.47	0.49		0.18	0.07
Uniform Delay, d1	4.7	4.5	10.4		14.0	6.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	0.3	0.4		0.3	0.0
Delay (s)	5.0	4.8	10.8		14.3	6.7
Level of Service	A	A	B		B	A
Approach Delay (s)		4.9	10.8		9.2	
Approach LOS		A	B		A	
Intersection Summary						
HCM 2000 Control Delay			8.4		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.48			
Actuated Cycle Length (s)			40.0		Sum of lost time (s)	13.5
Intersection Capacity Utilization			45.8%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis

5: MD 144 & Yeagertown Road

Bell Farm Property
AM Existing



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	86	305	409	7	44	200
Future Volume (Veh/h)	86	305	409	7	44	200
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	93	332	445	8	48	217
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	453				963	445
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	453				963	445
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				82	65
cM capacity (veh/h)	1108				260	613
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	93	332	445	8	265	
Volume Left	93	0	0	0	48	
Volume Right	0	0	0	8	217	
cSH	1108	1700	1700	1700	749	
Volume to Capacity	0.08	0.20	0.26	0.00	0.35	
Queue Length 95th (ft)	7	0	0	0	40	
Control Delay (s)	8.5	0.0	0.0	0.0	15.5	
Lane LOS	A				C	
Approach Delay (s)	1.9		0.0		15.5	
Approach LOS					C	
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			40.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

6: MD 144 & Boyers Mill Road

Bell Farm Property
AM Existing



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	109	170	203	81	242	270
Future Volume (vph)	109	170	203	81	242	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.62	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1155	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	118	185	221	88	263	293
RTOR Reduction (vph)	0	0	0	58	0	176
Lane Group Flow (vph)	118	185	221	30	263	117
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	10.6	10.6	10.6	10.6	11.1	11.1
Effective Green, g (s)	10.6	10.6	10.6	10.6	11.1	11.1
Actuated g/C Ratio	0.35	0.35	0.35	0.35	0.36	0.36
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	398	643	643	546	639	572
v/s Ratio Prot		0.10	c0.12		c0.15	
v/s Ratio Perm	0.10			0.02		0.07
v/c Ratio	0.30	0.29	0.34	0.06	0.41	0.21
Uniform Delay, d1	7.3	7.3	7.5	6.7	7.4	6.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.2	0.3	0.0	0.4	0.2
Delay (s)	7.7	7.6	7.8	6.8	7.8	6.9
Level of Service	A	A	A	A	A	A
Approach Delay (s)		7.6	7.5		7.3	
Approach LOS		A	A		A	

Intersection Summary

HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	30.7	Sum of lost time (s)	9.0
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

1: Yeagertown Road & Boyers Mill Road

Bell Farm Property
AM Background

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	749	311	8	335	67	6
Future Volume (Veh/h)	749	311	8	335	67	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	814	338	9	364	73	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1152		1365	983
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1152		1365	983
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		54	98
cM capacity (veh/h)			606		160	302
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	1152	373	80			
Volume Left	0	9	73			
Volume Right	338	0	7			
cSH	1700	606	167			
Volume to Capacity	0.68	0.01	0.48			
Queue Length 95th (ft)	0	1	57			
Control Delay (s)	0.0	0.5	45.0			
Lane LOS		A	E			
Approach Delay (s)	0.0	0.5	45.0			
Approach LOS			E			
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			69.1%	ICU Level of Service		C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: Yeagertown Road & Site Access

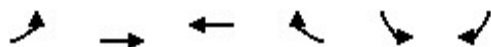
Bell Farm Property
AM Background

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	73	319	0
Future Volume (Veh/h)	0	0	0	73	319	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	79	347	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	426	347	347			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	426	347	347			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	585	696	1212			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	79	347			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1212	1700			
Volume to Capacity	0.00	0.00	0.20			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization		20.1%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

3: MD 144 & Meadow Road

Bell Farm Property
AM Background



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	246	676	419	744	71	321
Future Volume (vph)	246	676	419	744	71	321
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	1.00	0.90		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	3199		1770	1583
Flt Permitted	0.14	1.00	1.00		0.95	1.00
Satd. Flow (perm)	256	1863	3199		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	267	735	455	809	77	349
RTOR Reduction (vph)	0	0	371	0	0	150
Lane Group Flow (vph)	267	735	893	0	77	199
Turn Type	pm+pt	NA	NA		Prot	pt+ov
Protected Phases	7	4	8		6	6 7
Permitted Phases	4					
Actuated Green, G (s)	43.1	43.1	24.6		9.1	27.6
Effective Green, g (s)	43.1	43.1	24.6		9.1	27.6
Actuated g/C Ratio	0.70	0.70	0.40		0.15	0.45
Clearance Time (s)	4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	526	1312	1285		263	713
v/s Ratio Prot	0.12	c0.39	c0.28		0.04	c0.13
v/s Ratio Perm	0.24					
v/c Ratio	0.51	0.56	0.69		0.29	0.28
Uniform Delay, d1	8.7	4.4	15.2		23.2	10.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.8	0.6	1.6		0.6	0.2
Delay (s)	9.5	5.0	16.8		23.8	10.8
Level of Service	A	A	B		C	B
Approach Delay (s)		6.2	16.8		13.1	
Approach LOS		A	B		B	

Intersection Summary

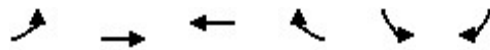
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	61.2	Sum of lost time (s)	13.5
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

5: MD 144 & Yeagertown Road

Bell Farm Property
AM Background



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	114	616	754	8	48	249
Future Volume (Veh/h)	114	616	754	8	48	249
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	124	670	820	9	52	271
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	829				1738	820
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	829				1738	820
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	85				36	28
cM capacity (veh/h)	803				81	375
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	124	670	820	9	323	
Volume Left	124	0	0	0	52	
Volume Right	0	0	0	9	271	
cSH	803	1700	1700	1700	377	
Volume to Capacity	0.15	0.39	0.48	0.01	0.86	
Queue Length 95th (ft)	14	0	0	0	204	
Control Delay (s)	10.3	0.0	0.0	0.0	51.1	
Lane LOS	B				F	
Approach Delay (s)	1.6		0.0		51.1	
Approach LOS					F	
Intersection Summary						
Average Delay			9.1			
Intersection Capacity Utilization			61.8%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

6: MD 144 & Boyers Mill Road

Bell Farm Property
AM Background



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	68	348	305	52	154	194
Future Volume (vph)	68	348	305	52	154	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.56	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1044	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	378	332	57	167	211
RTOR Reduction (vph)	0	0	0	35	0	142
Lane Group Flow (vph)	74	378	332	22	167	69
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	12.5	12.5	12.5	12.5	10.4	10.4
Effective Green, g (s)	12.5	12.5	12.5	12.5	10.4	10.4
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.33	0.33
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	409	730	730	620	577	516
v/s Ratio Prot		c0.20	0.18		c0.09	
v/s Ratio Perm	0.07			0.01		0.04
v/c Ratio	0.18	0.52	0.45	0.04	0.29	0.13
Uniform Delay, d1	6.3	7.4	7.2	6.0	8.0	7.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.6	0.5	0.0	0.3	0.1
Delay (s)	6.6	8.0	7.6	6.0	8.3	7.7
Level of Service	A	A	A	A	A	A
Approach Delay (s)		7.8	7.4		8.0	
Approach LOS		A	A		A	
Intersection Summary						
HCM 2000 Control Delay			7.7		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.41			
Actuated Cycle Length (s)			31.9		Sum of lost time (s)	9.0
Intersection Capacity Utilization			44.2%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

1: Yeagertown Road & Boyers Mill Road

Bell Farm Property
AM Total

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	749	314	11	335	72	11
Future Volume (Veh/h)	749	314	11	335	72	11
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	814	341	12	364	78	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1155		1372	984
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1155		1372	984
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		50	96
cM capacity (veh/h)			605		158	301
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	1155	376	90			
Volume Left	0	12	78			
Volume Right	341	0	12			
cSH	1700	605	168			
Volume to Capacity	0.68	0.02	0.53			
Queue Length 95th (ft)	0	2	68			
Control Delay (s)	0.0	0.6	48.6			
Lane LOS		A	E			
Approach Delay (s)	0.0	0.6	48.6			
Approach LOS			E			
Intersection Summary						
Average Delay		2.8				
Intersection Capacity Utilization		69.9%	ICU Level of Service		C	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

2: Yeagertown Road & Site Access

Bell Farm Property
AM Total

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	23	11	73	319	6
Future Volume (Veh/h)	10	23	11	73	319	6
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	25	12	79	347	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	454	350	354			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	454	350	354			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	96	99			
cM capacity (veh/h)	559	693	1205			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	36	91	354			
Volume Left	11	12	0			
Volume Right	25	0	7			
cSH	646	1205	1700			
Volume to Capacity	0.06	0.01	0.21			
Queue Length 95th (ft)	4	1	0			
Control Delay (s)	10.9	1.1	0.0			
Lane LOS	B	A				
Approach Delay (s)	10.9	1.1	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			27.2%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

3: MD 144 & Meadow Road

Bell Farm Property
AM Total



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	246	678	422	756	76	321
Future Volume (vph)	246	678	422	756	76	321
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	1.00	0.90		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	3199		1770	1583
Flt Permitted	0.14	1.00	1.00		0.95	1.00
Satd. Flow (perm)	253	1863	3199		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	267	737	459	822	83	349
RTOR Reduction (vph)	0	0	376	0	0	148
Lane Group Flow (vph)	267	737	905	0	83	201
Turn Type	pm+pt	NA	NA		Prot	pt+ov
Protected Phases	7	4	8		6	6 7
Permitted Phases	4					
Actuated Green, G (s)	43.4	43.4	24.9		9.3	27.8
Effective Green, g (s)	43.4	43.4	24.9		9.3	27.8
Actuated g/C Ratio	0.70	0.70	0.40		0.15	0.45
Clearance Time (s)	4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	522	1310	1291		266	713
v/s Ratio Prot	0.12	c0.40	c0.28		0.05	c0.13
v/s Ratio Perm	0.24					
v/c Ratio	0.51	0.56	0.70		0.31	0.28
Uniform Delay, d1	9.1	4.5	15.3		23.3	10.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.8	0.6	1.7		0.7	0.2
Delay (s)	9.9	5.0	17.0		24.0	10.9
Level of Service	A	A	B		C	B
Approach Delay (s)		6.3	17.0		13.4	
Approach LOS		A	B		B	

Intersection Summary

HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	61.7	Sum of lost time (s)	13.5
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

5: MD 144 & Yeagertown Road

Bell Farm Property
AM Total

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	121	616	754	12	56	264
Future Volume (Veh/h)	121	616	754	12	56	264
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	132	670	820	13	61	287
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	833				1754	820
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	833				1754	820
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	83				22	23
cM capacity (veh/h)	800				78	375
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	132	670	820	13	348	
Volume Left	132	0	0	0	61	
Volume Right	0	0	0	13	287	
cSH	800	1700	1700	1700	373	
Volume to Capacity	0.17	0.39	0.48	0.01	0.93	
Queue Length 95th (ft)	15	0	0	0	250	
Control Delay (s)	10.4	0.0	0.0	0.0	65.2	
Lane LOS	B				F	
Approach Delay (s)	1.7		0.0		65.2	
Approach LOS					F	
Intersection Summary						
Average Delay			12.1			
Intersection Capacity Utilization			62.7%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

6: MD 144 & Boyers Mill Road

Bell Farm Property
AM Total



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	68	356	309	52	154	194
Future Volume (vph)	68	356	309	52	154	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.56	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1040	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	387	336	57	167	211
RTOR Reduction (vph)	0	0	0	35	0	142
Lane Group Flow (vph)	74	387	336	22	167	69
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	12.7	12.7	12.7	12.7	10.5	10.5
Effective Green, g (s)	12.7	12.7	12.7	12.7	10.5	10.5
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.33	0.33
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	410	734	734	624	577	516
v/s Ratio Prot		c0.21	0.18		c0.09	
v/s Ratio Perm	0.07			0.01		0.04
v/c Ratio	0.18	0.53	0.46	0.04	0.29	0.13
Uniform Delay, d1	6.4	7.5	7.2	6.0	8.1	7.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.7	0.5	0.0	0.3	0.1
Delay (s)	6.6	8.1	7.7	6.0	8.4	7.8
Level of Service	A	A	A	A	A	A
Approach Delay (s)		7.9	7.4		8.0	
Approach LOS		A	A		A	
Intersection Summary						
HCM 2000 Control Delay			7.8		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.42			
Actuated Cycle Length (s)			32.2		Sum of lost time (s)	9.0
Intersection Capacity Utilization			44.4%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Bell Farm Property
PM Existing

Synchro 11 Report
Page 1

HCM Unsignalized Intersection Capacity Analysis

2: Yeagertown Road & Site Access

Bell Farm Property
PM Existing

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	162	183	0
Future Volume (Veh/h)	0	0	0	162	183	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	176	199	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	375	199	199			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	375	199	199			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	626	842	1373			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	176	199			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1373	1700			
Volume to Capacity	0.06	0.00	0.12			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.0				
Intersection Capacity Utilization		13.0%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

3: MD 144 & Meadow Road

Bell Farm Property
PM Existing



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	113	789	274	354	116	218
Future Volume (vph)	113	789	274	354	116	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	1.00	0.92		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	3240		1770	1583
Flt Permitted	0.25	1.00	1.00		0.95	1.00
Satd. Flow (perm)	460	1863	3240		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	858	298	385	126	237
RTOR Reduction (vph)	0	0	252	0	0	127
Lane Group Flow (vph)	123	858	431	0	126	110
Turn Type	pm+pt	NA	NA		Prot	pt+ov
Protected Phases	7	4	8		6	6 7
Permitted Phases	4					
Actuated Green, G (s)	28.8	28.8	16.4		9.6	22.0
Effective Green, g (s)	28.8	28.8	16.4		9.6	22.0
Actuated g/C Ratio	0.61	0.61	0.35		0.20	0.46
Clearance Time (s)	4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	497	1131	1121		358	734
v/s Ratio Prot	0.04	c0.46	0.13		c0.07	0.07
v/s Ratio Perm	0.11					
v/c Ratio	0.25	0.76	0.38		0.35	0.15
Uniform Delay, d1	4.7	6.8	11.7		16.2	7.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	3.0	0.2		0.6	0.1
Delay (s)	4.9	9.7	11.9		16.8	7.4
Level of Service	A	A	B		B	A
Approach Delay (s)		9.1	11.9		10.7	
Approach LOS		A	B		B	
Intersection Summary						
HCM 2000 Control Delay			10.3		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.74			
Actuated Cycle Length (s)			47.4		Sum of lost time (s)	13.5
Intersection Capacity Utilization			55.5%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis

5: MD 144 & Yeagertown Road

Bell Farm Property
PM Existing



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	165	463	411	24	35	132
Future Volume (Veh/h)	165	463	411	24	35	132
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	179	503	447	26	38	143
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	473				1308	447
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	473				1308	447
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				74	77
cM capacity (veh/h)	1089				147	612
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	179	503	447	26	181	
Volume Left	179	0	0	0	38	
Volume Right	0	0	0	26	143	
cSH	1089	1700	1700	1700	700	
Volume to Capacity	0.16	0.30	0.26	0.02	0.26	
Queue Length 95th (ft)	15	0	0	0	26	
Control Delay (s)	9.0	0.0	0.0	0.0	18.0	
Lane LOS	A				C	
Approach Delay (s)	2.4		0.0		18.0	
Approach LOS					C	
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization			44.1%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

6: MD 144 & Boyers Mill Road

Bell Farm Property
PM Existing

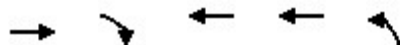


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	320	362	271	246	200	185
Future Volume (vph)	320	362	271	246	200	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.58	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1080	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	348	393	295	267	217	201
RTOR Reduction (vph)	0	0	0	134	0	124
Lane Group Flow (vph)	348	393	295	133	217	77
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	21.6	21.6	21.6	21.6	12.7	12.7
Effective Green, g (s)	21.6	21.6	21.6	21.6	12.7	12.7
Actuated g/C Ratio	0.50	0.50	0.50	0.50	0.29	0.29
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	538	929	929	789	519	464
v/s Ratio Prot		0.21	0.16		c0.12	
v/s Ratio Perm	c0.32			0.08		0.05
v/c Ratio	0.65	0.42	0.32	0.17	0.42	0.17
Uniform Delay, d1	8.0	6.9	6.5	5.9	12.3	11.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	0.3	0.2	0.1	0.5	0.2
Delay (s)	10.7	7.2	6.7	6.0	12.9	11.5
Level of Service	B	A	A	A	B	B
Approach Delay (s)		8.8	6.4		12.2	
Approach LOS		A	A		B	
Intersection Summary						
HCM 2000 Control Delay			8.9		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.56			
Actuated Cycle Length (s)			43.3		Sum of lost time (s)	9.0
Intersection Capacity Utilization			54.3%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis

1: Yeagertown Road & Boyers Mill Road

Bell Farm Property
PM Background



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	729	209	9	817	187	12
Future Volume (Veh/h)	729	209	9	817	187	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	792	227	10	888	203	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume				1019	1814	906
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				1019	1814	906
tC, single (s)				4.1	6.4	6.2
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				99	0	96
cM capacity (veh/h)				681	85	335
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	1019	898	216			
Volume Left	0	10	203			
Volume Right	227	0	13			
cSH	1700	681	89			
Volume to Capacity	0.60	0.01	2.43			
Queue Length 95th (ft)	0	1	499			
Control Delay (s)	0.0	0.4	752.9			
Lane LOS		A	F			
Approach Delay (s)	0.0	0.4	752.9			
Approach LOS			F			
Intersection Summary						
Average Delay			76.4			
Intersection Capacity Utilization			68.8%		ICU Level of Service	
Analysis Period (min)			15		C	

HCM Unsignalized Intersection Capacity Analysis

2: Yeagertown Road & Site Access

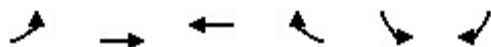
Bell Farm Property
PM Background

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	198	218	0
Future Volume (Veh/h)	0	0	0	198	218	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	215	237	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	452	237	237			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	452	237	237			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	565	802	1330			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	215	237			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1330	1700			
Volume to Capacity	0.06	0.00	0.14			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization		14.8%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

