



**Appendix C:**  
**I-81 Point of Access Study**  
*April 2011*

# I-81 FEASIBILITY STUDY & CONCEPTUAL POINT OF ACCESS

Franklin County, Pennsylvania

Prepared for:



Pennsylvania Department of Transportation - District 8-0  
and  
Guilford and Hamilton Townships

Prepared by:

**McCormick**  
Engineers & Planners  
Since 1946  
**Taylor**

5 Capital Drive, Suite 400  
Harrisburg, PA 17110



April 2011

# I-81 Feasibility Study / Conceptual Point of Access

## Executive Summary

The I-81 Feasibility Study and Conceptual Point of Access Report involves the development of transportation improvements to accommodate existing and planned commercial and industrial development to the south of Chambersburg in Franklin County, Pennsylvania. The study area extends along I-81 from Chambersburg near Exit 14, Wayne Avenue Interchange, to Marion near Exit 10, Marion Interchange, and from the area to the west of U.S. 11 to the area to the east of I-81. The study area is primarily within Guilford Township, but a portion of Chambersburg Borough is also within the study limits, and the Hamilton Township boundary is just to the west of the study area limits.

The focus of the Feasibility Study is to evaluate the existing and future conditions and transportation needs to access I-81 and to develop a comprehensive land use and transportation solution that balances anticipated growth of industrial, commercial, and residential development with the existing and future roadway infrastructure. The intent of the Conceptual Point of Access Report is to evaluate the transportation solution for a new access to I-81 developed in the Feasibility Study and submit it to PennDOT and the Federal Highway Administration for a determination of engineering and operational acceptability.

The existing conditions within the study area were assessed, including the environmental features, traffic and safety conditions, and land use. The future land use conditions were projected for the design year of 2030. This future land use information was used to develop the future no-build traffic volumes for all intersections within the study area, including the AM and PM peak hour volumes and turning movements, as well as the Level of Service results for all intersections within the study area. Using the future land use and future traffic information, seven (7) design options, including the no-build option, were conceptually developed in an attempt to address the safety and mobility needs of the study area. These seven options were then evaluated against each other to determine which option best met the project need.

It was determined that the Guilford Springs Road Interchange option best provides the ultimate solution to address the mobility and safety issues associated with the commercial and industrial development in the study area. Therefore, the Conceptual Point of Access Request Report was prepared for this option.

However, it was determined that the Southbound I-81 Access Ramps at Guilford Springs Road with Selected TSM Improvements option best addresses the short-term access needs of the study area. In coordination with Smart Transportation guidelines, it is proposed that the improvements at Guilford Springs Road be phased to comply with progressive development and land use changes. The phased approach will provide an opportunity for Guilford Township and Franklin County Planning Commission to establish a project deployment plan, by which the improvements can be incrementally staged to meet traffic demands and funding availability. A land development scenario coupled with transportation improvements was developed for years 2015, 2020, 2025, and 2030.

This document was prepared as a tool to allow the municipalities to plan and program future transportation improvements to meet ongoing development needs. Extensive coordination was conducted with Guilford Township, Hamilton Township, Franklin County, PennDOT and the Federal Highway Administration.

**I-81 Feasibility Study / Conceptual Point of Access  
Table of Contents**

1.0	Introduction / Study Area .....	1
2.0	Project Purpose and Need .....	3
2.1	Project Purpose .....	3
2.2	Project Need .....	3
3.0	Existing Conditions .....	4
3.1	Origin-Destination Study .....	4
3.2	Existing Traffic Volumes .....	13
3.3	Safety Conditions / Crash Analysis .....	13
3.4	Existing Deficiencies .....	24
4.0	Environmental Features .....	25
5.0	Existing and Future Land Use .....	29
5.1	Existing Land Use / Land Cover .....	29
5.2	Projections and Development.....	31
5.3	Future Land Use / Land Cover .....	33
6.0	Future No-Build Traffic.....	36
6.1	Trip Generation and Distribution.....	36
6.2	Future Year 2030 No-Build Traffic .....	36
7.0	Design Options .....	53
7.1	Design Options Not Requiring New or Modified I-81 Access.....	53
	• No-Build .....	53
	• Transportation Systems Management (TSM) .....	53
	• Transportation Systems Management (TSM) and Widening Improvements.....	53
7.2	Design Options Requiring New or Modified I-81 Access.....	56
	• Guilford Springs Road Interchange.....	56
	• Lighthouse Road Interchange .....	60
	• Collector-Distributor Road .....	65
	• Southbound I-81 Access Ramps at Guilford Springs Road with Selected TSM Improvements .....	70
7.3	Summary of Design Options .....	72
8.0	Phased Implementation of Transportation and Land Use.....	76
8.1	Year 2015 Land Development and Transportation Improvements Plan .....	76
8.2	Year 2020 Land Development and Transportation Improvements Plan .....	78
8.3	Year 2025 Land Development and Transportation Improvements Plan .....	80
8.4	Year 2030 Land Development and Transportation Improvements Plan .....	80

**I-81 Feasibility Study / Conceptual Point of Access  
List of Figures**

<b>Figure 1.1</b>	<b>Study Area Map .....</b>	<b>2</b>
<b>Figure 3.2.1</b>	<b>Study Area Intersections .....</b>	<b>14</b>
<b>Figure 3.2.2</b>	<b>Average Daily Total Volumes (North) .....</b>	<b>15</b>
<b>Figure 3.2.3</b>	<b>Average Daily Total Volumes (South).....</b>	<b>16</b>
<b>Figure 3.2.4</b>	<b>2007 Existing Peak Hour Traffic Volumes (North) .....</b>	<b>17</b>
<b>Figure 3.2.5</b>	<b>2007 Existing Peak Hour Truck Volumes (North) .....</b>	<b>18</b>
<b>Figure 3.2.6</b>	<b>2007 Existing Peak Hour Traffic Volumes (South).....</b>	<b>19</b>
<b>Figure 3.2.7</b>	<b>2007 Existing Peak Hour Truck Volumes (South).....</b>	<b>20</b>
<b>Figure 4.1</b>	<b>Environmental Features.....</b>	<b>26</b>
<b>Figure 5.1.1</b>	<b>Existing Land Use .....</b>	<b>30</b>
<b>Figure 5.3.1</b>	<b>Future Land Use .....</b>	<b>34</b>
<b>Figure 6.1.1</b>	<b>Traffic Analysis Zones .....</b>	<b>37</b>
<b>Figure 6.2.1</b>	<b>2030 Future Peak Hour Total Traffic Volumes (North) 100% Built.....</b>	<b>39</b>
<b>Figure 6.2.2</b>	<b>2030 Future Peak Hour Total Traffic Volumes (South) 100% Built.....</b>	<b>40</b>
<b>Figure 6.2.3</b>	<b>2030 Future Peak Hour Total Truck Volumes (North) 100% Heavy Vehicles.....</b>	<b>41</b>
<b>Figure 6.2.4</b>	<b>2030 Future Peak Hour Total Truck Volumes (South) 100% Heavy Vehicles .....</b>	<b>42</b>
<b>Figure 6.2.5</b>	<b>2030 Future Peak Hour Total Traffic Volumes (North) 80% Build.....</b>	<b>43</b>
<b>Figure 6.2.6</b>	<b>2030 Future Peak Hour Total Traffic Volumes (South) 80% Build.....</b>	<b>44</b>
<b>Figure 6.2.7</b>	<b>2030 Future Peak Hour Truck Volumes (North) 80% Heavy Vehicles .....</b>	<b>45</b>
<b>Figure 6.2.8</b>	<b>2030 Future Peak Hour Truck Volumes (South) 80% Heavy Vehicles.....</b>	<b>46</b>
<b>Figure 6.2.9</b>	<b>2030 Future Peak Hour Total Traffic Volumes (North) 50% Build &amp; 80% Heavy Vehicles ...</b>	<b>47</b>
<b>Figure 6.2.10</b>	<b>2030 Future Peak Hour Total Traffic Volumes (South) 50% Build &amp; 80% Heavy Vehicles ..</b>	<b>48</b>
<b>Figure 6.2.11</b>	<b>2030 Future Build Average Daily Traffic (ADT) Volumes (North).....</b>	<b>49</b>
<b>Figure 6.2.12</b>	<b>2030 Future Build Average Daily Traffic (ADT) Volumes (South).....</b>	<b>50</b>
<b>Figure 7.1.1</b>	<b>Transportation Systems Management (TSM).....</b>	<b>54</b>
<b>Figure 7.1.2</b>	<b>Transportation Systems Management (TSM) and Widening Option.....</b>	<b>55</b>
<b>Figure 7.1.3</b>	<b>Typical Section – US11 Existing and Widening .....</b>	<b>56</b>
<b>Figure 7.2.1</b>	<b>Guilford Springs Road Interchange Option.....</b>	<b>57</b>
<b>Figure 7.2.2</b>	<b>Lighthouse Road Interchange Option.....</b>	<b>61</b>
<b>Figure 7.2.3</b>	<b>Collector – Distributor Road Option .....</b>	<b>66</b>
<b>Figure 7.2.4</b>	<b>Collector – Distributor Road Option – Typical Section .....</b>	<b>65</b>
<b>Figure 7.2.5</b>	<b>Southbound I-81 Access Ramps at Guilford Springs Road with Selected TSM Improvements.....</b>	<b>71</b>
<b>Figure 8.1.1</b>	<b>Year 2015 Land Development and Transportation Improvements Plan .....</b>	<b>77</b>
<b>Figure 8.2.1</b>	<b>Year 2020 Land Development and Transportation Improvements Plan .....</b>	<b>79</b>
<b>Figure 8.3.1</b>	<b>Year 2025 Land Development and Transportation Improvements Plan .....</b>	<b>81</b>
<b>Figure 8.4.1</b>	<b>Year 2030 Land Development and Transportation Improvements Plan .....</b>	<b>82</b>

**I-81 Feasibility Study / Conceptual Point of Access  
List of Tables**

<b>Table 3.1.1</b>	<b>Summary of Surveys Collected (Origin-Destination Study) .....</b>	<b>5</b>
<b>Table 3.1.2</b>	<b>Vehicle Type (Origin-Destination Study) .....</b>	<b>6</b>
<b>Table 3.1.3</b>	<b>Vehicle Occupancy (Origin-Destination Study) .....</b>	<b>6</b>
<b>Table 3.1.4</b>	<b>Trip Frequency (Origin-Destination Study) .....</b>	<b>7</b>
<b>Table 3.1.5</b>	<b>Travel Length-Minutes (Origin-Destination Study) .....</b>	<b>8</b>
<b>Table 3.1.6</b>	<b>Alternate Routes (Origin-Destination Study) .....</b>	<b>9</b>
<b>Table 3.1.7</b>	<b>Alternate Route Frequency (Origin-Destination Study) .....</b>	<b>9</b>
<b>Table 3.1.8</b>	<b>Reason for taking Alternate Route (Origin-Destination Study) .....</b>	<b>10</b>
<b>Table 3.1.9</b>	<b>Trip Origin (Origin-Destination Study).....</b>	<b>11</b>
<b>Table 3.1.10</b>	<b>Trip Destination (Origin-Destination Study).....</b>	<b>11</b>
<b>Table 3.1.11</b>	<b>Exit 10 Trip Origin by Zip Code (Origin-Destination Study).....</b>	<b>12</b>
<b>Table 3.1.12</b>	<b>Exit 10 Trip Destination by Zip Code (Origin-Destination Study).....</b>	<b>12</b>
<b>Table 3.1.13</b>	<b>Exit 14 Trip Origin by Zip Code (Origin-Destination Study).....</b>	<b>12</b>
<b>Table 3.1.14</b>	<b>Exit 14 Trip Destination by Zip Code (Origin-Destination Study).....</b>	<b>12</b>
<b>Table 3.2.1</b>	<b>2007 Existing Conditions Delay and LOS.....</b>	<b>21</b>
<b>Table 3.3.1</b>	<b>High Crash Locations in the Study Area .....</b>	<b>23</b>
<b>Table 5.2.1</b>	<b>Study Area Population 1970-2030 .....</b>	<b>32</b>
<b>Table 6.2.1</b>	<b>2030 No-Build Conditions Delay and LOS.....</b>	<b>51</b>
<b>Table 7.2.1</b>	<b>Guilford Springs Road Interchange Delay and LOS.....</b>	<b>58</b>
<b>Table 7.2.2</b>	<b>Lighthouse Road Interchange Delay and LOS.....</b>	<b>62</b>
<b>Table 7.2.3</b>	<b>2030 Collector-Distributor System at Wayne Avenue Delay and LOS .....</b>	<b>67</b>
<b>Table 7.3.1</b>	<b>Comparison of Design Concepts</b>	
	<b>No-Build, TSM, and TSM/Widening Options.....</b>	<b>73</b>
	<b>Guilford Springs Road Interchange and Lighthouse Road Interchange Options .....</b>	<b>74</b>
	<b>Collector-Distributor Road and Southbound I-81 Access Ramps at Guilford Springs Road with Selected TSM Improvements.....</b>	<b>75</b>

**I-81 Feasibility Study / Conceptual Point of Access  
Appendices**

**Appendix A\***

Origin-Destination Survey Form

**Appendix B\***

Turning Movement Traffic Counts

**Appendix C\***

Automatic Traffic Recorder (ATR) Data

**Appendix D\***

Highway Capacity Manual Reports for Study Area Intersections

**Appendix E\***

Design Criteria for Roadway Deficiencies

**Appendix F\***

Trip Generation and Distribution

**Appendix G**

I-81 Conceptual Point of Access Request Report

**Appendix H**

Local Letters of Support

**Appendix I**

Meeting Reports

\* Appendices are contained on the CDs at the back of the report

# I-81 Feasibility Study / Conceptual Point of Access

## 1.0 Introduction / Study Area

This study involves the development of transportation improvements to accommodate existing and planned commercial and industrial development to the south of Chambersburg, Pennsylvania. The study area extends from Chambersburg to the north to Marion to the south, and from west of U.S. 11 to east of I-81, primarily within Guilford Township. However, a portion of the Borough of Chambersburg also is within the study limits. This corridor has been zoned Commercial and Industrial and has been developing rapidly with business parks and distribution centers. **(Figure 1.1)**. This area is ideally suited for distribution centers, with a location on a major northeast U.S. Interstate highway, with I-76 just to the north and I-70 just to the south. In addition, it is served by both Norfolk Southern and CSX rail lines. The study also considered the traffic effects of planned residential development from outside the study area.

The focus of this study is to evaluate the existing and future transportation needs to access I-81 and to develop a comprehensive land use and transportation solution that balances the development pressure with the existing infrastructure. Currently, traffic from the commercial and industrial facilities (predominantly truck traffic) accesses I-81 at the Wayne Avenue Interchange on PA 316, and to a lesser extent at the Marion Interchange on Swamp Fox Road (PA 914). The expectations of the local municipalities and the Franklin County Planning Commission is that the commercial / industrial corridor will continue to build out, and in conjunction with increased residential development from Hamilton Township, will result in increased congestion and safety problems at the existing I-81 interchanges.

There are two general solutions to address the I-81 access difficulties. First is an improvement to local roadways and intersections to facilitate travel between the traffic generators and the I-81 Interchanges. Second is improved or new direct access onto I-81. In the event that direct access to I-81 is identified as a potential solution, this Conceptual Point of Access Study was completed to address the traffic consequences of that connection.

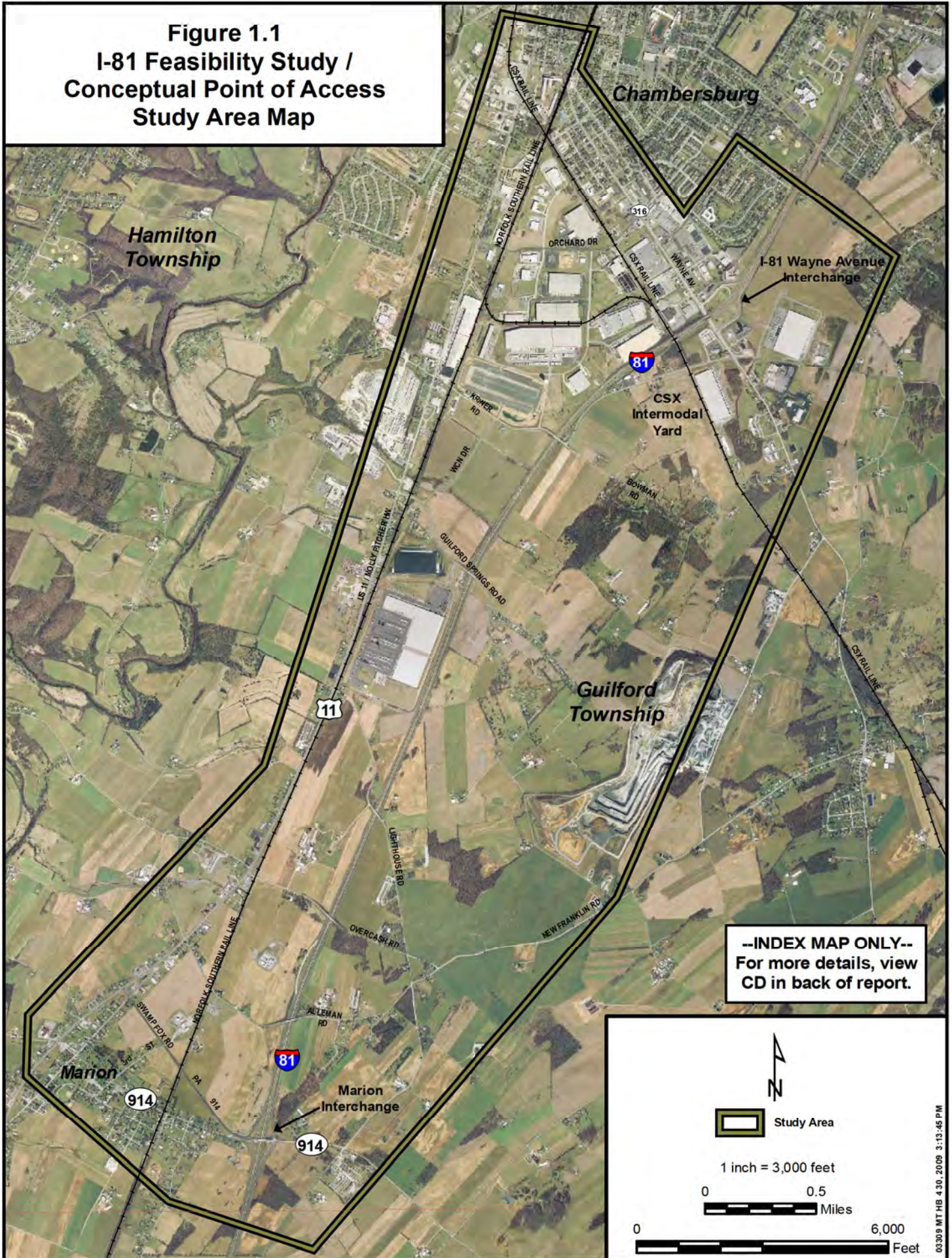


Development around the I-81 Wayne Avenue Interchange

This document was prepared as a tool to allow the municipalities to plan and program future transportation improvements to meet ongoing development needs. Extensive coordination was conducted with Guilford Township, Hamilton Township, Franklin County, PennDOT and the Federal Highway Administration.



**Figure 1.1**  
**I-81 Feasibility Study /**  
**Conceptual Point of Access**  
**Study Area Map**



## 2.0 Project Purpose and Need

### 2.1 Project Purpose

The project purpose is to accommodate existing and proposed development by providing mobility and connectivity to I-81 while improving corridor-wide safety for both commuter and truck traffic. The development is occurring in a corridor between U.S. 11 to the west and I-81 to the east, from Chambersburg to Marion, and consists of distribution centers, warehouses, light industry, and business parks.



The Target Distribution Center

### 2.2 Project Need

- The existing access to I-81 for commuter and truck traffic causes vehicle conflicts on the local roadway system, especially on Wayne Avenue (PA 316) and at the Wayne Avenue Interchange.
- The future (2030) access to I-81 for commuter and truck traffic will cause substantial congestion and vehicle conflicts on the local roadway system, on Wayne Avenue (PA 316), the Wayne Avenue Interchange, Molly Pitcher Highway (U.S. 11), Swamp Fox Road (PA 914), and the Marion Interchange.
- Traffic from new and proposed residential developments (especially in Hamilton Township) that would access I-81 will add to the future congestion and mobility problems on the local routes in the project corridor.
- Truck traffic from the recently constructed CSX Intermodal Yard to the east of I-81 will substantially add to the future congestion, vehicle conflicts, and mobility problems on Wayne Avenue (PA 316) and at the Wayne Avenue Interchange.
- Safety concerns related to the substantial number of at-grade railroad crossings (nine on Norfolk Southern and three on CSX) in the study area. The Norfolk Southern trains through the study corridor run at 30 to 35 mph. Some of the at-grade crossings are protected by gates and flashers (Guilford Springs Road, Overcash Road, Orchard Drive), some by flashers and no gates (Kriener Road) and some by crossbucks only (Lighthouse Road, Alleman Road, Third Street).



Truck Traffic at the I-81/Wayne Ave. Interchange



CSX Intermodal Yard



At-grade railroad crossing on Third Street near Marion

## 3.0 Existing Conditions

### 3.1 Origin Destination Study

To better understand existing travel patterns and factors influencing route choices, an interview origin-destination (OD) study was completed. Roadside interviews were used to collect information on trip origin and destination, travel routes, and other travel pattern data from a selected sample of drivers. A blank survey form is included in **Appendix A** (contained on CD at the back of this report).

The OD interviews were conducted on **November 8, 2007 and November 15, 2007** from 7:00 am to 9:00 am (AM period) and from 3:00 pm to 5:00 pm (PM period) on the ramps at the following two interchanges:

- I-81 Exit 10 (The Marion Interchange) at Swamp Fox Road (PA 914)
- I-81 Exit 14 at Wayne Avenue (PA 316)

Survey locations were set up on each ramp at the two interchanges, creating eight survey locations. During the survey, traffic control was set up, including advanced warning signs and traffic cones. Drivers were pulled over at random and interviewed.

#### Number of Surveys Collected

During the OD study, 575 surveys were collected. While most of the selected drivers completed the survey, some drivers did not want to participate, and those surveys did not yield any meaningful data. For other surveys that were still considered usable, there were some instances where drivers did not complete the entire survey. For this reason, when certain data is summarized, the number of surveys may total less than 575. **Table 3.1.1** summarizes the number of surveys collected by location. Utilizing traffic volume data also collected on the day of the survey, the approximate volume of traffic passing by the survey location was determined. This volume was then compared to the number of surveys collected to determine the percentage of traffic surveyed. Considering the collection of 575 usable surveys, approximately 8 percent of the vehicles passing through the survey locations were captured. This percentage is typical of other interview-type OD studies.

**Table 3.1.1 Summary of Surveys Collected**

<b>Location</b>	<b>Surveys Collected</b>	<b>Traffic Volume (During Survey)</b>	<b>Percent Surveyed</b>
I-81 Northbound On Exit 10: Marion AM	21	148	14%
I-81 Northbound On Exit 10: Marion PM	33	156	21%
I-81 Northbound Off Exit 10: Marion AM	20	151	13%
I-81 Northbound Off Exit 10: Marion PM	47	439	11%
I-81 Southbound On Exit 10: Marion AM	11	467	2%
I-81 Southbound On Exit 10: Marion PM	32	243	13%
I-81 Southbound Off Exit 10: Marion AM	19	145	13%
I-81 Southbound Off Exit 10: Marion PM	31	261	12%
I-81 Northbound On Exit 14: Wayne AM	41	730	6%
I-81 Northbound On Exit 14: Wayne PM	53	1010	5%
I-81 Northbound Off Exit 14: Wayne AM	40	334	12%
I-81 Northbound Off Exit 14: Wayne PM	51	495	10%
I-81 Southbound On Exit 14: Wayne AM	36	460	8%
I-81 Southbound On Exit 14: Wayne PM	50	299	17%
I-81 Southbound Off Exit 14: Wayne AM	40	879	5%
I-81 Southbound Off Exit 14: Wayne PM	50	886	6%
<b>Total</b>	<b>575</b>	<b>7103</b>	<b>8.10%</b>

Vehicle Type and Occupancy

Of the vehicles surveyed at all eight locations, 82.6 percent were automobiles, 4.3 percent were medium trucks, and 13.1 percent were heavy trucks. **Table 3.1.2** categorizes the vehicle types by location and time period.

The average automobile occupancy within the study area was 1.27 persons per vehicle, and 438 of the 575 surveys collected (80 percent) were from single occupant vehicles. Less than one percent of vehicles held four or more people. **Table 3.1.3** categorizes the vehicle occupancy by location and time period.

**Table 3.1.2 Vehicle Type**

Location	Car	Medium Truck	Heavy Truck
I-81 Northbound On Exit 10: Marion AM	16	1	4
I-81 Northbound On Exit 10: Marion PM	27	0	6
I-81 Northbound Off Exit 10: Marion AM	12	2	4
I-81 Northbound Off Exit 10: Marion PM	40	3	2
I-81 Southbound On Exit 10: Marion AM	9	0	0
I-81 Southbound On Exit 10: Marion PM	24	2	5
I-81 Southbound Off Exit 10: Marion AM	15	1	3
I-81 Southbound Off Exit 10: Marion PM	29	0	0
I-81 Northbound On Exit 14: Wayne AM	31	3	5
I-81 Northbound On Exit 14: Wayne PM	45	3	5
I-81 Northbound Off Exit 14: Wayne AM	31	1	6
I-81 Northbound Off Exit 14: Wayne PM	38	3	8
I-81 Southbound On Exit 14: Wayne AM	29	2	3
I-81 Southbound On Exit 14: Wayne PM	46	0	4
I-81 Southbound Off Exit 14: Wayne AM	31	1	7
I-81 Southbound Off Exit 14: Wayne PM	37	2	11
<b>Total</b>	<b>460</b>	<b>24</b>	<b>73</b>

**Table 3.1.3 Vehicle Occupancy**

Location	1 person	2 people	3 people	4 people
I-81 Northbound On Exit 10: Marion AM	14	6	1	0
I-81 Northbound On Exit 10: Marion PM	29	2	2	0
I-81 Northbound Off Exit 10: Marion AM	16	3	0	0
I-81 Northbound Off Exit 10: Marion PM	31	10	1	2
I-81 Southbound On Exit 10: Marion AM	5	6	0	0
I-81 Southbound On Exit 10: Marion PM	21	6	4	0
I-81 Southbound Off Exit 10: Marion AM	14	3	2	0
I-81 Southbound Off Exit 10: Marion PM	25	4	2	0
I-81 Northbound On Exit 14: Wayne AM	30	7	1	0
I-81 Northbound On Exit 14: Wayne PM	40	7	3	2
I-81 Northbound Off Exit 14: Wayne AM	29	9	2	0
I-81 Northbound Off Exit 14: Wayne PM	41	8	0	0
I-81 Southbound On Exit 14: Wayne AM	25	7	1	0
I-81 Southbound On Exit 14: Wayne PM	42	5	2	1
I-81 Southbound Off Exit 14: Wayne AM	35	5	0	0
I-81 Southbound Off Exit 14: Wayne PM	41	6	3	0
<b>Total</b>	<b>438</b>	<b>94</b>	<b>24</b>	<b>5</b>

Trip Frequency and Length

**Table 3.1.4** summarizes the trip frequency. About 35 percent of all traffic travels within the study area at least once a day. Approximately 30 percent of traffic makes the same trip less than once a week.

**Table 3.1.4 Trip Frequency**

Location	Once per Day	More than Once per Day	Once per Week	2-3 times per Week	Less than Once per Week
I-81 Northbound On Exit 10: Marion AM	1	4	1	4	11
I-81 Northbound On Exit 10: Marion PM	3	11	7	2	10
I-81 Northbound Off Exit 10: Marion AM	2	6	4	1	5
I-81 Northbound Off Exit 10: Marion PM	3	22	8	1	13
I-81 Southbound On Exit 10: Marion AM	0	4	1	0	6
I-81 Southbound On Exit 10: Marion PM	1	11	8	4	8
I-81 Southbound Off Exit 10: Marion AM	1	5	3	4	5
I-81 Southbound Off Exit 10: Marion PM	0	17	7	2	5
I-81 Northbound On Exit 14: Wayne AM	0	11	12	5	13
I-81 Northbound On Exit 14: Wayne PM	7	23	8	3	11
I-81 Northbound Off Exit 14: Wayne AM	6	13	4	5	11
I-81 Northbound Off Exit 14: Wayne PM	1	23	9	2	17
I-81 Southbound On Exit 14: Wayne AM	1	13	7	2	10
I-81 Southbound On Exit 14: Wayne PM	0	22	6	6	16
I-81 Southbound Off Exit 14: Wayne AM	1	12	11	5	11
I-81 Southbound Off Exit 14: Wayne PM	0	17	4	1	28
<b>Total</b>	27	214	100	47	180

**Table 3.1.5** summarizes the trip length. Overall, approximately 92 percent of trips were longer than 10 minutes and over one-third of trips were longer than 30 minutes. Those trips completed more than once a day are typically less than 30 minutes.

**Table 3.1.5 Travel Length (Minutes)**

Location	Less than 10 Minutes	10-30 Minutes	Greater than 30 Minutes
I-81 Northbound On Exit 10: Marion AM	3	9	9
I-81 Northbound On Exit 10: Marion PM	0	20	11
I-81 Northbound Off Exit 10: Marion AM	2	11	5
I-81 Northbound Off Exit 10: Marion PM	3	24	20
I-81 Southbound On Exit 10: Marion AM	0	6	5
I-81 Southbound On Exit 10: Marion PM	2	20	10
I-81 Southbound Off Exit 10: Marion AM	4	9	6
I-81 Southbound Off Exit 10: Marion PM	1	26	4
I-81 Northbound On Exit 14: Wayne AM	4	26	11
I-81 Northbound On Exit 14: Wayne PM	5	27	20
I-81 Northbound Off Exit 14: Wayne AM	2	21	16
I-81 Northbound Off Exit 14: Wayne PM	3	27	22
I-81 Southbound On Exit 14: Wayne AM	1	22	8
I-81 Southbound On Exit 14: Wayne PM	3	31	16
I-81 Southbound Off Exit 14: Wayne AM	6	11	24
I-81 Southbound Off Exit 14: Wayne PM	9	24	17
<b>Total</b>	<b>48</b>	<b>314</b>	<b>204</b>

#### Alternate Routes and Frequency

Over 29 percent of the drivers interviewed had alternate routes they used in place of the routes they were traveling on during the survey. Drivers interviewed at each location were asked if they ever use the other location as an alternate route. For traffic traveling on I-81 using the Marion Exit 10, about 44 percent named Wayne Avenue as a common alternate route. For traffic traveling on I-81 using the Wayne Exit 14, almost half of the drivers surveyed named Wayne Avenue as a common alternate route. **Table 3.1.6** summarizes the alternate routes. The alternate routes were generally utilized less than once a week. **Table 3.1.7** summarizes the alternate route frequency. Alternate routes were generally used because of traffic issues. Nearly 30 percent of drivers use alternate routes because of traffic issues, while less than 25 percent of drivers use alternate routes when having alternate destinations. **Table 3.1.8** summarizes the reasons that drivers take alternate routes.

Table 3.1.6 Alternate Routes

Location	Use Exit 14	Use Swamp Fox Rd	Use Wayne Ave	Use U.S. 11	Use Others
I-81 Northbound On Exit 10: Marion AM	8	1	4	2	2
I-81 Northbound On Exit 10: Marion PM	11	2	10	6	2
I-81 Northbound Off Exit 10: Marion AM	8	0	2	3	1
I-81 Northbound Off Exit 10: Marion PM	14	3	0	4	0
I-81 Southbound On Exit 10: Marion AM	0	0	0	0	0
I-81 Southbound On Exit 10: Marion PM	4	1	3	2	0
I-81 Southbound Off Exit 10: Marion AM	6	0	0	6	0
I-81 Southbound Off Exit 10: Marion PM	12	3	8	5	4
I-81 Northbound On Exit 14: Wayne AM	9	0	0	0	0
I-81 Northbound On Exit 14: Wayne PM	9	0	0	0	0
I-81 Northbound Off Exit 14: Wayne AM	20	3	0	13	4
I-81 Northbound Off Exit 14: Wayne PM	25	6	2	12	4
I-81 Southbound On Exit 14: Wayne AM	22	3	1	14	3
I-81 Southbound On Exit 14: Wayne PM	13	0	1	6	0
I-81 Southbound Off Exit 14: Wayne AM	3	2	1	3	0
I-81 Southbound Off Exit 14: Wayne PM	6	1	3	5	0
<b>Total</b>	170	25	35	81	20

Table 3.1.7 Alternate Route Frequency

Location	Once per Day	More than Once per Day	Once per Week	2-3 times per Week	Less than Once per Week
I-81 Northbound On Exit 10: Marion AM	0	1	0	0	0
I-81 Northbound On Exit 10: Marion PM	0	0	1	1	2
I-81 Northbound Off Exit 10: Marion AM	0	1	0	1	0
I-81 Northbound Off Exit 10: Marion PM	1	1	7	2	3
I-81 Southbound On Exit 10: Marion AM	0	0	0	0	0
I-81 Southbound On Exit 10: Marion PM	0	0	1	0	3
I-81 Southbound Off Exit 10: Marion AM	0	0	1	3	2
I-81 Southbound Off Exit 10: Marion PM	0	0	2	6	4
I-81 Northbound On Exit 14: Wayne AM	0	1	0	1	6
I-81 Northbound On Exit 14: Wayne PM	0	1	0	0	1
I-81 Northbound Off Exit 14: Wayne AM	0	2	5	2	9
I-81 Northbound Off Exit 14: Wayne PM	0	3	10	1	4
I-81 Southbound On Exit 14: Wayne AM	0	3	5	0	7
I-81 Southbound On Exit 14: Wayne PM	0	0	2	5	2
I-81 Southbound Off Exit 14: Wayne AM	0	0	1	2	0
I-81 Southbound Off Exit 14: Wayne PM	0	0	0	0	3
<b>Total</b>	1	13	35	24	46



**Table 3.1.8 Reason for taking Alternate Route**

Location	Shop	Traffic Issues	Work/ Bus.	Alt. Dest.	Shorter Faster	Other
I-81 Northbound On Exit 10: Marion AM	0	2	1	1	0	1
I-81 Northbound On Exit 10: Marion PM	0	1	3	3	2	1
I-81 Northbound Off Exit 10: Marion AM	0	2	0	1	1	1
I-81 Northbound Off Exit 10: Marion PM	2	1	3	1	1	3
I-81 Southbound On Exit 10: Marion AM	0	0	0	0	0	0
I-81 Southbound On Exit 10: Marion PM	1	2	0	0	0	0
I-81 Southbound Off Exit 10: Marion AM	1	1	0	1	0	2
I-81 Southbound Off Exit 10: Marion PM	6	4	1	0	0	1
I-81 Northbound On Exit 14: Wayne AM	0	0	1	5	2	0
I-81 Northbound On Exit 14: Wayne PM	0	0	0	7	1	0
I-81 Northbound Off Exit 14: Wayne AM	0	10	0	0	0	7
I-81 Northbound Off Exit 14: Wayne PM	1	11	0	7	0	2
I-81 Southbound On Exit 14: Wayne AM	1	4	1	2	8	4
I-81 Southbound On Exit 14: Wayne PM	0	3	0	4	1	3
I-81 Southbound Off Exit 14: Wayne AM	0	0	2	1	0	0
I-81 Southbound Off Exit 14: Wayne PM	2	0	2	1	0	0
<b>Total</b>	14	41	14	34	16	25

Trip Purpose – Trip Origins and Destinations

A significant amount of trips taken through the survey area on a weekday are between home and work. During the AM survey period, 56 percent of drivers reported that their destination was "work". 65 percent of drivers in the PM survey period started their trips at work and 48 percent of them were driving home. I-81 Off Exit 10: Marion Interchange has the most significant amount of work-related trips, with 68.4 percent of AM trips destined for work. I-81 On Exit 14: Wayne Avenue Interchange has the most significant amount of PM work-related trips with 77 percent of PM trips originating at work. Recreational, shopping, and other trips are also a significant source of traffic accounting for about 18 percent of the total trips surveyed. **Table 3.1.9** summarizes the origin of the trips and **Table 3.1.10** summarizes the destinations of the trips.

**Table 3.1.9 Trip Origin**

<b>Location</b>	<b>Home</b>	<b>Work</b>	<b>Other</b>
I-81 Northbound On Exit 10: Marion AM	13	2	6
I-81 Northbound On Exit 10: Marion PM	8	20	6
I-81 Northbound Off Exit 10: Marion AM	8	7	4
I-81 Northbound Off Exit 10: Marion PM	2	22	5
I-81 Southbound On Exit 10: Marion AM	7	1	4
I-81 Southbound On Exit 10: Marion PM	10	16	4
I-81 Southbound Off Exit 10: Marion AM	4	10	5
I-81 Southbound Off Exit 10: Marion PM	6	15	9
I-81 Northbound On Exit 14: Wayne AM	22	13	4
I-81 Northbound On Exit 14: Wayne PM	4	40	6
I-81 Northbound Off Exit 14: Wayne AM	17	16	6
I-81 Northbound Off Exit 14: Wayne PM	5	38	5
I-81 Southbound On Exit 14: Wayne AM	14	10	9
I-81 Southbound On Exit 14: Wayne PM	13	26	11
I-81 Southbound Off Exit 14: Wayne AM	21	9	6
I-81 Southbound Off Exit 14: Wayne PM	12	31	6
<b>Total</b>	166	276	96

**Table 3.1.10 Trip Destination**

<b>Location</b>	<b>Home</b>	<b>Work</b>	<b>Other</b>
I-81 Northbound On Exit 10: Marion AM	0	11	10
I-81 Northbound On Exit 10: Marion PM	14	11	7
I-81 Northbound Off Exit 10: Marion AM	2	11	5
I-81 Northbound Off Exit 10: Marion PM	21	5	4
I-81 Southbound On Exit 10: Marion AM	0	4	7
I-81 Southbound On Exit 10: Marion PM	9	12	9
I-81 Southbound Off Exit 10: Marion AM	7	11	1
I-81 Southbound Off Exit 10: Marion PM	21	6	4
I-81 Northbound On Exit 14: Wayne AM	4	19	13
I-81 Northbound On Exit 14: Wayne PM	29	9	6
I-81 Northbound Off Exit 14: Wayne AM	7	25	8
I-81 Northbound Off Exit 14: Wayne PM	23	20	8
I-81 Southbound On Exit 14: Wayne AM	10	16	8
I-81 Southbound On Exit 14: Wayne PM	25	17	8
I-81 Southbound Off Exit 14: Wayne AM	8	25	6
I-81 Southbound Off Exit 14: Wayne PM	11	27	13
<b>Total</b>	191	229	117

Trip Origins and Destinations by Zip Code

The majority of vehicle origins and destinations for both Exit 10 and Exit 14 come from Chambersburg, which comprises zip codes 17201 and 17202. Nearly 50 percent of origin zip codes for Exit 10 are from Chambersburg and about 40 percent of the destination zip codes for Exit 10 are from Chambersburg. Approximately 46 percent of origin zip codes for Exit 14 are from Chambersburg and nearly 60 percent of the destination zip codes for Exit 14 are from Chambersburg. A small percentage of drivers with Chambersburg destinations travel southbound on I-81 past Exit 14 to use Exit 10, and similarly, a small percentage travel northbound on I-81 past Exit 10 to use Exit 14. These people are the ones who are likely to benefit most from a new interchange. Of the other zip codes used often, vehicles must travel multiple roads to get to these exits. **Table 3.1.11** summarizes the zip code origins of the trips from Exit 10, **Table 3.1.12** summarizes the zip codes destinations from Exit 10. **Table 3.1.13** summarizes the zip code origins of the trips from Exit 14, and **Table 3.1.14** summarizes the zip code destinations from Exit 14.

**Table 3.1.11 - Exit 10 Trip Origin by Zip Code**

Zip Code	City	State	Percentage
17201	Chambersburg	PA	34.2%
17202	Chambersburg	PA	13.2%
17222	Fayetteville	PA	2.4%
17225	Greencastle	PA	13.7%
17235	Marion	PA	2.9%
17257	Shippensburg	PA	4.9%
21740	Hagerstown	MD	10.7%
Other			18%

**Table 3.1.12 - Exit 10 Trip Destination by Zip Code**

Zip Code	City	State	Percentage
17201	Chambersburg	PA	25.6%
17202	Chambersburg	PA	15.3%
17225	Greencastle	PA	16.8%
17235	Marion	PA	5.4%
17257	Shippensburg	PA	3.5%
17268	Fox Hill	PA	2.5%
21740	Hagerstown	MD	13.8%
Other			17.1%

**Table 3.1.13 - Exit 14 Trip Origin by Zip Code**

Zip Code	City	State	Percentage
17201	Chambersburg	PA	34.7%
17202	Chambersburg	PA	10.9%
17222	Fayetteville	PA	2.9%
17225	Greencastle	PA	8.9%
17235	Marion	PA	10.0%
17257	Shippensburg	PA	3.4 %
21740	Hagerstown	MD	7.5%
Other			21.7%

**Table 3.1.14 - Exit 14 Trip Destination by Zip Code**

Zip Code	City	State	Percentage
17201	Chambersburg	PA	41.8%
17202	Chambersburg	PA	17.4%
17222	Fayetteville	PA	2.0%
17225	Greencastle	PA	4.8%
17257	Shippensburg	PA	4.8%
17268	Fox Hill	PA	12.2%
21201	Baltimore	MD	3.4%
Other			13.6%

### 3.2 Existing Traffic Volumes

Within the study area a total of 22 intersections were analyzed. In order to evaluate these study area intersections, manual turning movement counts were conducted by McCormick Taylor during the months of November and December 2007 from 8 AM to 9 AM and 5 PM to 6 PM to capture typical weekday traffic conditions. **Figure 3.2.1** shows the locations of the intersections where traffic volumes were counted. Traffic was observed during the heaviest volume conditions for the morning and evening time periods. This data was utilized to determine the existing weekday AM and PM peak hour turning movement volumes necessary for analysis purposes. The manual turning movement count traffic data can be found in **Appendix B** (contained on CD at the back of this report).

McCormick Taylor also collected directional vehicular classification volumes via Automatic Traffic Recorder (ATR) counts at several locations that were determined to be important to assess potential impacts. The locations included the I-81 ramps at the Marion Interchange, Swamp Fox Road east and west of the Marion Interchange, Overcash Road, Lighthouse Road, Guilford Spring Road, Bowman Road, Kriner Road, U.S. 11 south of Orchard Drive, U.S. 11 south of Social Island Road, the I-81 ramps at the Wayne Avenue Interchange, and Wayne Avenue east and west of the Wayne Avenue Interchange.

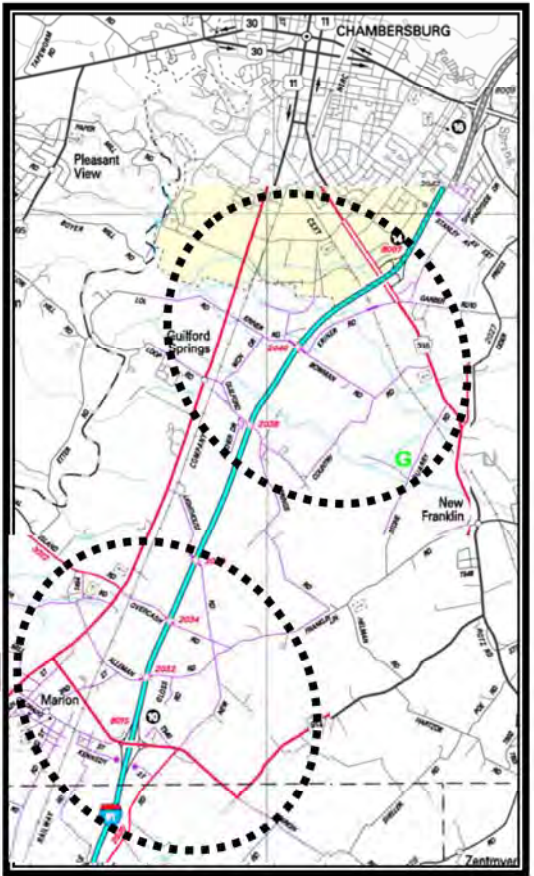
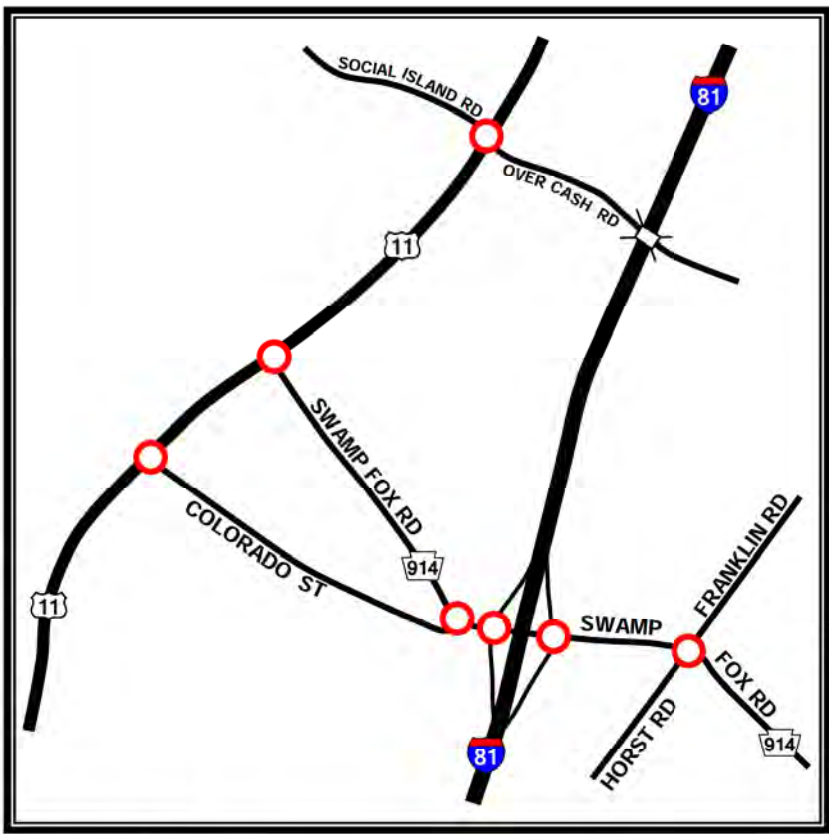
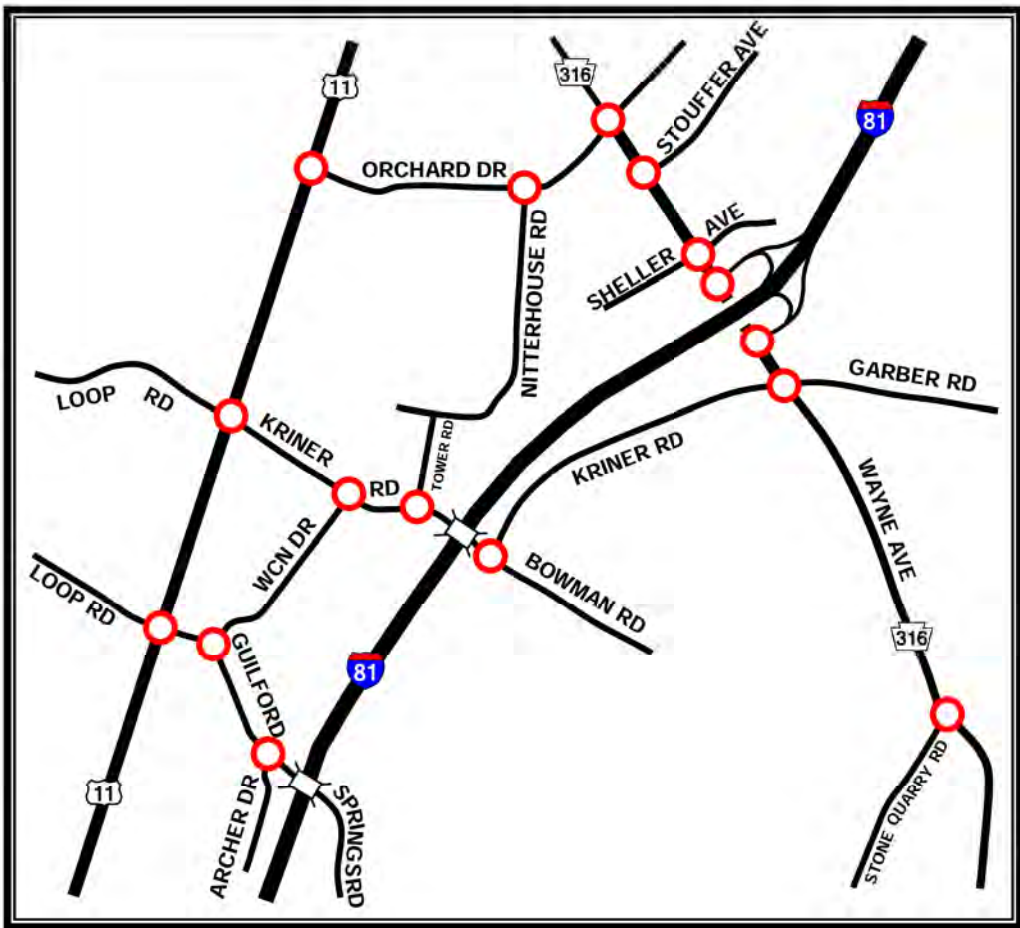
The ATR counts were conducted from Tuesday, November 27, 2007 through Thursday, November 29, 2007. The ATR data was used to establish the existing Average Annual Daily Traffic (AADT) volumes along these routes using yearly adjustment factors from the *2006 Pennsylvania Traffic Data Report*. The ATR data used to calculate the AADT volumes can be found in **Appendix C** (contained on CD at the back of this report).

