June, 2019

TECHNICAL REPORT

EISENHOWER DRIVE EXTENSION

Traffic & Operational Alternatives Analysis

PennDOT ECMS Agreement: E00187 / Hanover Area Transportation Improvements / WO#12

Submitted to:
Pennsylvania Department of Transportation
Engineering District 8-0
2140 Herr Street
Harrisburg, PA 17103-1699

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EXECUTIVE SUMMARY

The Eisenhower Drive Extension Project consists of the proposed construction of a new roadway within Conewago Township (Adams County) from Carlisle Street (SR 0094) just north of Hanover Borough (York County) to Hanover Road (SR 0116) west of McSherrystown Borough (Adams County). The project area map shown in **Figure ES-1** depicts the approximate limits of the study area. The identified needs of the project are:

- Improve traffic congestion
- Improve vehicular and pedestrian safety
- Improve mobility and connectivity

There were four build alternatives and two sub-alternatives evaluated for the Opening Year (2022) and Design Year (2042). The alignment alternatives are presented in **Figure ES-2**. Conceptual alternatives were developed for a total of eight alignments. The conceptual alternatives included a No Build, a Transportation Systems Management (TSM) Alternative (Alternative 1), and Alternatives 2 through 7 which were new and/or partially new alignments. In addition, there were three sub-alternatives (A, B, and C) developed to address tie-in locations for the new alignment at the western edge of the project. The TSM Alternative evaluated capacity preserving and capacity adding improvements along the existing roadway network. The TSM Alternative, Alternative 3, Alternative 4, and Alternative 5 were carried forward, as well as sub-Alternatives B and C, and the remaining conceptual alternatives were dropped from further consideration. The operational impacts of alignment Alternative 4 and Alternative 5 affect the study area similarly and are presented as a single alternative. **Alternative 5 with sub-Alternative C is the preferred alternative**.

DATA COLLECTION & TRAFFIC VOLUMES

To effectively evaluate existing and future transportation conditions, the following data collection activities were completed:

- Manual Turning Movement Counts (TMC) and Automatic Traffic Recorder (ATR) Counts
- Origin-Destination (OD) Study
- Travel Time Study

Manual TMCs were performed during the morning and evening peak time periods at each study area intersection and ATR counts were conducted on key roadway links for a continuous 72-hours. A license plate matching OD study was conducted at seven intersections and included 10 turning movements. The travel time study was completed using the Floating Car Technique. The Floating Car Technique utilizes a vehicle that is driven like an "average or typical" vehicle in traffic. Both the OD survey and travel time study were conducted during the morning and evening peak hour time periods. A background growth rate was applied to the existing traffic volumes to determine both the Opening Year (2022) and Design Year (2042) no build traffic volumes. Utilizing the travel time study results, the origin-destination study data, and engineering judgement the no build traffic volumes were reassigned to the new alignment for each alternative to develop build scenario traffic volumes.

Morning and evening peak hour traffic volumes as well as Average Annual Daily Traffic (AADT) volumes were developed for existing conditions and the Opening Year (2022) and the Design Year (2042) no build and build scenarios. **Table ES-1** summarizes the AADT volumes for each scenario along key roadway links within the study area for the Design Year (2042). Values in green indicate that the traffic volumes along the link are anticipated to be less than the traffic volumes along the same link during the no build scenario and

red values indicate that traffic volumes are anticipated to increase during the build scenario. Changes in traffic volume are attributed to the new alignment.

Table ES-1 – Design Year (2042) Traffic Volume Summary[1]

Roadway	To/From	To/From	AADT			
			Existing (2015)	No Build/ TSM (2042)	Alt. 3 (2042)	Alt 4/5 (2042)
Eisenhower Dr (T679/Boro)	High St (TT535/Boro)	Carlisle St (SR 0094)	9,800	12,100	**17,400**	**17,400**
Hanover Rd (SR 0116) **(sub-Alt C)**	Littlestown Rd (SR 2019) /Bender Rd (T464)	Race Horse Rd (SR 2021) /Sunday Dr (T460)	10,600	13,200	**9,900**	**9,900**
Main St (SR 0116)	Centennial Rd (SR 2006)	Oxford Ave (SR 2008)/ 3rd St (SR 0116)	15,500	18,900	**12,500**	**11,600**
Elm Ave (SR 2008/SR 3098)	Oxford Ave (SR 2008) / 3rd St (SR 0116)	Carlisle St (SR 0094)	10,400	12,800	**10,900**	**10,900**
Carlisle St (SR 0094)	Eisenhower Dr (T679/Boro)	Elm Ave (SR 3098)	15,600	19,000	**14,400**	**14,400**
High St (T535/Boro)	Elm Ave (SR 3098)	Eisenhower Dr (T679/Boro)	10,600	13,000	**9,000**	**9,000**
Kindig Ln (T477/Boro)	Oxford Ave (SR 2008)	High St (T535/Boro)	5,500	6,800	**3,600**	**3,600**
Sunday Dr (T460) **(sub-Alt C)**	Hanover Rd (SR 0116)	Centennial Rd (SR 2006)	1,800	2,400	**7,800**	**7,800**
Sunday Dr (T460) **(sub-Alt B)**	Hanover Rd (SR 0116)	Centennial Rd (SR 2006)			**11,600**	**11,600**
Oxford Ave (SR 2008)	Main St (SR 0116) / Elm Ave (SR 3098)	Kindig Ln (T477/Boro)	7,100	8,800	**8,100**	**9,000**
Alignment	Church St (SR 2011)	Oxford Ave (SR 2008)	--	--	**12,200**	**12,100**

: Link along Alignment Alternative
Green : AADT less than No Build
Red : AADT greater than No Build
[1] All volumes reflect sub-Alternative C except where indicated.

As noted in **Table ES-1**, changes in traffic volumes due to the new alignment alternatives (Alternative 3, Alternative 4, and Alternative 5) are very similar. On average, each new alignment is projected to carry between 10,000 and 12,000 vehicles per day between Centennial Road (SR 2006) and High Street (T535/Boro). Additionally, traffic volumes along Carlisle Street (SR 0094), Hanover Road/Main Street (SR 0116), and High Street (T535/Boro) are expected decrease by approximately 4,000 vehicles per day each when compared to the No Build Scenario. Traffic volumes along Sunday Drive (T460) are anticipated to increase by 5,000 vehicles per day under sub-Alternative C and by 9,000 vehicles per day under sub-Alternative B when compared to the No Build Scenario. The increase in traffic along Sunday Drive (T460) is attributed to a shift in traffic originating from the Littlestown Borough area (SR 0194) and points southwest (SR 2005) that today utilize Hanover Pike (SR 0194) and Carlisle Street (SR 0094) to travel through the region. Carlisle Street (SR 0094) is anticipated to carry, on average, just over 14,000 vehicles per day and Main Street (SR 0116) in McSherrystown Borough is expected to carry between 11,000 and 13,000 vehicles per day under the build alternatives.

There are subtle differences in traffic volumes between each new alignment alternative. In Alternative 3, due to the northern position of the alignment, local traffic from McSherrystown Borough and southern Hanover Borough destined to the east and west are not expected to utilize the new alignment because of the additional travel time needed to access the alignment. However, there will be a slight shift of traffic from Edgegrove Road (SR 2008) to the new alignment because of travel time savings. Conversely, in Alternative 4/5, due to the southern location of the alignment, local traffic from McSherrystown Borough and southern Hanover Borough destined to the east and west are expected to utilize the new alignment because of the savings in travel time due to the proximity of access points of the alignment. Traffic from Edgegrove Road (SR 2008) will not shift to the new alignment because of longer travel times necessary to access the alignment.

PERFORMANCE MEASURES

For the No Build Scenario and each Design Year (2042) alternative the following performance measures were evaluated: **Level of Service**, **Travel Time and Travel Speed**, and **Safety**. It should be noted that there are currently no capacity adding capital improvements programmed within the study area that will impact future conditions, except for the adaptive signal installation project within Hanover Borough. This project was included in future year analysis.

Level of Service (LOS) is a quantitative performance measure that represents the quality of service being provided along a roadway or at an intersection. The measures used to determine LOS for transportation system elements are called service measures. The Highway Capacity Manual (HCM) defines six levels of service, ranging from A to F. LOS A represents the best operating conditions from a traveler's perspective and LOS F represents the worst. Typically, roadways are not designed to operate at LOS A during peak conditions, but instead provide a lower LOS that balances costs and other impacts. In this area, non-rural, LOS A through LOS D is considered acceptable operation and unacceptable operation is considered LOS E and LOS F. The roadway network was evaluated using Synchro plus SimTraffic (Trafficware, LLC) software (Version 10) which utilizes the methodologies outlined in the HCM. **Table ES-2** summarizes the levels of service for each study area intersection for each scenario.

Table ES-2 – Design Year (2042) Level of Service Summary[1]

#	Intersection	Existing (2015)	No Build (2042)	TSM (2042)	Alt. 3 (2042)	Alt 4/5 (2042)
1	Oxford Avenue (SR 2008)/3rd Street (SR 0116) & Main Street (SR 0116)/Elm Avenue (SR 2008)	🟢	🔴	🟡	🟢	🟢
2	Centennial Road (SR 2006) & Main Street (SR 0116)	🟢	🟢	🟢	🟢	🟢
3C	Sunday Drive (T460)/Race Horse Road (SR 2021) & Main Street (SR 0116) (**sub-Alt C**)	🟢	🟢	🟢	🟢	🟢
3B	Sunday Drive (T460)/Race Horse Road (SR 2021) & Main Street (SR 0116) **(sub-Alt B)**				🟢	🟢
4	5th Street (Boro) & Main Street (SR 0116)	🔴	🔴	🟢	🔴	🔴
5	2nd Street (SR 2011) & Main Street (SR 0116)	🔴	🔴	🟢	🔴	🔴
6	High Street (T535/Boro) & Kindig Lane (T477/Boro)	🔴	🔴	🟢	🟢	🟢
7	High Street (T535/Boro) & Elm Avenue (SR 3098)	🟢	🟢	🟢	🟢	🟢
8	Church Street (SR 2011) & Edgegrove Road (SR 2008)	🟢	🟢	🟢	🟢	🟢
9	Oxford Avenue (SR 2008) & Kindig Lane (T477/Boro)	🟡	🔴	🟢	🟡	🟡

#	Intersection	Existing (2015)	No Build (2042)	TSM (2042)	Alt. 3 (2042)	Alt 4/5 (2042)
10	Oxford Avenue (SR 2008/T476) & Edgegrove Road (SR 2008)	●	●	●	●	●
11	Centennial Road (SR 2006) & Sunday Drive (T460)/Alignment	●	●	●	●	●
12	Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116)	●	●	●	●	●
13	Bender Road (T464) & Geiselman Road (T478)	●	●	●	●	●
14	Centennial Road (SR 2006) & Bender Road (T464)	●	●	●	●	●
15	High Street (T535/Boro) & Eisenhower Drive (T679/Boro)	●	●	●	●	●
16	Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro)	●	●	●	●	●
17	Carlisle Street (SR 0094) & Elm Avenue (SR 3098)	●	●	●	●	●
18	Geiselman Road (T478) & Hanover Road (SR 0116)	●	●	●	●	●
20	Oxford Avenue (SR 2008) & Alignment	--	--	--	●	●
21	Church Street (SR 2011) & Alignment	--	--	--	●	●
22C	Sunday Drive (T460) & Alignment (**sub-Alt C**)	--	--	--	●	●
23C	Hanover Road (SR 0116) & Alignment (**sub-Alt C**)	--	--	--	●	●

: Intersection along Alignment Alternative
● : Level of Service A, B, or C (acceptable)
● : Level of Service D (acceptable)
● : Level of Service E or F (unacceptable)
Refer to **LOS Summary Tables in **Appendix B** for detailed information

During the Design Year (2042) No Build Scenario, traffic delay is anticipated to increase significantly within McSherrystown Borough. At the unsignalized intersections along Main Street (SR 0116), the side street delay is anticipated to be approximately seven minutes per vehicle during the evening peak hour time period. At the signalized intersection of Oxford Avenue (SR 2008)/3rd Street (SR 0116) & Main Street (SR 0116)/Elm Avenue (SR 2008) the northbound left turn movement is expected to experience a delay of over one minute per vehicle. While not as severe, delay is anticipated to increase at the intersections in and around Hanover Borough. Failing conditions are expected at the intersection of High Street (T535/Boro) and Kindig Lane (T477/Boro) during both the morning and evening peak hour time periods. During the evening peak hour at Eisenhower Drive (T679/Boro) and High Street (T477/Boro) both the northbound and westbound approaches are anticipated to operate at unacceptable levels of service. At the intersection of Carlisle Street (SR 0094) and Eisenhower Drive (T679/Boro) there are multiple turning movements that are expected to operate at unacceptable levels of service during both the morning and evening peak hours. Although the overall intersection level of service is acceptable at Carlisle Street (SR 0094) and Elm Avenue (SR 3098) individual turning movements during the evening peak hour are anticipated to operate at unacceptable levels of service.

In the TSM Alternative, capacity and signal improvements were implemented to attain a LOS D or better for all turning movements. However, at the intersection of Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116), the northbound and southbound approaches are anticipated to operate at unacceptable levels of service during the evening peak hour. Additionally, at the intersection of Carlisle Street (SR 0094) and Eisenhower Drive (T679/Boro) there are individual lane groups operate at LOS E; but all approaches operate a LOS D. **Figure ES-3** provides the regional overview of the recommended improvements for the TSM Alternative.

All three new alignment alternatives (Alternative 3 and Alternative 4/5) are anticipated to significantly improve operations at existing intersections within the study area. Overall, all signalized intersections, including all individual lane groups/turning movements, are projected to operate at LOS D or better during both the morning and evening peak hours except at the intersection of Carlisle Street (SR 0094) and Eisenhower Drive (T679/Boro). Similar to the TSM Alternative, there are individual lane groups that are anticipated to operate at LOS E. However, vehicle delay is projected to be less than 60 second per vehicle and all approaches will operate at LOS D. The unsignalized intersections in McSherrystown Borough, 2nd Street (SR 2011) and 5th Street (Boro), will continue to operate at unacceptable levels of service during both the morning and evening peak hour time periods. However, the side-street delay is projected to be comparable to the delay currently experienced at these intersections. For either of the alignment scenarios, at the intersection of Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116), the northbound and southbound approaches are anticipated to operate at unacceptable levels of service during the evening peak hour. **Figure ES-4** and **Figure ES-5** shows a regional overview of the recommended improvements for Alternative 3 and Alternative 4/5, respectively.

Utilizing SimTraffic (Trafficware, LLC) software (Version 10) the travel time and travel speeds were determined for both the morning and evening peak hour time periods and averaged. **Table ES-3** compares the travel time during the evening peak hour (worse case) for the trip from the intersection of Carlisle Street (SR 0094) and Eisenhower Drive (T679/Boro) to the intersection of Hanover Road (SR 0116) and Bender Road (T464)/Littlestown Road (SR 2019) along the existing travel path to the same trip utilizing the new alignment.

Table ES-3 – Design Year (2042) Travel Time Summary

Trip	From	To	Existing (2015)[1]	No Build (2042)	TSM (2042)	Alt. 3 (2042)	Alt. 4/5 (2042)
Eisenhower Dr (T679/Boro), High St (T535/Boro), Elm Ave (SR 3098/SR 2008), Main St/Hanover Rd (SR 0116)	Carlisle St (SR 0094)	Littlestown Rd (SR2019)/Bender Rd (T464)	12:54 (27)	26:58 (20)	**18:40 (24)**	**13:14 (25)**	**15:17 (25)**
Alignment	Carlisle St (SR 0094)	Littlestown Rd (SR2019)/Bender Rd (T464)	--	--	--	**06:29 (31)**	**06:10 (31)**

12:52 (28) : Travel Time (mm:ss) (Travel Speed (mph)
Green : Travel Time less than No Build
Red : Travel Time greater than No Build
[1]Existing (2015) : Actual Travel Time and Travel Speed (Field measured)
**Trip is from the intersection of Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro) to Hanover Road (SR 0116) and Littlestown Road (SR 2019)/Bender Road (T464)
Travel Times represent worst case

Travel from one end of the study area to the other will take on average approximately 19 minutes at a travel speed of 24 mph during the TSM Alternative. This trip under Alternative 3 will be approximately 13 minutes and 14 seconds which is a reduction in travel time of about 13 minutes when compared to the No Build Scenario. Similarly, in Alternative 4/5, the travel time along the existing travel path is projected to be approximately 15 minutes and 17 seconds; about two minutes longer than Alternative 3. The difference can be attributed to the local traffic from McSherrystown Borough traveling north to access the alignment under Alternative 4/5 (turning traffic). However, the same trip along a new alignment will take approximately 6-7 minutes which is a travel time savings of almost 20

minutes when compared to the No Build Scenario and approximately seven to ten minutes faster than the existing travel path in each of the alignment alternatives.

To predict the impacts to safety in Design Year 2042 a Highway Safety Manual (HSM) analysis was conducted for the proposed alternatives: No Build, TSM, Alternative 3, and Alternative 4/5. Similar to how the HCM evaluates how design elements impact operations the HSM evaluates how design elements impact safety. The analysis was performed utilizing the Department's HSM Safety Analysis Tool. **Table ES-4** summarized the results of the HSM analysis by roadway and by future scenario.

Table ES-4 – Design Year (2042) Highway Safety Analysis Summary[1]

Roadway	No Build (2042)	TSM (2042)	Alternative 3		Alternative 4/5	
			Sub-Alt B	Sub-Alt C	Sub-Alt B	Sub-Alt C
Carlisle St (SR 0094)	91.4	101.8	78.6	78.6	78.6	78.6
Hanover Rd/Main St/Oxford Ave (SR 0116)	79.2	78.4	63.2	63.7	61.1	61.6
Centennial Rd/3rd St (SR 2006)	16.0	16.0	13.4	13.4	13.0	13.0
Edgegrove Rd/Oxford Ave/Elm Ave (SR 2008)	28.6	28.3	25.4	25.4	25.9	25.9
Church St/2nd St (SR 2011)	4.0	4.0	5.0	5.0	4.8	4.8
Race Horse Rd (SR 2021)	1.2	1.2	1.6	1.6	1.6	1.6
Elm Ave (SR 3098)	19.8	19.8	17.9	17.9	17.9	17.9
Sunday Dr (T460)	1.2	1.2	--	1.9	--	1.9
Eisenhower Dr (T679/Boro)	4.4	4.4	--	--	--	--
High St (T535/Boro)	31.2	30.6	21.2	21.2	21.2	21.2
Kindig Ln (T477)	5.0	5.0	3.0	3.0	3.0	3.0
Alignment	--	--	31.5	36.7	30.9	36.1
Total	**282.0**	**290.7**	**260.7**	**268.3**	**258.1**	**265.7**

Total crashes **greater than** No Build Conditions:
Total crashes **less than** No Build Conditions:

[1] Displayed in **crashes per year**

During the Build Scenario for all alternatives except the TSM Alternative, the predicted number of crashes is expected to decrease by approximately 10 percent even though there is approximately 3.5 miles of new roadway and up to five new intersections being proposed. This decrease is attributed to the shift of traffic from the existing roadway network, which consists of on-street parking, a significant number of driveways/access points, and narrow or non-existent clear zones, to a new alignment that incorporates 12-foot travel lanes, standard width shoulders, and clear zones. Sub-Alternative B provides a slightly better crash performance than sub-Alternative C, which is due to the additional lane-miles and new intersections introduced by sub-Alternative C. Crashes are predicted to increase by approximately three percent in the TSM Alternative. This is primarily due to the additional lane miles needed along Carlisle Street (SR 0094).

PREFERRED ALTERNATIVE & IMPROVEMENT SUMMARY

The preferred alternative is Alternative 5 with sub-Alternative C. Although the traffic-based metrics are similar to Alternative 3 with sub-Alternative C; a southern alignment allows for more traffic to shift from Main Street/Hanover Road (SR 0116) in McSherrytown Borough. Sub-Alternative C is preferred because it minimizes increased traffic along Sunday Drive (T460) and eliminates the off-alignment improvements that would be required at Sunday Drive (T460)/Race Horse Road (SR 2021) and Main Street (SR 0116). A summary of the proposed improvements for all build alternatives is provided in **Table ES-5**.

Table ES-5 – Improvement Summary

#	Intersection	TSM Alternative	Alternative 3	Alternative 4/5
1	Oxford Avenue (SR 2008)/3rd Street (SR 0116) & Main Street (SR 0116)/Elm Avenue (SR 2008)	• Construct additional EB through lane • Construct additional WB through lane • Construct EB left turn lane • Construct WB left turn lane • Construct SB left turn lane • Reconstruct existing signal	--	--
2	Centennial Road (SR 2006) & Main Street (SR 0116)	--	--	--
3C	Sunday Drive (T460)/Race Horse Road (SR 2021) & Main Street (SR 0116) (**sub-Alt C**)	--	--	--
3B	Sunday Drive (T460)/Race Horse Road (SR 2021) & Main Street (SR 0116) **(sub-Alt B)**	--	• Construct NB left turn lane • Construct EB left turn lane • Construct WB left turn lane	• Construct NB left turn lane • Construct EB left turn lane • Construct WB left turn lane
4	5th Street (Boro) & Main Street (SR 0116)	• Install new traffic signal	• Monitor location	• Monitor location
5	2nd Street (SR 2011) & Main Street (SR 0116)	• Install new traffic signal	• Monitor location	• Monitor location
6	High Street (T535/Boro) & Kindig Lane (T477/Boro)	• Install new traffic signal	--	--
7	High Street (T535/Boro) & W Elm Avenue (SR 3098)	--	--	--
8	Church Street (SR 2011) & Edgegrove Road (SR 2008)	--	--	--
9	Oxford Avenue (SR 2008) & Kindig Lane (T477/Boro)	• Convert to all-way stop controlled	--	--
10	Oxford Avenue (SR 2008/T476) & Edgegrove Road (SR 2008)	--	--	--

#	Intersection	TSM Alternative	Alternative 3	Alternative 4/5
11	Centennial Road (SR 2006) & Sunday Drive (T460)/Alignment	--	• Install new traffic signal • Construct EB left turn lane • Construct WB left turn lane **Or** - Consider roundabout	• Install new traffic signal • Construct EB left turn lane • Construct WB left turn lane **Or** - Consider roundabout
12	Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116)	• Monitor location	• Monitor location	• Monitor location
13	Bender Road (T464) & Geiselman Road (T478)	--	--	--
14	Centennial Road (SR 2006) & Bender Road (T464)	--	--	--
15	High Street (T535/Boro) & Eisenhower Drive (T679/Boro)	• Install new traffic signal • Construct SB left turn lane • Channelize NB right turn w/ yield	• Install new traffic signal • Construct NB left turn lane • Construct SB left turn lane • Construct EB left turn lane • Construct WB left turn lane	• Install new traffic signal • Construct NB left turn lane • Construct SB left turn lane • Construct EB left turn lane • Construct WB left turn lane
16	Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro)	• Revise existing signal timings • Monitor location	• Revise existing signal timings • Monitor location	• Revise existing signal timings • Monitor location
17	Carlisle Street (SR 0094) & E Elm Avenue (Boro)/W Elm Avenue (SR 3098)	• Construct additional NB through lane • Construct additional SB through lane • Reconstruct existing signal	--	--
18	Geiselman Road (T478) & Hanover Road (SR 0116)	--	--	--

#	Intersection	TSM Alternative	Alternative 3	Alternative 4/5
20	Oxford Avenue (SR 2008) & Alignment	--	• Install new traffic signal • Construct NB left turn lane • Construct SB left turn lane • Construct EB left turn lane • Construct WB left turn lane **Or** - Consider roundabout	• Install new traffic signal • Construct NB left turn lane • Construct SB left turn lane • Construct EB left turn lane • Construct WB left turn lane **Or** - Consider roundabout
21	Church Street (SR 2011) & Alignment	--	• Two-way stop controlled • Construct EB left turn lane • Construct WB left turn lane **Or** - Consider roundabout	• Two-way stop controlled • Construct EB left turn lane • Construct WB left turn lane **Or** - Consider roundabout
22C	Sunday Drive (T460) & Alignment (**sub-Alt C**)	--	• Stop controlled (Sunday Drive (T460) • Construct channelized NB right turn • Construct WB left turn lane	• Stop controlled (Sunday Drive (T460) • Construct channelized NB right turn • Construct WB left turn lane
23C	Hanover Road (SR 0116) & Alignment (**sub-Alt C**)	--	• Install new traffic signal • Construct WB left turn lane **Or** - Consider roundabout	• Install new traffic signal • Construct WB left turn lane **Or** - Consider roundabout

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FIGURE ES-1

SITE LOCATION MAP

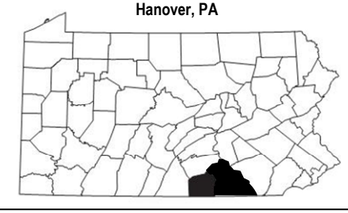
Eisenhower Drive Extension

LEGEND

: Study Area

REGIONAL SETTING

Hanover, PA



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Agreement: PennDOT / E00187

FIGURE ES-2

ALIGNMENT ALTERNATIVES

REGIONAL OVERVIEW

Eisenhower Drive Extension

LEGEND

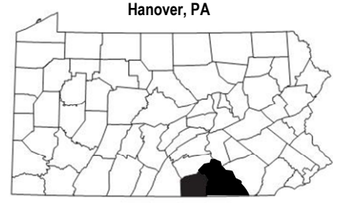
5 : Alignment Alternative

: Proposed Access Point

TSM = Transportation Systems Management

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

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Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro)
- Revise existing signal timings
- Monitor location

High Street (T535/Boro) & Eisenhower Drive (T679/Boro)
- Install new traffic signal
- Construct SB left turn lane
- Channelize NB right turn w/ yield

Oxford Avenue (SR 2008) & Kindig Lane (T477/Boro)
- Convert to all-way stop controlled

High Street (T535/Boro) & Kindig Lane (T477/Boro)
- Install new traffic signal

Main Street (SR 0116) & 5th Street (Boro)
- Install new traffic signal

Main Street (SR 0116) & 2nd Street (SR 2011)
- Install new traffic signal

Elm Avenue (SR 3098) & Carlisle Street (SR 0094)
- Construct additional NB through lane
- Construct additional SB through lane
- Reconstruct existing signal

Main Street (SR 0116) & Oxford Avenue (SR 2008)
- Construct additional EB through lane
- Construct additional WB through lane
- Construct EB left turn lane
- Construct WB left turn lane
- Construct SB left turn lane
- Reconstruct existing signal

Hanover Road (SR 0116) & Littlestown Road (SR 2019)/ Bender Road (T464)
- Monitor location

Hanover
McSherrystown
Eisenhower Drive (T679/Boro)
High Street (T535/Boro)
Carlisle Street (SR 0094)
94
E. Elm Avenue (Boro)
W. Elm Avenue (SR 3098)
W. Elm Avenue (SR 2008)
Kindig Lane (T477/Boro)
Oxford Avenue (T476)
Oxford Avenue (SR 2008)
Edgegrove Road (SR 2008)
Church Street (SR 2011)
Centennial Road (SR 2006)
Main Street (SR 0116)
3rd Street (SR 0116)
2nd Street (Boro)
5th Street (Boro)
Bender Road (T464)
Sunday Drive (T460)
Geiselman Road (T478)
Hanover Road (SR 0116)
Littlestown Road (SR 2019)
Race Horse Road (SR 2021)
Adams County
York County
116
STOP
TSM

Agreement: PennDOT / E00187

FIGURE ES-3

TSM ALTERNATIVE RECOMMENDED IMPROVEMENTS

REGIONAL OVERVIEW

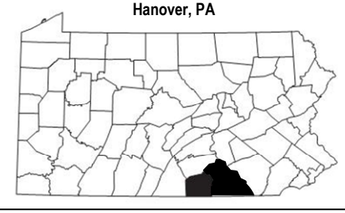
Eisenhower Drive Extension

LEGEND

- : Existing Traffic Signal
- : New/Reconstructed Traffic Signal
- : All-way Stop
- : Limits of widening
- 5 : Alignment Alternative

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

Date: June 14, 2019

High Street (T535/Boro) & Eisenhower Drive (T679/Boro)
- Install new traffic signal
- Construct NB left turn lane
- Construct SB left turn lane
- Construct EB left turn lane
- Construct WB left turn lane

Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro)
- Revise existing signal timings
- Monitor location

Oxford Avenue (SR 2008) & Alignment
- Install new traffic signal
- Construct NB left turn lane
- Construct SB left turn lane
- Construct EB left turn lane
- Construct WB left turn lane

Church Street (SR 2011) & Alignment
- Two-way stop controlled
- Construct EB left turn lane
- Construct WB left turn lane

Centennial Road (SR 2006) & Sunday Drive (T460)/Alignment
- Install new traffic signal
- Construct EB left turn lane
- Construct WB left turn lane

Sunday Drive (T460) & Alignment (sub-Alternative C only)
- Stop controlled (Sunday Drive (T460))
- Construct channelized NB right turn
- Construct WB left turn lane

Hanover Road (SR 0116) & Littlestown Road (SR 2019)/ Bender Road (T464)
- Monitor location

Hanover Road (SR 0116) & Alignment (sub-Alternative C only)
- Install new traffic signal
- Construct WB left turn lane

Main Street (SR 0116) & Race Horse Road (SR 2021)/ Sunday Drive (T460) (sub-Alternative B only)
- Construct NB left turn lane
- Construct EB left turn lane
- Construct WB left turn lane
- Reconstruct existing signal

Main Street (SR 0116) & 5th Street (Boro)
- Monitor location

Main Street (SR 0116) & 2nd Street (Boro)
- Monitor location

Consider a roundabout at the following locations:
- Oxford Avenue (SR 2008) & Alignment
- Church Street (SR 2011) & Alignment
- Centennial Road (SR 2006) & Alignment
- Hanover Road (SR 0116) & Alignment (sub-Alt C only)

Agreement: PennDOT / E00187

FIGURE ES-4

ALTERNATIVE 3 RECOMMENDED IMPROVEMENTS

REGIONAL OVERVIEW

Eisenhower Drive Extension

LEGEND

: Existing Traffic Signal
: New/Reconstructed Traffic Signal
: All-way Stop
: Limits of widening
: Alignment Alternative

REGIONAL SETTING

Hanover, PA

JMT Project Number: 02-0308-012

Date: June 14, 2019

High Street (T535/Boro) & Eisenhower Drive (T679/Boro)
- Install new traffic signal
- Construct NB left turn lane
- Construct SB left turn lane
- Construct EB left turn lane
- Construct WB left turn lane

Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro)
- Revise existing signal timings
- Monitor location

Oxford Avenue (SR 2008) & Alignment
- Install new traffic signal
- Construct NB left turn lane
- Construct SB left turn lane
- Construct EB left turn lane
- Construct WB left turn lane

Church Street (SR 2011) & Alignment
- Two-way stop controlled
- Construct EB left turn lane
- Construct WB left turn lane

Centennial Road (SR 2006) & Sunday Drive (T460)/Alignment
- Install new traffic signal
- Construct EB left turn lane
- Construct WB left turn lane

Sunday Drive (T460) & Alignment (sub-Alternative C only)
- Stop controlled (Sunday Drive (T460))
- Construct channelized NB right turn
- Construct WB left turn lane

Hanover Road (SR 0116) & Littlestown Road (SR 2019)/ Bender Road (T464)
- Monitor location

Hanover Road (SR 0116) & Alignment (sub-Alternative C only)
- Install new traffic signal
- Construct WB left turn lane

Main Street (SR 0116) & Race Horse Road (SR 2021)/ Sunday Drive (T460) (sub-Alternative B only)
- Construct NB left turn lane
- Construct EB left turn lane
- Construct WB left turn lane
- Reconstruct existing signal

Main Street (SR 0116) & 5th Street (Boro)
- Monitor location

Main Street (SR 0116) & 2nd Street (Boro)
- Monitor location

Consider a roundabout at the following locations:
- Oxford Avenue (SR 2008) & Alignment
- Church Street (SR 2011) & Alignment
- Centennial Road (SR 2006) & Alignment
- Hanover Road (SR 0116) & Alignment (sub-Alt C only)

Agreement: PennDOT / E00187

FIGURE ES-5

ALTERNATIVE 4 & 5 RECOMMENDED IMPROVEMENTS

REGIONAL OVERVIEW

Eisenhower Drive Extension

LEGEND

: Existing Traffic Signal

: New/Reconstructed Traffic Signal

: All-way Stop

: Limits of widening

: Alignment Alternative

REGIONAL SETTING

Hanover, PA

JMT Project Number: 02-0308-012

1. INTRODUCTION

The Eisenhower Drive Extension Project consists of the proposed construction of a new roadway within Conewago Township (Adams County) between Carlisle Street (SR 0094) just north of Hanover Borough (York County) and Hanover Road (SR 0116) west of McSherrystown Borough (Adams County). The project area map shown in **Figure 1 (Appendix A)** depicts the approximate limits of the study area.

The proposed project was identified in the Hanover Area Transportation Planning Study, which was prepared for the Pennsylvania Department of Transportation (PennDOT or Department) in 1997. This study established a recommended transportation improvement program which included several key projects aimed at addressing the transportation needs in the area. The development of the region has been consistent with the anticipated growth that was defined in the study and the overall needs have remained the same for the past 20 plus years. The identified needs of the project are:

- Improve traffic congestion
- Improve vehicular and pedestrian safety
- Improve mobility and connectivity

The purpose of this project is to facilitate safe and efficient multi-modal travel within the study area to meet both the current and future transportation needs of the area. The transportation improvements associated with this project are anticipated to reduce congestion and accommodate planned growth within the region, including truck and commuter traffic. A secondary purpose of the project is to provide a functional and modern roadway that maximizes current design criteria and promotes and enhances multi-modal connections and alternative transportation.

This technical report documents the traffic, operations, and safety analysis performed and includes the recommended improvements needed to provide acceptable levels of service within the study area. Analysis and documentation include an Existing Conditions scenario, a No Build scenario, and four Build scenarios, including a Transportation Systems Management (TSM) Alternative for both the Opening Year (2022) and the Design Year (2042).

2. EXISTING CONDITIONS

2.1. STUDY AREA

The study area for the project is primarily located within Conewago Township and McSherrystown Borough in Adams County and Hanover Borough, York County. Regionally, the study area is situated in south-central Pennsylvania approximately 10 miles north of the Maryland border between Gettysburg Borough and York City. The project area is generally bound by Carlisle Street (SR 0094) in the east, Hanover Road/Main Street (SR 0116) in the south, Bender Road (T464) in the west, and Edgegrove Road (SR 2008) in the north. Land uses within the study area range from high density residential to commercial, industrial, and agricultural. Additionally, Hanover Borough is one of the largest urbanized areas within Pennsylvania not directly served by the Interstate highway system. This section provides an overview of the intersections and roadways within the study area.

2.1.1. Intersections

The study area includes 11 unsignalized and six signalized intersections within the existing network. The following intersections and their corresponding traffic control devices are listed below:

- Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro) (Signal controlled)
- Carlisle Street (SR 0094) & Elm Avenue (SR 3098) (Signal controlled)
- Hanover Road (SR 0116) & Littlestown Road (SR 2019)/Bender Road (T464) (Two-way stop controlled)
- Hanover Road (SR 0116) & Race Horse Road (SR 2021)/Sunday Drive (T460) (Signal controlled)
- Main Street (SR 0116) & Centennial Road (SR 2006) (Signal controlled)
- Main Street (SR 0116) & 5th Street (T468/Boro) (Two-way stop controlled)
- Main Street (SR 0116) & 2nd Street (SR 2011) (Two-way stop controlled)
- Oxford Avenue (SR 2008)/3rd Street (SR 0116) & Main Street (SR 0116)/Elm Avenue (SR 2008) (Signal controlled)
- Elm Avenue (SR 3098) & High Street (T535/Boro) (Signal controlled)
- Eisenhower Drive (T679/Boro) & High Street (T535/Boro) (All-way stop controlled)
- High Street (T535/Boro) & Kindig Lane (T477/Boro) (Two-way stop controlled)
- Oxford Avenue (SR 2008) & Kindig Lane (T477/Boro) (Two-way stop controlled)
- Oxford Avenue (SR 2008) & Edgegrove Road (SR 2008) (Two-way stop controlled)
- Edgegrove Road (SR 2008) & Church Street (SR 2011) (Two-way stop controlled)
- Centennial Road (SR 2006) & Sunday Drive (T460) (Two-way stop controlled)
- Centennial Road (SR 2006) & Bender Road (T464) (Two-way stop controlled)
- Bender Road (T464) & Geiselman Road (T478) (Two-way stop controlled)

Is should be noted that the Carlisle Street (SR 0094) corridor is a coordinated traffic signal system that extends to the south, and, in addition to the study area intersections, also includes the signalized intersections at Radio Road (Boro), Kuhn Drive (Boro)/Dart Drive (Boro), Clearview Road (Boro), and Stock Street (Boro).

2.1.2. Roadways

Regionally, the primary roadways serving the study area are Carlisle Street (SR 0094) and Hanover Road/Main Street/3rd Street (SR 0116). Carlisle Street (SR 0094) provides access to US Route 30 and US Route 15 in the north and Interstate 795 to the south in Maryland. Hanover Road/Main Street/3rd Street (SR 0116) provide access regionally to Bonneauville Borough and Gettysburg Borough

in the west and Spring Grove Borough and York City in the east. Both Carlisle Street (SR 0094) and Hanover Road/Main Street/3rd Street (SR 0116) form the square in downtown Hanover Borough just south of the study area. The Central Pennsylvania Transportation Authority (CATA) provides public transportation services through rabbitttransit within both Hanover and McSherrystown Boroughs. The following summarizes the general characteristics of the roadway network within the study area.

2.1.2.1. Eisenhower Drive (T679/Boro)

Eisenhower Drive (T679/Boro) is a non-state-maintained roadway that is classified as a Collector within the study area and runs between Carlisle Street (SR 0094) and High Street (T535/Boro). The proposed new alignment would extend Eisenhower Drive (T679/Boro) from High Street (T535/Boro) to the west. East of the study area Eisenhower Drive (T679/Boro) connects Carlisle Street (SR 0094) and Broadway Street (SR 0194) in northern Hanover Borough. Land uses adjacent to the roadway along this section of Eisenhower Drive (T679/Boro) are dense commercial. Between High Street (T535/Boro) and Carlisle Street (SR 0094), Eisenhower Drive (T679/Boro) has a posted speed limit of 25 miles per hour (mph) and provides one lane in each direction including a two-way-left-turn lane (TWLTL). Travelers currently utilize Eisenhower Drive (T679/Boro) and High Street (T535/Boro) to travel; to/from McSherrystown Borough and points west along Hanover Road/Main Street (SR 0116). Land uses within the study area are commercial; however, sidewalks are not continuous through the corridor.

2.1.2.2. Carlisle Street (SR 0094)

Carlisle Street (SR 0094) is classified as a Other Principal Arterial with a posted speed limit of 35 mph and is the major north-south roadway through Hanover Borough. North of the Kuhn Drive (Boro)/Dart Drive (Boro) intersection there are two travel lanes provided in each direction with a TWLTL. Land uses adjacent to the roadway are primarily commercial. South of the Kuhn Drive (Boro)/Dart Drive (Boro) intersection there is one travel lane provided in each direction with a TWLTL. Land uses adjacent to this section of roadway are mixed use and include high-density residential and commercial. This corridor includes many access points to the commercial and residential land uses and typically provides signalized access at major intersections (with turn lanes). The Utz's Factory Outlet is located at the Clearview Road (Boro) intersection. The section of Carlisle Street (SR 0094) within the study area is from Eisenhower Drive (T679/Boro) in the north to Elm Avenue (SR 3098) in the south and includes sidewalks on both sides of the roadway. In 2013, between Eisenhower Drive (T679/Boro) and Kuhn Drive (Boro)/Dart Drive (Boro), Carlisle Street (SR 0094) was widened from a three-lane cross section to its current five-lane cross section.

2.1.2.3. Hanover Road/Main Street/3rd Street (SR 0116)

Hanover Road/Main Street/3rd Street (SR 0116) is an east-west roadway that travels through multiple jurisdictions within the study area. Within Conewago Township, Adams County, Hanover Road (SR 0116) is a two-lane Other Principal Arterial with a posted speed limit of 45 mph from Littlestown Road (SR 2019)/Bender Road (T464) to Race Horse Road (SR 2021)/Sunday Drive (T460) and a posted speed limit of 40 mph from Race Horse Road (SR 2021)/Sunday Drive (T460) to just east of Centennial Road (SR 2006) (township line). Hanover Road (SR 0116) has the design characteristics of a typical Pennsylvania rural two-lane highway. Land uses adjacent to the roadway are typically residential with occasional commercial land uses. Traffic signals are provided only at major intersections.

Within McSherrystown Borough, Hanover Road (SR 0116) becomes Main Street (SR 0116). Main Street (SR 0116) remains a Other Principal Arterial but the characteristics of the roadway change to a suburban/urban cross-section consisting of one lane in each direction and includes on-street parking in the eastbound direction. The posted speed limit is 25 mph. Sidewalks are provided on both

sides of the street and access to the residential land uses are typically provided by parallel facilities (from the back). The residential land uses are high-density and in close proximity to the edge of the roadway. Neighborhood commercial land uses also exist along the corridor, typically at cross streets. The only traffic signal along Main Street (SR 0116) within the borough is located at Oxford Avenue/Elm Avenue (SR 2008). A recent intersection improvement project added a northbound left turn lane at the intersection of Main Street (SR 0116)/Elm Avenue (SR 2008) and 3rd Street (SR 0116)/Oxford Avenue (SR 2008) to increase capacity and improve operations.