3: MD 144 & Meadow Road

Bell Farm Property
PM Background



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	433	1169	322	636	164	442
Future Volume (vph)	433	1169	322	636	164	442
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	1.00	0.90		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	3187		1770	1583
Flt Permitted	0.13	1.00	1.00		0.95	1.00
Satd. Flow (perm)	243	1863	3187		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	471	1271	350	691	178	480
RTOR Reduction (vph)	0	0	298	0	0	203
Lane Group Flow (vph)	471	1271	743	0	178	277
Turn Type	pm+pt	NA	NA		Prot	pt+ov
Protected Phases	7	4	8		6	6 7
Permitted Phases	4					
Actuated Green, G (s)	58.6	58.6	33.9		12.4	37.1
Effective Green, g (s)	58.6	58.6	33.9		12.4	37.1
Actuated g/C Ratio	0.73	0.73	0.42		0.16	0.46
Clearance Time (s)	4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	563	1364	1350		274	734
v/s Ratio Prot	0.21	c0.68	0.23		c0.10	0.17
v/s Ratio Perm	0.40					
v/c Ratio	0.84	0.93	0.55		0.65	0.38
Uniform Delay, d1	18.4	9.0	17.3		31.8	13.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	10.4	11.6	0.5		5.2	0.3
Delay (s)	28.8	20.6	17.8		37.0	14.3
Level of Service	C	C	B		D	B
Approach Delay (s)		22.9	17.8		20.4	
Approach LOS		C	B		C	
Intersection Summary						
HCM 2000 Control Delay			20.9		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.94			
Actuated Cycle Length (s)			80.0		Sum of lost time (s)	13.5
Intersection Capacity Utilization			78.1%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis

5: MD 144 & Yeagertown Road

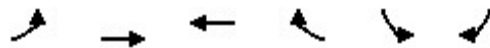
Bell Farm Property
PM Background

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	230	992	794	26	38	193
Future Volume (Veh/h)	230	992	794	26	38	193
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	250	1078	863	28	41	210
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	891				2441	863
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	891				2441	863
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	67				0	41
cM capacity (veh/h)	761				23	354
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	250	1078	863	28	251	
Volume Left	250	0	0	0	41	
Volume Right	0	0	0	28	210	
cSH	761	1700	1700	1700	114	
Volume to Capacity	0.33	0.63	0.51	0.02	2.19	
Queue Length 95th (ft)	36	0	0	0	537	
Control Delay (s)	12.0	0.0	0.0	0.0	626.7	
Lane LOS	B				F	
Approach Delay (s)	2.3		0.0		626.7	
Approach LOS					F	
Intersection Summary						
Average Delay			64.9			
Intersection Capacity Utilization			67.9%		ICU Level of Service	C
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

6: MD 144 & Boyers Mill Road

Bell Farm Property
PM Background



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	220	519	471	148	149	102
Future Volume (vph)	220	519	471	148	149	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.41	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	755	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	239	564	512	161	162	111
RTOR Reduction (vph)	0	0	0	74	0	83
Lane Group Flow (vph)	239	564	512	87	162	28
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	23.6	23.6	23.6	23.6	11.0	11.0
Effective Green, g (s)	23.6	23.6	23.6	23.6	11.0	11.0
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.25	0.25
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	408	1008	1008	856	446	399
v/s Ratio Prot		0.30	0.27		c0.09	
v/s Ratio Perm	c0.32			0.06		0.02
v/c Ratio	0.59	0.56	0.51	0.10	0.36	0.07
Uniform Delay, d1	6.7	6.6	6.3	4.9	13.4	12.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.7	0.4	0.1	0.5	0.1
Delay (s)	8.9	7.3	6.7	4.9	13.9	12.5
Level of Service	A	A	A	A	B	B
Approach Delay (s)		7.7	6.3		13.3	
Approach LOS		A	A		B	
Intersection Summary						
HCM 2000 Control Delay			8.1		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.51			
Actuated Cycle Length (s)			43.6		Sum of lost time (s)	9.0
Intersection Capacity Utilization			61.0%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis

1: Yeagertown Road & Boyers Mill Road

Bell Farm Property
PM Total

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	729	214	14	817	191	16
Future Volume (Veh/h)	729	214	14	817	191	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	792	233	15	888	208	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1025		1826	908
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1025		1826	908
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		0	95
cM capacity (veh/h)			677		83	333
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	1025	903	225			
Volume Left	0	15	208			
Volume Right	233	0	17			
cSH	1700	677	88			
Volume to Capacity	0.60	0.02	2.57			
Queue Length 95th (ft)	0	2	529			
Control Delay (s)	0.0	0.6	813.9			
Lane LOS		A	F			
Approach Delay (s)	0.0	0.6	813.9			
Approach LOS			F			
Intersection Summary						
Average Delay		85.3				
Intersection Capacity Utilization		72.4%		ICU Level of Service		C
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

2: Yeagertown Road & Site Access

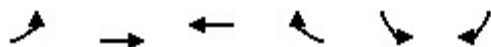
Bell Farm Property
PM Total

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	19	25	198	218	10
Future Volume (Veh/h)	8	19	25	198	218	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	21	27	215	237	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	512	242	248			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	512	242	248			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	97	98			
cM capacity (veh/h)	512	796	1318			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	30	242	248			
Volume Left	9	27	0			
Volume Right	21	0	11			
cSH	682	1318	1700			
Volume to Capacity	0.04	0.02	0.15			
Queue Length 95th (ft)	3	2	0			
Control Delay (s)	10.5	1.0	0.0			
Lane LOS	B	A				
Approach Delay (s)	10.5	1.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			37.2%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

3: MD 144 & Meadow Road

Bell Farm Property
PM Total



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	433	1173	325	645	176	442
Future Volume (vph)	433	1173	325	645	176	442
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	1.00	0.90		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	3186		1770	1583
Flt Permitted	0.13	1.00	1.00		0.95	1.00
Satd. Flow (perm)	237	1863	3186		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	471	1275	353	701	191	480
RTOR Reduction (vph)	0	0	297	0	0	202
Lane Group Flow (vph)	471	1275	757	0	191	278
Turn Type	pm+pt	NA	NA		Prot	pt+ov
Protected Phases	7	4	8		6	6 7
Permitted Phases	4					
Actuated Green, G (s)	59.2	59.2	34.4		12.7	37.5
Effective Green, g (s)	59.2	59.2	34.4		12.7	37.5
Actuated g/C Ratio	0.73	0.73	0.43		0.16	0.46
Clearance Time (s)	4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	558	1363	1354		277	733
v/s Ratio Prot	0.21	c0.68	0.24		c0.11	0.18
v/s Ratio Perm	0.41					
v/c Ratio	0.84	0.94	0.56		0.69	0.38
Uniform Delay, d1	19.0	9.2	17.5		32.2	14.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	11.2	12.0	0.5		7.0	0.3
Delay (s)	30.2	21.2	18.0		39.2	14.5
Level of Service	C	C	B		D	B
Approach Delay (s)		23.7	18.0		21.5	
Approach LOS		C	B		C	
Intersection Summary						
HCM 2000 Control Delay			21.5		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.95			
Actuated Cycle Length (s)			80.9		Sum of lost time (s)	13.5
Intersection Capacity Utilization			79.0%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis

5: MD 144 & Yeagertown Road

Bell Farm Property
PM Total

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	246	992	794	35	45	205
Future Volume (Veh/h)	246	992	794	35	45	205
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	267	1078	863	38	49	223
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	901				2475	863
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	901				2475	863
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	65				0	37
cM capacity (veh/h)	754				21	354
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	267	1078	863	38	272	
Volume Left	267	0	0	0	49	
Volume Right	0	0	0	38	223	
cSH	754	1700	1700	1700	96	
Volume to Capacity	0.35	0.63	0.51	0.02	2.82	
Queue Length 95th (ft)	40	0	0	0	648	
Control Delay (s)	12.4	0.0	0.0	0.0	917.9	
Lane LOS	B				F	
Approach Delay (s)	2.5		0.0		917.9	
Approach LOS					F	
Intersection Summary						
Average Delay			100.5			
Intersection Capacity Utilization			68.8%		ICU Level of Service	C
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

6: MD 144 & Boyers Mill Road

Bell Farm Property
PM Total



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	220	526	480	148	149	102
Future Volume (vph)	220	526	480	148	149	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.40	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	739	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	239	572	522	161	162	111
RTOR Reduction (vph)	0	0	0	73	0	83
Lane Group Flow (vph)	239	572	522	88	162	28
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	24.5	24.5	24.5	24.5	11.4	11.4
Effective Green, g (s)	24.5	24.5	24.5	24.5	11.4	11.4
Actuated g/C Ratio	0.55	0.55	0.55	0.55	0.25	0.25
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	403	1016	1016	863	449	401
v/s Ratio Prot		0.31	0.28		c0.09	
v/s Ratio Perm	c0.32			0.06		0.02
v/c Ratio	0.59	0.56	0.51	0.10	0.36	0.07
Uniform Delay, d1	6.9	6.7	6.4	4.9	13.8	12.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.7	0.4	0.1	0.5	0.1
Delay (s)	9.2	7.4	6.9	5.0	14.3	12.8
Level of Service	A	A	A	A	B	B
Approach Delay (s)		7.9	6.4		13.7	
Approach LOS		A	A		B	
Intersection Summary						
HCM 2000 Control Delay			8.2		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.52			
Actuated Cycle Length (s)			44.9		Sum of lost time (s)	9.0
Intersection Capacity Utilization			61.5%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

MOVEMENT SUMMARY

 **Site: 4 [MD 144 & Eaglehead Drive]**

Bell Farm Property
Site Category: AM Existing
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Stickleback Street												
3	L2	43	3.0	0.085	5.1	LOS A	0.3	7.6	0.50	0.44	0.50	33.6
8	T1	26	3.0	0.085	5.1	LOS A	0.3	7.6	0.50	0.44	0.50	33.5
18	R2	1	3.0	0.085	5.1	LOS A	0.3	7.6	0.50	0.44	0.50	32.5
Approach		71	3.0	0.085	5.1	LOS A	0.3	7.6	0.50	0.44	0.50	33.5
East: MD 144												
1	L2	15	3.0	0.327	7.0	LOS A	1.5	38.4	0.47	0.38	0.47	34.2
6	T1	489	3.0	0.327	6.9	LOS A	1.5	38.4	0.47	0.37	0.47	34.2
16	R2	168	3.0	0.327	6.6	LOS A	1.5	37.8	0.45	0.36	0.45	33.3
Approach		673	3.0	0.327	6.8	LOS A	1.5	38.4	0.46	0.37	0.46	33.9
North: Eaglehead Drive												
7	L2	160	3.0	0.240	7.3	LOS A	0.9	24.2	0.56	0.55	0.56	32.0
4	T1	27	3.0	0.240	7.3	LOS A	0.9	24.2	0.56	0.55	0.56	31.9
14	R2	252	3.0	0.295	7.5	LOS A	1.2	30.6	0.56	0.55	0.56	32.8
Approach		439	3.0	0.295	7.4	LOS A	1.2	30.6	0.56	0.55	0.56	32.4
West: MD 144												
5	L2	224	3.0	0.207	5.2	LOS A	0.9	22.4	0.35	0.24	0.35	32.5
2	T1	192	3.0	0.194	4.8	LOS A	0.8	20.3	0.33	0.22	0.33	35.4
12	R2	32	3.0	0.194	4.8	LOS A	0.8	20.3	0.33	0.22	0.33	34.2
Approach		448	3.0	0.207	5.0	LOS A	0.9	22.4	0.34	0.23	0.34	33.8
All Vehicles		1630	3.0	0.327	6.4	LOS A	1.5	38.4	0.46	0.38	0.46	33.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 4 [MD 144 & Eaglehead Drive]

Bell Farm Property
Site Category: AM Background
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Stickleback Street												
3	L2	183	3.0	0.518	12.9	LOS B	3.1	80.5	0.71	0.85	1.12	30.4
8	T1	104	3.0	0.518	12.9	LOS B	3.1	80.5	0.71	0.85	1.12	30.3
18	R2	84	3.0	0.518	12.9	LOS B	3.1	80.5	0.71	0.85	1.12	29.5
Approach		371	3.0	0.518	12.9	LOS B	3.1	80.5	0.71	0.85	1.12	30.2
East: MD 144												
1	L2	75	3.0	0.624	14.8	LOS B	5.6	143.3	0.75	0.95	1.30	30.4
6	T1	667	3.0	0.624	14.4	LOS B	5.7	146.1	0.74	0.95	1.29	30.5
16	R2	301	3.0	0.624	13.8	LOS B	5.7	146.1	0.73	0.93	1.27	30.1
Approach		1043	3.0	0.624	14.3	LOS B	5.7	146.1	0.74	0.94	1.29	30.4
North: Eaglehead Drive												
7	L2	288	3.0	0.659	19.8	LOS C	4.7	120.1	0.80	1.03	1.56	27.5
4	T1	116	3.0	0.659	19.8	LOS C	4.7	120.1	0.80	1.03	1.56	27.5
14	R2	312	3.0	0.572	17.9	LOS C	3.4	86.5	0.77	0.93	1.32	28.4
Approach		716	3.0	0.659	19.0	LOS C	4.7	120.1	0.78	0.99	1.46	27.9
West: MD 144												
5	L2	235	3.0	0.391	9.0	LOS A	1.9	48.5	0.60	0.61	0.66	31.5
2	T1	227	3.0	0.391	8.7	LOS A	1.9	48.5	0.59	0.59	0.63	32.6
12	R2	218	3.0	0.391	8.5	LOS A	1.8	47.1	0.58	0.57	0.62	32.4
Approach		680	3.0	0.391	8.7	LOS A	1.9	48.5	0.59	0.59	0.64	32.1
All Vehicles		2811	3.0	0.659	14.0	LOS B	5.7	146.1	0.71	0.86	1.15	30.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Background.sip8

MOVEMENT SUMMARY

 **Site: 4 [MD 144 & Eaglehead Drive]**

Bell Farm Property
Site Category: AM Total
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Stickleback Street												
3	L2	183	3.0	0.533	13.6	LOS B	3.3	83.6	0.73	0.87	1.17	30.1
8	T1	104	3.0	0.533	13.6	LOS B	3.3	83.6	0.73	0.87	1.17	30.1
18	R2	84	3.0	0.533	13.6	LOS B	3.3	83.6	0.73	0.87	1.17	29.3
Approach		371	3.0	0.533	13.6	LOS B	3.3	83.6	0.73	0.87	1.17	29.9
East: MD 144												
1	L2	75	3.0	0.634	15.1	LOS C	5.8	149.3	0.76	0.97	1.34	30.3
6	T1	684	3.0	0.634	14.8	LOS B	6.0	152.4	0.75	0.96	1.33	30.4
16	R2	301	3.0	0.634	14.1	LOS B	6.0	152.4	0.74	0.95	1.31	29.9
Approach		1060	3.0	0.634	14.6	LOS B	6.0	152.4	0.75	0.96	1.32	30.3
North: Eaglehead Drive												
7	L2	312	3.0	0.708	22.6	LOS C	5.5	141.4	0.82	1.10	1.74	26.6
4	T1	116	3.0	0.708	22.6	LOS C	5.5	141.4	0.82	1.10	1.74	26.6
14	R2	288	3.0	0.536	16.9	LOS C	3.0	75.9	0.76	0.90	1.24	28.8
Approach		716	3.0	0.708	20.3	LOS C	5.5	141.4	0.79	1.02	1.54	27.4
West: MD 144												
5	L2	235	3.0	0.405	9.4	LOS A	2.1	52.5	0.62	0.65	0.72	31.4
2	T1	235	3.0	0.405	9.1	LOS A	2.1	52.5	0.60	0.63	0.69	32.4
12	R2	218	3.0	0.405	8.8	LOS A	2.0	51.4	0.60	0.62	0.68	32.2
Approach		688	3.0	0.405	9.1	LOS A	2.1	52.5	0.60	0.63	0.70	32.0
All Vehicles		2835	3.0	0.708	14.6	LOS B	6.0	152.4	0.72	0.88	1.20	29.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 **Site: 4 [MD 144 & Eaglehead Drive]**

Bell Farm Property
Site Category: PM Existing
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Stickleback Street												
3	L2	45	3.0	0.170	8.3	LOS A	0.6	14.8	0.63	0.63	0.63	32.5
8	T1	42	3.0	0.170	8.3	LOS A	0.6	14.8	0.63	0.63	0.63	32.4
18	R2	12	3.0	0.170	8.3	LOS A	0.6	14.8	0.63	0.63	0.63	31.5
Approach		99	3.0	0.170	8.3	LOS A	0.6	14.8	0.63	0.63	0.63	32.3
East: MD 144												
1	L2	17	3.0	0.288	7.2	LOS A	1.2	31.2	0.53	0.48	0.53	34.0
6	T1	378	3.0	0.288	7.0	LOS A	1.2	31.2	0.52	0.47	0.52	34.1
16	R2	133	3.0	0.288	6.7	LOS A	1.2	30.8	0.51	0.45	0.51	33.2
Approach		528	3.0	0.288	6.9	LOS A	1.2	31.2	0.52	0.46	0.52	33.9
North: Eaglehead Drive												
7	L2	152	3.0	0.199	6.2	LOS A	0.8	20.0	0.50	0.45	0.50	32.4
4	T1	20	3.0	0.199	6.2	LOS A	0.8	20.0	0.50	0.45	0.50	32.3
14	R2	195	3.0	0.207	5.9	LOS A	0.8	20.7	0.48	0.42	0.48	33.6
Approach		366	3.0	0.207	6.0	LOS A	0.8	20.7	0.49	0.43	0.49	33.0
West: MD 144												
5	L2	333	3.0	0.378	7.2	LOS A	1.9	49.3	0.41	0.29	0.41	32.2
2	T1	498	3.0	0.378	6.9	LOS A	1.9	49.3	0.40	0.27	0.40	33.9
12	R2	26	3.0	0.378	6.8	LOS A	1.9	48.4	0.39	0.27	0.39	33.2
Approach		857	3.0	0.378	7.0	LOS A	1.9	49.3	0.40	0.28	0.40	33.2
All Vehicles		1850	3.0	0.378	6.9	LOS A	1.9	49.3	0.46	0.38	0.46	33.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: \\LTC-OFFICE\LTC-Drive\LTC-Server\I-Projects\Bell Farm_New Market Lake Langanore\20230925 TIS\20231031 Sidra\PM Existing.sip8