The 2007 AADT volumes are presented in **Figure 3.2.2** and **Figure 3.2.3**. The 2007 Existing Conditions AM and PM peak hour volumes for all vehicles, along with truck volumes by movement for the AM and PM peak hours, are presented in **Figure 3.2.4**, **Figure 3.2.5**, **Figure 3.2.6**, and **Figure 3.2.7** respectively.

Highway capacity analysis utilizing the methodologies from the Highway Capacity Manual (HCM) 2000, was completed for all the study area intersection for both the AM and the PM peak hours. **Table 3.2.1** summarizes the delay and resulting Level-of-Service (LOS) results from the capacity analysis. Highway Capacity Manual reports from the analysis for the study area intersections are included in **Appendix D** (contained on CD at the back of this report).

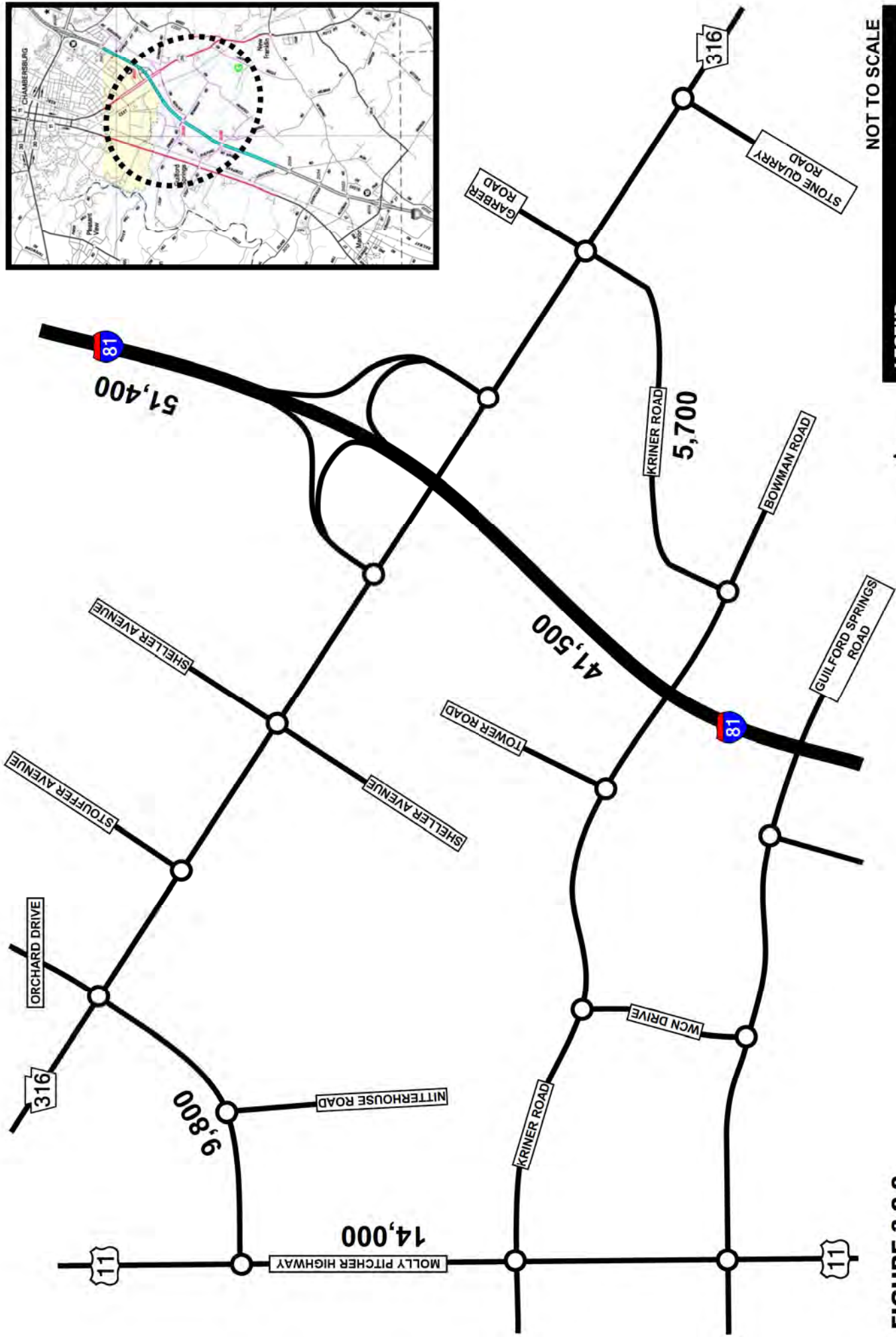
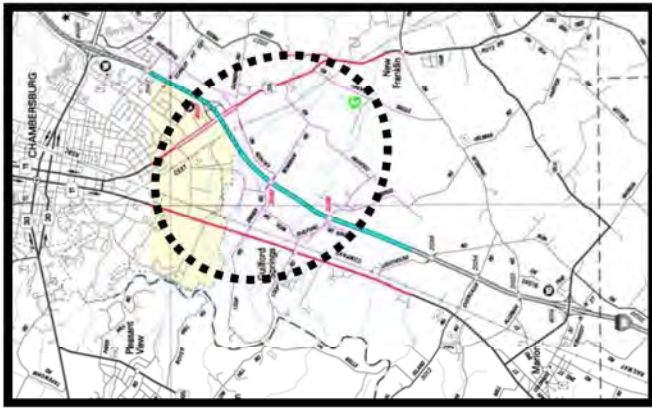
### 3.3 Safety Conditions

In order to assess the study area roadways and intersections for potential safety issues, a review of the most recent five years of crash data was performed. PennDOT supplied the crash data for the years 2002-2006 which included reportable crashes along U.S. 11 (Molly Pitcher Highway), Wayne Avenue (PA 316), Swamp Fox Road (PA 914), and for the I-81 interchanges at Exit 10 (Swamp Fox Road) and Exit 14 (Wayne Avenue). McCormick Taylor reviewed the crash history to determine if any safety issues might be identified by crash causes that could potentially be mitigated through site improvements. The following sections summarize the crash data for the subject roadways reviewed. The crash data reports were supplied by PennDOT and detailed analysis worksheets for the subject roadways were developed.



**FIGURE 3.2.1.**  
**Study Area Intersections**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania



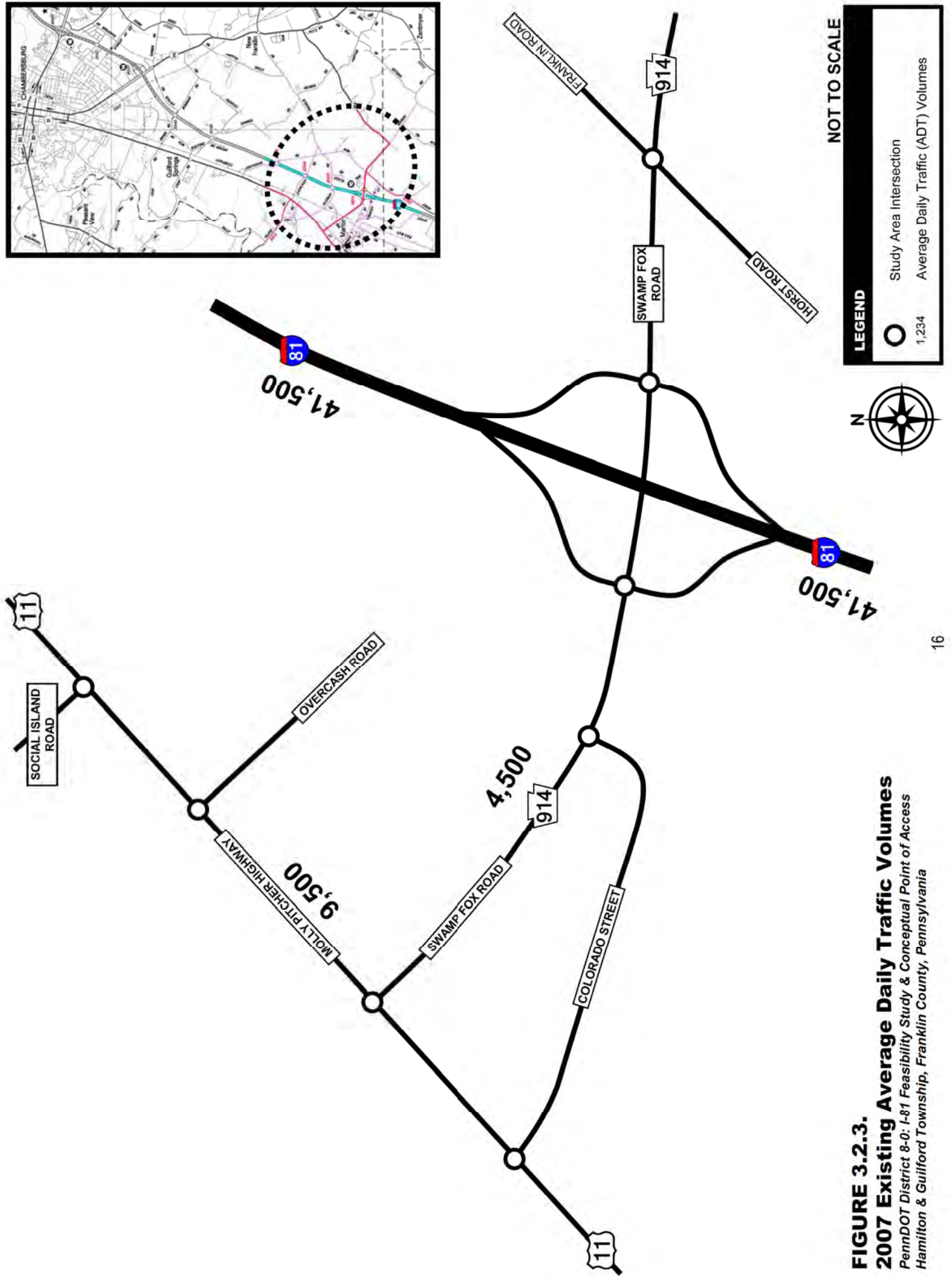


NOT TO SCALE

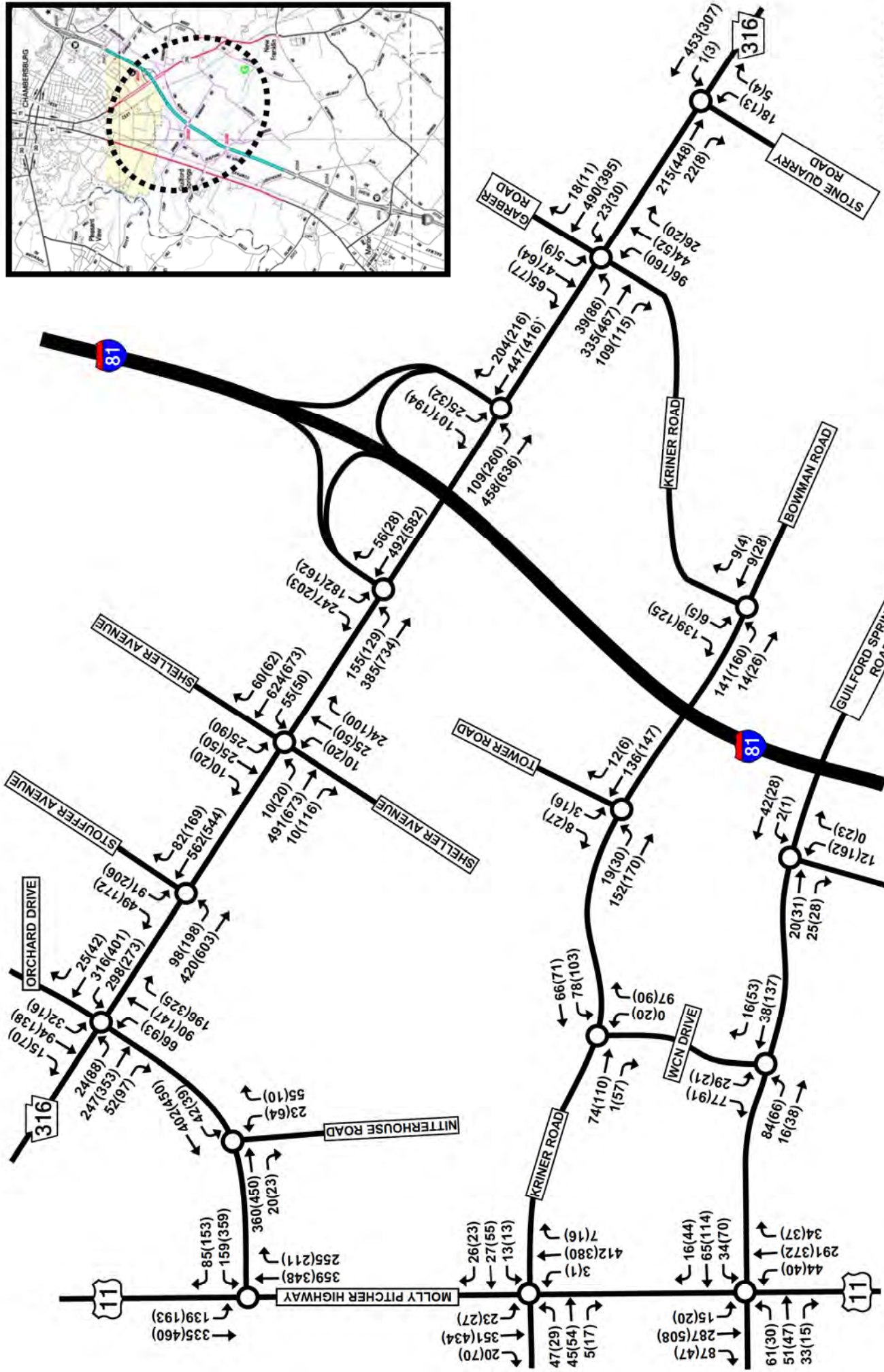
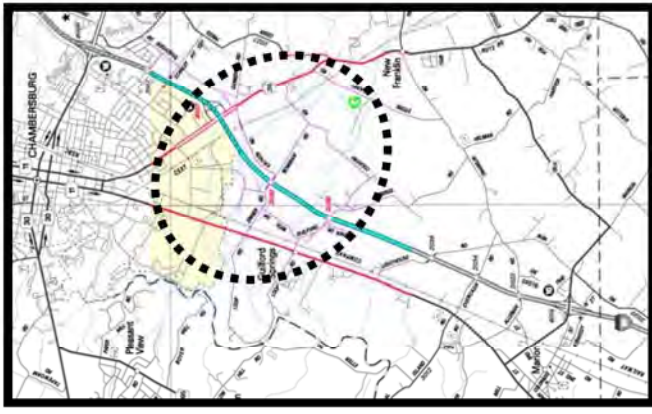


- LEGEND**
- Study Area Intersection
  - 1,234 Average Daily Traffic (ADT) Volumes

**FIGURE 3.2.2.**  
**2007 Existing Average Daily Traffic Volumes**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania



**FIGURE 3.2.3.**  
**2007 Existing Average Daily Traffic Volumes**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania



NOT TO SCALE

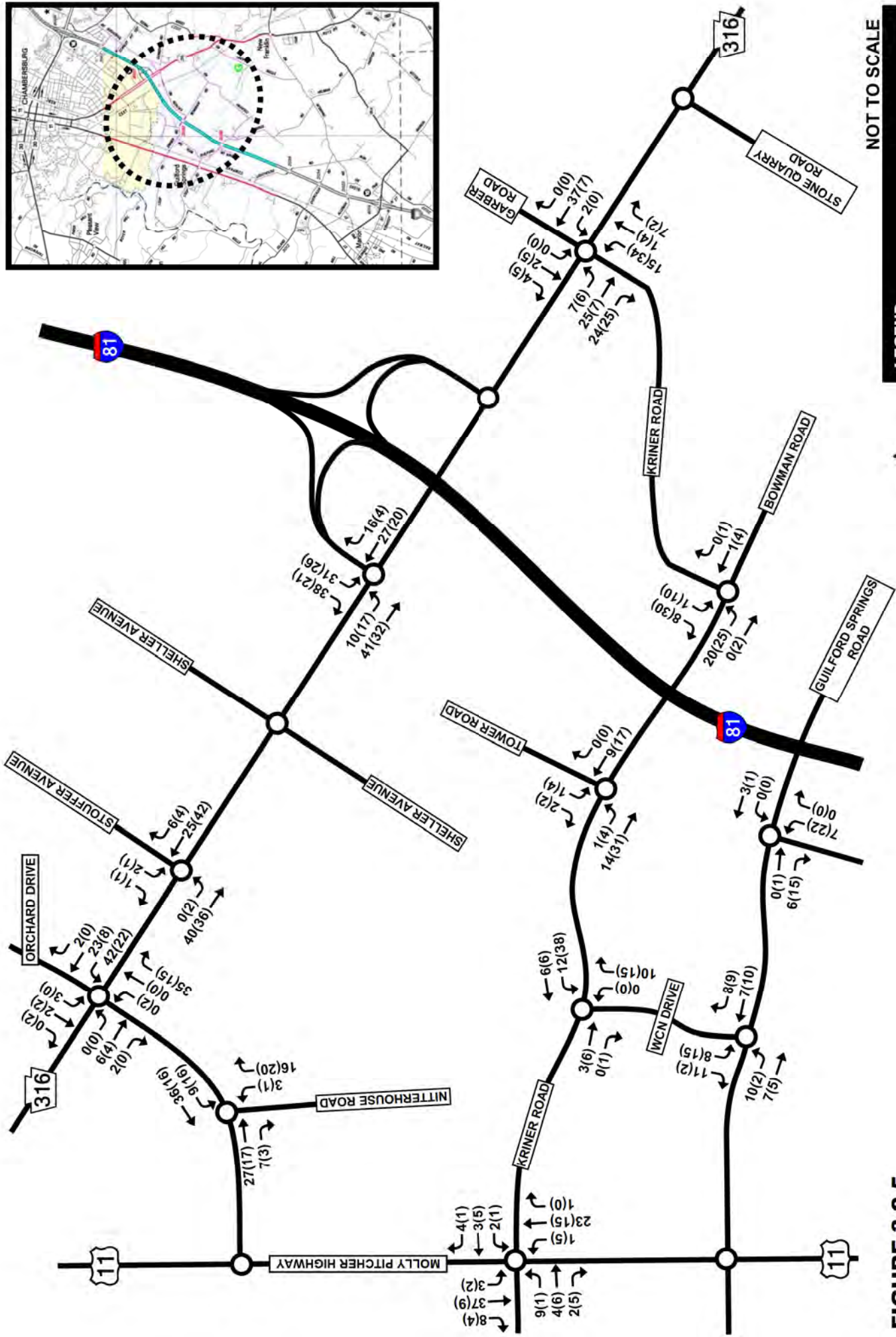
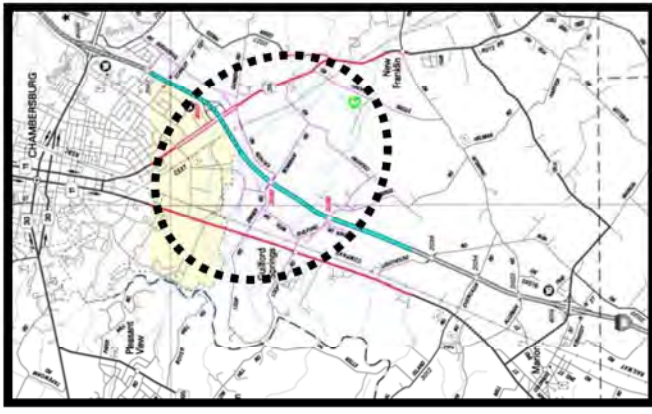


**LEGEND**

- Study Area Intersection
- ↔ AM (PM) Turning Movement Traffic Volume

**FIGURE 3.2.4.**  
**2007 Existing Peak Hour Traffic Volumes**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania





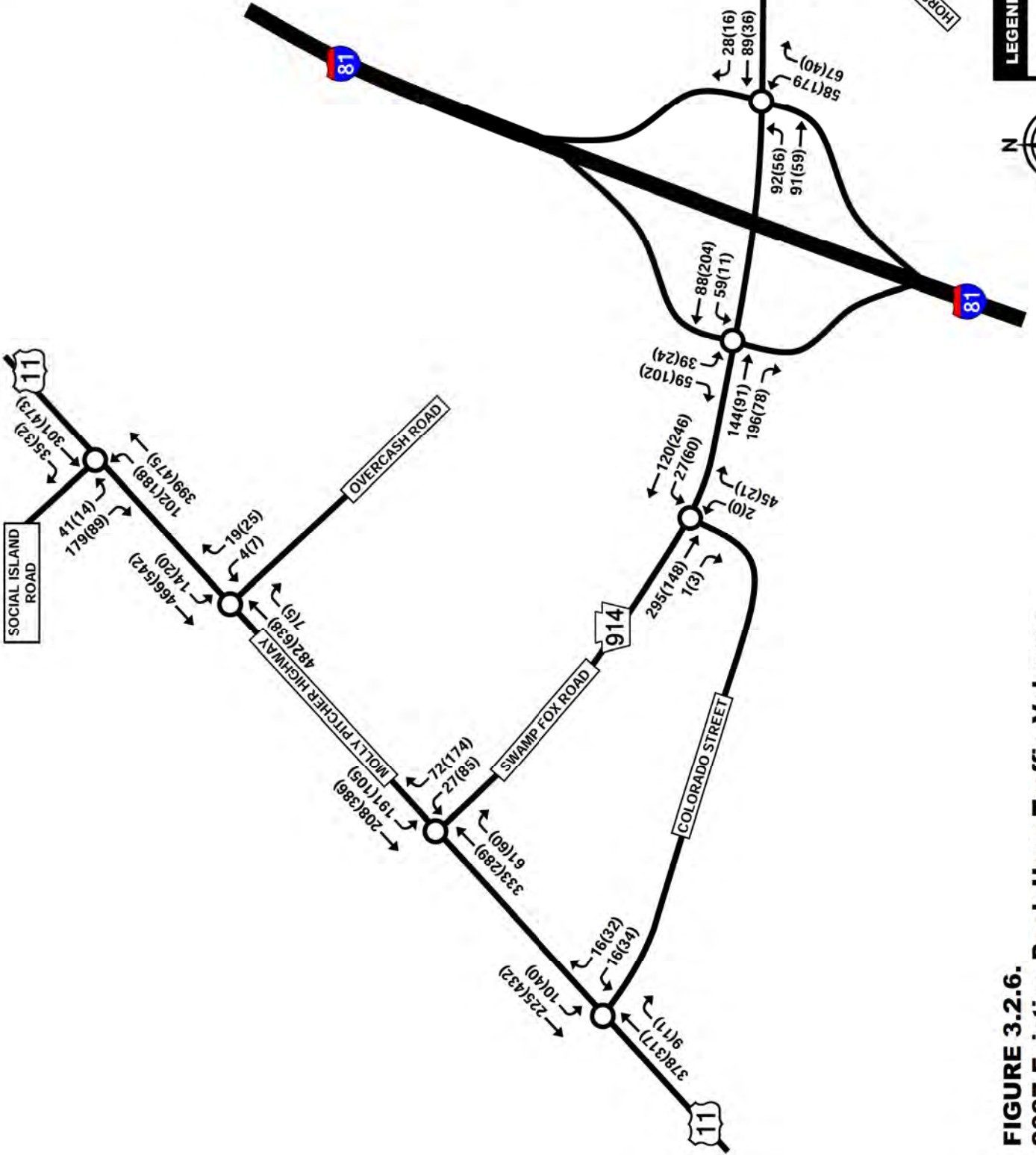
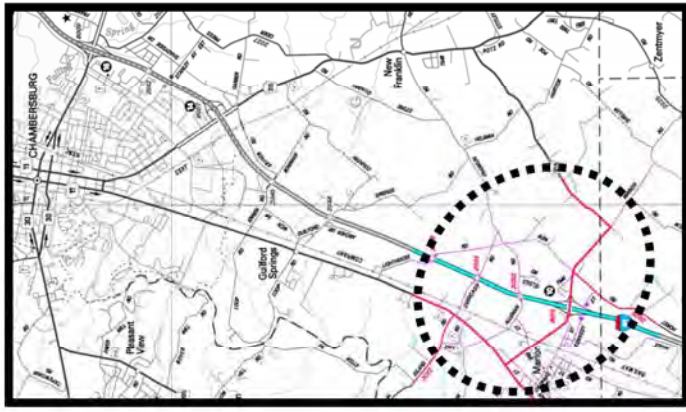
**NOT TO SCALE**

**LEGEND**

- Study Area Intersection
- ↔ AM (PM) Turning Movement Traffic Volume



**FIGURE 3.2.5.**  
**2007 Existing Peak Hour Truck Volumes**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania

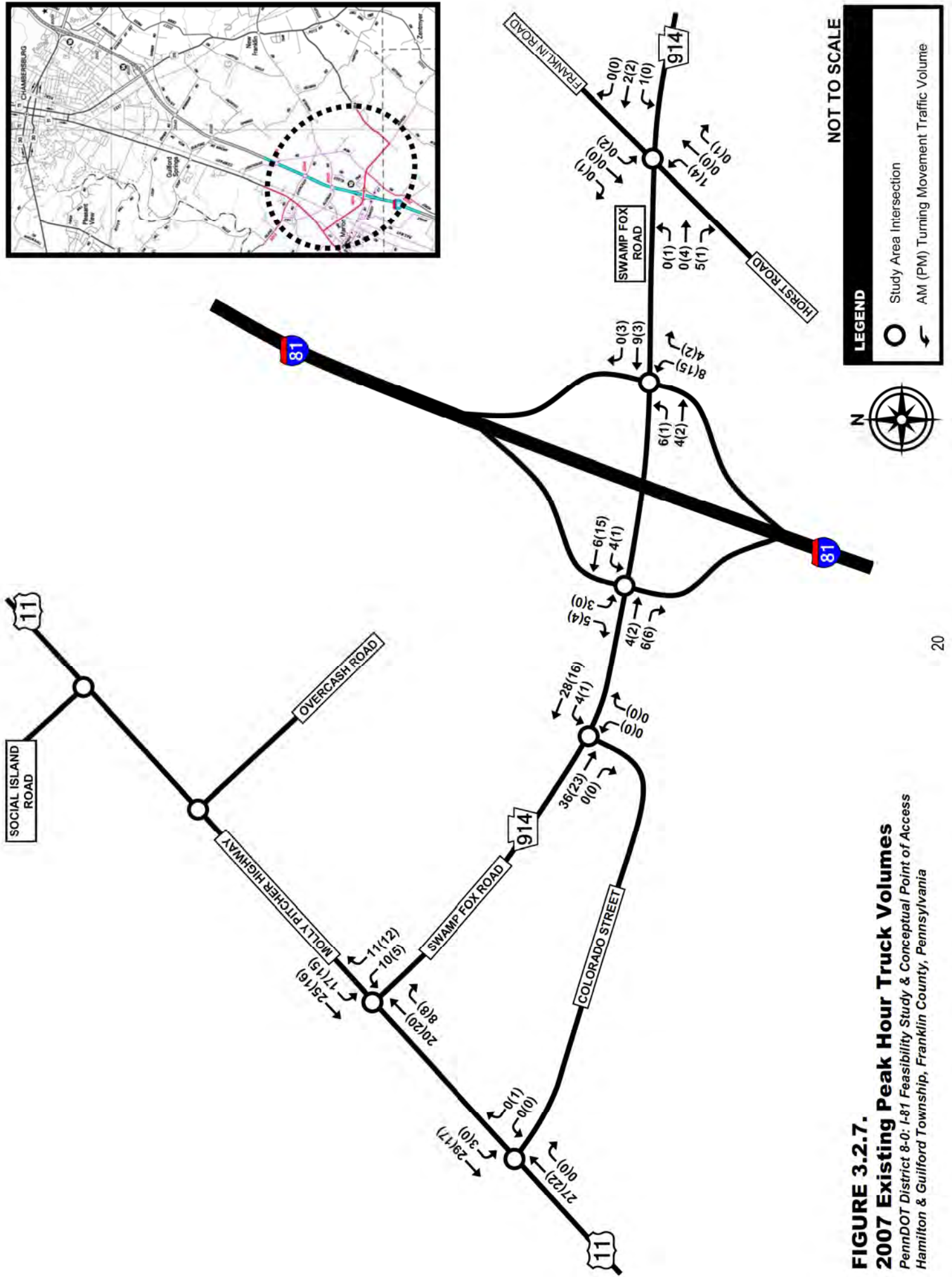
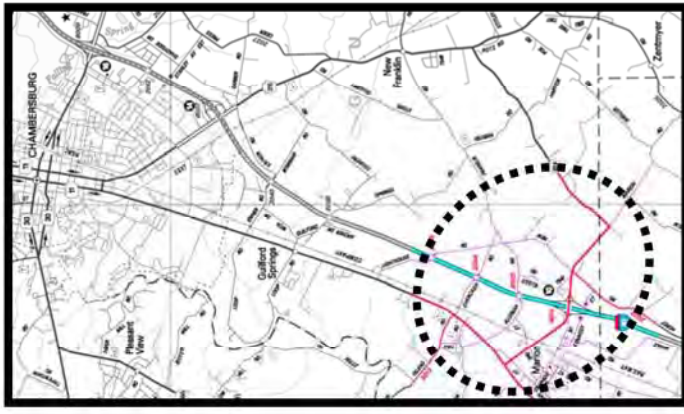


NOT TO SCALE



- LEGEND**
- Study Area Intersection
  - ↔ AM (PM) Turning Movement Traffic Volume

**FIGURE 3.2.6.**  
**2007 Existing Peak Hour Traffic Volumes**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania



NOT TO SCALE

**LEGEND**

- Study Area Intersection
- ↔ AM (PM) Turning Movement Traffic Volume



**FIGURE 3.2.7.**  
**2007 Existing Peak Hour Truck Volumes**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania

**Table 3.2.1 – 2007 Existing Conditions Delay & LOS**

Intersection	Type	Movement	AM		PM	
			Delay	LOS	Delay	LOS
US 11 & Colorado Street	Unsignalized	WB	13.4	b	17.5	c
		SB-Left	0.5	a	1.2	a
Swamp Fox Road & Franklin Road/Horst Road	Unsignalized	EB-Left	1.3	a	2.4	a
		WB-Left	0.9	a	0.8	a
		NB	9.7	a	10.0	a
		SB	9.0	a	9.6	a
Swamp Fox Road & I-81 NB Ramp	Unsignalized	EB-Left	4.1	a	3.8	a
		NB	12.5	b	14.1	b
Swamp Fox Road & I-81 SB Ramp	Unsignalized	WB-Left	3.7	a	0.5	a
		SB	12.0	b	11.1	b
Swamp Fox Road & Colorado Street	Unsignalized	WB-Left	1.8	a	2.1	a
		NB	10.6	b	9.3	a
US 11& Overcash Road	Unsignalized	WB	13.7	b	18.8	c
		SB-Left	0.4	a	0.7	a
Swamp Fox Road & US 11	Unsignalized	WB	22.3	c	34.0	d
		SB-Left	9.5	a	8.5	a
US 11 & Social Island Road	Unsignalized	EB	21.9	c	20.3	c
		NB-Left	8.3	a	9.5	a
Loop Road & US 11	Signalized	Overall	15.0	B	15.6	B
Guilford Springs Road & WCN Drive	Unsignalized	EB	8.6	a	9.0	a
		WB	8.0	a	9.7	a
		SB	8.3	a	9.0	a
Kriner Road & US 11	Unsignalized	EB	64.7	f	55.2	f
		WB	28.0	d	37.6	e
		NB-Left	0.1	a	0.0	a
		SB-Left	0.8	a	0.8	a
Kriner Road & WCN Drive	Unsignalized	WB-Left	4.4	a	5.3	a
		NB	9.5	a	11.6	b
Orchard Drive & US 11	Signalized	Overall	15.4	B	22.8	C
Orchard Drive & Nitterhouse Drive	Unsignalized	WB-Left	8.3	a	8.7	a
		NB	13.3	b	28.4	d
Guilford Springs Road & Archer Drive	Unsignalized	EB	7.3	a	8.0	a
		WB	7.4	a	7.9	a
		NB	8.4	a	10.4	b
Kriner Road & Tower Road	Unsignalized	EB-Left	1.0	a	1.4	a
		SB	10.1	b	11.0	b
Bowman Road & Kriner Road	Unsignalized	SB	8.9	a	9.2	a
Orchard Drive & Wayne Avenue	Signalized	Overall	15.8	B	20.0	C
Stouffer Road & Wayne Avenue	Signalized	Overall	6.9	A	14.3	B
Sheller Avenue & Wayne Avenue	Signalized	Overall	5.1	A	8.9	A
I-81 SB Ramp & Wayne Avenue	Signalized	Overall	15.4	B	11.6	B
I-81 NB Ramp & Wayne Avenue	Signalized	Overall	5.7	A	12.8	B
Kriner Road & Wayne Avenue	Signalized	Overall	13.5	B	19.5	B
Stone Quarry Road & Wayne Avenue	Unsignalized	EB	10.6	b	10.7	b
		NB	15.2	c	11.7	b
		SB	10.2	b	16.4	c

#### Crash Summary for U.S. 11 (Molly Pitcher Highway)

Crash data for U.S. 11, Segment 0210 through Segment 0300, in Franklin County was reviewed for this study. Most of the segments demonstrated five or more mid-block crashes during the study period, yielding at least one crash per year per segment on average. A total of 79 crashes were reported during the five year period between 2002 and 2006.

#### Crash Summary for PA 316 (Wayne Avenue)

Crash data was reviewed for PA 316, Segment 0290 through Segment 0360. A total of 85 crashes were reported along these sections of PA 316 during the past five years. The number of crashes per year average to a range between 18 – 24. The main collision types and driver actions are typical of crashes at intersections. 50% of the crashes involved angle collisions, and the top two causes are listed as improper or careless turns and running a red light.

#### Crash Summary for PA 914 (Swamp Fox Road) & I-81 Access Ramps for Exit #10

Crash data was reviewed for PA 914, Segment 0010 to Segment 0040. A total of 23 crashes were reported along these four segments of Swamp Fox Road. A majority of these crashes occurred at specific intersection locations. Three crashes were recorded on SR-8015 segments (the I-81 access ramps).

The crash data from these study area corridors was reviewed to identify high crash locations that could be addressed by mitigation. The locations identified are as follows:

1. U.S. 11 and Guilford Springs Road / Loop Road intersection (Segment 0280 offset 476 and 532). 14 of the 20 crashes for this segment from 2002-2006, resulting in approximately 2.8 crashes per year for this intersection during the study period. This area is of specific concern given the substantial predicted traffic volume increase due to future build rates and the possible increase in crash rates as a result. The most notable increases are the Northbound and Southbound Route 11 traffic volume increase, the Westbound Guilford Springs Road left turn traffic volume, and the Route 11 Northbound right turn traffic volume increase.
2. PA 316 (Wayne Avenue) and Orchard Drive intersection (Segment 0340) with 14 crashes from 2002-2006. Resulting in approximately 2.8 crashes per year for this intersection during the study period. It should be noted that given the significantly lower number of crashes at this intersection in 2004, the actual rate per year could be higher – closer to 3.0 or 3.2 crashes per year. Substantial increases in traffic volumes are predicted here as well, with the Eastbound and Westbound Wayne Avenue through traffic volumes, the Westbound Wayne Avenue left turning traffic volume, and the Northbound Orchard Drive right turn traffic volume, along with the increase in heavy truck volume, are of most interest.
3. PA 316 intersection with I-81 Northbound access ramps / SR 8007 (PA 316 Segment 0320, offsets 528, 620 & 641) with 11 crashes from 2002-2006, resulting in 2.2 crashes per year for this intersection during the study period. The projected increases in PA 316 traffic volumes (especially in the PM peak hour) for the Eastbound and Westbound through traffic movements and the Eastbound left turn traffic movement to the I-81 Northbound access ramp cause concern for the increase the rate of crashes.
4. U.S. 11 and Kriner Road / Loop Road intersection (Segment 0290 offset 969 and 998) with 9 crashes from 2002-2006. Resulting in approximately 1.8 crashes per year for this intersection during the study period. Here again, we see significant increases in the predicted traffic volumes for the Northbound and Southbound Route 11 traffic which could lead to an increase in the crash rate.
5. PA 316 (Wayne Avenue) and Sheller Avenue intersection (Segment 0340) with 8 crashes or 1.6 crashes per year during the 2002-2006 study period. Increases in the PM traffic volumes for the Eastbound and Westbound through movements on PA 316 could significantly increase the frequency of crashes.
6. The U.S. 11 & PA 914 (Swamp Fox Road) intersection (Segment 0210), recorded 7 crashes during the study period or 1.4 crashes per year. The predicted ADT increases for both of these roads causes reason for concern, especially given the projected increases in heavy truck volume.

**Table 3.3.1** summarizes the high crash locations in the study area. These locations were used to help identify existing deficiencies (discussed in the following section) and to determine where appropriate mitigation measures would be warranted.

**Table 3.3.1 – High Crash Locations in the Study Area**

Route	Segments	Crash Locations: Intersection Type or Mid-block	Details
I- 81	0140 & 0141	Mid-block and Ramps	I-81 At Wayne Avenue interchange (Exit #14), 6.6 crashes per year (33 total) for combined Northbound and Southbound traffic and 1.0 crashes per year (5 total) on access ramps SR-8007. One Fatality on I-81 segment 0140, another fatality on SR-8007 segment 0750.
	0094 & 0095	Mid-block and Ramps	I-81 At Swamp Fox Road Interchange (Exit #10). 3.4 crashes per year (17 total) for combined Northbound and Southbound traffic. 3 crashes total on SR-8015. No fatalities.
	0134 & 0135	Mid-block	3 crashes per year (15 total) for combined Northbound and Southbound traffic. One fatality on segment 0135, and one major injury for segment 0134 – All other crashes were property damage only.
	0090 & 0091	Midblock	2.2 crashes per year (11 total) for combined traffic Northbound and Southbound.
U.S. 11	0280	4-way Intersection, Midblock, & T-Intersection	4 crashes per year (20 total), 2.8 per year at Guilford Springs Road intersection. 1 Fatality at Guilford Springs intersection.
	0210	Mid-block, 4-way, & T-Intersection	2.8 crashes per year (14 total), 1.2 per year midblock, and 1 per year at the Colorado Street intersection. One midblock fatality.
	0290	4-way Intersection, Midblock	2.6 crashes per year (13 total), 1.8 per year at Kriner Road / Loop Road intersection. No fatalities.
	0220	T – Intersection, Midblock	2.2 crashes per year (11 total), 1.4 per year at Swamp Fox Road intersection. One fatality at Swamp Fox Road intersection.
	0240	4-way, Mid-block, & T-Intersection	2.2 crashes per year (11 total), 1.0 per year (5 total) at Overcash Road intersection. One midblock fatality.
	0300	T-Intersection & Mid-block	2.0 crashes per year (10 total), 1.0 per year (5 total) midblock crashes, 3 total at the Orchard Drive intersection. No fatalities.
	Note - Numerous segments have 6 midblock crashes for 2002-2005. These include: 0200, 0210, 0250, 0270		
PA 914	0010	T-Intersection & Mid-block	1.8 crashes per year (9 total), 1.4 per year at intersection with SR-11. One fatality at U.S. 11 Intersection.
	0020	T-Intersection & Mid-block	1.4 per year (7 crashes total), 0.6 per year at Colorado Street intersection. One fatality at railroad crossing.
	0040	4-way Intersection	1 crashes per year (5 total) – all at New Franklin Road intersection. No fatalities.
PA 316	0340	4-way Intersection & Midblock	4.6 crashes per year (23 total), 2.8 crashes per year at Orchard Drive intersection. One fatality at Orchard Drive intersection.
	0320	T – Intersection, Midblock, & 4-way	I-81 at Wayne Avenue interchange, 4 crashes per year (20 total), 3 per year occur at intersections with the I-81 access ramps – 2.2 per year at the I-81 Northbound ramp intersection. No fatalities.
	0310	Mid-block, 4-way, & T-Intersection	3.6 crashes per year (18 total) 1.8 midblock crashes per year, 1.4 crashes per year at Kriner Road intersection. No fatalities.
	0330	4-way, Mid-block, & T	2.6 crashes per year (13 total), 1.6 per year at the Sheller Avenue intersection. One pedestrian fatality at the Sheller Avenue intersection. No fatalities.
	0350	Mid-block & 4-way	2.2 crashes per year (11 total), 1.6 at midblock locations. No fatalities.

### 3.4 Existing Deficiencies

The analysis of the crash data from the previous section was used to help identify locations with a high number of crashes. This was the first step in identifying any existing deficiencies within the study area boundaries. Additional deficiencies were identified by developing roadway criteria based upon PennDOT and AASHTO roadway design standards and comparing that criterion to existing conditions. Locations where the existing conditions deviated significantly from the desirable conditions were also flagged as existing deficiencies.

**Appendix E** (contained on CD at the back of this report) lists the design criteria used to evaluate the existing I-81 interchanges and the local roadways and intersections within the study area. A map of the study area showing the locations of the existing deficiencies is also provided in the appendix. Also included are field photographs showing the deficiencies identified by the map.

In summary, the following list provides an overview of existing deficiencies within the study area:

- Seven locations along U.S. 11 were identified as having insufficient pavement width compared to the desirable design criteria.
- Additional pavement width deficiencies were identified along Colorado Street, Swamp Fox Road, and Guilford Springs Road.
- There were twelve identified at-grade railroad crossings; Orchard Drive (CSX and Norfolk Southern), Kriner Road, Guilford Springs Road, Lighthouse Road, Overcash Road, Alleman Road, Third Street, Swamp Fox Road, Colorado Street, U.S. 11, and Stone Quarry Road.
- Kriner Road was identified as having horizontal design deficiencies.
- The I-81 acceleration and deceleration lanes at Exit #14 for Wayne Avenue are deficient in lane length. (Both are being addressed by current projects.)
- The I-81 acceleration and deceleration lanes at Exit #10 for Swamp Fox Road were also identified as being deficient in lane length.

## 4.0 Environmental Features

Identification of the environmental features within the study area was primarily based on a review of existing literature and environmental data. However, field verification was performed for some features. The focus of the investigation was on the environmental features that have regulatory significance under state or federal laws. These features would include wetlands, threatened and endangered species, historic resources and agricultural land. These features have been identified on the Environmental Features mapping (**Figure 4.1**), along with other existing natural, cultural and socioeconomic features within the study area.

### Natural Resources

Natural resources within the study area consist of streams and other water bodies, wetlands and threatened and endangered species. Carbonate bedrock is also present throughout the majority of the study area.

There are numerous water resources within the study area, including ponds and streams. The majority of ponds are small and are located on private property throughout the study area. All streams within the study area are located within the Potomac River drainage basin. The majority of the streams are unnamed tributaries to the Conococheague Creek, and may be intermittent at times throughout the year. Within the study area, the unnamed tributaries to the Conococheague Creek are all listed as a Warm Water Fisheries, according to the Pennsylvania Code, Title 25. Environmental Protection, Chapter 93. Water Quality Standards. The exception to this is an unnamed tributary to the Falling Springs Branch Creek, located adjacent to the northern study limit, to the east of I-81. This stream may also be intermittent at times throughout the year. According to the Pennsylvania Code, this unnamed tributary is listed as a High Quality Cold Water Fishery, since it is located east of the Borough of Chambersburg / Guilford Township boundary. None of the streams have designated 100-year floodplains within the study area.

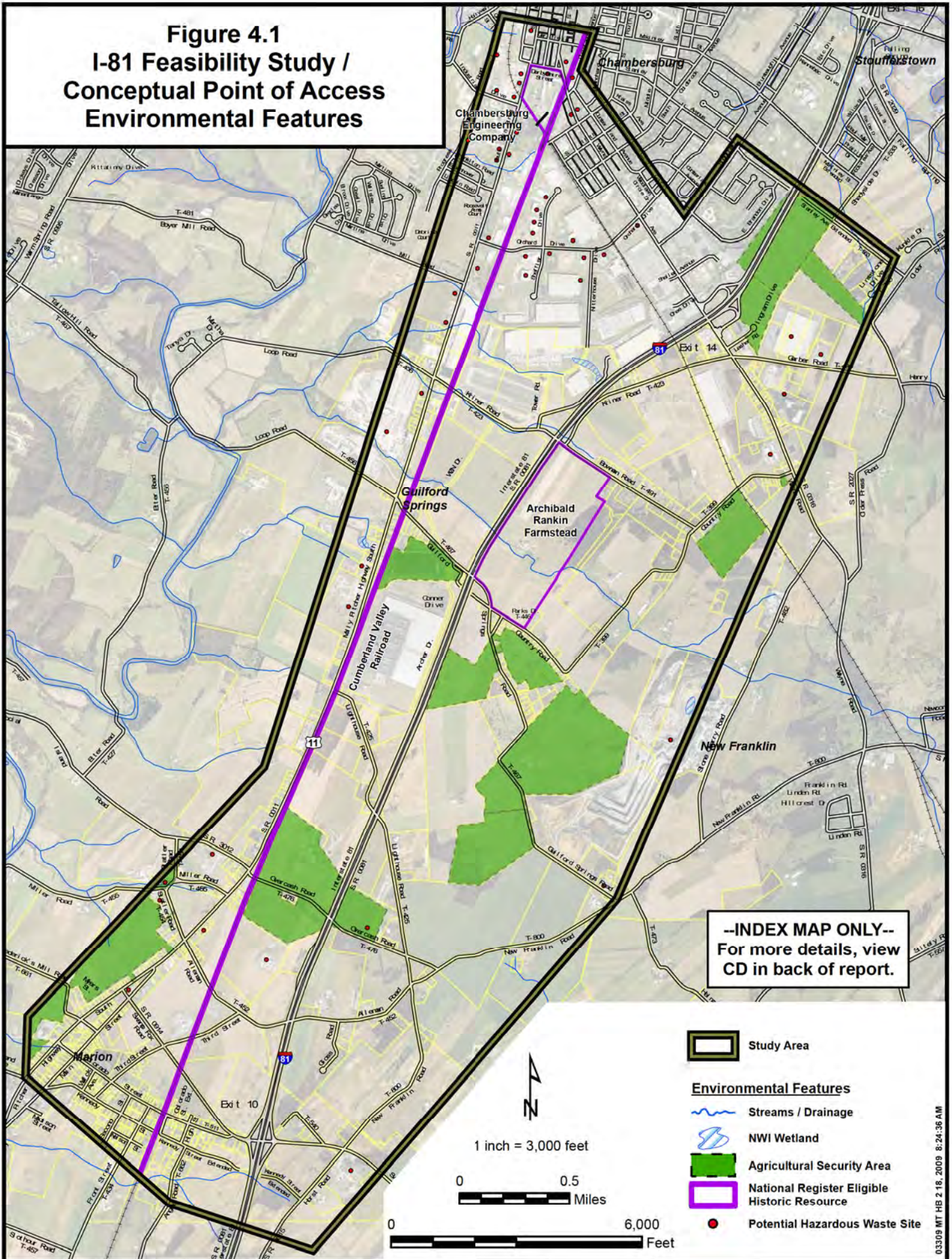
The wetlands within the study area were mapped using the National Wetlands Inventory (NWI) database, maintained by the U.S. Fish & Wildlife Service. The majority of the wetlands are located along the tributaries to the Conococheague Creek. Potential wetland areas may also be present within the study area limits, and additional investigations should be performed when specific improvements are identified.