At its intersection with Oxford Avenue (SR 2008); Main Street (SR 0116) changes to 3rd Street (SR 0116) and travels southeast back into Conewago Township and eventually Hanover Borough, York County. Similar to the section through McSherrystown Borough, 3rd Street (SR 0116) is a Other Principal Arterial providing one lane in each direction including on-street parking in the eastbound direction and sidewalks on both sides of the roadway. The posted speed limit is 25mph and adjacent land uses are primarily high-density residential.

2.1.2.4. Centennial Road (SR 2006)

North of Hanover Road (SR 0116), Centennial Road (SR 2006) is classified as an east-west Collector roadway with a posted speed limit of 45 mph. Centennial Road (SR 2006) intersects Hanover Road (SR 0116) just west of McSherrystown Borough. Land uses adjacent to the roadway are primarily residential and agricultural with commercial land uses concentrated near Hanover Road (SR 0116). Typically, there are no turn lanes provided at intersecting roadways and there are no sidewalks provided except for a short segment at the eastern terminus at Hanover Road (SR 0116). There is one travel lane provided in each direction which includes paved shoulders.

2.1.2.5. 3rd Street (SR 2006)

3rd Street (SR 2006) is offset to the east of Centennial Road (SR 2006) beginning at Main Street (SR 0116), in McSherrystown Borough and heading south. 3rd Street (SR 2006) is a two-lane roadway which includes on-street parking in the northbound direction. The posted speed limit along 3rd Street (SR 2006) is 25 mph within McSherrystown Borough and 35 mph in Conewago Township where it becomes Mt. Pleasant Road (SR 2006). Land uses adjacent to 3rd Street (SR 2006) are primarily residential; 3rd Street (SR 2006) connects McSherrystown Borough with Hanover Pike (SR 0194).

2.1.2.6. Edgegrove Road/Oxford Avenue/Elm Avenue (SR 2008)

Within the study area, Edgegrove Road (SR 2008), is classified as an east-west Collector roadway with one travel lane in each direction. Between Chapel Road (SR 2009) and Church Street (SR 2011), Edgegrove Road (SR 2008) provides 8-foot travel lanes in each direction with narrow 3-foot shoulders. Primarily, high density residential and commercial land uses are situated close the edge of roadway throughout the section. Conewago Enterprises, a major truck generator, is located at Chapel Road (SR 2009). East of Church Street (SR 2011), the cross-section of Edgegrove Road (SR 2008) becomes more typical; 12-foot travel lanes with full shoulders. Land uses adjacent to the roadway are residential to the north and agricultural to the south and the posted speed limit along Edgegrove Road (SR 2008) is 35 mph. Sidewalks are not provided between Chapel Road (SR 2009) and Oxford Avenue (T476). Traffic signals are not present within this segment and turn lanes are not provided at any intersection.

Edgegrove Road (SR 2008) becomes Oxford Avenue (SR 2008) and heads southeast toward Main Street (SR 0116) in McSherrystown Borough. Oxford Avenue (SR 2008) continues as a two-lane Collector roadway with a posted speed limit of 40 mph. North of Kindig Lane (T477/Boro), land uses adjacent to the roadway way are primarily agricultural and residential. South of Kindig Lane (T477/Boro),

Oxford Avenue (SR 2008) acts as the jurisdictional boundary between McSherrystown Borough and Conewago Township and the cross-section becomes more suburban/urban providing one lane in each direction with on-street parking provided. Sidewalks are provided southbound just south of Kindig Lane (T477/Boro) and land uses adjacent to the roadway are primarily residential. Traffic control is provided via stop signs except at Main Street (SR0116), which is signalized.

At Main Street (SR 0116), Elm Avenue (SR 2008) heads east as a Minor Arterial with a speed limit of 35 mph providing one lane in each direction, on-street parking is only provided east of Madison Street (T470). Access to Elm Avenue (SR 2008) from the cross streets and driveways are stop controlled and turn lanes are not provided. Land uses adjacent to the roadway include Conewago Elementary School, commercial, industrial, and residential. Sidewalks are not continuous but are provided in certain locations.

2.1.2.7. Church Street/2nd Street (SR 2011)

Church Street/2nd Street (SR 2011) is a north-south Collector roadway with one lane provided in each direction. Lane widths (10 feet) and shoulders (2 feet) are narrow within the study area. Within McSherrystown Borough, from Main Street (SR 0116) to Oak Lane, 2nd Street (SR 2011) has a posted speed limit of 25 mph and provides for on-street parking. North of McSherrystown Borough, Church Street (SR 2011) has a posted speed limit of 40 mph. North of McSherrystown, land uses adjacent to the roadway are rural residential, industrial, and agricultural. Within McSherrytown land uses are high density residential situated in proximity to the edge of the roadway. Turn lanes are not provided along Church Street/2nd Street (SR 2011) and access is stop controlled.

2.1.2.8. Littlestown Road (SR 2019)

Littlestown Road (SR 2019) represents the western edge of the study area and is a north-south Collector roadway that provides access to Littlestown Borough. The posted speed limit along the roadway is 40 mph and there is one lane provided in each direction with narrow shoulders. Land uses adjacent to the roadway are residential and agricultural. This is a rural setting and there are no sidewalks or turn lanes provided along this corridor. Littlestown Road (SR 2019) becomes Bender Road (T464) north of Hanover Road (SR 0116).

2.1.2.9. Race Horse Road (SR 2021)

Race Horse Road (SR 2021) is classified as a Minor Collector roadway with a posted speed limit of 40 mph. There is one travel lane in each direction and there is no on-street parking along the corridor. Race Horse Road (SR 2021) connects Hanover Road (SR 0116) with Hanover Pike (SR 0194) to the south and land uses adjacent to the roadway are residential and agricultural. Sidewalks and turn lanes are not provided along this corridor.

2.1.2.10. Elm Avenue (SR 3098)

In York County, Elm Avenue (SR 3098) continues as an east-west Minor Arterial until it terminates (as a state-maintained roadway) at Carlisle Street (SR 0094) in Hanover Borough. Elm Avenue (SR 3098) continues through the intersection with Carlisle Street (SR 0094) as a non-state-maintained roadway. The posted speed limit within the study area is 35 mph. Elm Avenue (SR 3098) has one travel lane in each direction and on-street parking on both sides. Turn lanes are present at High Street (T535/Boro) and Carlisle Street (SR 0094). Land uses adjacent to the roadway are primarily high density residential with commercial land uses located at major intersections. Sidewalks are provided on both sides of the roadway. An at-grade rail crossing (CSX) exists just west of High Street (T535/Boro) and there are two train movements per day (same rail line that crosses Kindig Lane (T477/Boro).

2.1.2.11. Sunday Drive (T460)

Sunday Drive (T460) is a north-south local township roadway with one 10-foot travel lane in each direction with generally no shoulders provided within the study area. No Truck signs (R5-2) are located at Centennial Road (SR 2006) in the north and Hanover Road (SR 0116) in the south prohibiting trucks, except for the purpose of locally delivering or picking up materials or merchandise. Land uses adjacent to the roadway are residential and agricultural. Sidewalks are provided northbound along the frontage of a newer residential subdivision at Wheat Drive and at the intersection of Sunday Drive (T460) and Hanover Road (SR 0116). The posted speed limit along the corridor is 35 mph.

2.1.2.12. Bender Road (T464)

Bender Road (T464) connects Hanover Road (SR 0116) and Centennial Road (SR 2006) and runs along the western edge of the study area. Land uses adjacent to the roadway are industrial, residential, and agricultural. Hanover Architectural Products Commercial Freight plant is located along Bender Road (T464) just north of Hanover Road (SR 0116). There is one travel lane provided in each direction and there are no shoulders provided. The posted speed limit along the corridor is 35 mph. There are no sidewalks provided and turn lanes are not present at intersections or driveways.

2.1.2.13. Kindig Lane (T477/Boro)

Kindig Lane (T477/Boro) is an east-west local roadway in both Conewago Township and Hanover Borough. Land uses adjacent to Kindig Lane (T477) include large distribution facilities for Utz Quality Foods and Clark Shoes. Just west of the intersection with High Street (T535/Boro), there is an at-grade (CSX) rail crossing that has two trains movements per day. This is the same rail line that crosses Elm Avenue (SR 3098) to the south. There is one travel lane in each direction with full shoulders provided; however, there are no turn lanes provided at intersections. Sidewalks are provided along the north side of the roadway between Oxford Avenue (SR 2008) to an unnamed tributary creek and the south side of the roadway from the unnamed tributary to the at-grade rail crossing. Sidewalks are not provided on the Hanover Borough section of Kindig Lane (T477/Boro). The posted speed limit is 35 mph.

2.1.2.14. High Street (T535/Boro)

High Street (T535/Boro) is a north-south Collector roadway that runs parallel to Carlisle Street (SR 0094) along the York/Adams County line. High Street (T535/Boro) is currently used by vehicles to travel to/from north Carlisle Street (SR 0094) to McSherrystown Borough and points west along Hanover Road (SR 0116). The posted speed limit along High Street (T535/Boro) is 35 mph and adjacent land uses are residential, commercial, and industrial. The Utz Quality Food factory is located at the corner of High Street (T535/Boro) and Kindig Lane (T477/Boro). There is one lane provided in each direction and on-street parking is provided only in certain areas. Turn lanes are generally not provided; however, turn lanes are provided at the intersection with Elm Avenue (SR 3098) the only signalized intersection along the corridor. Sidewalks are provided along most of the roadway.

2.2. DATA COLLECTION

To effectively evaluate existing and future transportation conditions, the following data collection activities were completed:

- Manual Turning Movement Counts (TMC) and Automatic Traffic Recorder (ATR) Counts
- Origin-Destination (OD) Study
- Travel Time Study

Details related to how the data was collected and the collection time periods are described in this section.

2.2.1. Traffic Count Program

Within the study area, data collection occurred during a typical day in October 2015. Manual TMCs were performed using Miovision cameras to gather peak hour volumes for each movement at each study area intersection. Traffic counts were performed during the following time periods:

- Morning peak period (6:00 AM – 9:00 AM)
- Evening peak period (3:30 PM – 6:30 PM)

ATR counts utilizing pneumatic tubes to gather daily traffic volumes at key locations within the network recorded data for a continuous 72-hours. **Figure 2** (**Appendix A**) illustrates the traffic count locations and the raw traffic count data can be found in **Appendix C**. The existing traffic volume summary and discussion is provided in **Section 2.3.1 – Existing Conditions, Operational Summary, Traffic Volumes**.

2.2.2. Origin-Destination Study

A license plate matching study was conducted at seven key study intersections in October 2015 which included monitoring ten individual turning movements. **Table 1** lists the intersections and turning movements included in the OD survey.

Table 1 – Origin-Destination Survey Locations

Location	Intersection	Movement	Description
A	Eisenhower Drive (T697/Boro) & High Street (T535/Boro)	1	Westbound Left
		2	Southbound Through
B	High Street (T535/Boro) & Kindig Lane (T477/Boro)	3	Southbound Right
C	Carlisle Street (SR 0094) & Elm Avenue (SR 3098)	4	Southbound Right
D	High Street (T535/Boro) & Elm Avenue (SR 3098)	5	Southbound Right
E	Oxford Avenue (SR 2008)/3rd Street (SR 0116) & Elm Avenue (SR 2008)/Main Street (SR 0116)	6	Westbound Through
F	Oxford Avenue (SR 2008) & Kindig Lane (T477/Boro)	7	Westbound Right
		8	Westbound Left
G	Centennial Road (SR 2011) & Main Street (SR 0116)	9	Westbound Through
		10	Westbound Right

The OD survey was conducted between 6:30 AM and 8:30 AM during the morning peak period and from 3:30 PM and 6:00 PM during the evening peak period. This origin-destination study was used to aid in developing and balancing future traffic volume projections for each alternative in the build scenarios. **Table 2** summarizes the results of the OD survey which are also illustrated on **Figure 3 (Appendix A)**. The percentages represent the amount of traffic that was observed at the destination location that was also observed at the origin location.

Table 2 – Origin-Destination Survey Results[1]

Origin / Destination[2]		A		B	C	D	E	F		G		Total
		WB LT	SB TH	SB RT	SB RT	SB RT	WB TH	WB RT	WB LT	WB TH	WB RT	
A	WB LT	--	--	--	--	--	11/20	04/07	10/17	12/21	02/04	**39/69**
	SB TH	--	--	--	--	--	02/04	00/02	03/04	02/04	02/02	**09/16**
B	SB RT	--	--	--	--	--	--	15/19	32/46	13/23	05/05	**65/93**
C	SB RT	--	--	--	--	--	34/48	--	--	15/38	07/09	**56/95**
D	SB RT	--	--	--	--	--	42/56	--	--	32/43	07/08	**81/107**
E	WB TH	--	--	--	--	--	--	--	--	--	--	**--/--**
F	WB RT	--	--	--	--	--	--	--	--	--	--	**--/--**
	WB LT	--	--	--	--	--	--	--	--	12/19	04/04	**16/23**
G	WB TH	--	--	--	--	--	--	--	--	--	--	**--/--**
	WB RT	--	--	--	--	--	--		--	--	--	**--/--**
Total		**--/--**	**--/--**	**--/--**	**--/--**	**--/--**	**21/36**	**08/13**	**20/31**	**15/27**	**05/06**	**51/77**

[1] ## - represents percentage of origin volume present at the destination; ##/## - Morning Peak Hour/Evening Peak Hour
[2] Origin / Destination – See Table 1

On average, just over 50 percent of the vehicles entering the study area were matched with traffic exiting the study area during the morning peak hour. In the evening peak hour, over 75 percent of the vehicles entering the study area were matched with traffic exiting the study area. It should be noted, vehicles could have been observed at more than one OD survey stations within the study area resulting in total station percentages over 100 percent. The OD survey data is provided in **Appendix D**.

2.2.3. Travel Time Study

Travel time studies were conducted September 26, 2017 and September 28, 2017 along several key roadways within the study area during the morning (6:00 AM – 9:00 AM) and evening (3:00 PM – 6:00 PM) peak hour time periods. The Floating Car Technique was utilized for data collection. The Floating Car Technique utilizes a vehicle that is driven like an "average or typical" vehicle in traffic. Each round trip is considered one run. Three runs were conducted along each roadway during each peak hour time period (six total) and averaged to determine the average travel time per segment/corridor. **Figure 4** (**Appendix A**) and **Figure 5** (**Appendix A**) illustrate the average travel time and travel speed for each link during the morning and evening peak hour time periods. **Table 3** summarizes the existing average delay, travel time, and travel speed within the study area along the key roadway links.

Table 3 – Existing Travel Time Summary

Route	From	To	Delay (s/veh)	Travel Time (mm:ss)	Arterial Speed (mph)
Hanover Rd (SR 0116)/Main St (SR 0116)/Elm Ave (SR 3098)	Littlestown Rd (SR 2019)/ Bender Rd (T464)	Carlisle Street (SR 0094)	189	09:01	26
Carlisle Street (SR 0094)	Eisenhower Drive (T679/Boro)	Elm Avenue (SR 3098)	50	02:20	26
High Street (T535/Boro)	Elm Avenue (SR 3098)	Eisenhower Drive (T679/Boro)	50	02:14	26

On average, traveling through the study area between Carlisle Street (SR 0094) and Littlestown Road (SR 2019)/Bender Road (T464) takes approximately 9 minutes at an average speed of 26 mph. Traveling north-south utilizing High Street (T535/Boro) or Carlisle Street (SR 0094) will take approximately 2-3 minutes each with an average speed of 26 mph. As illustrated on **Figure 4** and **Figure 5 (Appendix A)**, the directional travel times show increased delay and slower speeds heading toward Main Street (SR 0116) and Carlisle Street (SR 0094) during the morning peak hour. In the evening peak hour, increased delays and slower speeds were experienced heading away from Main Street (SR 0116) and Carlisle Street (SR 0094). **Appendix F** includes the results of the travel time study for existing conditions and each build alternative.

2.3. OPERATIONAL SUMMARY

This section provides a summary of the existing operational characteristics at study area intersections and roadways. This includes a summary of peak hour turning movement volumes, daily traffic volumes, levels of service, and crashes (safety). The existing conditions analysis helps identify locations that experience excessive delay, where capacity or operational improvements may be required, or where crash rates exceed the statewide average.

2.3.1. Traffic Volumes

The traffic count data described in **Section 2.2.1 – Existing Conditions, Data Collection. Traffic Count Program** was reviewed, adjusted and balanced for each corridor to determine the existing morning and evening peak hour turning movement volumes at each study area intersection and the Average Annual Daily Traffic (AADT) volumes for each link within the network. **Figure 6** and **Figure 7** illustrate the morning and evening peak hour traffic volumes, respectively, and **Figure 8** illustrates the AADT volumes for each link. Figures are provided in **Appendix A**. **Table 4** lists the directional peak hour volumes and AADT volumes for key roadway segments within the study area. Key roadway segments were identified as roadway links that would be most impacted by a new roadway alignment.

Table 4 – Existing Peak Hour and AADT Volumes

Roadway	To/From	To/From	Morning Peak Hour			Evening Peak Hour			AADT
			NB/ EB	SB/ WB	Total	NB/ EB	SB/ WB	Total	
Eisenhower Dr (T679/Boro)	High St (T535/Boro)	Carlisle St (SR 0094)	338	255	**593**	550	370	**920**	**9,800**
Hanover Rd (SR 0116)	Littlestown Rd (SR 2019) /Bender Rd (T464)	Race Horse Rd (SR 2021) /Sunday Dr (T460)	353	410	**763**	503	445	**948**	**10,600**
Main St (SR 0116)	Centennial Rd (SR 2006)	Oxford Ave (SR 2008) /3rd St (SR 0116)	600	464	**1,064**	602	697	**1,378**	**15,500**
Elm Ave (SR 2008/ SR 3098)	Oxford Ave (SR 2008) /3rd St (SR 0116)	Carlisle St (SR 0094)	378	258	**635**	474	499	**973**	**10,400**
Carlisle St (SR 0094)	Eisenhower Dr (T679/Boro)	Elm Ave (SR 3098)	438	433	**870**	665	720	**1,385**	**15,600**
High St (T535/Boro)	Elm Ave (SR 3098)	Eisenhower Dr (T679/Boro)	468	246	**714**	564	430	**994**	**10,600**
Kindig Ln (T477/Boro)	Oxford Ave (SR 2008)	High St (T535/Boro)	178	168	**345**	163	353	**515**	**5,500**
Sunday Dr (T460)	Hanover Rd (SR 0116)	Centennial Rd (SR 2006)	79	93	**172**	98	65	**163**	**1,800**
Oxford Ave (SR 2008)	Main St (SR 0116) /Elm Ave (SR 3098)	Kindig Ln (T477/Boro)	218	323	**540**	275	390	**665**	**7,100**

On average, the Directional Factor (D Factor) within the study area is 56% but ranges between 50% to 70%. Major roadways within the study area, such as Hanover Road/Main Street (SR 0116) and Carlisle Street (SR 0094), have a D Factor close to 56% whereas local

roadways experience D Factors that are more directional. K Factors were developed based on the existing traffic count data collected as part of this project and range between 9.97% and 8.90%. The average K Factor within the study is 9.30%.

Main Street (SR 0116) within McSherrystown Borough and Carlisle Street (SR 0094) within Hanover Borough experience the highest traffic volumes within the study area. Carlisle Street (SR 0094) in Hanover Borough carries between 19,100 and 13,900 vehicle per day and Main Street (SR 0116) in McSherrystown Borough carries approximately 16,100 and 14,500 vehicles per day. High Street (T535/Boro) carries between 9,200 and 12,000 vehicles per day. All other roadways within the study area carry less than 10,000 vehicles per day.

2.3.2. Levels of Service

Level of Service (LOS) is a quantitative performance measure that represents the quality of service being provided along a roadway or at an intersection. The measures used to determine LOS for transportation system elements are called service measures. The Highway Capacity Manual (HCM) defines six levels of service, ranging from A to F. LOS A represents the best operating conditions from a traveler's perspective and LOS F represents the worst. Typically, roadways are not designed to operate at LOS A during peak conditions, but instead provide a lower LOS that balances costs and other impacts. In this area, non-rural, LOS A through LOS D is considered acceptable operation and unacceptable operation is considered LOS E and LOS F. **Table 5** describes the criteria and gradations used to assign the LOS at signalized and stop-controlled intersections.

Table 5 – Intersection Level of Service Criteria

LOS	Control Delay (sec/veh)		
	Signals[1]	Two-Way Stop Controlled[2]	All-Way Stop Controlled[3]
A	<=10	0-10	0-10
B	>10-20	>10-15	>10-15
C	>20-35	>15-25	>15-25
D	>35-55	>25-35	>25-35
E	>55-80	>35-50	>35-50
F	>80 or V/C>1	>50 or V/C>1	>50 or V/C>1

[1] Highway Capacity Manual, 6th Edition, Chapter 19, Signalized Intersections, Exhibit 19-8
[2] Highway Capacity Manual, 6th Edition, Chapter 20, Two-Way Stopped-Controlled Intersections, Exhibit 20-2
[3] Highway Capacity Manual, 6th Edition, Chapter 21, All-Way Stop-Controlled Intersections, Exhibit 21-8

An existing conditions LOS analysis was performed for the signalized and unsignalized intersections within the study area. Existing traffic signal plans and coordination plans timings were obtained from the District 8-0 Traffic Unit. The existing roadway network was evaluated using Synchro plus SimTraffic (Trafficware, LLC) software (Version 10) which utilizes the methodologies outlined in the HCM. A summary of the overall study area intersections levels of service is contained in **Table 6** and detailed level of service reports are provided in **Appendix F**.

Table 6 – Existing Intersection Levels of Service

#	Intersection	Lovel of Service (LOS)/ Expected Delay (sec per vehicle)[1]	
		Morning	Evening
1	Oxford Avenue (SR 2008)/3rd Street (SR 0116) & Main Street (SR 0116)/Elm Avenue (SR 2008)	B(16)	B(20)
2	Centennial Road (SR 2006) & Main Street (SR 0116)	A(10)	B(12)
3	Sunday Drive (T460)/Race Horse Road (SR 2021) & Main Street (SR 0116)	A(10)	B(11)
4	5th Street (Boro) & Main Street (SR 0116)	f(50)	f(98)
5	2nd Street (SR 2011) & Main Street (SR 0116)	e(37)	f(91)
6	High Street (T535/Boro) & Kindig Lane (T477/Boro)	d(26)	f(96)
7	High Street (T535/Boro) & Elm Avenue (SR 3098)	B(12)	B(18)
8	Church Street (SR 2011) & Edgegrove Road (SR 2008)	b(10)	b(11)
9	Oxford Avenue (SR 2008) & Kindig Lane (T477/Boro)	b(14)	d(28)
10	Oxford Avenue (SR 2008) & Edgegrove Road (SR 2008)	b(10)	b(10)
11	Centennial Road (SR 2006) & Sunday Drive (T460)	b(11)	b(12)
12	Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116)	c(19)	c(24)
13	Bender Road (T464) & Geiselman Road (T478)	a(9)	a(9)
14	Centennial Road (SR 2006) & Bender Road (T464)	a(10)	b(11)
15	High Street (T535/Boro) & Eisenhower Drive (T679/Boro)	b(12)	c(21)
16	Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro)	C(25)	D(35)
17	Carlisle Street (SR 0094) & Elm Avenue (SR 3098)	B(17)	C(24)
18	Geiselman Road (T478) & Hanover Road (SR 0116)	c(16)	c(19)

A(##) – Signalized Level of Service (Expected Delay (seconds))
a(##) – Unsignalized Level of Service (Expected Delay (seconds))
red – LOS E/F (unacceptable)
[1]Unsignalized LOS represents the turning movement that experiences the most delay.
Refer to **LOS Summary Tables in **Appendix B** for detailed information

All signalized intersections operate at an overall LOS D or better during both the morning and evening peak hour time periods. However, at the intersection of Carlisle Street (SR 0094) and Eisenhower Drive (T679/Boro) individual movements operate at unacceptable levels of service during both the morning and evening peak hour time periods. Within McSherrystown Borough, the unsignalized intersections at 5th Street (Boro) and 2nd Street (SR 2011) operate at unacceptable levels of service during both peak hour time periods. In Hanover Brough, the intersection of High Street (T535/Boro) and Kindig Lane (T477/Boro) operates at an unacceptable level of service during the evening peak hour time period. The morning and evening peak hour levels of service, by movement, for each intersection within the study area is provided in **Figure 9** and **Figure 10** (**Appendix A)**. The detailed intersection LOS summaries for each intersection are included in **Appendix B**.

2.3.3. Crash Summary

Reportable crash histories for the state-maintained roadways within the study area were obtained from PennDOT's Crash Data Analysis and Retrieval Tool (CDART) from January 1, 2010 through December 31, 2014. A reportable crash is one that occurs on a highway which results in the injury or death of any persons or when the damage to any vehicle is to the extent that it cannot be driven under its own power and therefore requires towing. Crash rates were developed for each state-maintained roadway segment within the study area and compared to the *Homogeneous Report for State Road Crashes in Years 2010 to 2014* developed by the Department's Center for Highway Safety. The Homogenous Report defines statewide average crash rates by roadway type, roadway width, and average daily traffic volume. **Table 7** shows a comparison of the actual crash rate of the study area roadways to the statewide average crash rate.

Table 7 – 5-Year Crash Rate Summary

Roadway	Length (miles)	Average Daily Traffic	Crash Frequency (5-years)	Crash Rate (crashes per million vehicle miles traveled)	
				Actual	Statewide Average
Carlisle Street (SR 0094)	1.81	15,210	142	2.83	1.77
Hanover Road/Main Street/3rd Street (SR 0116)	4.40	11,475	88	0.96	1.77
Centennial Road/3rd Street (SR 2006)	1.95	4,315	10	0.65	2.17
Edgegrove Road/Oxford Avenue/Elm Avenue (SR 2008)	2.62	6;505	35	1.13	1.77
Church Street/2nd Street (SR 2011)	1.18	2,000	18	4.17	1.52
Elm Avenue (SR 3098) (York County)	0.51	10,155	41	4.35	1.95

red – Actual crash rate exceeds the statewide average crash rate

On average, overall crash rates exceed the statewide average rate along Carlisle Street (SR 0094), Church Street/2nd Street (SR 2011), and Elm Avenue (SR 3098). Although, the overall crash rates along Hanover Road/Main Street/3rd Street (SR 0116) and Edgegrove Road/Oxford Avenue/Elm Avenue (SR 2008) are below statewide averages, individual segments exceed the statewide average. Segments of Main Street (SR 0116) and Oxford Avenue (SR 2008) within McSherrystown Borough experience a crash rate higher than the statewide average for similar roadways. **Figure 11** (**Appendix A**) illustrates the locations within the study area where the actual crash rate exceeds the statewide average crash rate.

There was a total of 336 crashes (5-year total) that occurred within the study area and approximately 55 percent (184 crashes) resulted in a fatality or an injury. The remaining 45 percent (152 crashes) resulted in property damage only (non-injury). There were two fatalities within the study area over the 5-year crash history. One fatality occurred at the intersection of Edgegrove Road (SR 2008) and Oxford Avenue (SR 2008) and one fatality occurred just west of Race Horse Road (SR 2021)/Sunday Drive (T460) on Hanover Road (SR 0116). The operator that caused the fatal crash along Hanover Road (SR 0116) was affected by a physical condition and the fatality that occurred at the intersection of Edgegrove Road (SR 2008) and Oxford Avenue (SR 2008) was due to the operator running a stop sign.

Approximately 15 percent (55 crashes) of all crashes occurred along the more rural roadway segments and the remaining 85 percent (281 crashes) occurred along the suburban/urban corridors in and around McSherrystown and Hanover Boroughs. Thirty-eight percent (126 crashes) of all crashes occurred at an intersection while the remaining 62 percent (210 crashes) occurred at a midblock location. According to the Department's Crash Facts & Statistics reports approximately 50 percent of all crashes within Pennsylvania are either angle or rear-end collision types. However, within the study, almost 70 percent (229 crashes) of all collision types are either angle or rear-end. This disproportion is indicative of congestion, cross traffic, a significant number of access points, on-street parking, and through traffic not anticipating local traffic patterns.

The top five study area intersections with the highest crash frequencies are listed below (5-year total):

- Carlisle Street (SR 0094) & Kuhn Drive (Boro)/Dart Drive (Boro): 14 crashes
- Elm Avenue (SR 3098) & High Street (T535/Boro): 13 crashes
- Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro): 12 crashes
- Carlisle Street (SR 0094) & Elm Avenue (SR 3098): 12 crashes
- Carlisle Street (SR 0094) & Radio Road (Boro): 9 crashes

All of the locations noted above are signalized intersections and four of the locations with the highest crash frequency are along Carlisle Street (SR 0094) in Hanover Borough. Sixty percent (36 crashes) of all crashes occurring at these locations result in an injury and 78 percent (47 crashes) are either angle or rear-end collisions.

Appendix G contains the worksheets for the segment and roadway crash rate analysis and crash diagrams.

3. FUTURE CONDITIONS

This section summarizes the future traffic conditions for the Opening Year and (2022) Design Year (2042) for both the No Build and Build scenarios. Future year traffic volumes, when compared to the existing roadway network plus the programed improvements, assist in identifying areas that need capital or operational improvements to ensure the efficient movement of people and goods. Future year scenarios were analyzed for the No Build Scenario and the four build scenarios. Three of the four build scenarios include a new roadway alignment between High Street (T535/Boro) at Eisenhower Drive (T679/Boro) and Hanover Road (SR 0116) west of Race Horse Road (SR 2021)/Sunday Drive (T460). Based upon the anticipated completion of construction, the Opening Year of 2022 was established, and the Design Year of 2042 was determined based on a 20-year design life.

3.1. METHODOLOGY

This section summarizes the methodology for developing the future traffic volumes and future roadway network.

3.1.1. Traffic Volume Development

Future traffic projections consist of existing traffic volumes plus background growth. Background growth reflects the anticipated change in traffic volumes between now and some future date. Once future year base traffic volumes are established (considered the No Build Scenario) operational impacts due to a new roadway alignment and capacity or operational improvements can be evaluated. Additionally, any programmed capital improvement projects scheduled to be constructed prior to the Opening Year (2022) or Design Year (2042) are included in the future year operational analysis. The No Build Scenario is used as a baseline for comparison to the build scenarios to determine any necessary improvements and the potential impacts due to each alignment.

3.1.1.1. Background Growth

The computer-based travel demand models from both the Adams County Transportation Planning Organization (ACTPO) and the York County Planning Commission (YCPC) were obtained and evaluated for developing future traffic volumes within the study area. However, due to the location of this project at the York and Adams County line, the travel demand models would have to be appended to each other. Additionally, the ACTPO Long Range Transportation Plan (LRTP) has a horizon year of 2040 and the YCPC LRTP has a horizon year of 2045 so the demographic inputs, trip generation, mode split, etc. for the travel demand models used to develop these plans would have to be updated. These are the primary reasons why the travel demand models were not utilized to develop the future traffic volumes. It was determined to utilize a regional growth rate for development of future traffic projections. A regional growth rate of 0.76% (annually) was determined by using the YCPC 2010 Base and 2040 No Build travel demand models. The growth factors for the Opening Year (2022) and Design Year (2042) are:

- **Growth Factor (2015-2022): 1.05%**
- **Growth Factor (2015-2042): 1.21%**

This growth rate was applied to the existing traffic volumes collected as part of this project to determine both the Opening Year (2022) and Design Year (2042) No Build traffic volumes. **Appendix H** contains the information utilized to determine the growth rate within the study area.

3.1.2. Capital Improvements

There are several planned/programmed projects included in the York and Adams Counties Transportation Improvement Program (TIP) within or surrounding the study area. Planned/Programmed projects that impact the study area are accounted for in the future year analysis scenarios. In addition to this project (**Primary Project ID: 58137: Highway Reconstruction**; Between SR 0116 and SR 0094 in Conewago Township; Anticipated Let Date NTP: November 2021), the following three projects are listed on the York and Adams Counties TIP and scheduled to be constructed within the study area prior to the Design Year (2042). Information related to each project was obtained from the PennDOT One Map.

1. **Primary Project ID: 104371: Existing Signal Improvement**
   Install Adaptive Signals Signalized Intersections Hanover Borough
   Anticipated Let Date NTP: September 2017 (Currently under construction)

2. **Primary Project ID: 99812: Bridge Improvement**
   PA 116 (Hanover Road) over Plum Creek in McSherrystown Borough and Conewago Township
   Anticipated Let Date NTP: February 2025

3. **Primary Project ID: 99743 Bridge Preservation Activities**
   SR 2006 (Centennial Rd) over S. Branch of Conewago Creek in Mount Pleasant and Conewago Townships
   Anticipated Let Date NTP: May 2025

The installation of adaptive signals (#1) in Hanover Borough will have an impact on future operations along Carlisle Street (SR 0094) and Elm Avenue (SR 3098) within the study area. However, during the alternatives analysis, traffic signals were optimized to provide the most ideal timings for each scenario; which, is essentially the function of adaptive traffic signals. The bridge improvement (#2 above) and the bridge preservation (#3 above) projects will not add capacity and would not impact future operations. Therefore, there are currently no capacity adding capital improvements programmed within the study area that will impact future conditions for either the Opening Year (2022) or Design Year (2042).

3.2. OPERATIONAL ANALYSIS

This section discusses the impacts to the study area in the Opening Year (2022) and the Design Year (2042) for the No Build Scenario and the proposed alignment alternatives. In addition to the No Build Scenario, there were four build alternatives and two sub-alternatives evaluated. Utilizing the travel time study results, the origin-destination study data, and engineering judgement the No Build traffic volumes were reassigned to the new alignment for each proposed alignment alternative. Once the peak hour traffic volumes were established, an operational analysis was completed to evaluate network performance.

3.2.1. Design Alternatives

Conceptual alternatives were developed for a total of eight alignments. The conceptual alternatives included a Transportation Systems Management (TSM) Alternative (Alternative 1) and Alternatives 2 through 7 which were new and/or partially new alignments. In addition, there were three sub-alternatives (A, B, and C) developed to address tie-in locations for the new alignment at the western edge of the project. Alternative 3, Alternative 4, and Alternative 5 were carried forward, as well as sub-Alternatives B and C, and the remaining conceptual alternatives were dropped from further consideration. For additional information on the conceptual alternatives refer to **New Alignment Alternatives – Dismissal Narrative**. It should be noted that the operational impacts of alignment Alternative 4 and Alternative 5 affect the study area similarly and are presented as a single alternative. The alignment alternatives are presented in **Figure 12** (**Appendix A**) and are described below.

3.2.1.1. Transportation Systems Management (TSM) Alternative

The Federal Highway Administration (FHWA) has placed a concerted effort in developing a program that addresses reliability, mobility, and congestion by utilizing strategies that optimize capacity. While this may not prevent major capacity adding infrastructure projects, it may delay or reduce the need for adding capacity. Transportation System Management and Operations (TSMO) is defined as a "a set of integrated strategies to optimize the performance of operations on existing infrastructure through implementation of multimodal, cross-jurisdictional systems, services, and projects designed to preserve capacity and improve security, safety, and reliability of a transportation system." PennDOT has developed a TSMO Strategic Framework and Program Plan that focuses on several different business areas. The PennDOT TSMO Business Areas are: Inclement Weather, ITS and Traffic Signals, Work Zones, Traffic Incidents, Special Events, Bottlenecks, Traffic Management Centers, Traveler Information, and Connected/Automated Vehicles. The TSM Alternative will evaluate the effectiveness of applicable strategies, including capacity adding infrastructure, and recommend potential solutions. The TSM Alternative for this study area includes evaluating Intelligent Transportation Systems (ITS) and traffic signals (Traffic Management), public transit (Transit Management), and ride sharing such as carpooling and services such as Uber and Lyft (Demand Management).

Traffic Management is a set of strategies used to dynamically manage recurring (i.e. bottlenecks) and non-recurring (i.e. crashes) congestion based on prevailing and predicted traffic conditions. This allows for better trip reliability and improves safety. Traffic Management solutions in the study area include Intelligent Transportation Systems (ITS) and traffic signals. ITS solutions are used to maximize capacity by utilizing technology such as Closed Caption Television (CCTV) cameras, weather stations, INRIX data, and Waze© to monitor speeds and congestion, detect incidents, and collect roadway weather information. All these data feeds are evaluated in a centralized location by PennDOT at the District 8-0 Regional Traffic Management Center (RTMC) and real-time traffic conditions and traveler information is disseminated back to the traveling public. This information is provided via PA511 (Website and Mobile App), Dynamic Message Signs (DMS), and Highway Advisory Radio (HAR). Additionally, PennDOT makes this data available to

third parties such as news outlets and mobile apps such as Waze©, Google Maps, and Apple Maps. Within the study area, the only ITS solutions currently collecting information are INRIX and Waze© and the only source available to travelers is PA511. Traveler information allows the driver to make an educated decision on what route to take, which way is faster, and when to begin your trip all of which reduces congestion, promotes alternate travel routes, and improves regional safety. There is no future planned or programmed ITS device deployments within the study area. Adaptive traffic signal controllers are currently being installed within Hanover Borough. This may help manage congestion and capacity along Carlisle Street (SR 0094) and Elm Avenue (SR 3098). As stated previously this improvement has been reflected in all of the build alternatives.

The Central Pennsylvania Transportation Authority (CATA) (operator rabbittransit) provides transit services for the greater Hanover area via a fixed route bus network and its shared-ride/paratransit division. There are four fixed routes that serve Hanover Borough; three of which also serve McSherrystown Borough and other points of interest within the study area. Additionally, regional transit to Harrisburg is only provided via transfer through the City of York. Although transit service is continually expanding and improving within the area, the capacity and operational analysis indicates that congestion along Main Street (SR 0116) and Carlisle Street (SR 0094) will continue to deteriorate. Transit Management and transit system improvements alone will not reduce congestion to alleviate the operational deficiencies within the study area. However, an efficient transit system needs to be an integral component of any improvement alternative to provide a complete and efficient transportation system.

Commuter Services of Pennsylvania is a professionally staffed organization funded by federal Congestion Mitigation & Air Quality (CMAQ) funds with the goal of reducing traffic congestion by assisting commuters and employers in finding alternatives, other than driving alone. These alternatives also help improve air quality and highway safety. Alternatives include carpool, vanpool, transit, bike, walk, and even telework. There are no existing park and rides within the Hanover area (York or Adams Counties). The closest park and rides are in Gettysburg to the west and York to the east. Most recently, with the advent of ride sharing services such as Uber and Lyft, mobility has changed significantly. These ride sharing services are providing another option for transit riders and for people who no longer can or want to drive their own vehicles. This results in more vehicles and congestion on the roadway. While this is convenient for travelers it puts an added burden on transportation agencies to accommodate additional vehicular traffic. Ride sharing services currently have limited availability within the Hanover region. Demand Management improvements alone will not address the operational deficiencies within the study area.

Capacity adding infrastructure improvements and traffic signal improvements were evaluated as part of the TSM Alternative.

3.2.1.2. Alternative 3

Alternative 3 begins at the existing Eisenhower Drive(T679/Boro) and High Street (T535/Boro) intersection and travels west over a CSX rail line and continues westbound along the northern edge of the study area, intersecting with Oxford Avenue (SR 2008) and Church Street (SR 2011) just south of Edgegrove Road (SR 2008) and continuing across Plum Creek. After crossing Plum Creek, the alignment turns south along the western edge of Plum Creek and intersect with Centennial Road (SR 2006) near the existing Centennial Road (SR 2006) and Sunday Drive (T460) intersection. Sub-alternative B would utilize existing Sunday Drive (T460) to tie the new alignment into Hanover Road (SR 0116) west of McSherrystown. Sub-Alternative C would utilize a short section of the existing Sunday Drive (T460) before continuing west on a new alignment. Sub-Alternative C would ultimately tie into Hanover Road (SR 0116) east of the Conewago Creek South Branch. For the purposes of this analysis the existing portion of Eisenhower Boulevard (T679/Boro) from High Street (T535/Boro) to Carlisle Street (SR 0094) is considered part of the alignment.

The alignment cross section would be a two-lane suburban center corridor from High Street (T535/Boro) to west of the CSX rail line and would then transition to a typical two-lane rural corridor cross section. The suburban center corridor would consist of two 12-foot travel lanes (one in each direction) and a 4-foot shoulder plus sidewalk on either side. The rural corridor cross-section would include two 12-foot travel lanes (one in each direction) and an 8-foot shoulder on either side.

In addition to the new alignment, other capacity adding infrastructure and signal improvements were evaluated at locations within the study area.