MOVEMENT SUMMARY

 Site: 4 [MD 144 & Eaglehead Drive]

[illegible]

MOVEMENT SUMMARY

 **Site: 4 [MD 144 & Eaglehead Drive]**

Bell Farm Property
Site Category: PM Total
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Stickleback Street												
3	L2	153	3.0	1.083	112.5	LOS F	17.5	447.0	1.00	2.15	5.52	13.1
8	T1	101	3.0	1.083	112.5	LOS F	17.5	447.0	1.00	2.15	5.52	13.1
18	R2	85	3.0	1.083	112.5	LOS F	17.5	447.0	1.00	2.15	5.52	13.0
Approach		339	3.0	1.083	112.5	LOS F	17.5	447.0	1.00	2.15	5.52	13.1
East: MD 144												
1	L2	72	3.0	0.758	25.9	LOS D	7.2	184.6	0.85	1.20	1.97	26.5
6	T1	449	3.0	0.758	25.7	LOS D	7.5	192.4	0.85	1.20	1.97	26.5
16	R2	455	3.0	0.758	23.8	LOS C	7.5	192.4	0.85	1.20	1.96	26.4
Approach		976	3.0	0.758	24.8	LOS C	7.5	192.4	0.85	1.20	1.96	26.5
North: Eaglehead Drive												
7	L2	534	3.0	0.802	24.8	LOS C	10.5	269.3	0.89	1.32	2.18	25.8
4	T1	83	3.0	0.802	24.8	LOS C	10.5	269.3	0.89	1.32	2.18	25.7
14	R2	379	3.0	0.545	13.9	LOS B	3.6	92.6	0.73	0.88	1.17	29.9
Approach		996	3.0	0.802	20.7	LOS C	10.5	269.3	0.83	1.15	1.79	27.2
West: MD 144												
5	L2	565	3.0	0.932	44.1	LOS E	18.3	469.7	1.00	1.80	3.44	21.2
2	T1	595	3.0	0.932	41.8	LOS E	19.5	499.3	1.00	1.83	3.47	22.3
12	R2	180	3.0	0.932	41.4	LOS E	19.5	499.3	1.00	1.83	3.47	22.0
Approach		1340	3.0	0.932	42.7	LOS E	19.5	499.3	1.00	1.82	3.45	21.8
All Vehicles		3651	3.0	1.083	38.4	LOS E	19.5	499.3	0.91	1.50	2.79	22.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Critical Lane Volume (CLV) Methodology for MSHA

Main Line: Boyers Mill Road
Minor Street: Yeagertown Road
Study Period: Existing Traffic

Analyst: Lenhart Traffic Consulting

BOYERS MILL ROAD

--- TL

	AM	PM
T	155	449
L	7	8

adjusted lefts 21 16

PM	AM	
414	449	T
175	277	R

TR ---

BOYERS MILL ROAD

|
LR

Yeagertown Road

	L	R
AM	56	6
PM	151	11

Critical Lane Volume Analysis

Morning Peak Hour					
Dir	Thru Volumes			+ Opposing Lefts	AM
	VOL	x LUF	= Total	VOL x LUF = Total	CLV
NB	62	1.00	62		62
EB	726	1.00	726	7 1.00 7	733
WB	176	1.00	176		
CLV TOTAL=					795
Level of Service (LOS) =					A

Evening Peak Hour					
Dir	Thru Volumes			+ Opposing Lefts	PM
	VOL	x LUF	= Total	VOL x LUF = Total	CLV
NB	162	1.00	162		162
EB	589	1.00	589	8 1.00 8	597
WB	465	1.00	465		
CLV TOTAL=					759
Level of Service (LOS) =					A

Critical Lane Volume Analysis



LENHART TRAFFIC CONSULTING, INC.
 645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
 SEVERNA PARK, MD 21146
 www.lenharttraffic.com

**Boyers Mill Road &
 Yeagertown Road
 (Existing Traffic)**

**Intersection
 1**

Critical Lane Volume (CLV) Methodology for MSHA

Main Line: Boyers Mill Road
Minor Street: Yeagertown Road
Study Period: Background Traffic

Analyst: Lenhart Traffic Consulting

BOYERS MILL ROAD

--- TL

	AM	PM
T	335	817
L	8	9

adjusted lefts 40 36

PM	AM	
729	749	T
209	311	R

TR ---

BOYERS MILL ROAD

|
LR

Yeagertown Road

	L	R
AM	67	6
PM	187	12

Critical Lane Volume Analysis

Morning Peak Hour					
Dir	Thru Volumes			+ Opposing Lefts	AM
	VOL	x LUF	= Total	VOL x LUF = Total	CLV
NB	73	1.00	73		73
EB	1060	1.00	1060	8 1.00 8	1068
WB	375	1.00	375		
CLV TOTAL=					1141
Level of Service (LOS) =					B

Evening Peak Hour					
Dir	Thru Volumes			+ Opposing Lefts	PM
	VOL	x LUF	= Total	VOL x LUF = Total	CLV
NB	199	1.00	199		199
EB	938	1.00	938	9 1.00 9	947
WB	853	1.00	853		
CLV TOTAL=					1146
Level of Service (LOS) =					B

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 1**

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Main Line: Boyers Mill Road
Minor Street: Yeagertown Road
Study Period: Total Traffic

Analyst: Lenhart Traffic Consulting

BOYERS MILL ROAD

--- TL

	AM	PM
T	335	817
L	11	14

adjusted lefts 55 56

PM	AM	
729	749	T
214	314	R

TR ---

BOYERS MILL ROAD

|
LR

Yeagertown Road

	L	R
AM	72	11
PM	191	16

Critical Lane Volume Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	83	1.00	83			
EB	1063	1.00	1063	11	1.00	11
WB	390	1.00	390			
CLV TOTAL=						1157
Level of Service (LOS) =						C

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
NB	207	1.00	207			
EB	943	1.00	943	14	1.00	14
WB	873	1.00	873			
CLV TOTAL=						1164
Level of Service (LOS) =						C

Critical Lane Volume Analysis



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**Boyers Mill Road &
 Yeagertown Road**
 (Total Traffic)

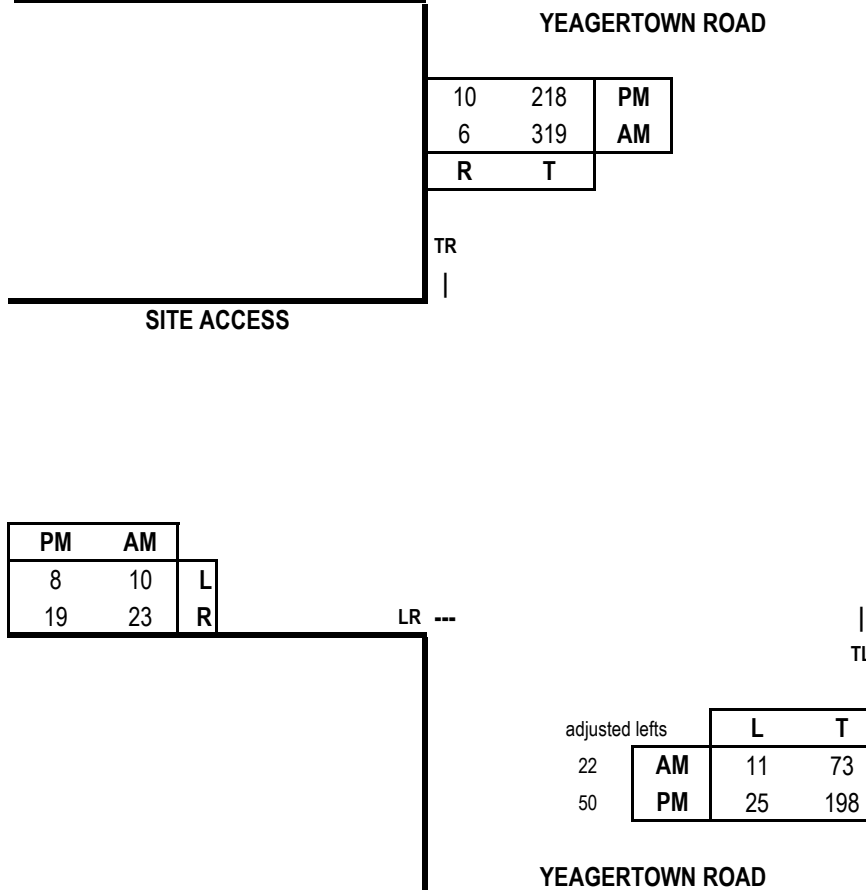
**Intersection
 1**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Intersection of: Yeagertown Road
and: Site Access
Conditions: Total Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Capacity Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
EB	33	1.00	33			
NB	95	1.00	95			
SB	325	1.00	325	11	1.00	11
CLV TOTAL=						369
Level of Service (LOS)=						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
EB	27	1.00	27			
NB	248	1.00	248			
SB	228	1.00	228	25	1.00	25
CLV TOTAL=						280
Level of Service (LOS)=						A

Critical Lane Volume Analysis



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**Yeagertown Road &
Site Access
(Total Traffic)**

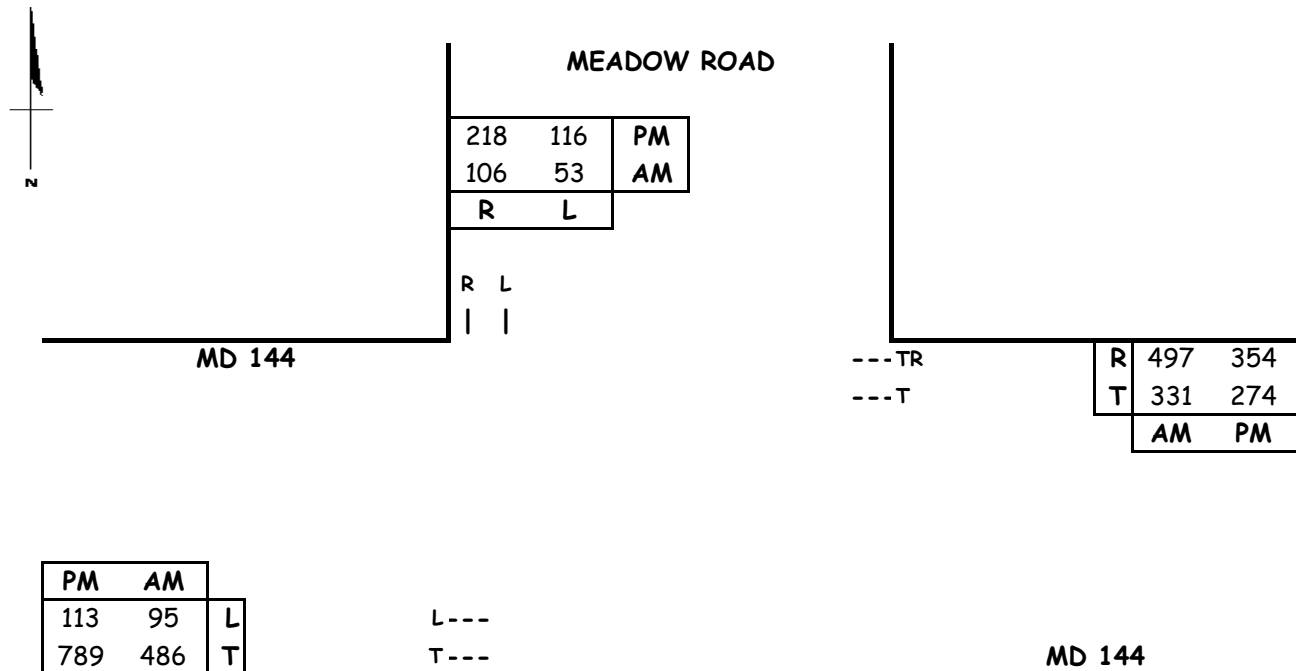
**Intersection
2**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Intersection of: Meadow Road
and: MD 144
Conditions: Existing Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Capacity Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	53	1.00	53			
EB	486	1.00	486			
WB	828	0.55	455	95	1.00	95
CLV TOTAL=						603
Level of Service (LOS)=						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	116	1.00	116			
EB	789	1.00	789			
WB	628	0.55	345	113	1.00	113
CLV TOTAL=						905
Level of Service (LOS)=						A

Critical Lane Volume Analysis



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**Meadow Road &
MD 144
(Existing Traffic)**

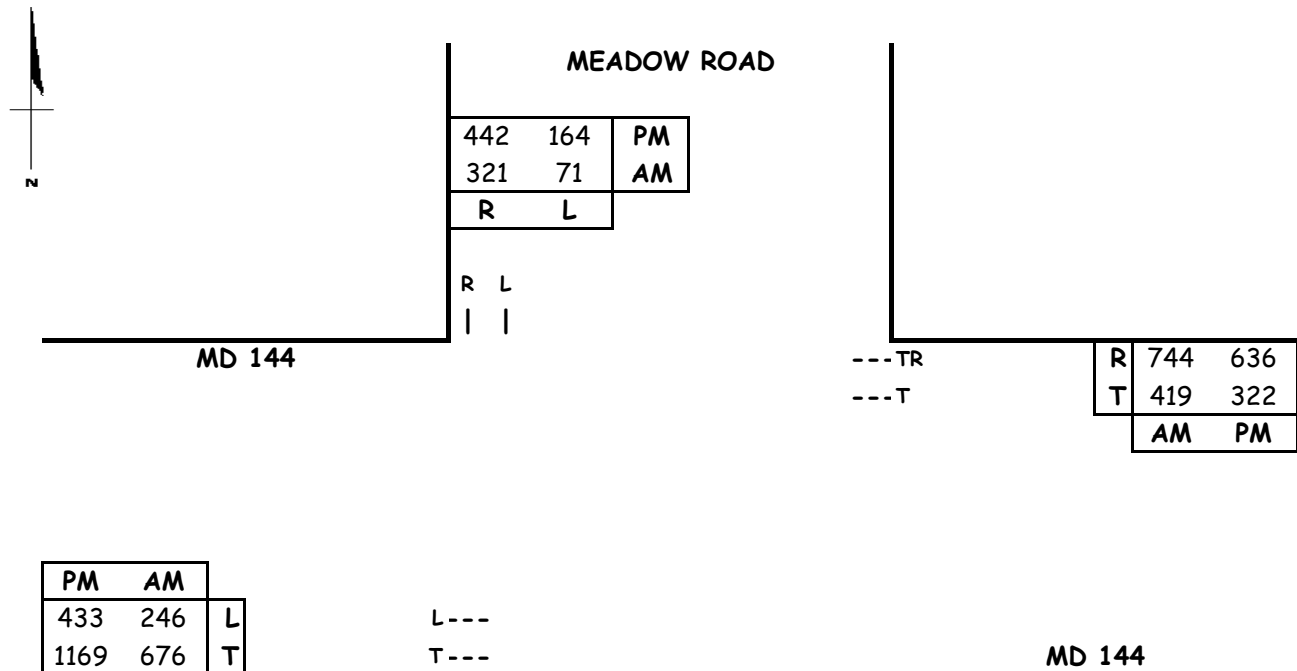
**Intersection
3**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Intersection of: Meadow Road
and: MD 144
Conditions: Background Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Capacity Analysis

Morning Peak Hour					
Dir	Thru Volumes			+ Opposing Lefts	
	VOL	x LUF	= Total	VOL	x LUF = Total
SB	75	1.00	75		
EB	676	1.00	676		
WB	1163	0.55	640	246	1.00 246
CLV TOTAL=					961
Level of Service (LOS)=					A

Evening Peak Hour					
Dir	Thru Volumes			+ Opposing Lefts	
	VOL	x LUF	= Total	VOL	x LUF = Total
SB	164	1.00	164		
EB	1169	1.00	1169		
WB	958	0.55	527	433	1.00 433
CLV TOTAL=					1333
Level of Service (LOS)=					D

Critical Lane Volume Analysis



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Meadow Road &
MD 144
(Background Traffic)

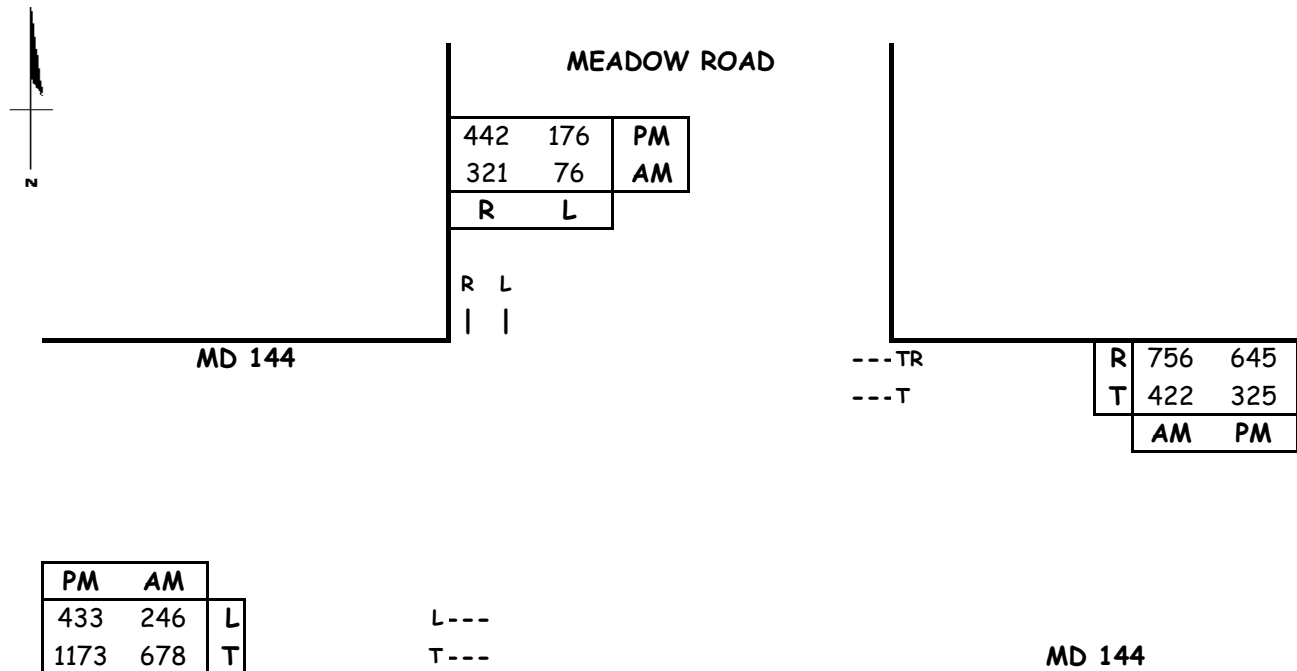
**Intersection
3**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Intersection of: Meadow Road
and: MD 144
Conditions: Total Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Capacity Analysis