Preliminary threatened and endangered species investigations were performed using the Pennsylvania Natural Diversity Inventory, which is maintained by the Pennsylvania Department of Conservation and Natural Resources, and "A Natural Areas Inventory of Franklin County, Pennsylvania 2004", which was prepared for the Franklin County Planning Commission by the Pennsylvania Science Office of The Nature Conservancy. These preliminary investigations resulted in no threatened and endangered species and no natural areas being present within the project area. However, it is recommended that additional investigations be performed when specific improvements are identified.

The study area is part of the Great Valley Section of the Ridge and Valley Physiographic Province of Pennsylvania. The bedrock geology of the study area was obtained from the United States Geological Survey and consists primarily of carbonate bedrock, with formations such as the Rockdale Run Formation, the Stonehenge Formation, the Chambersburg Formation, and the St. Paul Group Formation. All of these formations, as well as the various others present within the study area, consist of limestone and dolomite and were formed during the Ordovician period.



**Figure 4.1**  
**I-81 Feasibility Study /**  
**Conceptual Point of Access**  
**Environmental Features**



03309 MT HB 2 18, 2009 8:24:36 AM

## Cultural Resources

Cultural resources within the study area include National Register of Historic Places listed or eligible historic resources.

The National Register files list seven eligible resources within the study area limits. This information was obtained from the Pennsylvania Cultural Resource Geographic Information System, which is a partnership between the Pennsylvania Historical and Museum Commission and PennDOT.

However, three of the seven eligible resources, the Adam Vandreau Farmstead, the Jacob Eters Farmstead, and the J. Allison Eyster Farmstead no longer exist. In addition, the National Register eligible Kriner Road Bridge has been moved to a location outside of the study area. The three National Register eligible resources remaining are the Archibald Rankin Farmstead on the east side of I-81 between Bowman Road and Guilford Springs Road, the Chambersburg Engineering Company along U.S. 11 in southern Chambersburg, and the Cumberland Valley Railroad (now Norfolk Southern) that parallels U.S. 11 in both Guilford Township and Chambersburg Borough.



The Archibald Rankin Farmstead



The Chambersburg Engineering Company

Historic resources that are potentially eligible for the National Register of Historic Places (i.e. older than 50 years) have not been evaluated or mapped. However, potentially eligible resources are assumed to be present and it is recommended that additional investigations be performed when specific improvements are identified.



The National Register eligible Cumberland Valley Railroad

## Socioeconomic Resources

Socioeconomic resources within the study area include Agricultural Security Areas, potential hazardous waste sites, and community facilities and emergency services, all of which are interspersed throughout the study area.

The Agricultural Security Area (ASA) information was obtained from the Franklin County Planning Commission. ASAs are present throughout the study area, with the largest percentage being located in the Agricultural / Residential zones within Guilford Township. However, there are two ASAs present within the corridor between U.S. 11 and I-81, which is zoned Commercial and Industrial.

A substantial number of potential hazardous waste sites are present within the study area. The background information and location of these potential sites was obtained from Environmental Data Resources, Inc. Potential sites include a range of facilities, such as gas stations and auto repair facilities, utility plants, farming operations, concrete manufacturers and construction companies. The highest number of potential sites within the study area is concentrated in urban areas, such as the Borough of Chambersburg, and along major transportation corridors, including U.S. 11 and PA 316. The rural and

agricultural areas of the study area have very few potential hazardous waste sites. All potential sites have been located on the Environmental Features mapping.

Community facilities and emergency services within the study area include educational facilities and police, fire and ambulance services. Various schools are within the study limits, the majority of which are elementary schools located in the Borough of Chambersburg and Marion. Police services and ambulance services are based out of the Borough of Chambersburg, just beyond the study area boundaries. However, these facilities serve the entire study area. Fire services include the Marion Volunteer Fire Company, as well as a few fire companies within the Borough of Chambersburg, located just beyond the study area boundaries. Facilities in these locations serve the entire study area. These community facilities and emergency services have been located on the Existing Land Use / Land Cover mapping (**Figure 5.1.1**), and are primarily considered Institutional uses.

## 5.0 Existing and Future Land Use

### 5.1 Existing Land Use / Land Cover

The existing land use information within the defined study is based on aerial photography and was verified in the field to update the mapping. The current study area setting varies from urban (within the Borough of Chambersburg) to suburban, to agricultural and forested settings. Outside the Borough of Chambersburg, the developed areas are mainly adjacent to the U.S. 11, PA 316, and PA 914 corridors. Recent trends in development are converting land from agricultural uses to commercial or industrial uses, with some land also being converted to residential uses.



Commercial development in the northern study area, adjacent to the Borough of Chambersburg

As illustrated on the Existing Land Use / Land Cover map (**Figure 5.1.1**), residential land use is currently dispersed along most roadways, with a concentration in Marion and at the northern limit of the study area in the Borough of Chambersburg. The majority of the existing commercial and industrial land uses are focused in the Borough of Chambersburg and in Guilford Township along U.S. 11, Kriner Road and PA 316. In areas to the east of I-81, the dominant existing land uses/land covers are agricultural and forest land.

Land use and land cover categories that exist within the study area, and which have been mapped as a part of this study, include residential, commercial, institutional, industrial, transportation, commercial / industrial, agricultural, barren, forest, water, and wetland.

The land use categories were determined using the following criteria:

**Residential** – This land use category includes all residential densities and lot sizes, as well as rural residential units. No farmsteads have been included in the residential category.

**Commercial** – The commercial land use category includes uses such as shopping centers, hotels, offices, warehouses, and waste disposal areas.

**Institutional** – Uses in this category consist of educational facilities, churches and religious facilities, healthcare facilities, and correctional and military facilities. Due to mapping constraints, small institutional units, such as some churches and smaller schools, were typically included within another category which was the dominant land use, such as residential or commercial.

**Industrial** – The industrial land use category includes both light and heavy manufacturing facilities.

**Transportation** – This land use category includes all roadways, highways and interchanges, railroads and associated facilities, and airports within the study area.

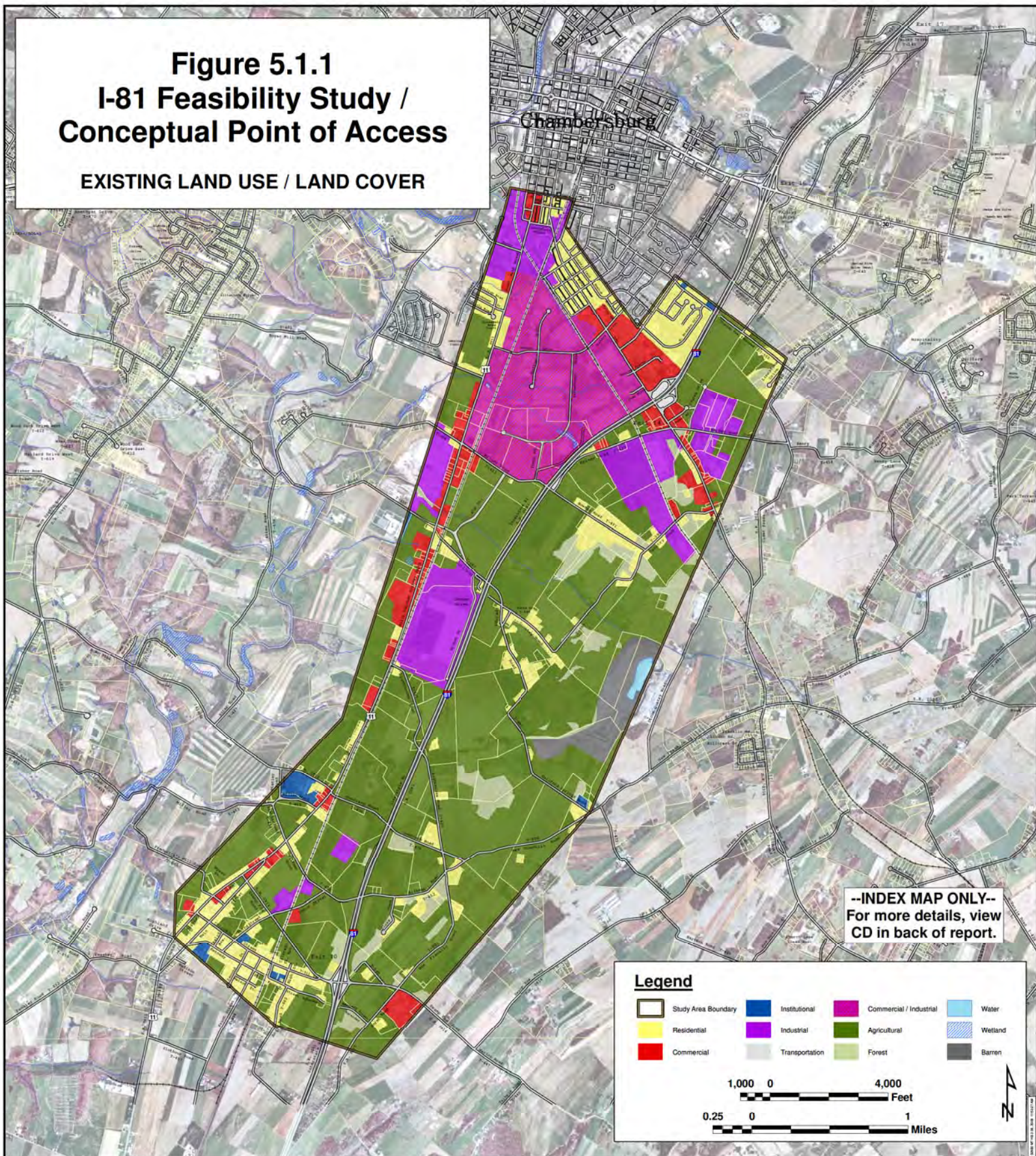
**Commercial / Industrial** – This land use category was used in areas where both industrial and commercial land uses occur together in close proximity, such as warehousing, wholesaling, and retailing, and where at



View of the Marion Interchange and the southern part of the study area illustrating mainly agricultural land use

# Figure 5.1.1 I-81 Feasibility Study / Conceptual Point of Access

EXISTING LAND USE / LAND COVER



--INDEX MAP ONLY--  
For more details, view  
CD in back of report.

**Legend**

Study Area Boundary	Institutional	Commercial / Industrial	Water
Residential	Industrial	Agricultural	Wetland
Commercial	Transportation	Forest	Barren

1,000 0 4,000 Feet  
0.25 0 1 Miles

least 1/3 of the minor use was present within the dominant use. This mixed use also occurs in areas where each specific land use cannot be separated at mapping scale.

**Agricultural** – The agricultural land use category consists of land used for production of food or fiber, such as cropland, pasture, orchards, vineyards, and feeding operations, including livestock, dairy, poultry, and hog farms. Farmsteads are also included in the agricultural land use category.

**Barren** – Land uses in this category consist of areas in transition from one land use to another or when neither the previous use nor the future use can be discerned.

The land cover categories within the study area were determined using the following criteria:

**Forest** – This land cover category includes areas with a deciduous and/or evergreen tree-crown with an aerial density of 10% or greater. Land where trees have been removed to less than 10%, but that have not been developed for another use are also included, such as clear cutting rotations or block planting.

**Water** – The water land cover category consists of all areas that are persistently covered with water, such as streams, lakes, ponds and reservoirs.

**Wetland** – This land cover category includes areas where the water table is at or near the land surface for a significant part of most years, such as marshes, swamps, and bogs. Cultivated wetlands are classified as agricultural.

#### Existing Water and Sewer Infrastructure

Information concerning the extent of the existing water and sewer infrastructure was obtained from the Franklin County Planning Commission and was verified by the Borough of Chambersburg and Guilford Township. During the municipal verification process, it was noted that no major water or sewer infrastructure extensions are anticipated prior to the design year of 2030. This infrastructure was identified in order to assist in determining where future development may occur.

Within the study area, both public water and public sewer infrastructure currently exists throughout the Borough of Chambersburg and in Guilford Township along PA 316 and between the I-81 and U.S. 11 corridors from approximately Kriner Road to Lighthouse Road. Public water infrastructure currently exists along the majority of the U.S. 11 corridor, along Bowman Road and Country Road, and throughout the majority of Marion. The remainder of the study area is without any public infrastructure.

## **5.2 Projections and Development**

### Population Growth

Historic and projected population data was obtained from the Franklin County Planning Commission for the two municipalities within the study area, as well as for Franklin County as a whole. The population data for each decade from 1970 to 2020 was provided. The 2030 population was then derived by comparing the historic growth trends for each municipality, using the average growth and projecting an additional ten years. **Table 5.2.1** illustrates the historic and projected population data. Compared to the Franklin County average population growth rate, the growth rate of Guilford Township is above the average rate. The

Borough of Chambersburg is almost entirely built out, especially within the study area limits, and is not expected to experience much additional growth.

**Table 5.2.1: Study Area Population 1970-2030**

Municipality	1970	1980	1990	2000	2010*	2020*	2030*
Franklin County	100,830	113,630	121,080	129,310	140,540	152,740	166,030
Guilford Township	9,290	10,570	11,890	13,100	14,120	15,540	16,790
Chambersburg Borough	17,320	16,170	16,650	17,860	19,010	19,720	19,940

*\* Projected Population*

Since the majority of the study area is zoned for Commercial and Industrial uses or zoned Agricultural / Residential, where development potential is limited by local planning initiatives, the population growth and number of housing starts anticipated between the present and the design year of 2030 is not particularly relevant to the growth of the study area. The number of housing units that would be required to accommodate the population growth does not account for the additional commercial, industrial, and institutional units that may also be required to sustain the increased population in the design year. Instead, the undeveloped land within the Commercial and Industrial zones, where future growth will be focused, will be of principal importance.

#### Business / Railroad Coordination

As part of determining the existing and future access needs of the commercial and industrial businesses within the study area, and to assist in the projection of future development, coordination occurred with these businesses. The focus was on the larger distribution centers, the businesses in the Chambers 5 Business Park in the southern section of the Borough of Chambersburg, and the larger businesses along the Wayne Avenue (PA 316) corridor. Coordination was primarily conducted via telephone, however, some surveys were sent to the businesses, from which a written response was received. Coordination consisted of a series of questions, which were asked to the managers or owners of the businesses to determine the number of truck trips, direction of truck trips, number of employees, hours of operation, existing access locations and difficulties, plans for future expansion, and other relevant facts. A total of 46 commercial and industrial businesses were identified to be surveyed. Information was obtained from 33 of these businesses, which is approximately 72 percent of the total.

Coordination also occurred with CSX regarding their inter-modal facility adjacent to Kriner Road, which is presently operating at maximum capacity and generates a total of 300 truck trips daily but was only operating at 50% of its capacity when the counts were completed. This facility generates the highest amount of truck traffic within the study area, with the Target and Franklin Storage distribution centers being the second highest, each with a total of 200 truck trips daily.

#### Proposed Development

Identification of the proposed development areas was based on discussions with Guilford Township, the Borough of Chambersburg, and the Franklin County Planning Commission. Proposed development areas consist of development that has been approved for construction or which is currently under review by the municipalities.

Residential development is proposed near the Borough of Chambersburg and Guilford Township boundary, in the area of U.S. 11 and Mill Road. Development is proposed on both the north and south side of Mill Road and will consist of a mixture of single-family homes, duplexes, and townhouses. In Guildford Township, approximately 65 acres have been re-zoned for residential use in the area adjacent to I-81 and

Stanley Avenue, and development is currently proposed in this area. In addition to these locations, residential growth is occurring directly to the west of the study limits in Hamilton Township, which is also expected to travel throughout the study area.

In Guilford Township, approximately 45 acres directly adjacent to I-81 to the east between Stanley Avenue and Ingram Drive have been re-zoned for commercial use, and development is currently proposed in this area. The CSX Intermodal Yard is proposing to expand their facility to the south and east of the existing facility in Guilford Township in the area between Kriner Road, Country Road and the CSX railroad line.

In discussions with Guilford Township and the Franklin County Planning Commission, it was noted that the area between the U.S. 11 and I-81 corridors, which is zoned for Commercial and Industrial uses, is expected to be built out according to current zoning by the design year of 2030. However, at the present time, no formal proposals for development have been submitted to Guilford Township for review.

### **5.3 Future Land Use / Land Cover**

Future land was projected for the design year of 2030 in coordination with the Franklin County Planning Commission, Guilford Township and the Borough of Chambersburg. The future land use was able to be adequately estimated for the study area by considering projected population growth, proposed development, existing utility infrastructure, existing land uses / land covers, and environmental constraints, in accordance with local planning initiatives. Zoning Ordinances, as well as Subdivision and Land Development Ordinances, have been enacted and adopted by both Guilford Township and the Borough of Chambersburg. These planning documents, as well as the Franklin County Comprehensive Plan, were considered when projecting future land use.

The Future Land Use / Land Cover map (**Figure 5.3.1**) was developed using the same criteria as the existing land use and land cover categories, which have been previously discussed in the Existing Land Use / Land Cover section. When comparing the future land uses (2030) to the existing land uses (2009), approximately 1,300 additional acres of the total 6,000 study area acres, or approximately 21 percent, will be developed in 2030. These acres will be converted from agricultural and forested land uses / land covers to primarily residential, commercial and industrial land uses.

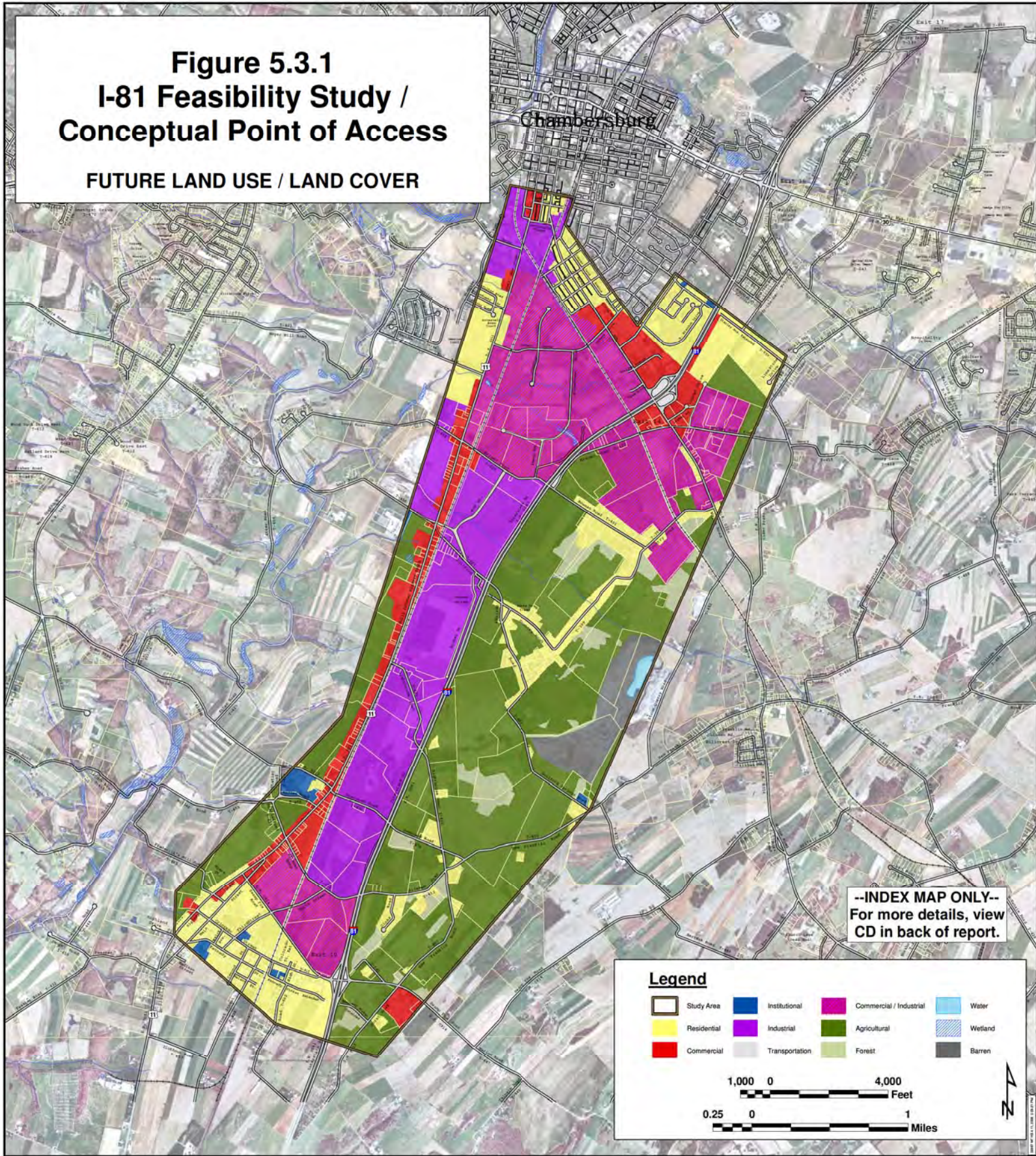
As illustrated on the Future Land Use / Land Cover map, substantial commercial and industrial development is expected to occur within the study area, with some residential development expected to occur as well. The future commercial land use will be focused along U.S. 11, in the area between the Interstate 81 and U.S. 11 corridors, along Wayne Avenue (PA 316), and within the southern portion of Borough of Chambersburg, which presently exists. The future industrial land use will be concentrated in the area between the U.S. 11 and Interstate 81 corridors, where the zoning and transportation and utility infrastructure can accommodate this use. A few industrial uses will also be interspersed throughout the southern section of the Borough of Chambersburg, which presently exist, and along the CSX railroad line. Future residential land use will be focused in Marion at the southern limit of the study area, with some clusters located along U.S. 11 near Mill Road, along Wayne Avenue (PA 316) in the Borough of Chambersburg, and along I-81 at the northern limit of the study area. Some residential land uses will also be distributed throughout the agricultural areas to the east of I-81.

Few additional institutional and transportation land uses, compared to the existing development, are expected to be present in the design year. The stone quarry adjacent to Guilford Springs Road at the eastern limit of the study area will expand to the south of the existing facility, which will slightly increase the barren land use. The agricultural and forest land uses / land covers will be the dominant land uses / land covers throughout the majority of the eastern section of the study area. However, these land uses / land



# Figure 5.3.1 I-81 Feasibility Study / Conceptual Point of Access

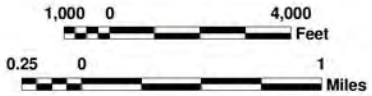
FUTURE LAND USE / LAND COVER



--INDEX MAP ONLY--  
For more details, view  
CD in back of report.

**Legend**

- Study Area
- Institutional
- Commercial / Industrial
- Water
- Residential
- Industrial
- Agricultural
- Wetland
- Commercial
- Transportation
- Forest
- Barren



covers will be considerably reduced compared to their existing coverage, and will be replaced with the expanding residential, commercial and industrial land uses. The remaining land covers are expected to experience little change, including the water and wetland land cover.

## 6.0 Future No-Build Traffic

### 6.1 Trip Generation, Distribution, and Assignment

As a first step, estimates of trip generation associated with the forecasted land development were prepared for the study area as a whole, according to the land use type, size/scale of the development, and trip-making rates. The amount of forecasted land development was determined, as discussed previously. The trip-making rates for new development, in terms of trips per residential dwelling unit or building square footage (retail, commercial, industrial), were obtained from two different sources: Trip Generation, 7<sup>th</sup> Edition, as published by the Institute of Transportation Engineers (ITE); or local trip-making rates, particularly for industrial development, as determined through counts of traffic at similar land uses.

Special consideration was given to account for unique trip-making dynamics at certain land use types according to the ITE Trip Generation methodologies. For retail uses, including shopping centers, the ITE data indicate that a portion of the generated trips will be drawn from the traffic already on the adjacent roadways. Therefore, these “pass-by” trips are deducted from the overall trip generation to determine the total number of “new” trips. For industrial uses, the local trip generation studies had prepared separate trip-making rates for automobile and truck trips, since truck traffic is a paramount concern in the study area. As such, automobile trips were generated separately from truck trips.

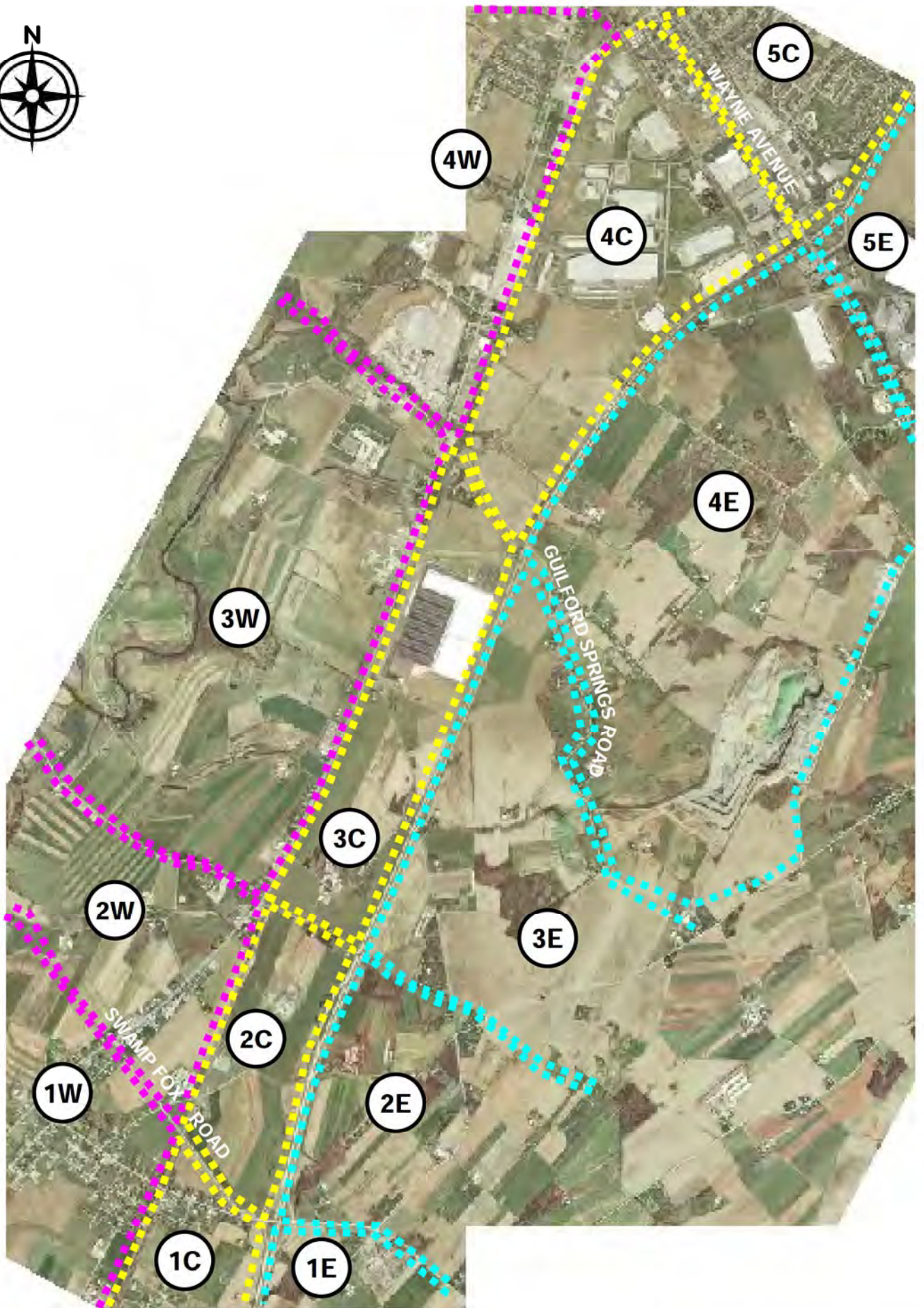
As a tool for accounting the new land development and vehicle trips, the study area was then divided into fourteen traffic analysis zones (TAZs), as illustrated in **Figure 6.1.1**. The TAZs were delineated along existing roadways with four zones west of U.S. 11, five central zones between U.S. 11 and I-81, and five zones east of I-81. The total new vehicle trips for the study area were allocated to the TAZs by land use type according to the likelihood of land development in those zones.

The trip distribution step identifies the following two trip-making characteristics: A) the general directions that new trips would approach and depart each TAZ (usually related to the assumed origin or destination of a trip); and B) the proportion of the new trips that would approach and depart each TAZ in those given directions. As such, the data collected during the origin-destination study supplied significant information about both the direction and proportion of travel in the vicinity of the I-81 interchanges. Traffic count data and knowledge of local travel patterns informed the trip distribution for other parts of the study area.

As the final step, the newly generated trips were assigned to the roadway network according to the directions and proportions identified in the trip distribution. The step-wise processes of trip generation, distribution, and assignment were completed with the help of a spreadsheet traffic model. Estimates of new trips on the roadway network were prepared for the AM Peak and PM Peak hours of traffic. The trip generation data is in **Appendix F** (contained on a CD at the back of this report).

### 6.2 Future Year 2030 No-Build Traffic

The Future Year 2030 No-Build traffic volumes represent the sum of Existing Year traffic volumes, “New” traffic volume from forecasted land development within the study area, and Background traffic volume from regional growth outside the study area.



**FIGURE 6.1.1**  
**Traffic Analysis Zones**

*PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
Hamilton & Guilford Township, Franklin County, Pennsylvania*

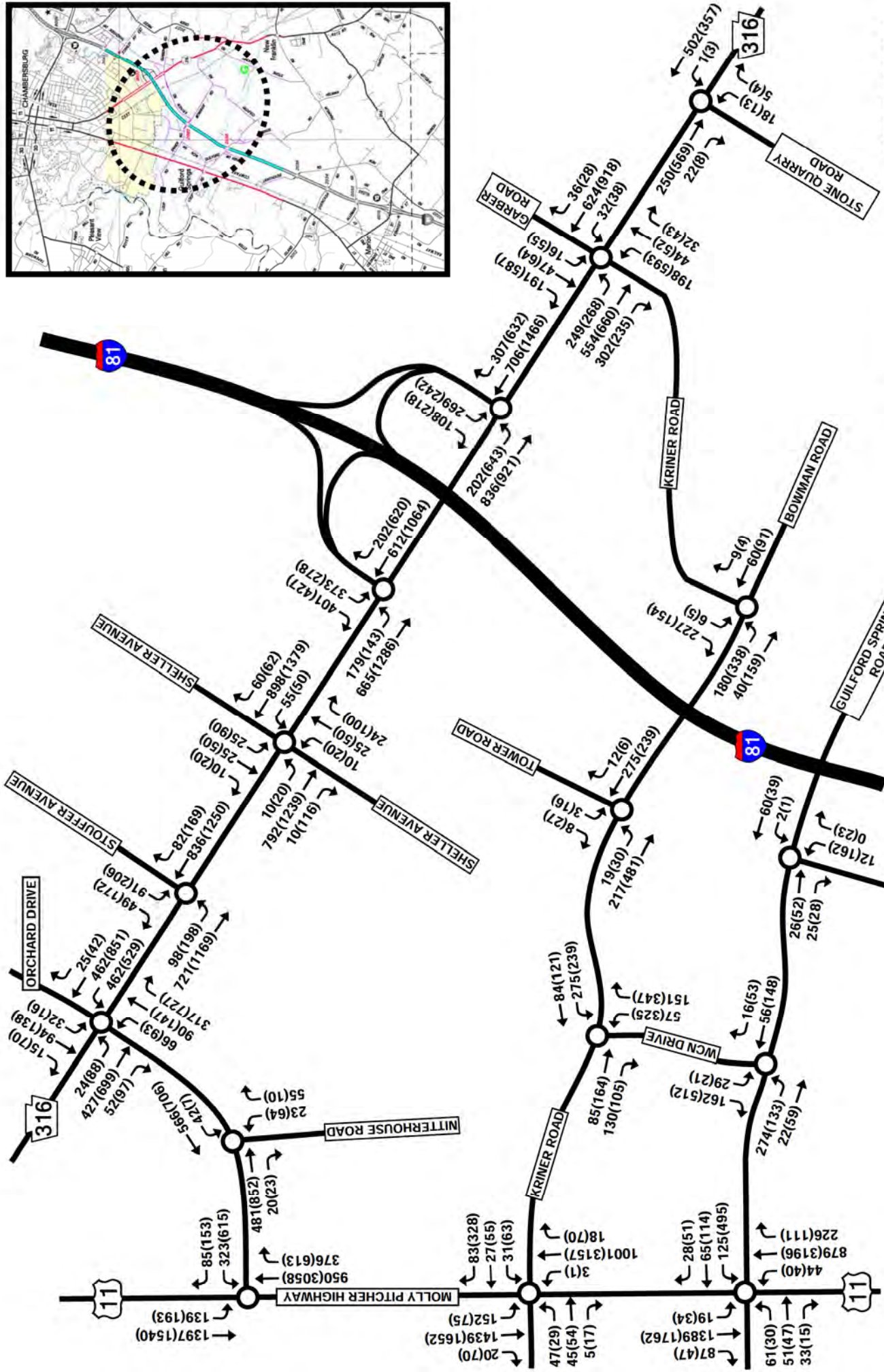
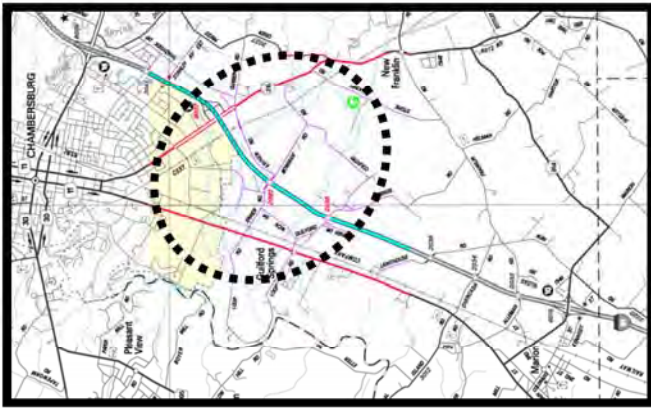
In estimating the Future Year 2030 No-Build traffic volumes, multiple future year traffic volume “scenarios” were prepared according to differing levels and combinations of automobile and truck traffic generation. Three Automobile Traffic Volume scenarios and three Truck Traffic Volume scenarios were prepared assuming trip generation levels of 100%, 80%, or 50% for the forecasted land development. **Figure 6.2.1, Figure 6.2.2, Figure 6.2.3 and Figure 6.2.4** show the forecasted 2030 traffic volumes assuming the 100% build conditions for all traffic by movement and also for trucks by movement respectively. **Figure 6.2.5, Figure 6.2.6, Figure 6.2.7 and Figure 6.2.8** show the volumes for the 80% build scenario in the same way. These traffic volume levels and their likelihood, given a variety of land development demand and roadway capacity factors, were reviewed by the project steering committee, which is comprised of the attendees at the November 19, 2007 kick-off meeting and the May 29, 2008 status meeting. Minutes from these meetings are included in **Appendix I**. The following assumptions were recommended for use in the study:

- 50% Build levels for Retail, Industrial, and Commercial automobile trip generation
- 80% Build levels for Industrial & Commercial truck trip generation
- 80% Build levels for Residential automobile trip generation

Reductions in these rates were based on trip rates of comparable land uses in the area and coordination with PennDOT and FHWA. There was also recognition that the existing infrastructure would not support the full build out scenario and reduction in future traffic volumes would result in a more realistic and efficient land use and transportation environment. This was further expanded with the phased implementation of land use and transportation described in **Section 8.0** of this report.

The traffic volumes associated with this scenario—which was identified as the “50+80 Scenario”—were adopted as the Future Year 2030 No-Build traffic volumes through agreement at the project team meeting on May 29, 2008. Minutes from this meeting are included in **Appendix I**. All analyses of future year traffic are based upon the assumptions built into the 50+80 Scenario. **Figure 6.2.9 and Figure 6.2.10** show the 2030 50+80 Scenario volumes used to analyze the future alternatives. **Figures 6.2.11 and 6.2.12** show the adjusted future year 2030 ADT volumes.

Highway capacity analysis utilizing the methodologies from the Highway Capacity Manual (HCM) 2000, was completed for all of the study area intersections for both the AM and the PM peak hours. **Table 6.2.1** summarizes the delay and resulting Level-of-Service (LOS) results from the capacity analysis. Highway Capacity Manual reports from the analysis for the study area intersections are included in **Appendix D**, which is contained on the CD at the back of this report.

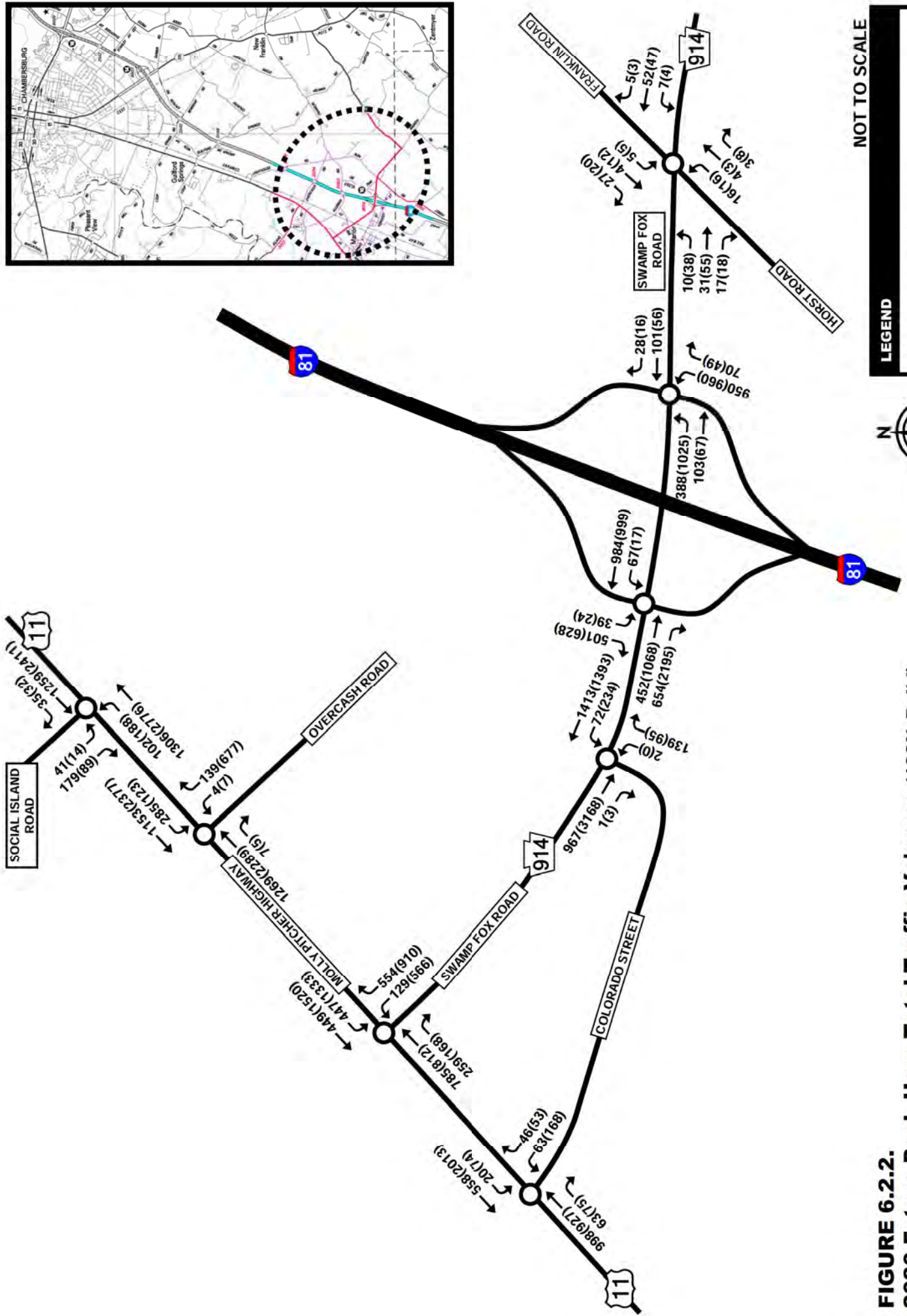
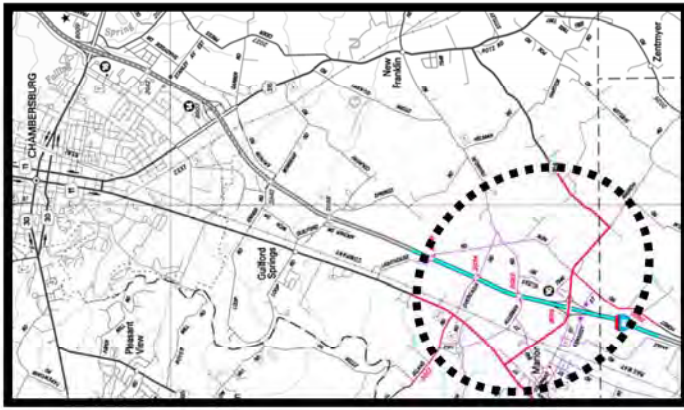


NOT TO SCALE



- LEGEND**
- Study Area Intersection
  - ↔ AM (PM) Turning Movement Traffic Volume

**FIGURE 6.2.1.**  
**2030 Future Peak Hour Total Traffic Volumes (100% Build)**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania



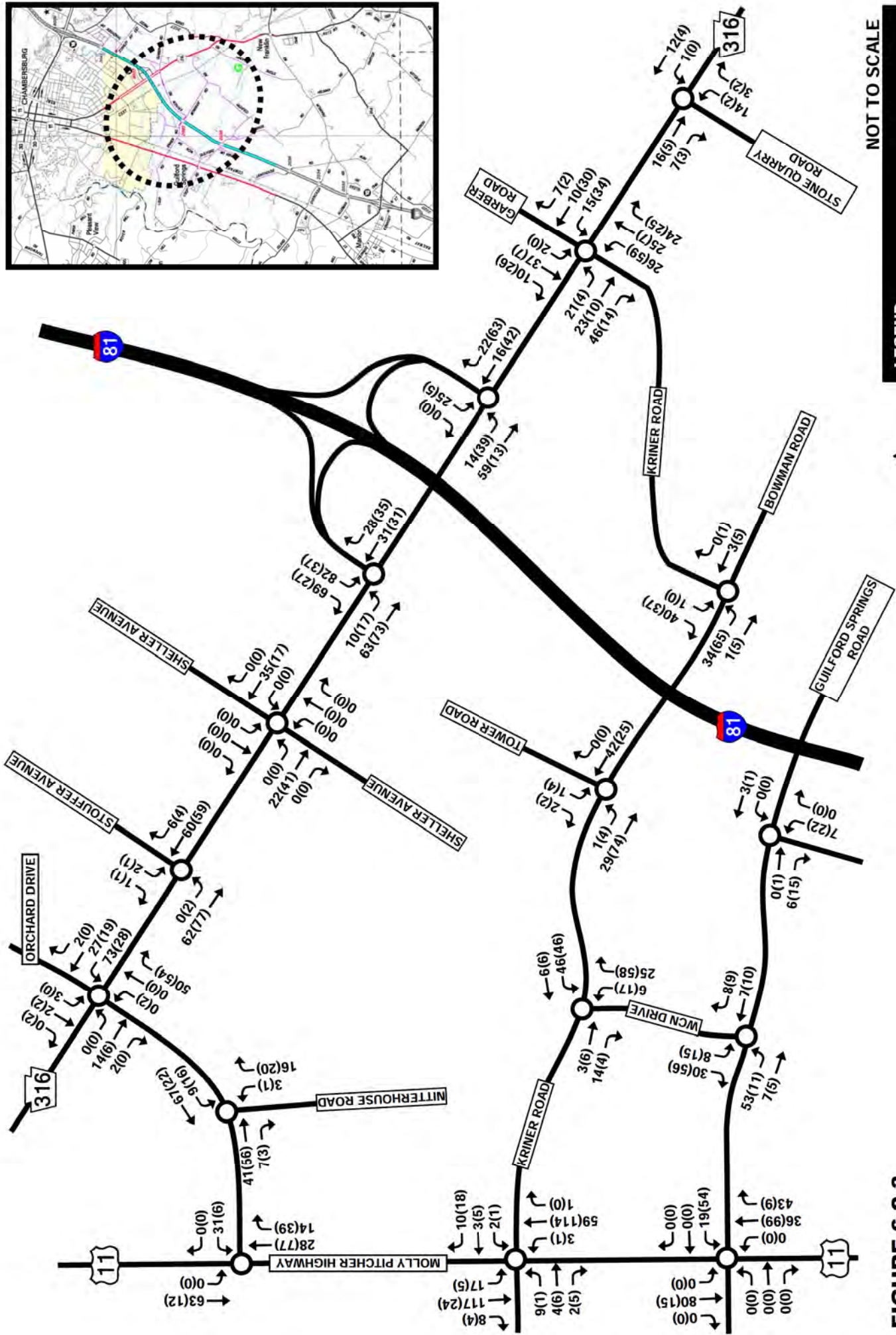
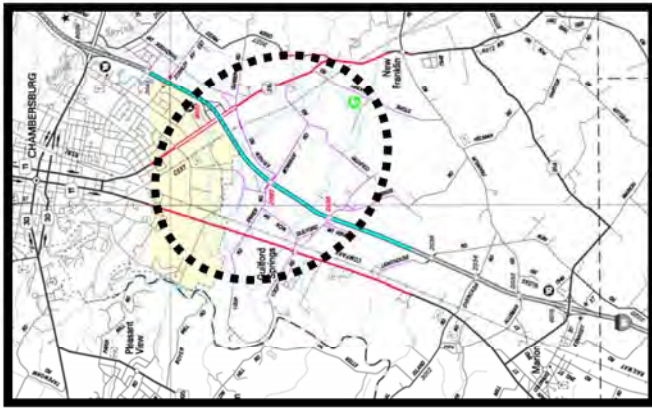
NOT TO SCALE



**LEGEND**

- Study Area Intersection
- ↔ AM (PM) Turning Movement Traffic Volume

**FIGURE 6.2.2.**  
**2030 Future Peak Hour Total Traffic Volumes (100% Build)**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania



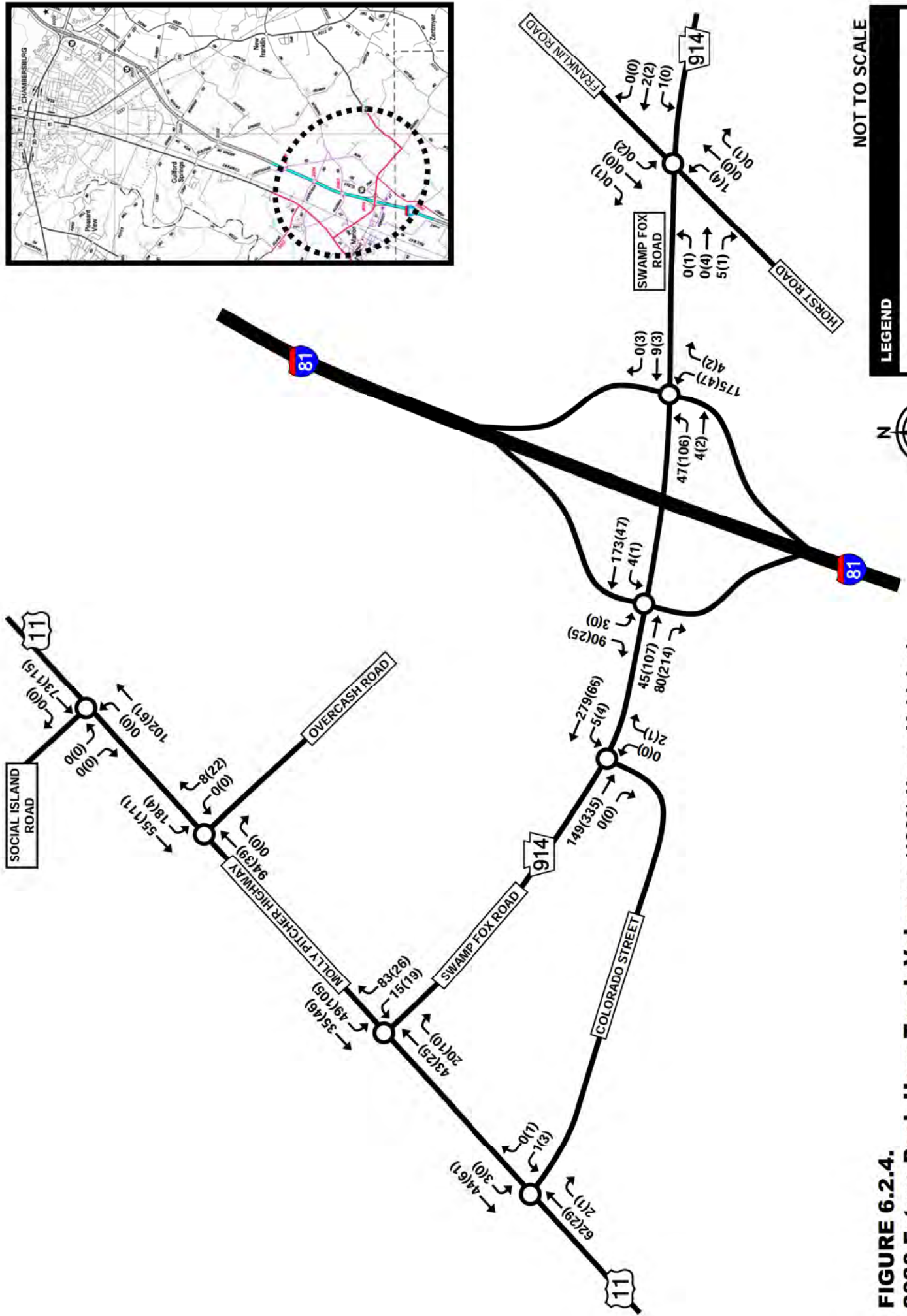
NOT TO SCALE



- LEGEND**
- Study Area Intersection
  - ↔ AM (PM) Turning Movement Traffic Volume

**FIGURE 6.2.3.**  
**2030 Future Peak Hour Truck Volumes (100% Heavy Vehicles)**  
*PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access*  
*Hamilton & Guilford Township, Franklin County, Pennsylvania*



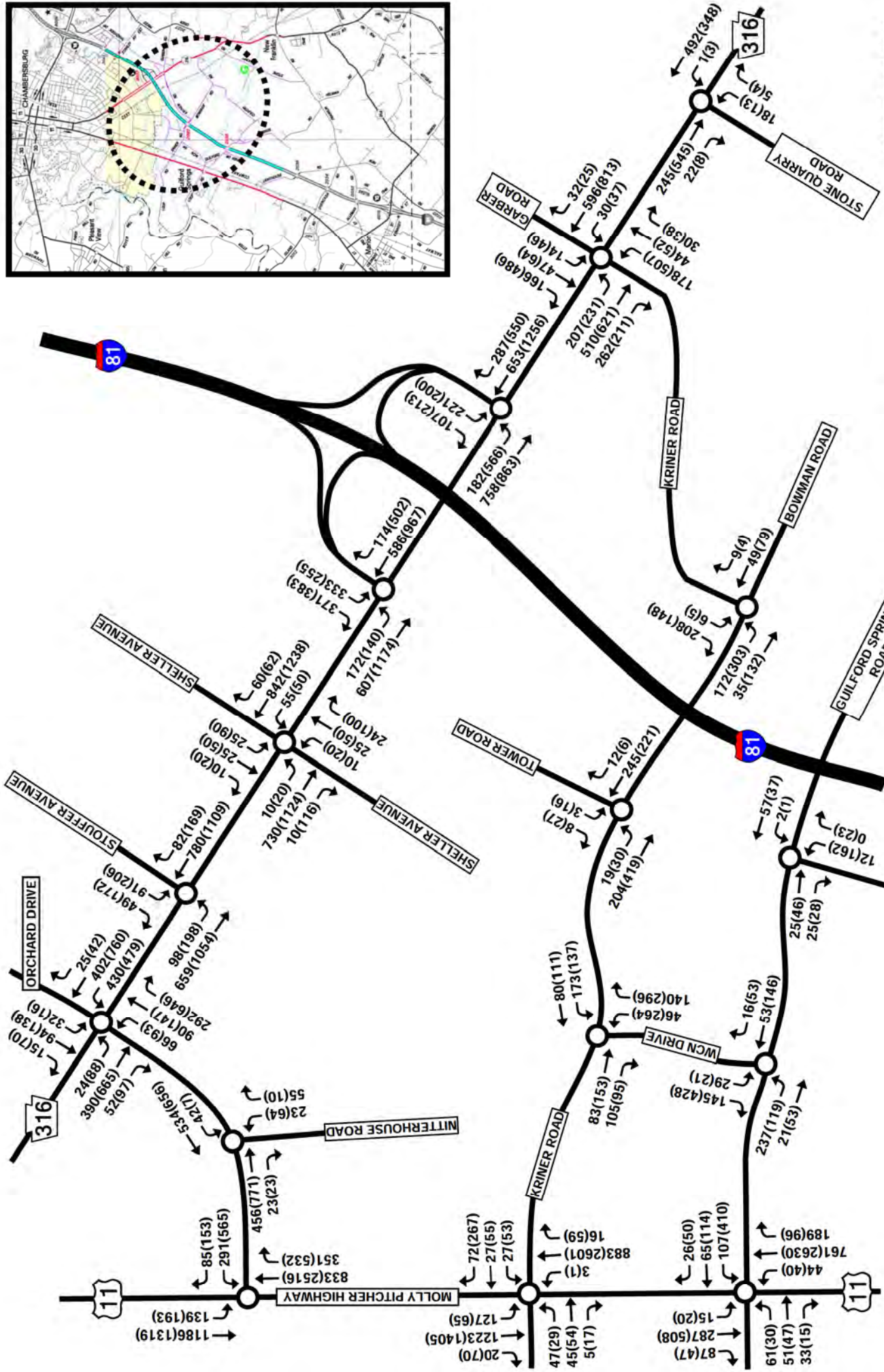
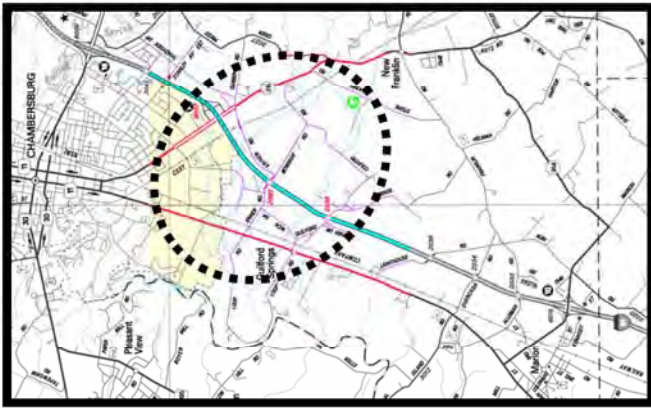


NOT TO SCALE



- LEGEND**
- Study Area Intersection
  - ↔ AM (PM) Turning Movement Traffic Volume

**FIGURE 6.2.4.**  
**2030 Future Peak Hour Truck Volumes (100% Heavy Vehicles)**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania



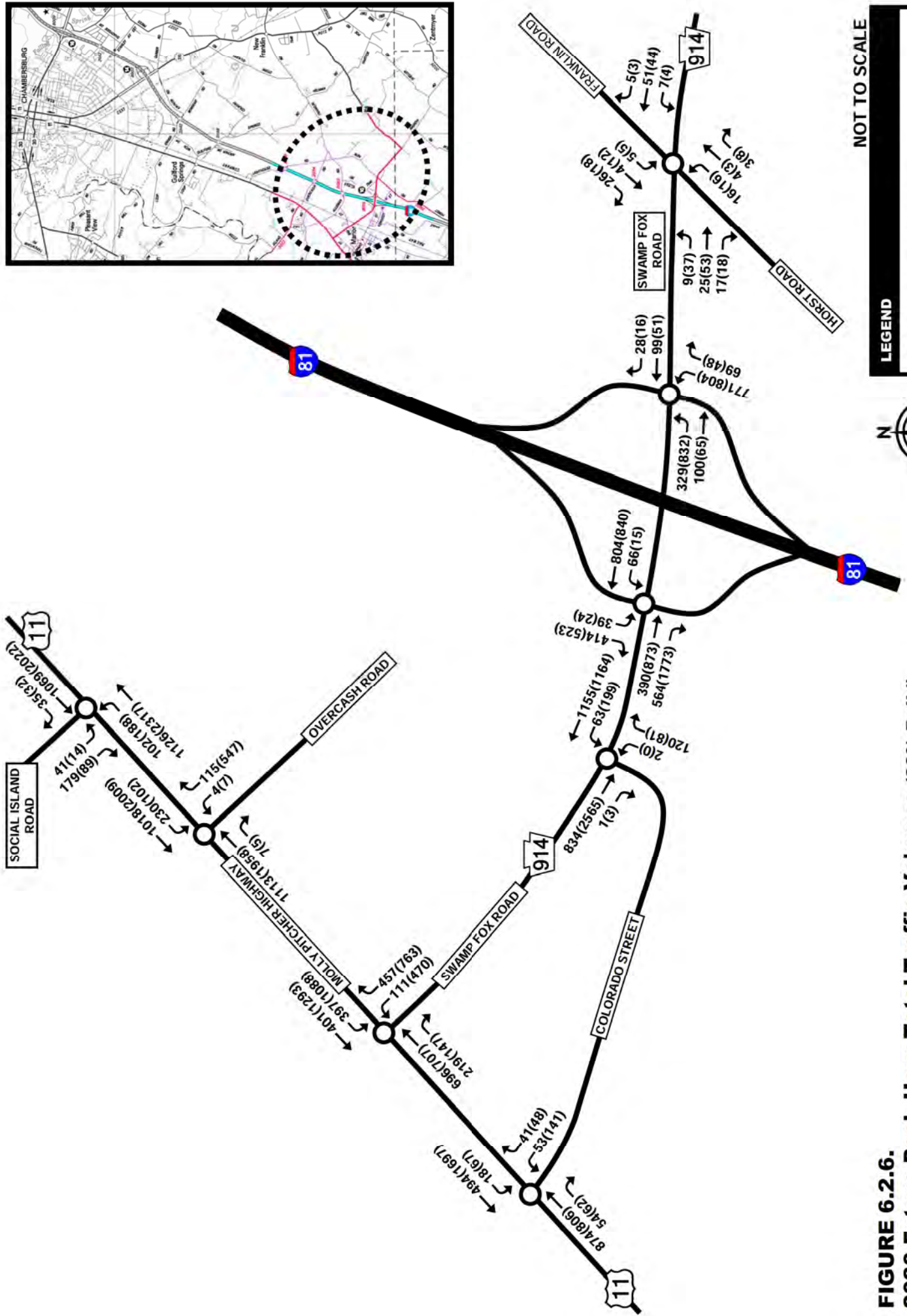
NOT TO SCALE



**LEGEND**

- Study Area Intersection
- AM (PM) Turning Movement Traffic Volume

**FIGURE 6.2.5.**  
**2030 Future Peak Hour Total Traffic Volumes (80% Build)**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania



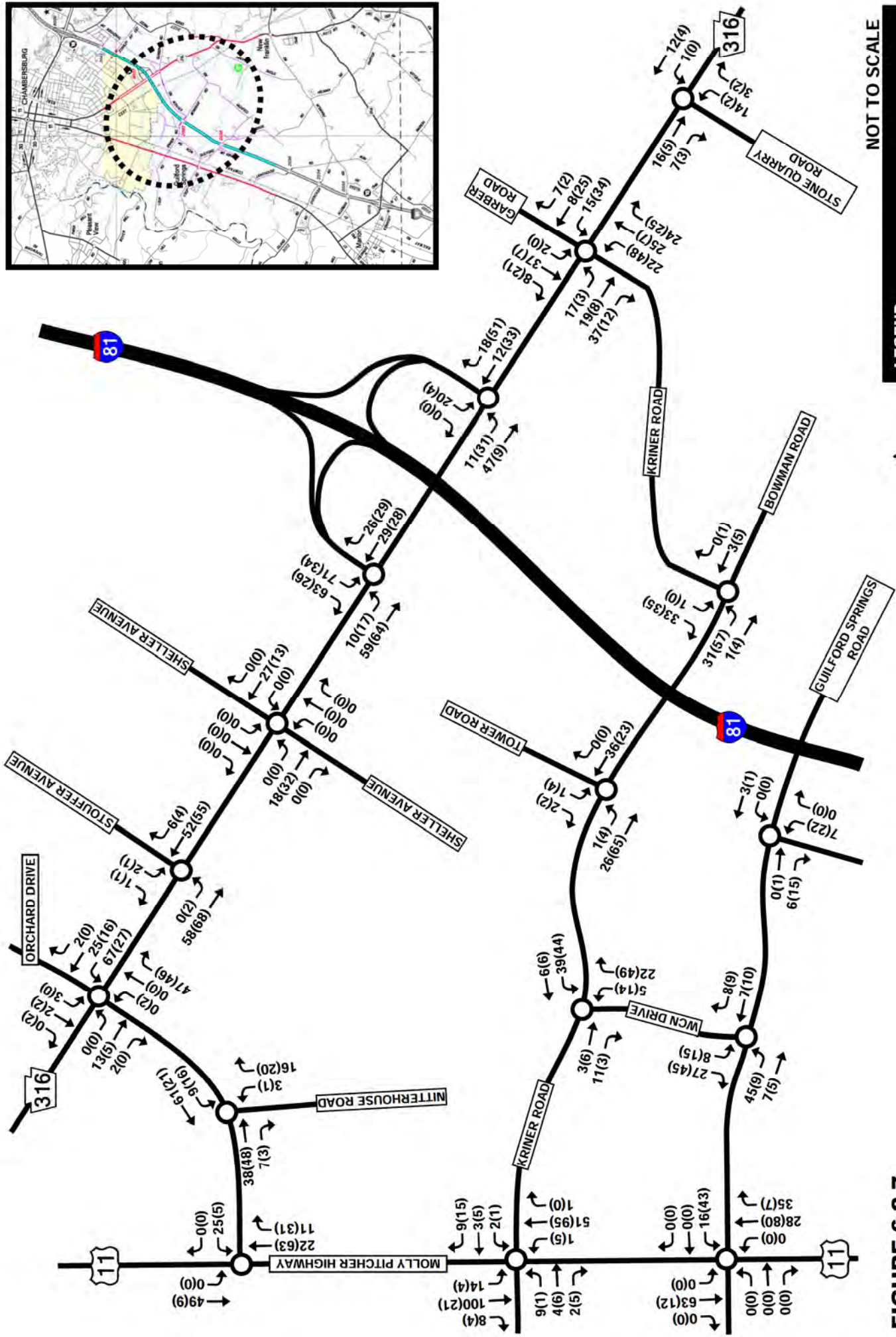
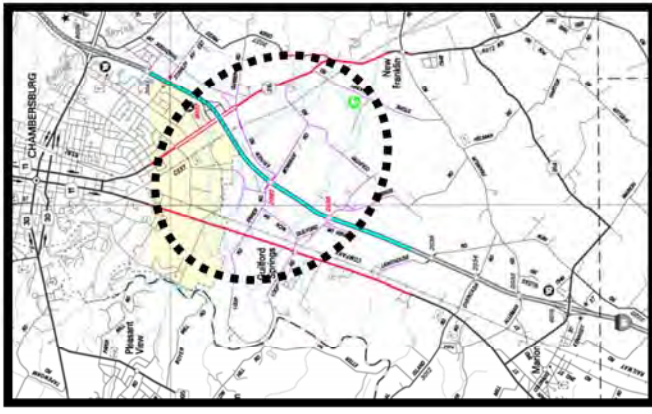
NOT TO SCALE

**LEGEND**

- Study Area Intersection
- ↪ AM (PM) Turning Movement Traffic Volume



**FIGURE 6.2.6.**  
**2030 Future Peak Hour Total Traffic Volumes (80% Build)**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania



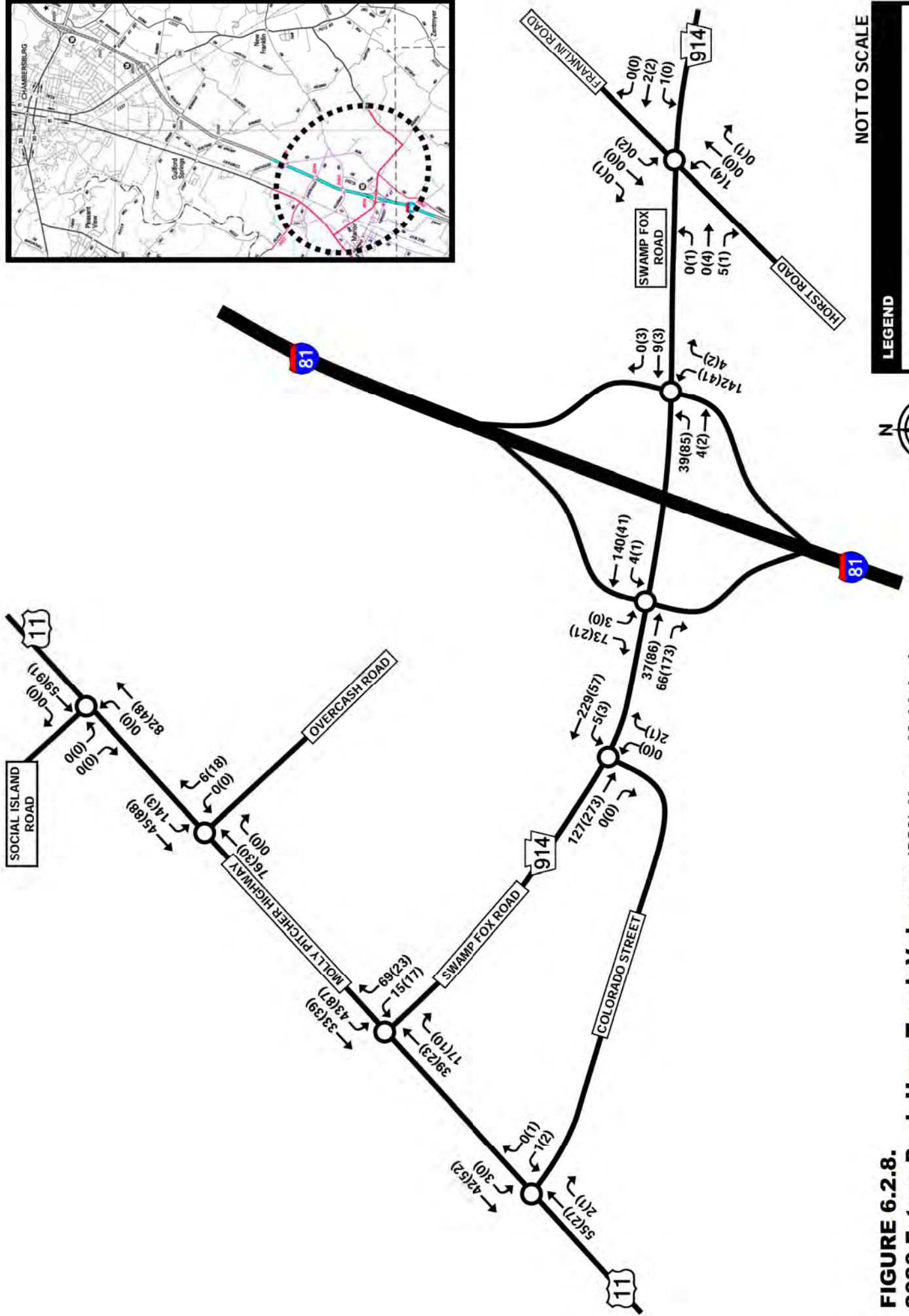
NOT TO SCALE

**LEGEND**

- Study Area Intersection
- ↔ AM (PM) Turning Movement Traffic Volume



**FIGURE 6.2.7.**  
**2030 Future Peak Hour Truck Volumes (80% Heavy Vehicles)**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania

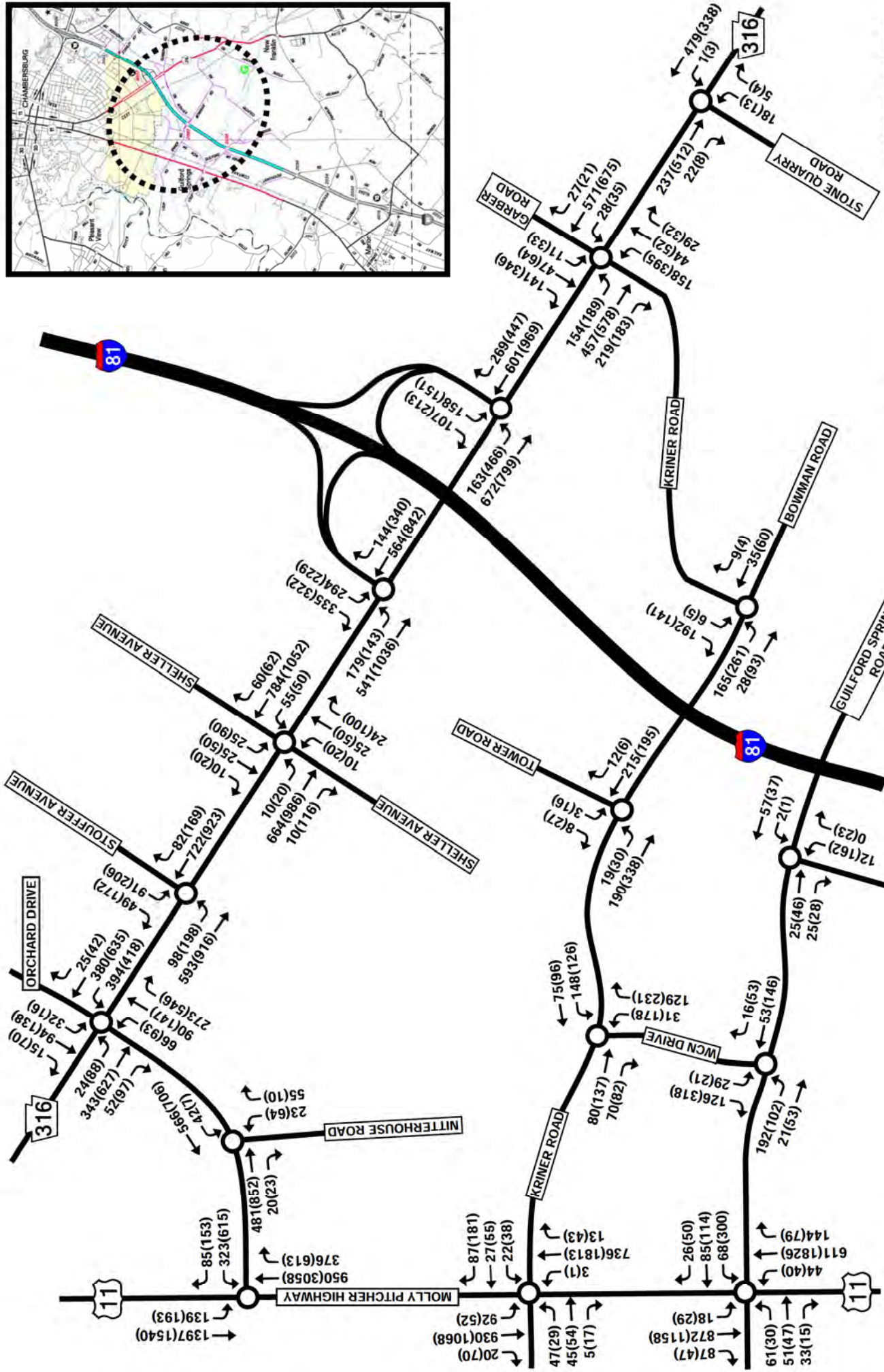
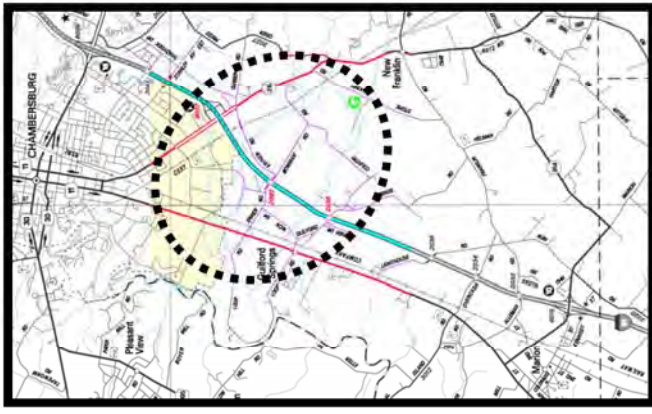


NOT TO SCALE



- LEGEND**
- Study Area Intersection
  - ↔ AM (PM) Turning Movement Traffic Volume

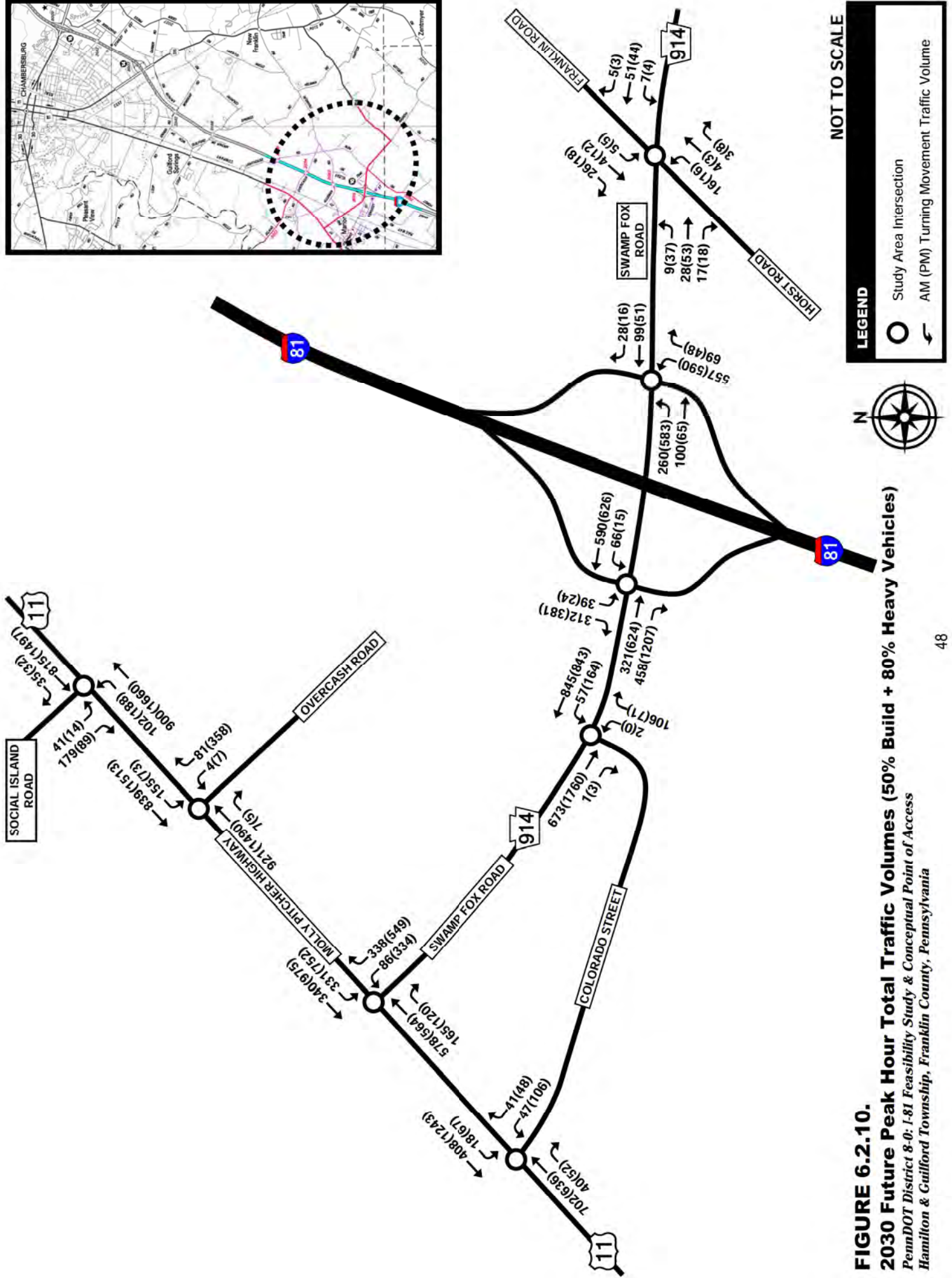
**FIGURE 6.2.8.**  
**2030 Future Peak Hour Truck Volumes (80% Heavy Vehicles)**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania



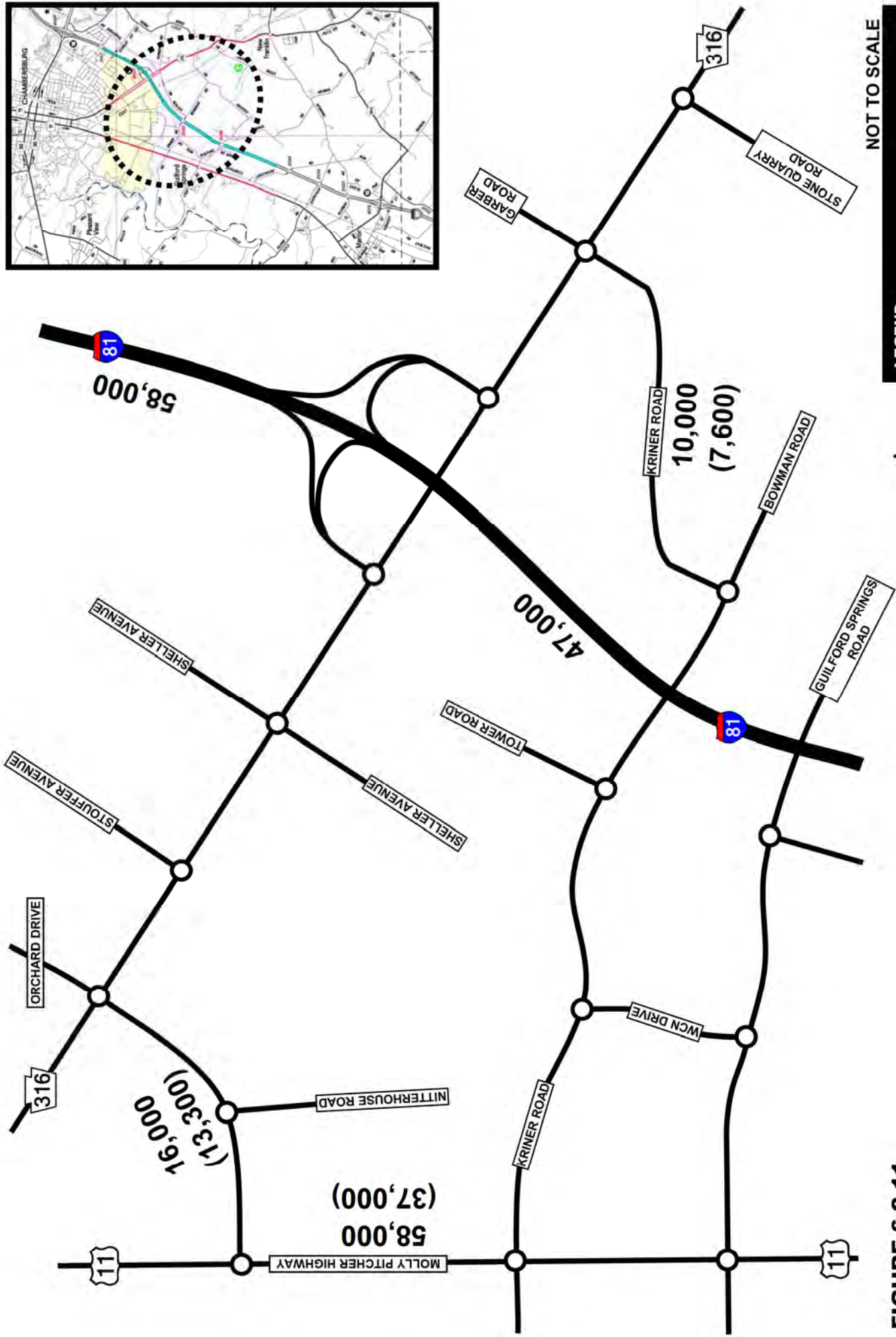
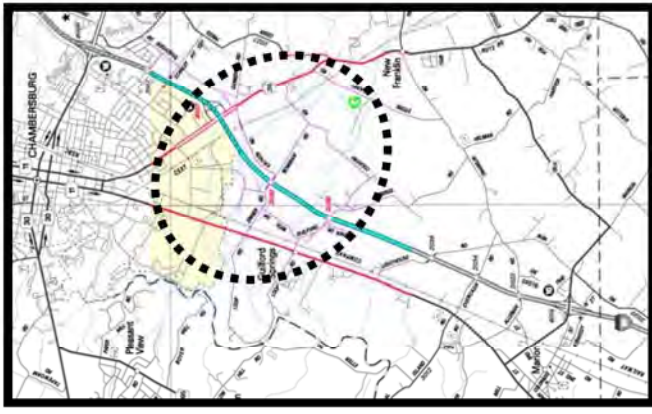
NOT TO SCALE

**FIGURE 6.2.9.** 2030 Future Peak Hour Total Traffic Volumes (50% Build + 80% Heavy Vehicles)

PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
Hamilton & Guilford Township, Franklin County, Pennsylvania



**FIGURE 6.2.10.**  
**2030 Future Peak Hour Total Traffic Volumes (50% Build + 80% Heavy Vehicles)**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania



NOT TO SCALE

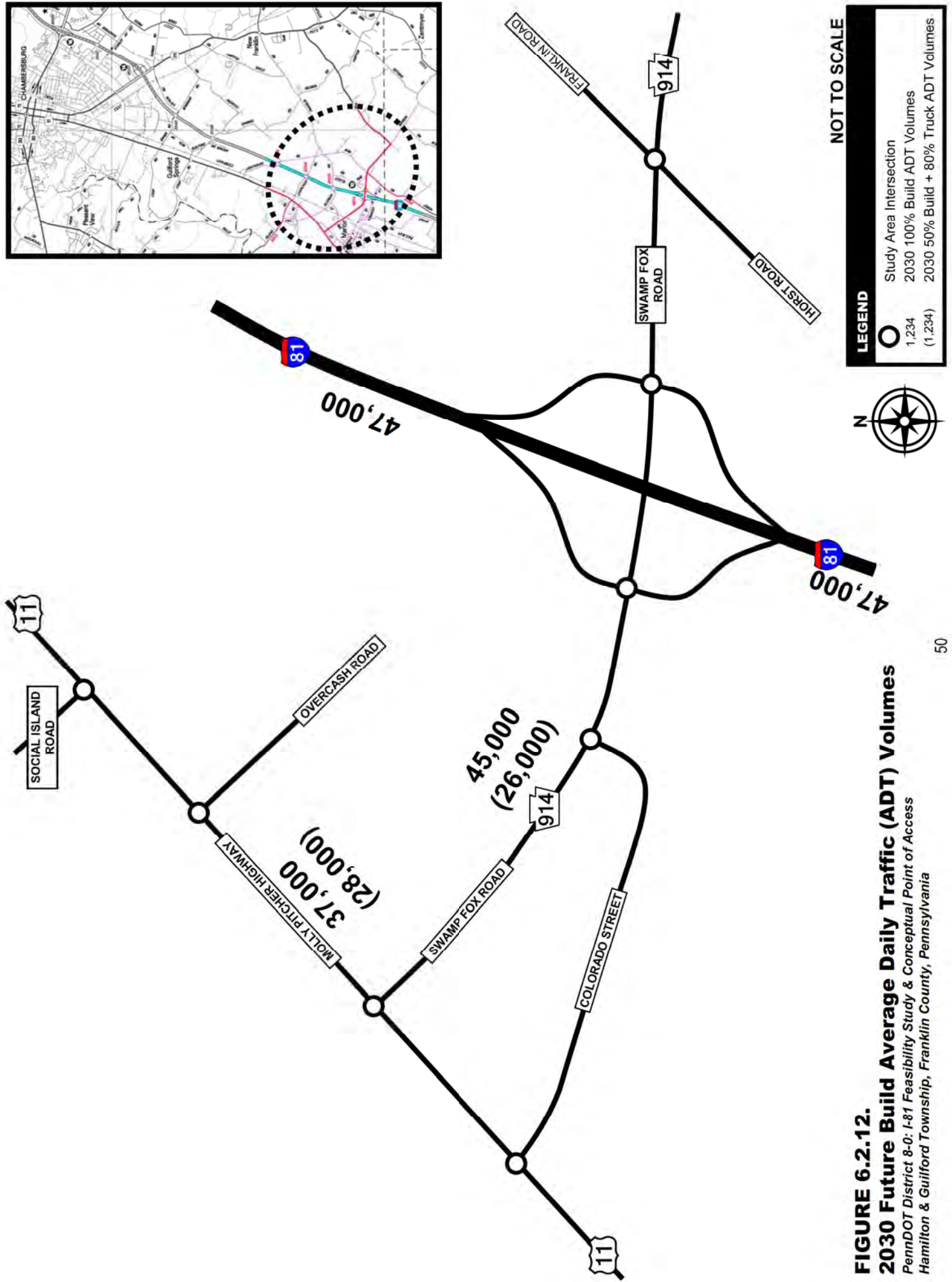
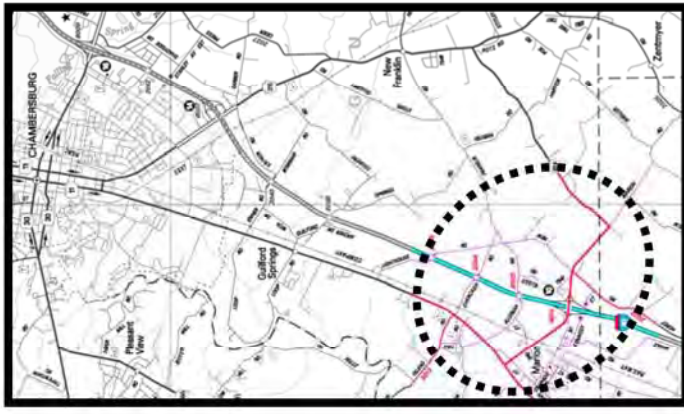
**LEGEND**

- Study Area Intersection
- 1,234
- (1,234)



**FIGURE 6.2.11.**  
**2030 Future Build Average Daily Traffic (ADT) Volumes**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania





**FIGURE 6.2.12.**  
**2030 Future Build Average Daily Traffic (ADT) Volumes**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania

**Table 6.2.1 – 2030 No-Build Conditions Delay and LOS**

Intersection	No-Build						No-Build (TSM Improvements)			
	Type	Movement	AM		PM		Type	Movement	PM	
			Delay	LOS	Delay	LOS			Delay	LOS
US 11 & Colorado St	Unsignalized	WB	82.4	f	*	f	Signalized	Overall	11.6	B
		SB-Left	1.2	a	71.9	f				
Swamp Fox Rd & Franklin Rd/Horst Rd	Unsignalized	EB-Left	1.3	a	2.6	a	Unsignalized	EB-Left	2.6	a
		WB-Left	0.9	a	0.7	a		WB-Left	0.7	a
		NB	10.0	b	10.7	b		NB	10.7	b
		SB	9.1	a	10.0	a		SB	10.0	a
Swamp Fox Rd & I-81 NB Ramp	Unsignalized	EB-Left	6.5	a	9.0	a	Signalized	Overall	75.8	E
		NB	*	f	*	f				
Swamp Fox Rd & I-81 SB Ramp	Unsignalized	WB-Left	3.1	a	3.3	a	Signalized	Overall	27.0	C
		SB	267.4	f	567.1	f				
Swamp Fox Rd & Colorado St	Unsignalized	WB-Left	2.6	a	69.6	f	Signalized***	Overall	18.4	B
		NB	21.4	c	253.9	f				
US 11 & Overcash Rd	Unsignalized	WB	189.4	f	*	f	Signalized	Overall	64.7	E
		SB-Left	21.7	c	1.2	a				
Swamp Fox Rd & US 11	Unsignalized	WB	9999.0	f	*	f	Signalized	Overall	71.9	E
		SB-Left	30.2	d	198.2	f				
US 11 & Social Island Rd	Unsignalized	EB	*	f	*	f	Signalized	Overall	64.7	E
		NB-Left	13.3	b	139.6	f				
Loop Rd & US 11	Signalized	Overall	46.2	D	311.6	F	Signalized	Overall	34.4	C
Guilford Springs Rd & WCN Dr	Unsignalized	EB	11.0	b	11.1	b	Unsignalized	EB	11.1	b
		WB	8.7	a	11.5	b		WB	11.5	b
		SB	9.3	a	13.7	b		SB	13.7	b
Kriner Rd & US 11	Unsignalized	EB	*	f	*	f	Signalized	Overall	33.0	C
		WB	*	f	*	f				
		NB-Left	0.6	a	0.0	a				
		SB-Left	10.9	b	184.2	f				
Kriner Rd & WCN Dr	Unsignalized	WB-Left	5.9	a	5.6	a	Unsignalized	WB-Left	1.4	a
		NB	12.1	b	54.6	f		NB	19.1	c
Orchard Dr & US 11	Signalized	Overall	64.9	E	397.2	F	Signalized	Overall	77.4	E
Orchard Dr & Nitterhouse Dr	Unsignalized	WB-Left	9.2	a	12.6	b	Signalized	Overall	11.1	B
		NB	19.3	c	86.5	f				
Guilford Springs Rd & Archer Dr	Unsignalized	EB	7.2	a	8.3	a	Unsignalized	EB	8.3	a
		WB	7.5	a	8.0	a		WB	8.0	a
		NB	8.5	a	9.5	a		NB	9.5	a
Kriner Rd & Tower Rd	Unsignalized	EB-Left	0.9	a	1.0	a	Unsignalized	EB-Left	1.0	a
		SB	11.0	b	12.7	b		SB	12.7	b
Bowman Rd & Kriner Rd	Unsignalized	SB	10.4	b	10.2	b	Unsignalized	SB	10.2	b
Orchard Dr & Wayne Ave	Signalized	Overall	21.1	C	70.3	E	Signalized	Overall	26.2	C
Stouffer Rd & Wayne Ave	Signalized	Overall	5.6	A	10.9	B	Signalized	Overall	10.9	B
Sheller Ave & Wayne Ave	Signalized	Overall	4.0	A	9.1	A	Signalized	Overall	9.1	A

(Table Continues)

\* The Highway Capacity Manual does not generate a result due to excessive delay.

\*\* All proposed Signals are actuated-uncoordinated.

\*\*\* Signalization of this intersection should be evaluated further during preliminary engineering. It may be more beneficial to the overall network to have it remain unsignalized.

**Table 6.2.1 – 2030 No-Build Conditions Delay and LOS (continued)**

Intersection	No-Build						No-Build (TSM Improvements)			
	Type	Movement	AM		PM		Type	Movement	PM	
			Delay	LOS	Delay	LOS			Delay	LOS
I-81 SB Ramp & Wayne Ave	Signalized	Overall	16.5	B	15.0	B	Signalized	Overall	15.0	B
I-81 NB Ramp & Wayne Ave	Signalized	Overall	8.5	A	40.4	D	Signalized	Overall	40.4	D
Kriner Rd & Wayne Ave	Signalized	Overall	17.5	B	59.0	E	Signalized	Overall	55.0	D
Stone Quarry Rd & Wayne Ave	Unsignalized	EB	10.7	b	9.9	a	Unsignalized	EB	9.9	a
		NB	20.6	c	13.8	b		NB	13.8	b
		SB	11.5	b	25.3	d		SB	25.3	d

\* The Highway Capacity Manual does not generate a result due to excessive delay.

\*\* All proposed signals are actuated-uncoordinated.

\*\*\* Signalization of this intersection should be evaluated further during preliminary engineering. It may be more beneficial to the overall network to have it remain unsignalized.

## 7.0 Design Options Considered

### 7.1 Design Options Not Requiring New or Modified I-81 Access

#### No-Build:

The No-Build option involves no improvements to the roadway system except for routine maintenance. The No-Build would not address any of the existing and future safety and mobility needs of the study area. The No-Build is used as a basis of comparison to the build options.

#### Transportation Systems Management (TSM):

The TSM option involves the implementation of strategies to improve the operational efficiency of the existing system. **(Figure 7.1.1)**. The strategies can include signal installation, signal timing optimization, pavement striping, signage, lighting, and minor roadway / intersection geometric improvements, including the addition of turn lanes. Intersections that would be upgraded for the TSM option include:

- Orchard Drive and Wayne Avenue (PA 316)
- Orchard Drive and Nitterhouse Drive
- Wayne Avenue (PA 316) and Kriner Road
- Kriner Road and WCN Drive
- Colorado Street and Molly Pitcher Highway (U.S. 11)
- Swamp Fox Road (PA 914) and I-81 ramp intersections at the Marion Interchange (2)

The TSM option would not meet the needs of the project because the amount of operational improvement gained would not accommodate the anticipated traffic volumes onto and off of I-81. Nor would it address the safety concerns of the at-grade railroad crossings.

#### Transportation Systems Management (TSM) and Widening Improvements:

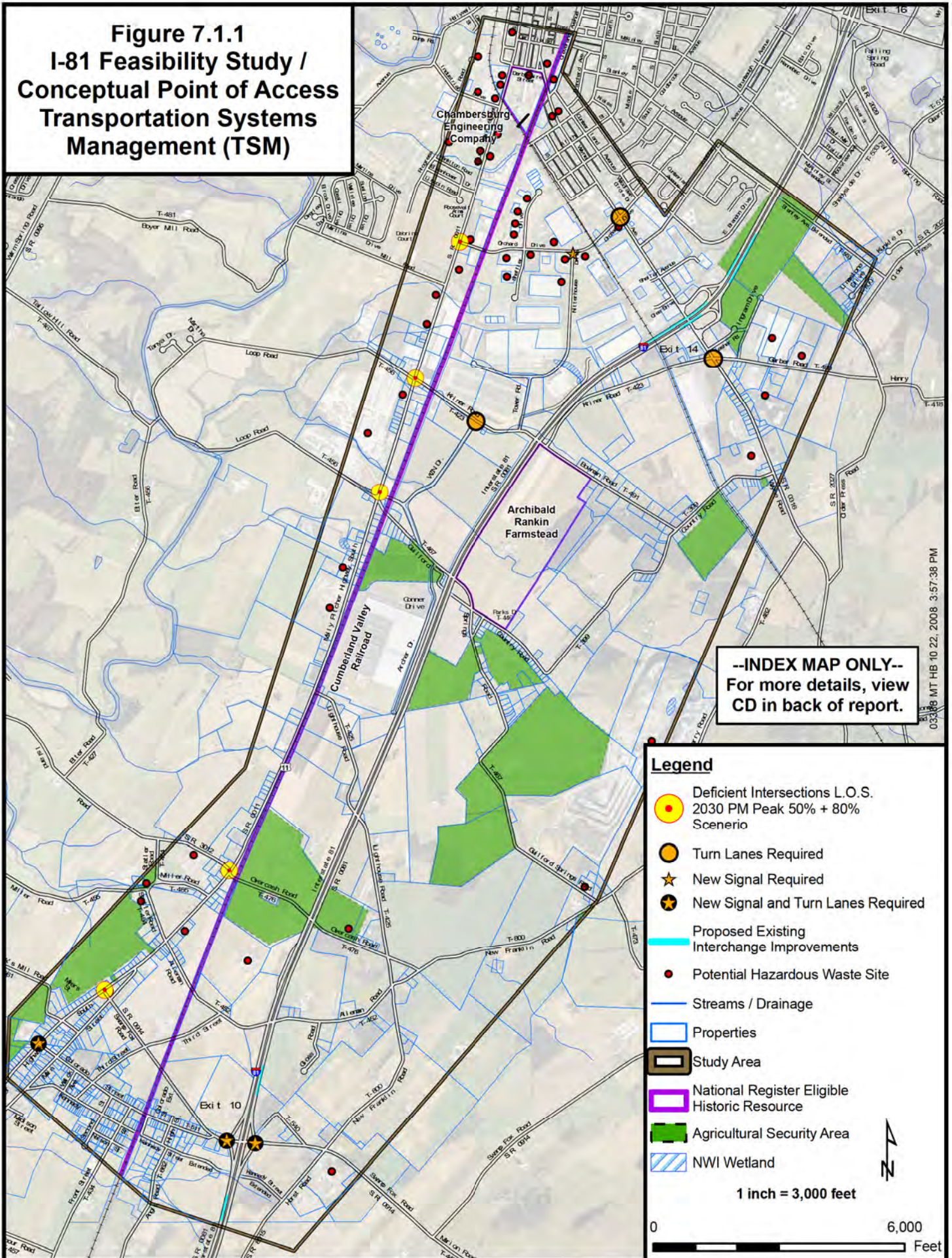
In addition to the improvements described in the discussion of the TSM option, this option also would include lane widening, lane additions, and shoulder improvements. **(Figure 7.1.2)**. The Molly Pitcher Highway (U.S. 11) would be widened to five lanes – two lanes in each direction plus a center turn lane – between Orchard Drive and Swamp Fox Road (PA 914). **(Figure 7.1.3)**.