3.2.1.3. Alternative 4/5

Alternative 4 begins at the existing Eisenhower Drive (T679/Boro) and High Street (T535/Boro) intersection and travels west over the CSX rail line and continues west along the northern edge of the study area. East of Oxford Avenue (SR 2008), Alternative 4 turns south and crosses Oxford Avenue (SR 2008) approximately 2,000 feet north of Kindig Lane (T477/Boro) in the central portion of the study area. After intersecting Oxford Avenue (SR 2008), the alignment heads west and continues along the southern edge of existing farm land adjacent to residential neighborhoods to Church Street (SR 2011) and crossing Plum Creek. After crossing Plum Creek, Alternative 4 continues west and intersects Centennial Road (SR 2006) near the existing Sunday Drive (T460) intersection.

Alternative 5 also begins at the existing Eisenhower Drive (T679/Boro) and High Street (T545/Boro) intersection and travels west over the CSX rail line then quickly turns south and west to run adjacent to the Utz Quality Foods and Clark Shoe properties. Alternative 5 continues west, crossing Oxford Avenue (SR 2008), Church Street (SR 2011), and Plum Creek along the southern edge of existing farm land adjacent to residential neighborhoods. After crossing Plum Creek, Alternative 5 would continue west and intersect with Centennial Road (SR 2006) near the existing Sunday Drive (T460) intersection.

Alignment 4 and Alignment 5 follow the same alignment west of Oxford Avenue (SR 2008). Sub-Alternative B and sub-Alternative C alignments are as described in **Section 3.2.1.2. Design Alternatives, Alternative 3**. The alignment cross section is the same as Alternative 3 described in **Section 3.2.1.2. Design Alternatives, Alternative 3**.

In addition to the new alignment, other capacity adding infrastructure and signal improvements were evaluated at locations within the study area under this alternative scenario. Operational impacts to transportation network by either Alternative 4 or Alternative 5 are anticipated to be the same; therefore, the traffic volume and operational summary are displayed together.

3.2.2.No Build Alternative

This section summarizes the traffic projections, levels of service, and performance measures for the No Build Scenario.

3.2.2.1. Traffic Volumes

No Build AADT volumes were developed for each link within the network and for the morning and evening peak hour turning movements at each study area intersection in both the Opening Year (2022) and Design Year (2042). **Figure 13** and **Figure 14** illustrate the morning and evening peak hour traffic volumes, respectively, and **Figure 15** illustrates the AADT volumes for each link in the Opening Year (2022). Similarly, **Figure 16**, **Figure 17**, and **Figure 18** illustrate the morning peak hour, evening peak hour, and daily traffic volumes for the Design Year (2042). Figures are provided in **Appendix A**. **Table 8 (next page)** lists the directional peak hour volumes and AADT volumes for key roadway segments within the study area for both the Opening Year (2022) and the Design Year (2042).

Similar to existing conditions, Main Street (SR 0116) within McSherrystown Borough and Carlisle Street (SR 0094) within Hanover Borough experience the highest traffic volumes within the study area; AADT volumes are approaching 20,000 vehicles per day in the Design Year (2042). Travel patterns within the study area are anticipated to remain similar to existing conditions. Traffic from the north headed to McSherrystown Borough and points west utilize Eisenhower Drive (T679/Boro) to High Street (T535/Boro) to Elm Avenue (SR 3098). High Street (T535/Boro) between Eisenhower Drive (T679/Boro) and Kindig Lane (T477/Boro) is projected to carry 13,000 vehicles per day in the Design Year (2042). Traffic volumes along the remaining roadways within the study area are typically less than 10,000 vehicles per day.

Table 8 – No Build Peak Hour and AADT Volumes

Roadway	To/From	To/From	Opening Year (2022)							Design Year (2042)						
			Morning Peak Hour			Evening Peak Hour			AADT	Morning Peak Hour			Evening Peak Hour			AADT
			NB/EB	SB/WB	Total	NB/EB	SB/WB	Total		NB/EB	SB/WB	Total	NB/EB	SB/WB	Total	
Eisenhower Dr (T679/Boro)	High St (T535/Boro)	Carlisle St (SR 0094)	358	273	**630**	588	395	**983**	**10,500**	420	318	**738**	673	460	**1,133**	**12,100**
Hanover Rd (SR 0116)	Littlestown Rd (SR 2019)/ Bender Rd (T464)	Race Horse Rd (SR 2021)/ Sunday Dr (T460)	380	443	**823**	538	480	**1,018**	**11,400**	440	510	**950**	625	553	**1,178**	**13,200**
Main St (SR 0116)	Centennial Rd (SR 2006)	Oxford Ave (SR 2008)/3rd St (SR 0116)	639	495	**1,134**	724	739	**1,463**	**16,400**	734	568	**1,303**	833	852	**1,684**	**18,900**
Elm Ave (SR 2008/SR 3098)	Oxford Ave (SR 2008)/3rd St (SR 0116)	Carlisle St (SR 0094)	406	281	**688**	508	534	**1,041**	**11,100**	466	318	**784**	583	611	**1,194**	**12,800**
Carlisle St (SR 0094)	Eisenhower Dr (T679/Boro)	Elm Ave (SR 3098)	465	460	**925**	710	768	**1,478**	**16,600**	535	533	**1,068**	813	880	**1,693**	**19,000**
High St (T535/Boro)	Elm Ave (SR 3098)	Eisenhower Dr (T679/Boro)	498	264	**761**	601	461	**1,063**	**11,400**	570	304	**874**	690	526	**1,216**	**13,000**
Kindig Ln (T477/Boro)	Oxford Ave (SR 2008)	High St (T535/Boro)	193	180	**373**	175	378	**553**	**5,900**	223	205	**428**	200	433	**633**	**6,800**
Sunday Dr (T460)	Hanover Rd (SR 0116)	Centennial Rd (SR 2006)	88	105	**193**	110	78	**188**	**2,100**	108	118	**225**	130	89	**219**	**2,400**
Oxford Ave (SR 2008)	Main St (SR 0116)	Kindig Ln (T477/Boro)	238	343	**580**	298	415	**713**	**7,600**	273	398	**670**	340	480	**820**	**8,800**

3.2.2.2. Levels of Service

A summary of the overall study area intersection levels of service is contained in **Table 9** for both the Opening Year (2022) and Design Year (2042). The morning and evening peak hour levels of service, by movement, for each intersection within the study area in the Opening Year (2022) is provided in **Figure 19** and **Figure 20** (**Appendix A**). **Figure 21** and **Figure 22 (Appendix A)** illustrate the morning and evening peak hour levels of service during in the Design Year (2042).

Table 9 – No Build Intersection Levels of Service and Expected Delay

#	Intersection	Opening Year (2022)		Design Year (2042)	
		Morning	Evening	Morning	Evening
1	Oxford Avenue (SR 2008)/3rd Street (SR 0116) & Main Street (SR 0116)/Elm Avenue (SR 2008)	B(20)	C(21)	C(26)	F(42)
2	Centennial Road (SR 2006) & Main Street (SR 0116)	B(10)	B(12)	B(12)	B(15)
3	Sunday Drive (T460)/Race Horse Road (SR 2021) & Main Street (SR 0116)	B(10)	B(11)	B(11)	B(17)
4	5th Street (Boro) & Main Street (SR 0116)	f(71)	f(166)	f(181)	f(475)
5	2nd Street (SR 2011) & Main Street (SR 0116)	e(47)	f(158)	f(99)	f(542)
6	High Street (T535/Boro) & Kindig Lane (T477/Boro)	d(32)	f(156)	f(63)	f(407)
7	High Street (T535/Boro) & Elm Avenue (SR 3098)	B(12)	C(21)	B(13)	C(34)
8	Church Street (SR 2011) & Edgegrove Road (SR 2008)	b(11)	b(11)	b(11)	b(12)
9	Oxford Avenue (SR 2008) & Kindig Lane (T477/Boro)	b(15)	e(37)	c(18)	f(88)
10	Oxford Avenue (SR 2008) & Edgegrove Road (SR 2008)	b(11)	b(10)	b(11)	b(11)
11	Centennial Road (SR 2006) & Sunday Drive (T460)	b(11)	b(12)	b(12)	b(14)
12	Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116)	c(21)	d(33)	d(32)	f(68)
13	Bender Road (T464) & Geiselman Road (T478)	a(9)	a(9)	a(9)	a(10)
14	Centennial Road (SR 2006) & Bender Road (T464)	b(10)	b(11)	b(10)	b(12)
15	High Street (T535/Boro) & Eisenhower Drive (T679/Boro)	b(13)	e(39)	c(17)	f(104)
16	Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro)	C(31)	D(47)	C(32)	E(60)
17	Carlisle Street (SR 0094) & Elm Avenue (SR 3098)	C(20)	C(26)	C(20)	C(34)
18	Geiselman Road (T478) & Hanover Road (SR 0116)	c(17)	c(22)	c(20)	d(28)

A(##) – Signalized Level of Service (Expected Delay (seconds))
a(##) – Unsignalized Level of Service (Expected Delay (seconds))
red – LOS E/F (unacceptable)
[1]Unsignalized LOS represents the turning movement that experiences the most delay.
Refer to **LOS Summary Tables in **Appendix B** for detailed information

During the Design Year (2042) No Build Scenario, traffic delay is anticipated to increase significantly within McSherrystown Borough. At the unsignalized intersections along Main Street (SR 0116), the side street delay is anticipated to be greater than seven minutes per vehicle during the evening peak hour time period. At the signalized intersection of Oxford Avenue (SR 2008)/3rd Street (SR 0116) & Main Street (SR 0116)/Elm Avenue (SR 2008) the northbound left turn movement is expected to experience a delay of over one minute per vehicle.

While not as severe, delay is anticipated to increase at the intersections in and around Hanover Borough. Failing conditions are expected at the intersection of High Street (T535/Boro) and Kindig Lane (T477/Boro) during both the morning and evening peak hour time periods in the Design Year (2042). During the evening peak hour at Eisenhower Drive (T679/Boro) and High Street (T477/Boro) both the northbound and westbound approaches are anticipated to operate at unacceptable levels of service. At the intersection of Carlisle Street (SR 0094) and Eisenhower Drive (T679/Boro) there are multiple turning movements that are expected to operate at unacceptable levels of service during both the morning and evening peak hours. Although the overall intersection level of service is acceptable at Carlisle Street (SR 0094) and Elm Avenue (SR 3098) individual turning movements during the evening peak hour are anticipated to operate at unacceptable levels of service. The detailed intersection LOS summaries for each intersection for both the Opening Year (2022) and Design Year (2042) are included in **Appendix B**.

Intersections within Conewago Township are projected to operate at acceptable levels of service. At the western edge of the study, in Union Township, the intersection of Hanover Road (SR 0116) and Littlestown Road (SR 2019)/Bender Road (T464) is anticipated to operate at unacceptable levels of service during the evening peak hour time period in the Design Year (2042).

SimTraffic (Trafficware, LLC) software (Version 10) was utilized to determine network performance measures. For the No Build Alternative, delay, travel time, and travel speed were determined for both the morning and evening peak hour time periods and averaged. **Table 10** summarizes the performance measures for key study area roadways for the Opening Year (2022) and the Design Year (2042).

Table 10 – No Build Performance Measures

Route	From	To	Delay (s/veh)	Travel Time (mm:ss)	Arterial Speed (mph)
Opening Year (2022)					
Hanover Rd (SR 0116)/Main St (SR 0116)/W Elm Ave (SR 3098)	Littlestown Rd (SR 2019)/ Bender Rd (T464)	Carlisle St (SR 0094)	338	12:47	25
Carlisle Street (SR 0094)	Eisenhower Dr (T679/Boro)	Elm Ave (SR 3098)	37	03:11	35
High Street (T535/Boro)	Elm Ave (SR 3098)	Eisenhower Dr (T679/Boro)	30	01:50	32
Design Year (2042)					
Hanover Rd (SR 0116)/Main St (SR 0116)/W Elm Ave (SR 3098)	Littlestown Rd (SR 2019)/ Bender Rd (T464)	Carlisle St (SR 0094)	612	17:36	22
Carlisle Street (SR 0094)	Eisenhower Dr (T679/Boro)	Elm Ave (SR 3098)	72	03:32	25
High Street (T535/Boro)	Elm Ave (SR 3098)	Eisenhower Dr (T679/Boro)	90	03:03	28

In the Design Year (2042) to travel from one end of the study area to the other along Hanover Road/Main Street (SR 0116) and Elm Avenue (SR 3098) will take, on average, over 17 minutes at a speed of 22 mph. Traveling north or south through the study area via Carlisle Street (SR 0094) or High Street will take approximately 3 minutes with an average speed of 27 mph. Opening Year (2022) delay, travel time, and travel speed is anticipated to be comparable to existing conditions. Refer to **Appendix I** for the No Build Scenario traffic volumes worksheet and capacity analysis reports.

3.2.3. Transportation System Management (TSM) Alternative

This section summarizes the traffic projections, levels of service, performance measures, and recommended improvements.

3.2.3.1. Traffic Volumes

Refer to **Section 3.2.2.1 No Build Alternative, Traffic Volumes**.

3.2.3.2. Levels of Service

A summary of the study area intersection levels of service is contained in **Table 11**. The Opening Year (2022) and Design Year (2042) morning and evening peak hour levels of service, by movement, for each intersection within the study area are provided in **Figure 23** through **Figure 26** (**Appendix A)**.

Table 11 – TSM Alternative Intersection Levels of Service

#	Intersection	Opening Year (2022)		Design Year (2042)	
		Morning	Evening	Morning	Evening
1	Oxford Avenue (SR 2008)/3rd Street (SR 0116) & Main Street (SR 0116)/Elm Avenue (SR 2008)	C(34)	D(37)	D(38)	D(44)
2	Centennial Road (SR 2006) & Main Street (SR 0116)	B(10)	B(12)	B(11)	B(15)
3	Sunday Drive (T460)/Race Horse Road (SR 2021) & Main Street (SR 0116)	B(10)	B(11)	B(11)	B(17)
4	5th Street (Boro) & Main Street (SR 0116)	C(21)	B(14)	B(20)	B(14)
5	2nd Street (SR 2011) & Main Street (SR 0116)	A(8)	A(8)	A(8)	A(9)
6	High Street (T535/Boro) & Kindig Lane (T477/Boro)	A(8)	A(9)	A(9)	B(15)
7	High Street (T535/Boro) & Elm Avenue (SR 3098)	B(12)	C(21)	B(13)	C(34)
8	Church Street (SR 2011) & Edgegrove Road (SR 2008)	b(11)	b(11)	b(11)	b(12)
9	Oxford Avenue (SR 2008) & Kindig Lane (T477/Boro)	b(10)	b(15)	b(12)	c(19)
10	Oxford Avenue (SR 2008/T476) & Edgegrove Road (SR 2008)	b(11)	b(10)	b(11)	b(11)
11	Centennial Road (SR 2006) & Sunday Drive (T460)	b(11)	b(12)	b(12)	b(14)
12	Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116)	c(21)	d(33)	d(32)	f(68)
13	Bender Road (T464) & Geiselman Road (T478)	a(9)	a(9)	a(9)	a(10)
14	Centennial Road (SR 2006) & Bender Road (T464)	b(10)	b(11)	b(10)	b(12)
15	High Street (T535/Boro) & Eisenhower Drive (T679/Boro)	B(11)	B(11)	B(10)	B(11)
16	Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro)	C(31)	D(37)	C(32)	D(42)
17	Carlisle Street (SR 0094) & Elm Avenue (SR 3098)	C(22)	C(28)	C(22)	C(28)
18	Geiselman Road (T478) & Hanover Road (SR 0116)	c(17)	c(22)	c(20)	d(28)

A(##) – Signalized Level of Service (Expected Delay (seconds))
a(##) – Unsignalized Level of Service (Expected Delay (seconds))
red – LOS E/F (unacceptable)
[1]Unsignalized LOS represents the turning movement that experiences the most delay.
Refer to **LOS Summary Tables in **Appendix B** for detailed information

Capacity and signal improvements were implemented to attain a LOS D or better for all turning movements except at the intersection of Carlisle Street (SR 0094) and Eisenhower Drive (T679/Boro) there are lane groups that operate at LOS E. However, delays are less than 60 seconds per vehicle and all approaches operate at LOS D. At the intersection of Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116), the northbound and southbound approaches are anticipated to operate at unacceptable levels of service during the evening peak hour in the Design Year (2042). The detailed intersection LOS summaries for each intersection are included in **Appendix B**.

SimTraffic (Trafficware, LLC) software (Version 10) was utilized to determine network performance measures. The delay, travel time, and travel speed were determined for both the morning and evening peak hour time periods and averaged. **Table 12** summarizes the average performance measures for key study area roadways.

Table 12 – TSM Alternative Performance Measures

Route	From	To	Delay (s/veh)	Travel Time (mm:ss)	Arterial Speed (mph)
Opening Year (2022)					
Hanover Rd (SR 0116)/Main St (SR 0116)/Elm Ave (SR 3098)	Littlestown Rd (SR 2019)/ Bender Rd (T464)	Carlisle St (SR 0094)	265	12:24	28
Carlisle Street (SR 0094)	Eisenhower Dr (T679/Boro)	Elm Ave (SR 3098)	20	02:47	31
High Street (T535/Boro)	Elm Ave (SR 3098)	Eisenhower Dr (T679/Boro)	35	01:55	29
Design Year (2042)					
Hanover Rd (SR 0116)/Main St (SR 0116)/Elm Ave (SR 3098)	Littlestown Rd (SR 2019)/ Bender Rd (T464)	Carlisle St (SR 0094)	359	13:08	24
Carlisle St (SR 0094)	Eisenhower Dr (T679/Boro)	Elm Ave (SR 3098)	23	03:17	30
High St (T535/Boro)	Elm Ave (SR 3098)	Eisenhower Dr (T679/Boro)	51	02:11	27

In the Design Year (2042), to travel from one end of the study area to the other along Hanover Road/Main Street (SR 0116) and Elm Avenue (SR 3098) will take on average 13 minutes at an average speed of 24 mph. Traveling north or south through the study area via Carlisle Street (SR 0094) will take approximately 3 minutes at a travel speed of 30 mph and just over 2 minutes along High Street (T535/Boro) at a travel speed of 27 mph. Refer to **Appendix J** for the TSM Alternative for capacity analysis reports.

3.2.3.3. Improvements

Table 13 includes the capacity and signal improvements required to accommodate future traffic volumes within the study area under the TSM Alternative. **Figure 27 (Appendix A)** provides a regional overview of the recommended improvements.

Table 13 – TSM Alternative Recommended Improvement

#	Intersection	TSM Alternative
1	Oxford Avenue (SR 2008)/3rd Street (SR 0116) & Main Street (SR 0116)/Elm Avenue (SR 2008)	• Construct additional EB through lane • Construct additional WB through lane • Construct EB left turn lane • Construct WB left turn lane • Construct SB left turn lane • Reconstruct existing signal
4	5th Street (Boro) & Main Street (SR 0116)	• Install new traffic signal
5	2nd Street (SR 2011) & Main Street (SR 0116)	• Install new traffic signal
6	High Street (T535/Boro) & Kindig Lane (T477/Boro)	• Install new traffic signal
9	Oxford Avenue (SR 2008) & Kindig Lane (T477/Boro)	• Convert to all-way stop controlled
12	Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116)	• Monitor location
15	High Street (T535/Boro) & Eisenhower Drive (T679/Boro)	• Install new traffic signal • Construct SB left turn lane • Channelize NB right turn w/ yield
16	Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro)	• Revise existing signal timings • Monitor location
17	Carlisle Street (SR 0094) & Elm Avenue (SR 3098)	• Construct additional NB through lane • Construct additional SB through lane • Reconstruct existing signal

There are no intersection or signal improvements recommended at the intersection of Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116). It is anticipated that signal warrants would not be met.

3.2.4. Alternative 3

This section summarizes the traffic projections, levels of service, performance measures, and recommended improvements.

3.2.4.1. Traffic Volumes

Build traffic volumes for Alternative 3 were developed for each study area intersection during the morning and evening peak hour time periods in both the Opening Year (2022) and Design Year (2042). Additionally, AADT volumes were developed for each link within the network. Traffic was assigned to the new alignment based upon the travel time study and the origin-destination study. **Figure 28** and **Figure 29** illustrate the morning and evening peak hour traffic volumes and **Figure 30** illustrates the AADT volumes for each link during the Opening Year (2022). Design Year (2042) morning peak hour, evening peak hour, and daily traffic volumes are provided in **Figure 31** through **Figure 33**. Figures are provided in **Appendix A**. **Table 14 (next page)** lists the directional peak hour volumes and AADT volumes for key roadway segments within the study area fo both the Opening (2022) and Design (2042) years. All volumes listed in the table reflect sub-Alternative B or sub-Alternative C except when indicated.

On average, the new alignment is projected to carry between 10,400 and 12,200 vehicles per day between Centennial Road (SR 2006) and High Street (T535/Boro) in the Design Year (2042). Traffic volumes along Carlisle Street (SR 0094), Hanover Road/Main Street (SR 0116), and High Street are expected to decrease by approximately 4,000 vehicles per day each when compared to the No Build Scenario. However, traffic volumes along Sunday Drive (T460) are anticipated to increase by 5,000 vehicles per day under sub-Alternative C and by 9,000 vehicles per day under sub-Alternative B when compared to the No Build Scenario. In the Design Year (2042), Carlisle Street (SR 0094) is anticipated to carry on average 14,400 vehicles per day and Main Street (SR 0116) in McSherrystown Borough is expected to carry approximately 12,500 vehicles per day.

Due to the northern location of the alignment, local traffic from McSherrystown Borough and southern Hanover Borough destined to the east and west are not expected to utilize the new alignment because of the additional travel time needed to access the alignment. However, there was a slight shift of traffic from Edgegrove Road (SR 2008) to the new alignment because of travel time savings. The increase in traffic along Sunday Drive (T460) is attributed to a shift in traffic originating from the Littlestown Borough area and points southwest that today utilize Hanover Pike (SR 0194) and Pine Grove Road (SR 2005) to access Carlisle Street (SR 0094) to travel through the region.

Table 14 – Alternative 3 Peak Hour and AADT Volumes[1]

Roadway	To/From	To/From	Opening Year (2022)							Design Year (2042)						
			Morning Peak Hour			Evening Peak Hour			AADT	Morning Peak Hour			Evening Peak Hour			AADT
			NB/EB	SB/WB	Total	NB/EB	SB/WB	Total		NB/EB	SB/WB	Total	NB/EB	SB/WB	Total	
Eisenhower Dr (T679/Boro)	High St (T535/Boro)	Carlisle St (SR 0094)	576	470	**1,045**	806	592	**1,398**	**15,700**	638	515	**1,153**	891	657	**1,548**	**17,400**
Hanover Rd (SR 0116) (sub-Alt C only)	Littlestown Rd (SR 2019)/ Bender Rd (T464)	Race Horse Rd (SR 2021)/ Sunday Dr (T460)	257	388	**644**	463	295	**758**	**8,500**	296	445	**741**	537	341	**878**	**9,900**
Main St (SR 0116)	Centennial Rd (SR 2006)	Oxford Ave (SR 2008)/ 3rd St (SR 0116)	412	388	**800**	566	401	**967**	**10,900**	471	444	**914**	648	462	**1,110**	**12,500**
Elm Ave (SR 2008/SR 3098)	Oxford Ave (SR 2008)/ 3rd St (SR 0116)	Carlisle St (SR 0094)	331	246	**577**	452	434	**885**	**9,500**	380	277	**657**	518	496	**1,014**	**10,900**
Carlisle St (SR 0094)	Eisenhower Dr (T679/Boro)	Elm Ave (SR 3098)	247	263	**510**	492	571	**1,063**	**11,900**	317	336	**653**	595	683	**1,278**	**14,400**
High St (T535/Boro)	Elm Ave (SR 3098)	Eisenhower Dr (T679/Boro)	328	200	**528**	491	244	**735**	**7,900**	375	229	**603**	562	276	**838**	**9,000**
Kindig Ln (T477/Boro)	Oxford Ave (SR 2008)	High St (T535/Boro)	64	127	**191**	80	218	**297**	**3,200**	74	142	**216**	89	248	**337**	**3,600**
Sunday Dr (T460) (sub-Alt C only)	Hanover Rd (SR 0116)	Centennial Rd (SR 2006)	339	294	**633**	340	336	**676**	**7,200**	370	312	**681**	368	362	**730**	**7,800**
Sunday Dr (T460) (sub-Alt B only)	Hanover Rd (SR 0116)	Centennial Rd (SR 2006)	509	375	**883**	459	570	**1,029**	**11,600**	509	375	**883**	459	570	**1,029**	**11,600**
Oxford Ave (SR 2008)	Main St (SR 0116) /	Kindig Ln (T477/Boro)	244	364	**607**	305	357	**662**	**7,100**	279	422	**701**	348	415	**763**	**8,100**
Alignment	Church Street (SR 2011)	Oxford Avenue (SR 2008)	486	328	**814**	406	591	**997**	**11,200**	527	349	**876**	436	649	**1,085**	**12,200**

: Link along alignment alternative

[1] All volumes reflect sub-Alternative B or sub-Alternative C except where indicated.

3.2.4.2. Levels of Service

A summary of the study areas intersection levels of service is contained in **Table 15**. All LOS listed below reflect sub-Alternative B or sub-Alternative C except when indicated. The morning and evening peak hour levels of service, by movement, for each intersection within the study area in the Opening Year (2022) and Design Year (2042) are provided in **Figure 34** through **Figure 37** (**Appendix A)**.

Table 15 – Alternative 3 Intersection Levels of Service

#	Intersection[1]	Opening Year (2022)		Design Year (2042)	
		Morning	Evening	Morning	Evening
1	Oxford Avenue (SR 2008)/3rd Street (SR 0116) & Main Street (SR 0116)/Elm Avenue (SR 2008)	B(11)	B(12)	B(14)	B(16)
2	Centennial Road (SR 2006) & Main Street (SR 0116)	A(9)	B(10)	A(9)	B(11)
3C	Sunday Drive (T460)/Race Horse Road (SR 2021) & Main Street (SR 0116) **(sub-Alt C only)**	B(11)	B(13)	B(12)	B(15)
3B	Sunday Drive (T460)/Race Horse Road (SR 2021) & Main Street (SR 0116) **(sub-Alt B only)**	B(12)	B(14)	B(14)	B(19)
4	5th Street (Boro) & Main Street (SR 0116)	d(26)	d(30)	e(37)	e(49)
5	2nd Street (SR 2011) & Main Street (SR 0116)	d(33)	f(63)	f(52)	f(157)
6	High Street (T535/Boro) & Kindig Lane (T477/Boro)	b(10)	c(16)	b(11)	c(19)
7	High Street (T535/Boro) & Elm Avenue (SR 3098)	B(11)	B(16)	B(12)	B(20)
8	Church Street (SR 2011) & Edgegrove Road (SR 2008)	b(10)	b(11)	b(11)	b(12)
9	Oxford Avenue (SR 2008) & Kindig Lane (T477/Boro)	b(13)	c(19)	b(14)	d(27)
10	Oxford Avenue (SR 2008/T476) & Edgegrove Road (SR 2008)	b(10)	b(10)	b(11)	b(11)
11	Centennial Road (SR 2006) & Sunday Drive (T460)/Alignment	A(8)	A(9)	A(8)	B(10)
12	Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116)	c(21)	d(33)	d(32)	f(68)
13	Bender Road (T464) & Geiselman Road (T478)	a(9)	a(9)	a(9)	a(10)
14	Centennial Road (SR 2006) & Bender Road (T464)	b(10)	b(11)	b(10)	b(12)
15	High Street (T535/Boro) & Eisenhower Drive (T679/Boro)	A(9)	B(15)	A(9)	B(15)
16	Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro)	C(34)	D(41)	C(35)	D(44)
17	Carlisle Street (SR 0094) & Elm Avenue (SR 3098)	C(24)	C(25)	C(23)	C(29)
18	Geiselman Road (T478) & Hanover Road (SR 0116)	c(17)	c(22)	c(20)	d(28)
20	Oxford Avenue (SR 2008) & Alignment	A(9)	B(11)	B(11)	B(12)
21	Church Street (SR 2011) & Alignment	c(22)	d(27)	c(25)	d(33)
22C	Sunday Drive (T460) & Alignment **(sub-Alt C only)**	b(12)	b(11)	b(12)	b(11)
23C	Hanover Road (SR 0116) & Alignment **(sub-Alt C only)**	A(8)	B(10)	A(8)	B(11)

: Intersection along alignment alternative

A(##) : Signalized Level of Service (Expected Delay (seconds))

a(##) : Unsignalized Level of Service (Expected Delay (seconds))

red : LOS E/F (unacceptable)

[1] All LOS reflect sub-Alternative C except where indicated.

[2] Unsignalized LOS represents the turning movement that experiences the most delay.

Refer to **LOS Summary Tables in **Appendix B** for detailed information

The proposed alignment is anticipated to significantly improve operations at the existing intersections within the study area. Overall, all signalized intersections, including all individual lane groups/turning movements, are projected to operate at LOS D or better during both the morning and evening peak hours in the Design Year (2042) except at the intersection of Carlisle Street (SR 0094) and Eisenhower Drive (T679/Boro). At this location, multiple lane groups are anticipated to operate at LOS E during the evening peak hour in the Design Year (2042); however, delays are anticipated to be 60 seconds or less per vehicle. Additionally, all approaches to the intersection are anticipated to operate at LOS D.

The unsignalized intersections in McSherrystown Borough, 2nd Street (SR 2011) and 5th Street (Boro), will continue to operate at unacceptable levels of service during both the morning and evening peak hour time periods in the Design Year (2042). However, the side-street delay is projected to be comparable to the delay currently experienced at these intersections. At the intersection of Hanover Road (SR 0116) & Littlestown Road (SR 2019)/Bender Road (T464), the northbound and southbound approaches are anticipated to operate at unacceptable levels of service during the evening peak hour. The detailed intersection LOS summaries for each intersection are included in **Appendix B**.

SimTraffic (Trafficware, LLC) software (Version 10) was utilized to determine network performance measures. The delay, travel time, and travel speed were determined for both the morning and evening peak hour time periods and averaged for both the Opening Year (2022) and Design Year (2042). **Table 16** summarizes the average performance measures for key study area roadways.

Table 16 – Alternative 3 Performance Measures

Route	From	To	Delay (s/veh)	Travel Time (mm:ss)	Arterial Speed (mph)
Opening Year (2022)					
Eisenhower Dr (T679/Boro)\ Alternative 3	Littlestown Rd (SR 2019)/ Bender Rd (T464)	Carlisle St (SR 0094)	76	06:19	33
Hanover Rd (SR 0116)/Main St (SR 0116)/Elm Ave (SR 3098)	Littlestown Rd (SR 2019)/ Bender Rd (T464)	Carlisle St (SR 0094)	124	08:46	28
Carlisle St (SR 0094)	Eisenhower Dr (T679/Boro)	Elm Avenue (SR 3098)	19	03:29	32
High St (T535/Boro)	Elm Ave (SR 3098)	Eisenhower Dr (T679/Boro)	27	01:54	30
Design Year (2042)					
Eisenhower Dr (T679/Boro)\ Alternative 3	Littlestown Rd (SR 2019)/ Bender Rd (T464)	Carlisle St (SR 0094)	80	06:23	33
Hanover Rd (SR 0116)/Main St (SR 0116)/Elm Ave (SR 3098)	Littlestown Rd (SR 2019)/ Bender Rd (T464)	Carlisle St (SR 0094)	191	09:46	26
Carlisle St (SR 0094)	Eisenhower Dr (T679/Boro)	Elm Avenue (SR 3098)	22	02:18	31
High St (T535/Boro)	Elm Ave (SR 3098)	Eisenhower Dr (T679/Boro)	27	01:54	30

: Alignment alternative

To travel from one end of the study area to the other along Hanover Road/Main Street (SR 0116) and Elm Avenue (SR 3098) will take almost 10 minutes at an average speed of 26 mph which is comparable to existing travel time for the same route. Traveling north or

south through the study area via Carlisle Street (SR 0094) will take approximately 2 minutes at a travel speed of 31 mph. Similarly, travel time along High Street (T535/Boro) between Eisenhower Drive (T679/Boro) and Elm Avenue (SR 3098) is also 2 minutes at a travel speed of 30 mph. Along the new alignment, traveling from one end of the study area to the other will take approximately 6-7 minutes at a travel speed of 33 mph. This is a travel time savings of almost 10 minutes when compared to the similar trip during No Build Scenario. Refer to **Appendix K** for the Alternative 3 traffic model and capacity analysis reports.

3.2.4.3. Improvements

Table 17 lists the improvements that would be required to accommodate future traffic volumes within the study area under alignment Alternative 3. Improvements apply to both sub-Alternative B and sub-Alternative C unless otherwise noted. Capacity adding improvements are only anticipated along the alignment except at Sunday Drive (T460)/Race Horse Road (SR 2021) & Main Street (SR 0116) under sub-Alternative B. **Figure 38 (Appendix A)** provides a regional overview of the recommended improvements.

Table 17 – Alternative 3 Recommended Improvements

#	Intersection	Alternative 3
3B	Sunday Drive (T460)/Race Horse Road (SR 2021) & Main Street (SR 0116) **(sub-Alt B)**	• Construct NB left turn lane • Construct EB left turn lane • Construct WB left turn lane • Reconstruct existing signal
4	5th Street (Boro) & Main Street (SR 0116)	• Monitor location
5	2nd Street (SR 2011) & Main Street (SR 0116)	• Monitor location
11	Centennial Road (SR 2006) & Sunday Drive (T460)/Alignment	• Install new traffic signal • Construct EB left turn lane • Construct WB left turn lane **Or** - Consider roundabout
12	Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116)	• Monitor location
15	High Street (T535/Boro) & Eisenhower Drive (T679/Boro)	• Install new traffic signal • Construct NB left turn lane • Construct SB left turn lane • Construct EB left turn lane • Construct WB left turn lane
16	Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro)	• Revise existing signal timings • Monitor location
20	Oxford Avenue (SR 2008) & Alignment	• Install new traffic signal • Construct NB left turn lane • Construct SB left turn lane • Construct EB left turn lane • Construct WB left turn lane **Or** - Consider roundabout

#	Intersection	Alternative 3
21	Church Street (SR 2011) & Alignment	• Two-way stop controlled • Construct EB left turn lane • Construct WB left turn lane **Or** - Consider roundabout
22C	Sunday Drive (T460) & Alignment (**sub-Alt C**)	• Stop controlled (Sunday Drive (T460) • Construct channelized NB right turn • Construct WB left turn lane
23C	Hanover Road (SR 0116) & Alignment (**sub-Alt C**)	• Install new traffic signal • Construct WB left turn lane **Or** - Consider roundabout

: Alignment alternative

There are no intersection or signal improvements recommended at the intersections of Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116), 5th Street (Boro) & Main Street (SR 0116), and 2nd Street (SR 2011) & Main Street (SR 0116). It is anticipated that signal warrants would not be met for these locations due to low side-street volumes and anticipated delay.

3.2.5. Alternative 4/5

This section summarizes the traffic projections, levels of service, performance measures, and recommended improvements for Alternative 4/5. Operational impacts to the transportation network by either Alternative 4 or Alternative 5 are anticipated to be the same.

3.2.5.1. Traffic Volumes

Build traffic volumes for Alternative 4/5 were developed for each study area intersection during both the morning and evening peak hour time periods for the Opening Year (2022) and Design Year (2042). Additionally, AADT volumes were developed for each link within the network. Traffic was assigned to the new alignments based upon the travel time study and the origin-destination study**.** **Figure 39** and **Figure 40** illustrate the morning and evening peak hour traffic volumes, respectively, and **Figure 41** illustrates the AADT volumes for each link for the Opening Year (2022). **Figure 42** through **Figure 44** illustrate the morning peak hour, evening peak hour, and daily traffic volumes for the Design Year (2042). Figures are provided in **Appendix A**. **Table 18 (next page)** lists the directional peak hour volumes and AADT volumes for key roadway segments within the study area for both the Opening Year (2022) and Design Year (2042). All volumes listed below reflect sub-Alternative B or sub-Alternative C except when indicated.

On average, the new alignment is projected to carry between 11,300 and 12,100 vehicles per day between Centennial Road (SR 2006) and High Street (T535/Boro) in the Design Year (2042). Traffic volumes along Carlisle Street (SR 0094), Hanover Road/Main Street (SR 0116), and High Street (T535/Boro) are expected decrease by approximately 4,000 vehicles per day each when compared to the No Build Scenario. However, traffic volumes along Sunday Drive (T460) are anticipated to increase by 5,000 vehicles per day under sub-Alternative C and by 9,000 vehicles per day under sub-Alternative B when compared to the No Build Scenario. Carlisle Street (SR 0094) is anticipated to carry on average 14,400 vehicles per day and Main Street (SR 0116) in McSherrystown Borough is expected to carry approximately 11,600 vehicles per day.

Table 18 – Alternative 4/5 Peak Hour and AADT Volumes[1]

Roadway	To/From	To/From	Opening Year (2022)							Design Year (2042)						
			Morning Peak Hour			Evening Peak Hour			AADT	Morning Peak Hour			Evening Peak Hour			AADT
			NB/EB	SB/WB	Total	NB/EB	SB/WB	Total		NB/EB	SB/WB	Total	NB/EB	SB/WB	Total	
Eisenhower Dr (T679/Boro)	High St (T535/Boro)	Carlisle St (SR 0094)	576	470	**1,045**	806	592	**1,398**	**15,700**	638	515	**1,153**	891	657	**1,548**	**17,400**
Hanover Rd (SR 0116) (sub-Alt C only)	Littlestown Rd (SR 2019)/ Bender Rd (T464)	Race Horse Rd (SR 2021)/ Sunday Dr (T460)	257	388	**644**	463	295	**758**	**8,500**	296	445	**741**	537	341	**878**	**9,900**
Main St (SR 0116)	Centennial Rd (SR 2006)	Oxford Ave (SR 2008)/ 3rd St (SR 0116)	377	370	**747**	527	370	**897**	**10,100**	431	424	**854**	603	427	**1,030**	**11,600**
Elm Ave (SR 2008/SR 3098)	Oxford Ave (SR 2008)/ 3rd St (SR 0116)	Carlisle St (SR 0094)	331	246	**577**	452	434	**885**	**9,500**	380	277	**657**	518	496	**1,014**	**10,900**
Carlisle St (SR 0094)	Eisenhower Dr (T679/Boro)	Elm Ave (SR 3098)	247	263	**510**	492	571	**1,063**	**11,900**	317	336	**653**	595	683	**1,278**	**14,400**
High St (T535/Boro)	Elm Ave (SR 3098)	Eisenhower Dr (T679/Boro)	328	200	**528**	491	244	**735**	**7,900**	375	229	**603**	562	276	**838**	**9,000**
Kindig Ln (T477/Boro)	Oxford Ave (SR 2008)	High St (T535/Boro)	64	127	**191**	80	218	**297**	**3,200**	74	142	**216**	89	248	**337**	**3,600**
Sunday Dr (T460) (sub-Alt C only)	Hanover Rd (SR 0116)	Centennial Rd (SR 2006)	339	294	**633**	340	336	**676**	**7,200**	370	312	**681**	368	362	**730**	**7,800**
Sunday Dr (T460) (sub-Alt B only)	Hanover Rd (SR 0116)	Centennial Rd (SR 2006)	509	375	**883**	459	570	**1,029**	**11,600**	509	375	**883**	459	570	**1,029**	**11,600**
Oxford Ave (SR 2008)	Main St (SR 0116)	Kindig Ln (T477/Boro)	262	399	**660**	336	396	**732**	**7,800**	299	462	**761**	383	460	**843**	**9,000**
Alignment	Church St (SR 2011)	Oxford Ave (SR 2008)	487	328	**815**	421	573	**994**	**11,200**	528	348	**876**	453	628	**1,081**	**12,100**

: Link along alignment alternative

[1] All volumes reflect sub-Alternative B or sub-Alternative C except where indicated.

Due to the southern location of the alignment, local traffic from McSherrystown Borough and southern Hanover Borough destined to the east and west are expected to utilize the new alignment because of the savings in travel time due to the proximity of access points of the alignment. However, traffic from Edgegrove Road (SR 2008) between Church Street (SR 2011) and Oxford Avenue (SR 2008) will not shift to the new alignment because of longer travel times necessary to access the alignment. The increase in traffic along Sunday Drive (T460) is attributed to a shift in traffic originating from the Littlestown Borough area and points southwest that today utilize Hanover Pike (SR 0194) and Pine Grove Road (SR 2005) to access Carlisle Street (SR 0094) to travel through the region.

3.2.5.2. Levels of Service

A summary of the study area intersections levels of service is contained in **Table 19**. All LOS listed below reflect sub-Alternative B or sub-Alternative C except when indicated. The morning and evening peak hour levels of service, by movement, for each intersection within the study area for the Opening Year (2022) is provided in **Figure 45** and **Figure 46** (**Appendix A)**. The morning and evening peak hour levels of service, by movement, for each intersection within the study area for the Design Year (2042) is provided in **Figure 47** and **Figure 48 (Appendix A)**.