Morning Peak Hour					
Dir	Thru Volumes			+ Opposing Lefts	
	VOL	x LUF	= Total	VOL	x LUF = Total
SB	76	1.00	76		
EB	678	1.00	678		
WB	1178	0.55	648	246	1.00 246
CLV TOTAL=					970
Level of Service (LOS)=					A

Evening Peak Hour					
Dir	Thru Volumes			+ Opposing Lefts	
	VOL	x LUF	= Total	VOL	x LUF = Total
SB	176	1.00	176		
EB	1173	1.00	1173		
WB	970	0.55	534	433	1.00 433
CLV TOTAL=					1349
Level of Service (LOS)=					D

Critical Lane Volume Analysis



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Meadow Road &
MD 144
(Total Traffic)

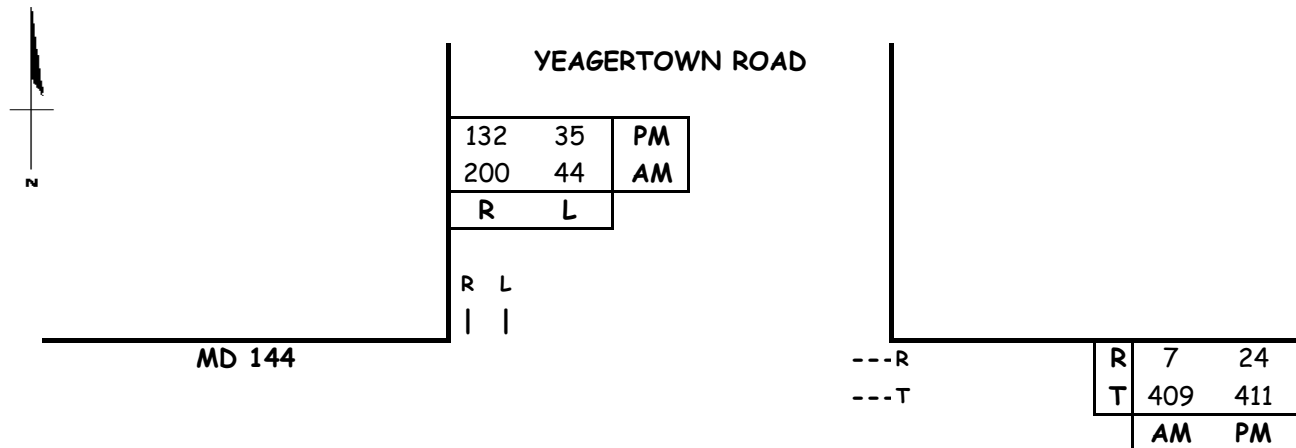
**Intersection
3**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Intersection of: Yeagertown Road
and: MD 144
Conditions: Existing Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



PM	AM	
165	86	L
463	305	T

L ---
T ---

MD 144

Capacity Analysis

Morning Peak Hour					
Dir	Thru Volumes			+ Opposing Lefts	
	VOL	x LUF	= Total	VOL	x LUF = Total
SB	114	1.00	114		
EB	305	1.00	305		
WB	409	1.00	409	86	1.00 86
CLV TOTAL=					609
Level of Service (LOS) =					A

Evening Peak Hour					
Dir	Thru Volumes			+ Opposing Lefts	
	VOL	x LUF	= Total	VOL	x LUF = Total
SB	35	1.00	35		
EB	463	1.00	463		
WB	411	1.00	411	165	1.00 165
CLV TOTAL=					611
Level of Service (LOS) =					A

Critical Lane Volume Analysis



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Yeagertown Road &
MD 144
(Existing Traffic)

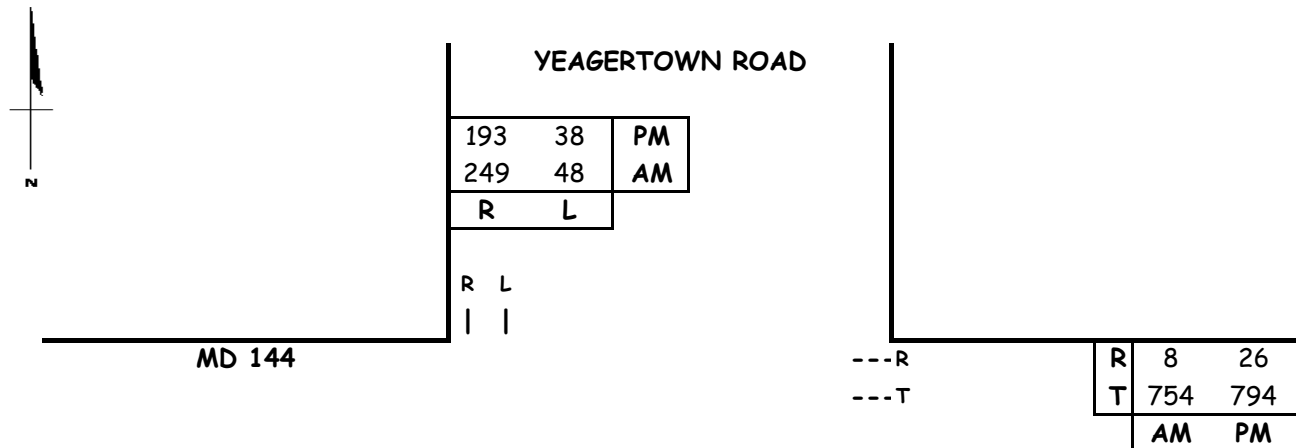
**Intersection
5**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Intersection of: Yeagertown Road
and: MD 144
Conditions: Background Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



PM	AM	
230	114	L
992	616	T

L ---
T ---

MD 144

Capacity Analysis

Morning Peak Hour					
Dir	Thru Volumes			+ Opposing Lefts	
	VOL	x LUF	= Total	VOL	x LUF = Total
SB	135	1.00	135		
EB	616	1.00	616		
WB	754	1.00	754	114	1.00 114
CLV TOTAL=					1003
Level of Service (LOS) =					B

Evening Peak Hour					
Dir	Thru Volumes			+ Opposing Lefts	
	VOL	x LUF	= Total	VOL	x LUF = Total
SB	38	1.00	38		
EB	992	1.00	992		
WB	794	1.00	794	230	1.00 230
CLV TOTAL=					1062
Level of Service (LOS) =					B

Critical Lane Volume Analysis



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Yeagertown Road &
MD 144
(Background Traffic)

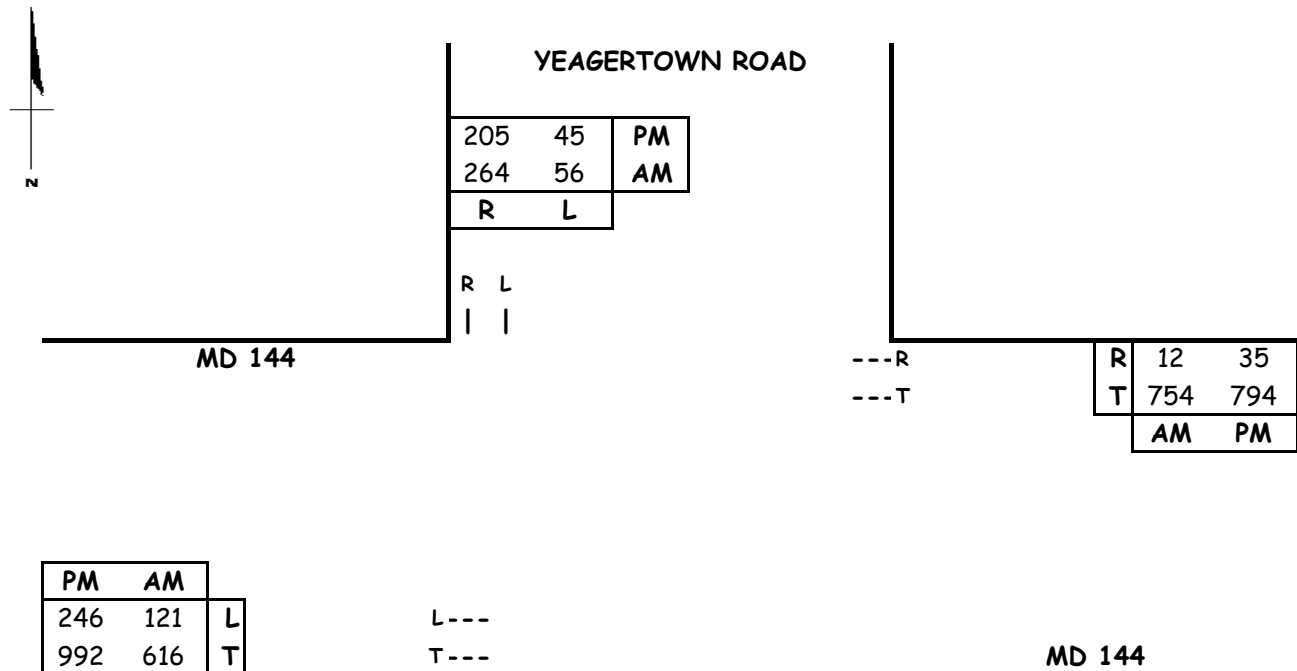
**Intersection
5**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Intersection of: Yeagertown Road
and: MD 144
Conditions: Background Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Capacity Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	143	1.00	143			
EB	616	1.00	616			
WB	754	1.00	754	121	1.00	121
CLV TOTAL=						1018
Level of Service (LOS) =						B

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	45	1.00	45			
EB	992	1.00	992			
WB	794	1.00	794	246	1.00	246
CLV TOTAL=						1085
Level of Service (LOS) =						B

Critical Lane Volume Analysis



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**Yeagertown Road &
MD 144
(Background Traffic)**

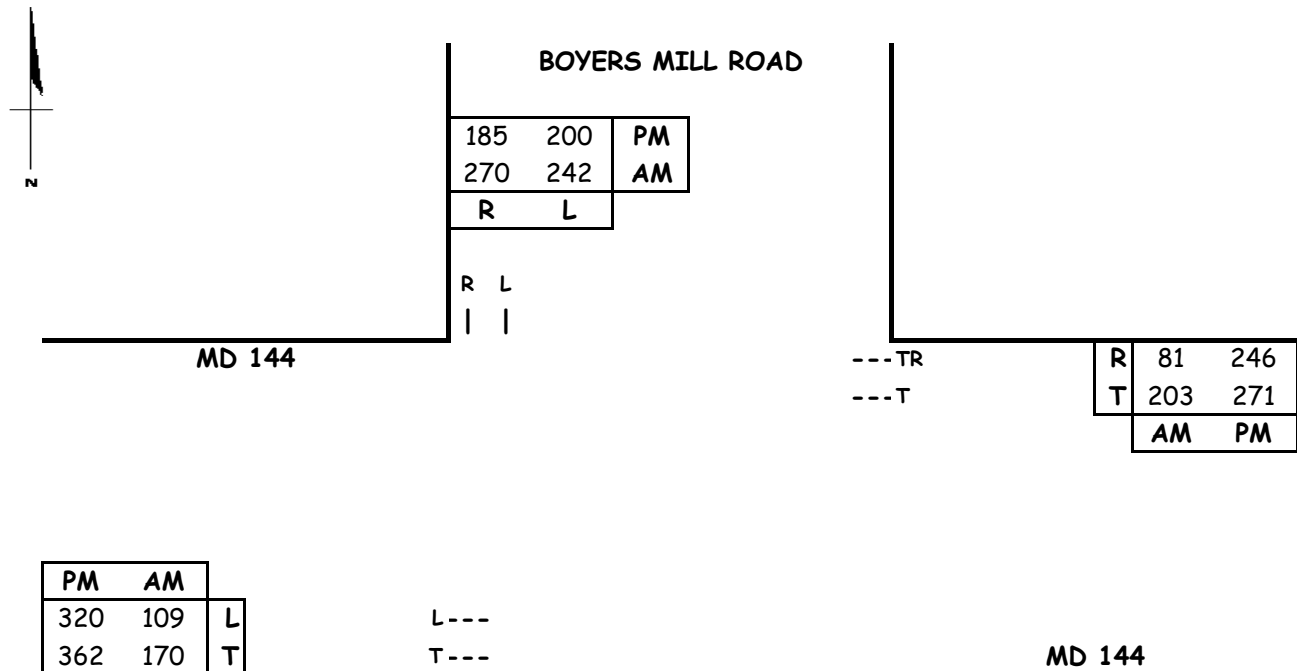
**Intersection
5**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Intersection of: Boyers Mill Road
and: MD 144
Conditions: Existing Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Capacity Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	242	1.00	242			
EB	170	1.00	170			
WB	284	0.55	156	109	1.00	109
CLV TOTAL=						507
Level of Service (LOS)=						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	200	1.00	200			
EB	362	1.00	362			
WB	517	0.55	284	320	1.00	320
CLV TOTAL=						804
Level of Service (LOS)=						A

Critical Lane Volume Analysis



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Boyers Mill Road &
MD 144
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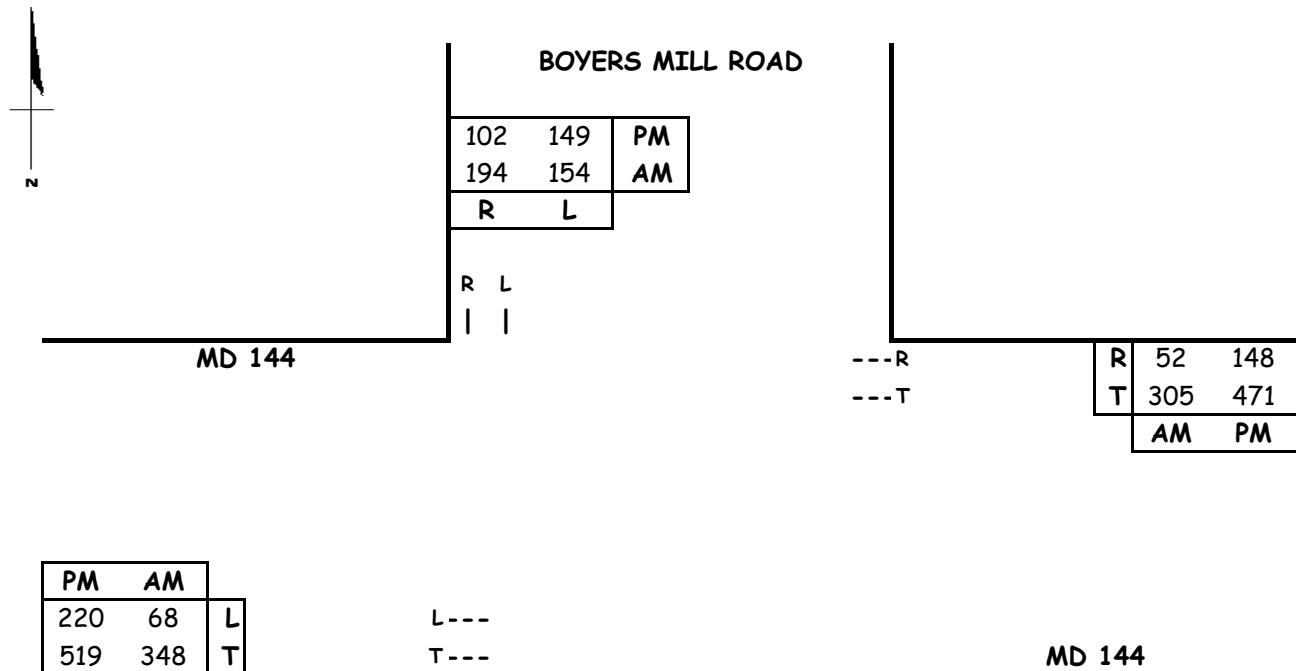
**Intersection
6**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Intersection of: Boyers Mill Road
and: MD 144
Conditions: Background Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Capacity Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	154	1.00	154			
EB	348	1.00	348			
WB	305	1.00	305	68	1.00	68
CLV TOTAL=						527
Level of Service (LOS) =						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	149	1.00	149			
EB	519	1.00	519			
WB	471	1.00	471	220	1.00	220
CLV TOTAL=						840
Level of Service (LOS) =						A

Critical Lane Volume Analysis



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**Boyers Mill Road &
MD 144
(Background Traffic)**