While this TSM and widening improvements option would address the mobility needs for existing and future traffic, it would not meet the issue of addressing the future CSX Intermodal Yard traffic or the at-grade rail crossing safety issue because more traffic would need to cross the Norfolk Southern and CSX lines to access the Molly Pitcher Highway (U.S. 11), Wayne Avenue (PA 316), and Swamp Fox Road (PA 914) to reach I-81. In addition, the option would result in substantial displacements and property impacts along the Molly Pitcher Highway (U.S. 11), and would introduce access and safety issues from the many driveways because of difficulties making left turns across five lanes of traffic.

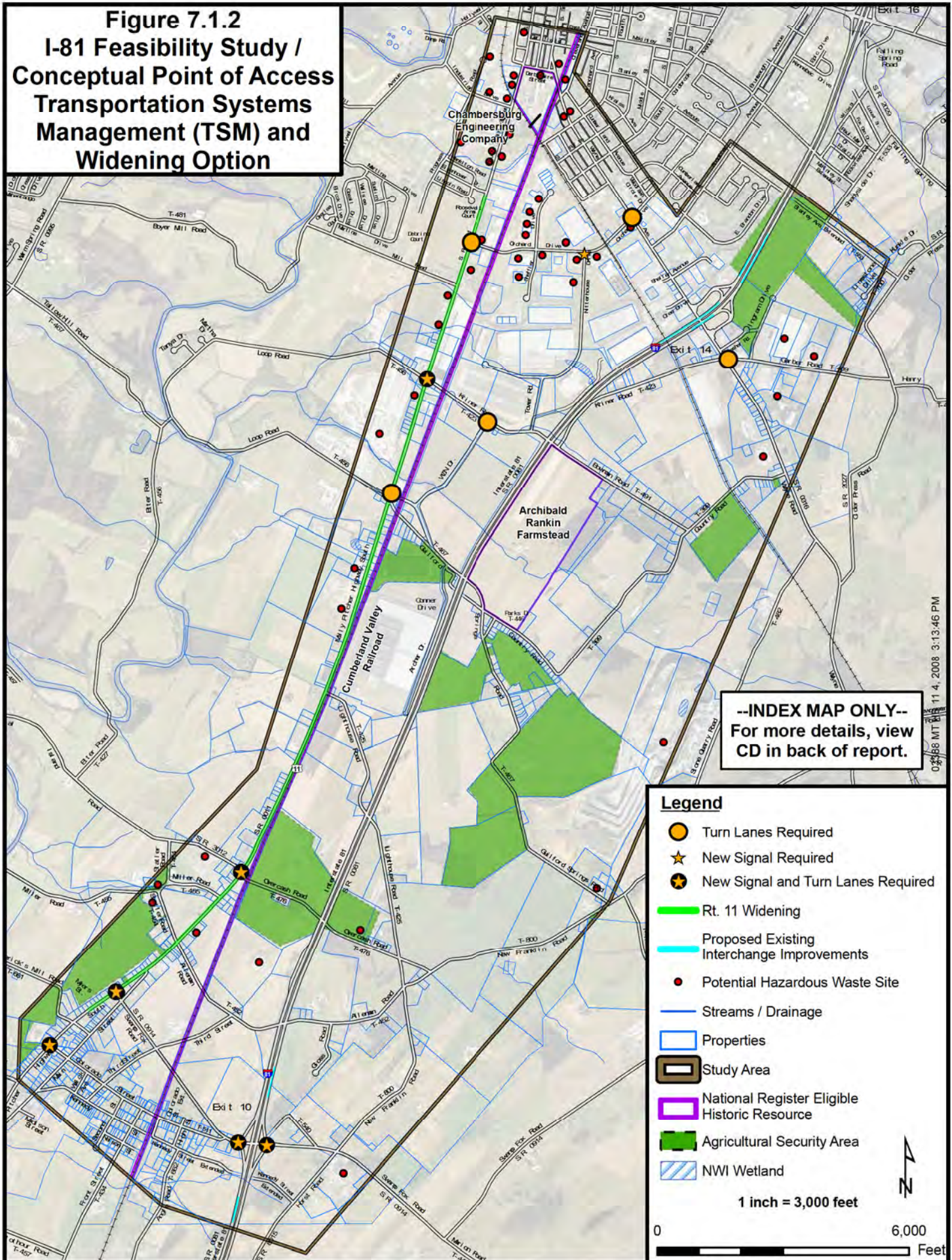


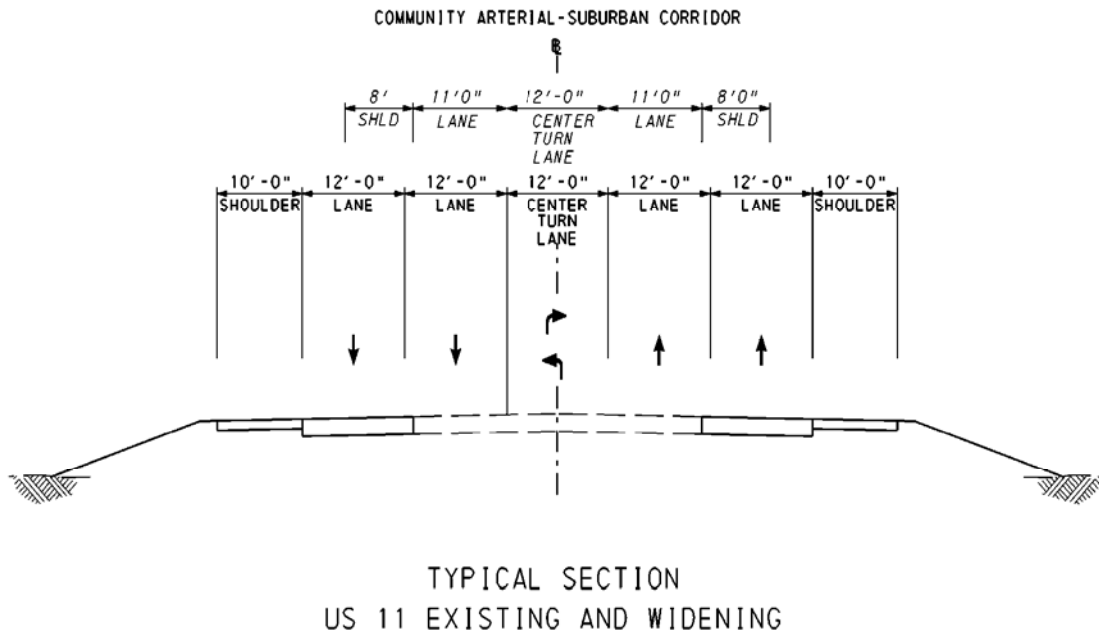
Existing U.S. 11 is three lanes with adjacent residential / historical properties and railroad

**Figure 7.1.1**  
**I-81 Feasibility Study /**  
**Conceptual Point of Access**  
**Transportation Systems**  
**Management (TSM)**



**Figure 7.1.2**  
**I-81 Feasibility Study /**  
**Conceptual Point of Access**  
**Transportation Systems**  
**Management (TSM) and**  
**Widening Option**





**FIGURE 7.1.3**

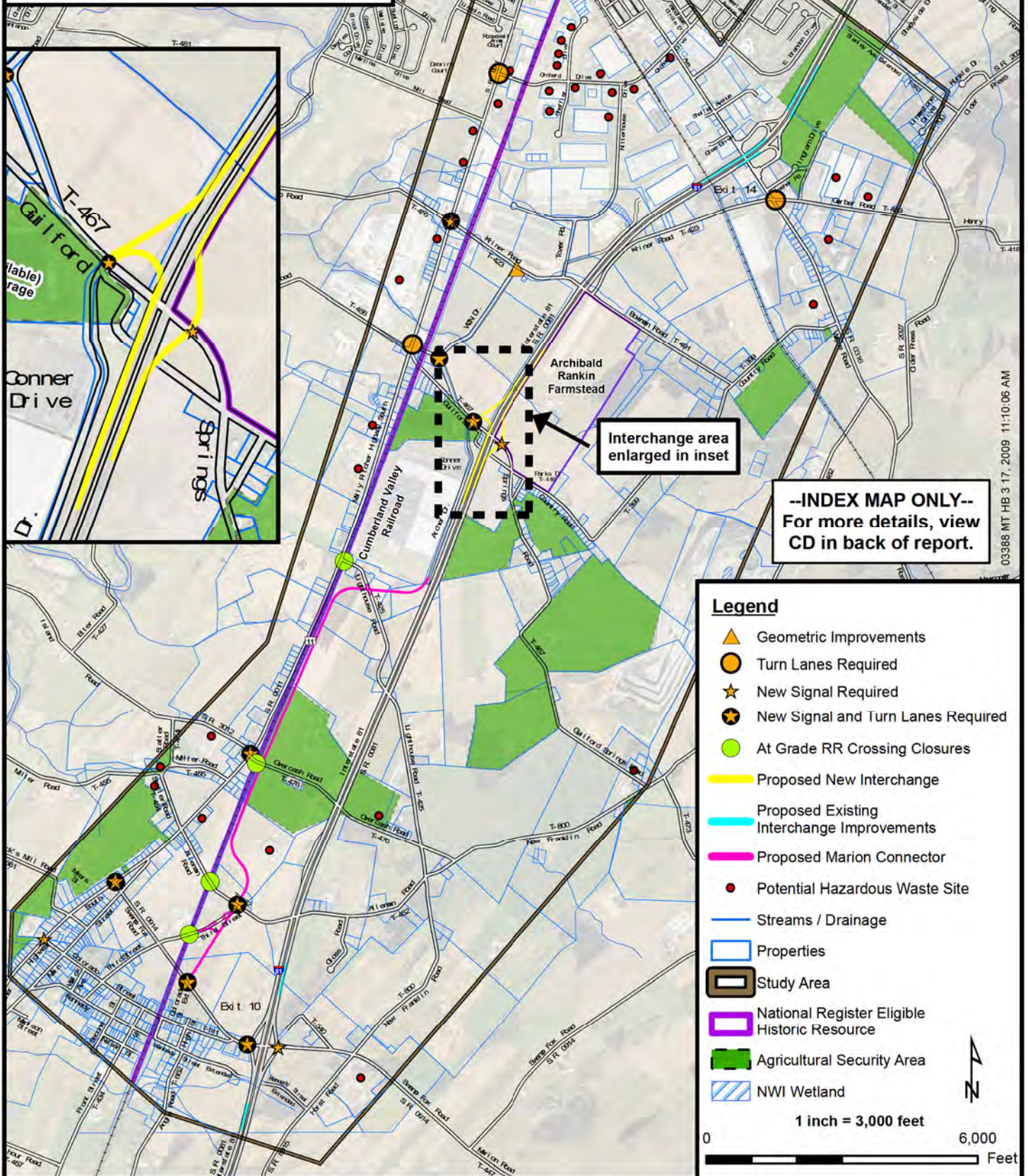
## 7.2 Alternatives Requiring New I-81 Access

### Guilford Springs Road Interchange

This option consists of a new three quadrant interchange of I-81 and Guilford Spring Road. (**Figure 7.2.1**). It would feature a diamond ramp in both of the eastern quadrants and a diamond ramp and loop ramp in the northwest quadrant. The configurations would avoid impacts to the Texas Eastern gas pipeline facility in the southwest quadrant. In conjunction with the new interchange, improvements to various study area intersections are proposed. Also, a two-lane connector road (the Marion Connector) is proposed from Archer Drive to Swamp Fox Road (SR-914), paralleling the Norfolk Southern railroad lines. The Marion Connector would accommodate development that has yet to occur in the southern section of the commercial / industrial area between US-11 and I-81. This development is expected to be in place by the design year of 2030. Since the intersection at Guilford Springs Road would accommodate the existing development without the Marion Connector, it is proposed that the Marion Connector and the various intersection improvements be completed at a later time from the Guilford Springs Road interchange construction and be funded by prospective commercial / industrial developers.

Highway capacity analysis utilizing the methodologies from the Highway Capacity Manual (HCM) 2000, was completed for all the study area intersection for both the AM and the PM peak hours. **Table 7.2.1** summarizes the delay and resulting Level-of-Service (LOS) results from the capacity analysis. Highway Capacity Manual reports from the analysis for the study area intersections are included in **Appendix D** (contained on CD at the back of this report).

**Figure 7.2.1**  
**I-81 Feasibility Study /**  
**Conceptual Point of Access**  
**Guilford Springs Road**  
**Interchange Option**





**Table 7.2.1 – Guilford Springs Road Interchange Design Option  
2030 Delay and LOS**

Intersection	Type	Movement	2030 Build				2030 Build With Improvements			
			AM		PM		Type	Movement	PM	
			Delay	LOS	Delay	LOS			Delay	LOS
US 11 & Colorado St	Unsignalized	WB	82.4	f	*	f	Signalized	Overall	11.6	B
		SB-Left	0.8	a	75.6	f				
Swamp Fox Rd & Franklin Rd/Horst Rd	Unsignalized	EB-Left	0.0	a	0.2	a	Unsignalized	EB-Left	0.2	a
		WB-Left	0.0	a	0.0	a		WB-Left	0.0	a
		NB	9.9	a	10.5	b		NB	10.5	b
		SB	9.1	a	10.0	a		SB	10.0	a
Swamp Fox Rd & I-81 NB Ramp	Unsignalized	EB-Left	1.6	a	2.4	a	Signalized	Overall	35.9	D
		NB	499.8	f	*	f				
Swamp Fox Road & I-81 SB Ramp	Unsignalized	WB-Left	1.4	a	0.8	a	Signalized	Overall	10.0	B
		SB	56.4	f	148.5	f				
Swamp Fox Rd & Colorado St	Unsignalized	WB-Left	1.3	a	14.3	b	Signalized***	Overall	29.2	C
		NB	17.1	c	47.9	e				
US 11 & Overcash Road	Unsignalized	WB	898.3	f	*	f	Signalized	Overall	19.7	B
		SB-Left	13.6	b	120.0	f				
Swamp Fox Rd & US 11	Unsignalized	WB	*	f	*	f	Signalized	Overall	22.2	C
		SB-Left	19.7	c	20.4	c				
US 11 & Social Island Rd	Unsignalized	EB	*	f	*	f	N/A			
		NB-Left	12.4	b	35.0	e				
Loop Rd & US 11	Signalized	Overall	52.5	D	213.3	F	Signalized	Overall	41.2	D
Guilford Springs Rd & WCN Dr	Unsignalized	EB	12.8	b	32.0	d	Signalized	Overall	17.4	B
		WB	12.7	b	166.8	f				
		SB	11.8	b	66.1	f				
Kriner Rd & US 11	Unsignalized	EB	*	f	*	f	Signalized	Overall	28.9	C
		WB	*	f	*	f				
		NB-Left	0.4	a	0.0	a				
		SB-Left	8.2	a	60.7	f				
Kriner Rd & WCN Dr	Unsignalized	WB-Left	0.8	a	1.2	a	Unsignalized	WB-Left	1.2	a
		NB	11.2	b	31.0	d		NB	31.0	d
Orchard Dr & US 11	Signalized	Overall	36.1	D	287.4	F	Signalized	Overall	57.1	E
Orchard Dr & Nitterhouse Dr	Unsignalized	WB-Left	9.1	a	11.0	b	Unsignalized	WB-Left	11.0	b
		NB	26.6	d	38.5	e		NB	38.5	e
Guilford Springs Rd & Archer Dr	Unsignalized	EB	12.8	b	149.5	f	Signalized	Overall	30.0	C
		WB	13.1	b	17.1	c				
		NB	11.6	b	366.8	f				
Kriner Rd & Tower Rd	Unsignalized	EB-Left	0.2	a	0.3	a	Unsignalized	EB-Left	0.3	a
		SB	10.4	b	11.7	b		SB	11.7	b
Bowman Rd & Kriner Rd	Unsignalized	SB	9.6	a	10.1	b	Unsignalized	SBL	10.1	b
Orchard Dr & Wayne Ave	Signalized	Overall	17.9	B	30.3	C	Signalized	Overall	30.3	C
Stouffer Rd & Wayne Ave	Signalized	Overall	5.4	A	10.0	A	Signalized	Overall	10.0	A
Sheller Ave & Wayne Ave	Signalized	Overall	5.6	A	8.6	A	Signalized	Overall	8.6	A

(Table Continues)

\* The Highway Capacity Manual does not generate a result due to excessive delay.

\*\* All proposed signals are actuated-uncoordinated.

\*\*\* Signalization of this intersection should be evaluated further during preliminary engineering. It may be more beneficial to the overall network to have it remain unsignalized.

**Table 7.2.1 – Guilford Springs Road Interchange Design Option  
2030 Delay and LOS (continued)**

Intersection	2030 Build						2030 Build With Improvements			
	Type	Movement	AM		PM		Type	Movement	PM	
			Delay	LOS	Delay	LOS			Delay	LOS
I-81 SB Ramp & Wayne Ave	Signalized	Overall	13.5	B	13.3	B	Signalized	Overall	13.3	B
I-81 NB Ramp & Wayne Ave	Signalized	Overall	8.7	A	15.7	B	Signalized	Overall	15.7	B
Kriner Rd & Wayne Ave	Signalized	Overall	16.3	B	36.8	D	Signalized	Overall	34.2	C
Stone Quarry Rd & Wayne Ave	Unsignalized	EB	10.7	b	9.9	a	Unsignalized	EB	20.9	c
		NB	20.6	c	13.8	b		NB	0.1	a
		SB	11.5	b	25.3	d		SB	0.0	a
Lighthouse Rd & Connector Rd	Unsignalized	WBL			7.7	a	Unsignalized	WBL	7.7	a
		NBT			9.0	a		NBT	9.0	a
		SBT			8.1	a		SBT	8.1	a
Overcash Rd & Connector Rd	Unsignalized	EBL			12.4	b	Signalized	Overall	13.1	B
		NBT			44.5	e				
		SBT			11.8	b				
Alleman Rd & Connector Rd	Unsignalized	EBL			17.8	c	Signalized	Overall	26.0	C
		NBT			99.7	f				
		SBT			157.9	f				
Third St & Connector Rd	Unsignalized	EBL			9.7	a	Unsignalized	EBL	31.2	d
		NBT			10.1	b		NBT	0.0	a
		SBT			82.5	f		SBT	0.0	a
Swamp Fox Rd & Connector Rd	Signalized	Overall			88.4	f	Signalized	Overall	41.0	D
Guilford Springs Rd / Proposed NB ramp	Unsignalized	EBL			39.5	e	Signalized	Overall	19.9	B
		NBL			11.1	b				
		WBT			9.5	a				

\* The Highway Capacity Manual does not generate a result due to excessive delay.

\*\* All proposed signals are actuated-uncoordinated.

\*\*\* Signalization of this intersection should be evaluated further during preliminary engineering. It may be more beneficial to the overall network to have it remain unsignalized.

Based upon the LOS analysis completed for the Guilford Springs Road option, the following improvements are suggested to mitigate the deficient LOS conditions:

1. Signalize the U.S. 11 and Colorado Street intersection and install railroad preemption for the adjacent at-grade crossing.
2. Signalize the I-81 northbound access ramps and Swamp Fox Road intersection.
3. Signalize the I-81 southbound access ramps and Swamp Fox Road intersection, construct and eastbound right-turn lane and a southbound right-turn lane.
4. Signalize the U.S. 11 and Overcash Road intersection, align Social Island Road with Overcash Road, and construct a northbound left-turn lane.
5. Signalize the U.S. 11 and Swamp Fox Road intersection; construct a westbound right turn lane and a southbound right turn lane.
6. Construct left-turn lanes for all four approaches at the U.S. 11 and Loop Road intersection at Guilford Springs Road with double left turn lane provided for the westbound approach.
7. Signalize the intersection of Guilford Springs Road and WCN Drive and construct a southbound right turn lane.
8. Signalize the intersection of U.S. 11 and Kriner Road and construct a westbound right turn lane.
9. Construct a northbound right turn lane at the signalized intersection of U.S. 11 and Orchard Drive.

10. Signalize the I-81 northbound access ramps at Guilford Springs Road and the Guilford Springs Road and Archer Road intersection and construct a left turn lane for the eastbound approach and a right turn lane for the northbound approach.
11. Construct a westbound right-turn lane at the signalized intersection of Kriner Road and Wayne Avenue.
12. Change the stop control at the Wayne Avenue and Stone Quarry Road intersection so that only eastbound Stone Quarry Road stops and the northbound and southbound Wayne Avenue approaches operate free.
13. Signalize the intersection of Alleman Road and the proposed Marion Connector, construct a westbound left turn lane.
14. Change the stop control at the Third Street and the proposed Marion Connector intersection so that only eastbound proposed Marion Connector stop and the northbound and southbound Third Street approaches operate free.
15. Construct westbound and southbound right-turn lanes and an eastbound left-turn lane at the signalized intersection of Swamp Fox Road and the proposed Marion Connector.

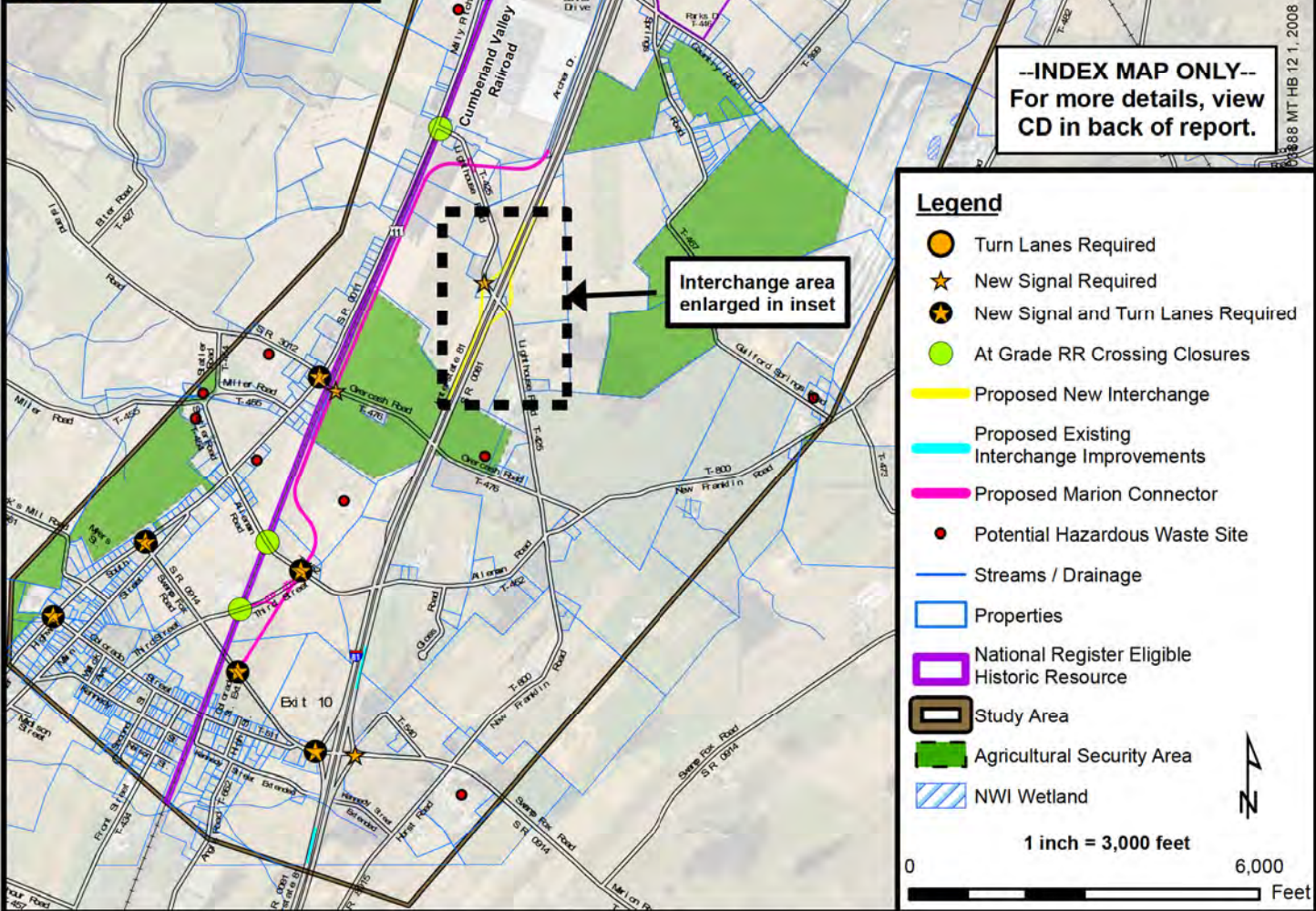
The proposed interchange would address the mobility and safety needs of the corridor, including a reduction in traffic across the at-grade railroad crossings. The estimated environmental effects would consist of minor impacts to one National Register historic resource and one Agricultural Security Area, which has been developed and will presumably lose the farmland protection status. The boundary of the eligible historic resource has yet to be established, and may not extend to the impact area. No displacements or access impairments would result from this design option.

### **Lighthouse Road Interchange**

This option consists of a new diamond interchange of I-81 and Lighthouse Road. (**Figure 7.2.2**). It would feature a diamond ramp in all four quadrants. As with the Guilford Springs Road Interchange, improvements to various study area intersections are also proposed. Also, like that Guilford Spring Road Interchange, a two-lane connector road (the Marion Connector) is proposed from Archer Drive to Swamp Fox Road (SR-914), paralleling the Norfolk Southern railroad lines. The Marion Connector would accommodate development that has yet to occur in the southern section of the commercial / industrial area between U.S. 11 and I-81. This development is expected to be in place by the design year of 2030. Like the Guilford Spring Road interchange, it is proposed that the Marion Connector and the various intersection improvements be completed at a later time from the Lighthouse Road Interchange construction and be funded by prospective commercial / industrial developers.

Highway capacity analysis utilizing the methodologies from the Highway Capacity Manual (HCM) 2000, was completed for all the study area intersection for both the AM and the PM peak hours. **Table 7.2.2** summarizes the delay and resulting Level-of-Service (LOS) results from the capacity analysis. Highway Capacity Manual reports from the analysis for the study area intersections are included in **Appendix D** (contained on CD at the back of this report).

**Figure 7.2.2**  
**I-81 Feasibility Study /**  
**Conceptual Point of Access**  
**Lighthouse Road**  
**Interchange Option**



**--INDEX MAP ONLY--**  
**For more details, view**  
**CD in back of report.**

**Interchange area**  
**enlarged in inset**

**Legend**

- Turn Lanes Required
- New Signal Required
- New Signal and Turn Lanes Required
- At Grade RR Crossing Closures
- Proposed New Interchange
- Proposed Existing Interchange Improvements
- Proposed Marion Connector
- Potential Hazardous Waste Site
- Streams / Drainage
- Properties
- National Register Eligible Historic Resource
- Study Area
- Agricultural Security Area
- NWI Wetland

1 inch = 3,000 feet

0 6,000 Feet

08/28/08 MT HB 12 T. 2008 3:23:24 PM

**Table 7.2.2 – Lighthouse Road Interchange Design Option  
2030 Delay and LOS**

Intersection	Type	Movement	2030 Build				2030 Build With Improvements			
			AM		PM		Type	Movement	PM	
			Delay	LOS	Delay	LOS			Delay	LOS
US 11 & Colorado St	Unsignalized	WB	82.4	f	*	f	Signalized	Overall	50.9	D
		SB-Left	0.8	a	75.6	f				
Swamp Fox Rd & Franklin Rd/Horst Rd	Unsignalized	EB-Left	0.0	a	0.2	a	Unsignalized	EB-Left	0.2	a
		WB-Left	0.0	a	0.0	a		WB-Left	0.0	a
		NB	9.9	a	10.5	b		NB	10.5	b
		SB	9.1	a	10.0	a		SB	10.0	a
Swamp Fox Rd & I-81 NB Ramp	Unsignalized	EB-Left	1.6	a	2.4	a	Signalized	Overall	34.6	C
		NB	499.8	f	*	f				
Swamp Fox Road & I-81 SB Ramp	Unsignalized	WB-Left	1.4	a	0.8	a	Signalized	Overall	10.4	B
		SB	56.4	f	148.5	f				
Swamp Fox Rd & Colorado St	Unsignalized	WB-Left	1.3	a	14.3	b	Signalized***	Overall	34.6	C
		NB	17.1	c	47.9	e				
US 11 & Overcash Road	Unsignalized	WB	1013.1	f	*	f	Signalized	Overall	19.7	B
		SB-Left	15.0	b	281.4	f				
Swamp Fox Rd & US 11	Unsignalized	WB	*	f	*	f	Signalized	Overall	54.4	D
		SB-Left	19.7	c	20.4	c				
US 11 & Social Island Rd	Unsignalized	EB	*	f	*	f	N/A			
		NB-Left	12.5	b	41.8	e				
Loop Rd & US 11	Signalized	Overall	30.7	C	203.9	F	Signalized	Overall	27.1	C
Guilford Springs Rd & WCN Dr	Unsignalized	EB	11.7	b	16.9	c	Signalized	Overall	23.6	C
		WB	10.9	b	49.8	e				
		SB	10.8	b	34.9	d				
Kriner Rd & US 11	Unsignalized	EB	*	f	*	f	Unsignalized	Overall	32.6	C
		WB	*	f	*	f				
		NB-Left	0.4	a	0.0	a				
		SB-Left	8.7	a	87.6	f				
Kriner Rd & WCN Dr	Unsignalized	WB-Left	1.0	a	1.3	a	Unsignalized	WB-Left	1.3	a
		NB	11.7	b	40.3	e		NB	26.8	d
Orchard Dr & US 11	Signalized	Overall	42.5	D	323.4	F	Signalized	Overall	66.9	E
Orchard Dr & Nitterhouse Dr	Unsignalized	WB-Left	9.1	a	11.3	b	Unsignalized	WB-Left	11.3	b
		NB	27.3	d	48.0	e		NB	48.0	e
Guilford Springs Rd & Archer Dr	Unsignalized	EB	8.9	a	17.4	c	Unsignalized	EB	17.4	c
		WB	8.4	a	10.0	b		WB	10.0	b
		NB	10.4	b	30.8	d		NB	30.8	d
Kriner Rd & Tower Rd	Unsignalized	EB-Left	0.2	a	0.3	a	Unsignalized	EB-Left	0.3	a
		SB	10.7	b	12.2	b		SB	12.2	b
Bowman Rd & Kriner Rd	Unsignalized	SB	9.8	a	10.2	b	Unsignalized	SBL	10.2	b
Orchard Dr & Wayne Ave	Signalized	Overall	18.5	B	39.3	D	Signalized	Overall	20.3	C
Stouffer Rd & Wayne Ave	Signalized	Overall	6.0	A	15.9	B	Signalized	Overall	15.9	B
Sheller Ave & Wayne Ave	Signalized	Overall	3.9	A	10.1	B	Signalized	Overall	10.1	B

(Table Continues)

\* The Highway Capacity Manual does not generate a result due to excessive delay.

\*\* All proposed signals are actuated-uncoordinated.

\*\*\* Signalization of this intersection should be evaluated further during preliminary engineering. It may be more beneficial to the overall network to have it remain unsignalized.

**Table 7.2.2 – Lighthouse Road Interchange Design Option  
2030 Delay and LOS (continued)**

Intersection	Type	Movement	2030 Build				2030 Build With Improvements			
			AM		PM		Type	Movement	PM	
			Delay	LOS	Delay	LOS			Delay	LOS
I-81 SB Ramp & Wayne Ave	Signalized	Overall	14.8	B	13.1	B	Signalized	Overall	13.1	B
I-81 NB Ramp & Wayne Ave	Signalized	Overall	9.3	A	16.9	B	Signalized	Overall	16.9	B
Kriner Rd & Wayne Ave	Signalized	Overall	16.3	B	41.8	D	Signalized	Overall	41.8	D
Stone Quarry Rd & Wayne Ave	Unsignalized	EB	10.7	b	9.9	a	Unsignalized	EB	20.9	c
		NB	20.6	c	13.8	b		NB	0.0	a
		SB	11.5	b	25.3	d		SB	0.0	a
Lighthouse Rd & Connector Rd	Unsignalized	WBL			16.5	c	Unsignalized	WBL	16.5	c
		NBR			23.7	c		NBR	23.7	c
		SBL			35.3	e		SBL	35.3	e
Overcash Rd & Connector Rd	Unsignalized	EBT			15.5	c	Signalized	Overall	20.0	B
		WBT			11.7	b				
		NBL			68.4	f				
Alleman Rd & Connector Rd	Unsignalized	EBT			17.8	c	Signalized	Overall	28.0	C
		WBT			377.0	f				
		NBL			99.7	f				
Third St & Connector Rd	Unsignalized	EBL			9.7	a	Unsignalized	EBL	33.7	d
		NBT			10.1	b		NBT	0.0	a
		SBT			82.5	f		SBT	0.0	a
Swamp Fox Rd & Connector Rd	Unsignalized	EBL			73.8	f	Signalized	Overall	45.1	D
		WBT			269.2	f				
		SBL			471.6	f				
NB Ramp & Lighthouse Rd	Unsignalized	EBL			16.4	c	Unsignalized	EBL	16.4	c
		WBT			8.0	a		WBT	8.0	a
		NBL			9.9	a		NBL	9.9	a
SB Ramp & Lighthouse Rd	Unsignalized	EBR			68.3	f	Signalized	Overall	8.6	A
		SBR			10.1	b				
		NBT			9.7	a				

\* The Highway Capacity Manual does not generate a result due to excessive delay.

\*\* All proposed signals are actuated-uncoordinated.

\*\*\* Signalization of this intersection should be evaluated further during preliminary engineering. It may be more beneficial to the overall network to have it remain unsignalized.

Based upon the LOS analysis completed for the Lighthouse Road option, the following improvements are suggested to mitigate the deficient LOS conditions:

1. Signalize the U.S. 11 and Colorado Street intersection and construct a southbound left-turn lane.
2. Signalize the I-81 northbound and southbound access ramps at Swamp Fox Road. Construct an eastbound right turn lane at the I-81 southbound ramps and Swamp Fox Road intersection.
3. Signalize the U.S. 11 and Overcash Road intersection. Align Social Island Road with Overcash Road and construct eastbound and northbound left-turn lanes.
4. Signalize the intersection of U.S. 11 and Swamp Fox Road; construct a westbound right turn lane and a southbound left turn lane.
5. Construct left-turn lanes for all approaches at the U.S. 11 and Loop Road intersection at Guilford Springs Road.
6. Signalize the Guilford Springs Road and WCN Drive intersection; construct a southbound right turn lane.
7. Signalize the intersection of U.S. 11 and Kriner Road; construct a westbound right turn lane.

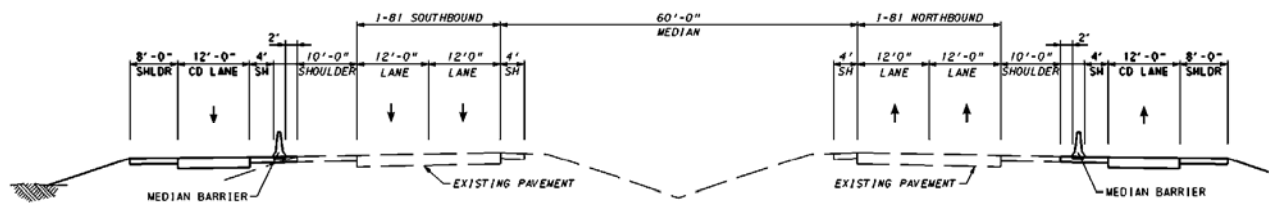
8. Construct a northbound right turn lane at the intersection of Kriner Road and WCN Driver.
9. Construct a northbound right turn lane at the intersection of U.S. 11 and Orchard Drive.
10. Rearrange the stop control at the intersection of Bowman Road and Kriner Road to permit the eastbound and westbound movements to operate free with only the southbound approach stop controlled.
11. Rearrange the stop control at the intersection of Wayne Avenue and Stone Quarry Road to permit the northbound and southbound approaches to operate free with only the eastbound approach stop controlled.
12. Signalize the intersection of Overcash Road and the proposed Marion Connector.
13. Signalize the intersection of Alleman Road and the proposed Marion Connector; construct northbound and westbound left turn lanes.
14. Rearrange the stop control at the intersection of Third Street and the proposed Marion Connector to permit the northbound and southbound movements to operate free with only the eastbound approach stop controlled.
15. Signalize the intersection of Swamp Fox Road and the proposed Marion Connector; construct right turn lanes for the westbound and southbound approaches and construct a left turn lane for the eastbound approach.
16. Signalize the proposed southbound I-81 access ramps intersection with Lighthouse Road.

The proposed interchange would address the mobility and safety needs of the corridor, including a reduction in traffic across the at-grade crossings, but less effectively than the Guilford Springs Road interchange. The reason for this is that the location farther to the south makes the interchange more remote from the established development and less likely to attract traffic away from the Wayne Avenue interchange in the near term. However, as the future commercial / industrial development progresses south to Marion, the necessity for the Marion Connector will increase.

The estimated environmental effects would consist of minor impacts to farming operations surrounding the proposed interchange location. None of the affected area appears to be in an Agricultural Security Area or other farmland preservation program. There is a farmstead in the northeast quadrant that would be potentially displaced, which is also potentially eligible for the National Register of Historic Places.

## Collector Distributor Road

This option consists of a collector-distributor (C-D) roadway that would parallel both sides of I-81. (**Figure 7.2.3**) The C-D road would provide access to local roads, but would be barrier separated from I-81. The C-D roadway would be constructed on the outside of I-81 to preserve the median width for a proposed third travel lane in each direction. (**Figure 7.2.4**) This option would not involve the creation of additional access points on I-81. Instead it would move two of the access points from the Wayne Avenue Interchange – the southbound on-ramp and the northbound off-ramp – to Kriner Road. As with the Guilford Springs Road Interchange and the Lighthouse Road Interchange, improvements to various study area intersections are proposed. As with the two interchange concepts, a two-lane connector road (the Marion Connector) is proposed from Archer Drive to Swamp Fox Road (SR-914), paralleling the Norfolk Southern railroad lines.



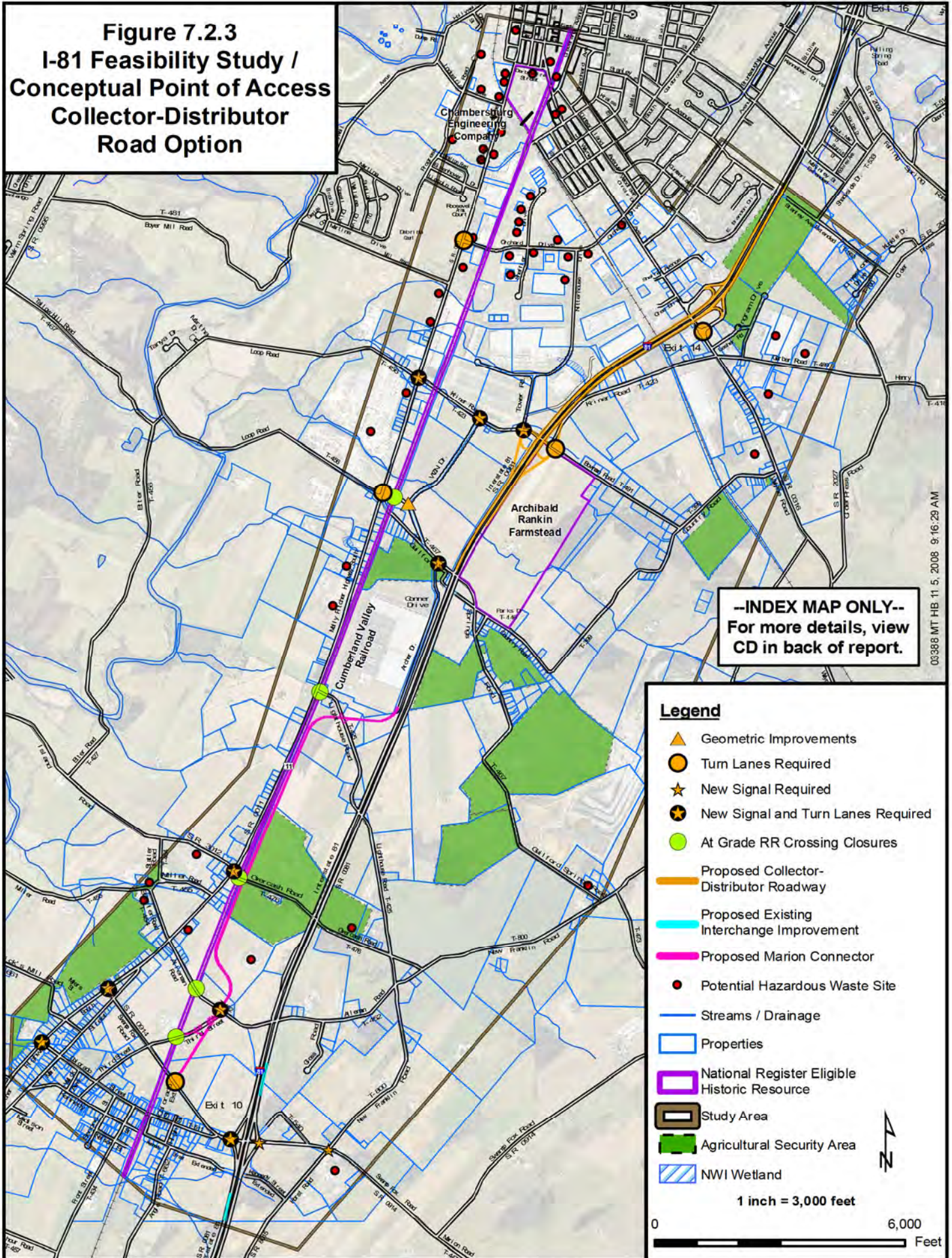
TYPICAL SECTION  
CD SYSTEM

FIGURE 7.2.4

Highway capacity analysis utilizing the methodologies from the Highway Capacity Manual (HCM) 2000, was completed for all the study area intersection for both the AM and the PM peak hours. **Table 7.2.3** summarizes the delay and resulting Level-of-Service (LOS) results from the capacity analysis. Highway Capacity Manual reports from the analysis for the study area intersections are included in **Appendix D** (contained on the CD at the back of this report).



**Figure 7.2.3**  
**I-81 Feasibility Study /**  
**Conceptual Point of Access**  
**Collector-Distributor**  
**Road Option**



**--INDEX MAP ONLY--**  
**For more details, view**  
**CD in back of report.**

**Legend**

- Geometric Improvements
- Turn Lanes Required
- New Signal Required
- New Signal and Turn Lanes Required
- At Grade RR Crossing Closures
- Proposed Collector-Distributor Roadway
- Proposed Existing Interchange Improvement
- Proposed Marion Connector
- Potential Hazardous Waste Site
- Streams / Drainage
- Properties
- National Register Eligible Historic Resource
- Study Area
- Agricultural Security Area
- NWI Wetland

1 inch = 3,000 feet

0 6,000 Feet

03388 MT HB 11 5, 2008 9:16:29 AM

**Table 7.2.3 – Collector Distributor System at Wayne Avenue  
2030 Delay and LOS**

Intersection	Type	Movement	2030 Build				2030 Build With Improvements			
			AM		PM		Type	Movement	PM	
			Delay	LOS	Delay	LOS			Delay	LOS
US 11 & Colorado St	Unsignalized	WB	82.4	f	*	f	Signalized	Overall	9.1	A
		SB-Left	0.8	a	75.6	f				
Swamp Fox Rd & Franklin Rd/Horst Rd	Unsignalized	EB-Left	0.0	a	0.2	a	Signalized	Overall	5.8	A
		WB-Left	0.0	a	0.0	a				
		NB	9.9	a	10.5	b				
		SB	9.1	a	10.0	a				
Swamp Fox Rd & I-81 NB Ramp	Unsignalized	EB-Left	1.6	a	2.4	a	Signalized	Overall	34.4	C
		NB	499.8	f	*	f				
Swamp Fox Rd & I-81 SB Ramp	Unsignalized	WB-Left	1.4	a	0.8	a	Signalized	Overall	9.9	A
		SB	56.4	f	148.5	f				
Swamp Fox Rd & Colorado St	Unsignalized	WB-Left	1.3	a	14.3	b	Signalized***	Overall	34.6	C
		NB	17.1	c	47.9	e				
US 11 & Overcash Rd	Unsignalized	WB	562.4	f	*	f	Signalized	Overall	45.6	D
		SB-Left	13.9	b	159.0	f				
Swamp Fox Rd & US 11	Unsignalized	WB	*	f	*	f	Signalized	Overall	19.2	B
		SB-Left	19.7	c	20.4	c				
US 11 & Social Island Rd	Unsignalized	EB	*	f	*	f	N/A			
		NB-Left	12.5	b	38.7	e				
Loop Rd & US 11	Signalized	Overall	29.2	C	188.9	F	Signalized	Overall	36.7	D
Guilford Springs Rd & WCN Dr	Unsignalized	EB	12.8	b	12.1	b	Unsignalized	EB	1.4	a
		WB	11.5	b	135.0	f		WB	0.0	a
		SB	16.1	c	15.4	c		SB	29.4	d
Kriner Rd & US 11	Unsignalized	EB	*	f	*	f	Signalized	Overall	41.6	D
		WB	*	f	*	f				
		NB-Left	0.4	a	0.0	a				
		SB-Left	9.4	a	106.1	f				
Kriner Rd & WCN Dr	Unsignalized	WB-Left	4.6	a	3.7	a	Signalized	Overall	47.1	D
		NB	32.8	d	*	f				
Orchard Dr & US 11	Signalized	Overall	36.1	D	287.4	F	Signalized	Overall	59.3	E
Orchard Dr & Nitterhouse Dr	Unsignalized	WB-Left	9.0	a	11.0	b	Unsignalized	WB-Left	0.3	a
		NB	26.2	d	38.0	e		NB	39.2	e
Guilford Springs Rd & Archer Dr	Unsignalized	EB	10.6	b	11.3	b	Signalized	Overall	24.9	C
		WB	8.3	a	9.7	a				
		NB	10.4	b	112.3	f				
Kriner Rd & Tower Rd	Unsignalized	EB-Left	0.2	a	1.0	a	Unsignalized	EB-Left	1.0	a
		SB	13.0	b	33.4	d		SB	33.4	d
Bowman Rd & Kriner Rd	Signalized	Overall			*	f	Signalized	Overall	18.5	B
Orchard Dr & Wayne Ave	Signalized	Overall	17.5	B	37.4	D	Signalized	Overall	37.4	D
Stouffer Rd & Wayne Ave	Signalized	Overall	5.4	A	12.7	B	Signalized	Overall	12.7	B
Sheller Ave & Wayne Ave	Signalized	Overall	4.9	A	10.6	B	Signalized	Overall	10.6	B

(Table Continues)

\* The Highway Capacity Manual does not generate a result due to excessive delay.

\*\* All proposed signals are actuated-uncoordinated.