Table 19 – Alternative 4/5 Intersection Levels of Service

#	Intersection[1]	Opening Year (2022)		Design Year (2042)	
		Morning	Evening	Morning	Evening
1	Oxford Avenue (SR 2008)/3rd Street (SR 0116) & Main Street (SR 0116)/Elm Avenue (SR 2008)	B(16)	B(17)	C(21)	C(23)
2	Centennial Road (SR 2006) & Main Street (SR 0116)	A(8)	A(9)	A(8)	B(10)
3C	Sunday Drive (T460)/Race Horse Road (SR 2021) & Main Street (SR 0116) (**sub-Alt C only**)	B(12)	B(13)	B(13)	B(16)
3B	Sunday Drive (T460)/Race Horse Road (SR 2021) & Main Street (SR 0116) **(sub-Alt B only)**	B(12)	B(14)	B(14)	B(19)
4	5th Street (Boro) & Main Street (SR 0116)	c(23)	d(26)	d(31)	e(38)
5	2nd Street (SR 2011) & Main Street (SR 0116)	d(28)	e(49)	e(42)	f(105)
6	High Street (T535/Boro) & Kindig Lane (T477/Boro)	b(10)	c(16)	b(11)	c(19)
7	High Street (T535/Boro) & Elm Avenue (SR 3098)	B(11)	B(16)	B(12)	C(20)
8	Church Street (SR 2011) & Edgegrove Road (SR 2008)	b(11)	b(11)	b(11)	b(12)
9	Oxford Avenue (SR 2008) & Kindig Lane (T477/Boro)	b(14)	c(22)	c(15)	d(33)
10	Oxford Avenue (SR 2008/T476) & Edgegrove Road (SR 2008)	b(11)	b(10)	b(11)	b(11)
11	Centennial Road (SR 2006) & Sunday Drive (T460)/Alignment	A(8)	A(9)	A(9)	B(11)
12	Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116)	c(20)	d(33)	d(32)	f(68)
13	Bender Road (T464) & Geiselman Road (T478)	a(9)	a(9)	a(9)	a(10)
14	Centennial Road (SR 2006) & Bender Road (T464)	b(10)	b(11)	b(10)	b(12)
15	High Street (T535/Boro) & Eisenhower Drive (T679/Boro)	B(13)	B(20)	B(13)	B(20)
16	Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro)	D(37)	D(42)	D(38)	D(47)
17	Carlisle Street (SR 0094) & Elm Avenue (SR 3098)	C(24)	C(24)	C(23)	C(27)
18	Geiselman Road (T478) & Hanover Road (SR 0116)	c(17)	c(22)	c(20)	d(28)
20	Oxford Avenue (SR 2008) & Alignment	A(10)	B(11)	B(11)	B(14)

#	Intersection[1]	Opening Year (2022)		Design Year (2042)	
		Morning	Evening	Morning	Evening
21	Church Street (SR 2011) & Alignment	c(18)	c(24)	c(20)	d(27)
22C	Sunday Drive (T460) & Alignment (**sub-Alt C only**)	b(12)	b(11)	b(12)	b(11)
23C	Hanover Road (SR 0116) & Alignment (**sub-Alt C only**)	A(8)	A(9)	A(8)	B(11)

: Intersection along alignment alternative
A(##) – Signalized Level of Service (Expected Delay (seconds))
a(##) – Unsignalized Level of Service (Expected Delay (seconds))
red – LOS E/F (unacceptable)
[1] All LOS reflect sub-Alternative C except where indicated.
[2] Unsignalized LOS represents the turning movement that experiences the most delay.
Refer to **LOS Summary Tables in **Appendix B** for detailed information

The proposed alignment is anticipated to significantly improve operations at existing intersections within the study area. Overall, all signalized intersections, including all individual lane groups, are projected to operate at LOS D or better during both the morning and evening peak hours in the Design Year (2042) except at the intersection of Carlisle Street (SR 0094) and Eisenhower Drive (T679/Boro). At this location, multiple lane groups are anticipated to operate at LOS E during the evening peak hour in the Design Year (2042); however, delays are anticipated to be 62 seconds or less per vehicle. Additionally, all approaches to the intersection are anticipated to operate at LOS D.

The unsignalized intersections in McSherrystown Borough, 2nd Street (SR 2011) and 5th Street (Boro), will continue to operate at unacceptable levels of service during both the morning and evening peak hour time periods. However, the side-street delay is projected to be comparable to the delay currently experienced at these intersections. At the intersection of Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116), the northbound and southbound approaches are anticipated to operate at unacceptable levels of service during the evening peak hour. The detailed intersection LOS summaries for each intersection are included in **Appendix B**.

SimTraffic (Trafficware, LLC) software (Version 10) was utilized to determine network performance measures. The delay, travel time, and travel speed were determined for both the morning and evening peak hour time periods and averaged for both the Opening Year (2022) and Design Year (2042). **Table 20** summarizes the average performance measures for key study area roadways.

Table 20 – Alternative 4/5 Performance Measures

Route	From	To	Delay (s/veh)	Travel Time (mm:ss)	Arterial Speed (mph)
Opening Year (2022)					
Eisenhower Drive (T679/Boro) \Alternative 4/5	Littlestown Rd (SR 2019)/ Bender Rd (T464)	Carlisle St (SR 0094)	77	05:57	33
Hanover Rd (SR 0116)/Main St (SR 0116)/Elm Ave (SR 3098)	Littlestown Rd (SR 2019)/ Bender Rd (T464)	Carlisle St (SR 0094)	115	08:51	30
Carlisle St (SR 0094)	Eisenhower Drive (T679/Boro)	Elm Ave (SR 3098)	19	02:45	32
High St (T535/Boro)	Elm Avenue (SR 3098)	Eisenhower Dr (T679/Boro)	28	01:56	30

Route	From	To	Delay (s/veh)	Travel Time (mm:ss)	Arterial Speed (mph)
Design Year (2042)					
Eisenhower Drive (T679/Boro) \Alternative 4/5	Littlestown Rd (SR 2019)/ Bender Rd (T464)	Carlisle St (SR 0094)	81	06:01	33
Hanover Rd (SR 0116)/Main St (SR 0116)/Elm Ave (SR 3098)	Littlestown Rd (SR 2019)/ Bender Rd (T464)	Carlisle St (SR 0094)	245	11:12	27
Carlisle St (SR 0094)	Eisenhower Drive (T679/Boro)	Elm Ave (SR 3098)	24	03:28	31
High St (T535/Boro)	Elm Avenue (SR 3098)	Eisenhower Dr (T679/Boro)	29	01:55	30

: Alignment alternative

In the Design Year (2042), to travel from one end of the study area to the other along Hanover Road/Main Street (SR 0116) and Elm Avenue (SR 3098) will take, on average, over 11 minutes at an average speed of 27 mph which is two minutes slower than the existing travel time but five minutes slower than anticipated No Build travel time for the same route. Traveling north or south through the study area via Carlisle Street (SR 0094) will take over 3 minutes at a travel speed of 31 mph. Travel time along High Street (T535/Boro) between Eisenhower Drive (T679/Boro) and Elm Avenue (SR 3098) is approximately 2 minutes at a travel speed of 30 mph. Along the new alignment, traveling from one end of the study area to the other will take approximately 6 minutes at a travel speed of 33 mph. This is a travel time savings of almost 10 minutes when compared to the No Build Scenario. Refer to **Appendix L** for the Alternative 4/5 traffic model and capacity analysis reports.

3.2.5.3. Improvements

Table 21 lists the improvements that would be required to accommodate future traffic volumes within the study area under alignment Alternative 4/5. Improvements apply to both sub-Alternative B and sub-Alternative C unless otherwise noted. Capacity adding improvements are only anticipated along the alignment except at Sunday Drive (T460)/Race Horse Road (SR 2021) & Main Street (SR 0116) under sub-Alternative B. **Figure 49 (Appendix A)** provides a regional overview of the recommended improvements.

Table 21 – Alternative 4/5 Recommended Improvements

#	Intersection	Alternative 4/5
3B	Sunday Drive (T460)/Race Horse Road (SR 2021) & Main Street (SR 0116) **(sub-Alt B)**	• Construct NB left turn lane • Construct EB left turn lane • Construct WB left turn lane • Reconstruct existing signal
4	5th Street (Boro) & Main Street (SR 0116)	• Monitor location
5	2nd Street (SR 2011) & Main Street (SR 0116)	• Monitor location
11	Centennial Road (SR 2006) & Sunday Drive (T460)/Alignment	• Install new traffic signal • Construct EB left turn lane • Construct WB left turn lane **Or** - Consider roundabout

#	Intersection	Alternative 4/5
12	Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116)	• Monitor location
15	High Street (T535/Boro) & Eisenhower Drive (T679/Boro)	• Install new traffic signal • Construct NB left turn lane • Construct SB left turn lane • Construct EB left turn lane • Construct WB left turn lane
16	Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro)	• Revise existing signal timings • Monitor location
20	Oxford Avenue (SR 2008) & Alignment	• Install new traffic signal • Construct NB left turn lane • Construct SB left turn lane • Construct EB left turn lane • Construct WB left turn lane **Or** - Consider roundabout
21	Church Street (SR 2011) & Alignment	• Two-way stop controlled • Construct EB left turn lane • Construct WB left turn lane **Or** - Consider roundabout
22C	Sunday Drive (T460) & Alignment (**sub-Alt C**)	• Stop controlled (Sunday Drive (T460) • Construct channelized NB right turn • Construct WB left turn lane
23C	Hanover Road (SR 0116) & Alignment (**sub-Alt C**)	• Install new traffic signal • Construct WB left turn lane **Or** - Consider roundabout

There are no intersection or signal improvements recommended at the intersections of Littlestown Road (SR 2019)/Bender Road (T464) & Hanover Road (SR 0116), 5th Street (Boro) & Main Street (SR 0116), and 2nd Street (SR 2011) & Main Street (SR 0116). It is anticipated that signal warrants would not be met for these locations due to low side-street volumes anticipated delay.

3.3. SAFETY ANALYSIS

A Highway Safety Manual (HSM) analysis was completed for each alternative in order to evaluate the safety performance of each proposed alternative for the Design Year (2042).

To predict the impacts to safety in Design Year (2042) a Highway Safety Manual (HSM) analysis was conducted for the proposed alternatives: No Build, TSM Alternative, Alternative 3, and Alternative 4/5. The HSM provides analytical tools and techniques for quantifying potential effects of crashes as a result of decisions made during the planning, design, operations, and maintenance process. Similar to how the HCM evaluates how design elements impact operations the HSM evaluates how design elements impact safety. The analysis was performed utilizing the Department's HSM Safety Analysis Tool. The HSM Safety Analysis Tool combines Rural Two-Lane Roadways, Rural Multilane Highways, and Urban and Suburban Arterials into one spreadsheet which has been customized to Pennsylvania.

Table 22 (Next Page) summarizes the results of the HSM analysis by roadway and by scenario. The analysis predicts that there will be approximately 282 crashes per year occurring within the study area during the No Build Scenario. During the Build Scenario for all alternatives except the TSM, the predicted number of crashes is expected to decrease by approximately 10 percent even though there is approximately 3.5 miles of new roadway and up to five new intersections being proposed. This decrease is attributed to the shift of traffic from the existing roadway network, which consists of on-street parking, a significant number of driveways/access points, and narrow or non-existent clear zones, to a new alignment that incorporates 12-foot travel lanes, standard width shoulders, and sufficient clear zones. Sub-Alternative B provides a slightly better crash performance than sub-Alternative C, which is due to the additional lane-miles and new intersections introduced by sub-Alternative C. Crashes are predicted to increase by approximately three percent in the TSM Alternative. This is primarily due to the additional lane miles needed along Carlisle Street (SR 0094).

Along the key roadways within the study area, during all of the new alignment alternatives, crashes are expected to decrease by 15 percent along Carlisle Street (SR 0094), 20 percent along Hanover Road/Main Street (SR 0116), and 32 percent along High Street (T535/Boro) when compared to the No Build Scenario. Predicted crashes along Church Street/2nd Street (SR 2011) and Race Horse Road (SR 2021)/Sunday Drive (T460) will increase slightly due to increased volume under the new alignment alternatives. The HSM safety analysis predicts approximately 31 crashes (sub-Alternative B) to 37 (sub-Alternative C) crashes occurring per year along the proposed new alignments. Refer to **Appendix M** for the HSM analysis results.

Table 22 – Highway Safety Analysis[1] (Design Year 2042 Conditions)

Roadway	No Build Conditions			Build Conditions													
				TSM Alternative			Alignment 3B Alternative			Alignment 3C Alternative			Alignment 4B/5B Alternative			Alignment 4C/5C Alternative		
	FI[2]	PDO[3]	Total	FI	PDO	Total	FI	PDO	Total	FI	PDO	Total	FI	PDO	Total	FI	PDO	Total
Carlisle St (SR 0094)	60.5	30.9	**91.4**	73.5	28.3	**101.8**	52.2	26.4	**78.6**	52.2	26.4	**78.6**	52.2	26.4	**78.6**	52.2	26.4	**78.6**
Hanover Rd/Main St/Oxford Ave (SR 0116))	40.4	38.7	**79.2**	40.1	38.3	**78.4**	32.0	31.1	**63.2**	32.3	31.4	**63.7**	31.0	30.1	**61.1**	31.3	30.4	**61.6**
Centennial Rd/ 3rd St (SR 2006)	8.0	8.0	**16.0**	8.0	8.0	**16.0**	6.6	6.8	**13.4**	6.6	6.8	**13.4**	6.4	6.6	**13.0**	6.4	6.6	**13.0**
Edgegrove Rd/ Oxford Ave/Elm Ave (SR 2008)	14.2	14.4	**28.6**	14.1	14.2	**28.3**	12.6	12.8	**25.4**	12.6	12.8	**25.4**	12.8	13.1	**25.9**	12.8	13.1	**25.9**
Church St/2nd St (SR 2011)	1.8	2.2	**4.0**	1.8	2.2	**4.0**	2.3	2.7	**5.0**	2.3	2.7	**5.0**	2.2	2.6	**4.8**	2.2	2.6	**4.8**
Race Horse Rd (SR 2021)	0.5	0.6	**1.2**	0.5	0.6	**1.2**	0.7	0.9	**1.6**	0.7	0.9	**1.6**	0.7	0.9	**1.6**	0.7	0.9	**1.6**
Elm Ave (SR 3098)	10.7	9.1	**19.8**	10.7	9.1	**19.8**	9.6	8.3	**17.9**	9.6	8.3	**17.9**	9.6	8.3	**17.9**	9.6	8.3	**17.9**
Sunday Dr (T460)	0.6	0.6	**1.2**	0.6	0.6	**1.2**	--	--	**--**	0.9	0.9	**1.9**	--	--	**--**	0.9	0.9	**1.9**
Eisenhower Dr (T679/Boro)	2.5	1.9	**4.4**	2.5	1.9	**4.4**	--	--	**--**	--	--	**--**	--	--	**--**	--	--	**--**
High St (T535/Boro)	16.2	15.1	**31.2**	16.1	14.5	**30.6**	10.8	10.5	**21.2**	10.8	10.5	**21.2**	10.8	10.5	**21.2**	10.8	10.5	**21.2**
Kindig Ln (T477)	2.4	2.6	**5.0**	2.4	2.6	**5.0**	1.4	1.6	**3.0**	1.4	1.6	**3.0**	1.4	1.6	**3.0**	1.4	1.6	**3.0**
Alignment	--	--	**--**	--	--	**--**	17.1	14.4	**31.5**	19.4	17.3	**36.7**	16.8	14.1	**30.9**	19.1	17.0	**36.1**
Total	**157.7**	**124.2**	**282.0**	**170.2**	**120.4**	**290.7**	**145.2**	**115.5**	**260.7**	**148.7**	**119.6**	**268.3**	**143.9**	**114.2**	**258.1**	**147.4**	**118.4**	**265.7**

: Total crashes **greater than** No Build Conditions
: Total crashes **less than** No Build Conditions

[1] Displayed in **crashes per year**
[2] **FI** - Fatal and Injury crashes
[3] **PDO** – Property Damage Only crash

4. CONCLUSIONS

Based upon the analyses presented, the following results were found:

Existing Conditions:

- Generally, the existing network operates at acceptable Levels of Service. Some turning movements operate over capacity at the Carlisle Street (SR 0094) and Eisenhower Drive (T679/Boro) intersection. Additionally, the side street approaches within McSherrytown Borough and Hanover Borough operate at unacceptable levels of service (see **Figure 9** and **Figure 10**, **Appendix A**).
- The trip from Carlisle Street (SR S0094) and Eisenhower Drive (T679/Boro) to Hanover Road (SR0116) and Bender Road T464)/Littlestown Road (SR 2019) takes 11-mins at a speed of 28 mph (see **Figure 4** and **Figure 5**, **Appendix A**)**.**
- Crash rates (per million vehicle miles) along the key roadway links within the study area exceed the statewide average crash rates (per million vehicle miles) for similar type roadways (see **Figure 11**, **Appendix A**).

No Build Scenario:

- Traffic volumes are anticipated to increase by 21 percent by the Design Year (2042) (see **Figure 18**, **Appendix A**).
- The intersection of Carlisle Street (SR 0094) and Eisenhower Drive (T679/Boro) is projected to operate at unacceptable levels of service. The side street approaches at the unsignalized intersections within McSherrytown Borough and Hanover Borough are anticipated to operate at unacceptable levels of service (see **Figure 21** and **Figure 22**, **Appendix A**).
- The trip from Carlisle Street (SR S0094) and Eisenhower Drive (T679/Boro) to Hanover Road (SR0116) and Bender Road T464)/Littlestown Road (SR 2019) takes on average, 20-mins and 30-secs at a travel speed of 25 mph.
- The number of crashes is predicted to increase by approximately 15 percent over existing conditions.

TSM Alternative:

- Traffic Management, Transit Management, and Demand Management strategies alone are not anticipated to reduce congestion to alleviate operational deficiencies within the study area. Therefore, significant capacity adding infrastructure improvements would also be required (see **Figure 27**, **Appendix A**).
- The trip from Carlisle Street (SR S0094) and Eisenhower Drive (T679/Boro) to Hanover Road (SR0116) and Bender Road T464)/Littlestown Road (SR 2019) takes, on average, 15-mins and 20-secs at a travel speed of 26 mph.
- The number of crashes that occur within the study area is predicted to increase by approximately 3 percent when compared to the No Build Scenario (see **Table 22**).

Alternative 3:

- The proposed alignment alternative will carry, on average, 11,500 vehicles per day. This will reduce traffic along Carlisle Street (SR 0094), Hanover Street/Main Street (SR 0116), and High Street (T535/Boro) by approximately 4,000 vehicles per day each. The proposed alignment will increase traffic along Sunday Drive (T460) by 5,000 vehicles per day under sub-Alternative C and by 9,000 vehicles per day under sub-Alternative B (see **Figure 33**, **Appendix A**).

- Due to the northern location of this alignment alternative, traffic is anticipated to shift from Edgegrove Road (SR 2008) to the new alignment. Local trips from Main Street (SR 0116) in McSherrystown Borough will not utilize the new alignment.
- The only off alignment improvement that would be required is at Sunday Drive (T460)/Race Horse Road (SR 2021) and Main Street (SR 0116) during sub-Alternative B only. Refer to **Figure 38 (Appendix A)** for all regional improvements.
- The trip from Carlisle Street (SR S0094) and Eisenhower Drive (T679/Boro) to Hanover Road (SR0116) and Bender Road T464)/Littlestown Road (SR 2019) takes, on average, 11-mins 40-secs at a travel speed of 28 mph along the existing roadway network and the same trip takes approximately 6-mins and 20-secs along the new alignment.
- The number of crashes that occur within the study area is predicted to decrease by approximately 6 percent when compared to the No Build Scenario (see **Table 22**).

Alternative 4/5:

- The proposed alignment alternative will carry, on average, 11,700 vehicles per day. This will reduce traffic along Carlisle Street (SR 0094), Hanover Street/Main Street (SR 0116), and High Street (T535/Boro) by approximately 4,000 vehicles per day each. The proposed alignment will increase traffic along Sunday Drive (T460) by 5,000 vehicles per day under sub-Alternative C and by 9,000 vehicles per day under sub-Alternative B (see **Figure 44**, **Appendix A**).
- Due to the southern location of this alignment alternative, local trips along Main Street (SR 0116) within McSherrystown Borough are anticipated to shift to the new alignment. Traffic is not anticipated to shift to the new alignment from Edgegrove Road (SR 2008).
- The only off alignment improvement that would be required is at Sunday Drive (T460)/Race Horse Road (SR 2021) and Main Street (SR 0116) during sub-Alternative B only. Refer to **Figure 49 (Appendix A)** for all regional improvements.
- The trip from Carlisle Street (SR S0094) and Eisenhower Drive (T679/Boro) to Hanover Road (SR0116) and Bender Road T464)/Littlestown Road (SR 2019) takes, on average, 13-mins at a travel speed of 28 mph along the existing roadway network and the same trip takes approximately 6-mins along the new alignment.
- The number of crashes that occur within the study area is predicted to decrease by approximately 6 percent when compared to the No Build Scenario (see **Table 22**).

The preferred alternative is Alternative 5 with sub-Alternative C. Although the traffic-based metrics are similar to Alternative 3 with sub-Alternative C; a southern alignment allows for more traffic to shift from Main Street/Hanover Road (SR 0116). Sub-Alternative C is preferred because it minimizes increased traffic along Sunday Drive (T460) and eliminates the off-alignment improvements that would be required at Sunday Drive (T460)/Race Horse Road (SR 2021) and Main Street (SR 0116).

APPENDICES

APPENDIX A: FIGURES

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 1

SITE LOCATION MAP

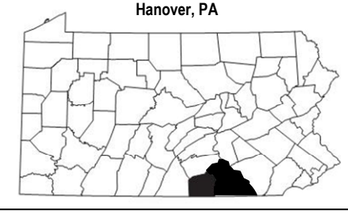
Eisenhower Drive Extension

LEGEND

: Study Area

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 2

TRAFFIC COUNT LOCATION MAP

Eisenhower Drive Extension

LEGEND

- : Study Area
- : Manual TMC Location & Traffic Control Device
- : ATR Count Location

REGIONAL SETTING

Hanover, PA

JMT Project Number: 02-0308-012

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 3

ORIGIN-DESTINATION STUDY SUMMARY

% of Origin Volume:
4% / 9%
15% / 19%

% of Origin Volume:
4% / 6%
5% / 5%
7% / 9%
7% / 8%
4% / 4%

% of Origin Volume:
13% / 21%
32% / 46%

% of Origin Volume:
13% / 24%
34% / 48%
42% / 56%

% of Origin Volume:
14% / 25%
13% / 23%
15% / 38%
32% / 44%
12% / 19%

Location	Intersection	Movement	Description
A	Eisenhower Drive (T697/Boro) & High Street (T535/Boro)	1	Westbound Left
		2	Southbound Through
B	High Street (T535/Boro) & Kindig Lane (T477/Boro)	3	Southbound Right
C	Carlisle Street (SR 0094) & Elm Avenue (SR 3098)	4	Southbound Right
D	High Street (T535/Boro) & Elm Avenue (SR 3098)	5	Southbound Right
E	Oxford Avenue (SR 2008)/3rd Street (SR 0116) & Elm Avenue (SR 2008)/Main Street (SR 0116)	6	Westbound Through
F	Oxford Avenue (SR 2008) & Kindig Lane (T477/Boro)	7	Westbound Right
		8	Westbound Left
G	Centennial Avenue (SR 2011) & Main Street (SR 0116)	9	Westbound Through
		10	Westbound Right

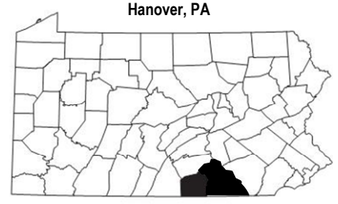
Eisenhower Drive Extension

LEGEND

- : Study Area
- B : Location/Intersection
- 3 : Movement (OD Survey Site)
- : Travel Path
- #% / #% : AM Peak / PM Peak

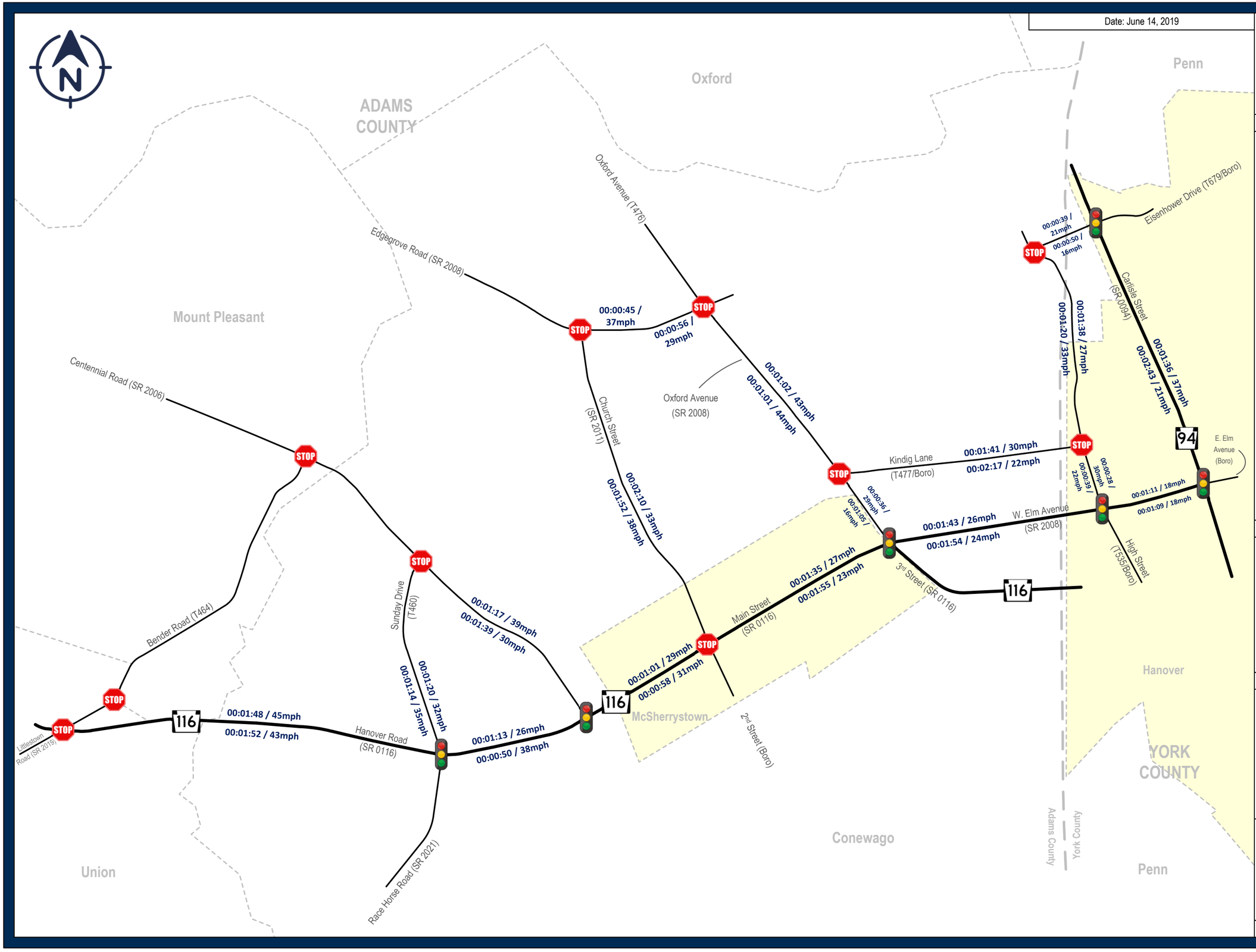
REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

Date: June 14, 2019



Agreement: PennDOT / E00187

FIGURE 4

EXISTING MORNING PEAK PERIOD TRAVEL TIME SUMMARY

Eisenhower Drive Extension

LEGEND

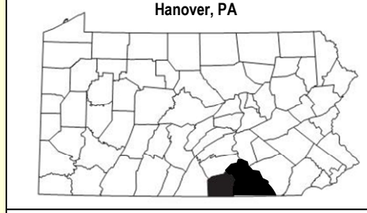
: Signalized Intersection

: Stop Controlled Intersection

00:01:25 / 24mph : Travel Time (hh:mm:ss) / Travel Speed (mile per hour)

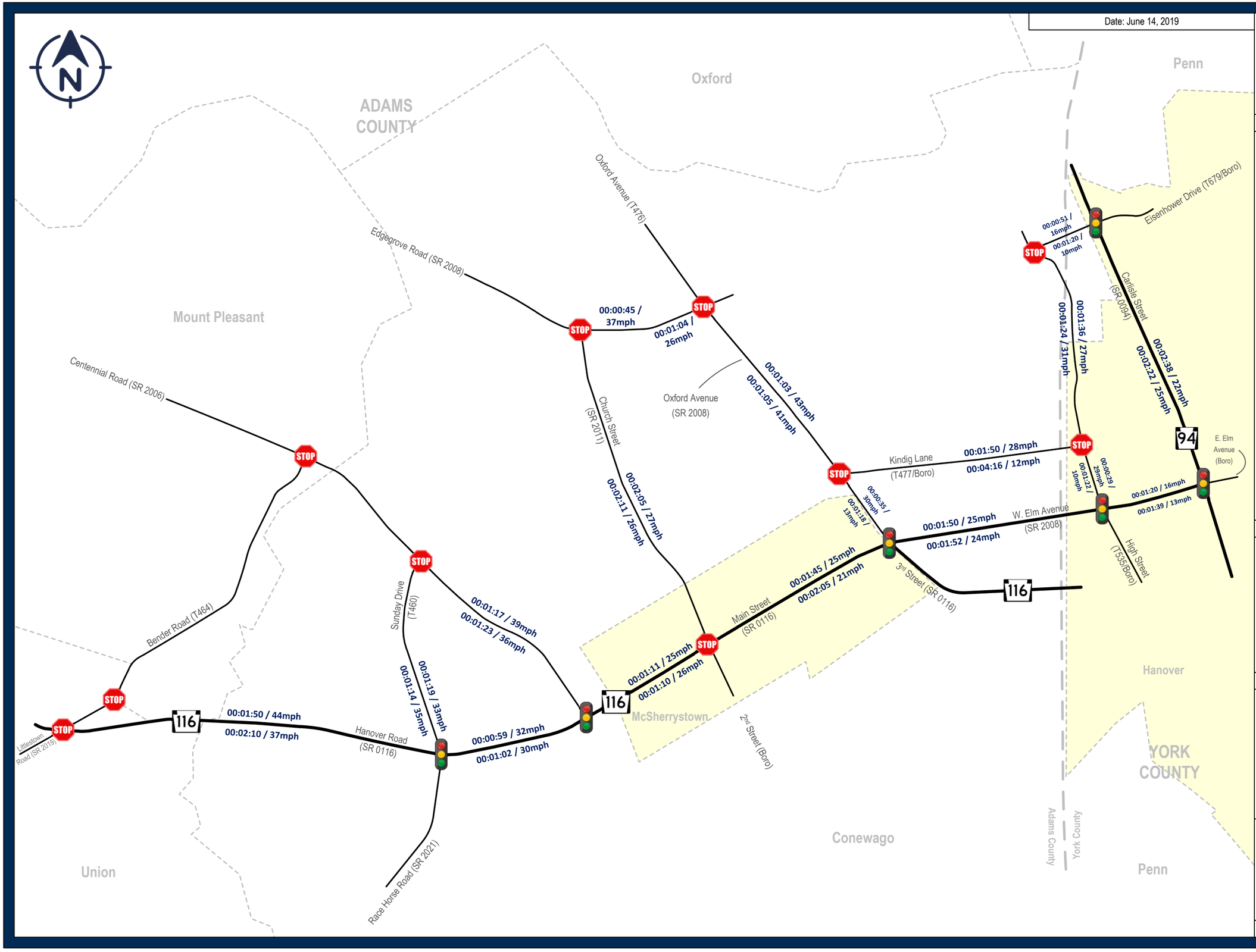
REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

Date: June 14, 2019



Agreement: PennDOT / E00187

FIGURE 5

EXISTING EVENING PEAK PERIOD TRAVEL TIME SUMMARY

Eisenhower Drive Extension

LEGEND

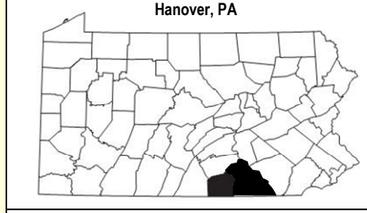
: Signalized Intersection

: Stop Controlled Intersection

00:01:25 / 24mph : Travel Time (hh:mm:ss) / Travel Speed (mile per hour)

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 6

EXISTING (2015) MORNING PEAK HOUR TRAFFIC VOLUMES

Eisenhower Drive Extension

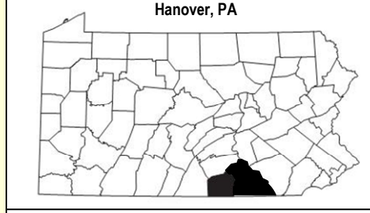
LEGEND

: Signalized Intersection

: Stop Controlled Intersection

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 7

EXISTING (2015) EVENING PEAK HOUR TRAFFIC VOLUMES

Eisenhower Drive Extension

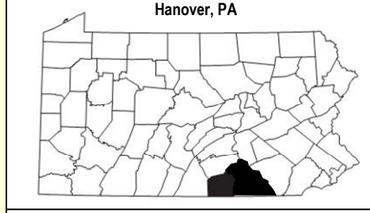
LEGEND

: Signalized Intersection

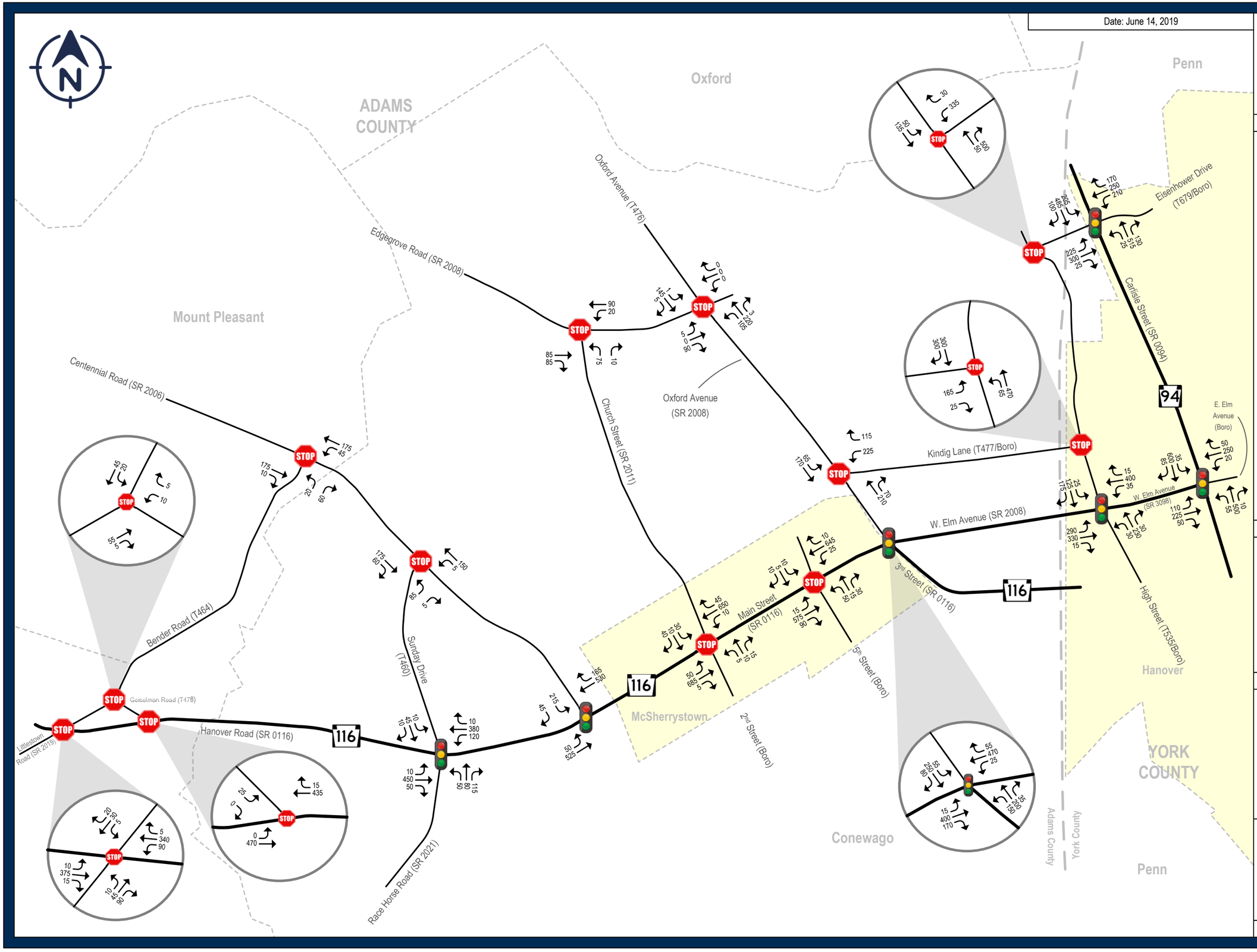
: Stop Controlled Intersection

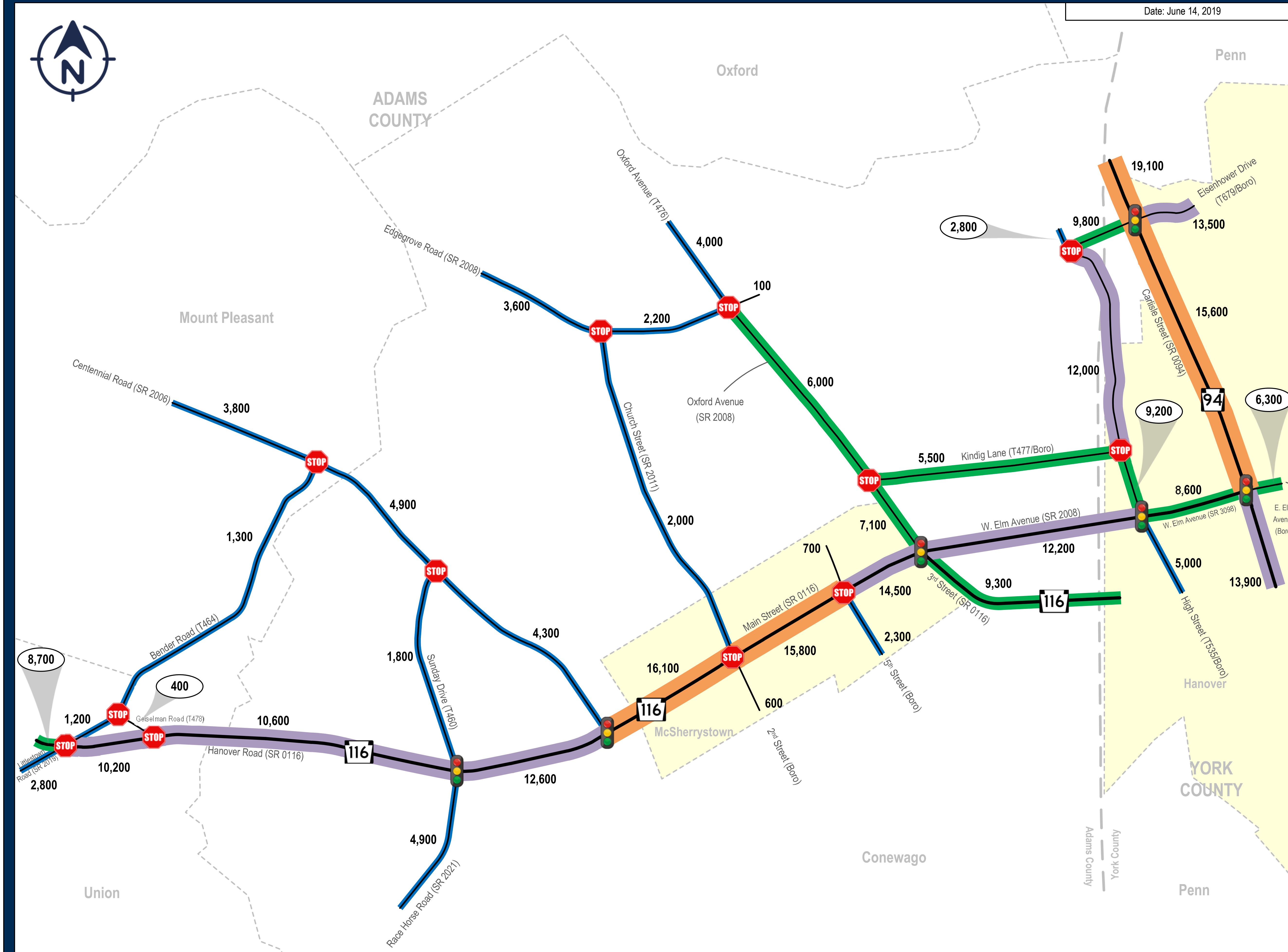
REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012