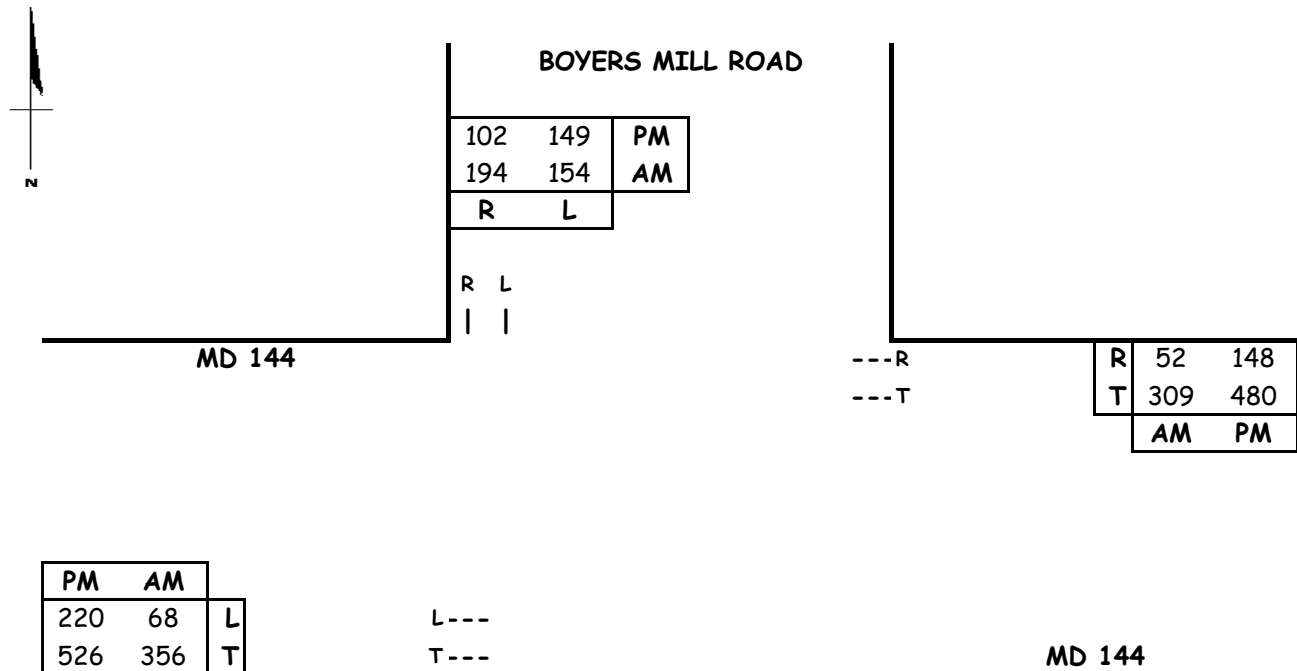
**Intersection
6**

CRITICAL LANE VOLUME (CLV) METHODOLOGY for MSHA

Intersection of: Boyers Mill Road
and: MD 144
Conditions: Total Traffic

Analyst: Lenhart Traffic Consulting

Lane Use + Traffic Volumes



Capacity Analysis

Morning Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	154	1.00	154			
EB	356	1.00	356			
WB	309	1.00	309	68	1.00	68
CLV TOTAL=						531
Level of Service (LOS) =						A

Evening Peak Hour						
Dir	Thru Volumes			+ Opposing Lefts		
	VOL	x LUF	= Total	VOL	x LUF	= Total
SB	149	1.00	149			
EB	526	1.00	526			
WB	480	1.00	480	220	1.00	220
CLV TOTAL=						849
Level of Service (LOS) =						A

Critical Lane Volume Analysis



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Boyers Mill Road &
MD 144
(Total Traffic)

**Intersection
6**

Intersection: 1: Yeagertown Road & Boyers Mill Road

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	35	322	150
Average Queue (ft)	2	41	55
95th Queue (ft)	14	195	131
Link Distance (ft)	482	563	509
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Yeagertown Road & Site Access

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: 3: MD 144 & Meadow Road

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	TR	L	R
Maximum Queue (ft)	155	228	231	279	109	231
Average Queue (ft)	71	107	109	138	43	123
95th Queue (ft)	125	187	187	234	86	194
Link Distance (ft)	548	548	816		409	409
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				500		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: MD 144 & Yeagertown Road

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	96	4	290	85
Average Queue (ft)	42	0	79	67
95th Queue (ft)	75	3	213	100
Link Distance (ft)	668		313	
Upstream Blk Time (%)			1	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)		175		60
Storage Blk Time (%)			8	26
Queuing Penalty (veh)			20	13

Intersection: 6: MD 144 & Boyers Mill Road

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	97	151	134	67	140	84
Average Queue (ft)	31	64	64	17	52	48
95th Queue (ft)	68	113	114	48	104	82
Link Distance (ft)		138	166		481	
Upstream Blk Time (%)	0	0	0			
Queuing Penalty (veh)	0	0	0			
Storage Bay Dist (ft)	100			125		60
Storage Blk Time (%)	0	1	0		4	2
Queuing Penalty (veh)	1	1	0		7	2

Intersection: 14: Bend

Movement	WB
Directions Served	T
Maximum Queue (ft)	18
Average Queue (ft)	1
95th Queue (ft)	13
Link Distance (ft)	138
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 44

Intersection: 1: Yeagertown Road & Boyers Mill Road

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	13	234	192
Average Queue (ft)	1	26	67
95th Queue (ft)	8	123	165
Link Distance (ft)	482	563	509
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Yeagertown Road & Site Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	46	36
Average Queue (ft)	21	4
95th Queue (ft)	44	22
Link Distance (ft)	534	744
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: MD 144 & Meadow Road

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	TR	L	R
Maximum Queue (ft)	160	213	205	345	112	242
Average Queue (ft)	71	102	109	152	47	119
95th Queue (ft)	125	184	181	272	92	199
Link Distance (ft)	548	548	816		409	409
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				500		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: MD 144 & Yeagertown Road

Movement	EB	WB	WB	SB	SB
Directions Served	L	T	R	L	R
Maximum Queue (ft)	105	4	4	314	85
Average Queue (ft)	41	0	0	166	74
95th Queue (ft)	80	3	3	360	105
Link Distance (ft)	668	412		313	
Upstream Blk Time (%)				15	
Queuing Penalty (veh)				0	
Storage Bay Dist (ft)			175		60
Storage Blk Time (%)				21	43
Queuing Penalty (veh)				55	24

Intersection: 6: MD 144 & Boyers Mill Road

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	75	138	112	52	120	85
Average Queue (ft)	31	66	58	17	49	47
95th Queue (ft)	63	114	99	44	91	80
Link Distance (ft)		138	166		481	
Upstream Blk Time (%)		0				
Queuing Penalty (veh)		0				
Storage Bay Dist (ft)	100			125		60
Storage Blk Time (%)	0	1	0		3	2
Queuing Penalty (veh)	0	1	0		6	3

Network Summary

Network wide Queuing Penalty: 88

Intersection: 1: Yeagertown Road & Boyers Mill Road

Intersection: 2: Yeagertown Road & Site Access

Intersection: 3: MD 144 & Meadow Road

Intersection: 5: MD 144 & Yeagertown Road

Intersection: 6: MD 144 & Boyers Mill Road

Network Summary

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Intersection: 1: Yeagertown Road & Boyers Mill Road

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	22	467	549
Average Queue (ft)	1	57	522
95th Queue (ft)	9	271	551
Link Distance (ft)	482	563	509
Upstream Blk Time (%)		1	97
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Yeagertown Road & Site Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	48	66
Average Queue (ft)	18	8
95th Queue (ft)	43	36
Link Distance (ft)	534	744
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: MD 144 & Meadow Road

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	TR	L	R
Maximum Queue (ft)	500	522	191	242	189	329
Average Queue (ft)	143	241	99	123	98	175
95th Queue (ft)	331	445	166	205	161	286
Link Distance (ft)	548	548	816		409	409
Upstream Blk Time (%)	0	1				0
Queuing Penalty (veh)	0	0				0
Storage Bay Dist (ft)				500		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: MD 144 & Yeagertown Road

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	265	136	24	4	360	85
Average Queue (ft)	72	5	1	0	322	64
95th Queue (ft)	167	96	9	3	374	123
Link Distance (ft)	668	668	412		313	
Upstream Blk Time (%)	0	0			90	
Queuing Penalty (veh)	0	0			0	
Storage Bay Dist (ft)				175		60
Storage Blk Time (%)					89	28
Queuing Penalty (veh)					183	12

Intersection: 6: MD 144 & Boyers Mill Road

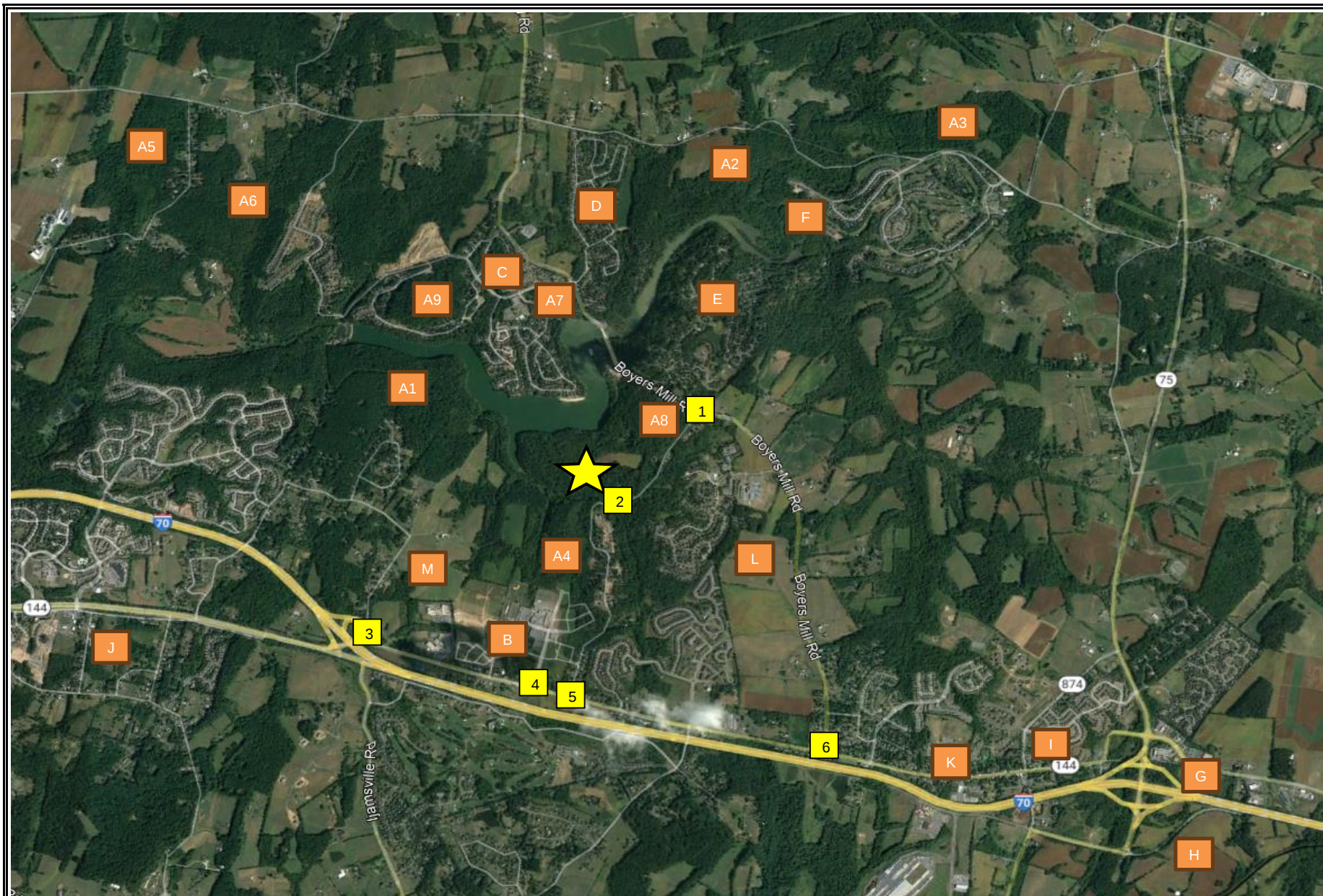
Movement	EB	EB	B14	WB	WB	SB	SB
Directions Served	L	T	T	T	R	L	R
Maximum Queue (ft)	124	198	111	186	145	188	85
Average Queue (ft)	81	95	10	82	37	80	47
95th Queue (ft)	125	180	93	149	92	147	90
Link Distance (ft)		138	388	166		481	
Upstream Blk Time (%)	1	3	1	0	0		
Queuing Penalty (veh)	0	0	0	0	0		
Storage Bay Dist (ft)	100				125		60
Storage Blk Time (%)	8	3		1	0	15	1
Queuing Penalty (veh)	43	7		2	0	16	1

Network Summary

Network wide Queuing Penalty: 265

Appendix C

Background Developments



Traffic Impact Analysis



LENHART TRAFFIC CONSULTING, INC.
645 BALTIMORE ANNAPOLIS BLVD, SUITE 214
SEVERNA PARK, MD 21146
www.lenharttraffic.com

Background Development Location Map



- Location of Site

**Exhibit
C-1**

Trip Generation Rates

Day Care Center (ksf, ITE-565)		<u>Trip Distribution (In/Out)</u>
Morning Trips = 11.00 x ksf		53/47
Evening Trips = 11.12 x ksf		47/53
Single-Family Attached Housing (ITE-215, Units)		<u>Trip Distribution (In/Out)</u>
Morning Trips = 0.52 x Units - 5.70		31/69
Evening Trips = 0.60 x Units - 3.93		57/43
Single-Family Detached Housing (ITE-210, Units)		<u>Trip Distribution (In/Out)</u>
Ln(Morning Trips) = 0.91 x Ln(Units) + 0.12		26/74
Ln(Evening Trips) = 0.94 x Ln(Units) + 0.27		63/37
Senior Adult Housing - Multifamily (ITE-252, Units)		<u>Trip Distribution (In/Out)</u>
Morning Trips = 0.19 x Units + 0.90		34/66
Evening Trips = 0.25 x Units + 0.07		56/44
Senior Adult Housing - Single Family (ITE-251, Units)		<u>Trip Distribution (In/Out)</u>
Ln(Morning Trips) = 0.76 x Ln(Units) + 0.16		33/67
Ln(Evening Trips) = 0.78 x Ln(Units) + 0.20		61/39

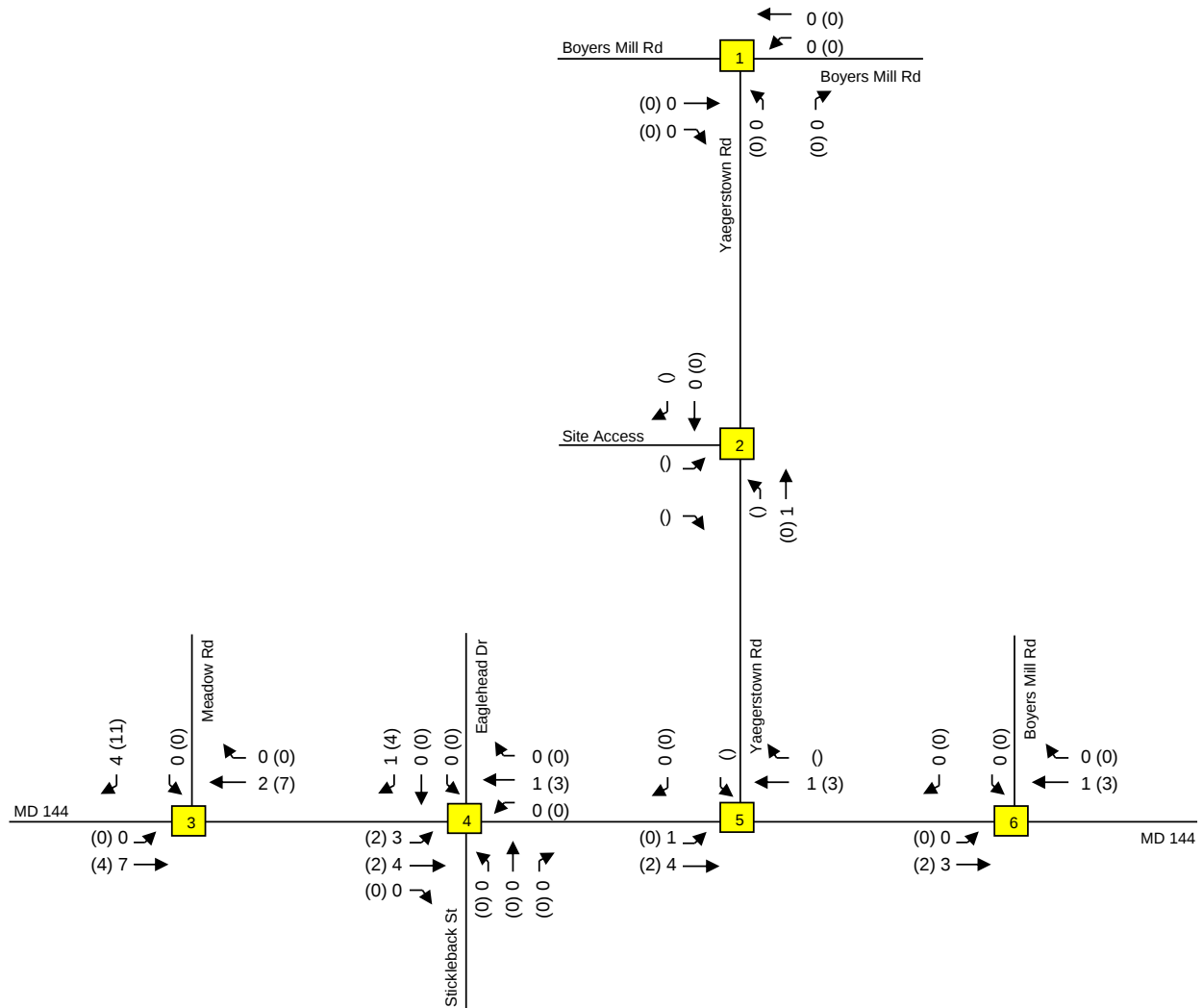
Trip Generation Totals

				AM Peak			PM Peak		
				In	Out	Total	In	Out	Total
A1	Eaglehead - Alpine	Obtained from Gordon Mill December 2022 TIS		469	1223	1692	1395	935	2330
A2&3	Eaglehead - Hamptons E&W	Obtained from Gordon Mill December 2022 TIS		469	1223	1692	1395	935	2330
A4	Eaglehead - Town Center	Obtained from Gordon Mill December 2022 TIS		469	1223	1692	1395	935	2330
A5	Eaglehead - Westridge	Obtained from Gordon Mill December 2022 TIS		469	1223	1692	1395	935	2330
A6	Eaglehead - Woodridge	Obtained from Gordon Mill December 2022 TIS		469	1223	1692	1395	935	2330
A7	Eaglehead - Coldstream	Obtained from Gordon Mill December 2022 TIS		469	1223	1692	1395	935	2330
A8	Eaglehead - Nightingale	Obtained from Gordon Mill December 2022 TIS		469	1223	1692	1395	935	2330
A9	Eaglehead - Aspen	Obtained from Gordon Mill December 2022 TIS		469	1223	1692	1395	935	2330
B	Oakdale Village	Day Care Center (ksf, ITE-565)		Built Out - According to Approved New Market East TIS					
C	Aubudon Terrace	Single-Family Attached Housing (ITE-215, Units)	21 units	2	3	5	5	4	9
D	Meadows	Single-Family Detached Housing (ITE-210, Units)	32 units	7	19	26	21	13	34
E	Pinehurst	Single-Family Detached Housing (ITE-210, Units)	157 units	29	83	112	96	56	152
F	Westwinds	Single-Family Attached Housing (ITE-215, Units)	73 units	10	22	32	23	17	40
G	New Market Ret. Center	Assumed to be LTC South Commercial, Obtained from Gordon Mill December 2022 TIS.							
H	Intercoastal	Assumed to not impact study intersections due to location							
I	Marley Commons	Obtained from Gordon Mill December 2022 TIS		1	5	6	5	3	8
J	Perston/Mains	Assumed to not impact study intersections due to location							
		Assumed to not impact study intersections due to location							
K	105/113 West Main	Obtained from Gordon Mill December 2022 TIS		13	17	30	40	28	68
L	Calumet	Obtained from Gordon Mill December 2022 TIS		112	394	506	402	223	625
M	Cromwell	Senior Adult Housing - Single Family (ITE-251, Units)	488 units	43	87	130	93	60	153

NOTE: Trip Generation Rates obtained from the ITE Trip Generation Manual, 11th Edition, or obtained from approved Traffic Impact Studies

Traffic Impact Analysis	Trip Generation for Background Developments	Exhibit C-2
Lenhart Traffic Consulting, Inc. Traffic Engineering & Transportation Planning		

Note: Trip distribution and assignment obtained from the Dec. 2022 Gordon Mill TIS.