\*\*\* Signalization of this intersection should be evaluated further during preliminary engineering. It may be more beneficial to the overall network to have it remain unsignalized.

**Table 7.2.3 – Collector Distributor System at Wayne Avenue  
2030 Delay and LOS (continued)**

Intersection	2030 Build						2030 Build With Improvements			
	Type	Movement	AM		PM		Type	Movement	PM	
			Delay	LOS	Delay	LOS			Delay	LOS
I-81 SB Ramp & Wayne Ave	Signalized	Overall	25.0	C	20.7	C	Signalized	Overall	20.7	C
I-81 NB Ramp & Wayne Ave	Signalized	Overall	19.8	B	184.0	F	Signalized	Overall	25.5	C
Kriner Rd & Wayne Ave	Signalized	Overall	16.9	B	39.8	D	Signalized	Overall	36.8	D
Stone Quarry Rd & Wayne Ave	Unsignalized	EB	10.7	b	9.9	a	Unsignalized	EB	9.9	a
		NB	20.6	c	13.8	b		NB	13.8	b
		SB	11.5	b	25.3	d		SB	25.3	d
Lighthouse Rd & Connector Rd	Unsignalized	WBR			7.5	a	Unsignalized	WBR	7.5	a
		NBT			8.5	a		NBT	8.5	a
		SBT			7.8	a		SBT	7.8	a
Overcash Rd & Connector Rd	Unsignalized	EBT			10.9	b	Unsignalized	EBT	10.9	b
		WBT			10.5	b		WBT	10.5	b
		NBL			35.1	e		NBL	35.1	e
Alleman Rd & Connector Rd	Unsignalized	EBT			17.8	c	Signalized	Overall	17.3	B
		WBT			377.0	f				
		NBL			99.7	f				
Third St & Connector Road	Unsignalized	EBL			9.7	a	Unsignalized	EBL	24.8	c
		NBT			10.1	b		NBT	0.0	a
		SBT			82.5	f		SBT	0.0	a
Swamp Fox Rd & Connector Rd	Signalized	Overall			88.4	F	Signalized	Overall	41.8	D

\* The Highway Capacity Manual does not generate a result due to excessive delay.

\*\* All proposed signals are actuated-uncoordinated.

\*\*\* Signalization of this intersection should be evaluated further during preliminary engineering. It may be more beneficial to the overall network to have it remain unsignalized.

Based upon the LOS analysis completed for the Collector-Distributor Road option, the following improvements are suggested to mitigate the deficient LOS conditions:

1. Signalize the U.S. 11 and Colorado Street intersection and construct a southbound left-turn lane.
2. Signalize the Swamp Fox Road and Franklin Road/Horst Road intersection.
3. Signalize the Swamp Fox Road and I-81 northbound and I-81 southbound access ramp intersections. Construct an eastbound right-turn lane at the I-81 southbound access ramp intersection.
4. Signalize the U.S. 11 and Overcash Road intersection. Realign Social Island Road with Overcash Road and construct an eastbound left-turn lane, a northbound left-turn lane, and a southbound right-turn lane.
5. Signalize the U.S. 11 and Swamp Fox Road intersection, construct a westbound right-turn lane and a southbound left-turn lane.
6. Construct left-turn lanes for all approaches at the U.S. 11 and Loop Road intersection at Guilford Springs Road.
7. Reconfigure the stop control at the Guilford Springs Road and WCN Drive intersection to allow eastbound and westbound movement to operate free. Construct a southbound right-turn lane.
8. Signalize the U.S. 11 and Kriner Road intersection, construct left-turn lanes for the eastbound, westbound and southbound approaches and a right-turn lane for the northbound approach.
9. Signalize the Kriner Road and WCN Drive intersection; construct a westbound left turn lane and a northbound right turn lane.
10. Construct a northbound right turn lane and a southbound left-turn lane at the U.S. 11 and Orchard Drive intersection.

11. Signalize the Guilford Springs Road and Archer Drive intersection and construct right-turn lanes for the eastbound and northbound approaches.
12. Construct a southbound left turn lane and a northbound right turn lane at the Bowman Road and Kriner Road intersection. Signalize the Tower Road and Kriner Road intersection and construct turn lanes.
13. Construct left turn lanes for the westbound and southbound approaches at the I-81 northbound ramps and Wayne Avenue intersection.
14. Signalize the Alleman Road and the proposed Marion Connector intersection, construct a westbound left turn lane and a southbound right turn lane.
15. Reconfigure the stop control at the Third Street and the proposed Marion Connector intersection to allow the northbound and southbound approaches to operate free.
16. Construct an eastbound left turn lane and construct right turn lanes for the westbound and southbound approaches at the Swamp Fox Road and the proposed Marion Connector intersection.

The Marion Connector would accommodate development that has yet to occur in the southern section of the commercial / industrial area between U.S. 11 and I-81. The development is expected to be in place by the design year of 2030. Like the two interchanges, it is proposed that the Marion Connector and the various intersection improvements be completed at a later time from the Collector-Distributor constructions and be funded by prospective commercial / industrial developers. The proposed C-D system would address the mobility and safety needs of the corridor, including a reduction in traffic across the at-grade railroad crossings.

The estimated environmental effects would focus on required right-of-way acquisition adjacent to I-81 from north of Wayne Avenue (PA 316) to Guilford Springs Road. Retaining walls would be built to reduce the amount of right-of-way acquisition required, and would avoid the displacement of Ozburn-Hessey Logistics on the west side of I-81. On the east side of I-81 between Kriner Road and the Interstate, displacement of the Gateway Gallery Auction could be avoided by the retaining wall installation, but adjacent buildings might need to be relocated.

Other environmental issues include tributaries that drain under I-81 with the potential for wetlands. One National Register eligible historic property is present to the east of I-81 between Bowman Road and Guilford Springs Road. Minor impacts to farming operations adjacent to I-81 would occur, including two parcels in an Agricultural Security Area.

One of the main liabilities of the C-D option is cost. The need to build extensive retaining walls and to replace the bridges at Wayne Avenue (PA 316) and over the CSX railroad lines results in a cost that is much greater than the Guilford Springs Road Interchange or the Lighthouse Road Interchange.

## Southbound I-81 Access Ramps at Guilford Springs Road with Selected TSM Improvements

This option was initiated at a project status meeting on October 27, 2008 in accordance with PennDOT's *Smart Transportation Guidebook* (March 2008). The focus of Smart Transportation is to develop transportation facilities that work well for all users, are affordable, and support smart growth community planning goals. In the case of the I-81 Conceptual Point of Access Study, this option will provide the incremental transportation infrastructure improvements to manage economic growth and development within the corridor, as the development progresses southward toward Marion. That is, the transportation improvements proposed today do not necessarily need to solve traffic problems from development that has not occurred yet. Rather the improvements should reflect the need to address existing problems into the short-term future and to be built upon as traffic demands manifest themselves. This smart approach avoids the diminishing returns associated with speculative over-building to address projected needs into the distant future. The key is to address the transportation issues in a cost-effective and community sensitive manner.

This initiative is well-suited for the commercial / industrial corridor south of Chambersburg. First, the transportation improvements are expected to progress in tandem with the land use development. Second, the infrastructure support involves roadway improvements for inter-modal transportation facilities. Third, the improvements involve the safety aspect of eliminating at-grade railroad crossings.

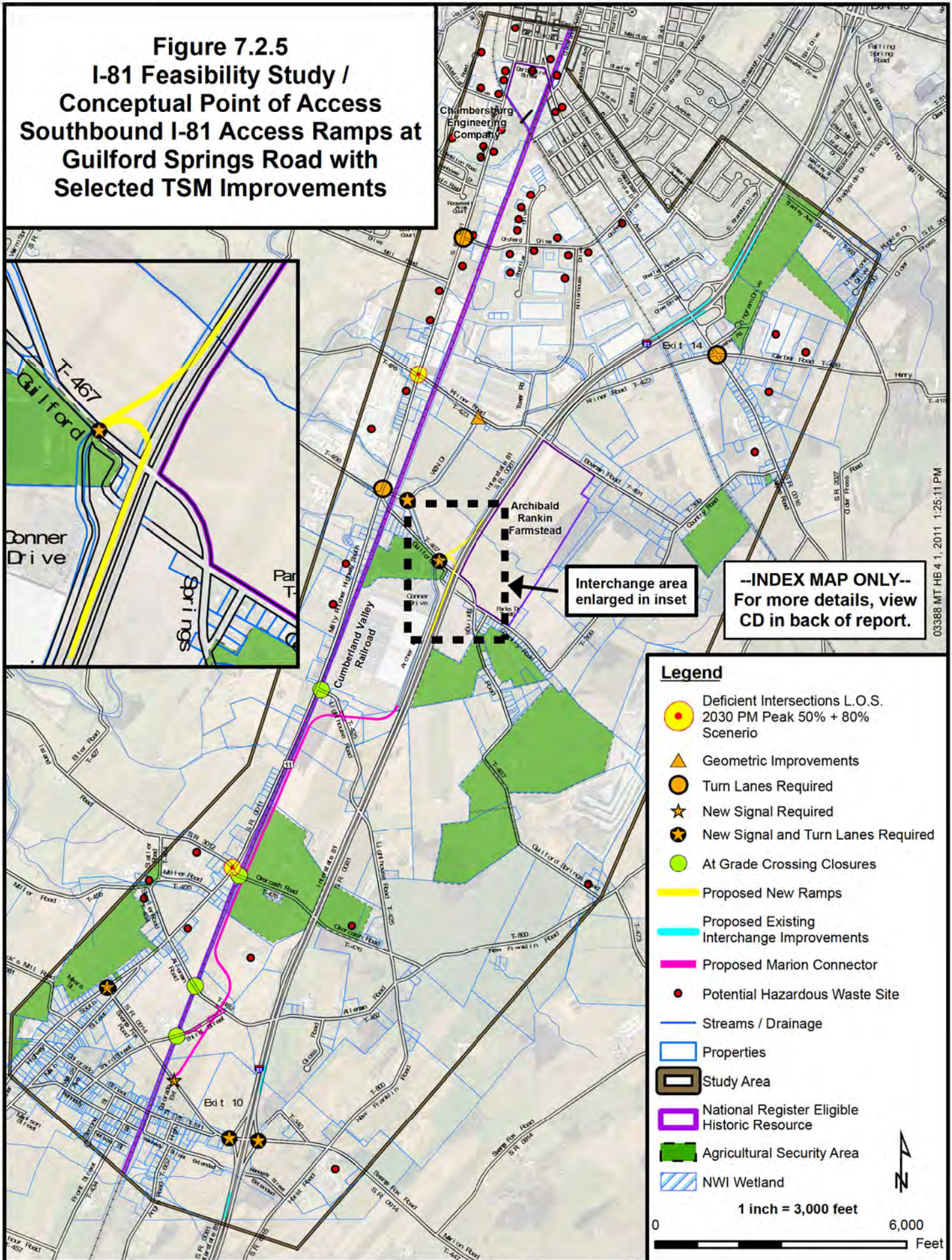
The Southbound I-81 Access Ramps Option would involve the construction of a southbound off-ramp and on-ramp at Guilford Springs Road and I-81. **(Figure 7.2.5)** The ramps would be in the northwest quadrant. Unlike the Guilford Springs Road Interchange Option that was described previously, this option would not include a full interchange with northbound ramps or widening of the Guilford Springs Road Bridge over I-81.

This option would also include improvements to the following intersections:

- Orchard Drive and Molly Pitcher Highway (U.S. 11)
- Wayne Avenue (PA 316) and Kriner Road
- Kriner Road and WCN Drive
- Guilford Springs Road and Molly Pitcher Highway (U.S. 11)
- Guilford Springs Road and WCN Drive
- Guilford Springs Road and the proposed I-81 southbound ramp intersection
- Swamp Fox Road (PA 914) and Molly Pitcher Highway (U.S. 11)
- Swamp Fox Road (PA 914) and I-81 ramp intersections at the Marion Interchange (2)
- Swamp Fox Road (PA 914) and the proposed Marion Connector roadway

The two-lane connector road (the Marion Connector) that was proposed for the Guilford Springs Road Interchange, Lighthouse Road Interchange, and Collector-Distributor Road Options is also included as part of the Southbound I-81 Access Ramps Option. This connector road would extend from Archer Drive to Swamp Fox Road (PA 914), paralleling the Norfolk Southern lines. The Marion Connector would accommodate development that has yet to occur in the southern section of the commercial / industrial area between U.S. 11 and I-81, thus is considered a future project. This option also would include the closure of the at-grade Norfolk Southern Rail crossings at Lighthouse Road, Overcash Road, Alleman Road and Third Street.

**Figure 7.2.5**  
**I-81 Feasibility Study /**  
**Conceptual Point of Access**  
**Southbound I-81 Access Ramps at**  
**Guilford Springs Road with**  
**Selected TSM Improvements**



Interchange area enlarged in inset

--INDEX MAP ONLY--  
 For more details, view CD in back of report.

**Legend**

- Deficient Intersections L.O.S. 2030 PM Peak 50% + 80% Scenerio
- ▲ Geometric Improvements
- Turn Lanes Required
- ★ New Signal Required
- ★ New Signal and Turn Lanes Required
- At Grade Crossing Closures
- Proposed New Ramps
- Proposed Existing Interchange Improvements
- Proposed Marion Connector
- Potential Hazardous Waste Site
- Streams / Drainage
- Properties
- Study Area
- National Register Eligible Historic Resource
- Agricultural Security Area
- NWI Wetland

1 inch = 3,000 feet

0 6,000 Feet

03388 MT HB 4.1, 2011 1:25:11 PM

Based on the project costs and benefits, Southbound I-81 Access Ramps Option offers a good balance between meeting the project needs and maintaining a reasonable investment level. The option would address the existing and short term needs, and would be a building block to subsequent improvements to address future long term needs.

### 7.3 Summary of Design Options

Considering a balance of ability to meet the project need, the extent of environmental impacts, and cost, the **Guilford Springs Road Interchange** option would provide the best solution to address the mobility and safety issues associated with the total build-out of the commercial / industrial development in the study corridor. The **Lighthouse Road Interchange** option would address the project need of redirecting traffic from Wayne Avenue (PA 316) onto a new connection slightly less well than the Guilford Springs Road Interchange option because it is located over one mile farther south, where most development has not yet occurred. The **Collector-Distributor Road** option would address the needs and would have comparable environmental effects, but would be cost prohibitive at a price much greater than each of the new interchange options. The **Transportation Systems Management (TSM)** option would have relatively low cost and few environmental effects, but would not address the mobility and safety needs of the future development and traffic conditions. The **Transportation Systems Management (TSM) and Widening Improvements** option would address the future mobility needs, but would actually exacerbate the safety issues associated with the at-grade railroad crossings. In addition, the option would have the potential to cause substantial displacements and access restrictions in the Molly Pitcher Highway (U.S. 11) widening area. As stated previously, the **No-Build** option would consist of routine maintenance only, and would not address any of the mobility and safety needs. A comparison of the design concepts are presented in **Table 7.3.1**. The best option to initially address the short-term access needs of this I-81 corridor in a *planned, staged, and fiscally responsible manner* is the **Southbound I-81 Access Ramps Option at Guilford Springs Road with Selected TSM Improvements**.

Several of the design options leave certain intersections with a deficient level of service in the design year even with build improvements in place. In an effort to balance costs, impacts, and future land use changes, these intersections were not proposed to be fully improved. They should be re-evaluated as the land use changes and the transportation system improves to accommodate the commercial, industrial and residential growth and development.

Since the Guilford Springs Road Interchange option provides the ultimate solution to address the mobility and safety issues associated with the total build-out of the commercial / industrial development in the study corridor, a Conceptual Point of Access Request Report was prepared for this option and is included in **Appendix G** at the back of this report. Although the Southbound I-81 Access Ramps Option at Guilford Springs Road with Selected TSM Improvements is the best option to address the short-term access needs of the study corridor, the ultimate solution option was used to complete the Conceptual Point of Access Request Report.

**I-81 Feasibility Study / Conceptual Point of Access**  
**Table 7.3.1 Comparison of Design Concepts**

	No-Build Option	TSM Option	TSM / Widening Option
<b>Project Purpose and Needs</b>			
Accommodates existing commercial / industrial corridor traffic volumes	Yes	Yes	Yes
Accommodates future (2030) commercial / industrial traffic volumes	No	No	partially
Accommodates future (2030) regional residential growth / traffic volumes	No	No	partially
Addresses future CSX Intermodal Yard truck traffic	No	No	No
Provides safety enhancements by reducing traffic at at-grade rail crossing	No	No	No (would increase traffic at at-grade crossings)
Overall ability to meet project needs	Does not meet project needs	Does not meet project needs	Does not meet project needs
<b>Environmental Impacts &amp; Issues</b>			
<b>Socioeconomics</b>			
Residential Displacements	None	None	24 to 40 (app.)
Commercial Displacements	None	None	8 to 12 (app.)
Access Restrictions	None	None	Multiple (driveways)
No. of active farming operations affected	None	None	3 to 5 parcels (minor impacts)
No. of protected farmland parcels affected	None	None	1 (minor impacts)
<b>Natural Resources</b>			
No. of stream crossing	None	None	4
Wetland involvement	None	None	Potential
<b>Cultural Resources</b>			
No. of NR eligible / listed historic resources affected	None	None	None
Potential for recovery of archaeological resources	None	None	Low (Disturbed)
<b>Intersection Improvements</b>			
No. of At-Grade RR Crossings Closed	0	0	0
No. of Intersections to be Signalized	0	1	1
No. of Intersections to be Improved with Turning Lanes	0	3	5
No. of Intersections to be Signalized and Improved with Turning Lanes	0	3	6
No. of Intersections to be Geometrically Improved	0	0	0
<b>Cost Estimates</b>			
Cost of Core Project	N/A	N/A	\$45,000,000
Cost of Wayne Ave. Interchange Improvements	N/A	\$4,400,000	\$4,400,000
Cost of Marion Interchange Improvements	N/A	\$860,000	\$860,000
Cost of I-81 Bridges over CSX Railroad	N/A	N/A	N/A
Cost of Marion Connector	N/A	N/A	N/A
Cost of Intersection Improvements	N/A	\$7,000,000	\$3,000,000
Total Project Cost	N/A	\$12,260,000	\$53,260,000
Less Developer Funded Improvements	N/A	(\$7,000,000)	(\$3,000,000)
PennDOT Project Costs	N/A	\$5,260,000	\$50,260,000



**I-81 Feasibility Study / Conceptual Point of Access**  
**Table 7.3.1 Comparison of Design Concepts**

	<b>Guilford Springs Road Interchange Option</b>	<b>Lighthouse Road Interchange Option</b>
<b>Project Purpose and Needs</b>		
Accommodates existing commercial / industrial corridor traffic volumes	Yes	Yes
Accommodates future (2030) commercial / industrial traffic volumes	Yes	Yes
Accommodates future (2030) regional residential growth / traffic volumes	Yes	Yes
Addresses future CSX Intermodal Yard truck traffic	Yes	Yes
Provides safety enhancements by reducing traffic at at-grade rail crossing	Yes	Yes
Overall ability to meet project needs	Meets project needs	Meets project needs
<b>Environmental Impacts &amp; Issues</b>		
<b>Socioeconomics</b>		
Residential Displacements	None	None
Commercial Displacements	None	None
Access Restrictions	(RR Crossings)	(RR Crossings)
No. of active farming operations affected	15 (app.)	19 (app.)
No. of protected farmland parcels affected	2	2
<b>Natural Resources</b>		
No. of stream crossing	1	None
Wetland involvement	No Known	No Known
<b>Cultural Resources</b>		
No. of NR eligible / listed historic resources affected	1	None
Potential for recovery of archaeological resources	Moderate	Moderate
<b>Intersection Improvements</b>		
No. of At-Grade RR Crossings Closed	4	4
No. of Intersections to be Signalized	3	3
No. of Intersections to be Improved with Turning Lanes	3	3
No. of Intersections to be Signalized and Improved with Turning Lanes	8	8
No. of Intersections to be Geometrically Improved	1	0
<b>Cost Estimates</b>		
Cost of Core Project	\$21,000,000 *	\$19,000,000*
Cost of Wayne Ave. Interchange Improvements	\$4,400,000	\$4,400,000
Cost of Marion Interchange Improvements	\$860,000	\$860,000
Cost of I-81 Bridges over CSX Railroad	N/A	N/A
Cost of Marion Connector	\$14,000,000	\$14,000,000
Cost of Intersection Improvements	\$5,000,000	\$6,000,000
Total Project Cost	\$45,260,000	\$44,260,000
Less Developer Funded Improvements	(\$19,000,000)	(\$20,000,000)
PennDOT Project Costs	\$26,260,000	\$24,260,000

\*Includes widening of bridge over I-81

**I-81 Feasibility Study / Conceptual Point of Access  
Table 7.3.1 Comparison of Design Concepts**

	<b>Collector - Distributor Road Option</b>	<b>Southbound I-81 Access Ramps at Guilford Springs Road with Selected TSM Improvements</b>
<b>Project Purpose and Needs</b>		
Accommodates existing commercial / industrial corridor traffic volumes	Yes	Yes
Accommodates future (2030) commercial / industrial traffic volumes	Yes	No*
Accommodates future (2030) regional residential growth / traffic volumes	Yes	No*
Addresses future CSX Intermodal Yard truck traffic	Yes	Yes
Provides safety enhancements by reducing traffic at at-grade rail crossing	Yes	Yes
Overall ability to meet project needs	Meets project needs	Meets short-term project needs
<b>Environmental Impacts &amp; Issues</b>		
<b>Socioeconomics</b>		
Residential Displacements	None	None
Commercial Displacements	None	None
Access Restrictions	(RR Crossings)	(RR Crossings)
No. of active farming operations affected	16 (app.)	14 (app.)
No. of protected farmland parcels affected	4	2
<b>Natural Resources</b>		
No. of stream crossing	2	1
Wetland involvement	Potential (West Side of I-81)	No Known
<b>Cultural Resources</b>		
No. of NR eligible / listed historic resources affected	1	0
Potential for recovery of archaeological resources	Moderate	Moderate
<b>Intersection Improvements</b>		
No. of At-Grade RR Crossings Closed	5	4
No. of Intersections to be Signalized	2	1
No. of Intersections to be Improved with Turning Lanes	5	3
No. of Intersections to be Signalized and Improved with Turning Lanes	9	5
No. of Intersections to be Geometrically Improved	1	1
<b>Cost Estimates</b>		
Cost of Core Project	\$87,000,000	\$9,900,000
Cost of Wayne Ave. Interchange Improvements	N/A	\$4,400,000
Cost of Marion Interchange Improvements	\$860,000	\$860,000
Cost of I-81 Bridges over CSX Railroad	\$18,000,000	N/A
Cost of Marion Connector	\$14,000,000	\$14,000,000
Cost of Intersection Improvements	\$4,500,000	\$4,000,000
Total Project Cost	\$124,360,000	\$33,160,000
Less Developer Funded Improvements	(\$18,500,000)	(\$18,000,000)
PennDOT Project Costs	\$105,860,000	\$15,160,000

## 8.0 Phased Implementation of Transportation and Land Use

In conjunction with Smart Transportation guidelines, it is proposed that the improvements specified in this Feasibility Study will be phased to comply with progressive development and land use changes. The Smart Transportation guidelines specifically reference "...linking land use and transportation decision making, improving project delivery and right sizing." The Right-Sizing guidelines specify "A 'best fit' transportation program or project (all modes) that meets transportation needs and considers community and regional goals / objectives, quality of life concerns, economic development initiatives, fiscal constraints and other social / environmental criteria."

This section of the report describes a sound approach to the restriction of land use and resulting trip generation rates as described in earlier sections of the report. The intent is to develop an integrated land use and transportation plan to address existing concerns and development patterns and help to guide future land use and transportation decisions in a responsible manner.

The phased approach will provide an opportunity for Guilford Township and Franklin County Planning Commission to establish a project deployment plan, by which the improvements can be incrementally staged to meet traffic demands and funding availability. A land development scenario coupled with transportation improvements was developed for years 2015, 2020, 2025, and 2030.

### 8.1 Year 2015 Land Development and Transportation Improvements Plan

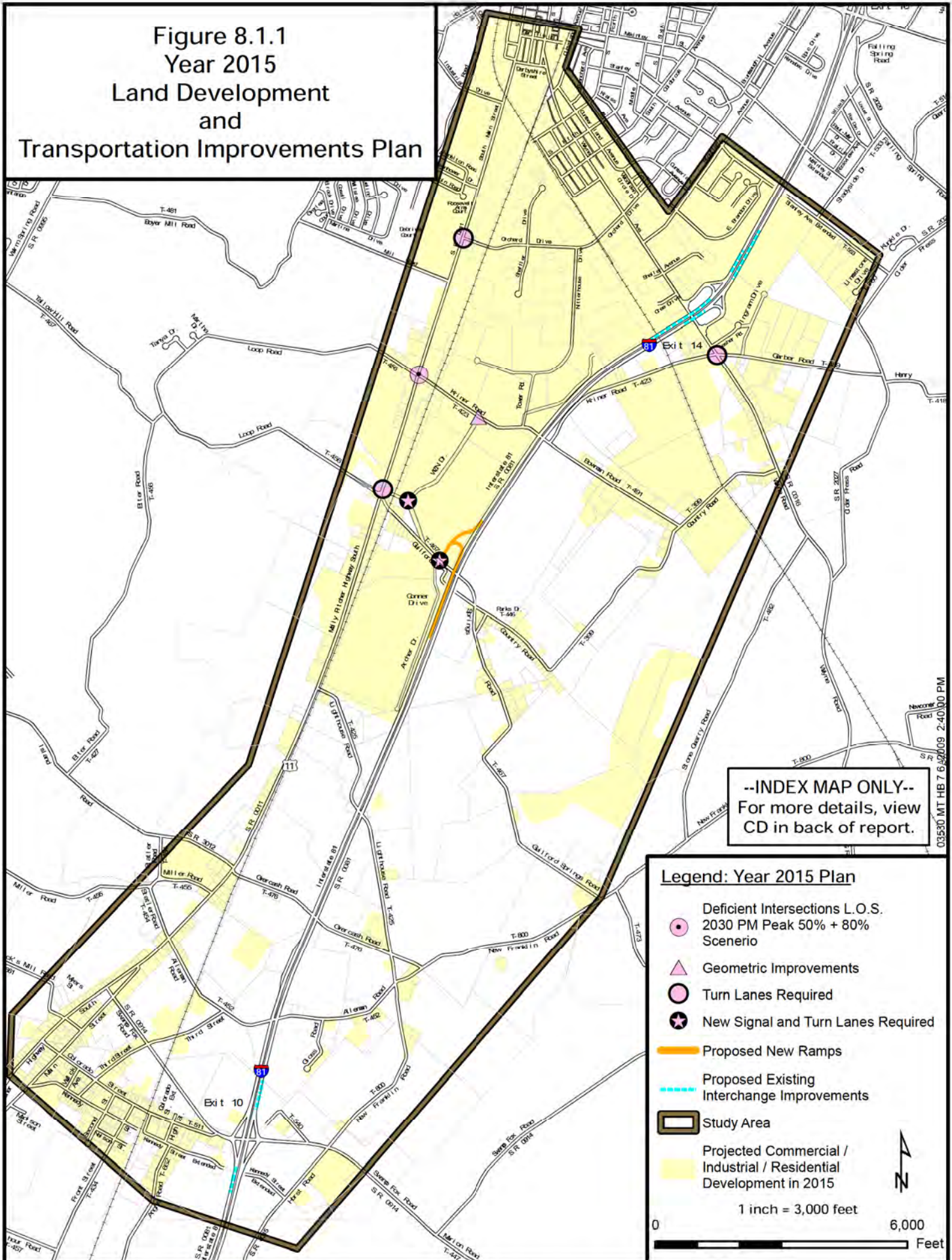


View of Currently undeveloped area between Kriner Road and Guilford Springs Road

The year 2015 land development and proposed transportation improvements are illustrated on **Figure 8.1.1**. Compared to existing conditions, the commercial and industrial development are anticipated to fill in the vacant parcels between Kriner Road and Guilford Springs Road and industrial development is expected to expand in the area of Kriner Road and the CSX rail line.

The increased traffic generated by the new development would result in increasing delays and congestion at the Wayne Avenue Interchange (Exit 14). In order to keep pace with the development and the traffic demands, the following improvements are proposed for construction in 2015:

Figure 8.1.1  
Year 2015  
Land Development  
and  
Transportation Improvements Plan



--INDEX MAP ONLY--  
For more details, view  
CD in back of report.

**Legend: Year 2015 Plan**

- Deficient Intersections L.O.S. 2030 PM Peak 50% + 80% Scenario
- ▲ Geometric Improvements
- Turn Lanes Required
- ★ New Signal and Turn Lanes Required
- Proposed New Ramps
- - - Proposed Existing Interchange Improvements
- Study Area
- Projected Commercial / Industrial / Residential Development in 2015

1 inch = 3,000 feet

0 6,000 Feet

- Improvements to intersections, including geometric changes and added turn lanes:
  - Geometric improvements to the Kriner Road / WCN Drive Intersection
  - Add turn lanes at the U.S. 11, Guilford Springs Road and Loop Road Intersection
  - Add turn lanes and traffic signals at the Guilford Springs Road and WCN Drive Intersection
  - Add turn lanes and traffic signals at the new intersection on Guilford Springs Road with I-81 southbound ramps
  - Add turn lanes at the U.S. 11 and Orchard Drive Intersection
  - Add turn lanes at Wayne Avenue, Kriner Road and Garber Road Intersection
- Improvements (lengthening) of accel and decel lanes on I-81 at the Wayne Avenue and Marion Interchanges
- Addition of a southbound off-ramp and a southbound on-ramp on I-81 at Guilford Springs Road

The Year 2015 Plan closely approximates the previously discussed design option: *Southbound I-81 Access Ramps at Guilford Springs Road with Selected TSM Improvements*. The difference is that the Year 2015 Plan would not include the Marion Connector and improvements to the southern part of the study area, since it is not yet developed into commercial / industrial land use.

## **8.2 Year 2020 Land Development and Transportation Improvements Plan**







The year 2020 land development and proposed transportation improvements are illustrated on **Figure 8.2.1**. Compared to the Year 2015 Plan, the commercial and industrial development will extend south of Guilford Springs Road to Lighthouse Road and residential, commercial, and industrial development is expected to expand in the Marion area.

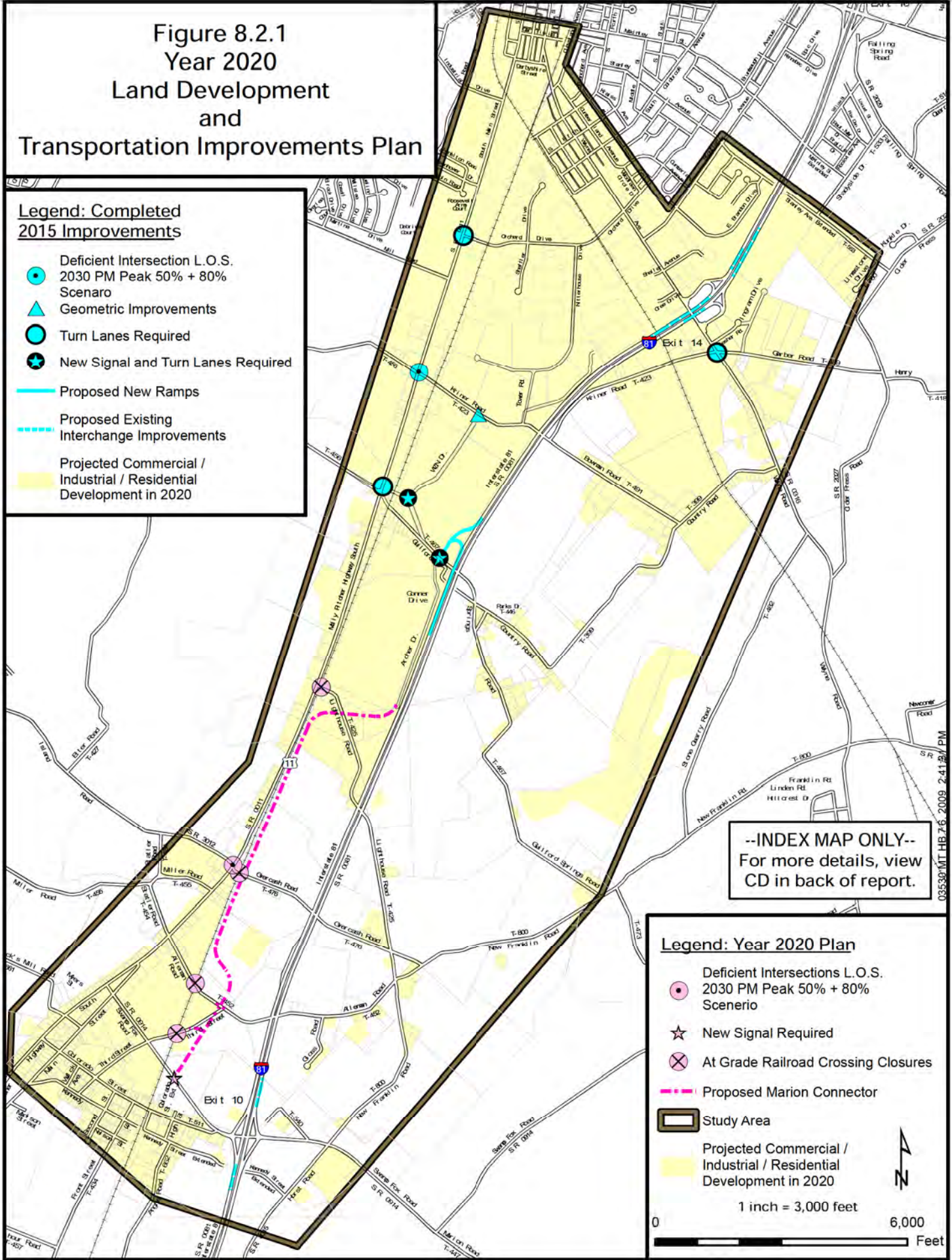
As traffic generators increase between Guilford Springs Road and Lighthouse Road, traffic between this area and I-81 will split between the southbound access / egress to I-81 at Guilford Springs Road, the Wayne Avenue Interchange (for northbound access), and the Marion Interchange on Swamp Fox Road. This increased traffic, especially the truck traffic, will result in congestion and delays on local roads leading to the I-81 Interchanges. The following improvements are proposed for construction in 2020:

- Possible closure of at-grade railroad crossings on Lighthouse Road, Overcash Road, Alleman Road and Third Street to improve safety. The at-grade crossing on Swamp Fox Road would remain open to provide access.
- Construction of the two-lane Marion Connector from Archer Drive to Swamp Fox Road and signalization of the intersection at Swamp Fox Road and the proposed Marion Connector.

Figure 8.2.1  
Year 2020  
Land Development  
and  
Transportation Improvements Plan







**Legend: Completed  
2015 Improvements**

-  Deficient Intersection L.O.S. 2030 PM Peak 50% + 80% Scenario
-  Geometric Improvements
-  Turn Lanes Required
-  New Signal and Turn Lanes Required
-  Proposed New Ramps
-  Proposed Existing Interchange Improvements
-  Projected Commercial / Industrial / Residential Development in 2020



--INDEX MAP ONLY--  
For more details, view  
CD in back of report.

**Legend: Year 2020 Plan**

-  Deficient Intersections L.O.S. 2030 PM Peak 50% + 80% Scenario
-  New Signal Required
-  At Grade Railroad Crossing Closures
-  Proposed Marion Connector
-  Study Area
-  Projected Commercial / Industrial / Residential Development in 2020

1 inch = 3,000 feet  
0 6,000 Feet

### 8.3 Year 2025 Land Development and Transportation Improvements Plan

The year 2025 land development and proposed transportation improvements are illustrated on **Figure 8.3.1**. Compared to the Year 2020 Plan, the commercial and industrial development will extend south between Lighthouse Road and Overcash Road and some additional residential, commercial, and industrial development will occur throughout other portions of the study area.

The volume of truck and car traffic to this point would provide justification for the following transportation upgrades:

- Improvements to intersections, including added turn lanes and signals:
  - Add turn lanes and signals at the U.S. 11 and Swamp Fox Road Intersection
  - Add turn lanes and signals at the southbound I-81 Marion Interchange ramps on Swamp Fox Road

At year 2025, there would be internal access from the commercial / industrial area to three interchanges on I-81: at Wayne Avenue, Guilford Springs Road, and Marion. The planned transportation access and mobility will support overall economic stimulus by encouraging businesses to establish themselves at this location, especially those in distribution or shipping services. When constructed, the local roadway network will sustain the growth and viability of this planned commercial / industrial corridor.

### 8.4 Year 2030 Land Development and Transportation Improvements Plan



View of the currently undeveloped study area between the Target Distribution Center and Swamp Fox Road











The year 2030 land development and proposed transportation improvements are illustrated on **Figure 8.4.1**. Compared to the Year 2025 Plan, the commercial and industrial development will extend south of Overcash Road to Swamp Fox Road and additional residential, commercial, and industrial development will occur in the Marion Area. The following improvements are proposed to accommodate additional traffic demands in 2030:

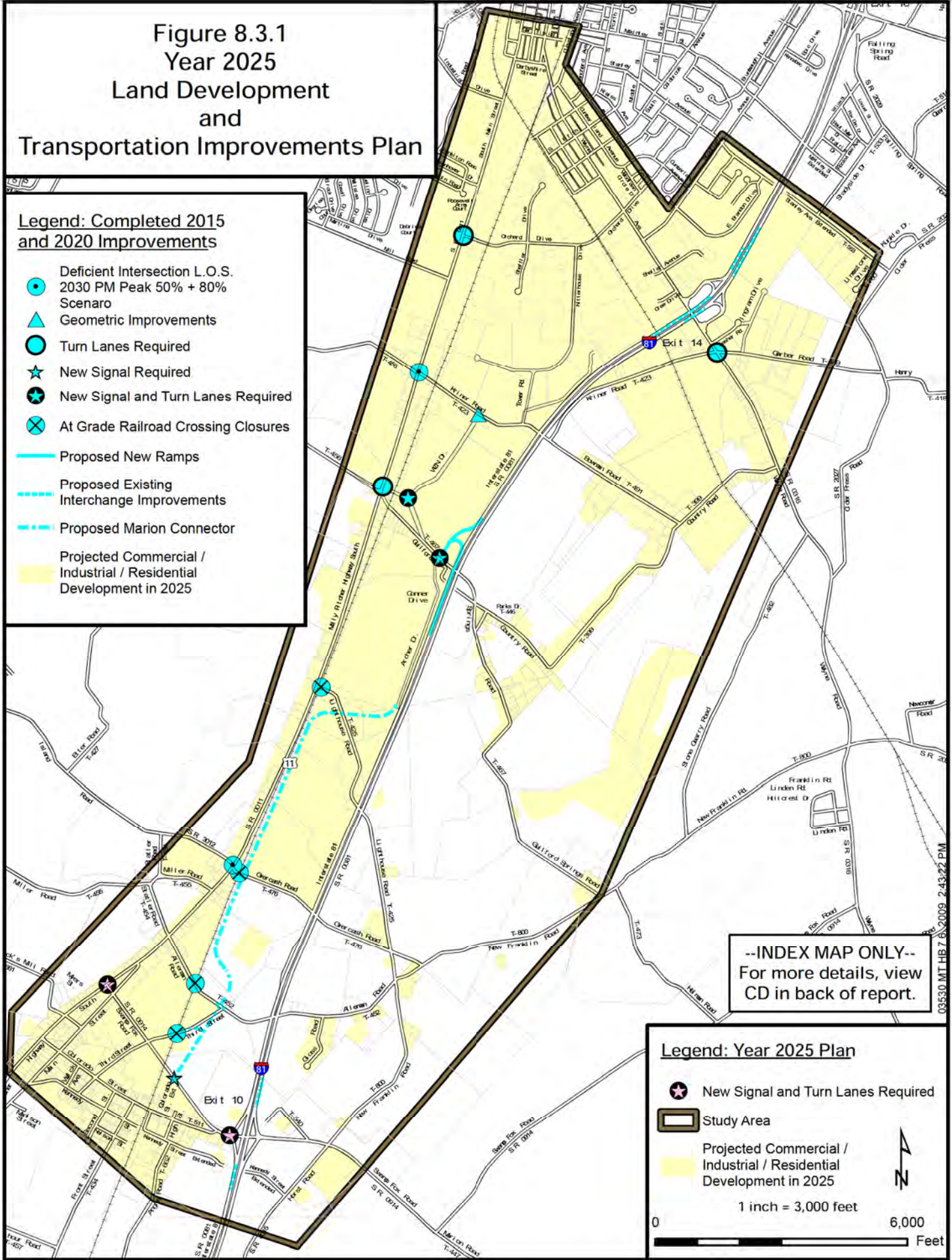
- Addition of a northbound off-ramp and a northbound on-ramp on I-81, and signals at Guilford Springs Road to complete the interchange. This addition would require the widening of the Guilford Springs Road bridge over I-81, as described in Section 7.2, the Guilford Springs Road Interchange.
- Add turn lanes and traffic signals at the intersection of Swamp Fox Road and the I-81 northbound ramps.

The commercial / industrial build-out to Swamp Fox Road would complete the development plan for this area. The highway infrastructure improvements to support the development would have been completed in 2030.

Figure 8.3.1  
Year 2025  
Land Development  
and  
Transportation Improvements Plan




**Legend: Completed 2015  
and 2020 Improvements**

-  Deficient Intersection L.O.S. 2030 PM Peak 50% + 80% Scenario
-  Geometric Improvements
-  Turn Lanes Required
-  New Signal Required
-  New Signal and Turn Lanes Required
-  At Grade Railroad Crossing Closures
-  Proposed New Ramps
-  Proposed Existing Interchange Improvements
-  Proposed Marion Connector
-  Projected Commercial / Industrial / Residential Development in 2025



--INDEX MAP ONLY--  
For more details, view  
CD in back of report.

**Legend: Year 2025 Plan**

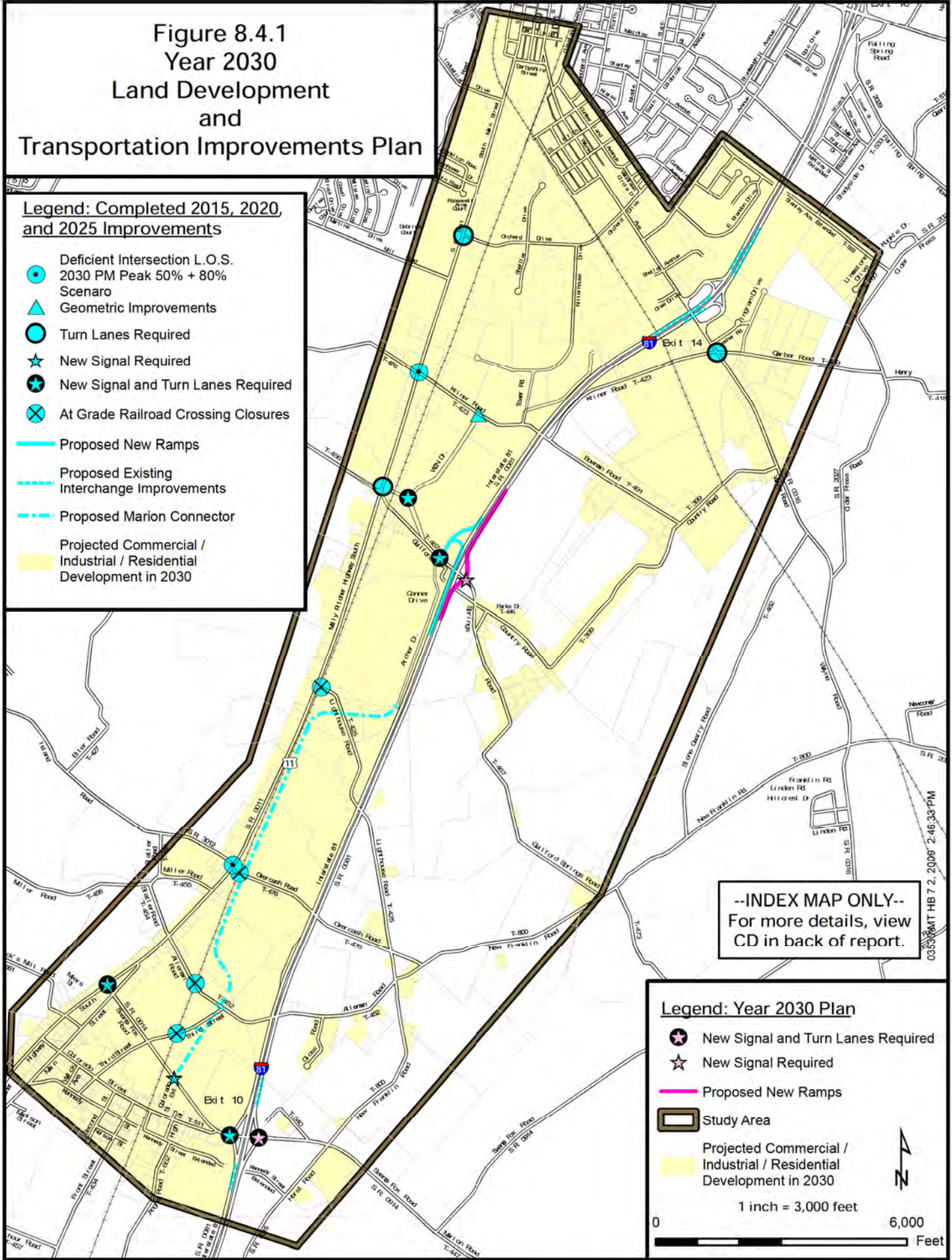
-  New Signal and Turn Lanes Required
  -  Study Area
  -  Projected Commercial / Industrial / Residential Development in 2025
- 1 inch = 3,000 feet
- 0 6,000 Feet



**Figure 8.4.1  
Year 2030  
Land Development  
and  
Transportation Improvements Plan**

**Legend: Completed 2015, 2020,  
and 2025 Improvements**

- Deficient Intersection L.O.S. 2030 PM Peak 50% + 80% Scenario
- Geometric Improvements
- Turn Lanes Required
- New Signal Required
- New Signal and Turn Lanes Required
- At Grade Railroad Crossing Closures
- Proposed New Ramps
- Proposed Existing Interchange Improvements
- Proposed Marion Connector
- Projected Commercial / Industrial / Residential Development in 2030



--INDEX MAP ONLY--  
For more details, view  
CD in back of report.

**Legend: Year 2030 Plan**

- New Signal and Turn Lanes Required
- New Signal Required
- Proposed New Ramps
- Study Area
- Projected Commercial / Industrial / Residential Development in 2030

1 inch = 3,000 feet  
0 6,000 Feet

# I-81 FEASIBILITY STUDY & CONCEPTUAL POINT OF ACCESS

Franklin County, Pennsylvania

## FIGURES & APPENDICES



# APPENDIX G

## I-81 CONCEPTUAL POINT OF ACCESS REQUEST REPORT

### A. Executive Summary, Introduction & Requirements

#### 1.0 Executive Summary

The intent of this I-81 Conceptual Point of Access Report is to evaluate the Guilford Springs Road Interchange alternative, which was conceptually developed as part of the I-81 Feasibility Study. This Conceptual Point of Access Report will be submitted to PennDOT and the Federal Highway Administration for a determination of engineering and operational acceptability. Extensive coordination was conducted with Guilford Township, Hamilton Township, Franklin County, PennDOT and the Federal Highway Administration in the development of the proposal for a new access to I-81 at Guilford Springs Road.

#### 2.0 Introduction

##### a. Project Description

The project area of influence is discussed in Section 1.0 of the I-81 Feasibility Study. Figure 1.1 illustrates the study area. The area of influence centers on the proposed I-81 / Guilford Springs Road Interchange. It includes I-81 from the Wayne Avenue Interchange at the northern limit to the Marion Interchange at the southern limit. Also included is Guilford Springs Road west to the intersection with U.S. 11 and east to the intersection with New Franklin Road.

In addition, the area of influence and the proposed Guilford Springs Road Interchange are not within a Transportation Management Area as defined in 23 CFR 450.104.