Date: June 14, 2019
ADAMS COUNTY
Oxford
Penn
Mount Pleasant
Union
Conewago
McSherrystown
Hanover
YORK COUNTY
Adams County
York County
Oxford Avenue (T476)
4,000
Edgegrove Road (SR 2008)
3,600
2,200
100
Oxford Avenue (SR 2008)
6,000
Centennial Road (SR 2006)
3,800
4,900
1,300
Church Street (SR 2011)
2,000
Kindig Lane (T477/Boro)
5,500
7,100
W. Elm Avenue (SR 2008)
12,200
700
Main Street (SR 0116)
14,500
3rd Street (SR 0116)
9,300
116
2,300
5th Street (Boro)
16,100
15,800
600
2nd Street (Boro)
Bender Road (T464)
8,700
400
1,200
Geiselman Road (T478)
10,600
Littlestown Road (SR 2019)
2,800
10,200
Hanover Road (SR 0116)
1,800
Sunday Drive (T460)
4,300
12,600
4,900
Race Horse Road (SR 2021)
19,100
Eisenhower Drive (T679/Boro)
9,800
13,500
2,800
Carlisle Street (SR 0094)
15,600
12,000
94
9,200
6,300
8,600
W. Elm Avenue (SR 3098)
E. Elm Avenue (Boro)
5,000
13,900
High Street (T535/Boro)

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Figure 8

Existing (2015) Average Daily Traffic Volumes

Eisenhower Drive Extension

Legend

- : 0 – 1,000 Vehicles per Day (VPD)
- : 1,000 – 5,000 VPD
- : 5,000 – 10,000 VPD
- : 10,000 – 15,000 VPD
- : 15,000 – 20,000 VPD
- : Greater than 20,000
- STOP :Traffic Control Device

Regional Setting

Hanover, PA

JMT Project Number: 02-0308-012

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 9

EXISTING (2015) MORNING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

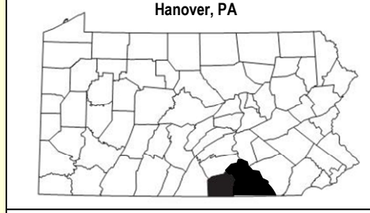
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

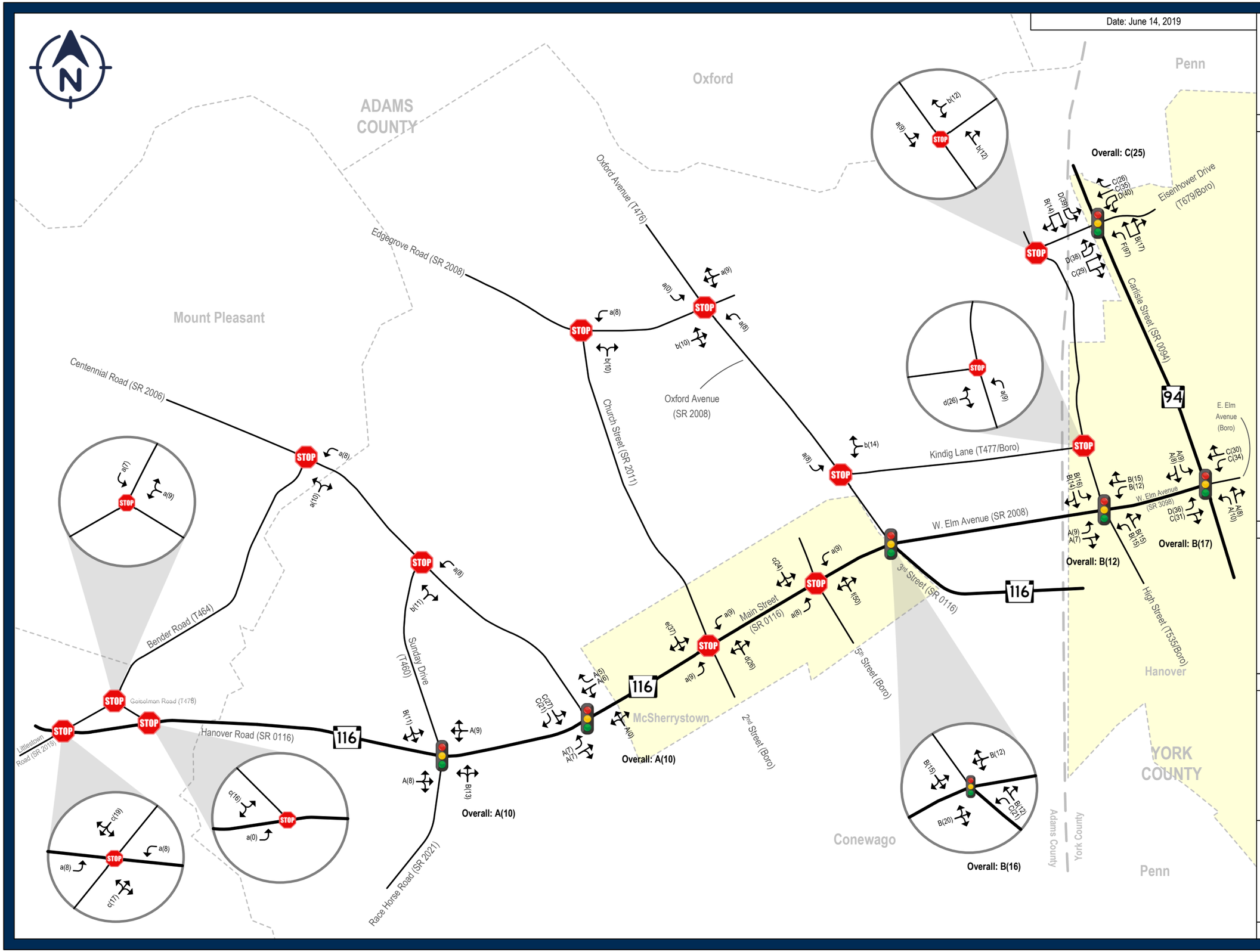
a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012



Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 10

EXISTING (2015) EVENING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

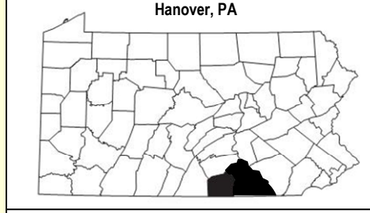
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

ADAMS COUNTY

Oxford

Penn

Mount Pleasant

Hanover

McSherrystown

Conewago

YORK COUNTY

Adams County

York County

Penn

Edgegrove Road (SR 2008)

Oxford Avenue (T476)

Oxford Avenue (SR 2008)

Church Street (SR 2011)

Centennial Road (SR 2006)

Bender Road (T464)

Coleman Road (T478)

Littlestown Road (SR 2019)

Hanover Road (SR 0116)

Sunday Drive (T460)

Race Horse Road (SR 2021)

Main Street (SR 0116)

2nd Street (Boro)

3rd Street (SR 0116)

5th Street (Boro)

Kindig Lane (T477/Boro)

W. Elm Avenue (SR 2008)

W. Elm Avenue (SR 3098)

E. Elm Avenue (Boro)

Eisenhower Drive (T679/Boro)

Carlisle Street (SR 0094)

High Street (T535/Boro)

116

94

Overall: B(11)

Overall: B(12)

Overall: B(20)

Overall: D(35)

Overall: B(18)

Overall: C(24)

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 11

EXISTING 5-YEAR CRASH RATE SUMMARY

(YEAR 2010 – YEAR 2014)

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

: Stop Controlled Intersection

: Actual Crash Rate exceeds Statewide Average Crash Rate

Crash rates determined for state-maintained roadways only.

REGIONAL SETTING

Hanover, PA

JMT Project Number: 02-0308-012

Hanover

McSherrystown

Eisenhower Drive (T679/Boro)

High Street (T535/Boro)

Carlisle Street (SR 0094)

94

E. Elm Avenue (Boro)

W. Elm Avenue (SR 3098)

Kindig Lane (T477/Boro)

W. Elm Avenue (SR 2008)

3rd Street (SR 0116)

116

Oxford Avenue (T476)

Edgegrove Road (SR 2008)

Church Street (SR 2011)

Oxford Avenue (SR 2008)

Centennial Road (SR 2006)

Main Street (SR 0116)

5th Street (Boro)

2nd Street (Boro)

Bender Road (T464)

Geiselman Road (T478)

Hanover Road (SR 0116)

Sunday Drive (T460)

Littlestown Road (SR 2019)

Race Horse Road (SR 2021)

Adams County

York County

STOP

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 12

ALIGNMENT ALTERNATIVES

REGIONAL OVERVIEW

Eisenhower Drive Extension

LEGEND

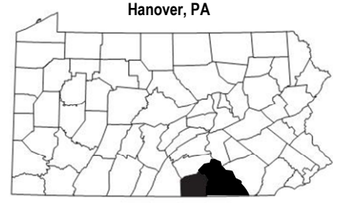
5 : Alignment Alternative

: Proposed Access Point

TSM = Transportation Systems Management

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

Oxford Avenue (T476)

Edgegrove Road (SR 2008)

Centennial Road (SR 2006)

Oxford Avenue (SR 2008)

Church Street (SR 2011)

High Street (T535/Boro)

Eisenhower Drive (T679/Boro)

Hanover

Carlisle Street (SR 0094)

TSM

94

E. Elm Avenue (Boro)

Kindig Lane (T477/Boro)

W. Elm Avenue (SR 2008)

W. Elm Avenue (SR 3098)

3rd Street (SR 0116)

116

Main Street (SR 0116)

McSherrystown

5th Street (Boro)

2nd Street (Boro)

Adams County

York County

Bender Road (T464)

Geiselman Road (T478)

Sunday Drive (T460)

Hanover Road (SR 0116)

Littlestown Road (SR 2019)

Race Horse Road (SR 2021)

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 13

OPENING YEAR (2022) NO BUILD & TSM ALTERNATIVES MORNING PEAK HOUR TRAFFIC VOLUMES

Eisenhower Drive Extension

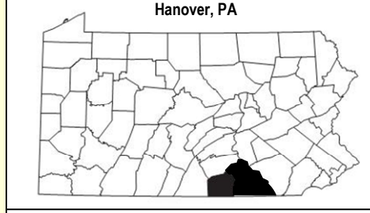
LEGEND

: Signalized Intersection

: Stop Controlled Intersection

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

ADAMS COUNTY

YORK COUNTY

Oxford

Penn

Mount Pleasant

Conewago

Hanover

McSherrystown

Edgegrove Road (SR 2008)

Oxford Avenue (T476)

Oxford Avenue (SR 2008)

Church Street (SR 2011)

Centennial Road (SR 2006)

Bender Road (T464)

Goldsmith Road (T478)

Littlestown Road (SR 2019)

Hanover Road (SR 0116)

Sunday Drive (T460)

Race Horse Road (SR 2021)

Kindig Lane (T477/Boro)

Eisenhower Drive (T679/Boro)

Carlisle Street (SR 0094)

E. Elm Avenue (Boro)

W. Elm Avenue (SR 2008)

W. Elm Avenue (SR 3098)

3rd Street (SR 0116)

Main Street (SR 0116)

2nd Street (Boro)

5th Street (Boro)

High Street (T535/Boro)

Adams County

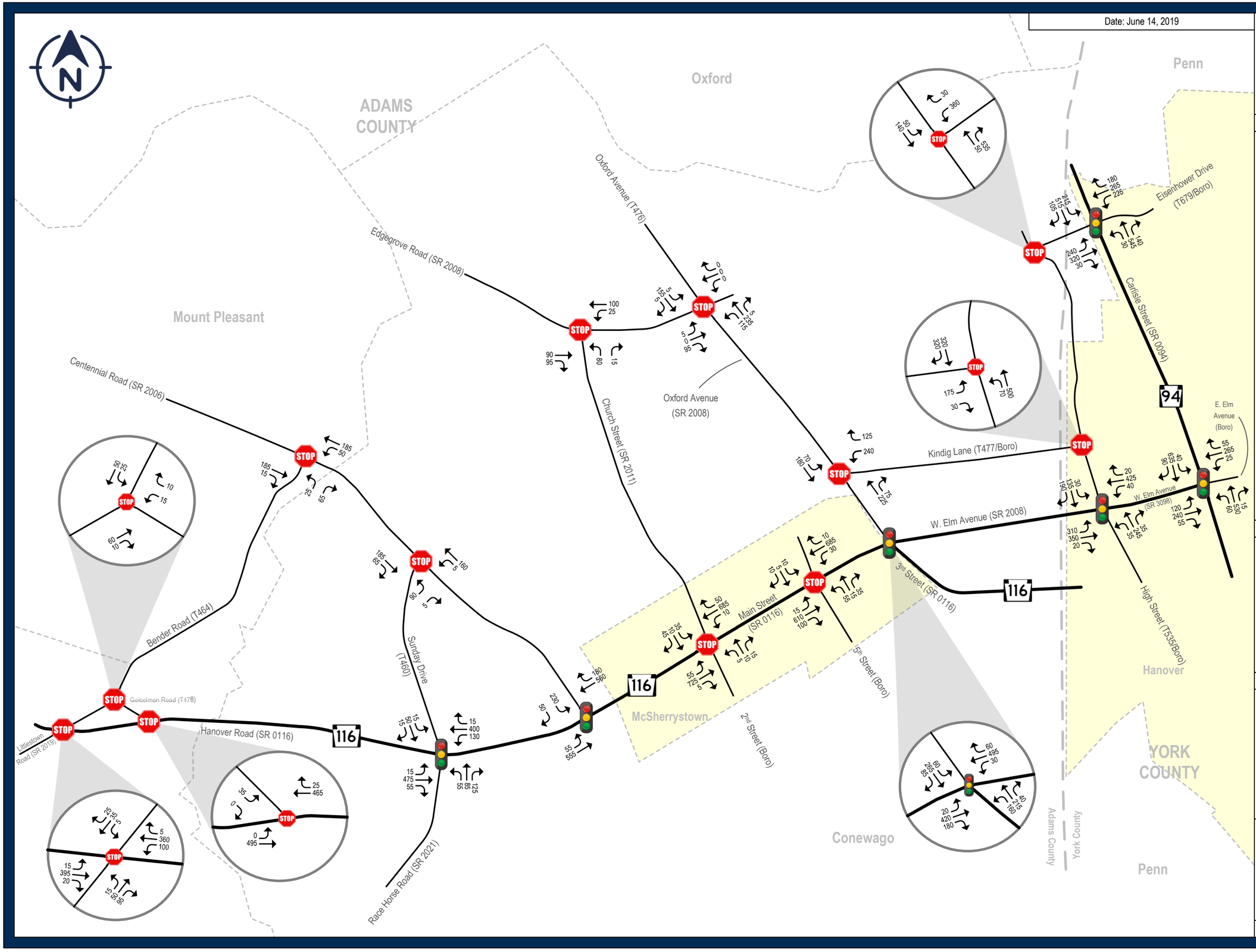
York County

116

94

STOP

Date: June 14, 2019



Agreement: PennDOT / E00187

FIGURE 14

OPENING YEAR (2022) NO BUILD & TSM ALTERNATIVES EVENING PEAK HOUR TRAFFIC VOLUMES

Eisenhower Drive Extension

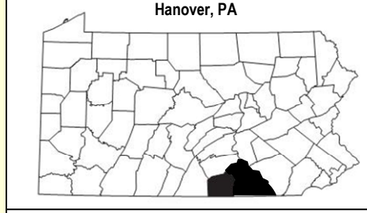
LEGEND

: Signalized Intersection

: Stop Controlled Intersection

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

Date: June 14, 2019

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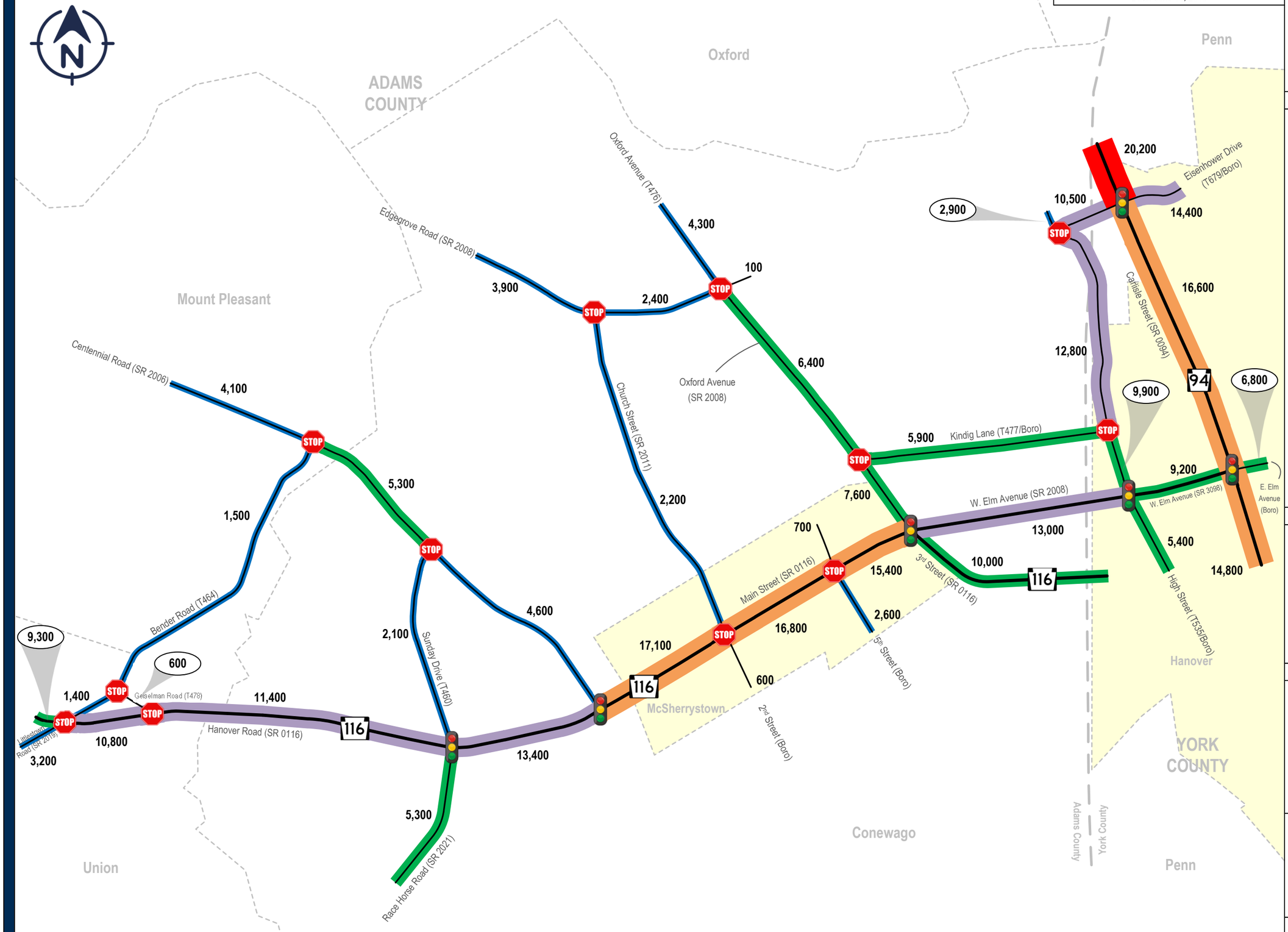
FIGURE 15

OPENING YEAR (2022) NO BUILD & TSM ALTERNATIVES AVERAGE DAILY TRAFFIC VOLUMES

Eisenhower Drive Extension

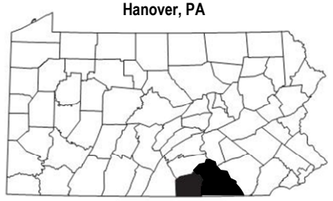


LEGEND

- : 0 – 1,000 Vehicles per Day (VPD)
- : 1,000 – 5,000 VPD
- : 5,000 – 10,000 VPD
- : 10,000 – 15,000 VPD
- : 15,000 – 20,000 VPD
- : Greater than 20,000
- STOP :Traffic Control Device

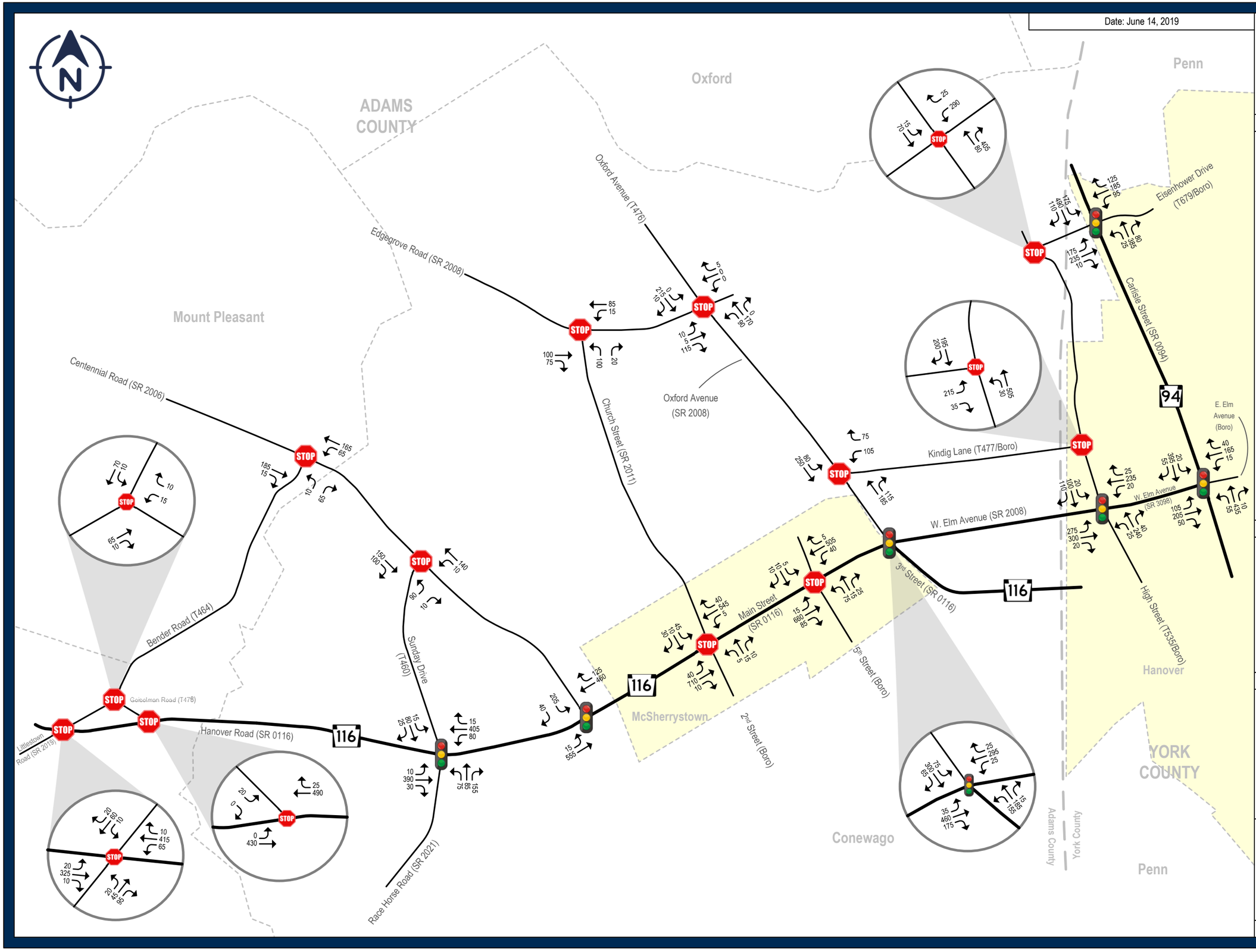
REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

Date: June 14, 2019



Design Year (2042) No Build & TSM Alternatives Morning Peak Hour Traffic Volumes

Eisenhower Drive Extension

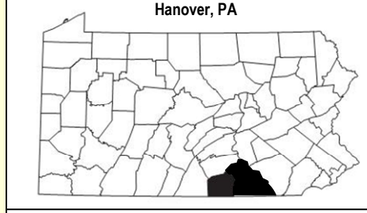
Legend

: Signalized Intersection

: Stop Controlled Intersection

Regional Setting

Hanover, PA

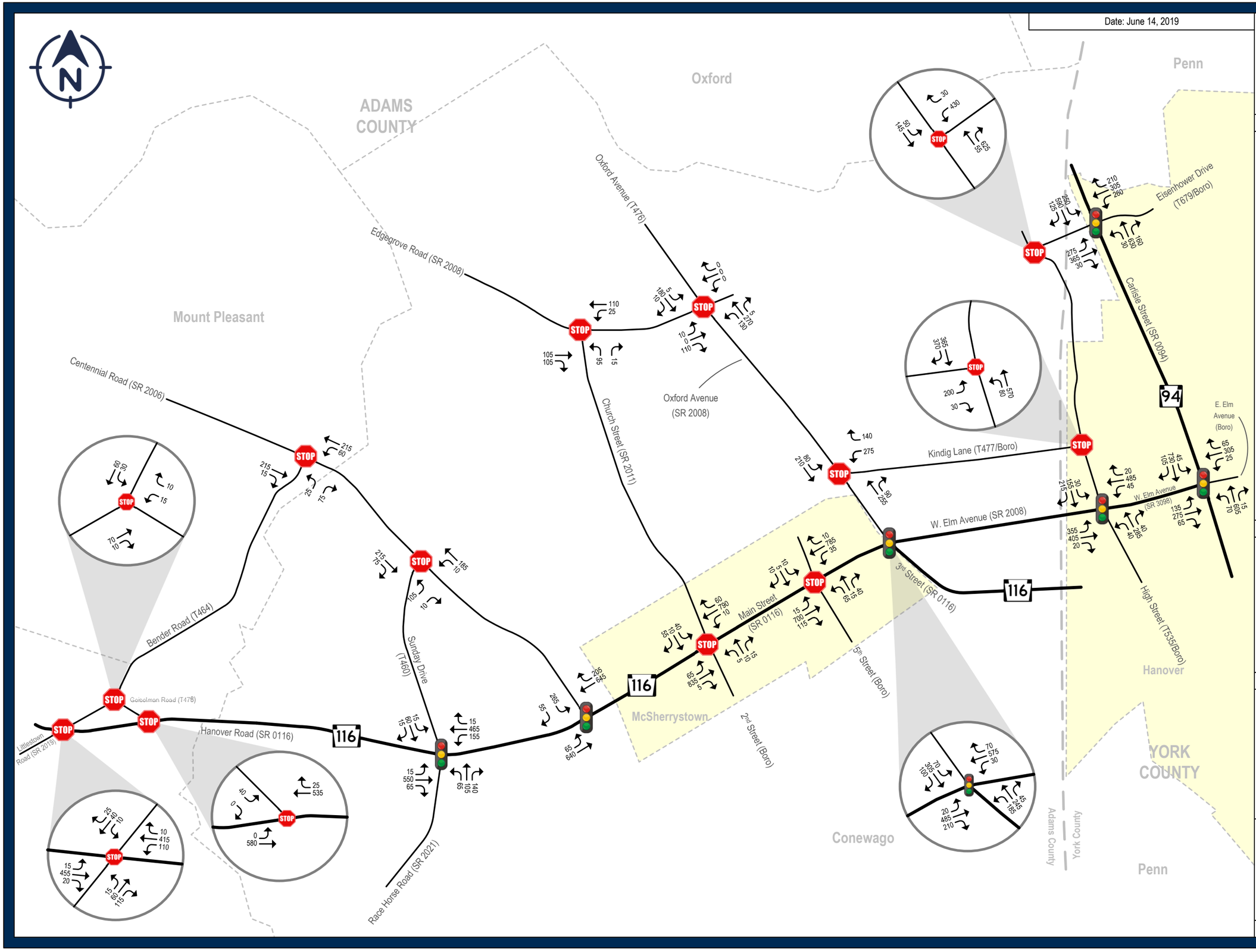


Agreement: PennDOT / E00187

FIGURE 16

JMT Project Number: 02-0308-012

Date: June 14, 2019



Agreement: PennDOT / E00187

FIGURE 17

DESIGN YEAR (2042) NO BUILD & TSM ALTERNATIVES EVENING PEAK HOUR TRAFFIC VOLUMES

Eisenhower Drive Extension

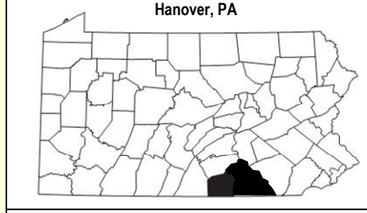
LEGEND

: Signalized Intersection

: Stop Controlled Intersection

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 18

DESIGN YEAR (2042) NO BUILD & TSM ALTERNATIVES AVERAGE DAILY TRAFFIC VOLUMES

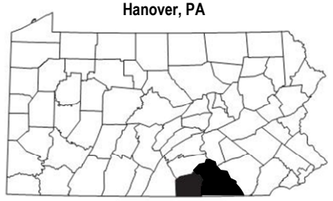
Eisenhower Drive Extension

LEGEND

- : 0 – 1,000 Vehicles per Day (VPD)
- : 1,000 – 5,000 VPD
- : 5,000 – 10,000 VPD
- : 10,000 – 15,000 VPD
- : 15,000 – 20,000 VPD
- : Greater than 20,000
- STOP :Traffic Control Device

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

ADAMS COUNTY
Oxford
Penn
Mount Pleasant
Union
Conewago
Hanover
McSherrystown
YORK COUNTY
Adams County
York County
Oxford Avenue (T476)
Edgegrove Road (SR 2008)
Centennial Road (SR 2006)
Oxford Avenue (SR 2008)
Church Street (SR 2011)
Bender Road (T464)
Littlestown Road (SR 2015)
Geiselman Road (T478)
Hanover Road (SR 0116)
Sunday Drive (T460)
Race Horse Road (SR 2021)
Main Street (SR 0116)
2nd Street (Boro)
5th Street (Boro)
3rd Street (SR 0116)
Kindig Lane (T477/Boro)
W. Elm Avenue (SR 2008)
W. Elm Avenue (SR 3098)
Carlisle Street (SR 0094)
Eisenhower Drive (T679/Boro)
High Street (T535/Boro)
E. Elm Avenue (Boro)
116
94
STOP
23,400
12,100
3,000
16,500
19,000
14,700
11,200
7,800
6,800
10,600
8,800
14,900
11,500
6,200
17,000
700
17,700
2,900
19,300
19,700
600
5,100
100
4,400
2,700
7,400
4,700
6,100
1,700
5,400
2,600
2,400
15,400
6,200
10,600
700
1,600
13,200
12,500
3,600

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 19

OPENING YEAR (2022) NO BUILD ALTERNATIVE MORNING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

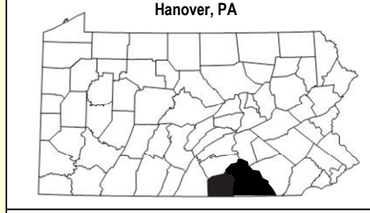
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

ADAMS COUNTY

Oxford

Penn

Mount Pleasant

Edgegrove Road (SR 2008)

Oxford Avenue (T476)

Oxford Avenue (SR 2008)

Church Street (SR 2011)

Centennial Road (SR 2006)

Bender Road (T464)

Coldsman Road (T478)

Littlestown Road (SR 2019)

Hanover Road (SR 0116)

Sunday Drive (T460)

Race Horse Road (SR 2021)

Main Street (SR 0116)

McSherrystown

2nd Street (Boro)

5th Street (Boro)

3rd Street (SR 0116)

Kindig Lane (T477/Boro)

W. Elm Avenue (SR 2008)

W. Elm Avenue (SR 3098)

Eisenhower Drive (T679/Boro)

Carlisle Street (SR 0094)

High Street (T535/Boro)

E. Elm Avenue (Boro)

Hanover

YORK COUNTY

Conewago

Adams County

York County

Penn

116

94

Overall: C(31)

Overall: B(10)

Overall: B(10)

Overall: B(12)

Overall: C(20)

Overall: B(20)

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 20

OPENING YEAR (2022) NO BUILD ALTERNATIVE EVENING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

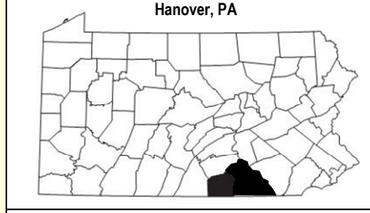
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

ADAMS COUNTY

YORK COUNTY

Oxford

Penn

Mount Pleasant

Conewago

Hanover

McSherrystown

Adams County

York County

Penn

Edgegrove Road (SR 2008)

Oxford Avenue (T476)

Oxford Avenue (SR 2008)

Church Street (SR 2011)

Centennial Road (SR 2006)

Bender Road (T464)

Goldsmith Road (T478)

Littlestown Road (SR 2019)

Hanover Road (SR 0116)

Sunday Drive (T460)

Race Horse Road (SR 2021)

Main Street (SR 0116)

2nd Street (Boro)

3rd Street (SR 0116)

5th Street (Boro)

Kindig Lane (T477/Boro)

W. Elm Avenue (SR 2008)

W. Elm Avenue (SR 3098)

E. Elm Avenue (Boro)

Eisenhower Drive (T679/Boro)

Carlisle Street (SR 0094)

High Street (T535/Boro)

116

94

Overall: B(11)

Overall: B(12)

Overall: C(21)

Overall: C(21)

Overall: C(26)

Overall: D(47)

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 21

DESIGN YEAR (2042) NO BUILD ALTERNATIVE MORNING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

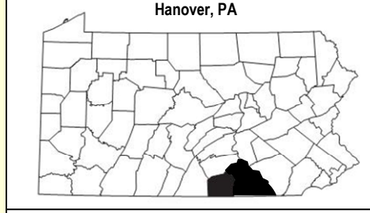
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

ADAMS COUNTY

Oxford

Penn

Mount Pleasant

Hanover

McSherrystown

Conewago

YORK COUNTY

Adams County

York County

Penn

Edgegrove Road (SR 2008)

Oxford Avenue (T476)

Oxford Avenue (SR 2008)

Church Street (SR 2011)

Centennial Road (SR 2006)

Bender Road (T464)

Coleman Road (T478)

Littlestown Road (SR 2019)

Hanover Road (SR 0116)

Sunday Drive (T460)

Race Horse Road (SR 2021)

Main Street (SR 0116)

2nd Street (Boro)

3rd Street (SR 0116)

5th Street (Boro)

Kindig Lane (T477/Boro)

W. Elm Avenue (SR 2008)

W. Elm Avenue (SR 3098)

E. Elm Avenue (Boro)

Eisenhower Drive (T679/Boro)

Carlisle Street (SR 0094)

High Street (T535/Boro)

116

94

Overall: B(11)

Overall: B(12)

Overall: C(26)

Overall: C(32)

Overall: B(13)

Overall: C(20)

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 22

DESIGN YEAR (2042) NO BUILD ALTERNATIVE EVENING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

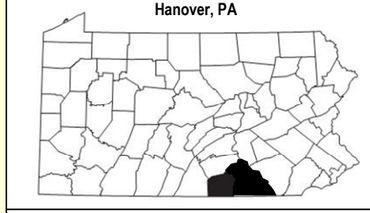
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

ADAMS COUNTY

YORK COUNTY

Oxford

Penn

Mount Pleasant

Conewago

Adams County

York County

Penn

Hanover

McSherrystown

Edgegrove Road (SR 2008)

Oxford Avenue (T476)

Oxford Avenue (SR 2008)

Centennial Road (SR 2006)

Bender Road (T464)

Goldsmith Road (T478)

Littlestown Road (SR 2019)

Hanover Road (SR 0116)

Church Street (SR 2011)

Sunday Drive (T460)

Race Horse Road (SR 2021)

Main Street (SR 0116)

2nd Street (Boro)

3rd Street (SR 0116)

5th Street (Boro)

W. Elm Avenue (SR 2008)

Kindig Lane (T477/Boro)

Eisenhower Drive (T679/Boro)

Carlisle Street (SR 0094)

E. Elm Avenue (Boro)

W. Elm Avenue (SR 3098)

High Street (T535/Boro)

116

94

STOP

Overall: B(15)

Overall: B(17)

Overall: E(60)

Overall: C(34)

Overall: C(34)

Overall: F(42)

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 23

OPENING YEAR (2022) TSM ALTERNATIVE MORNING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

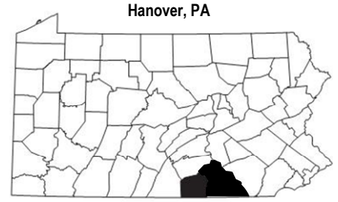
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

ADAMS COUNTY

YORK COUNTY

Oxford

Mount Pleasant

Penn

Conewago

Adams County

York County

Hanover

McSherrystown

Edgegrove Road (SR 2008)

Oxford Avenue (T476)

Oxford Avenue (SR 2008)

Centennial Road (SR 2006)

Bender Road (T464)

Goldman Road (T478)

Littlestown Road (SR 2019)

Hanover Road (SR 0116)

Sunday Drive (T460)

Race Horse Road (SR 2021)

Church Street (SR 2011)

Kindig Lane (T477/Boro)

W. Elm Avenue (SR 2008)

W. Elm Avenue (SR 3098)

E. Elm Avenue (Boro)

Eisenhower Drive (T679/Boro)

Carlisle Street (SR 0094)

3rd Street (SR 0116)

Main Street (SR 0116)

5th Street (Boro)

2nd Street (Boro)

High Street (T535/Boro)

116

94

Overall: B(11)

Overall: C(31)

Overall: A(8)

Overall: b(10)

Overall: C(21)

Overall: B(10)

Overall: B(10)

Overall: B(12)

Overall: C(22)

Overall: C(34)

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 24

OPENING YEAR (2022) TSM ALTERNATIVE EVENING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

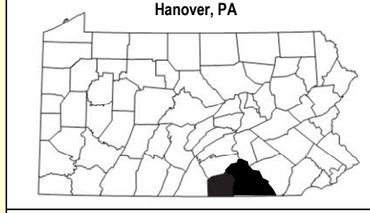
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

ADAMS COUNTY

YORK COUNTY

Oxford

Mount Pleasant

Conewago

Penn

Hanover

McSherrystown

Edgegrove Road (SR 2008)

Oxford Avenue (T476)

Oxford Avenue (SR 2008)

Church Street (SR 2011)

Centennial Road (SR 2006)

Bender Road (T464)

Goldsmith Road (T478)

Littlestown Road (SR 2019)

Hanover Road (SR 0116)

Sunday Drive (T460)

Race Horse Road (SR 2021)

Main Street (SR 0116)

2nd Street (Boro)

3rd Street (SR 0116)

5th Street (Boro)

W. Elm Avenue (SR 2008)

W. Elm Avenue (SR 3098)

Kindig Lane (T477/Boro)

Eisenhower Drive (T679/Boro)

Carlisle Street (SR 0094)

High Street (T535/Boro)

E. Elm Avenue (Boro)

116

94

Overall: B(11)

Overall: A(9)

Overall: D(37)

Overall: b(15)

Overall: B(14)

Overall: A(8)

Overall: B(12)

Overall: B(11)

Overall: C(21)

Overall: C(28)

Overall: D(37)

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 25

DESIGN YEAR (2042) TSM ALTERNATIVE MORNING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

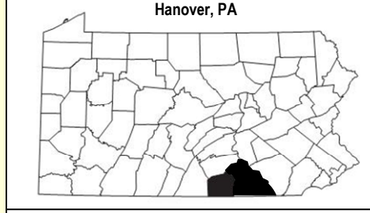
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

ADAMS COUNTY

YORK COUNTY

Oxford

Penn

Mount Pleasant

Conewago

Hanover

McSherrystown

Adams County

York County

Penn

Edgegrove Road (SR 2008)

Oxford Avenue (T476)

Centennial Road (SR 2006)

Bender Road (T464)

Goldsmith Road (T478)

Littlestown Road (SR 2019)

Hanover Road (SR 0116)

Sunday Drive (T460)

Race Horse Road (SR 2021)

Church Street (SR 2011)

Oxford Avenue (SR 2008)

Main Street (SR 0116)

2nd Street (Boro)

3rd Street (SR 0116)

5th Street (Boro)

W. Elm Avenue (SR 2008)

Kindig Lane (T477/Boro)

Eisenhower Drive (T679/Boro)

Carlisle Street (SR 0094)

W. Elm Avenue (SR 3098)

E. Elm Avenue (Boro)

High Street (T535/Boro)

116

94

Overall: B(10)

Overall: C(32)

Overall: A(9)

Overall: b(12)

Overall: B(20)

Overall: A(8)

Overall: B(11)

Overall: B(11)

Overall: B(13)

Overall: C(22)

Overall: D(38)

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 26

DESIGN YEAR (2042) TSM ALTERNATIVE EVENING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

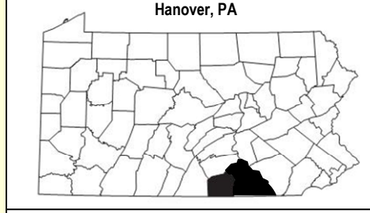
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