Traffic Impact Analysis

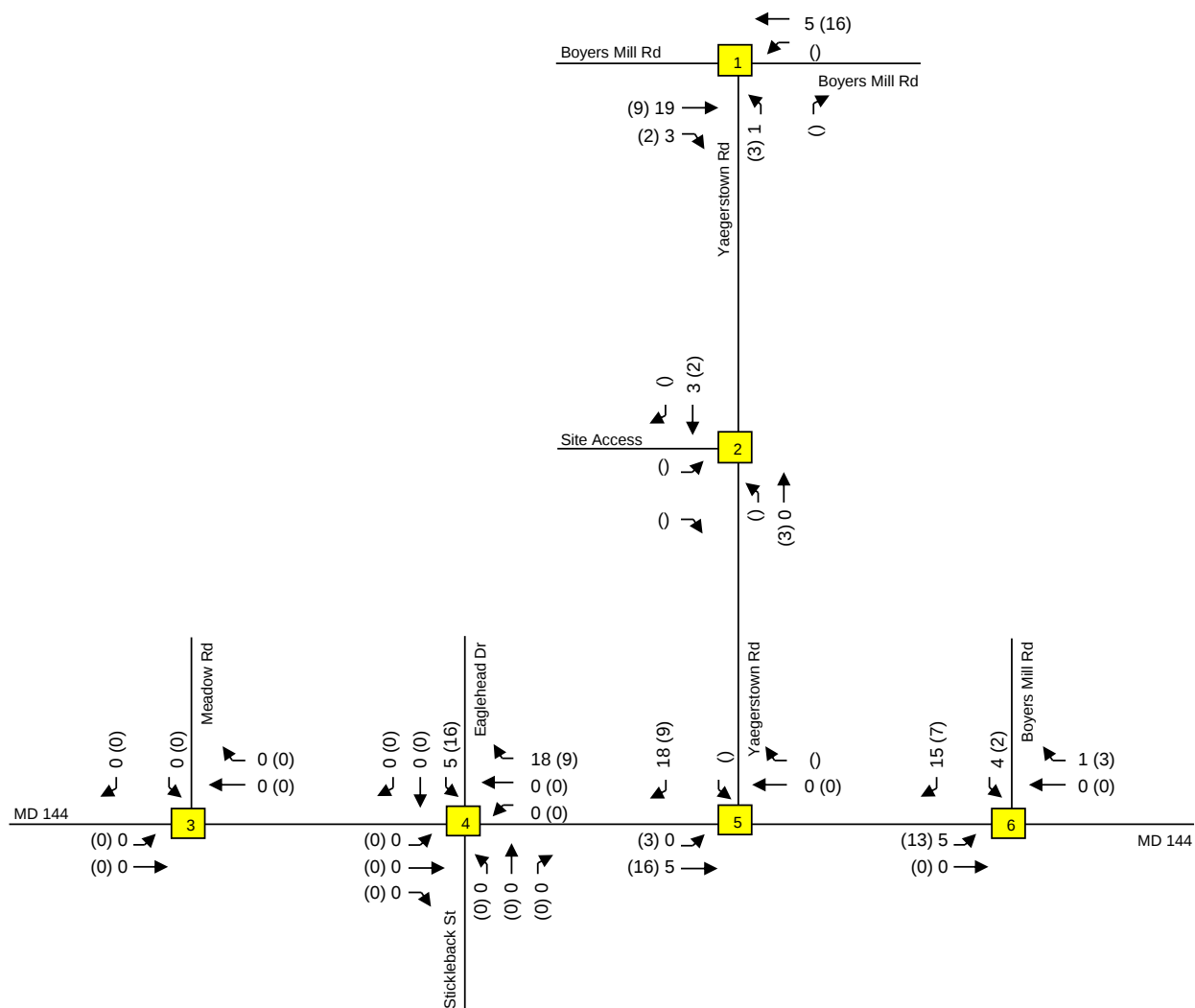
Lenhart Traffic Consulting, Inc.
Traffic Engineering & Transportation Planning

Background Trip Assignment Eaglehead - Alpine

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
C-3a**

Note: Trip distribution and assignment obtained from the Dec. 2022 Gordon Mill TIS.



Traffic Impact Analysis

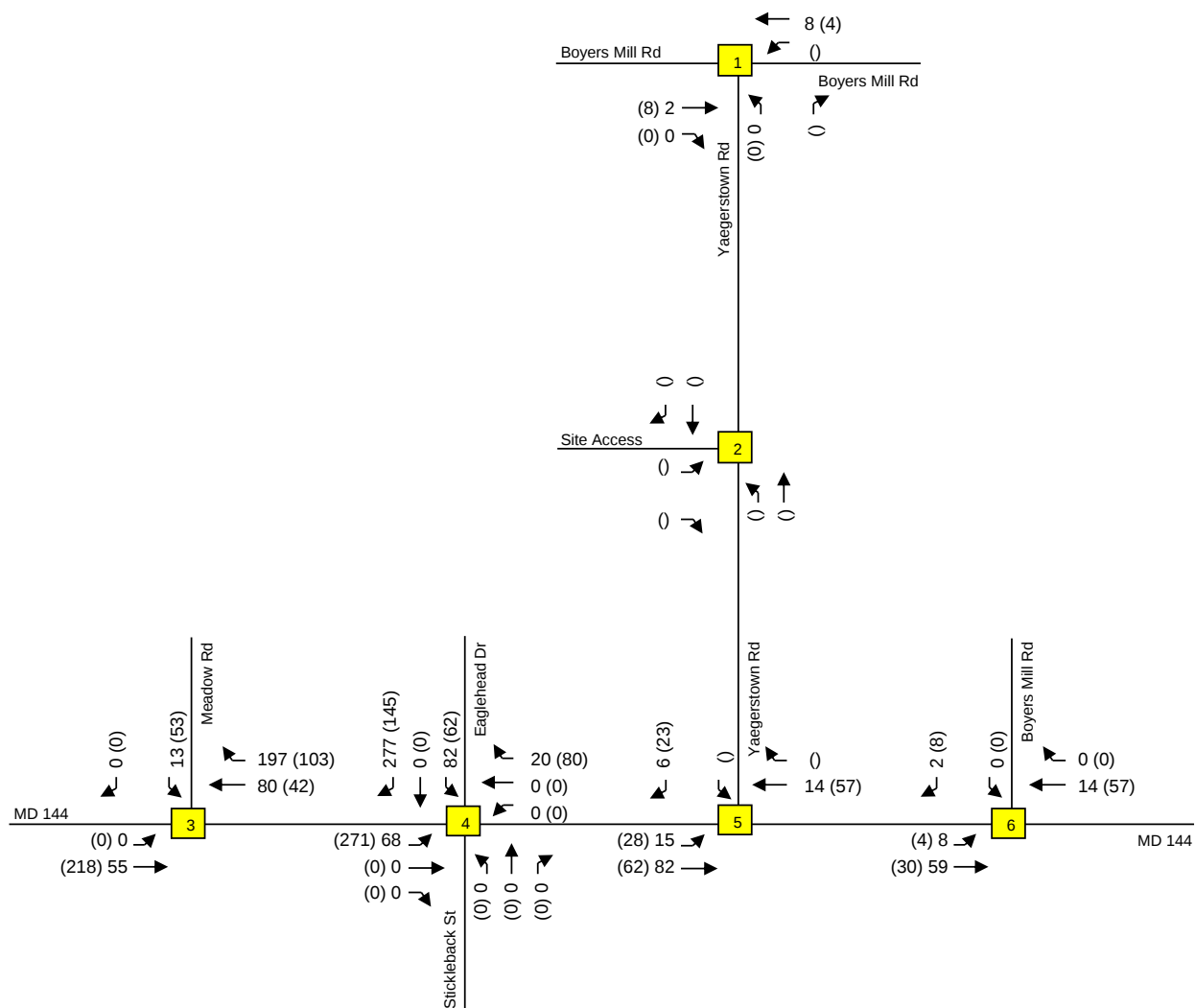
Lenhart Traffic Consulting, Inc.
Traffic Engineering & Transportation Planning

Background Trip Assignment Eaglehead - Hamptons East & West

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
C-3b**

Note: Trip distribution and assignment obtained from the Dec. 2022 Gordon Mill TIS.



Traffic Impact Analysis

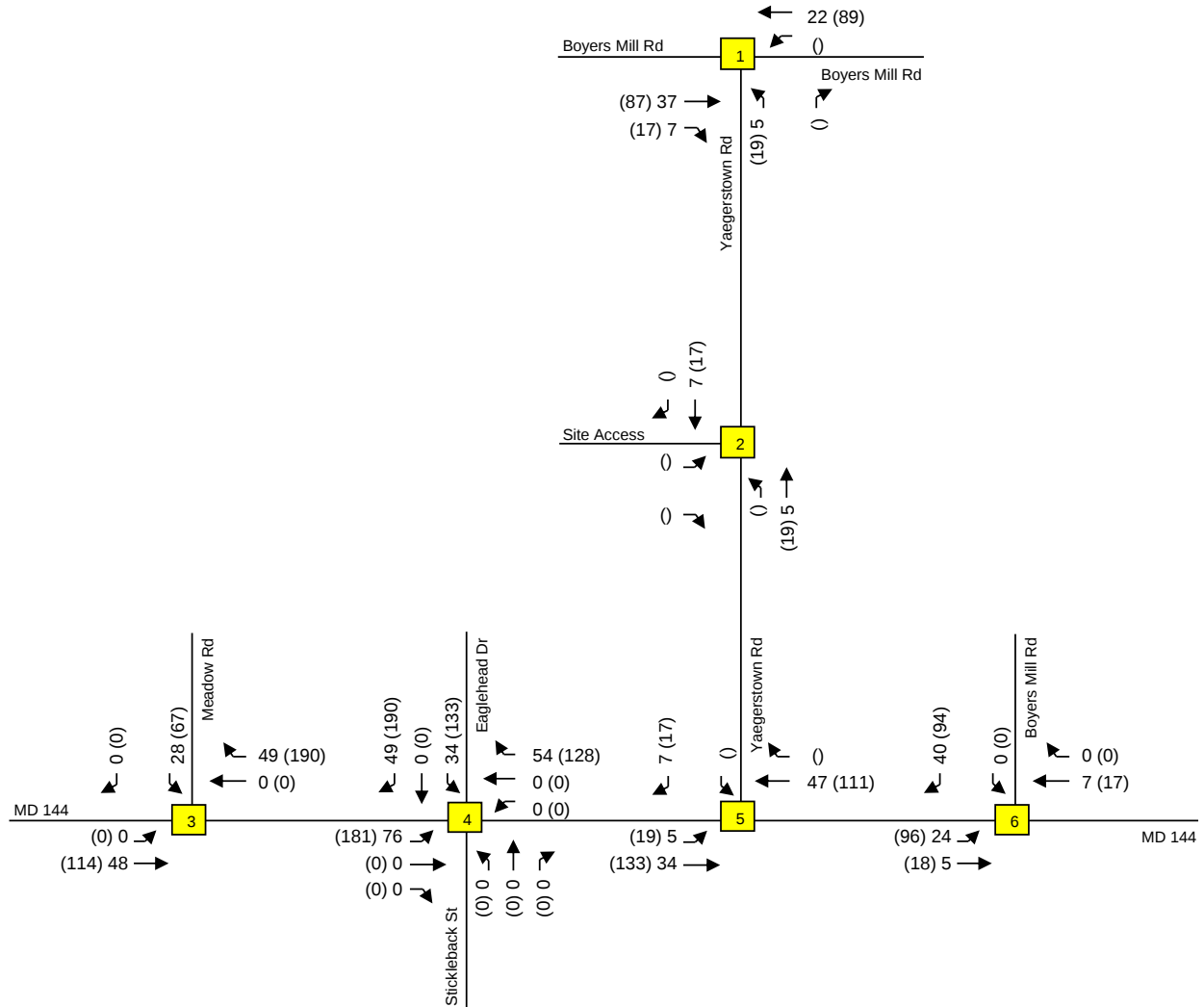
Lenhart Traffic Consulting, Inc.
Traffic Engineering & Transportation Planning

Background Trip Assignment Eaglehead - Town Center (Res.)

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
C-3c**

Note: Trip distribution and assignment obtained from the Dec. 2022 Gordon Mill TIS.



Traffic Impact Analysis

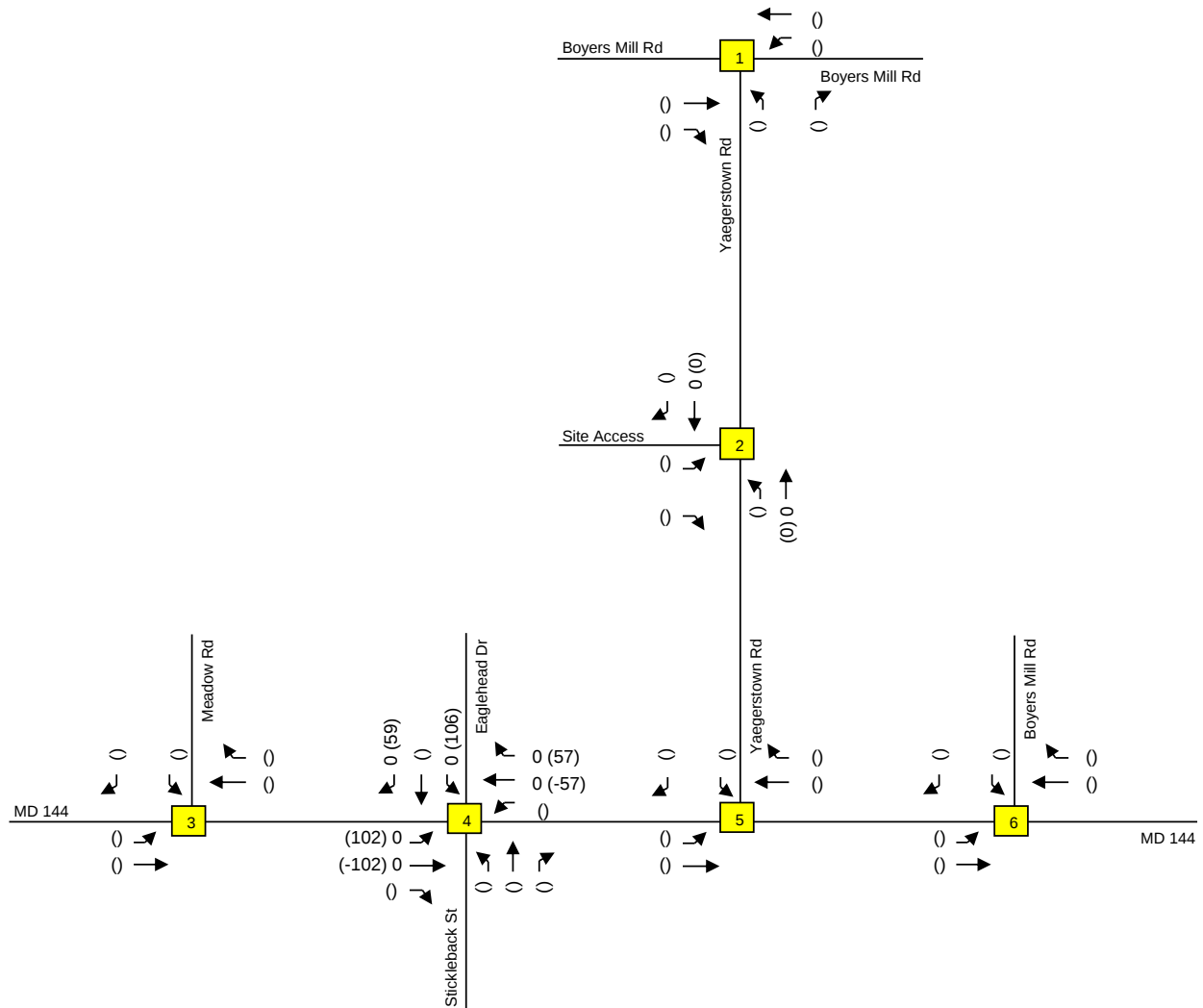
Lenhart Traffic Consulting, Inc.
Traffic Engineering & Transportation Planning

Background Trip Assignment Eaglehead - Town Center (Ret.)

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
C-3d**

Note: Trip distribution and assignment obtained from the Dec. 2022 Gordon Mill TIS.