##### b. Purpose and Need

The project purpose and need that relate to new access to I-81 at Guilford Springs Road are presented in Section 2.0 of the I-81 Feasibility Study. Those needs involve congestion and mobility problems that will result from the planned and projected build-out of the commercial / industrial corridor between U.S. 11 and I-81 from Wayne Avenue (PA 316) to Marion. It was determined that only direct access to I-81 would address the project needs, and the Guilford Springs Road location provides the optimal access and mobility characteristics.

##### c. Background

The I-81 Feasibility Study and Conceptual Point of Access Request Report is related to a few other studies that have been recently performed within the project area of influence.

The Greater Chambersburg Southwest Corridor Study was completed in December 2006 and was prepared for Hamilton Township and PennDOT District 8-0. The purpose of the study was to present a range of roadway improvement concepts that could be planned and programmed for future projects. Along the US 11 and I-81 corridors, this study area extended from Chambersburg south to the Borough of Marion and along the US 30 corridor, the study area extended from

Chambersburg west to beyond St. Thomas. The area between these two US routes, extending roughly from St. Thomas to Marion, was also included in the study area. Although no specific roadway improvements to the I-81 corridor were identified in this study, the existing environmental features were identified and the future land use and future traffic volumes were projected for the area along the I-81 corridor. This information provided insight to the future roadway improvements that may be necessary in this area and served as the basis for the I-81 Feasibility Study.

The Draft I-81 Feasibility Study was prepared in July 2009 for Guilford and Hamilton Townships and PennDOT District 8-0. This study area extended from Chambersburg to Marion and from the west side of US 11 to the east side of I-81, primarily within Guilford Township in Franklin County. The focus of this study was to evaluate the existing and future transportation needs to access I-81 and to develop a comprehensive land use and transportation solution that balances development with infrastructure needs. This study concluded that a new point of access to I-81 at Guilford Springs Road, with selected Transportation Systems Management improvements, was the best solution to address the mobility and safety issues associated with the future development of the study area corridor.

The I-81 Widening Study was completed in February 2005 and was prepared for PennDOT in conjunction with the Federal Highway Administration. The purpose of this study was to evaluate the need to improve or widen I-81 from the Maryland state line (Exit 1) to PA 581 (Exit 59) and from I-83 (Exit 70) to I-78 (Exit 89). It was determined that I-81 would need to be widened in order to achieve an acceptable Level of Service for the projected 2030 traffic volumes. This includes Segment 2, in the Chambersburg area, which is within the area of influence of the I-81 Conceptual Point of Access Request Report. In addition, it was determined that all existing overhead bridges within the Chambersburg segment can accommodate the widening of I-81, because the majority of the widening would occur in the grass median.

The I-81 Conceptual Point of Access Request Report is consistent with the local planning process. The proposed I-81 / Guilford Springs Road Interchange project has received the support of the local municipalities, the Franklin County Planning Commission, and the Franklin County Rural Planning Organization (RPO). Letters of support from these entities are contained in **Appendix H**. The Franklin County RPO was recently established in May 2009. Because of this timeframe, a Long Range Transportation Plan has not yet been established by the RPO. However, a long range plan is currently being developed by RPO in conjunction with a revision to the Franklin County Comprehensive Plan, which was last adopted in July 1999.

### **3.0 Requirements for Approval of Access**

PennDOT has identified the following eight (8) requirements as being necessary for the approval of access. These requirements are also consistent with FHWA's policy on Interstate access. The I-81 Conceptual Point of Access Request Report is consistent with each of these requirements as described below.

#### **a. Existing Infrastructure**

The existing transportation network in the feasibility study area is under stress and pressure from existing, planned and future development. The area is zoned appropriately (commercial / industrial), which is facilitating the development of intermodal freight facilities that will help with minimizing truck traffic in general, by the use of rail lines, but would constitute an additional traffic

burden in the Chambersburg to Marion study corridor and specifically to the operation of the I-81 / Wayne Avenue Interchange. The local municipalities have been using zoning, development, official maps and their own funds to create a more functionally adequate roadway network, but the interchange areas at Exit 10, Wayne Avenue, and Exit 14, Marion, are beginning to operate with declining levels of service and with continued future development will be unable to accommodate the expected future traffic. Additionally, the existing network requires trucks and other traffic to navigate several at-grade rail crossings in order to access I-81.

**b. Transportation System Management (TSM)**

Section 7.1 of the I-81 Feasibility Study describes the no-build and TSM options that were investigated as part of this study. The TSM with some limited widening improvements along key corridors do not fully meet the needs of the existing and future development.

**c. Operational and Safety Analysis**

An operational and safety analysis was completed as part of the I-81 Feasibility Study and a summary of those analyses can be found in Section 3.0. The conceptual interchange configuration on Guilford Springs Road would have no adverse effect on the safety and operation of I-81, based on the roadway geometry and the adequate distance to the adjacent Wayne Avenue and Marion interchanges. Additionally, the ramp termini on Guilford Springs Road would be signalized and would not adversely affect the safety and operation of Guilford Springs Road, including the intersection with U.S. 11 to the west.

**d. Proposed Access**

Three proposed access points were investigated as part of the I-81 Feasibility Study and are documented in Section 7.3. Because of proximity, distance to existing interchanges and compatibility with existing and proposed land use, the Guilford Springs Road interchange was identified as the best solution to address mobility and safety issues. The I-81 / Guilford Springs Road Interchange ramps would connect to a public road, Guilford Springs Road, and after final build-out would provide full northbound and southbound access to I-81.

**e. Consistent with Local and Regional Land Use and Transportation Plans**

The I-81 Conceptual Point of Access Request Report for the I-81 / Guilford Springs Road Interchange is consistent with the local (Guilford Township) and regional (Franklin County) land use plan and water and sewer service, which has already been developed in this area. As part of the I-81 Feasibility Study, a phased land use plan with associated roadway network improvements was identified. Some of these network improvements could be potentially funded by private developers. The proposed development of an interchange on I-81 at Guilford Springs Road has received the support of the local municipalities, the Franklin County Planning Commission, the Franklin County RPO, and other local organizations. Letters of support from these entities are contained in **Appendix H**. The proposed interchange on I-81 at Guilford Springs Road will be proposed for inclusion on the next Transportation Improvement Program (TIP) update.

**f. Network Study**

Network connections and overall circulation to the two adjacent interchanges were explored and are documented in the I-81 Feasibility Study. The location of the railroad tracks and existing at-grade crossings make using the existing transportation system problematic. The potential for additional interchanges on this area of I-81 would not exist because of limited distance between

Guilford Springs Road and the existing Wayne Avenue Interchange, which is approximately 1.4 miles, and between Guilford Springs Road and the existing Marion Interchange, which is approximately 2.5 miles.

**g. Land Use and Transportation System Coordination**

Section 8.0 of the I-81 Feasibility Study describes a phased land use and transportation plan that would support the proposed interchange at Guilford Springs Road. It also identifies developer funded solutions and local roadway improvements that would enhance the function of the proposed I-81 / Guilford Springs Road Interchange. Extensive coordination has occurred with Franklin County and Guilford Township officials to ascertain that the proposed access improvements are in context with the existing and anticipated industrial, commercial and residential development of the area.

**h. Environmental Status**

The existing environmental features within the Wayne Avenue to Marion study corridor are identified in Section 4.0 of the I-81 Feasibility Study. However, the NEPA environmental clearance process has not yet started for the proposed action since this is a Conceptual Point of Access Request Report, and the I-81 / Guilford Springs Road Interchange is not yet programmed on the TIP.

**B. Engineering Study**

**1.0 Existing Conditions**

**a. Existing Facility and Roadway Network**

The roadways within the project area of influence consist of the following:

- I-81, a four lane limited access Interstate roadway with two full direction interchanges; a two quadrant interchange on PA 316, Wayne Avenue (Exit 14) and a four quadrant diamond interchange on PA 914 in Marion (Exit 10).
- U.S. 11, a two lane free access roadway with a continuous center turn lane.
- PA 316, Wayne Avenue, a free access roadway with variable number of lanes.
- PA 914, Swamp Fox Road, a free access two lane roadway
- Numerous two lane local roadways serving industrial, commercial and residential area.

These roadways are illustrated on Figure 1.1 in the I-81 Feasibility Study.

Existing traffic volumes are discussed in Section 3.2 of the I-81 Feasibility Study. Existing (2007) AADT volumes are illustrated on Figure 3.2.2 and Figure 3.2.3. Existing (2007) AM and PM peak hour volumes, including movements, are illustrated on Figures 3.2.4 – 3.2.7. Operating conditions / Level of Service are addressed in Section 3.2, Table 3.2.1. and Highway Capacity Manual reports from the data analysis are contained in **Appendix D**.

**b. Existing Interchanges**

The existing interchanges within the project area of influence are the I-81 / Wayne Avenue Interchange (Exit 14) and the I-81 / Marion Interchange (Exit 10). The I-81 / Wayne Avenue Interchange on PA 316 is a full direction, two quadrant configuration with signalized ramps. It is approximately 1.4 miles north of the proposed interchange on Guilford Springs Road. The I-81 /

Marion Interchange on PA 914, Swamp Fox Road, is a full direction, four quadrant diamond interchange configuration with stop controlled ramps. It is approximately 2.5 miles south of the proposed interchange on Guilford Springs Road.

Geometric conditions are discussed in Section 3.4 of the I-81 Feasibility Study and **Appendix E** lists the design criteria used to evaluate the existing I-81 interchanges, the local roadways, and the intersections within the study area. The existing Exit 10, Marion Interchange, currently functions well and has stop controlled termini. Acceleration and deceleration lane lengths on I-81 were noted as a potential issue under current design criteria for this interchange. Future development with associated increased traffic volumes is the major problem expected at this interchange. The existing Exit 14, Wayne Avenue Interchange, operates acceptably, but the signalized terminals are beginning to exhibit congestion problems during the peak periods and will experience significant pressure with future development. Acceleration and deceleration lane lengths were noted as concerns, but are both being addressed by a current construction project at the interchange. Exit 14 is also very constrained by existing commercial development and the ability to add capacity is very limited.

**c. Existing Safety and Operational Conditions**

Safety conditions and crash data are discussed in Section 3.3 of the I-81 Feasibility Study. Table 3.3.1 lists the high crash locations within the study area. Existing traffic volumes are discussed in Section 3.2 of the I-81 Feasibility Study. Existing (2007) AADT volumes are illustrated on Figure 3.2.2 and Figure 3.2.3. Existing (2007) AM and PM peak hour volumes, including movements, are illustrated on Figures 3.2.4 – 3.2.7. Operating conditions / Level of Service is addressed in Section 3.2, Table 3.2.1. and Highway Capacity Manual reports from the data analysis are contained in **Appendix D**.

**d. Existing Land Use and Demographics**

Existing land use and land cover are discussed in Section 5.1 of the I-81 Feasibility Study and are illustrated on Figure 5.1.1. In addition, the existing public water and sewer infrastructure is discussed in Section 5.1. Proposed development within the study area is identified in Section 5.2. Population growth and trends are discussed in Section 5.2 and shown in Table 5.2.1. Section 6.1 includes a discussion of the Traffic Analysis Zones (TAZs) and Figure 6.1.1 illustrates the TAZs. Additionally, the **Table G.1** below lists the distances to the various population centers.

**Table G.1**

Location	Approximate Distance to Proposed POA	Population (per 2000 Census Data)
Chambersburg, PA	5 Miles	17,961
Shippensburg, PA	15 Miles	5,586
York, PA	60 Miles	40,862
Harrisburg, PA	57 Miles	48,950
Baltimore, MD	94 Miles	651,154
Fredrick, MD	51 Miles	52,767
Hagerstown, MD	20 Miles	36,687

**e. Alternative Travel Modes**

Alternate travel modes are limited within the area of influence, and are restricted to bus service. This bus service is also limited to certain locations within the study area. However, it should be noted that one of the major developments within the study area is the CSX intermodal facility adjacent to Exit 14. The intermodal facility is intended to encourage the overall use of rail instead of roads, and is therefore considered an alternate travel mode for freight traffic.

**f. Environmental Constraints**

Environmental features, including natural, cultural, and socioeconomic resources, are discussed in Section 4.0 of the I-81 Feasibility Study. These features are illustrated on Figure 4.1 and on Figure 5.1.1. There are no known controversies or issues of community concerns at this time. However, public involvement activities will be completed during the NEPA process, and any potential issues will become known at that time.

**2.0 Methodology**

**a. Future Year Traffic Development**

Methodology for the future year (2030) traffic development is adequately discussed in Section 6.0 of the I-81 Feasibility Study. The various forecasted land development scenarios are shown on Figures 6.2.1 – 6.2.12. Population growth and development projections, as well as future land use projections, used in the development of the future year traffic volumes are contained in Section 5.2 and Section 5.3 of the I-81 Feasibility Study, respectively.

**b. Area of Influence**

The project area of influence is discussed in Section 1.0 of the I-81 Feasibility Study. Figure 1.1 illustrates the study area. The area of influence centers of the proposed I-81 interchange location on Guilford Springs Road. It includes I-81 to the north, to the Wayne Avenue Interchange, and to the south, to the Marion Interchange. Also included is Guilford Springs Road west to the intersection with U.S. 11 and east to the intersection with New Franklin Road.

**3.0 Alternatives**

The alternatives that were considered as part of the I-81 Feasibility Study are discussed in Section 7.0 of the study. A total of seven (7) alternatives were conceptually developed, and are as follows:

- No-Build
- Transportation Systems Management (TSM)
- Transportation Systems Management (TSM) and Widening Improvements
- Guilford Springs Road Interchange
- Lighthouse Road Interchange
- Collector-Distributor Road
- Southbound I-81 Access Ramps at Guilford Springs Road with Selected TSM Improvements

Corresponding illustrations, Level of Service, potential environmental impacts, and the ability to meet the project needs are discussed for each conceptual alternative in Section 7.0 as well.



## 4.0 Alternatives Analysis

### a. Safety

The alternatives that feature a new access onto I-81 would have better safety characteristics for two main reasons. First, they would reduce the traffic through the numerous at-grade railroad crossings in the area of influence. Second, they would reduce the required travel on local roads to access I-81, especially for truck traffic. A discussion of the number of at-grade railroad crossings is included in Section 7.3 and in the evaluation matrix in Table 7.3.1 of the I-81 Feasibility Study. All build alternatives that feature direct access to I-81 address safety issues along Interstate 81 in a similar manner and all alternatives can be developed within acceptable design criteria.

### b. Operational Performance

An operational analysis was completed for each of the seven (7) conceptual alternatives described above and these analyses are documented in the tables within Section 7.0 of the I-81 Feasibility Study.

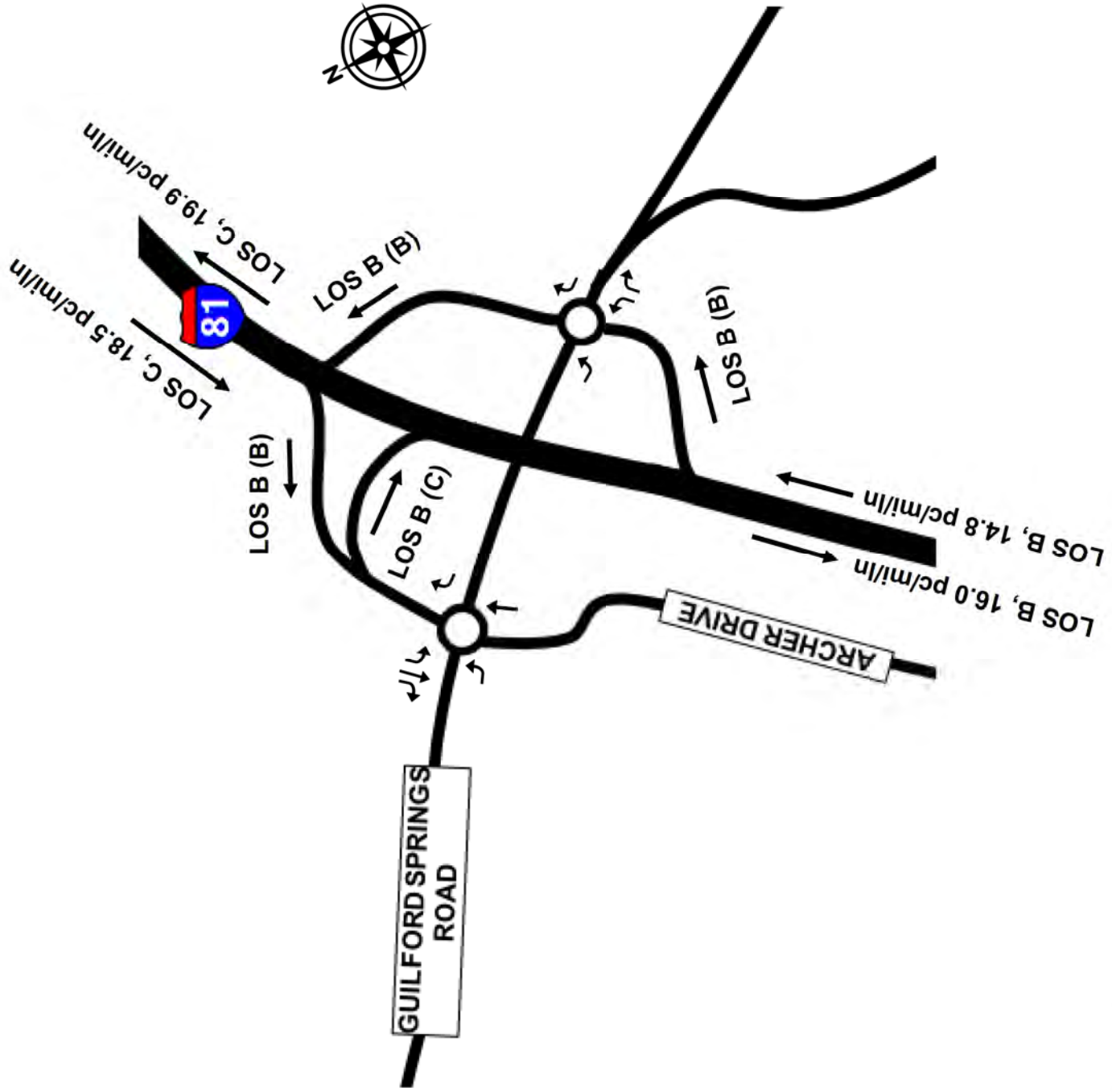
In addition to those tables, **Figures G.1 – G.6** have been included within this appendix which summarize the Interstate operational analysis of the Guilford Springs Road interchange, as well as the existing interchanges at Exit 14 and Exit 10.

As noted in the capacity analysis sections of the feasibility study, the Guilford Springs Road Interchange option with the recommended set of network improvements would function at an acceptable level of service. Additionally, the merge and diverge operations as well as the mainline operations would be acceptable in the design year for the two existing interchanges and the Guilford Springs Road interchange.

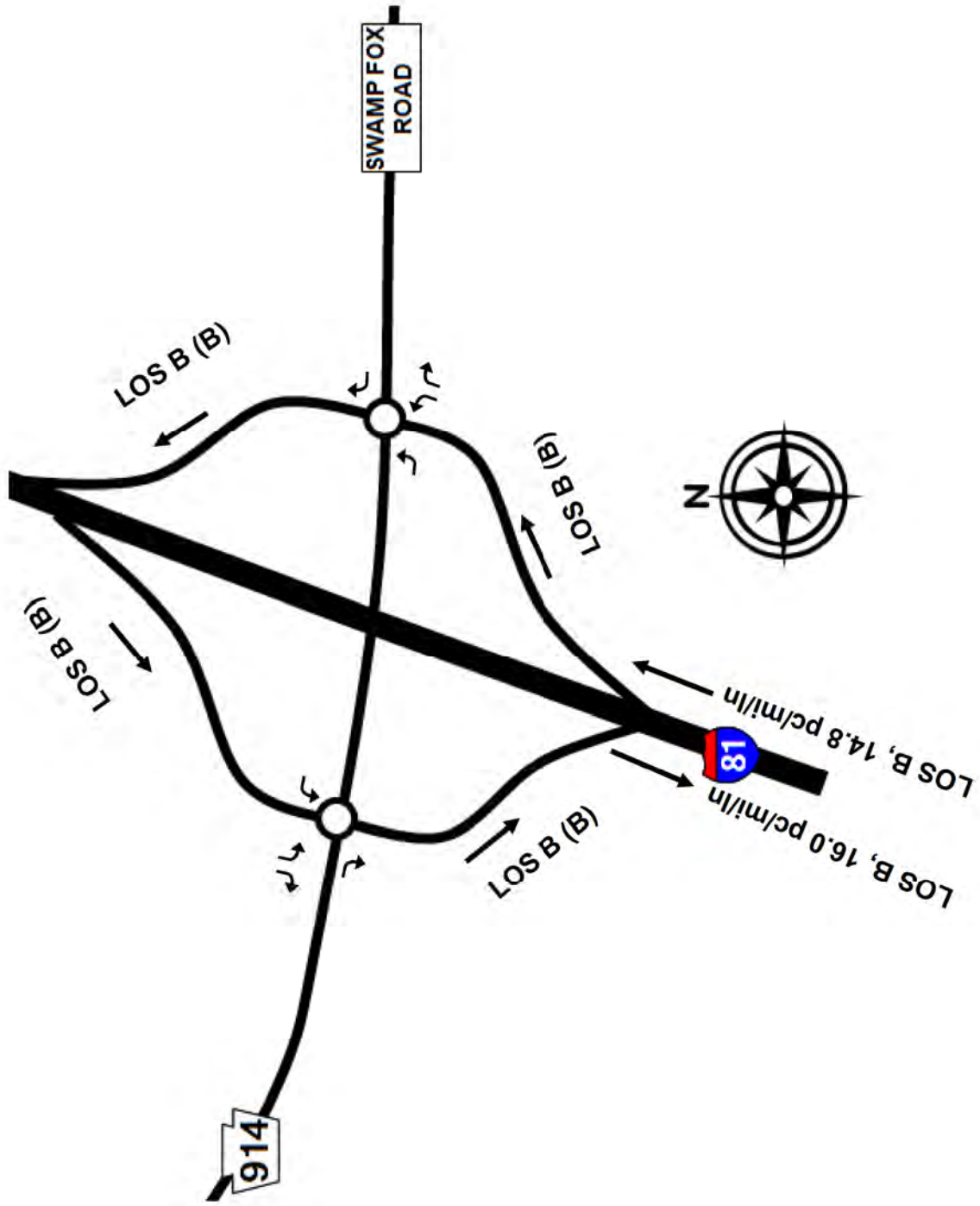
A conceptual signing plan has been included and is shown in **Figure G.7 and G.8** and **Tables G.2 – G.5**. This signing plan shows the conceptual trailblazing and anticipated sign requirements on the interstate. A full signing plan would be developed once the project moves into preliminary engineering. Additionally, the gore to gore distances between the two existing interchanges and the proposed interchange are provided and fall within the one mile requirement for urban areas.

### c. Stakeholder and Environmental Concerns

A key stakeholder group was developed at the onset of the study, and this group was consulted at various stages throughout the project process. The stakeholder group consists of staff from Guilford Township, Hamilton Township, the Franklin County Planning Commission, the Franklin County Area Development Corporation, as well as staff from PennDOT District 8-0, PennDOT Bureau of Design, and the Federal Highway Administration. The results of data collection and data analysis and the potential design concepts were discussed with the stakeholder group at various meetings throughout the study process. In addition, coordination with local businesses was conducted, by telephone or written survey, to determine their existing and future access needs. Coordination with CSX railroad was also conducted regarding the intermodal facility located within the study area. Since this is a Conceptual Point of Access, no public meetings were held during the study.

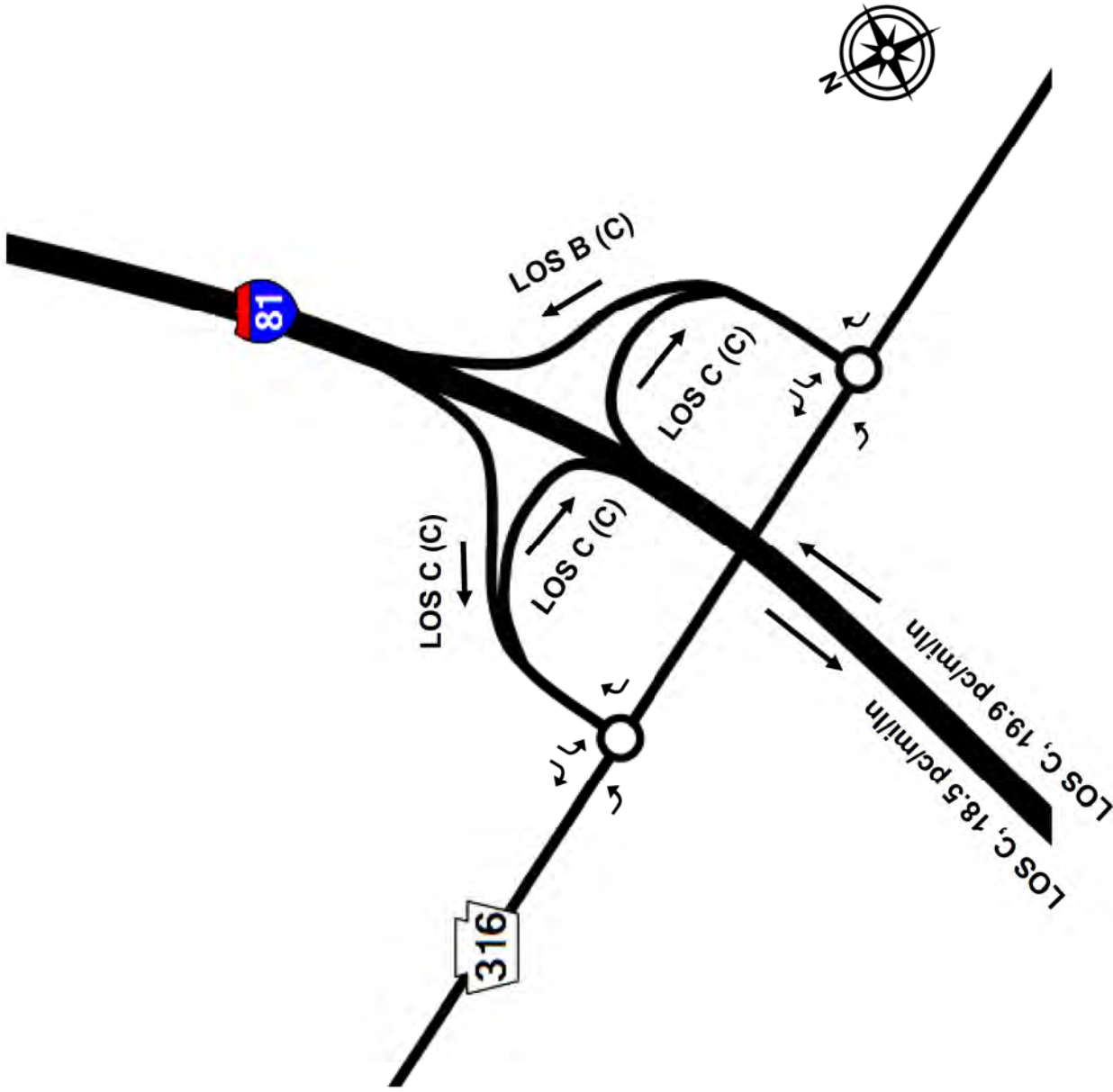


**FIGURE G.1**  
**Guilford Springs Interchange Diagram:**  
**2007 Existing Peak Hour LOS AM (PM)**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania

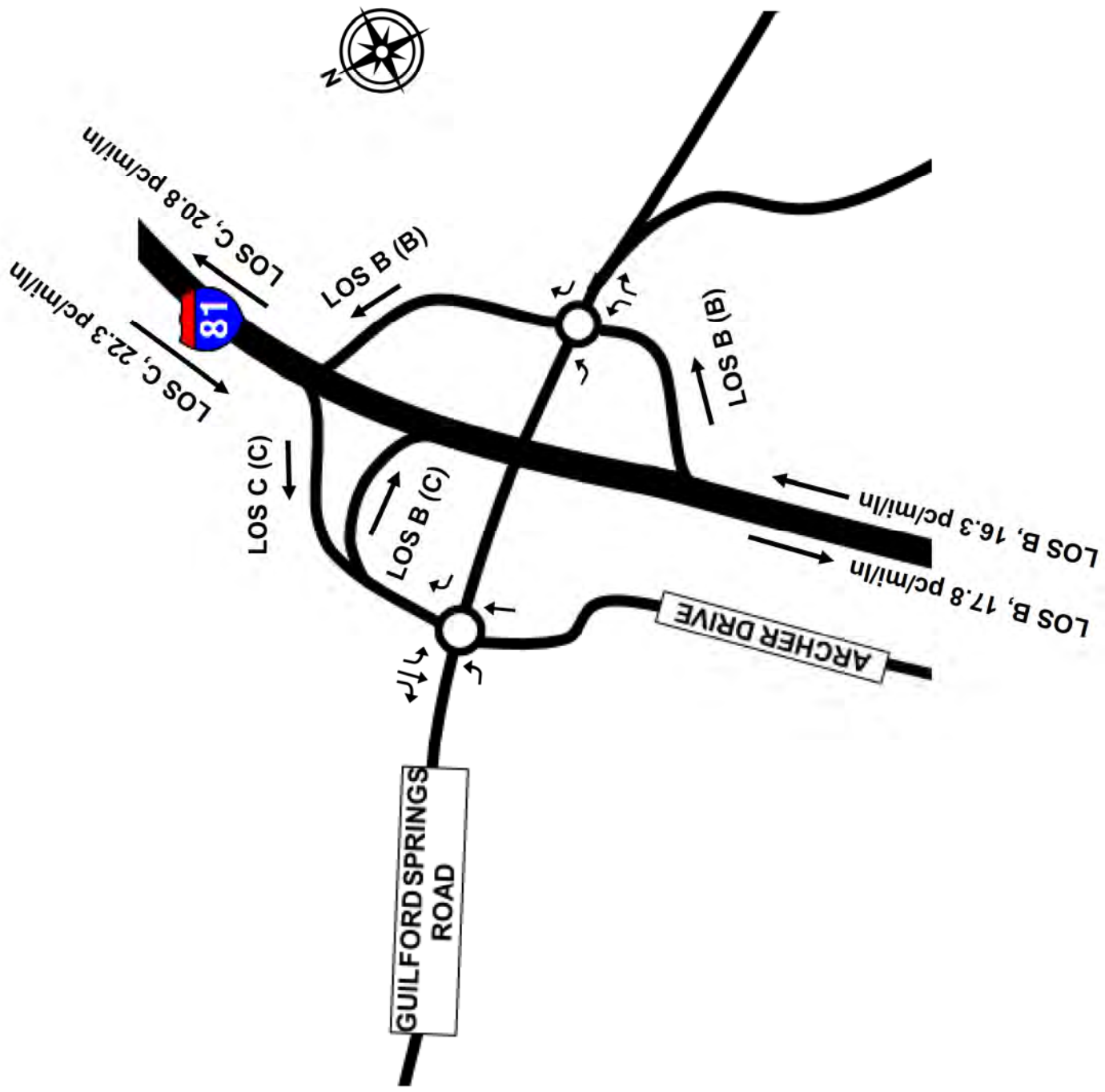


**FIGURE G.2**  
**Exit 10 Swamp Fox Road Interchange Diagram:**  
**2007 Existing Peak Hour LOS AM (PM)**

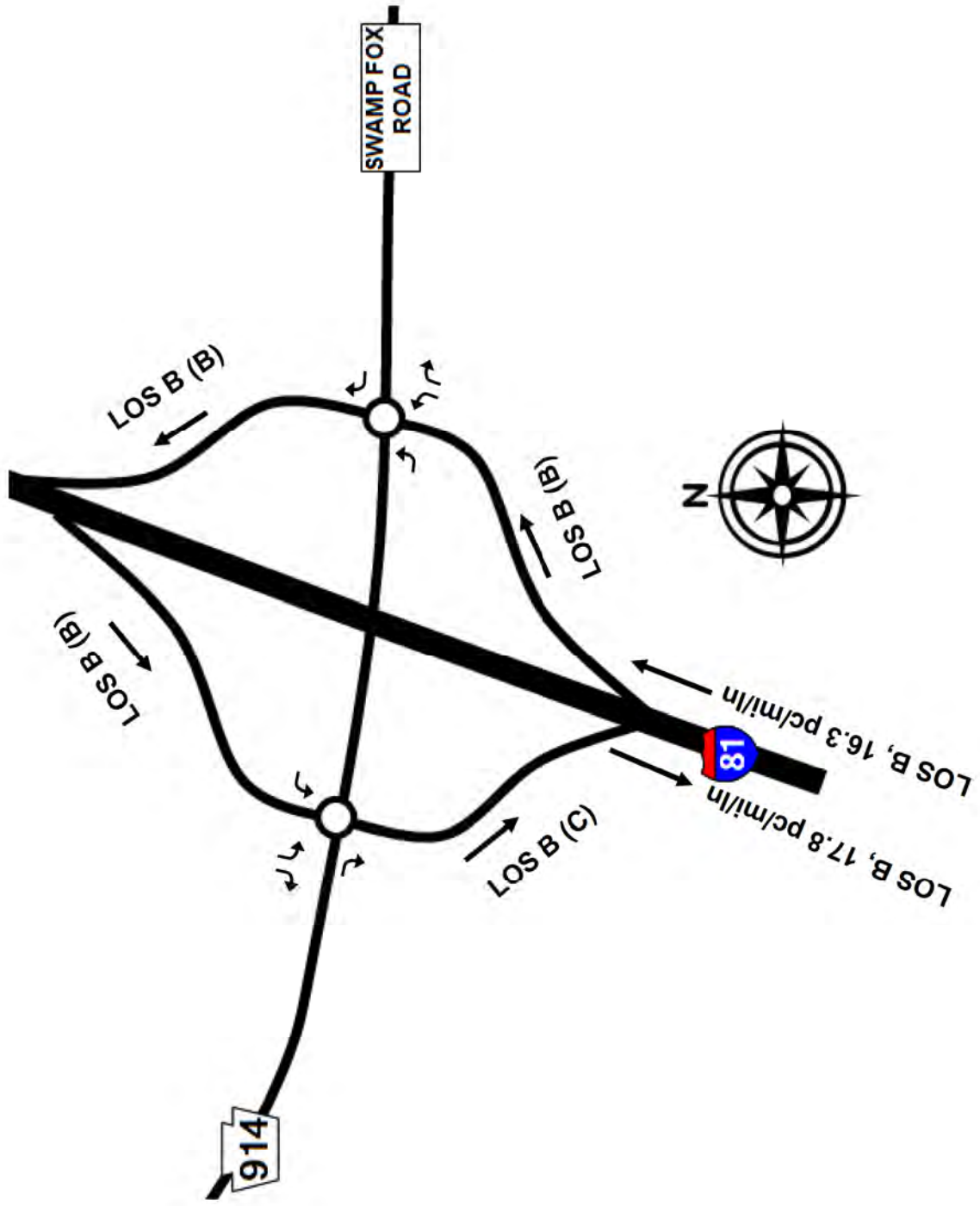
PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania



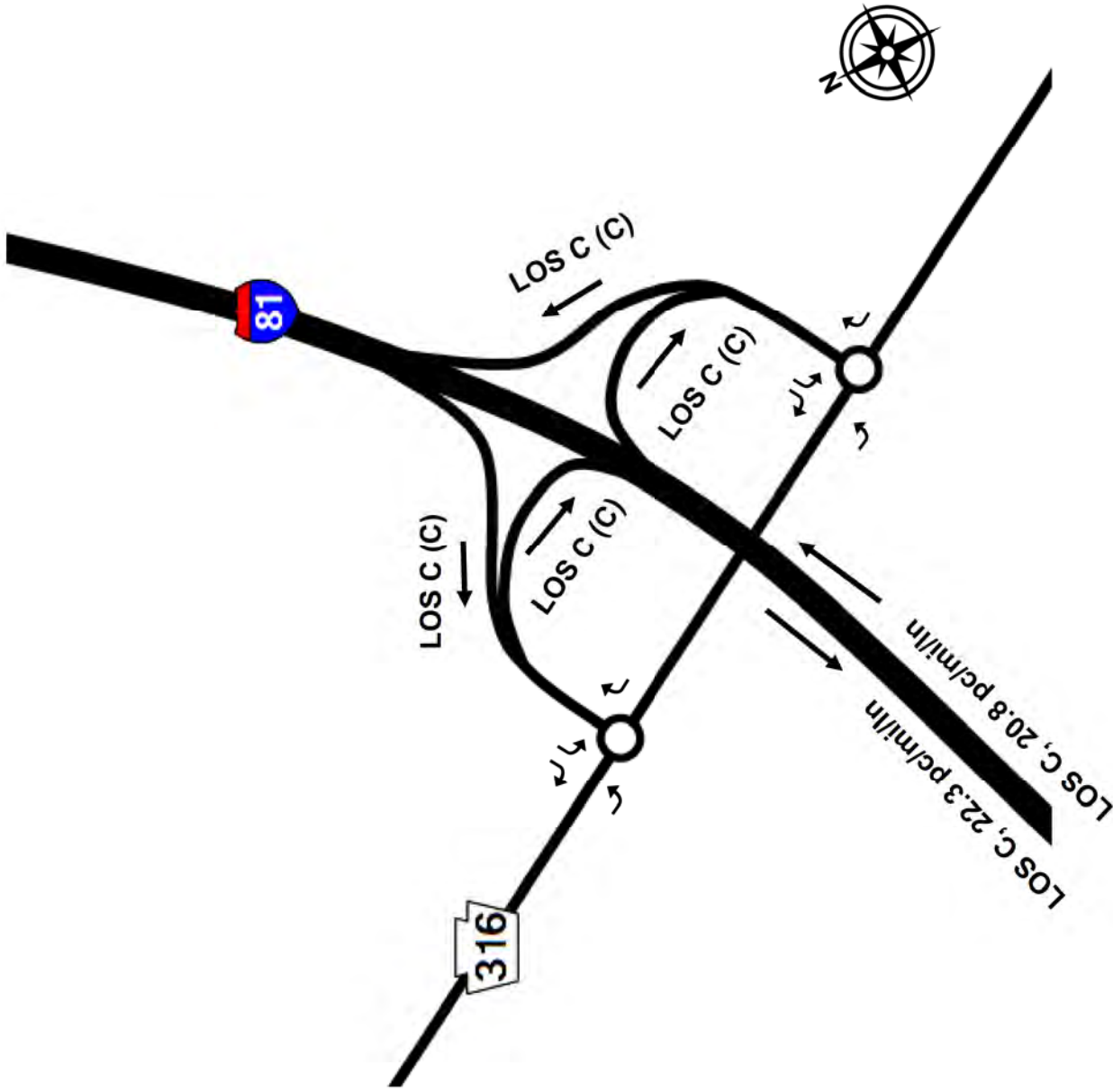
**FIGURE G.3**  
**Exit 14 Wayne Avenue Interchange Diagram:**  
**2007 Existing Peak Hour LOS AM (PM)**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania



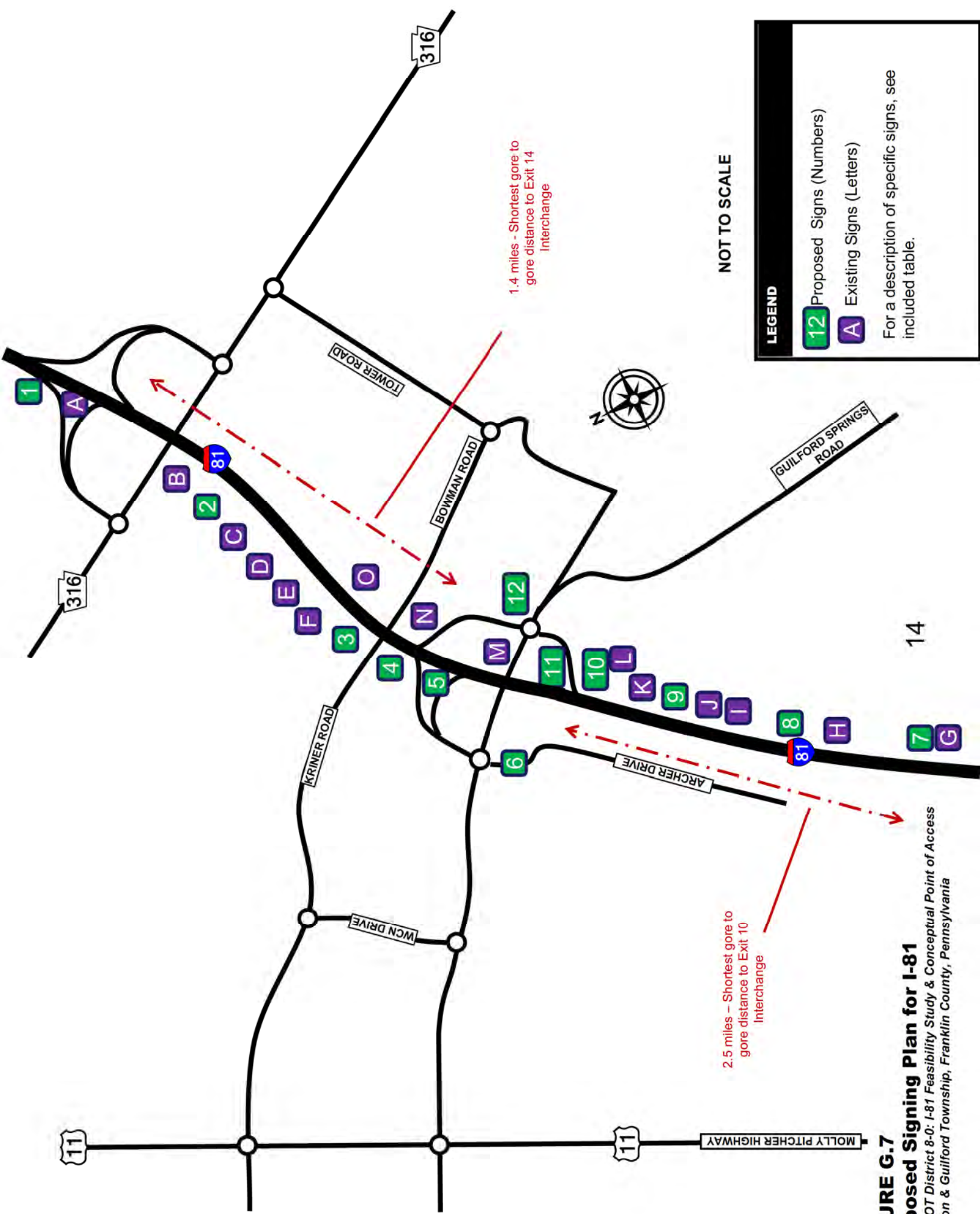
**FIGURE G.4**  
**Guilford Springs Interchange Diagram:**  
**2030 Peak Hour LOS AM (PM)**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania



**FIGURE G.5**  
**Exit 10 Swamp Fox Road Interchange Diagram:**  
**2030 Peak Hour LOS AM (PM)**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania

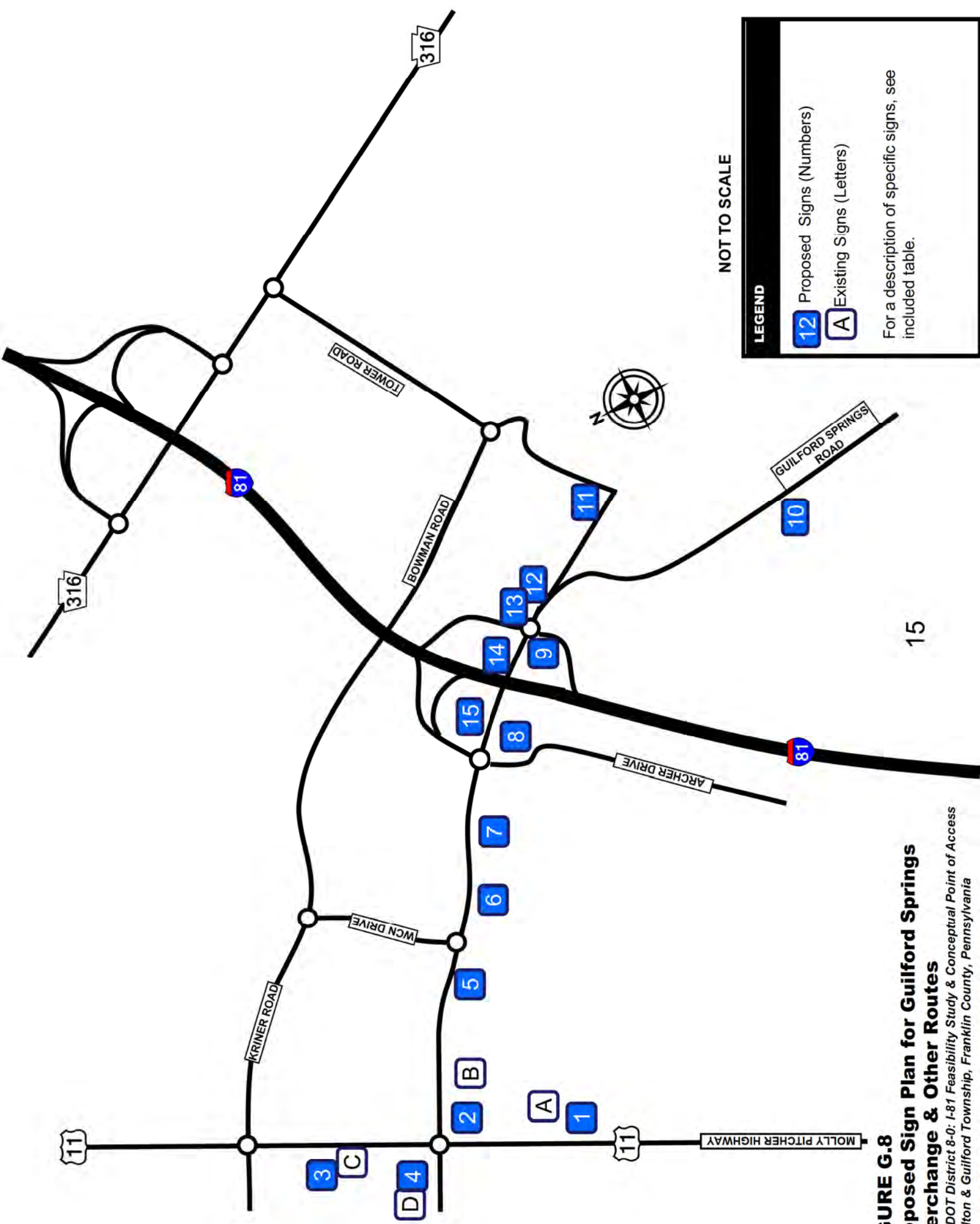


**FIGURE G.6**  
**Exit 14 Wayne Avenue Interchange Diagram:**  
**2030 Peak Hour LOS AM (PM)**  
 PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania



**FIGURE G.7**  
**Proposed Signing Plan for I-81**  
 PennDOT District 8-0; I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania





NOT TO SCALE

**LEGEND**

**12** Proposed Signs (Numbers)









**A** Existing Signs (Letters)

For a description of specific signs, see included table.