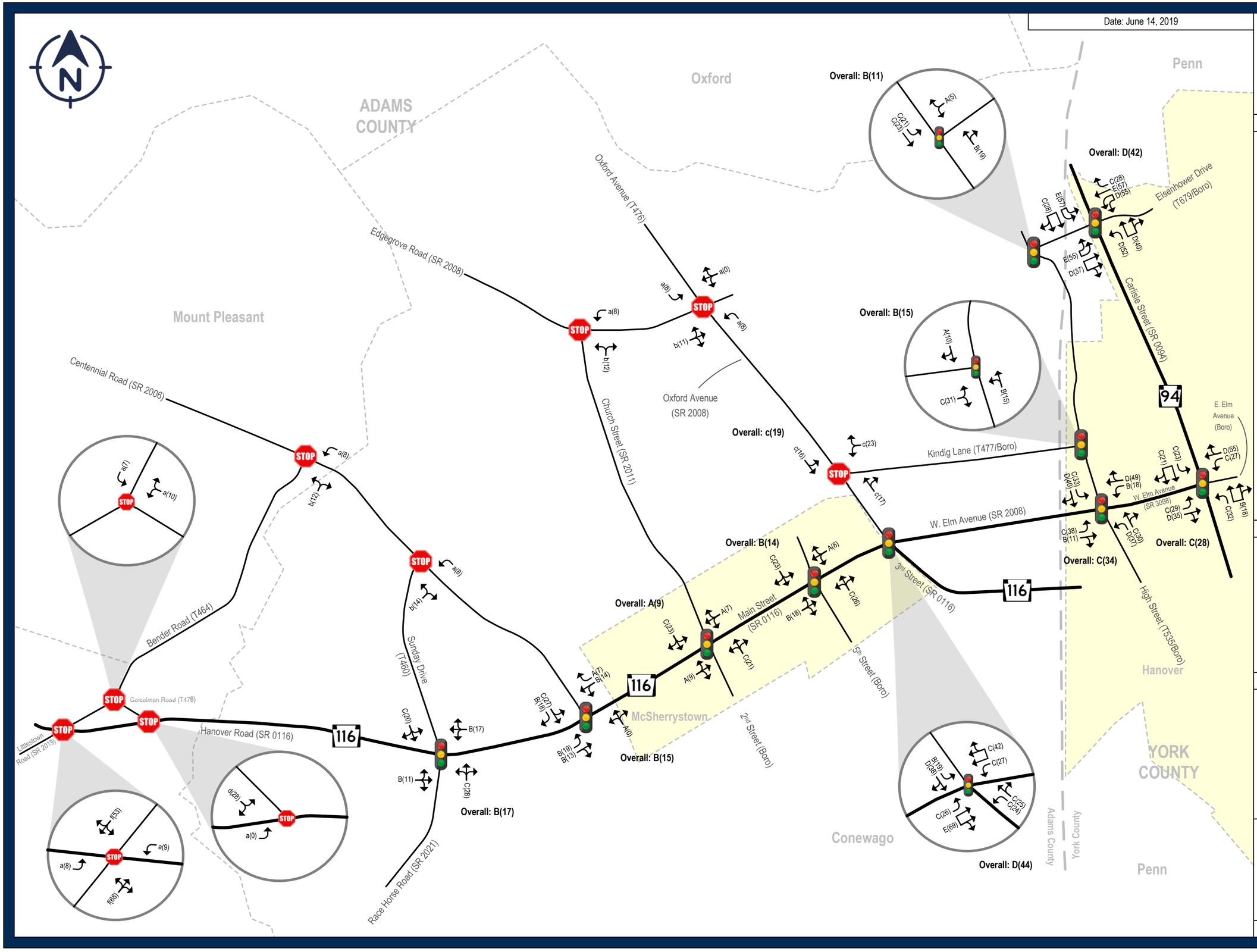
a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012



Date: June 14, 2019

Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro)
- Revise existing signal timings
- Monitor location

High Street (T535/Boro) & Eisenhower Drive (T679/Boro)
- Install new traffic signal
- Construct SB left turn lane
- Channelize NB right turn w/ yield

Oxford Avenue (SR 2008) & Kindig Lane (T477/Boro)
- Convert to all-way stop controlled

High Street (T535/Boro) & Kindig Lane (T477/Boro)
- Install new traffic signal

Main Street (SR 0116) & 5th Street (Boro)
- Install new traffic signal

Main Street (SR 0116) & 2nd Street (SR 2011)
- Install new traffic signal

Elm Avenue (SR 3098) & Carlisle Street (SR 0094)
- Construct additional NB through lane
- Construct additional SB through lane
- Reconstruct existing signal

Main Street (SR 0116) & Oxford Avenue (SR 2008)
- Construct additional EB through lane
- Construct additional WB through lane
- Construct EB left turn lane
- Construct WB left turn lane
- Construct SB left turn lane
- Reconstruct existing signal

Hanover Road (SR 0116) & Littlestown Road (SR 2019)/ Bender Road (T464)
- Monitor location

Hanover
McSherrystown
Eisenhower Drive (T679/Boro)
High Street (T535/Boro)
Carlisle Street (SR 0094)
94
E. Elm Avenue (Boro)
W. Elm Avenue (SR 3098)
W. Elm Avenue (SR 2008)
Kindig Lane (T477/Boro)
Oxford Avenue (T476)
Oxford Avenue (SR 2008)
Edgegrove Road (SR 2008)
Church Street (SR 2011)
Centennial Road (SR 2006)
Main Street (SR 0116)
3rd Street (SR 0116)
116
2nd Street (Boro)
5th Street (Boro)
Sunday Drive (T460)
Bender Road (T464)
Geiselman Road (T478)
Hanover Road (SR 0116)
Littlestown Road (SR 2019)
Race Horse Road (SR 2021)
TSM
STOP
Adams County
York County

Agreement: PennDOT / E00187

FIGURE 27

TSM ALTERNATIVE RECOMMENDED IMPROVEMENTS

REGIONAL OVERVIEW

Eisenhower Drive Extension

LEGEND

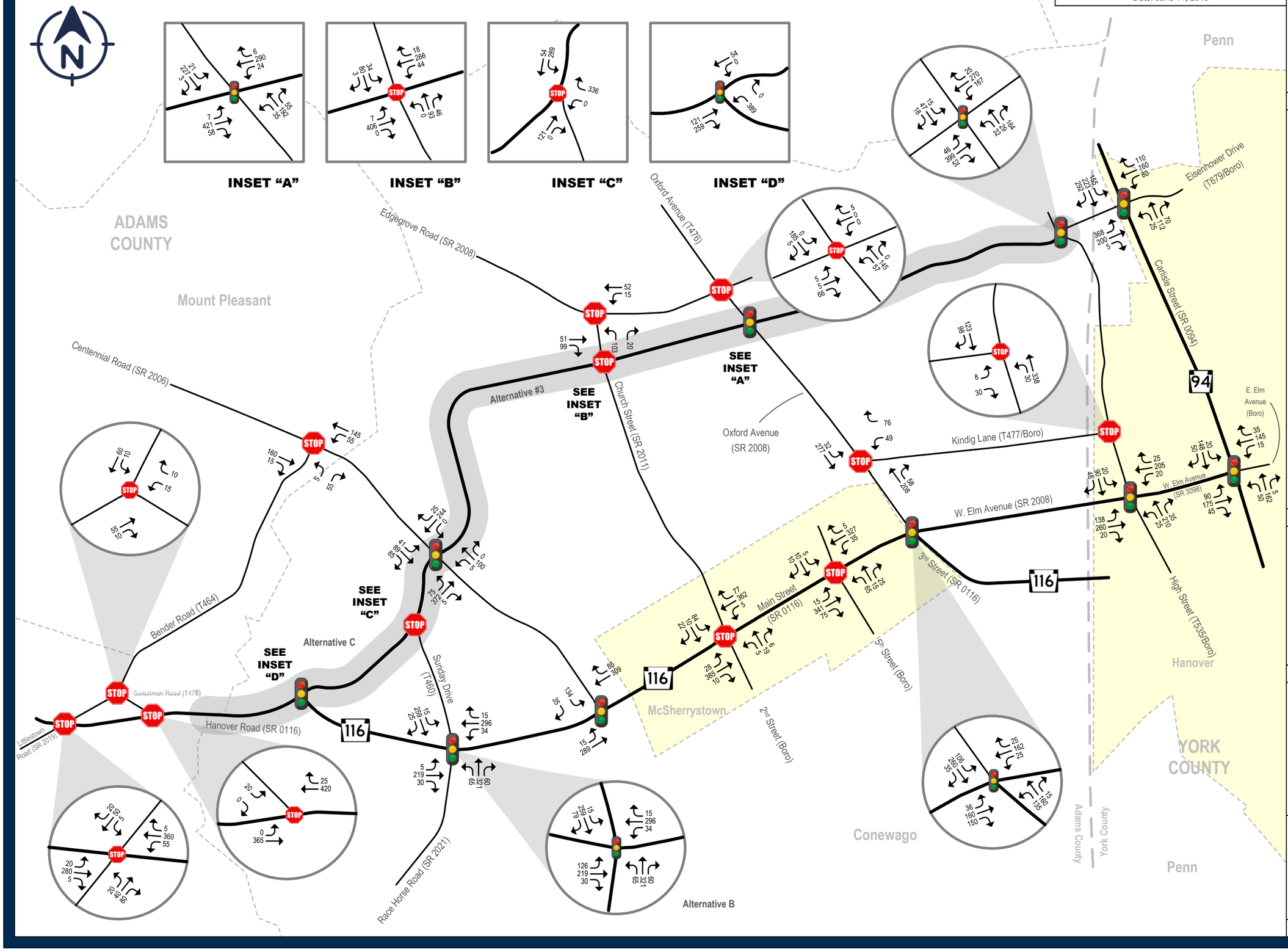
: Existing Traffic Signal
: New/Reconstructed Traffic Signal
: All-way Stop
: Limits of widening
5 : Alignment Alternative

REGIONAL SETTING

Hanover, PA

JMT Project Number: 02-0308-012

Date: June 14, 2019



Agreement: PennDOT / E00187

FIGURE 28

OPENING YEAR (2022) ALTERNATIVE 3 MORNING PEAK HOUR TRAFFIC VOLUMES

Eisenhower Drive Extension

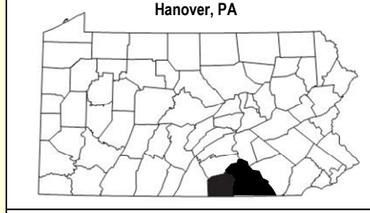
LEGEND

: Signalized Intersection

: Stop Controlled Intersection

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 29

OPENING YEAR (2022) ALTERNATIVE 3 EVENING PEAK HOUR TRAFFIC VOLUMES

Eisenhower Drive Extension

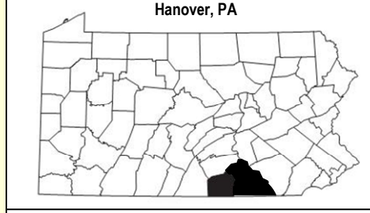
LEGEND

: Signalized Intersection

: Stop Controlled Intersection

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

INSET "A"

INSET "B"

INSET "C"

INSET "D"

ADAMS COUNTY

Mount Pleasant

Penn

Edgegrove Road (SR 2008)

Oxford Avenue (T476)

Centennial Road (SR 2006)

Alternative #3

SEE INSET "A"

SEE INSET "B"

SEE INSET "C"

SEE INSET "D"

Church Street (SR 2011)

Oxford Avenue (SR 2008)

Kindig Lane (T477/Boro)

Eisenhower Drive (T679/Boro)

Carlisle Street (SR 0094)

94

E. Elm Avenue (Boro)

W. Elm Avenue (SR 3098)

W. Elm Avenue (SR 2008)

Bender Road (T464)

Goldsmith Road (T478)

Littlestown Road (SR 2019)

Hanover Road (SR 0116)

Alternative C

Sunday Drive (T460)

Race Horse Road (SR 2021)

Alternative B

116

Main Street (SR 0116)

3rd Street (SR 0116)

5th Street (Boro)

2nd Street (Boro)

McSherrystown

High Street (T535/Boro)

Hanover

YORK COUNTY

Conewago

Adams County

York County

Penn

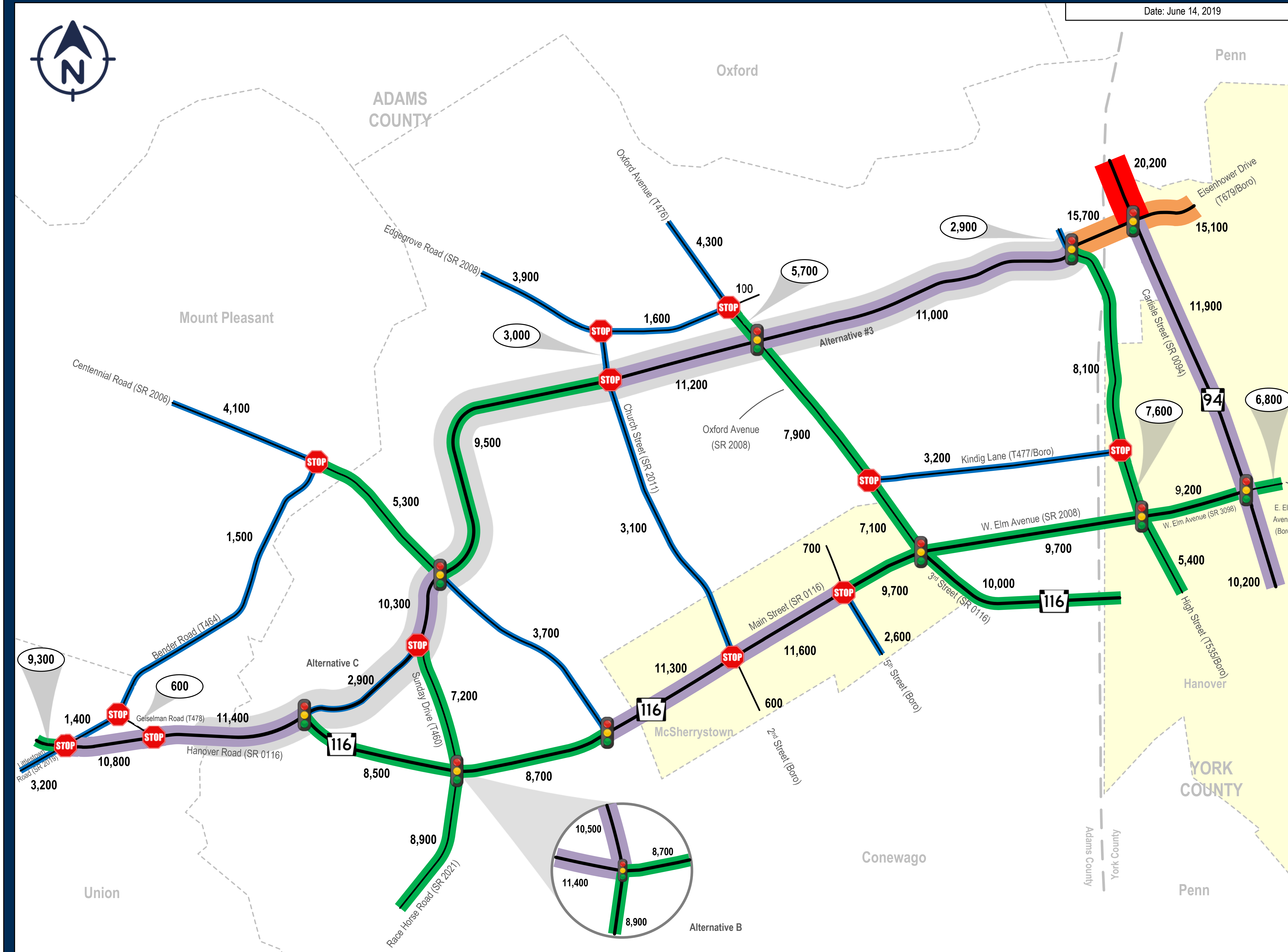
Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 30

OPENING YEAR (2022) ALTERNATIVE 3 AVERAGE DAILY TRAFFIC VOLUMES

Eisenhower Drive Extension



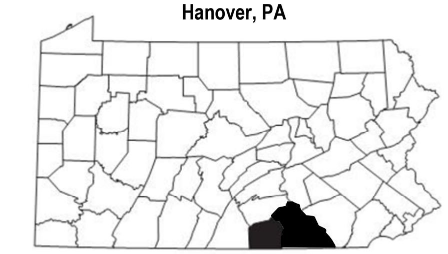
ADAMS COUNTY
Oxford
Penn
Mount Pleasant
Union
Conewago
McSherrystown
Hanover
YORK COUNTY
Adams County
York County
Edgegrove Road (SR 2008)
Oxford Avenue (T476)
Centennial Road (SR 2006)
Church Street (SR 2011)
Oxford Avenue (SR 2008)
Alternative #3
Eisenhower Drive (T679/Boro)
Carlisle Street (SR 0094)
Kindig Lane (T477/Boro)
W. Elm Avenue (SR 2008)
W. Elm Avenue (SR 3098)
E. Elm Avenue (Boro)
High Street (T535/Boro)
Main Street (SR 0116)
3rd Street (SR 0116)
5th Street (Boro)
2nd Street (Boro)
Bender Road (T464)
Geiselman Road (T478)
Hanover Road (SR 0116)
Littlestown Road (SR 2019)
Sunday Drive (T460)
Race Horse Road (SR 2021)
Alternative C
Alternative B
116
94
20,200
15,700
15,100
2,900
11,900
5,700
4,300
100
3,900
1,600
3,000
11,000
11,200
8,100
7,900
7,600
6,800
3,200
9,200
4,100
9,500
5,300
7,100
9,700
700
10,000
5,400
1,500
3,100
10,200
10,300
3,700
2,600
11,600
11,300
2,900
7,200
9,300
600
1,400
11,400
10,800
3,200
8,500
8,700
8,900
10,500

LEGEND

- : 0 – 1,000 Vehicles per Day (VPD)
- : 1,000 – 5,000 VPD
- : 5,000 – 10,000 VPD
- : 10,000 – 15,000 VPD
- : 15,000 – 20,000 VPD
- : Greater than 20,000
- :Traffic Control Device

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 31

DESIGN YEAR (2042) ALTERNATIVE 3 MORNING PEAK HOUR TRAFFIC VOLUMES

Eisenhower Drive Extension

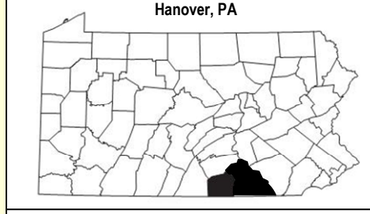
LEGEND

: Signalized Intersection

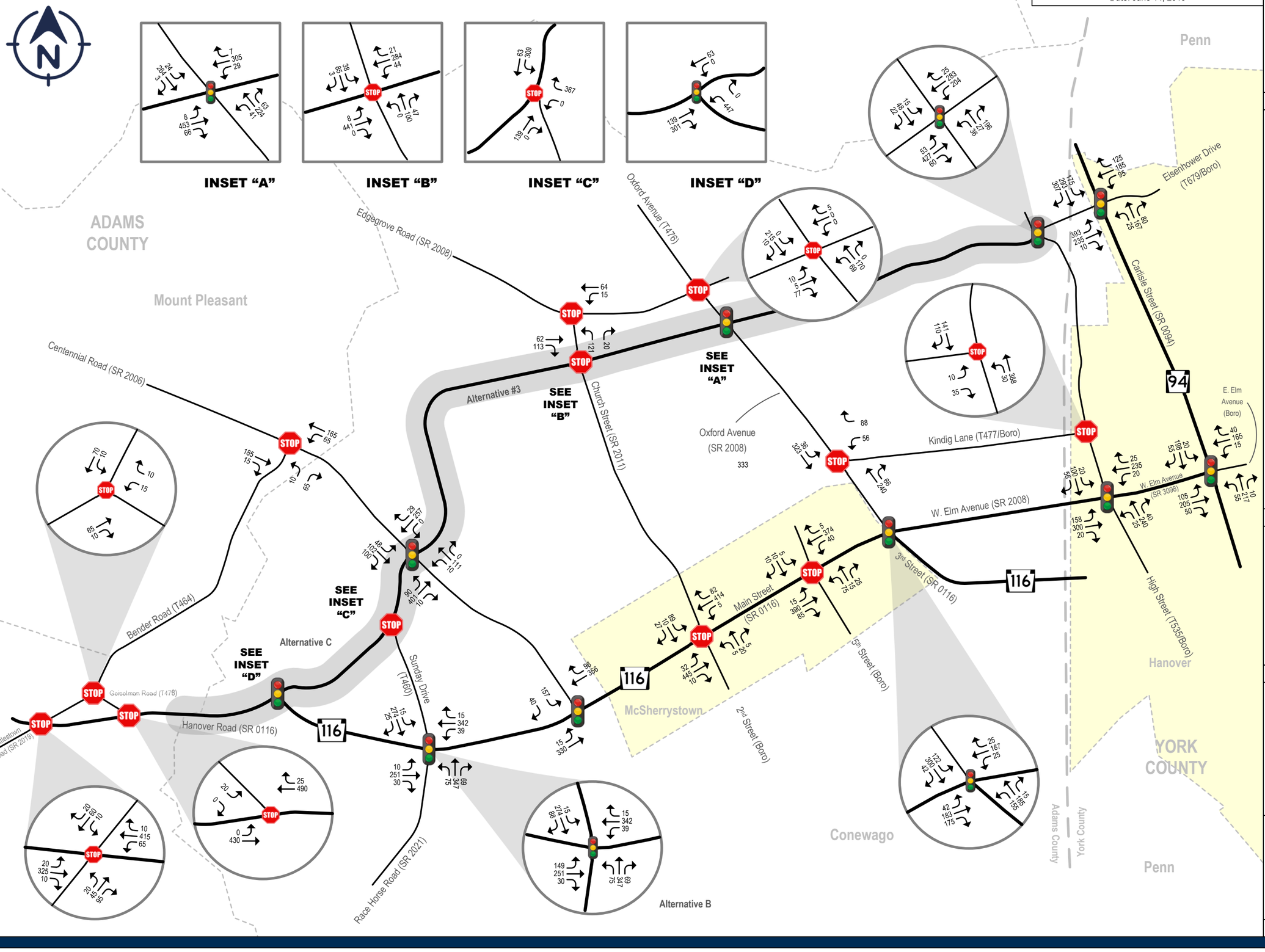
: Stop Controlled Intersection

REGIONAL SETTING

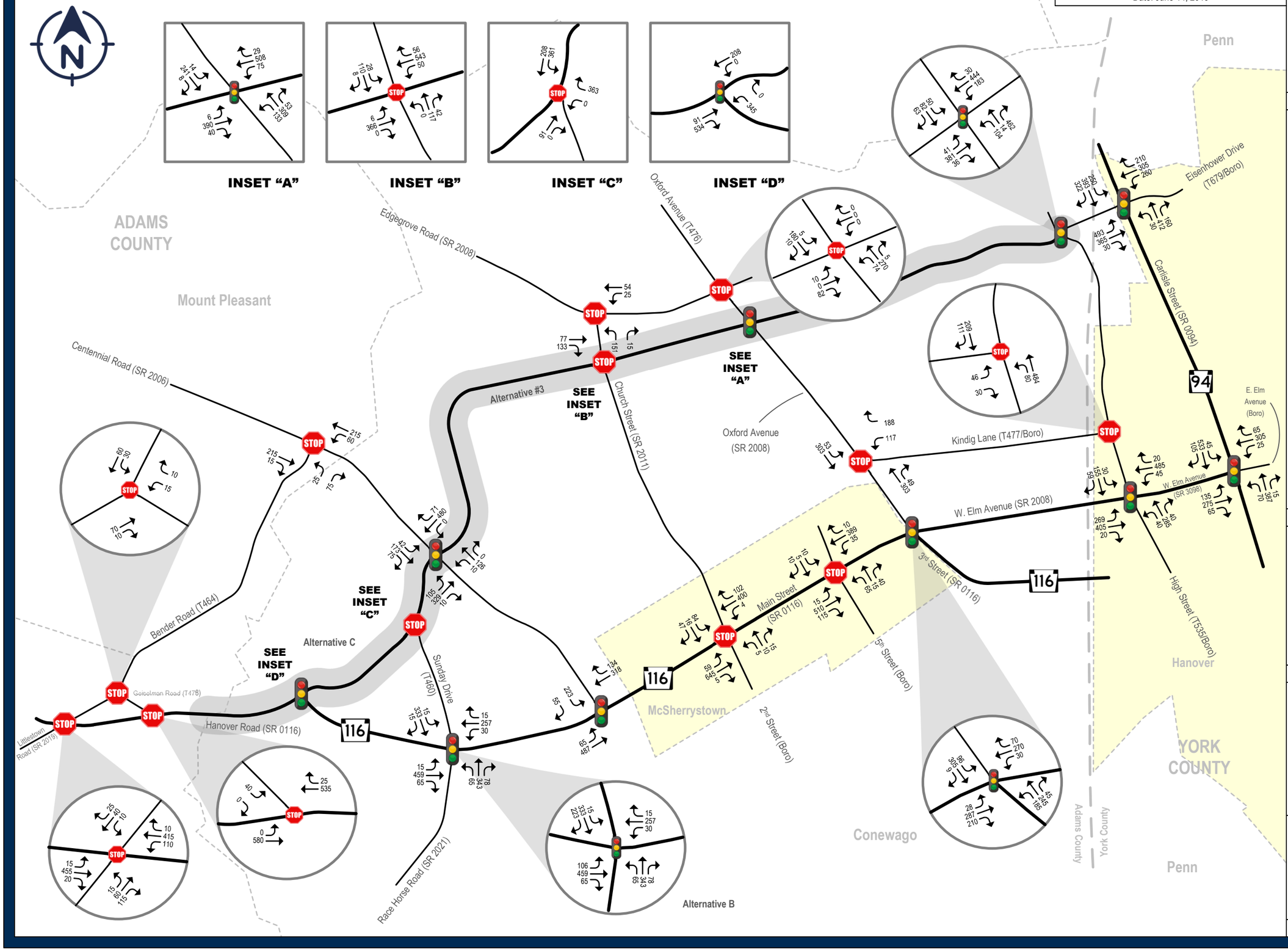
Hanover, PA



JMT Project Number: 02-0308-012



Date: June 14, 2019



Agreement: PennDOT / E00187

FIGURE 32

DESIGN YEAR (2042) ALTERNATIVE 3 EVENING PEAK HOUR TRAFFIC VOLUMES

Eisenhower Drive Extension

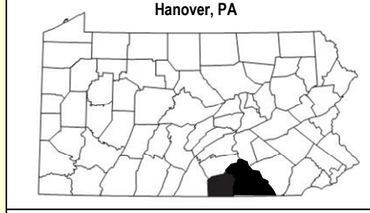
LEGEND

: Signalized Intersection

: Stop Controlled Intersection

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

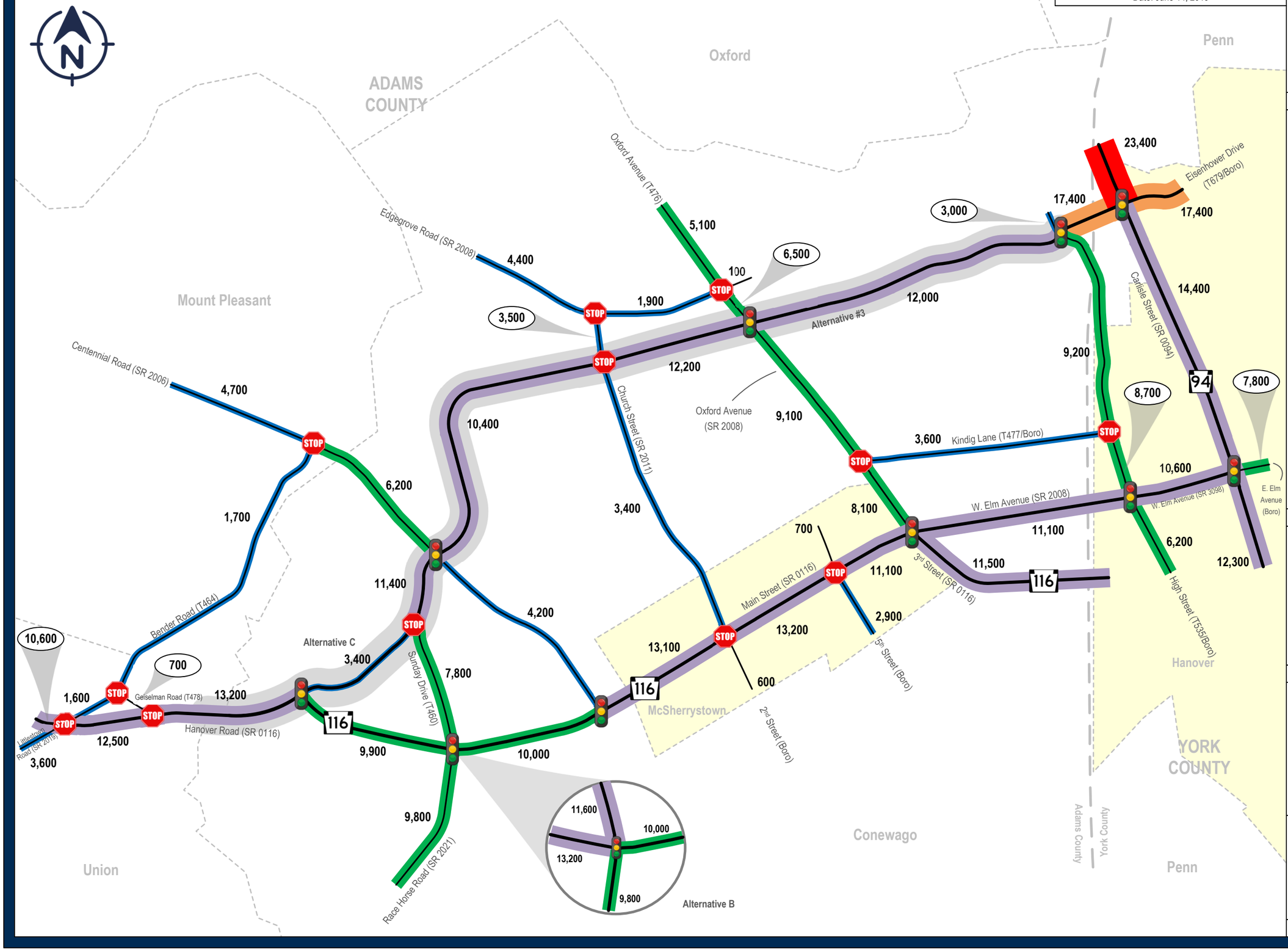
Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 33

DESIGN YEAR (2042) ALTERNATIVE 3 AVERAGE DAILY TRAFFIC VOLUMES

Eisenhower Drive Extension

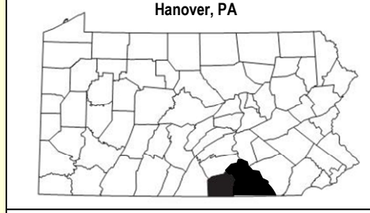


LEGEND

- : 0 – 1,000 Vehicles per Day (VPD)
- : 1,000 – 5,000 VPD
- : 5,000 – 10,000 VPD
- : 10,000 – 15,000 VPD
- : 15,000 – 20,000 VPD
- : Greater than 20,000
- STOP :Traffic Control Device

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 34

OPENING YEAR (2022) ALTERNATIVE 3 MORNING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

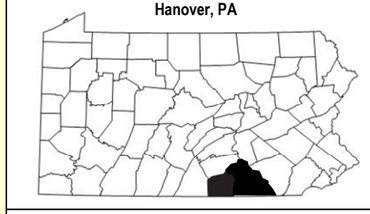
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

a(##) : Unsignalized LOS (Delay (seconds))

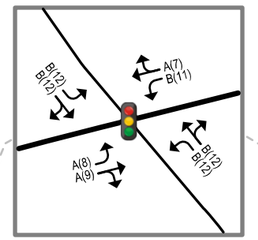
REGIONAL SETTING

Hanover, PA

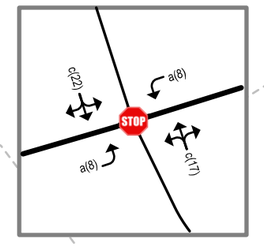


JMT Project Number: 02-0308-012

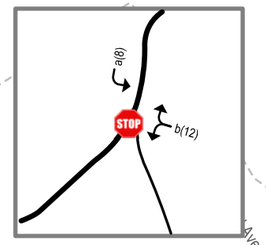
INSET "A"



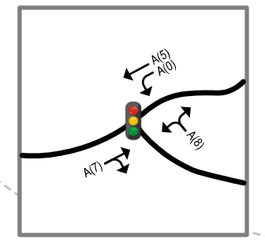
INSET "B"



INSET "C"



INSET "D"



Overall: A(9)

Overall: A(8)

Overall: A(9)

Overall: C(34)

Overall: A(8)

Overall: A(9)

Overall: B(11)

Alternative B

Overall: B(12)

Overall: B(11)

Overall: B(11)

Overall: C(24)

SEE INSET "A"

SEE INSET "B"

SEE INSET "C"

SEE INSET "D"

Alternative #3

Mount Pleasant

Penn

Hanover

McSherrystown

Conewago

YORK COUNTY

Adams County

York County

Penn

Edgegrove Road (SR 2008)

Centennial Road (SR 2006)

Bender Road (T464)

Gitts Run Road (T478)

Littlestown Road (SR 2015)

Hanover Road (SR 0116)

Church Street (SR 2011)

Oxford Avenue (SR 2008)

Sunday Drive (T460)

Race Horse Road (SR 2021)

Kindig Lane (T477/Boro)

W. Elm Avenue (SR 2008)

W. Elm Avenue (SR 3098)

E. Elm Avenue (Boro)

Eisenhower Drive (T679/Boro)

Carlisle Street (SR 0094)

3rd Street (SR 0116)

Main Street (SR 0116)

5th Street (Boro)

2nd Street (Boro)

High Street (T5356/Boro)

116

94

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 35

OPENING YEAR (2022) ALTERNATIVE 3 EVENING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

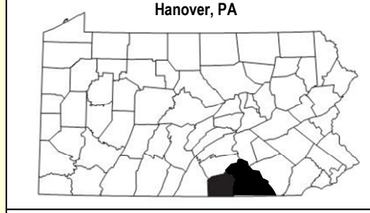
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

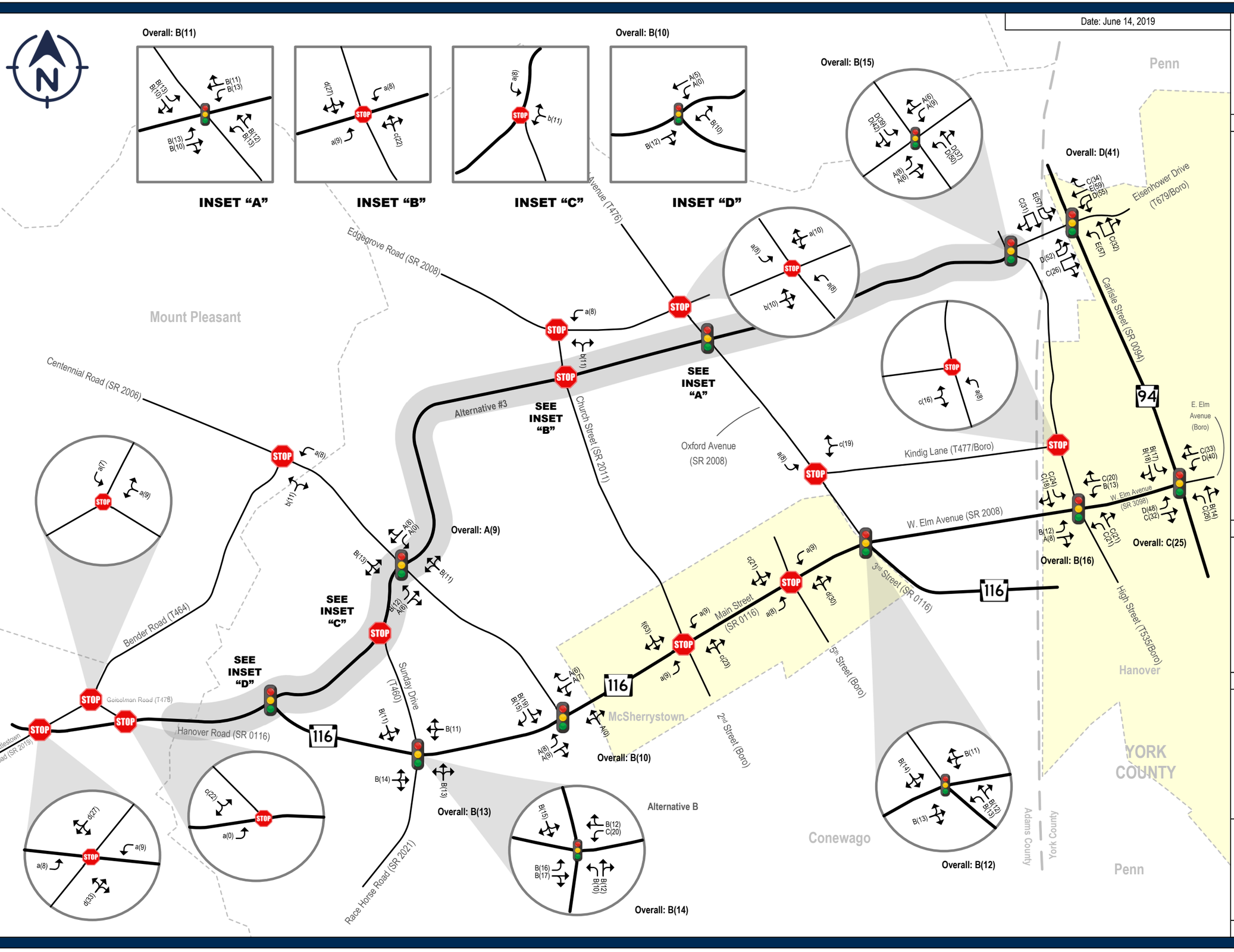
a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012



Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 36

DESIGN YEAR (2042) ALTERNATIVE 3 MORNING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

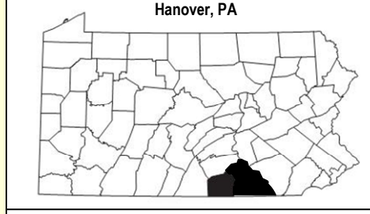
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

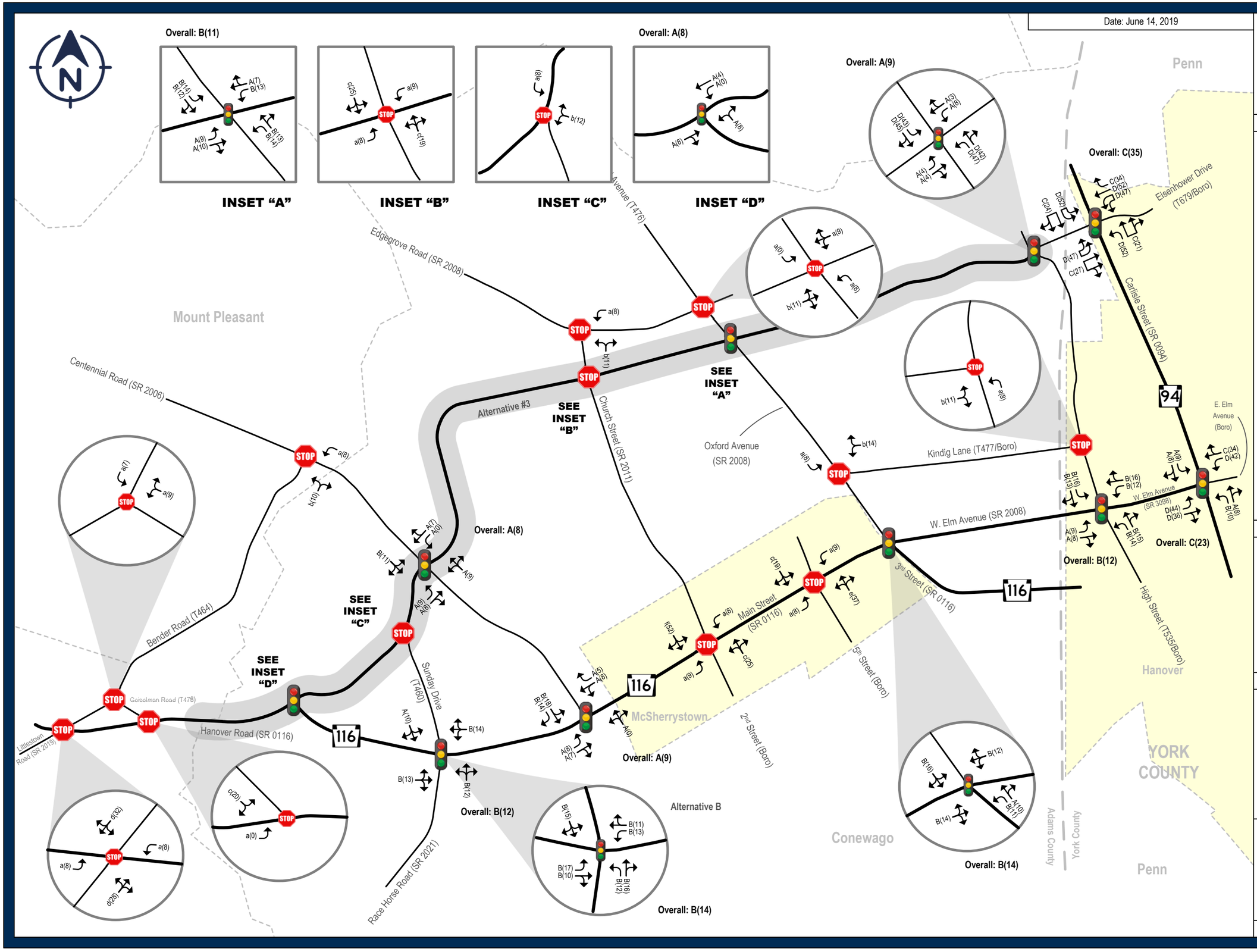
a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012



Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 37

DESIGN YEAR (2042) ALTERNATIVE 3 EVENING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

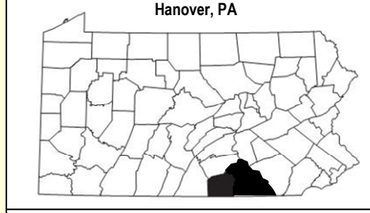
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

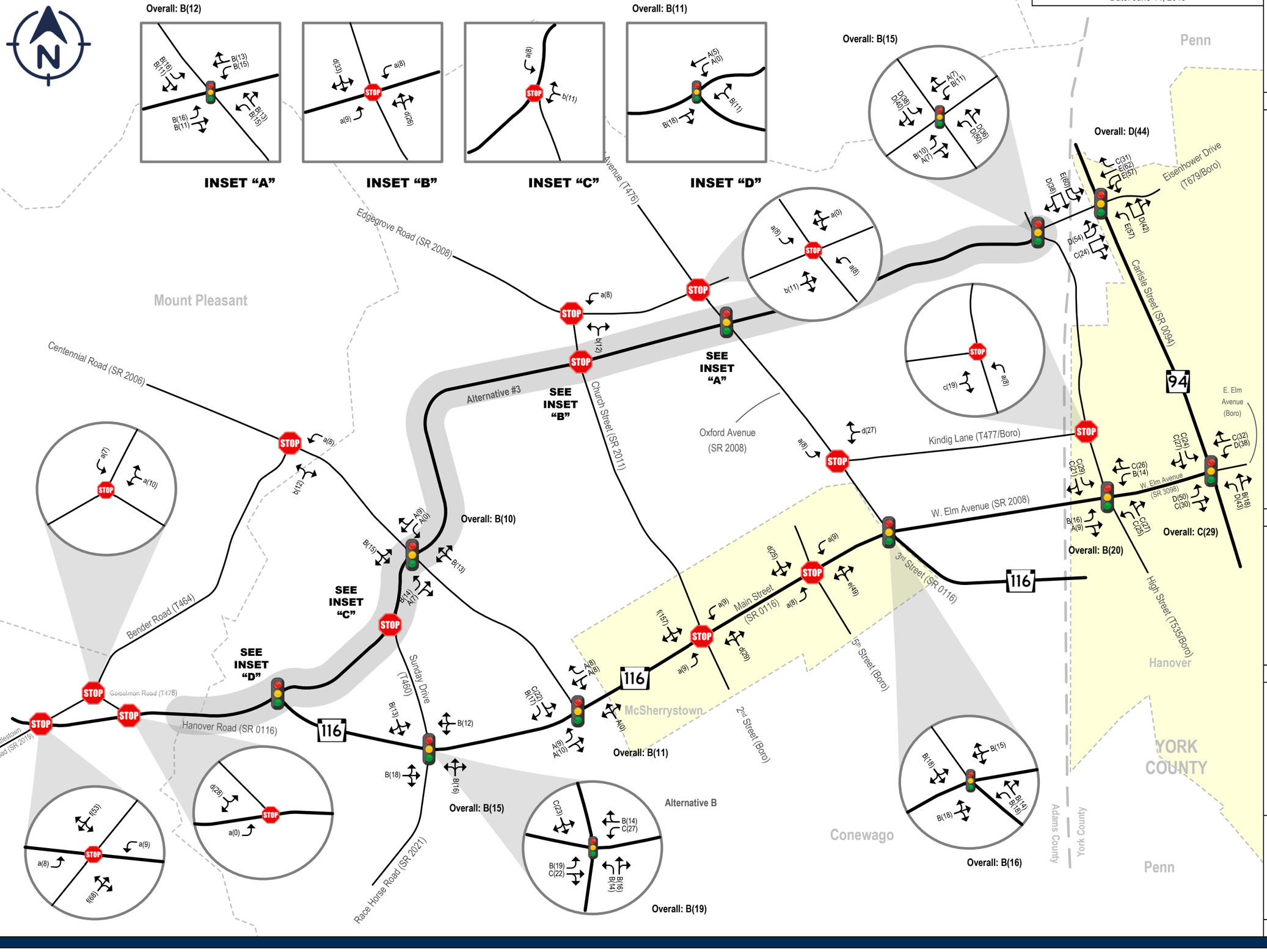
a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012



Date: June 14, 2019

High Street (T535/Boro) & Eisenhower Drive (T679/Boro)
- Install new traffic signal
- Construct NB left turn lane
- Construct SB left turn lane
- Construct EB left turn lane
- Construct WB left turn lane

Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro)
- Revise existing signal timings
- Monitor location

Oxford Avenue (SR 2008) & Alignment
- Install new traffic signal
- Construct NB left turn lane
- Construct SB left turn lane
- Construct EB left turn lane
- Construct WB left turn lane

Church Street (SR 2011) & Alignment
- Two-way stop controlled
- Construct EB left turn lane
- Construct WB left turn lane

Centennial Road (SR 2006) & Sunday Drive (T460)/Alignment
- Install new traffic signal
- Construct EB left turn lane
- Construct WB left turn lane

Sunday Drive (T460) & Alignment (sub-Alternative C only)
- Stop controlled (Sunday Drive (T460))
- Construct channelized NB right turn
- Construct WB left turn lane

Hanover Road (SR 0116) & Littlestown Road (SR 2019)/ Bender Road (T464)
- Monitor location

Hanover Road (SR 0116) & Alignment (sub-Alternative C only)
- Install new traffic signal
- Construct WB left turn lane

Main Street (SR 0116) & Race Horse Road (SR 2021)/ Sunday Drive (T460) (sub-Alternative B only)
- Construct NB left turn lane
- Construct EB left turn lane
- Construct WB left turn lane
- Reconstruct existing signal

Main Street (SR 0116) & 5th Street (Boro)
- Monitor location

Main Street (SR 0116) & 2nd Street (Boro)
- Monitor location

Consider a roundabout at the following locations:
- Oxford Avenue (SR 2008) & Alignment
- Church Street (SR 2011) & Alignment
- Centennial Road (SR 2006) & Alignment
- Hanover Road (SR 0116) & Alignment (sub-Alt C only)

Agreement: PennDOT / E00187

FIGURE 38

ALTERNATIVE 3 RECOMMENDED IMPROVEMENTS

REGIONAL OVERVIEW

Eisenhower Drive Extension

LEGEND

: Existing Traffic Signal
: New/Reconstructed Traffic Signal
: All-way Stop
: Limits of widening
: Alignment Alternative

REGIONAL SETTING

Hanover, PA

JMT Project Number: 02-0308-012

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 39

OPENING YEAR (2022) ALTERNATIVE 4 & 5 MORNING PEAK HOUR TRAFFIC VOLUMES

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

: Stop Controlled Intersection

REGIONAL SETTING

Hanover, PA

JMT Project Number: 02-0308-012

INSET "A"

INSET "B"

INSET "C"

INSET "D"

ADAMS COUNTY

Mount Pleasant

Penn

Hanover

McSherrystown

Conewago

YORK COUNTY

Adams County

York County

Edgegrove Road (SR 2008)

Oxford Avenue (T476)

Oxford Avenue (SR 2008)

Church Street (SR 2011)

Centennial Road (SR 2006)

Bender Road (T464)

Golbelman Road (T478)

Littlestown Road (SR 2019)

Hanover Road (SR 0116)

Sunday Drive (T460)

Race Horse Road (SR 2021)

Alternative #4

Alternative #5

Alternative #4/5

Alternative C

Alternative B

SEE INSET "A"

SEE INSET "B"

SEE INSET "C"

SEE INSET "D"

Kindig Lane (T477/Boro)

W. Elm Avenue (SR 2008)

W. Elm Avenue (SR 3098)

Eisenhower Drive (T679/Boro)

Carlisle Street (SR 0094)

E. Elm Avenue (Boro)

3rd Street (SR 0116)

Main Street (SR 0116)

2nd Street (Boro)

5th Street (Boro)

High Street (T535/Boro)

94

116

STOP

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 40

OPENING YEAR (2022) ALTERNATIVE 4 & 5 EVENING PEAK HOUR TRAFFIC VOLUMES

Eisenhower Drive Extension

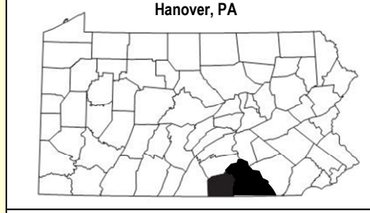
LEGEND

: Signalized Intersection

: Stop Controlled Intersection

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

INSET "A"

INSET "B"

INSET "C"

INSET "D"

ADAMS COUNTY

Mount Pleasant

Penn

Edgegrove Road (SR 2008)

Oxford Avenue (T476)

Oxford Avenue (SR 2008)

Centennial Road (SR 2006)

Church Street (SR 2011)

SEE INSET "A"

SEE INSET "B"

SEE INSET "C"

SEE INSET "D"

Alternative #4

Alternative #5

Alternative #4/5

Alternative C

Alternative B

Kindig Lane (T477/Boro)

Eisenhower Drive (T679/Boro)

Carlisle Street (SR 0094)

94

E. Elm Avenue (Boro)

W. Elm Avenue (SR 2008)

W. Elm Avenue (SR 3098)

3rd Street (SR 0116)

116

Main Street (SR 0116)

McSherrystown

2nd Street (Boro)

5th Street (Boro)

Hanover

High Street (T535/Boro)

YORK COUNTY

Conewago

Adams County

York County

Penn

Bender Road (T464)

Goldsmith Road (T478)

Littlestown Road (SR 2019)

Hanover Road (SR 0116)

Sunday Drive (T460)

Race Horse Road (SR 2021)

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 41

OPENING YEAR (2022) ALTERNATIVE 4 & 5 AVERAGE DAILY TRAFFIC VOLUMES

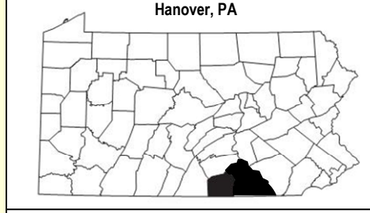
Eisenhower Drive Extension

LEGEND

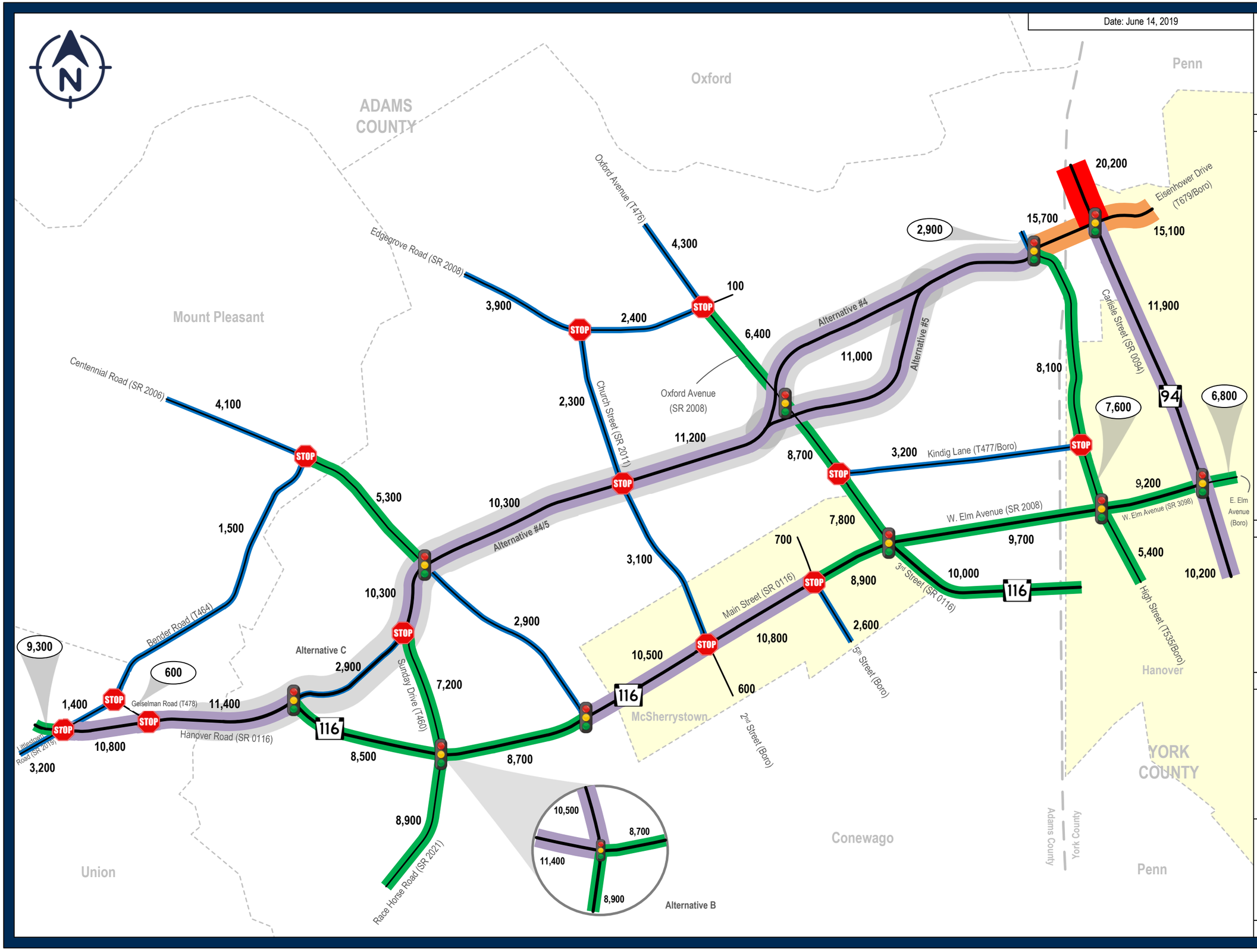
- : 0 – 1,000 Vehicles per Day (VPD)
- : 1,000 – 5,000 VPD
- : 5,000 – 10,000 VPD
- : 10,000 – 15,000 VPD
- : 15,000 – 20,000 VPD
- : Greater than 20,000
- STOP :Traffic Control Device

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012



Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 42

DESIGN YEAR (2042) ALTERNATIVE 4 & 5 MORNING PEAK HOUR TRAFFIC VOLUMES

Eisenhower Drive Extension

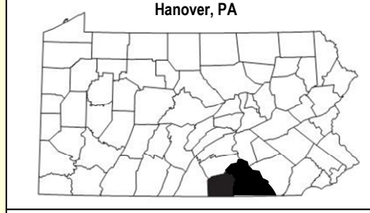
LEGEND

: Signalized Intersection

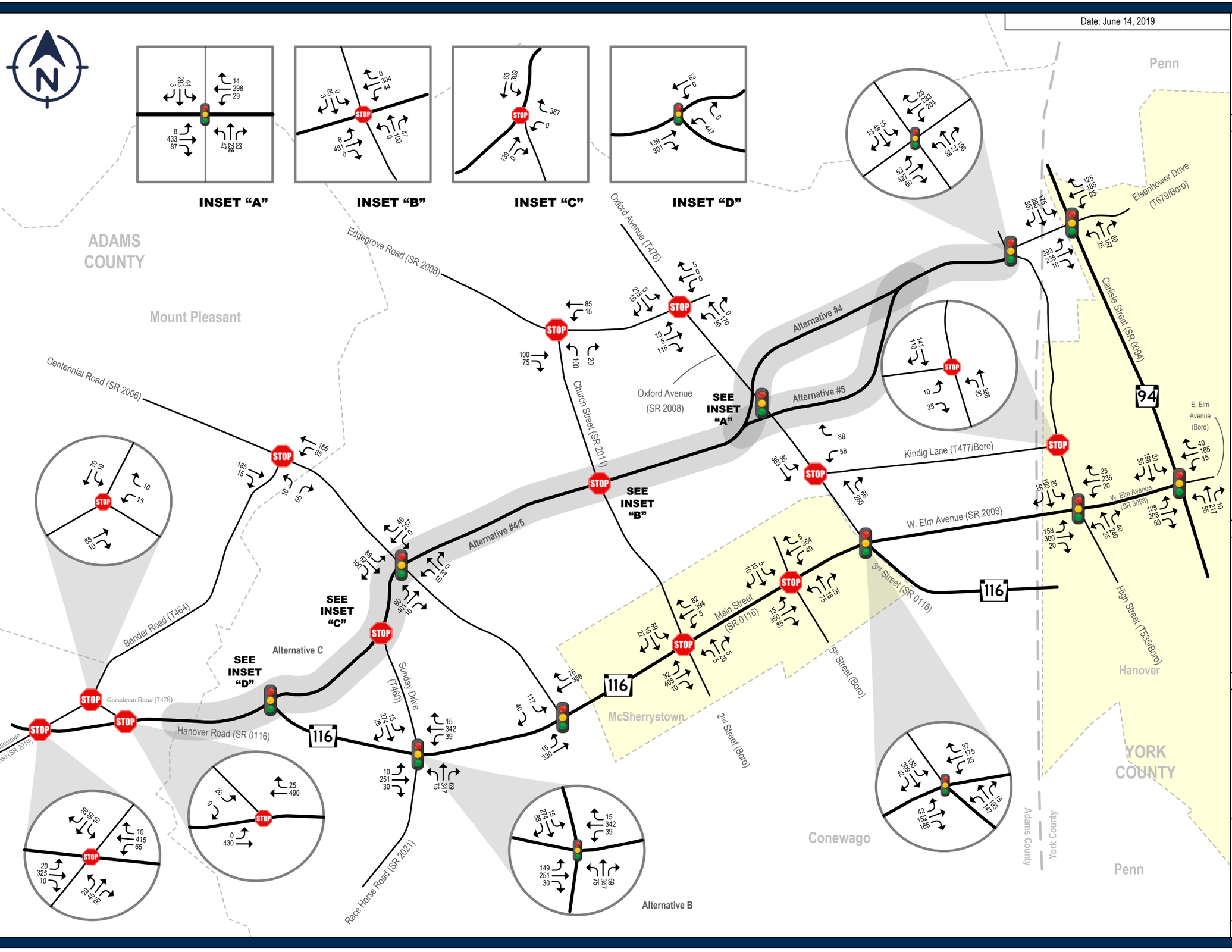
: Stop Controlled Intersection

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012



Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 43

DESIGN YEAR (2042) ALTERNATIVE 4 & 5 EVENING PEAK HOUR TRAFFIC VOLUMES

Eisenhower Drive Extension

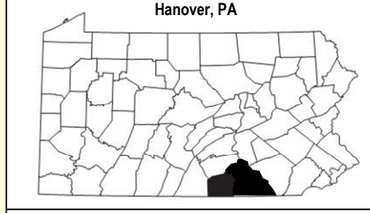
LEGEND

: Signalized Intersection

: Stop Controlled Intersection

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

INSET "A"

INSET "B"

INSET "C"

INSET "D"

ADAMS COUNTY

YORK COUNTY

Mount Pleasant

Penn

Conewago

Adams County

York County

McSherrystown

Hanover

Edgegrove Road (SR 2008)

Centennial Road (SR 2006)

Oxford Avenue (T476)

Oxford Avenue (SR 2008)

Church Street (SR 2011)

Alternative #4

Alternative #5

Alternative #4/5

Alternative C

Alternative B

SEE INSET "A"

SEE INSET "B"

SEE INSET "C"

SEE INSET "D"

Kindig Lane (T477/Boro)

W. Elm Avenue (SR 2008)

W. Elm Avenue (SR 3098)

E. Elm Avenue (Boro)

Eisenhower Drive (T679/Boro)

Carlisle Street (SR 0094)

3rd Street (SR 0116)

5th Street (Boro)

2nd Street (Boro)

Main Street (SR 0116)

High Street (T535/Boro)

Bender Road (T464)

Goldsmith Road (T478)

Littlestown Road (SR 2019)

Hanover Road (SR 0116)

Sunday Drive (T460)

Race Horse Road (SR 2021)

94

116

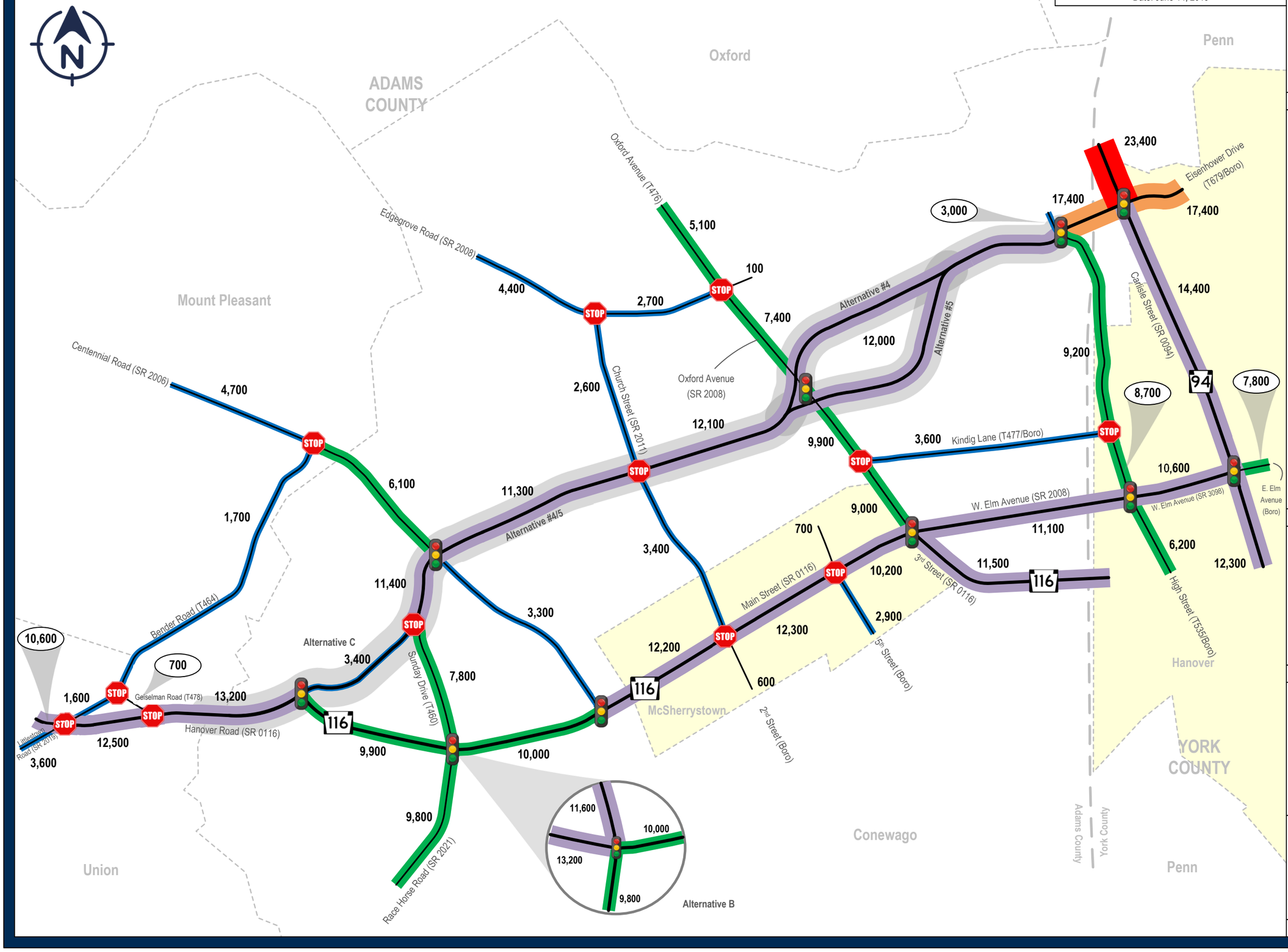
Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 44

DESIGN YEAR (2042) ALTERNATIVE 4 & 5 AVERAGE DAILY TRAFFIC VOLUMES

Eisenhower Drive Extension

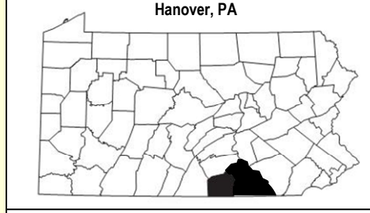


LEGEND

- : 0 – 1,000 Vehicles per Day (VPD)
- : 1,000 – 5,000 VPD
- : 5,000 – 10,000 VPD
- : 10,000 – 15,000 VPD
- : 15,000 – 20,000 VPD
- : Greater than 20,000
- STOP :Traffic Control Device

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 45

OPENING YEAR (2042) ALTERNATIVE 4 & 5 MORNING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

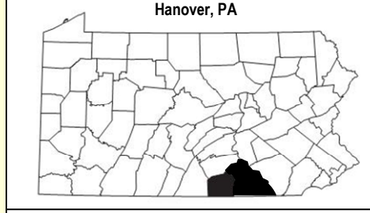
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

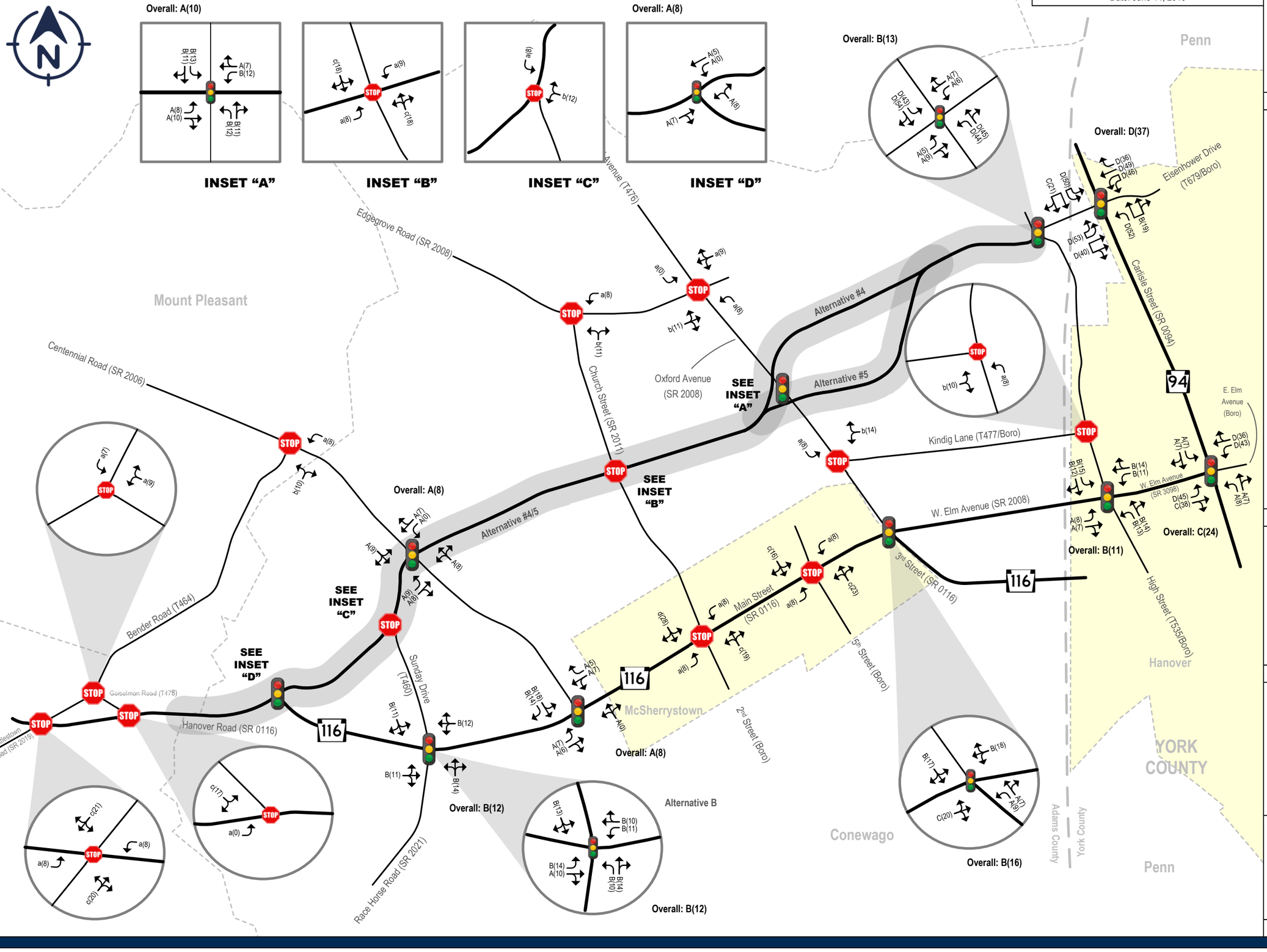
a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012



Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 46

OPENING YEAR (2022) ALTERNATIVE 4 & 5 EVENING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

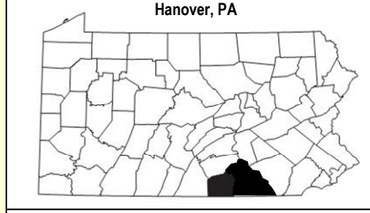
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012

Overall: B(11)

Overall: A(9)

Overall: B(20)

Overall: D(42)

INSET "A"

INSET "B"

INSET "C"

INSET "D"

Edgegrove Road (SR 2008)

Avenue (T476)

Mount Pleasant

Centennial Road (SR 2006)

Oxford Avenue (SR 2008)

Church Street (SR 2011)

Alternative #4

Alternative #5

Alternative #4/5

SEE INSET "A"

SEE INSET "B"

SEE INSET "C"

SEE INSET "D"

Kindig Lane (T477/Boro)

Penn

Eisenhower Drive (T679/Boro)

Carlisle Street (SR 0094)

94

E. Elm Avenue (Boro)

W. Elm Avenue (SR 3098)

W. Elm Avenue (SR 2008)

Overall: B(16)

Overall: C(24)

3rd Street (SR 0116)

116

Main Street (SR 0116)

5th Street (Boro)

2nd Street (Boro)

High Street (T535/Boro)

Hanover

McSherrystown

YORK COUNTY

Adams County

York County

Conewago

Penn

Overall: A(9)

Overall: B(17)

Bender Road (T464)

Goldsmith Road (T478)

Littlestown Road (SR 2019)

Hanover Road (SR 0116)

Sunday Drive (T460)

Race Horse Road (SR 2021)

Overall: B(13)

Alternative B

Overall: B(14)

Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 47

DESIGN YEAR (2042) ALTERNATIVE 4 & 5 MORNING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

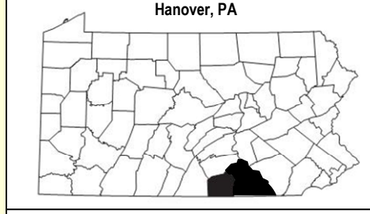
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

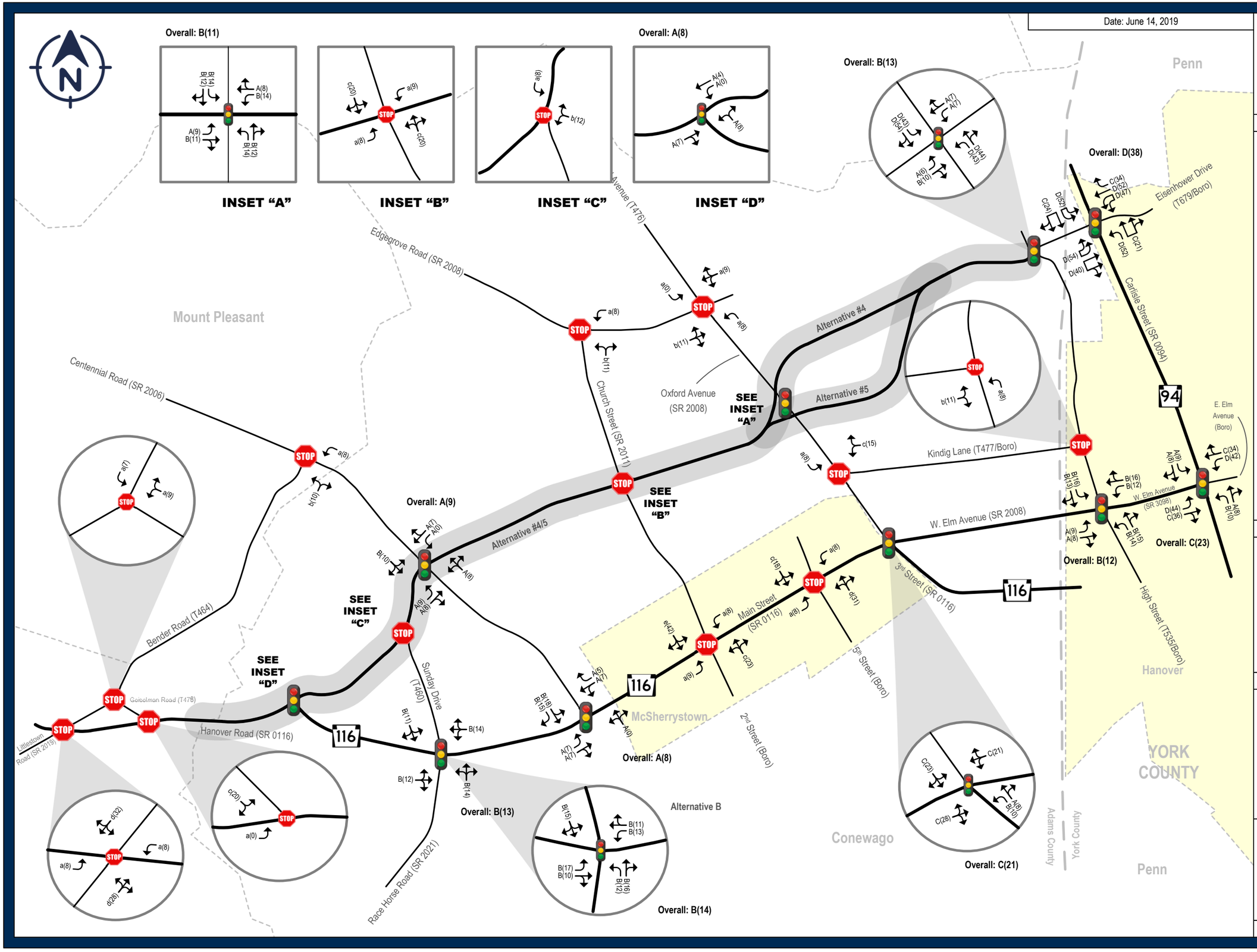
a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012



Date: June 14, 2019

Agreement: PennDOT / E00187

FIGURE 48

DESIGN YEAR (2042) ALTERNATIVE 4 & 5 EVENING PEAK HOUR LEVELS OF SERVICE

Eisenhower Drive Extension

LEGEND

: Signalized Intersection

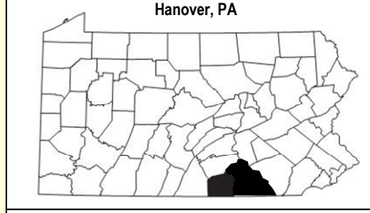
: Stop Controlled Intersection

A(##) : Signalized LOS (Delay (seconds))

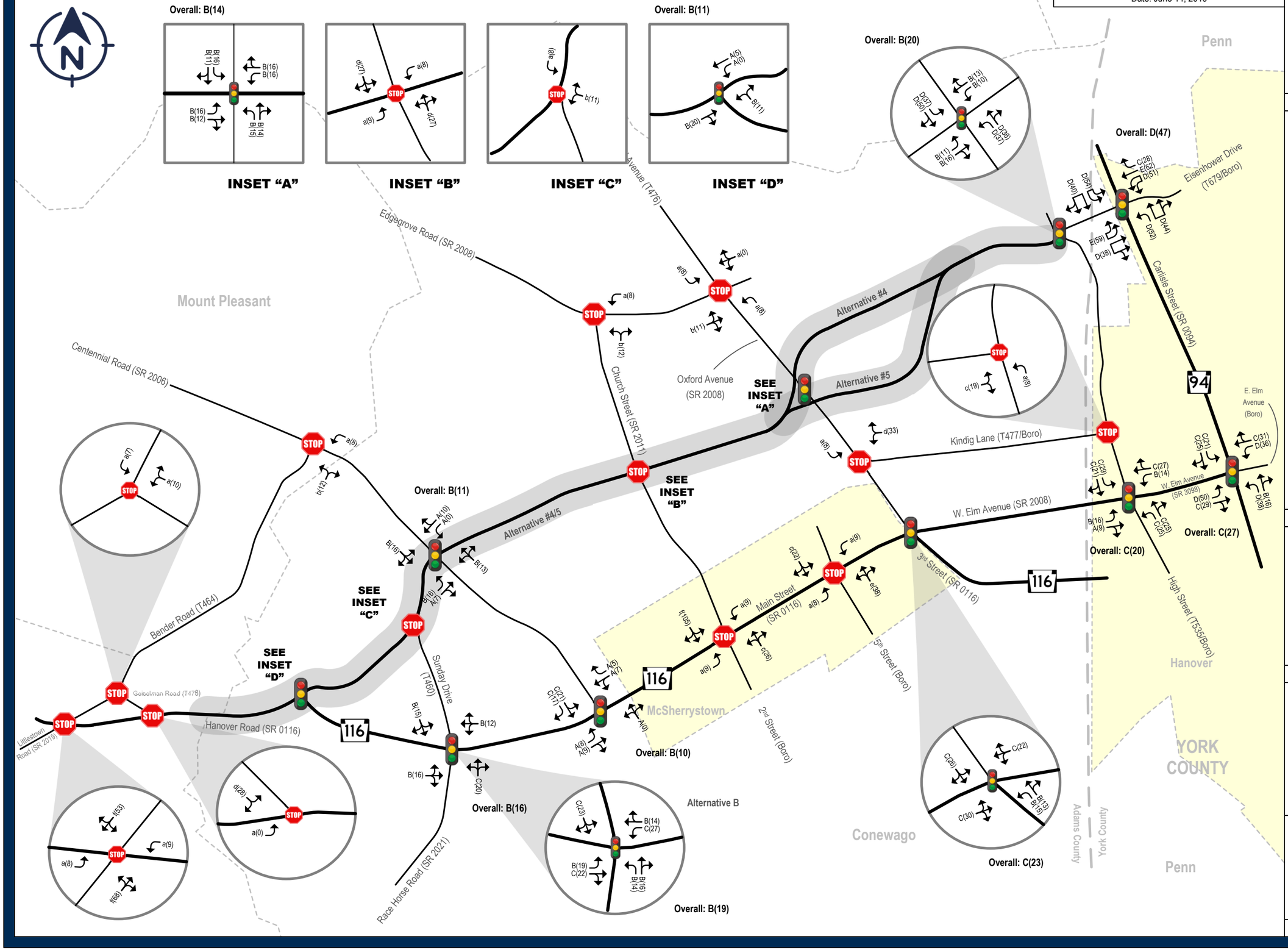
a(##) : Unsignalized LOS (Delay (seconds))

REGIONAL SETTING

Hanover, PA



JMT Project Number: 02-0308-012



Date: June 14, 2019

High Street (T535/Boro) & Eisenhower Drive (T679/Boro)
- Install new traffic signal
- Construct NB left turn lane
- Construct SB left turn lane
- Construct EB left turn lane
- Construct WB left turn lane

Carlisle Street (SR 0094) & Eisenhower Drive (T679/Boro)
- Revise existing signal timings
- Monitor location

Oxford Avenue (SR 2008) & Alignment
- Install new traffic signal
- Construct NB left turn lane
- Construct SB left turn lane
- Construct EB left turn lane
- Construct WB left turn lane

Church Street (SR 2011) & Alignment
- Two-way stop controlled
- Construct EB left turn lane
- Construct WB left turn lane

Centennial Road (SR 2006) & Sunday Drive (T460)/Alignment
- Install new traffic signal
- Construct EB left turn lane
- Construct WB left turn lane

Sunday Drive (T460) & Alignment (sub-Alternative C only)
- Stop controlled (Sunday Drive (T460))
- Construct channelized NB right turn
- Construct WB left turn lane

Hanover Road (SR 0116) & Littlestown Road (SR 2019)/ Bender Road (T464)
- Monitor location

Hanover Road (SR 0116) & Alignment (sub-Alternative C only)
- Install new traffic signal
- Construct WB left turn lane

Main Street (SR 0116) & Race Horse Road (SR 2021)/ Sunday Drive (T460) (sub-Alternative B only)
- Construct NB left turn lane
- Construct EB left turn lane
- Construct WB left turn lane
- Reconstruct existing signal

Main Street (SR 0116) & 5th Street (Boro)
- Monitor location

Main Street (SR 0116) & 2nd Street (Boro)
- Monitor location

Consider a roundabout at the following locations:
- Oxford Avenue (SR 2008) & Alignment
- Church Street (SR 2011) & Alignment
- Centennial Road (SR 2006) & Alignment
- Hanover Road (SR 0116) & Alignment (sub-Alt C only)