Traffic Impact Analysis

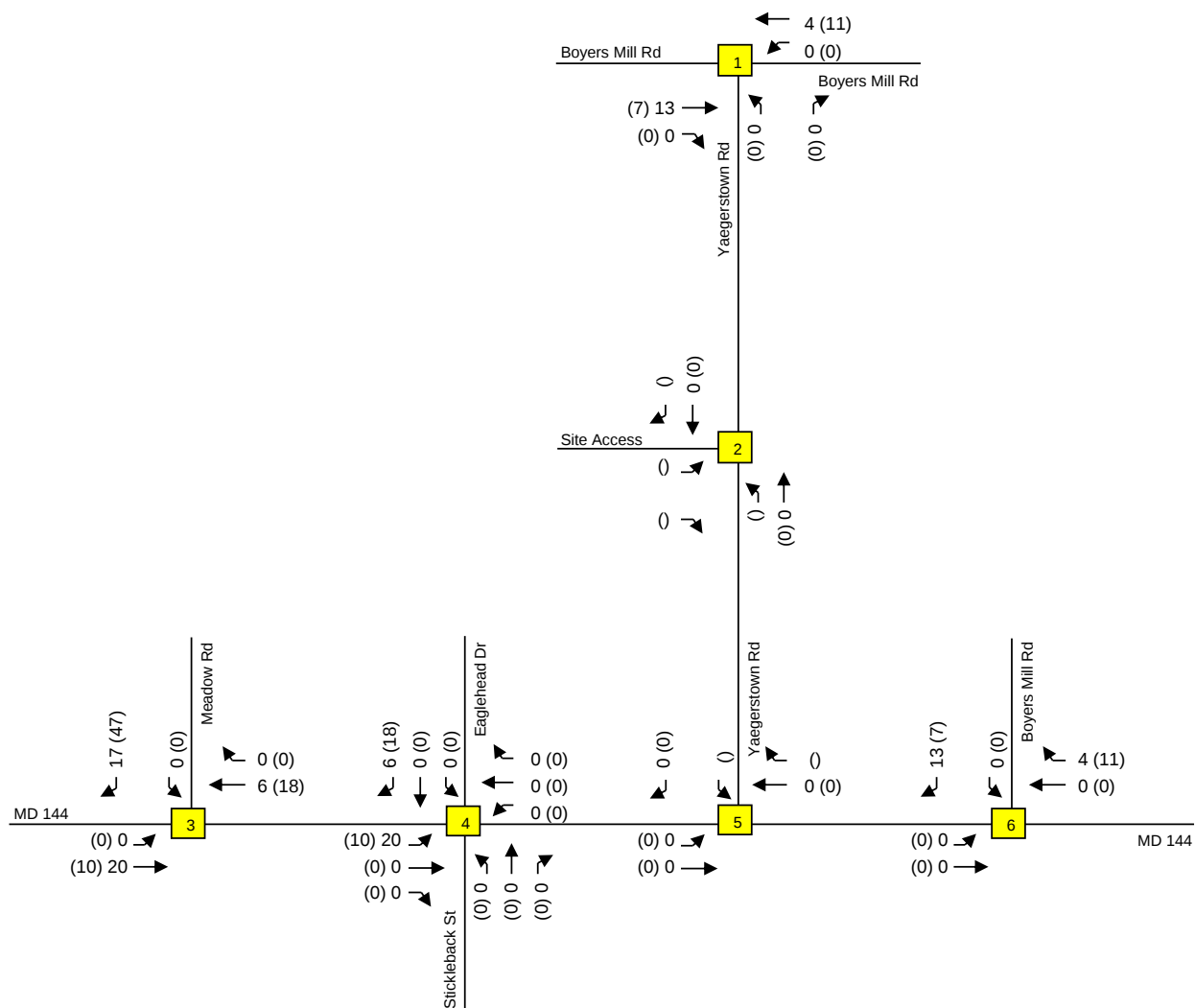
Lenhart Traffic Consulting, Inc.
Traffic Engineering & Transportation Planning

Background Trip Assignment Eaglehead - Town Center (Pass-by)

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
C-3e**

Note: Trip distribution and assignment obtained from the Dec. 2022 Gordon Mill TIS.



Traffic Impact Analysis

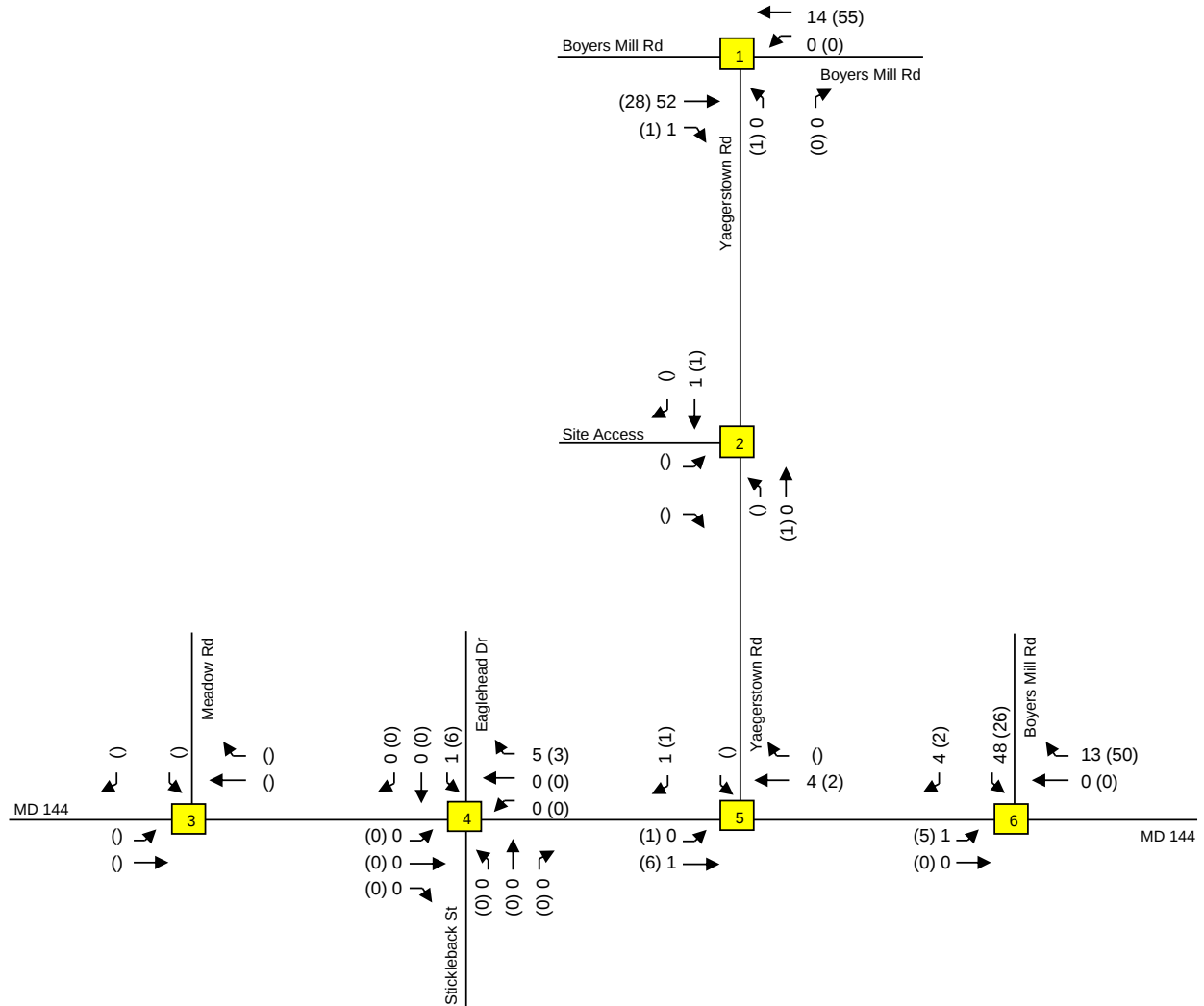
Lenhart Traffic Consulting, Inc.
Traffic Engineering & Transportation Planning

Background Trip Assignment Eaglehead - Westridge & Woolridge

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
C-3f**

Note: Trip distribution and assignment obtained from the Dec. 2022 Gordon Mill TIS.



Traffic Impact Analysis

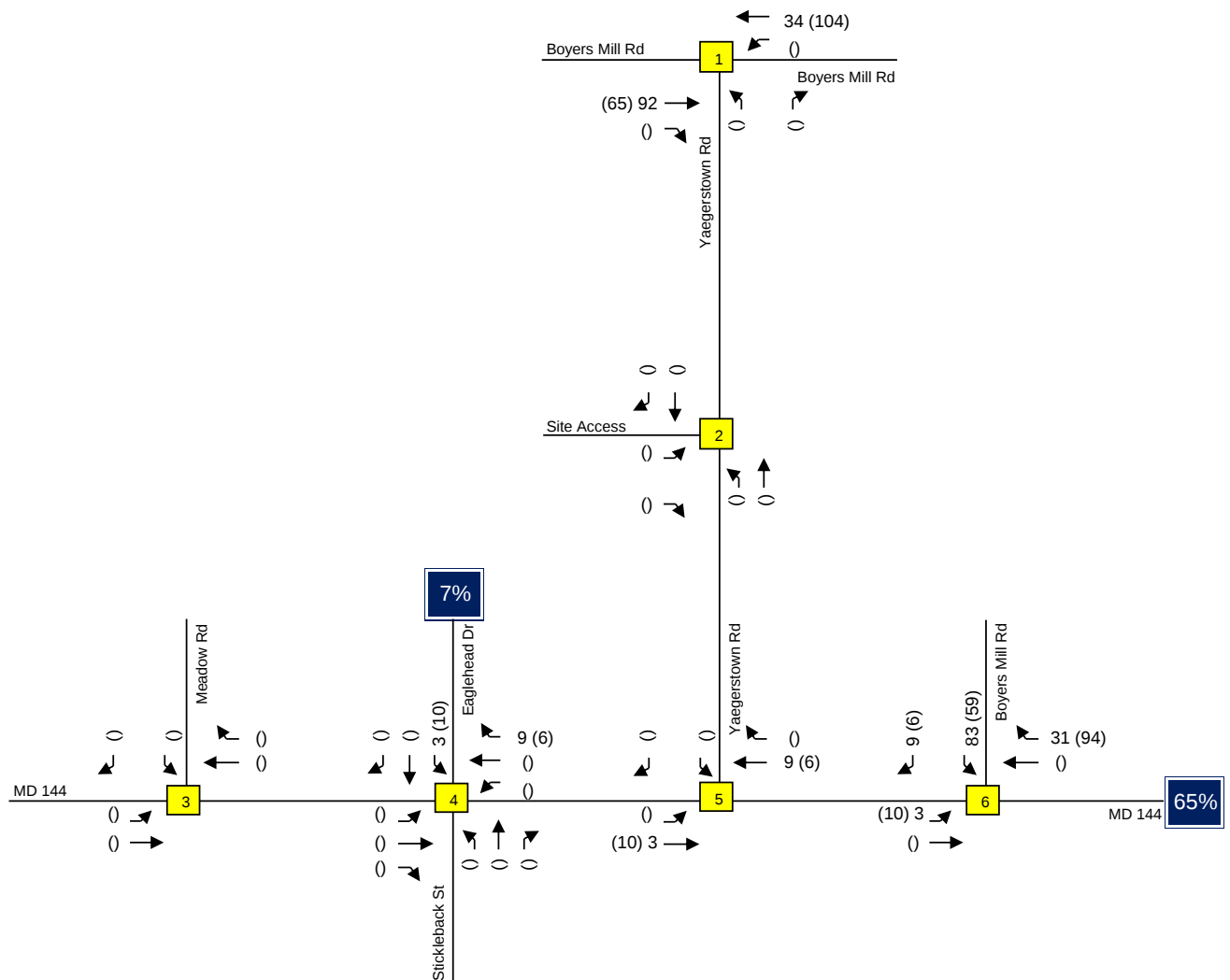
Lenhart Traffic Consulting, Inc.
Traffic Engineering & Transportation Planning

Background Trip Assignment

Eaglehead - Eaglestream, Nightingale, Aspen

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
C-3g**



Traffic Impact Analysis

Background Trip Assignment

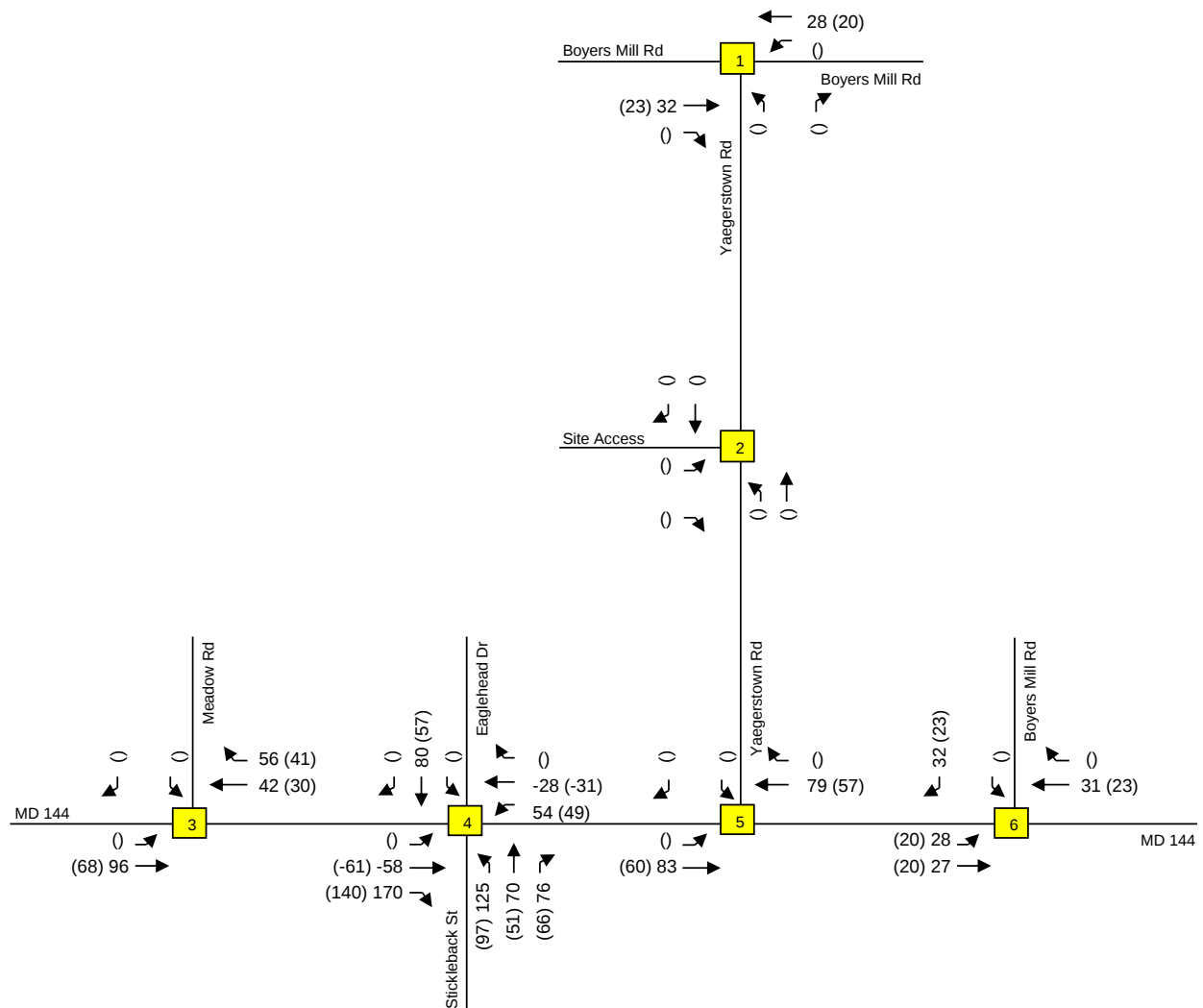
Aubudon Terrace, Meadows, Pinehurst, Westwinds

Lenhart Traffic Consulting, Inc.