**FIGURE G.8**  
**Proposed Sign Plan for Guilford Springs Interchange & Other Routes**

*PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access Hamilton & Guilford Township, Franklin County, Pennsylvania*

# I-81 Existing Signs

Sign Location	Example and Description of Sign
<b>A</b>	 Exit 14 Gore Sign
<b>B</b>	 Bridge May be Icy Warning Sign (Lighted)
<b>C</b>	 Bridge May be Icy Warning Sign
<b>D</b>	I-81 South Trailblazer Sign
<b>E</b>	 Post-Interchange Distance Signs (Hagerstown and Greencastle Destinations)
<b>F</b>	 Weigh Station Ahead Advanced Guide Sign - 2 miles
<b>G</b>	I-81 North Trailblazer Sign
<b>H</b>	 Post-Interchange Distance Signs (Chambersburg and Carlisle Destinations)
<b>I</b>	 Chambersburg Next 5 Exit Guide Signs
<b>J</b>	 Chambersburg Exits Guide Sign
<b>K</b>	 Advanced Guide Sign - Exit 14, 2 Miles
<b>L</b>	 Community Wayfinding Guide Signs - Exit 14
<b>M</b>	 Community Wayfinding Guide Signs - Exit 14
<b>N</b>	 Community Wayfinding Guide Signs - Exit 14
<b>O</b>	 Chambersburg CBD, Wilson College Community Wayfinding Guide Sign Exit 14

**TABLE G.2**  
**Existing Signs for I-81**

PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
 Hamilton & Guilford Township, Franklin County, Pennsylvania

# I-81 Proposed Signs

## Sign Location Example and Description of Sign

1		Advanced Guide Sign – Exit (New POA), 2 Miles
2		Advanced Guide Sign – Exit (New POA), 1 Mile
3		Advanced Guide Sign – Exit (New POA), 1/4 Mile
4		Exit Direction Sign - Exit (New POA)
5		Exit (New POA) Gore Sign
6		Destination Guide Sign
7		Advanced Guide Sign – Exit (New POA), 2 Miles
8		Advanced Guide Sign – Exit (New POA), 1 Mile
9		Advanced Guide Sign – Exit (New POA), 1/4 Mile
10		Exit Direction Sign - Exit (New POA)
11		Exit (New POA) Gore Sign
12		Destination Guide Sign





**TABLE G.3**

### Proposed Signs for I-81

PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
Hamilton & Guilford Township, Franklin County, Pennsylvania

## Existing Signs - Interchange

Sign Location Example and Description of Sign
















A	 Intersection Lane Control Sign
B	 Intersection Lane Control Sign
C	 Intersection Lane Control Sign
D	 Intersection Lane Control Sign

**TABLE G.4**  
**Existing Signs - Guilford Springs Interchange & Other Routes**  
*PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access*  
*Hamilton & Guilford Township, Franklin County, Pennsylvania*

Examples used from *Manual on Uniform Traffic Control Devices*, 2009 Edition, Washington DC, 2009

## Proposed Signs – Interchange

Sign Location Example and Description of Sign

<b>1</b>		I-81 Advanced Turn Arrow Auxiliary Sign with Route Sign
<b>2</b>		I-81 Advanced Turn Arrow Auxiliary Sign with Route Sign
<b>3</b>		I-81 Advanced Turn Arrow Auxiliary Sign with Route Sign
<b>4</b>		I-81 Advanced Turn Arrow Auxiliary Sign with Route Sign
<b>5</b>		I-81 Junction Assembly Sign
<b>6</b>		I-81 Destination Sign
<b>7</b>		I-81 Directional Assembly or Entrance Direction sign for South Bound Ramp
<b>8</b>		Advance Route Turn Assembly or Advance Entrance Direction Sign with an Advance Turn Arrow
<b>9</b>		Directional Assembly or Entrance Direction Sign for North Bound Ramp
<b>10</b>		I-81 Junction Assembly Sign
<b>11</b>		I-81 Junction Assembly Sign
<b>12</b>		I-81 Destination Sign
<b>13</b>		I-81 Directional Assembly or Entrance Direction sign for North Bound Ramp
<b>14</b>		Advance Route Turn Assembly or Advance Entrance Direction Sign with an Advance Turn Arrow
<b>15</b>		Directional Assembly or Entrance Direction Sign for North Bound Ramp

**TABLE G.5**

**Proposed Sign Plan for Guilford Springs Interchange &**

**Other Routes**

*PennDOT District 8-0: I-81 Feasibility Study & Conceptual Point of Access  
Hamilton & Guilford Township, Franklin County, Pennsylvania*

Examples used from *Manual on Uniform Traffic Control Devices*, 2009 Edition, Washington DC, 2009

Identification of the existing environmental features within the study area is discussed in Section 4.0 of the Feasibility Study. A preliminary assessment of the potential environmental impacts for each of the design concepts, considering all NEPA elements, is discussed in Section 7.0 of the Feasibility Study.

**d. Conformance with Transportation Plans**

The relationship of this Point of Access Request Report to similar studies is discussed above in the Background, Section A.2.c. of this appendix. The known or planned land uses within the study area are discussed in Section 5.2 and 5.3 of I-81 Feasibility Study.

The National Ambient Air Quality Standards (NAAQS) attainment status for Franklin County for the six principal pollutants identified in the Clean Air Act are as follows: Ozone, maintenance; Particulate Matter 2.5 and 10, attainment; SO<sub>2</sub>, attainment; Carbon Monoxide, attainment; Nitrogen Oxides, attainment; Lead, attainment.

At this point, the proposed improvements are part of a Conceptual Point of Access Request Report and therefore have not yet been included on a Transportation Improvement Program (TIP). When the conceptual report has received approval, steps will be taken to include the improvements on the regional TIP. The Franklin County RPO was recently established in May 2009. Because of this timeframe, a Long Range Transportation Plan has not yet been established by the RPO. However, a long range plan is currently being developed by the RPO, for which the process began in 2011 and is anticipated to be completed in 2012. This is being developed in conjunction with a revision to the Franklin County Comprehensive Plan, which was last adopted in July 1999.

**e. Evaluation Matrix**

Each of the seven (7) alternatives considered are summarized in Section 7.3 of I-81 Feasibility Study and a comparison of these alternatives is included in Table 7.3.1.

**f. Design Exceptions**

No design exceptions are anticipated for the proposed improvements.

**5.0 Engineering Study Appendices**

Appendices that include all of the supporting documentation for the traffic data and analysis and the engineering data are included in **Appendix A – F** of the I-81 Feasibility Study. A conceptual signing plan is discussed in Section B.4.b. of this appendix and is illustrated in **Figure G.7 and G.8** and **Tables G.2 – G.5** of this appendix.

**C. Estimate, Funding & Schedule**

The construction cost estimate for each of the seven (7) conceptual alternatives, including the Guilford Springs Road Interchange, is listed in Table 7.3.1 of the I-81 Feasibility Study. The cost estimates and general schedule for the final design, right-of-way and utility phases of the Guilford Springs Road Interchange project would be developed during the preliminary engineering phase of the project, and the construction cost estimate would also be refined during that time. Additionally, the funding sources for these phases would be identified when the project is proposed for inclusion on the next TIP update. The correlation between the transportation improvements and the local land development is discussed and illustrated in Section 8.0 of the I-81 Feasibility Study.

#### **D. Land Use & Access Management Report**

As this is a Conceptual Point of Access Request Report, a complete Land Use & Access Management Report has not yet been developed for the proposed project. This information will be prepared as part of the Final Point of Access Request Report. However, extensive coordination has occurred with Franklin County and Guilford Township officials to determine that the proposed access improvements are consistent with the current Franklin County Comprehensive Plan and the current Guilford Township zoning and land use ordinances.

The local municipalities have been using zoning, development, official maps and their own funds to create a more functionally adequate roadway network within the study area. However, none of the municipalities have implemented an access management ordinance to date.

The proposed development of an interchange on I-81 at Guilford Springs Road has received the support of the local municipalities, the Franklin County Planning Commission, the Franklin County RPO, and other local organizations. Letters of support from these entities are contained in **Appendix H**. Since this is a Conceptual Point of Access, no public meetings were held during the study. However, there are no known controversies or issues of community concern at this time. Public involvement activities will be completed during the NEPA process, during the Final Point of Access Report process.

The location of the proposed access was selected upon the potential environmental impacts being identified and considered. Environmental features, including natural, cultural, and socioeconomic resources, are discussed in Section 4.0 of the I-81 Feasibility Study and are illustrated on Figure 4.1 and Figure 5.1.1. A preliminary assessment of the potential environmental impacts for each of the design concepts, considering all NEPA elements, is discussed in Section 7.0 of the Feasibility Study.

#### **E. Environmental Compliance**

This Conceptual Point of Access Request Report is being submitted for conceptual approval only. The environmental clearance process has not yet been completed, and will not be completed until after conceptual approval has been issued and the project has been added to the TIP. All applicable environmental requirements and approvals will be obtained for the selected design alternative during the Final Point of Access Report process.

#### **F. Summary and Recommendations**

The requested change in access is identified and discussed in Section 7.0 of the I-81 Feasibility Study. A summary of all of the alternatives considered is presented in Section 7.3 and a comparison of the alternatives is illustrated in Table 7.3.1. The phased implementation of the selected change in access, at Guilford Springs Road, is outlined in Section 8.0 of the I-81 Feasibility Study. When approval of the Conceptual Point of Access Request Report has been issued, further actions will be pursued based on the chosen alternative, such as preparation of the Final Point of Access Report, NEPA clearance, and programming of final design.

#### **G. Local Government Agreements**

The preparation of the Conceptual Point of Access Request Report is being led by Guilford Township and Hamilton Township in Franklin County, in coordination with PennDOT District 8-0.

Letters of support from the local municipalities, as well as members of the project stakeholder group and the Franklin County RPO, have been previously submitted to PennDOT. The letters of support state that the proposed project, the I-81 / Guilford Springs Road Interchange, is endorsed by the local entities and that they concur with the Point of Access request. The letters of support can be found in **Appendix H**.

## **H. Appendices Documentation**

Previous studies and reports related to the proposed project and the Franklin County Comprehensive Plan are discussed in Section A.2.c. of this appendix. Letters of support from local government and other local entities are discussed in Section G. of this appendix and can be found in **Appendix H**. As this is a Conceptual Point of Access Request Report, the proposed project has not yet been included in the various local and regional plans.



## **APPENDIX H**

### **LOCAL LETTERS OF SUPPORT**

Letters of support from:

- Guilford Township Supervisors
- Hamilton Township Board of Supervisors
- Borough of Chambersburg
- Franklin County Rural Planning Organization
- Franklin County Planning Commission
- Franklin County Area Development Corporation
- Franklin County Career & Technology Center

# **GUILFORD TOWNSHIP SUPERVISORS**

115 Spring Valley Road  
Chambersburg, Pennsylvania 17202  
Phone (717) 264-6626 (Supervisors)  
(717) 264-0077 (Zoning)  
e-mail: gtsups@guilfordtp.us (Supervisors)  
wstatler@guilfordtp.us (Zoning)

July 16, 2009

**Mr. Michael S. Gillespie, P.E., Acting District Executive  
Engineering District 8-0  
Pennsylvania Department of Transportation  
2140 Herr Street  
Harrisburg, PA 17103**

**Attn: John Bachman**

**Dear Mr. Gillespie,**

**This correspondence is in regard to the I-81 Feasibility Study/Conceptual Point of Access Report that was prepared by McCormick-Taylor, Inc. for PennDOT District 8-0, Guilford Township, and Hamilton Township.**

**As you are aware, the local governments in the Chambersburg Area have been quite successful in creating jobs through economic development. The existing commercial and industrial development has resulted in a substantial number of heavy trucks on the local road system within the I-81 corridor between Wayne Avenue and Marion. The increased numbers of heavy truck traffic sharing the roads with personal vehicles has created operational difficulties and safety issues at intersections through the corridor as the trucks travel to I-81 at the Wayne Avenue and Marion Interchanges.**

**The I-81 Study considered several options at a number of locations to accommodate the increasing truck traffic within the study corridor accessing I-81 at the Wayne Avenue Interchange (Exit 14) and at the Marion Interchange (Exit 10). The conclusion of the report is that the location that best meets the project needs is at Guilford Springs Road. Coordination activities with the Department resulted in the recommendation that the initial improvements would consist of southbound access and egress ramps to I-81 at Guilford Springs Road along with improvements to selected intersections. These initial improvements would accommodate existing distribution centers, residential traffic entering Guilford Township from Hamilton Township, and other traffic. The construction of the southbound access ramps would not require widening or other improvements to the Guilford Springs Road Bridge over I-81. The interchange would eventually be completed with northbound ramps as development and traffic volumes demand.**

**In an effort to plan growth and development in an orderly fashion, and to preserve utility systems, the road system, and agricultural lands, the Guilford Township Supervisors implemented zoning for the first time in 1997. Further, in 2006 the Guilford Township Supervisors adopted a policy stating that the Guilford Township Supervisors will not consider changing any currently Agricultural/Residential (AR) zoned land to Residential (R) zoning for a twenty (20) year period. In addition, our Subdivision and Land Development Ordinance does not allow the extension of the public water and public sewer systems into the AR zone. A color-coded Guilford Township Zoning Map is attached for reference.**

**In 2008, CSX Railroad completed an intermodal site on Kriner Road. CSX plans to incrementally increase the shipment of containers in years to come. The rail company projects an increase in trains per day, and the containers are not stacked because of insufficient bridge clearances. Norfolk Southern Corporation also is proposing an intermodal site in the Greencastle area which has the potential to further increase heavy truck traffic in the project corridor. Intermodal facilities have the advantage of removing a substantial number of heavy truck traffic from the Interstate system, but the trucks carrying the off-loaded containers will re-enter the local road system at Chambersburg and Greencastle.**

**Even though Guilford Township has implemented the planning strategies noted above, it is imperative that improved access to I-81 be constructed at Guilford Springs Road. This improvement will extend the life of and minimize the need for costly upgrades to the Wayne Avenue Interchange (Exit 14), the Marion Interchange (Exit 10), and the Molly Pitcher Highway (U.S. 11).**

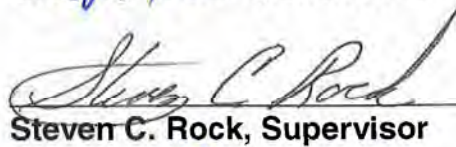
**We have attached support letters from the local governments whose road systems and economies will benefit from the construction of improved I-81 access at Guilford Springs Road. The Franklin County Area Development Corporation also has provided a letter indicating their support for the project and describing how improved access to I-81 will be a catalyst in the creation of employment opportunities.**

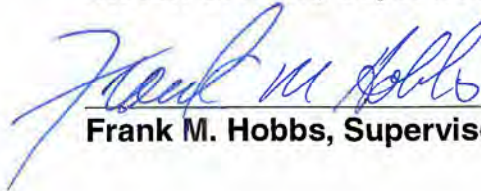
**As described in the I-81 Feasibility Study/Conceptual Point of Access Report, the proposed action is consistent with the nationwide economic stimulus initiatives, focusing on creating economic opportunities and boosting employment. The report also describes a phased approach to highway infrastructure improvements in conjunction with the pace of commercial and industrial development in the I-81 corridor. This approach is consistent with sound land use planning and Smart Transportation guidelines.**

The Guilford Township Board of Supervisors unanimously supports the construction of I-81 access improvements, selected intersection improvements, and ultimately a full interchange on Guilford Springs Road. We hope the Pennsylvania Department of Transportation and the Federal Highway Administration will look favorably on this proposal.

Sincerely,  
GUILFORD TOWNSHIP SUPERVISORS

  
\_\_\_\_\_  
Gregory L. Cook, Chairman

  
\_\_\_\_\_  
Steven C. Rock, Supervisor

  
\_\_\_\_\_  
Frank M. Hobbs, Supervisor

# HAMILTON TOWNSHIP BOARD OF SUPERVISORS

1270 Crottlestown Road  
Chambersburg, Pennsylvania 17202  
Telephone: (717) 264-2946  
Fax: (717) 264-2134  
Email: [hamiltontwp@comcast.net](mailto:hamiltontwp@comcast.net)

## Supervisors:

James C. Hollenshead  
Michael K. Kessinger  
Randall E. Negley

## Solicitor:

Welton J. Fischer

July 22, 2009

Mr. Michael S. Gillespie, P.E., Acting District Executive  
Engineering District 8-0  
Pennsylvania Department of Transportation  
2140 Herr Street  
Harrisburg, PA 17103

ATTN: John Bachman

Dear Mr. Gillespie:

This letter is written regarding the I-81 Feasibility Study and Conceptual Point of Access Report prepared by McCormick Taylor for Guilford and Hamilton Townships, as well as PennDOT District 8-0.

The above-mentioned study indicates that a new I-81 point of access located at Guilford Springs Road is warranted, as well as specific intersection improvements. Hamilton Township is in full agreement and support of the study's recommendation.

As was previously determined in the Greater Chambersburg Southwest Corridor Study, completed by McCormick Taylor in 2006, traffic congestion on U.S. Route 30 through Hamilton Township and the Borough of Chambersburg is resulting in motorists using local roads to travel in a west to south direction. That study concluded that private commuter vehicles and truck traffic alike are using these local roads to connect to U.S. Route 11 to access I-81 at Exit 14 Wayne Avenue (PA 316) and Exit 10 Marion/Swamp Fox Road (PA 914). While widening of U.S. Route 30 was recommended to alleviate traffic congestion, the need for other improvements along the U.S. Route 11/I-81 corridor were also suggested.

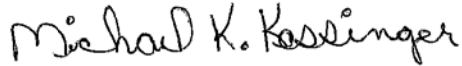
Recent growth of commercial and industrial development in the Chambersburg Area has caused a significant increase in heavy truck traffic destined for I-81. The combination of heavy truck traffic and private vehicles utilizing local roads, which are primarily residential in nature, raises concerns for safety and mobility.

Mr. Michael S. Gillespie, P.E., Acting District Executive  
PA Department of Transportation, District 8-0  
Page Two

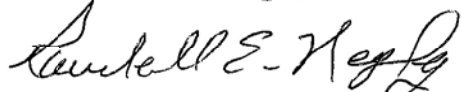
We respectfully request that the Pennsylvania Department of Transportation and the Federal Highway Administration carefully review the I-81 Feasibility Study and Conceptual Point of Access Report and act accordingly to move this project to implementation.

Sincerely,

HAMILTON TOWNSHIP BOARD OF SUPERVISORS



Michael K. Kessinger, Chairman



Randall E. Negley, Vice-Chairman



James C. Hollenshead, Supervisor

djh



# ***Borough of Chambersburg***

*Celebrating 50 years of consumer owned gas service  
and over 100 years of consumer owned electric service*

September 14, 2009

Attn: John Bachman  
Mr. Michael S. Gillespie, PE, Acting District Executive  
Engineering District 8-0  
Pennsylvania Department of Transportation  
2140 Herr Street  
Harrisburg, PA 17103

Dear Mr. Gillespie:

This correspondence is in regard to the I-81 Feasibility Study/Conceptual Point of Access Report that was prepared by McCormick-Taylor, Inc. for PennDOT District 8-0, Guilford Township, and Hamilton Township.

As you are aware, the local governments in the Chambersburg area have been quite successful in creating jobs through economic development. The existing commercial and industrial development has resulted in a substantial number of heavy trucks on the local road system within the I-81 corridor between Marion and Wayne Avenue including the southern portion of Chambersburg. The increased numbers of heavy truck traffic sharing the roads with personal vehicles has created operational difficulties and safety issues at intersections through the corridor as the trucks travel to I-81 at the Wayne Avenue and Marion Interchanges.

The I-81 Study considered several options at a number of locations to accommodate the increasing truck traffic within the study corridor accessing I-81 at the Wayne Avenue Interchange (Exit 14) and at the Marion Interchange (Exit 10). The conclusion of the report is that the location that best meets the project needs is at Guilford Springs Road. Coordination activities with the Department resulted in the recommendation that the initial improvements would consist of southbound access and egress ramps to I-81 at Guilford Springs Road along with improvements to selected intersections. These initial improvements would accommodate existing distribution centers, residential traffic entering Guilford Township from Hamilton Township and other traffic. The construction of the southbound access ramps would not require widening or other improvements to the Guilford Springs Road Bridge over I-81. The interchange would eventually be completed with northbound ramps as development and traffic volumes demand.

Attn: John Bachman  
Mr. Michael S. Gillespie, PennDOT  
September 14, 2009  
Page 2 of 2

Throughout the study process Borough officials were given the opportunity to make comment and participate in discussions regarding the study. As a result the Borough of Chambersburg is supportive of the study's conclusion that improved access to I-81 be constructed at Guilford Springs Road. This improvement will extend the life of and minimize the need for costly upgrades to the Wayne Avenue Interchange (Exit 14), the Marion Interchange (Exit 10) and the Molly Pitcher Highway (U.S. 11). It is imperative that this planning study be programmed on PennDOT's 12 year construction plan.

Sincerely,

BOROUGH OF CHAMBERSBURG

  
William F. McLaughlin,  
President of Town Council





Franklin County Planning Commission  
Administrative Annex  
218 North Second Street  
Chambersburg, PA 17201-1642

Phone: 717-261-3855  
Fax: 717-264-8667  
TDD: 717-264-8474  
Email: [sclayton@co.franklin.pa.us](mailto:sclayton@co.franklin.pa.us)

August 19, 2009

Michael S. Gillespie, P.E.  
Acting District Executive, Engineering District 8-0  
Pennsylvania Department of Transportation  
2140 Herr Street  
Harrisburg, PA 17103

Attn: John Bachman

RE: Interstate 81, Point of Access Study  
Guilford Township, PA

Dear Mr. Gillespie,

The Franklin County Rural Planning Organization (RPO) recently received a copy of the I-81 Point of Access Study for Guilford Township. We were also provided a brief presentation on the project at our most recent meeting. Following the presentation the RPO board voted unanimously to send you this letter of support for the project.

The Franklin County RPO fully supports the recommendation in the study to construct a "limited access" interchange at Guilford Springs Road as well as the other improvements to the associated transportation network. This area of the county is home to a number of large distribution facilities that utilize the local road system along Interstate 81 between the Wayne Avenue and Marion exits. Additionally, CSX recently constructed an intermodal facility that is now operational. The access lanes will enable traffic that currently impacts the local network to more easily access the interstate. We believe that this Point of Access Study reveals all of the improvements that will be necessary to support the changing development patterns project for this area.

In addition to our support, this project has the full support of the local municipality. We look forward to working with PennDOT to see that these objectives come to light in the future. If you have any questions, please feel free to contact me.

Sincerely,

Robert L. Thomas, Chairman  
Franklin County Rural Planning Organization

c: file



Franklin County Planning Commission  
Administrative Annex  
218 North Second Street  
Chambersburg, PA 17201-1642

Phone: 717-261-3855  
Fax: 717-264-8667  
TDD: 717-264-8474  
Email: sclayton@co.franklin.pa.us

September 10, 2009

Michael S. Gillespie, P.E.  
Acting District Executive, Engineering District 8-0  
Pennsylvania Department of Transportation  
2140 Herr Street  
Harrisburg, PA 17103

Attn: John Bachman

RE: Interstate 81, Point of Access Study  
Guilford Township, PA

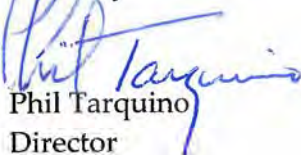
Dear Mr. Gillespie,

The Franklin County Planning Department recently received a copy of the I-81 Point of Access Study for Guilford Township. Staff has reviewed this study and finds that the project is consistent with the Franklin County Comprehensive Plan. Most specifically, an exit south of Chambersburg was identified as a necessary project in the transportation component of the implementation plan.

The Franklin County Planning Department fully supports the recommendations in the study and feels that the improvements identified should be considered to be completed earlier than the projected timeline to support anticipated growth in this area of the county.

If we can provide any additional information that would assist in this project, please feel free to contact this office.

Sincerely,

  
Phil Tarquino  
Director

c: file



1900 Wayne Road  
Chambersburg, PA 17201

(717) 263-8282  
FAX (717) 263-0662  
www.fcadc.com

July 28, 2009

Michael S. Gillespie, P.E.  
Acting District Executive, Engineering District 8-0  
Pennsylvania Department of Transportation  
2140 Herr Street  
Harrisburg, PA 17103

**Re: I-81 Point of Access, Guilford Township, Franklin County**

Dear Mr. Gillespie:

On behalf of the Franklin County Area Development Corporation (FCADC), I am writing in regards to the recently concluded Point of Access (POA) study conducted by McCormick Taylor. The study is the first step in what we hope will lead to the construction of a much needed interchange in Guilford Township, Franklin County.

The FCADC is fully supportive of the Township's recommendation which is to construct a "limited access" interchange at Guilford Springs Road (mile marker 12.) The initial improvements would consist of southbound access and egress ramps to I-81 at Guilford Springs Road along with improvements to selected intersections. The recommended improvements would accommodate the growing number of logistics centers, residential traffic entering Guilford Township from Hamilton Township, as well as other traffic. Construction of southbound access ramps would not require widening or other improvements to the Guilford Springs Road over I-81. Completion of the interchange via construction of northbound ramps would be completed as traffic demands warrant.

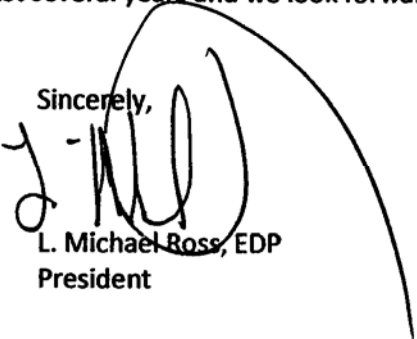
As you are aware, Franklin County is among the fastest growing counties in the Commonwealth, primarily the result of our proximity to the Baltimore/Washington metro area and the presence of I-81. Several major transportation improvements that either have been completed, are in progress, or have been recently announced are expected to contribute to a resurgence in growth beginning in 2010. Among the projects have been the CSX intermodal terminal at exit 14 (Wayne Avenue/Guilford Township), bridge improvements at exits 24 and 20 (Southampton and Greene Townships), and proposed interchange improvements and a Norfolk-Southern intermodal at exit 3 (Antrim Township). In addition to the more than 1,000 acres that will be available development at exit 3, there is another 350+ situated between Lighthouse and Kriner Roads (exits 10-14) that are prime

Michael Gillespie, P.E.  
July 28, 2009  
Page 2

for development. With an economy that is starting to re-emerge coupled with presence of the CSX intermodal and the anticipated N-S announcement, the new interchange will be needed sooner rather than later. The conservative version of the economic impact projections are mind boggling...more than \$1 Billion of capital investment and more than 5,000 jobs.

Unlike previous interchange construction in Franklin County, the proposed construction at Guilford Springs Road enjoys the full support of the local municipality. As evidenced by the letter from the Guilford Township Board of Supervisors, one can detect a sense of urgency to keeping the project on track so that construction can begin at the earliest possible date.

As the project progresses, should your office require any type of socio-economic information about Franklin County, please do not hesitate to contact our office. This project has been a community/economic development priority for the last several years and we look forward to its coming to fruition in the near future.

Sincerely,  
  
L. Michael Ross, EDP  
President

C: John Bachman, PennDot District 8-0  
Greg Cook, Chair, Guilford Township Board of Supervisors  
Michael Kessinger, Chair, Hamilton Township Board of Supervisors  
Phil Tarquino, Director, Franklin County Planning Office  
Congressman Bill Shuster  
Senator Richard Alloway  
Representative Rob Kauffman  
Representative Todd Rock  
FCADC Board of Directors



2463 Loop Road, Chambersburg, PA 17201  
(717) 263-9033  
(717) 263-6568 Fax

July 30, 2009

Mr. Michael Gillespie, P.E., Acting District Executive  
Engineering District 8-0  
Pennsylvania Department of Transportation  
2140 Herr Street  
Harrisburg, PA 17103

Dear Mr. Gillespie;

This letter is written in support of the development of a south-bound access on Interstate 81 at Guilford Springs Road. Access to and from I81 between Exit 10 and 14 is much needed due to the continued growth of industrial development south of Chambersburg.

The Franklin County Career and Technology Center is located at 2463 Loop Road, Chambersburg, PA approximately ½ mile from the proposed access point. Developing a Guilford Springs Road connection to I81 will provide our school much needed access for our growing clientele. Not only are we host to 750 secondary-aged students on annual basis, but recent partnerships with Harrisburg Area Community College and Penn State University has brought an increased number of adult learners into our school. We consider ourselves the workforce educational resource for the I81 corridor from the Maryland state line to the greater Carlisle area. Developing this access to I81 will facilitate the growth of workforce development in the area providing an immediate and convenient access to training needs within the south-central Pennsylvania region.

In addition, the Franklin County Career and Technology Center has entered into the design phase of a \$37 million school renovation and expansion which will make us a comprehensive school offering by the year 2012. This project could potentially double our student population making easy access even a more important issue when considering student and safety.

Your consideration of this proposal is appreciated. I can be reached at (717)263-9033 (x213) if you would like to talk to me further.

Sincerely,

A handwritten signature in blue ink that reads 'James T. Duffey'.

James T. Duffey  
Administrative Director

Cc; John Bachman

Serving Franklin County School Districts  
Chambersburg • Fannett-Metal • Greencastle-Antrim • Shippensburg • Tuscarora • Waynesboro

**APPENDIX I**  
**MEETING REPORTS**

## Interstate 81 Conceptual Point of Access / Feasibility Study

### Kick-Off Meeting Report

**Date:** November 19, 2007  
**Time:** 9:00 AM  
**Location:** Hamilton Township Municipal Office  
Franklin County, Pennsylvania

**Attendees:**

John Bachman  
John Bork  
Colleen Brown  
Sharon Okin  
Greg Cook  
Mike Kessinger  
Phil Tarquino  
Mike Ross  
David Mackley  
Brian St. John  
Brandy Rotz

**Representing:**

PennDOT District 8-0 Project Manager  
Federal Highway Administration  
PennDOT Bureau of Design  
PennDOT District 8-0 Environmental Unit  
Guilford Township  
Hamilton Township  
Franklin County Planning Commission  
Franklin County Area Development Corporation  
Franklin County Area Development Corporation  
McCormick Taylor  
McCormick Taylor

**Purpose of Meeting**

The meeting was held to discuss the purpose of the project, the scope of work and the project schedule for the I-81 Conceptual Point of Access / Feasibility Study.

**Meeting Discussion**

1. The meeting was opened with an overview of the project, including a description of the study area boundaries. It was noted that Notice to Proceed was issued by Hamilton Township in October 2007. In an effort to keep the project on schedule, McCormick Taylor began the traffic data collection efforts prior to the kick-off meeting.
2. Brian St. John discussed the traffic data collected to date. The origin-destination survey was conducted at the Wayne Avenue Interchange and the Marion Interchange on-ramps and off-ramps on two separate dates, November 8, 2007 and November 15, 2007. Automatic Traffic Recorder (ATR) counts were conducted at various locations throughout the study area on November 6 – 9, 2007 and November 13 – 16, 2007. Additional ATR counts will be conducted for the remaining locations during the last week of November. Manual traffic counts were conducted at various intersections and interchange ramps beginning on November 7, 2007 and are expected to be completed by mid-December. After the data collection efforts are complete, the analysis of the traffic data will begin.

3. Greg Cook stressed that it is important to move forward as quickly as possible with this study in order to accommodate the ever increasing development and traffic volumes within the study area. He stated that the CSX inter-modal facility is currently under construction and has already started a number of operations, creating truck traffic along Kriner Road and Wayne Avenue. The inter-modal facility is expected to be fully functional by April 2008, at which point approximately 150 trucks will be traveling to and from the facility daily. In addition to the CSX facility, there are a few new distribution / industrial facilities along I-81 that are currently vacant, but are anticipated to be in operation within next few months, which would create additional truck traffic.
4. Zoning within the study area was discussed, including current land uses. Within Guilford Township, the majority of the study area between Interstate 81 and US 11 is currently zoned as either Industrial or Commercial. This corridor is not yet built out, but has the potential to expand to its capacity in the near future. The study area to the east of I-81 from the CSX rail line to beyond the Marion Interchange is currently zoned as Agricultural / Residential. Development within this zone is severely limited, and no public water or sewer facilities are permitted to be extended into the zone, further discouraging development. Guilford Township does not foresee granting any variances within this zone in the near future.
5. Previously completed engineering and environmental studies near the general study area were discussed, stating that they should be referenced in an attempt to compile as much background data as possible and to avoid duplicating efforts. Mike Ross will provide McCormick Taylor with copies of the relevant studies. Planned projects within or near the study area were also discussed, including the improvements to the bridges over I-81, improvements to the CSX railroad bridge along I-81, and the Route 316 bridge widening.
6. John Bachman stated that potential improvements could include improvements to the existing interchanges at Wayne Avenue and Marion, a new interchange, new local access roads, or improvements to existing local access roads. Greg Cook stated that, if determined necessary, Guilford Township would support a new interchange. Greg also noted two potential locations for a new interchange, including that the interchange may not require the use of all four quadrants to facilitate the required movements. If possible, an interchange that utilizes only two quadrants should be investigated in order to minimize impacts to the surrounding area.
7. The remainder of the activities to be completed to fulfill the scope of work were discussed, along with their place in the anticipated project schedule. The anticipated project schedule was presented as a 12-month schedule from the Notice to Proceed date. However, it was noted that the schedule represents a best case scenario and



that it may need to be extended depending upon delays in review times or unforeseen project issues.

It was noted that the environmental work should be completed with the project needs document in mind, including economic development. Sharon Okin discussed a few resources that should be investigated in detail during the environmental inventory, including historic resource eligibility, karst geologic environments, and threatened and endangered species.

John Bachman stated that the next status meeting should be held in spring 2008, after the traffic analysis has been completed, instead of having two status meetings within this timeframe. The project team could then wait until the preliminary design concepts have been developed to have another status meeting, most likely in early summer 2008. The public meeting should be held in early fall 2008, slightly later than what is shown on the schedule.

8. Funding of the potential improvements was discussed. Mike Ross indicated that Senator Specter and Congressman Schuster support the conceptual project and would be willing to earmark funds when necessary.

The meeting ended at 10:30 AM.

Report prepared by:  
Brandy Rotz

## Interstate 81 Conceptual Point of Access / Feasibility Study

### Meeting Report

**Date:** May 29, 2008

**Time:** 9:00 AM

**Location:** Guilford Township Municipal Office  
Franklin County, Pennsylvania

**Attendees:**

John Bachman  
Frank Cavataio  
Sharon Okin  
Diana Zawatski  
Colleen Brown  
John Bork  
Bob Thomas  
Greg Cook  
Wayne Statler  
Mike Kessinger  
Phil Tarquino  
Brian St. John  
Brandy Rotz  
Joe Hollinger

**Representing:**

PennDOT District 8-0  
PennDOT District 8-0  
PennDOT District 8-0  
PennDOT District 8-0  
PennDOT Bureau of Design  
Federal Highway Administration  
Franklin County Commissioner  
Guilford Township  
Guilford Township  
Hamilton Township  
Franklin County Planning Commission  
McCormick Taylor  
McCormick Taylor  
McCormick Taylor

**Purpose of Meeting:**

The meeting was held to discuss the ongoing project activities, such as the traffic analysis, the O-D survey results, future land use, preliminary design concepts and other issues.

**Meeting Discussion:**

1. Introductions were made of the meeting attendees. Brandy Rotz gave an overview of the project to date, focusing on what has been accomplished since the initial kick-off meeting on November 19, 2007. She discussed the coordination with the area businesses that was conducted to determine the number of car and truck trips. Sharon Okin asked if there were any substantial areas of development outside of the study area. It was noted that the commercial / industrial area of the study is fairly self-contained, between I-81 and U.S. 11, but that there also is substantial new residential development west of the study area in Hamilton Township.

2. The existing and future land use maps were discussed by Brandy Rotz. The existing land use map illustrates the current residential, commercial, and industrial development in the study area. Within the I-81/U.S. 11 corridor, the commercial / industrial development has progressed southward to the target distribution facility, roughly half of the distance to Marion. The future land use map indicates the commercial / industrial area progressing southward between I-81 and U.S. 11 to the Marion Interchange, and also on the west side of U.S. 11. This represents substantial growth in the next 25 years. The local officials were asked if this growth scenario seems realistic. Bob Thomas stated that the Chambers 5 Business Park was projected to reach capacity in 25 years, but instead it has built out in less than 10 years. This is an indicator of the high development rate on this corridor. Phil Tarquino added that many Hamilton Township residents are selecting routes other than U.S. 30 that brings them into the U.S. 11 corridor. Greg Cook observed that a signal will be installed this fall at the Loop Road / Kriner Road Intersection. In summary, the local officials present at the meeting agreed with the future land use scenario and commercial / industrial build-out as indicated on the project mapping.
3. Brandy Rotz inquired about any recent project area development. Wayne Statler indicated that Flohr Pools will be constructing a maintenance facility on Kriner Road, followed by a sales facility that, in total, will require 16.5 acres. The plan is expected to be approved soon. Sharon Okin asked about the zoning for the proposed commercial strip along the west side of U.S. 11. A review of the zoning map indicated that the area, which currently is mixed commercial and residential, is zoned for commercial use.
4. The environmental features map was discussed by Brandy Rotz. She indicated that a more focused environmental inventory will be conducted when the design concepts under consideration are more defined and the area of potential impact can be more closely delineated. The historic resources were discussed. It was noted that the structures on the J. Allison Eyster Farmstead north of Guilford Springs Road have been removed, which suggests the site would no longer be eligible for the National Register of Historic Places. Also the designation of the Letterkenny Army Depot Chapel seems to be misplaced. The National Register files will be re-checked to confirm the correct identification. Brandy added that the hazardous waste sites and agricultural security areas have been identified. Wayne Statler stated that the farm at the northeast quadrant of the Wayne Avenue Interchange has been changed to commercial use. Phil Tarquino indicated that he will provide updated maps to McCormick Taylor that reflect this and other changes. It was noted that the Kriner Road Bridge over CSX, which was an eligible resource, has been replaced and has been moved to Norland Park. Greg Cook and Bob Thomas asked about the historic

- eligibility procedure, and Joe Hollinger explained the Section 106 process that is required when federal funds are involved.
5. Brian St. John discussed the study area deficiencies. He illustrated mapping of the study area roadway network, which is color coded to indicate roadways less than 24 feet wide, 24 to 36 feet wide, and greater than 36 feet wide. Roadway segments that do not meet current design criteria have also been identified. Two of the I-81 bridges were identified as having substandard vertical clearance, and John Bork questioned this finding. McCormick Taylor will verify the bridge clearances. *(It was subsequently determined that the clearance of the Kriner Road Bridge is 16 feet, 3 inches, and the Swamp Fox Road Bridge is not deficient at 16 feet, 11 inches.)* Brian stated that the at-grade railroad crossings were identified. He noted that there is an emphasis on eliminating at-grade crossings at all possible locations. Greg Cook confirmed that two local roads (sections of Bowman Road and Country Road) were posted to exclude trucks. Some new additions to the study area include a variable message sign on I-81 and a cell tower. As noted previously, Kriner Road crosses the CSX lines at separated grade on a new bridge. Country Road has been severed at the new CSX intermodal yard.
  6. Brian St. John discussed the AM and PM peak period traffic volumes. He pointed out that with the existing land use there is not heavy volumes to the south of the Target Distribution Center. The current traffic volumes at the Marion Interchange are low, and the interchange functions adequately. Brian also discussed the peak period truck volumes. Some large volume truck intersections include the Kriner Road / Wayne Avenue Intersection and the Orchard Road / Wayne Avenue Intersection. John Bork asked if the CSX intermodal terminal was in operation when the counts were completed. Brian stated that the terminal was partially operational at that time. Bob Thomas asked about the status of the bridge replacement at Molly Pitcher Highway and Swamp Fox Road at the time of the counts. Brian indicated that the counts were started a week after the bridge re-opened.
  7. The Origin-Destination Study was discussed. Brian St. John stated that the survey was conducted at the Wayne Avenue Interchange and at the Marion Interchange. Cars, medium trucks, and heavy trucks were surveyed, resulting in 600 usable survey forms. The survey itemized zip codes of the origin and the destination. The O-D zone maps were discussed. The study area was divided into 15 zones, with three east-west zones and five north-south zones. As expected, the results indicated most trucks going to and coming from northbound and southbound I-81. Phil Tarquino asked if the results indicated 18 percent from elsewhere, and that was confirmed.

8. The future traffic volumes were derived from two scenarios: a 100 percent future build-out and a 50 percent (industrial build-out - car traffic) / 80 percent (truck and car traffic) situation. Brian St. John noted that currently the area between Target and the Marion Interchange is not developed but it is being projected as totally or partially built out. The existing development in the study area was used as a model to predict future growth. Mike Kessinger asked if the projected traffic includes Hamilton Township traffic to the U.S. 11 area and Brian replied that the projections did not include that traffic. Because of that and other additional traffic, Brian will add background growth (probably 0.5 percent) to the traffic projections.
9. After reviewing the traffic matrices, Brian St. John stated that he would like to receive a consensus from the group regarding the build-out scenario and subsequent future traffic projections. It was reiterated that the Chambers 5 Business Park was anticipated to be built out in 25 years but instead it took only ten years. Frank Cavataio indicated that he has no trouble with a reduction of the trip generation from ITE based on local data. Wayne Statler stated that the rate and extent of the build-out depends on the availability of public sewer. He indicated that there has been interest in extending the sewer to the Marion Interchange, and that preliminary sewer design has been completed from Chambersburg to Marion.
10. Bob Thomas pointed out that the I-81 traffic projections are consistent with the local projections. He indicated that there has been the consideration of adding a third lane to I-81. Greg Cook stated that the traffic projections need to consider a worst case scenario. Specifically, background traffic, such as traffic from Hamilton Township, needs to be added to the calculations. Colleen Brown suggested that alternatives be developed to address 100 percent traffic and also the 50 percent / 80 percent scenario. Brian St. John indicated that the traffic through the interchanges has not been analyzed yet, because first it was necessary to attain a consensus on the projected traffic volumes at this meeting.
11. John Bork asked if there is public sewer in Marion. It was determined that Marion does not have public sewer, and that the Chambersburg system currently extends south to the Target distribution facility. In addition, no commercial / industrial development is proposed or zoned to the east of I-81. Wayne Statler mentioned that two large parking lots have been constructed on Bowman Road to serve the new CSX intermodal facility. Colleen Brown indicated that the improvements need to be considered in context with the surrounding area and consistent with Smart Transportation initiatives. A poor LOS in itself is not sufficient justification for improvements. Sharon Okin remarked that the O-D study shows substantial traffic to Hagerstown, and Bob Thomas indicated that he envisions the growth extending south past Greencastle to Hagerstown. He added that

Washington County has done projections and the numbers are similar to this study.

12. Brian St. John discussed the design concepts that were developed based on the preliminary traffic scenario. First, intersections with substantial truck traffic were identified. Consideration will be given to providing geometric improvements to address substandard features at those intersections. A number of design concepts were developed and discussed:

#### Parallel Collector-Distributor (C-D) System

This improvement would relocate the Wayne Avenue Interchange southbound on-ramp to the CD system, and provide a parallel C-D roadway on the east and west side of I-81 with a slip ramp to access I-81 at Guilford Springs Road. Colleen Brown asked if there were typical sections, and Brian indicated these design concepts were developed only in two dimensions. John Bachman asked if the current bridge improvements (widening) at the Wayne Avenue Interchange would be sufficient to accommodate the C-D system. Brian stated that the bridge would need to be 26 feet wider than the existing structure. The southbound service road would extend through the Marion Interchange and would tie into the I-81 southbound accel lane. The C-D system would accommodate the addition of future median (third) lanes on the I-81 mainline. John Bork indicated that there might be issues signing the C-D alternative. Bob Thomas stated that, based on an initial impression, he was not sold on the C-D option. Brian indicated that the plan would be to have future developers provide connections to the C-D system. Greg Cook asked if the C-D system would be within the PennDOT right-of-way. It was noted that right-of-way, mostly strip takes, would need to be acquired. Brian suggested that the developers might contribute to the facility construction through a private-public partnership or other financial arrangement. Greg Cook confirmed that, with this C-D scenario, there would not be an additional interchange. John Bork stated that the C-D system would be an alternative to a new interchange. John Bachman indicated that it is possible that either the C-D system or a new interchange could address the project needs. The I-81 northbound off-ramp at the Marion Interchange would be used to connect I-81 traffic to the northbound C-D system on the east side of I-81. The northbound C-D system would end at Lighthouse Road and a smaller C-D system would be installed between Guilford Springs Road and Kriner Road. Brian added that slip ramps from the east side of I-81 (northbound) would provide connecting crossovers.

#### Split Diamond Interchange

With this concept, the southbound on-ramp (loop) and the northbound off-ramp (loop) would be removed from the Wayne Avenue Interchange and relocated to the south on Kriner Road. This would improve the function of the Wayne Avenue Interchange by relocating traffic and creating two half-diamonds. John Bork indicated that, in addition to being difficult to sign, the configuration is not consistent with FHWA policy. That being the case, the Split Diamond Interchange was dismissed from further consideration.

#### Guilford Springs Road Interchange

The conceptual design for an interchange on Guilford Springs Road would feature a two-quadrant configuration, with ramps in the northwest and southeast quadrants. Some constraints at this location include utilities in the southwest quadrant and a Texas Eastern natural gas pipeline extending through the interchange. In addition, there is a potentially eligible historic resource in the northeast quadrant.

#### Lighthouse Road Interchange

This interchange configuration would be non-conventional, featuring a modified diamond design with relocation of Lighthouse Road to connect to the cul-de-sac behind Target. Wayne Statler indicated that the plan is to close the intersection of Lighthouse Road with U.S. 11 because of safety concerns regarding the proximity of the rail lines to the intersection. Greg Cook added that an interchange at this location would encourage the use of the Lighthouse Road / U.S. 11 Intersection, and that Norfolk Southern and PennDOT are in the process of discussing the road closure. This would necessitate a more circuitous route of access from the interchange to U.S. 11. It would require a connection behind Target to Guilford Springs Road, Lighthouse Road to Overcash Road on the east side of I-81, or a new alignment to connect with Overcash Road on the west side of I-81. John Bork and John Bachman suggested that a solution may be a combination of an interchange and a C-D system to keep the truck connection to I-81 east of the rail lines. Sharon Okin stated that a need of the project should include the closure of an at-grade railroad crossing.

In summary, it was decided to conduct further traffic analysis on the Parallel Collector-Distributor System, the Guilford Springs Road Interchange, the Lighthouse Road Interchange, and a combination of the C-D system with an interchange. John Bachman stated that the C-D system would work north of Guilford Springs Road, and would reduce the points of contact with I-81.

13. Brandy Rotz discussed the anticipated schedule of events. She stated that the plan is to conduct a peer review process in June, then to meet later in

- the summer with revised design concepts. A public meeting will be held in the fall, and the final report will be in late 2008 or early 2009.
14. Bob Thomas asked how the new Franklin County RPO status fit into the process. John Bachman stated that the RPO will need to work to obtain funding. Bob asked of a C-D road on I-81 was in fact part of I-81 and therefore not the RPO responsibility. Phil Tarquino will check on the funding requirements. John added that, after the design concepts are revised, the RPO will need to coordinate with District 8-0 and Central Office planning divisions. Since Terry Adams is retiring next week, the contact at the District will be Dennis Sloan. Colleen Brown stated that the project purpose and need will need to be established for the POA study. Sharon Okin added that the project need also will be necessary to present at the public meeting in the fall.
  15. Wayne Statler indicated that the next meeting should be as soon as possible, preferably in late July or early August. The meeting with PennDOT's programming staff could be in September. Bob Thomas asked at what point the state and federal legislators should be contacted. He asked if an executive report could be prepared to summarize the project through the development of the design concepts. The funding will be based on political interest in the project, so early coordination with the legislators is critical. Brian indicated that a public officials meeting is typically held before the public meeting to brief the local officials regarding the status of the project. Greg Cook emphasized that the goal of the project needs to be improving truck access onto I-81, so that U.S. 11 and other local roads can function effectively.

The meeting ended at 12:00 PM.

Report prepared by:  
Joe Hollinger



**I-81 Conceptual Point of Access / Feasibility Study**  
**Follow-up Activities**  
**May 29, 2008**

Item #	Activity	Responsibility	Anticipated Completion Date
1.	Verify vertical clearance for Kriner Road Bridge and Swamp Fox Road Bridge over I-81	Brian	06-08-08
2.	Provide updated land use maps to McCormick Taylor for farmland conversion and other changes	Phil	06-13-08
3.	Schedule next status meeting for late July or early August	Brandy	06-13-08
4.	Conduct additional traffic analysis on the Collector-Distributor, the Guilford Springs Road Interchange, the Lighthouse Road Interchange, and a combination C-D / interchange design at both 50% / 80% traffic and 100% traffic	Brian	06-20-08
5.	Develop briefing report (executive summary) for distribution to elected officials.	Joe / Brandy	06-20-08
6.	Check on funding requirements based on new RPO status	Phil	06-27-08
7.	Refine design concepts under consideration (C-D, Guilford Springs Road Interchange, Lighthouse Road Interchange, Combination C-D / interchange) with more detailed design, typical sections, estimated right-of-way and local road / intersection improvements	Brian	07-03-08
8.	Refine environmental impact study area to match design concepts under current development and update field verification.	Brandy / Joe	07-11-08