Agreement: PennDOT / E00187

FIGURE 49

ALTERNATIVE 4 & 5 RECOMMENDED IMPROVEMENTS

REGIONAL OVERVIEW

Eisenhower Drive Extension

LEGEND

: Existing Traffic Signal

: New/Reconstructed Traffic Signal

: All-way Stop

: Limits of widening

: Alignment Alternative

REGIONAL SETTING

Hanover, PA

JMT Project Number: 02-0308-012

APPENDIX B: LOS SUMMARY TABLES

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		OXFORD AVENUE (SR 2008)/3RD STREET (SR 0116) & MAIN STREET (SR 0116)/ELM AVENUE (SR 2008)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
OXFORD AVENUE (SR 2008)/3RD STREET (SR 0116)										
Northbound	Left	C (21)	B (19)	B (15)	B (10)	A (9)	C (30)	B (17)	B (11)	B (10)
	Through	B (12)	B (15)	B (18)	A (9)	A (7)	B (19)	C (20)	A (10)	A (8)
	Right									
Southbound	Left	B (15)	B (20)	B (14)	B (11)	B (17)	C (30)	B (16)	B (16)	C (23)
	Through			C (23)				C (28)		
	Right									
MAIN STREET (SR 0116)/ELM AVENUE (SR 2008)										
Eastbound	Left	B (20)	C (24)	C (27)	B (12)	C (20)	C (30)	C (26)	B (14)	C (28)
	Through			D (54)				E (63)		
	Right									
Westbound	Left	B (12)	B (15)	C (28)	B (10)	B (18)	B (14)	C (28)	B (12)	C (21)
	Through			C (32)				C (31)		
	Right									
OVERALL		B (16)	B (20)	C (34)	B (11)	B (16)	C (26)	D (38)	B (14)	C (21)

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		OXFORD AVENUE (SR 2008)/3RD STREET (SR 0116) & MAIN STREET (SR 0116)/ELM AVENUE (SR 2008)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
OXFORD AVENUE (SR 2008)/3RD STREET (SR 0116)										
Northbound	Left	C (29)	C (22)	B (18)	B (13)	B (12)	F (68)	C (24)	B (18)	B (15)
	Through	B (14)	B (17)	C (22)	B (12)	B (10)	C (20)	C (25)	B (14)	B (13)
	Right									
Southbound	Left	B (18)	C (22)	B (17)	B (14)	B (20)	D (51)	B (19)	B (18)	C (26)
	Through			C (29)				D (38)		
	Right									
MAIN STREET (SR 0116)/ELM AVENUE (SR 2008)										
Eastbound	Left	C (22)	C (22)	C (27)	B (13)	C (20)	D (42)	C (26)	B (18)	C (30)
	Through			E (57)				E (69)		
	Right									
Westbound	Left	B (19)	B (20)	C (27)	B (11)	B (18)	D (38)	C (27)	B (15)	C (22)
	Through			D (38)				C (42)		
	Right									
OVERALL		B (20)	C (21)	D (37)	B (12)	B (17)	F (42)	D (44)	B (16)	C (23)

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		CENTENNIAL ROAD (SR 2006) & MAIN STREET (SR 0116)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
CENTENNIAL ROAD (SR 2006)										
Northbound	Left	A (0)	A (0)	A (0)	A (0)	A (0)	A (0)	A (0)	A (0)	A (0)
	Through									
	Right									
Southbound	Left	C (27)	B (19)	B (19)	B (17)	B (18)	C (21)	C (21)	B (18)	B (18)
	Through									
	Right	C (21)	B (15)	B (15)	B (13)	B (14)	B (16)	B (16)	B (14)	B (15)
MAIN STREET (SR 0116)										
Eastbound	Left	A (7)	A (9)	A (9)	A (7)	A (7)	A (10)	A (10)	A (8)	A (7)
	Through	A (7)	A (10)	A (9)	A (7)	A (6)	B (11)	B (11)	A (7)	A (7)
	Right									
Westbound	Left	A (6)	A (8)	A (8)	A (7)	A (7)	A (9)	A (9)	A (8)	A (7)
	Through									
	Right	A (5)	A (6)	A (6)	A (5)	A (5)	A (6)	A (6)	A (5)	A (5)
OVERALL		A (10)	B (10)	B (10)	A (9)	A (8)	B (12)	B (11)	A (9)	A (8)

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		CENTENNIAL ROAD (SR 2006) & MAIN STREET (SR 0116)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
CENTENNIAL ROAD (SR 2006)										
Northbound	Left	A (0)	A (0)	A (0)	A (0)	A (0)	A (0)	A (0)	A (0)	A (0)
	Through									
	Right									
Southbound	Left	C (33)	C (23)	C (23)	B (19)	B (19)	C (27)	C (27)	C (22)	C (21)
	Through									
	Right	C (25)	B (17)	B (17)	B (15)	B (16)	B (18)	B (18)	B (17)	C (17)
MAIN STREET (SR 0116)										
Eastbound	Left	B (11)	B (14)	B (14)	A (8)	A (7)	B (19)	B (19)	A (9)	A (8)
	Through	A (8)	B (11)	B (11)	A (9)	A (8)	B (13)	B (13)	A (10)	A (9)
	Right									
Westbound	Left	A (8)	B (11)	B (11)	A (7)	A (6)	B (14)	B (14)	A (8)	A (7)
	Through									
	Right	A (6)	A (7)	A (7)	A (6)	A (5)	A (7)	A (7)	A (6)	A (5)
OVERALL		B (12)	B (12)	B (12)	B (10)	A (9)	B (15)	B (15)	B (11)	B (10)

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		SUNDAY DRIVE (T460)/RACE HORSE ROAD (SR 2021) & MAIN STREET (SR 0116)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3C	2022 Alternative 4C/5C	2042 No Build	2042 TSM Alternative	2042 Alternative 3C	2042 Alternative 4C/5C
SUNDAY DRIVE (T460)/RACE HORSE ROAD (SR 2021)										
Northbound	Left Through Right	B (13)	B (14)	B (14)	B (11)	B (14)	B (14)	B (14)	B (12)	B (14)
Southbound	Left Through Right	B (11)	B (11)	B (11)	A (9)	B (11)	B (11)	B (11)	A (10)	B (11)
MAIN STREET (SR 0116)										
Eastbound	Left Through Right	A (8)	A (9)	A (9)	B (12)	B (11)	A (10)	A (10)	B (13)	B (12)
Westbound	Left Through Right	A (9)	A (9)	A (9)	B (14)	B (12)	B (11)	B (11)	B (14)	B (14)
OVERALL		A (10)	B (10)	B (10)	B (11)	B (12)	B (11)	B (11)	B (12)	B (13)

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		SUNDAY DRIVE (T460)/RACE HORSE ROAD (SR 2021) & MAIN STREET (SR 0116)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3C	2022 Alternative 4C/5C	2042 No Build	2042 TSM Alternative	2042 Alternative 3C	2042 Alternative 4C/5C
SUNDAY DRIVE (T460)/RACE HORSE ROAD (SR 2021)										
Northbound	Left Through Right	B (16)	B (16)	B (16)	B (13)	B (14)	C (28)	C (28)	B (16)	C (20)
Southbound	Left Through Right	B (13)	B (13)	B (13)	B (11)	B (12)	B (20)	C (20)	B (13)	B (15)
MAIN STREET (SR 0116)										
Eastbound	Left Through Right	A (9)	A (10)	A (10)	B (14)	B (14)	B (11)	B (11)	B (18)	B (16)
Westbound	Left Through Right	A (10)	B (11)	B (11)	B (11)	B (11)	B (17)	B (17)	B (12)	B (12)
OVERALL		B (11)	B (11)	B (11)	B (13)	B (13)	B (17)	B (17)	B (15)	B (16)

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		SUNDAY DRIVE (T460)/RACE HORSE ROAD (SR 2021) & MAIN STREET (SR 0116)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3B	2022 Alternative 4B/5B	2042 No Build	2042 TSM Alternative	2042 Alternative 3B	2042 Alternative 4B/5B
SUNDAY DRIVE (T460)/RACE HORSE ROAD (SR 2021)										
Northbound	Left				B (10)	B (10)			B (12)	B (12)
	Through				B (13)	B (14)			B (16)	B (16)
	Right									
Southbound	Left				B (12)	B (13)			B (15)	B (15)
	Through									
	Right									
MAIN STREET (SR 0116)										
Eastbound	Left				B (16)	B (14)			B (17)	B (17)
	Through				B (11)	A (10)			B (10)	B (10)
	Right									
Westbound	Left				B (13)	B (11)			B (13)	B (13)
	Through				B (12)	B (10)			B (11)	B (11)
	Right									
OVERALL					B (12)	B (12)			B (14)	B (14)

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		SUNDAY DRIVE (T460)/RACE HORSE ROAD (SR 2021) & MAIN STREET (SR 0116)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3B	2022 Alternative 4B/5B	2042 No Build	2042 TSM Alternative	2042 Alternative 3B	2042 Alternative 4B/5B
SUNDAY DRIVE (T460)/RACE HORSE ROAD (SR 2021)										
Northbound	Left				B (10)	B (10)			B (14)	B (14)
	Through				B (12)	B (12)			B (16)	B (16)
	Right									
Southbound	Left				B (15)	B (15)			C (23)	C (23)
	Through									
	Right									
MAIN STREET (SR 0116)										
Eastbound	Left				B (16)	B (16)			B (19)	B (19)
	Through				B (17)	B (17)			C (22)	C (22)
	Right									
Westbound	Left				C (20)	C (20)			C (27)	C (27)
	Through				B (12)	B (12)			B (14)	B (14)
	Right									
OVERALL					B (14)	B (14)			B (19)	B (19)

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		5TH STREET (BORO) & MAIN STREET (SR 0116)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
5TH STREET (BORO)										
Northbound	Left	f (50)	f (71)	B (17)	d (26)	c (23)	f (181)	C (21)	e (37)	d (31)
	Through									
	Right									
Southbound	Left	c (24)	d (26)	B (16)	c (17)	c (16)	d (35)	B (19)	c (19)	c (18)
	Through									
	Right									
MAIN STREET (SR 0116)										
Eastbound	Left	a (8)	a (8)	C (24)	a (8)	a (8)	a (9)	C (22)	a (8)	a (8)
	Through									
	Right									
Westbound	Left	a (9)	a (9)	B (19)	a (8)	a (8)	a (10)	B (17)	a (9)	a (8)
	Through									
	Right									
OVERALL		--	--	C (21)	--	--	--	B (20)	--	--

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		5TH STREET (BORO) & MAIN STREET (SR 0116)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
5TH STREET (BORO)										
Northbound	Left	f (98)	f (166)	C (20)	d (30)	d (26)	f (475)	C (26)	e (49)	e (38)
	Through									
	Right									
Southbound	Left	e (41)	f (50)	B (18)	c (21)	c (19)	f (88)	C (23)	d (25)	c (22)
	Through									
	Right									
MAIN STREET (SR 0116)										
Eastbound	Left	a (9)	a (9)	C (21)	a (8)	a (8)	a (10)	B (18)	a (8)	a (8)
	Through									
	Right									
Westbound	Left	a (9)	a (9)	A(6)	a (9)	a (9)	a (10)	A (8)	a (9)	a (9)
	Through									
	Right									
OVERALL		--	--	B (14)	--	--	--	B (14)	--	--

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		2ND STREET (SR 2011) & MAIN STREET (SR 0116)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
2ND STREET (SR 2011)										
Northbound	Left	d (26)	d (30)	B (12)	c (20)	c (19)	e (41)	B (14)	c (25)	c (23)
	Through									
	Right									
Southbound	Left	e (37)	e (47)	B (12)	d (33)	d (28)	f (99)	B (15)	f (52)	e (42)
	Through									
	Right									
MAIN STREET (SR 0116)										
Eastbound	Left	a (9)	a (9)	A (8)	a (8)	a (8)	a (9)	A (8)	a (9)	a (9)
	Through									
	Right									
Westbound	Left	a (9)	a (9)	A (6)	a (8)	a (8)	a (9)	A (6)	a (8)	a (8)
	Through									
	Right									
OVERALL		--	--	A (8)	--	--	--	A (8)	--	--

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		2ND STREET (SR 2011) & MAIN STREET (SR 0116)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
2ND STREET (SR 2011)										
Northbound	Left	e (42)	f (52)	B (16)	c (23)	c (21)	f (104)	C (21)	d (29)	c (26)
	Through									
	Right									
Southbound	Left	f (91)	f (158)	B (17)	f (63)	e (49)	f (542)	C (23)	f (157)	f (105)
	Through									
	Right									
MAIN STREET (SR 0116)										
Eastbound	Left	a (10)	a (10)	A (7)	a (9)	a (8)	b (10)	A (9)	a (9)	a (9)
	Through									
	Right									
Westbound	Left	a (9)	a (9)	A (7)	a (9)	a (9)	a (10)	A (7)	a (9)	a (9)
	Through									
	Right									
OVERALL		--	--	A (8)	--	--	--	A (9)	--	--

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		HIGH STREET (T535/BORO) & KINDIG LANE (T477/BORO)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
HIGH STREET (T535/BORO)										
Northbound	Left	a (9)	a (8)	A (7)	a (8)	a (8)	a (8)	A (8)	a (8)	a (8)
	Through									
	Right									
Southbound	Left									
	Through			A (6)				A (7)		
	Right									
KINDIG LANE (T477/BORO)										
Eastbound	Left	d (26)	d (32)	B (13)	b (10)	b (10)	f (63)	B (14)	b (11)	b (11)
	Through									
	Right									
Westbound	Left									
	Through									
	Right									
OVERALL		--	--	A (8)	--	--	--	A (9)	--	--

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		HIGH STREET (T535/BORO) & KINDIG LANE (T477/BORO)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
HIGH STREET (T535/BORO)										
Northbound	Left	a (9)	a (9)	A (7)	a (8)	a (8)	a (10)	B (15)	a (8)	a (8)
	Through									
	Right									
Southbound	Left									
	Through			A (8)				A (10)		
	Right									
KINDIG LANE (T477/BORO)										
Eastbound	Left	f (96)	f (156)	C (20)	c (16)	c (16)	f (407)	C (31)	c (19)	c (19)
	Through									
	Right									
Westbound	Left									
	Through									
	Right									
OVERALL		--	--	A (9)	--	--	--	B (15)	--	--

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		HIGH STREET (T535/BORO) & W ELM AVENUE (SR 3098)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
HIGH STREET (T535/BORO)										
Northbound	Left	B (15)	B (15)	B (15)	B (13)	B (13)	B (16)	B (16)	B (14)	B (14)
	Through	B (15)	B (15)	B (15)	B (14)	B (14)	B (17)	B (16)	B (15)	B (15)
	Right									
Southbound	Left	B (16)	B (16)	B (16)	B (15)	B (15)	B (18)	B (18)	B (16)	B (16)
	Through	B (14)	B (14)	B (14)	B (12)	B (12)	B (15)	B (15)	B (13)	B (13)
	Right									
W ELM AVENUE (SR 3098)										
Eastbound	Left	A (9)	A (9)	A (9)	A (8)	A (8)	B (11)	B (11)	A (9)	A (9)
	Through	A (7)	A (7)	A (7)	A (7)	A (7)	A (8)	A (8)	A (8)	A (8)
	Right									
Westbound	Left	B (12)	B (12)	B (12)	B (11)	B (11)	B (13)	B (13)	B (12)	B (12)
	Through	B (15)	B (16)	B (16)	B (14)	B (14)	B (18)	B (18)	B (16)	B (16)
	Right									
OVERALL		B (12)	B (12)	B (12)	B (11)	B (11)	B (13)	B (13)	B (12)	B (12)

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		HIGH STREET (T535/BORO) & W ELM AVENUE (SR 3098)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
HIGH STREET (T535/BORO)										
Northbound	Left	C (27)	C (28)	C (28)	C (21)	C (21)	D (37)	D (37)	C (25)	C (25)
	Through	C (21)	C (22)	C (22)	C (21)	C (21)	C (30)	C (30)	C (27)	C (25)
	Right									
Southbound	Left	C (24)	C (26)	C (26)	C (24)	C (24)	C (33)	C (33)	C (29)	C (29)
	Through	C (22)	C (26)	C (26)	C (18)	B (18)	D (40)	D (40)	C (21)	C (21)
	Right									
W ELM AVENUE (SR 3098)										
Eastbound	Left	B (15)	B (17)	B (17)	B (12)	B (12)	C (38)	C (38)	B (16)	B (16)
	Through	A (9)	A (9)	A (9)	A (8)	A (8)	B (11)	B (11)	A (9)	A (9)
	Right									
Westbound	Left	B (15)	B (16)	B (16)	B (13)	B (13)	B (18)	B (18)	B (14)	B (14)
	Through	C (23)	C (30)	C (30)	C (20)	B (20)	D (49)	D (49)	C (26)	C (27)
	Right									
OVERALL		B (18)	C (21)	C (21)	B (16)	B (16)	C (34)	C (34)	B (20)	C (20)

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		CHURCH STREET (SR 2011) & EDGEGROVE ROAD (SR 2008)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
CHURCH STREET (SR 2011)										
Northbound	Left	b (10)	b (11)	b (11)	b (10)	b (11)	b (11)	b (11)	b (11)	b (11)
	Through									
	Right									
Southbound	Left									
	Through									
	Right									
EDGEGROVE ROAD (SR 2008)										
Eastbound	Left									
	Through									
	Right									
Westbound	Left	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)
	Through									
	Right									
OVERALL		--	--	--	--	--	--	--	--	--

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		CHURCH STREET (SR 2011) & EDGEGROVE ROAD (SR 2008)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
CHURCH STREET (SR 2011)										
Northbound	Left	b (11)	b (11)	b (11)	b (11)	b (11)	b (12)	b (12)	b (12)	b (12)
	Through									
	Right									
Southbound	Left									
	Through									
	Right									
EDGEGROVE ROAD (SR 2008)										
Eastbound	Left									
	Through									
	Right									
Westbound	Left	a (8)	a (7)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)
	Through									
	Right									
OVERALL		--	--	--	--	--	--	--	--	--

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		OXFORD AVENUE (SR 2008) & KINDIG LANE (T477/BORO)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
OXFORD AVENUE (SR 2008)										
Northbound	Left									
	Through			b (10)				b (11)		
	Right									
Southbound	Left	a (8)	a (8)	b (11)	a (8)	a (8)	a (8)	b (13)	a (8)	a (8)
	Through									
	Right									
KINDIG LANE (T477/BORO)										
Eastbound	Left									
	Through									
	Right									
Westbound	Left									
	Through	b (14)	b (15)	b (10)	b (13)	b (14)	c (18)	b (11)	b (14)	c (15)
	Right									
OVERALL		--	--	**b (10)**	--	--	--	**b (12)**	--	--

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		OXFORD AVENUE (SR 2008) & KINDIG LANE (T477/BORO)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
OXFORD AVENUE (SR 2008)										
Northbound	Left									
	Through			b (14)				c (17)		
	Right									
Southbound	Left	a (8)	a (8)	b (13)	a (8)	a (8)	a (8)	c (16)	a (8)	a (8)
	Through									
	Right									
KINDIG LANE (T477/BORO)										
Eastbound	Left									
	Through									
	Right									
Westbound	Left									
	Through	d (28)	e (37)	c (17)	c (19)	c (22)	f (88)	c (23)	d (27)	d (33)
	Right									
OVERALL		--	--	**b (15)**	--	--	--	**c (19)**	--	--

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		OXFORD AVENUE (SR 2008/T476) & EDGEGROVE ROAD (SR 2008)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
OXFORD AVENUE (SR 2008/T476)										
Northbound	Left	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)
	Through									
	Right									
Southbound	Left	a (0)	a (0)	a (0)	a (0)	a (0)	a (0)	a (0)	a (0)	a (0)
	Through									
	Right									
EDGEGROVE ROAD (SR 2008)										
Eastbound	Left									
	Through	b (10)	b (11)	b (11)	b (10)	b (11)	b (11)	b (11)	b (11)	b (11)
	Right									
Westbound	Left									
	Through	a (9)	a (9)	a (9)	a (9)	a (9)	a (9)	a (9)	a (9)	a (9)
	Right									
OVERALL		--	--	--	--	--	--	--	--	--

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		OXFORD AVENUE (SR 2008/T476) & EDGEGROVE ROAD (SR 2008)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
OXFORD AVENUE (SR 2008/T476)										
Northbound	Left	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)
	Through									
	Right									
Southbound	Left	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)
	Through									
	Right									
EDGEGROVE ROAD (SR 2008)										
Eastbound	Left									
	Through	b (10)	b (10)	b (10)	b (10)	b (10)	b (11)	b (11)	b (11)	b (11)
	Right									
Westbound	Left									
	Through	a (0)	a (0)	a (0)	a (0)	a (0)	a (0)	a (0)	a (0)	a (0)
	Right									
OVERALL		--	--	--	--	--	--	--	--	--

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		CENTENNIAL ROAD (SR 2006) & SUNDAY DRIVE (T460)/ALIGNMENT								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
CENTENNIAL ROAD (SR 2006)										
Northbound	Left	a (8)	a (8)	a (8)	A (9)	A (8)	a (8)	a (8)	A (9)	A (8)
	Through									
	Right									
Southbound	Left				B (10)	A (9)			B (11)	B (10)
	Through									
	Right									
SUNDAY DRIVE (T460)/ALIGNMENT										
Eastbound	Left	b (11)	b (11)	b (11)	A (8)	A (9)	b (12)	b (12)	A (9)	A (9)
	Through				A (7)	A (8)			A (8)	A (8)
	Right									
Westbound	Left				A (0)	A (0)			A (0)	A (0)
	Through				A (6)	A (7)			A (7)	A (7)
	Right									
OVERALL		--	--	--	A (8)	A (8)	--	--	A (8)	A (9)

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		CENTENNIAL ROAD (SR 2006) & SUNDAY DRIVE (T460)/ALIGNMENT								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
CENTENNIAL ROAD (SR 2006)										
Northbound	Left	a (8)	a (8)	a (8)	B (11)	B (11)	a (8)	a (8)	B (13)	B (13)
	Through									
	Right									
Southbound	Left				B (13)	B (13)			B (15)	B (16)
	Through									
	Right									
SUNDAY DRIVE (T460)/ALIGNMENT										
Eastbound	Left	b (12)	b (12)	b (12)	B (12)	B (13)	b (14)	b (14)	B (14)	B (16)
	Through				A (6)	A (6)			A (7)	A (7)
	Right									
Westbound	Left				A (0)	A (0)			A (0)	A (0)
	Through				A (8)	A (8)			A (9)	A (10)
	Right									
OVERALL		--	--	--	A (9)	A (9)	--	--	B (10)	B (11)

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		LITTLESTOWN ROAD (SR 2019)/BENDER ROAD (T464) & HANOVER ROAD (SR 0116)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
LITTLESTOWN ROAD (SR 2019)/BENDER ROAD (T464)										
Northbound	Left	c (17)	c (20)	c (20)	c (20)	c (20)	d (28)	d (28)	d (28)	d (28)
	Through									
	Right									
Southbound	Left	c (19)	c (21)	c (21)	c (21)	c (21)	d (32)	d (32)	d (32)	d (32)
	Through									
	Right									
HANOVER ROAD (SR 0116)										
Eastbound	Left	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)
	Through									
	Right									
Westbound	Left	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)
	Through									
	Right									
OVERALL		--	--	--	--	--	--	--	--	--

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		LITTLESTOWN ROAD (SR 2019)/BENDER ROAD (T464) & HANOVER ROAD (SR 0116)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
LITTLESTOWN ROAD (SR 2019)/BENDER ROAD (T464)										
Northbound	Left	c (24)	d (33)	d (33)	d (33)	d (33)	f (68)	f (68)	f (68)	f (68)
	Through									
	Right									
Southbound	Left	c (23)	d (27)	d (27)	d (27)	d (27)	f (53)	f (53)	f (53)	f (53)
	Through									
	Right									
HANOVER ROAD (SR 0116)										
Eastbound	Left	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)
	Through									
	Right									
Westbound	Left	a (9)	a (9)	a (9)	a (9)	a (9)	a (9)	a (9)	a (9)	a (9)
	Through									
	Right									
OVERALL		--	--	--	--	--	--	--	--	--

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		BENDER ROAD (T464) & GEISELMAN ROAD (T478)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
BENDER ROAD (T464)										
Northbound	Left									
	Through									
	Right									
Southbound	Left	a (7)	a (7)	a (7)	a (7)	a (7)	a (7)	a (7)	a (7)	a (7)
	Through									
	Right									
GEISELMAN ROAD (T478)										
Eastbound	Left									
	Through									
	Right									
Westbound	Left									
	Through	a (9)	a (9)	a (9)	a (9)	a (9)	a (9)	a (9)	a (9)	a (9)
	Right									
OVERALL		--	--	--	--	--	--	--	--	--

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		BENDER ROAD (T464) & GEISELMAN ROAD (T478)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
BENDER ROAD (T464)										
Northbound	Left									
	Through									
	Right									
Southbound	Left	a (7)	a (7)	a (7)	a (7)	a (7)	a (7)	a (7)	a (7)	a (7)
	Through									
	Right									
GEISELMAN ROAD (T478)										
Eastbound	Left									
	Through									
	Right									
Westbound	Left									
	Through	a (9)	a (9)	a (9)	a (9)	a (9)	a (10)	a (10)	a (10)	a (10)
	Right									
OVERALL		--	--	--	--	--	--	--	--	--

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		CENTENNIAL ROAD (SR 2006) & BENDER ROAD (T464)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
CENTENNIAL ROAD (SR 2006)										
Northbound	Left	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)
	Through									
	Right									
Southbound	Left									
	Through									
	Right									
BENDER ROAD (T464)										
Eastbound	Left	a (10)	b (10)	b (10)	b (10)	b (10)	b (10)	b (10)	b (10)	b (10)
	Through									
	Right									
Westbound	Left									
	Through									
	Right									
OVERALL		--	--	--	--	--	--	--	--	--

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		CENTENNIAL ROAD (SR 2006) & BENDER ROAD (T464)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
CENTENNIAL ROAD (SR 2006)										
Northbound	Left	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)	a (8)
	Through									
	Right									
Southbound	Left									
	Through									
	Right									
BENDER ROAD (T464)										
Eastbound	Left	b (11)	b (11)	b (11)	b (11)	b (11)	b (12)	b (12)	b (12)	b (12)
	Through									
	Right									
Westbound	Left									
	Through									
	Right									
OVERALL		--	--	--	--	--	--	--	--	--

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		HIGH STREET (T535/BORO) & EISENHOWER DRIVE (T679/BORO)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
HIGH STREET (T535/BORO)										
Northbound	Left				D (48)	D (44)			D (47)	D (43)
	Through	b (12)	b (13)	C (24)	D (43)	D (45)	c (17)	C (23)	D (42)	D (44)
	Right									
Southbound	Left	a (9)	a (9)	C (23)	D (44)	D (43)	a (10)	C (23)	D (43)	D (43)
	Through			C (23)	D (46)	D (54)		C (23)	D (45)	D (54)
	Right									
EISENHOWER DRIVE (T679/BORO)										
Eastbound	Left				A (3)	A (5)			A (4)	A (6)
	Through				A (3)	A (9)			A (4)	B (10)
	Right									
Westbound	Left	b (12)	b (12)	A (3)	A (6)	A (6)	b (15)	A (3)	A (8)	A (7)
	Through				A (3)	A (7)			A (3)	A (7)
	Right									
OVERALL		--	--	B (11)	A (9)	B (13)	--	B (10)	A (9)	B (13)

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		HIGH STREET (T535/BORO) & EISENHOWER DRIVE (T679/BORO)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
HIGH STREET (T535/BORO)										
Northbound	Left				D (50)	D (38)			D (50)	D (37)
	Through	b (9)	e (39)	B (19)	D (37)	D (37)	f (104)	B (19)	D (36)	D (36)
	Right									
Southbound	Left	b (13)	b (13)	C (21)	D (39)	D (37)	b (15)	C (21)	D (38)	D (37)
	Through			C (24)	D (42)	D (51)		C (23)	D (40)	D (50)
	Right									
EISENHOWER DRIVE (T679/BORO)										
Eastbound	Left				A (8)	A (10)			B (10)	B (11)
	Through				A (6)	B (14)			A (7)	B (16)
	Right									
Westbound	Left	c (21)	d (25)	A (5)	A (9)	A (9)	e (44)	A (5)	B (11)	B (10)
	Through				A (6)	B (12)			A (7)	B (13)
	Right									
OVERALL		--	--	B (11)	B (15)	B (20)	--	B (11)	B (15)	B (20)

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		CARLISLE STREET (SR 0094) & EISENHOWER DRIVE (T679/BORO)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
CARLISLE STREET (SR 0094)										
Northbound	Left	F (97)	F (90)	D (52)	D (52)	D (52)	F (90)	D (52)	D (52)	D (52)
	Through	B (17)	B (16)	B (16)	B (18)	B (19)	B (18)	B (18)	C (21)	C (21)
	Right									
Southbound	Left	D (39)	D (54)	D (54)	D (50)	D (50)	E (57)	E (57)	D (52)	D (52)
	Through	B (14)	B (13)	B (14)	C (21)	C (21)	B (16)	B (17)	C (24)	C (24)
	Right									
EISENHOWER DRIVE (T679/BORO)										
Eastbound	Left	D (38)	D (54)	D (54)	D (46)	D (53)	E (57)	E (57)	D (47)	D (54)
	Through	C (29)	D (40)	D (42)	C (28)	D (40)	D (38)	D (41)	C (27)	D (40)
	Right									
Westbound	Left	D (40)	D (52)	D (46)	D (46)	D (46)	D (51)	D (47)	D (47)	D (47)
	Through	C (35)	D (48)	D (48)	D (49)	D (49)	D (47)	D (47)	D (52)	D (52)
	Right	C (26)	D (36)	D (36)	D (36)	D (36)	C (34)	C (34)	C (34)	C (34)
OVERALL		C (25)	C (31)	C (31)	C (34)	D (37)	C (32)	C (32)	C (35)	D (38)

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		CARLISLE STREET (SR 0094) & EISENHOWER DRIVE (T679/BORO)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
CARLISLE STREET (SR 0094)										
Northbound	Left	F (87)	F (81)	D (52)	E (57)	D (52)	F (81)	D (52)	E (57)	D (52)
	Through	C (28)	C (25)	C (29)	C (32)	C (33)	C (30)	D (40)	D (42)	D (44)
	Right									
Southbound	Left	E (63)	F (113)	D (53)	E (57)	D (51)	F (168)	E (57)	E (60)	D (54)
	Through	C (21)	B (20)	C (23)	C (31)	C (32)	C (23)	C (28)	D (38)	D (40)
	Right									
EISENHOWER DRIVE (T679/BORO)										
Eastbound	Left	E (56)	F (102)	D (53)	D (52)	E (57)	F (147)	E (55)	D (54)	E (59)
	Through	C (32)	D (38)	C (38)	C (26)	D (39)	D (36)	D (37)	C (24)	D (38)
	Right									
Westbound	Left	D (51)	F (85)	D (52)	D (55)	D (49)	F (126)	D (55)	E (57)	D (51)
	Through	D (36)	D (46)	D (53)	E (59)	E (57)	D (48)	E (57)	E (62)	E (62)
	Right	C (26)	C (32)	C (30)	C (34)	C (30)	C (31)	C (28)	C (31)	C (28)
OVERALL		D (35)	D (47)	D (37)	D (41)	D (42)	E (60)	D (42)	D (44)	D (47)

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		CARLISLE STREET (SR 0094) & E ELM AVENUE (BORO)/W ELM AVENUE (SR 3098)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
CARLISLE STREET (SR 0094)										
Northbound	Left	A (10)	B (11)	B (11)	A (8)	A (8)	B (14)	B (13)	B (10)	B (10)
	Through	A (8)	A (8)	A (9)	A (7)	A (7)	B (10)	B (10)	A (8)	A (8)
	Right									
Southbound	Left	A (9)	B (10)	B (10)	A (7)	A (7)	B (13)	B (12)	A (9)	A (9)
	Through	A (8)	A (8)	A (9)	A (7)	A (7)	B (10)	B (10)	A (8)	A (8)
	Right									
E ELM AVENUE (BORO)/W ELM AVENUE (SR 3098)										
Eastbound	Left	D (36)	D (45)	D (35)	D (45)	D (45)	D (44)	C (33)	D (44)	D (44)
	Through	C (31)	D (38)	D (42)	D (38)	C (38)	D (36)	D (40)	D (36)	C (36)
	Right									
Westbound	Left	C (34)	D (43)	D (37)	D (43)	D (43)	D (42)	D (36)	D (42)	D (42)
	Through	C (30)	D (36)	D (50)	D (36)	D (36)	C (34)	D (49)	C (34)	C (34)
	Right									
OVERALL		B (17)	C (20)	C (22)	C (24)	C (24)	C (20)	C (22)	C (23)	C (23)

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		CARLISLE STREET (SR 0094) & E ELM AVENUE (BORO)/W ELM AVENUE (SR 3098)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
CARLISLE STREET (SR 0094)										
Northbound	Left	C (33)	D (38)	C (23)	C (26)	C (25)	E (64)	C (32)	D (43)	D (38)
	Through	B (16)	B (17)	B (15)	B (14)	B (13)	B (19)	B (18)	B (18)	B (16)
	Right									
Southbound	Left	C (21)	C (23)	B (18)	B (17)	B (16)	C (27)	C (23)	C (24)	C (21)
	Through	C (22)	C (24)	B (17)	B (18)	B (18)	C (35)	C (21)	C (27)	C (25)
	Right									
E ELM AVENUE (BORO)/W ELM AVENUE (SR 3098)										
Eastbound	Left	D (40)	D (48)	C (31)	D (48)	D (44)	E (81)	C (29)	D (50)	D (50)
	Through	C (28)	C (31)	D (39)	C (32)	C (29)	C (34)	D (35)	C (30)	C (29)
	Right									
Westbound	Left	C (34)	D (37)	C (29)	D (40)	D (36)	D (40)	C (27)	D (38)	D (36)
	Through	C (29)	C (33)	E (64)	C (33)	C (31)	D (37)	D (55)	C (32)	C (31)
	Right									
OVERALL		C (24)	C (26)	C (28)	C (25)	C (24)	C (34)	C (28)	C (29)	C (27)

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		GEISELMAN ROAD (T478) & HANOVER ROAD (SR 0116)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
GEISELMAN ROAD (T478)										
Northbound	Left									
	Through									
	Right									
Southbound	Left	c (16)	c (17)	c (17)	c (17)	c (17)	c (20)	c (20)	c (20)	c (20)
	Through									
	Right									
HANOVER ROAD (SR 0116)										
Eastbound	Left	a (0)	a (0)	a (0)	a (0)	a (0)	a (0)	a (0)	a (0)	a (0)
	Through									
	Right									
Westbound	Left									
	Through									
	Right									
OVERALL		--	--	--	--	--	--	--	--	--

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		GEISELMAN ROAD (T478) & HANOVER ROAD (SR 0116)								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
GEISELMAN ROAD (T478)										
Northbound	Left									
	Through									
	Right									
Southbound	Left	c (19)	c (22)	c (22)	c (22)	c (22)	d (28)	d (28)	d (28)	d (28)
	Through									
	Right									
HANOVER ROAD (SR 0116)										
Eastbound	Left	a (0)	a (0)	a (0)	a (0)	a (0)	a (0)	a (0)	a (0)	a (0)
	Through									
	Right									
Westbound	Left									
	Through									
	Right									
OVERALL		--	--	--	--	--	--	--	--	--

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		OXFORD AVENUE (SR 2008) & ALIGNMENT								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
OXFORD AVENUE (SR 2008)										
Northbound	Left				B (12)	B (12)			B (14)	B (14)
	Through				B (12)	B (11)			B (13)	B (12)
	Right									
Southbound	Left				B (12)	B (13)			B (14)	B (14)
	Through				B (12)	B (11)			B (12)	B (12)
	Right									
ALIGNMENT										
Eastbound	Left				A (8)	A (8)			A (9)	A (9)
	Through				A (9)	A (10)			A (10)	B (11)
	Right									
Westbound	Left				B (11)	B (12)			B (13)	B (14)
	Through				A (7)	A (7)			A (7)	A (8)
	Right									
OVERALL		--	--	--	A (9)	A (10)	--	--	B (11)	B (11)

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		OXFORD AVENUE (SR 2008) & ALIGNMENT								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
OXFORD AVENUE (SR 2008)										
Northbound	Left				B (13)	B (13)			B (15)	B (15)
	Through				B (12)	B (12)			B (13)	B (14)
	Right									
Southbound	Left				B (13)	B (14)			B (16)	B (16)
	Through				B (10)	B (10)			B (11)	B (11)
	Right									
ALIGNMENT										
Eastbound	Left				B (13)	B (14)			B (16)	B (16)
	Through				B (10)	A (10)			B (11)	B (12)
	Right									
Westbound	Left				B (13)	B (13)			B (15)	B (16)
	Through				B (11)	B (12)			B (13)	B (16)
	Right									
OVERALL		--	--	--	B (11)	B (11)	--	--	B (12)	B (14)

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		CHURCH STREET (SR 2011) & ALIGNMENT								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
CHURCH STREET (SR 2011)										
Northbound	Left				c (17)	c (18)			c (19)	c (20)
	Through									
	Right									
Southbound	Left				c (22)	c (18)			c (25)	c (20)
	Through									
	Right									
ALIGNMENT										
Eastbound	Left				a (8)	a (8)			a (8)	a (8)
	Through									
	Right									
Westbound	Left				a (8)	a (9)			a (9)	a (9)
	Through									
	Right									
OVERALL		--	--	--	--	--	--	--	--	--

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		CHURCH STREET (SR 2011) & ALIGNMENT								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3BC	2022 Alternative 4BC/5BC	2042 No Build	2042 TSM Alternative	2042 Alternative 3BC	2042 Alternative 4BC/5BC
CHURCH STREET (SR 2011)										
Northbound	Left				c (22)	c (23)			d (26)	d (27)
	Through									
	Right									
Southbound	Left				d (27)	c (24)			d (33)	d (27)
	Through									
	Right									
ALIGNMENT										
Eastbound	Left				a (9)	a (9)			a (9)	a (9)
	Through									
	Right									
Westbound	Left				a (8)	a (8)			a (8)	a (8)
	Through									
	Right									
OVERALL		--	--	--	--	--	--	--	--	--

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		SUNDAY DRIVE (T460) & ALIGNMENT								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3C	2022 Alternative 4C/5C	2042 No Build	2042 TSM Alternative	2042 Alternative 3C	2042 Alternative 4C/5C
SUNDAY DRIVE (T460)										
Northbound	Left				b (12)	b (12)			b (12)	b (12)
	Through									
	Right									
Southbound	Left									
	Through									
	Right									
ALIGNMENT										
Eastbound	Left									
	Through									
	Right									
Westbound	Left				a (8)	a (8)			a (8)	a (8)
	Through									
	Right									
OVERALL		--	--	--	--	--	--	--	--	--

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		SUNDAY DRIVE (T460) & ALIGNMENT								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3C	2022 Alternative 4C/5C	2042 No Build	2042 TSM Alternative	2042 Alternative 3C	2042 Alternative 4C/5C
SUNDAY DRIVE (T460)										
Northbound	Left				b (11)	b (11)			b (11)	b (11)
	Through									
	Right									
Southbound	Left									
	Through									
	Right									
ALIGNMENT										
Eastbound	Left									
	Through									
	Right									
Westbound	Left				a (8)	a (8)			a (8)	a (8)
	Through									
	Right									
OVERALL		--	--	--	--	--	--	--	--	--

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))

LEVEL OF SERVICE										
AM/PM PEAK		AM PEAK								
INTERSECTION		HANOVER ROAD (SR 0116) & ALIGNMENT								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3C	2022 Alternative 4C/5C	2042 No Build	2042 TSM Alternative	2042 Alternative 3C	2042 Alternative 4C/5C
HANOVER ROAD (SR 0116)										
Northbound	Left				A (8)	A (8)			A (8)	A (8)
	Through									
	Right									
Southbound	Left									
	Through									
	Right									
ALIGNMENT										
Eastbound	Left									
	Through				A (7)	A (7)			A (8)	A (7)
	Right									
Westbound	Left				A (0)	A (0)			A (0)	A (0)
	Through				A (5)	A (5)			A (4)	A (4)
	Right									
OVERALL		--	--	--	A (8)	A (8)	--	--	A (8)	A (8)

LEVEL OF SERVICE										
AM/PM PEAK		PM PEAK								
INTERSECTION		HANOVER ROAD (SR 0116) & ALIGNMENT								
Approach	Movement	Existing	2022 No Build	2022 TSM Alternative	2022 Alternative 3C	2022 Alternative 4C/5C	2042 No Build	2042 TSM Alternative	2042 Alternative 3C	2042 Alternative 4C/5C
HANOVER ROAD (SR 0116)										
Northbound	Left				B (10)	A (9)			B(11)	B (11)
	Through									
	Right									
Southbound	Left									
	Through									
	Right									
ALIGNMENT										
Eastbound	Left									
	Through				B (12)	B (13)			B (18)	B (20)
	Right									
Westbound	Left				A (0)	A (0)			A (0)	A (0)
	Through				A (5)	A (5)			A (5)	A (5)
	Right									
OVERALL		--	--	--	B (10)	A (9)	--	--	B (11)	B (11)

A (##) - Signalized Level of Service (Expected Delay (seconds))
a (##) - Unsignalized Level of Service (Expected Delay (seconds))