Traffic Engineering & Transportation Planning

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
C-3h**



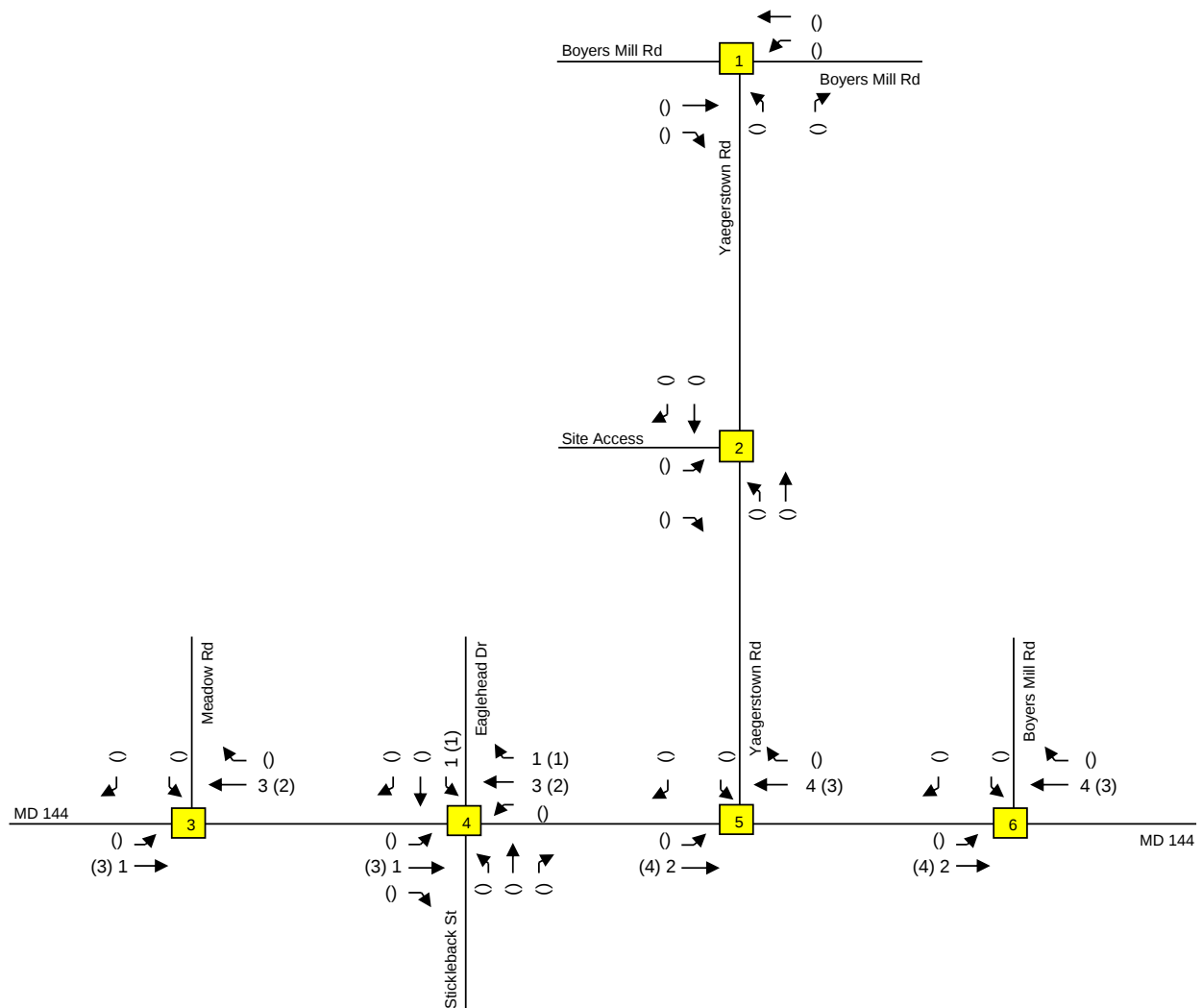
Traffic Impact Analysis

Lenhart Traffic Consulting, Inc.
Traffic Engineering & Transportation Planning

Background Trip Assignment New Market Retail Center

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
C-3i**



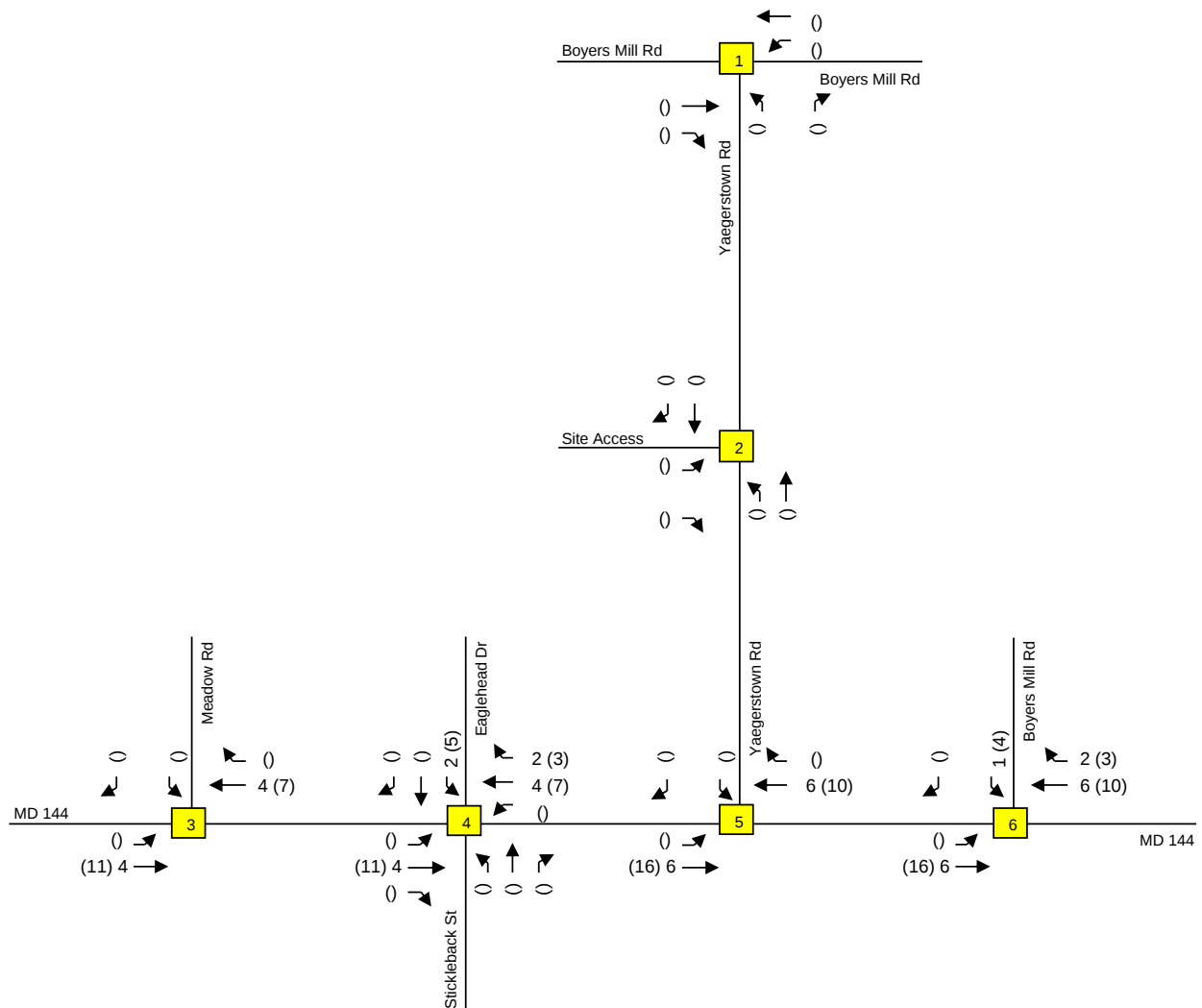
Traffic Impact Analysis

Lenhart Traffic Consulting, Inc.
Traffic Engineering & Transportation Planning

Background Trip Assignment Marley Commons

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
C-3j**



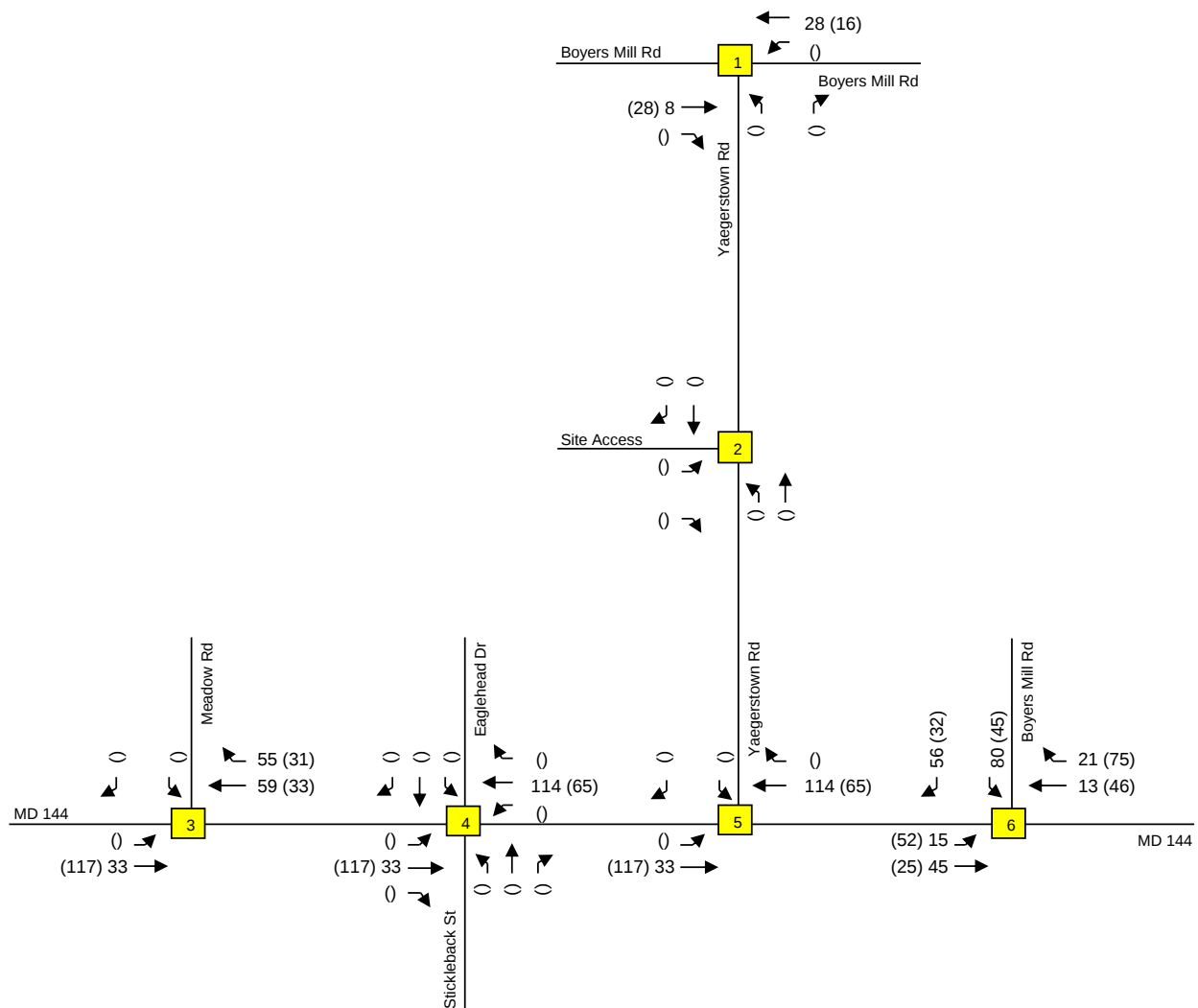
Traffic Impact Analysis

Lenhart Traffic Consulting, Inc.
Traffic Engineering & Transportation Planning

Background Trip Assignment 105/113 West Main

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
C-3k**



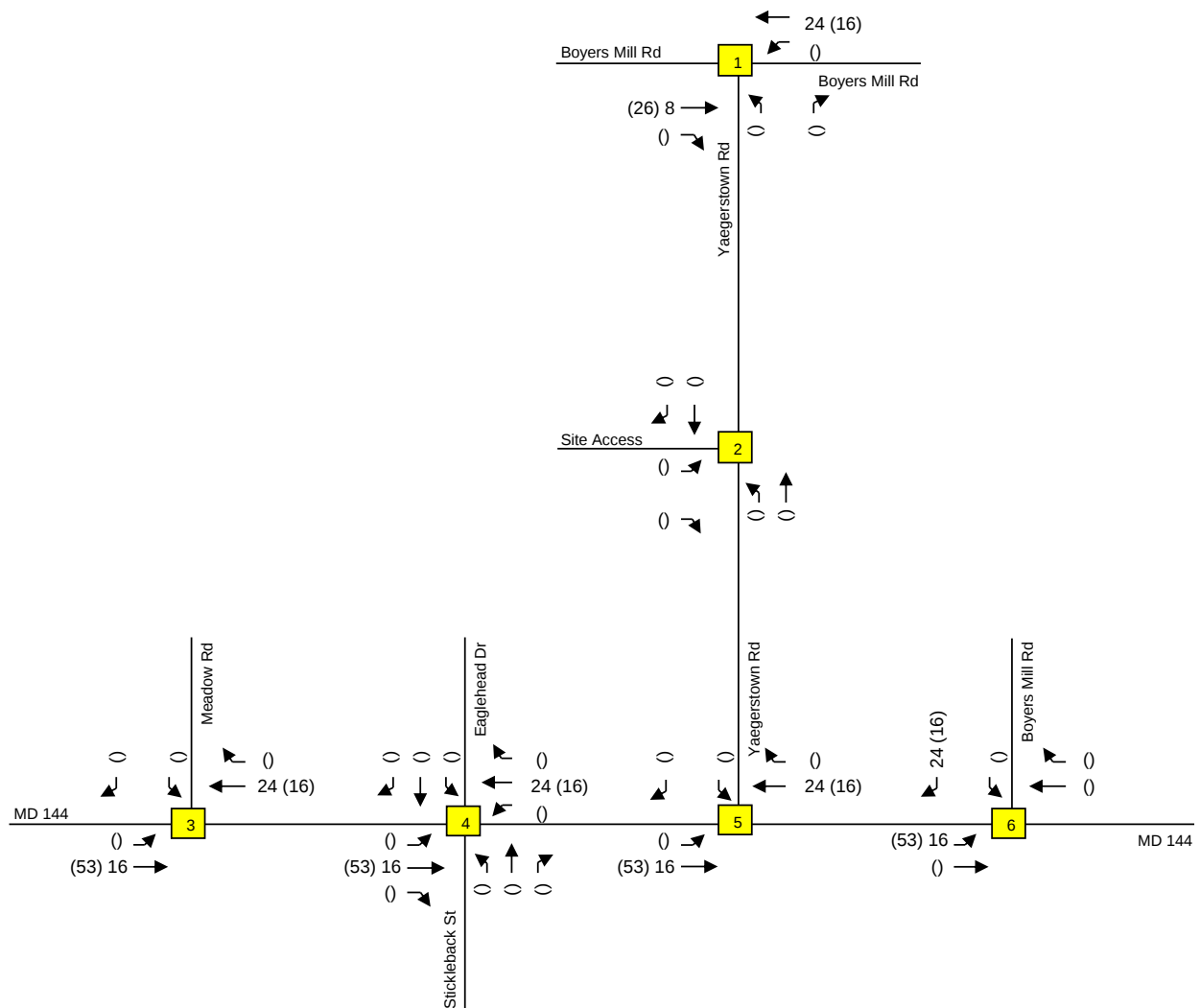
Traffic Impact Analysis

Lenhart Traffic Consulting, Inc.
Traffic Engineering & Transportation Planning

Background Trip Assignment Calumet

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
C-3I**



Traffic Impact Analysis

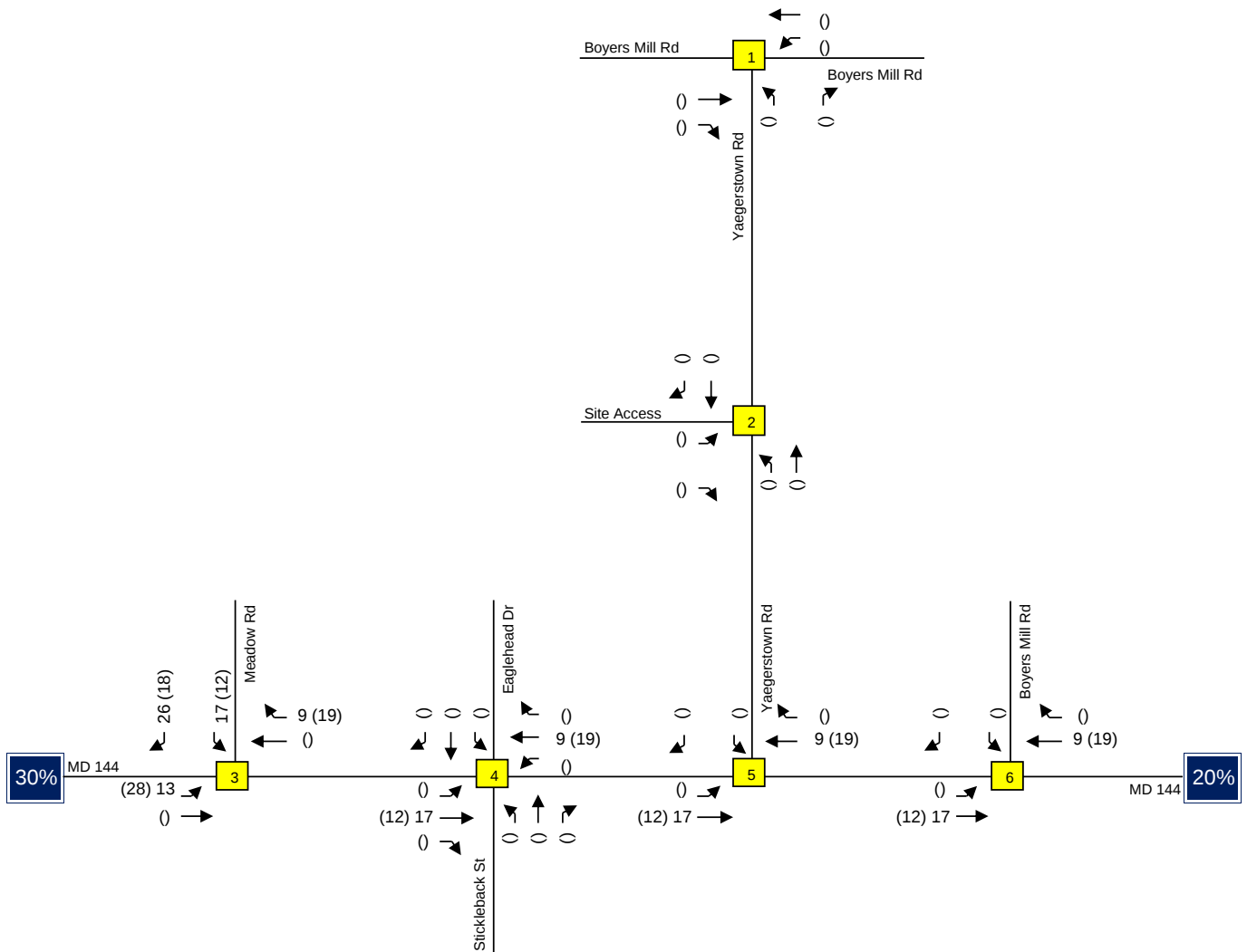
Background Trip Assignment Calumet

**Exhibit
C-3m**

Lenhart Traffic Consulting, Inc.
Traffic Engineering & Transportation Planning

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

Note: It is assumed that 50% of trips to/from the site are to/from the west along I-70, or to destinations north of the site. These trips will not pass through the study intersections.



Traffic Impact Analysis

Lenhart Traffic Consulting, Inc.
Traffic Engineering & Transportation Planning

Background Trip Assignment Cromwell

Key: xx = AM Peak Vol's (xx) = PM Peak Vol's

**Exhibit
C-3n**