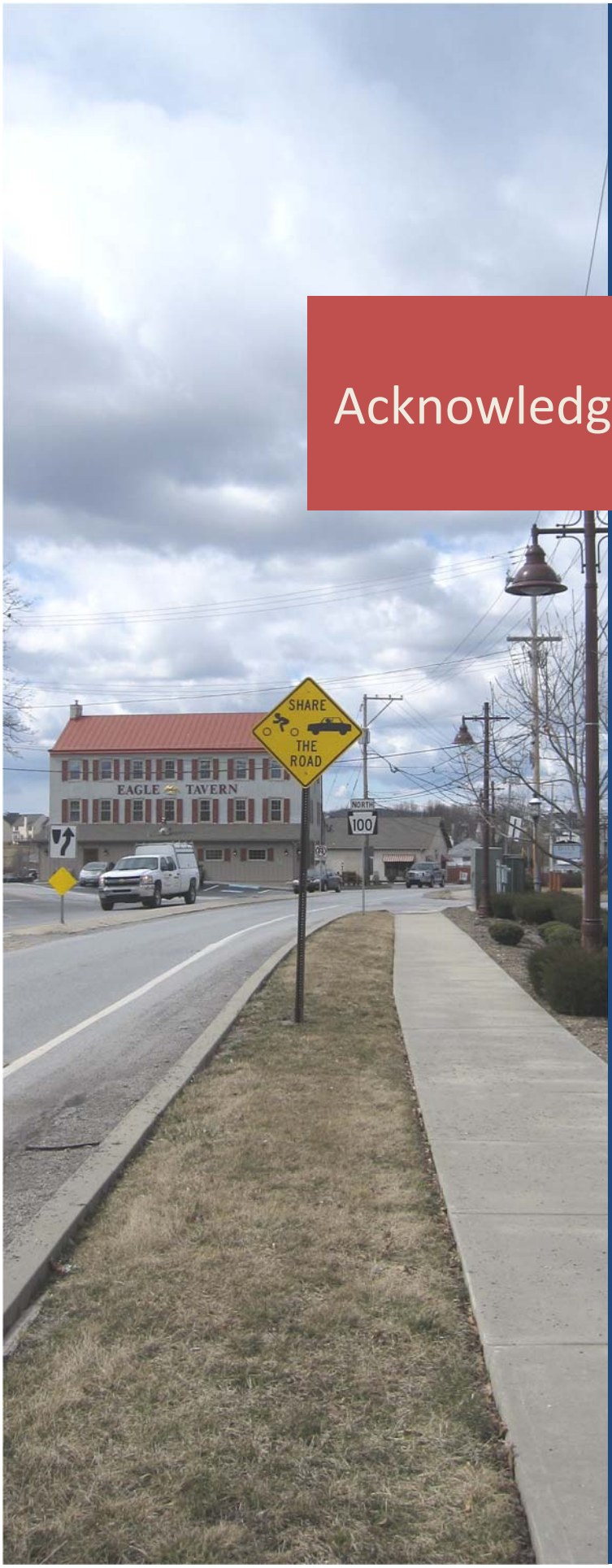
Village Transportation Plan

Upper Uwchlan Township
140 Pottstown Pike
Chester Springs, PA 19425

March 11, 2014



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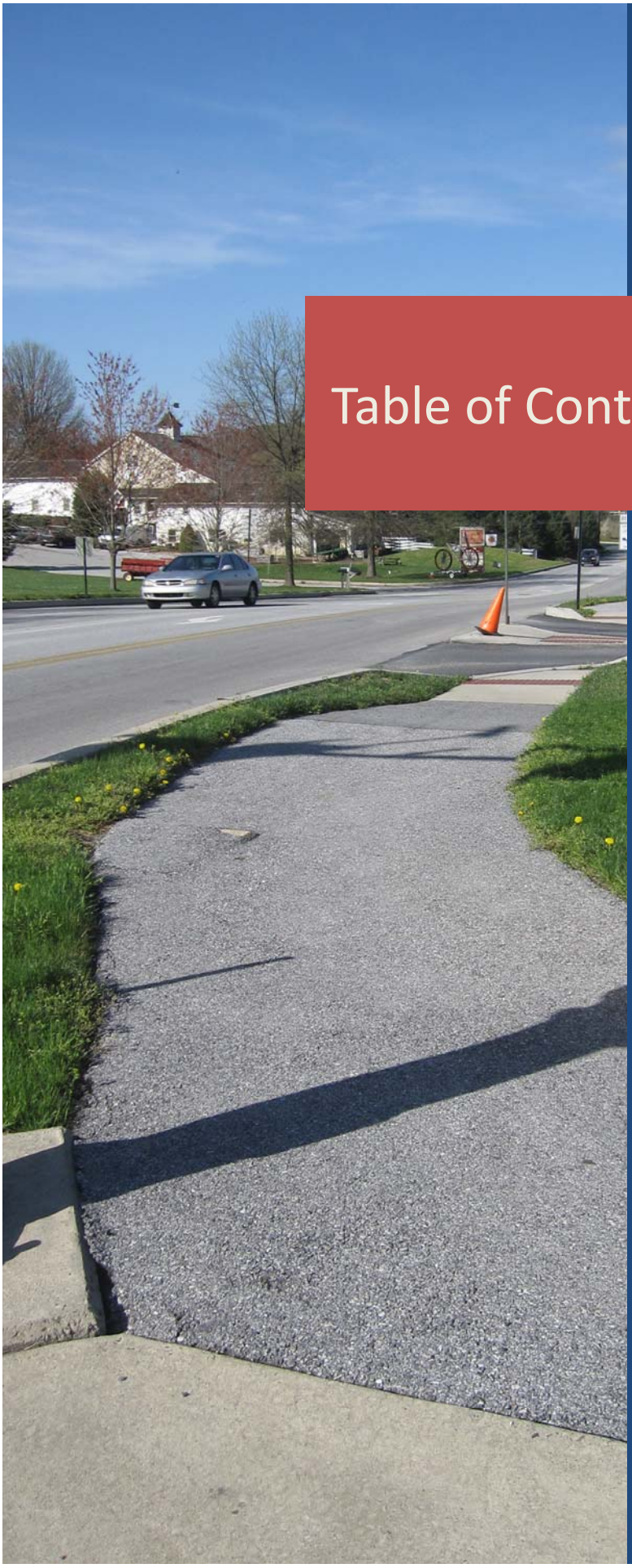

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Executive Summary

Project Goals

The Village of Eagle is a growth area and center of activity in Upper Uwchlan Township. The Village Transportation Plan builds on previous planning efforts to identify a transportation engineering concept for Pottstown Pike and adjacent roadways that is consistent with the vision for the historic Village, supports businesses and redevelopment, and includes improvements that accommodate all users of the transportation system. The project goals are:

- Provide a well connected bicycle and pedestrian network that supports non-vehicular travel within the Village of Eagle and to other key destinations
- Create a safe and comfortable walking and biking environment within the Village of Eagle
- Develop consistent streetscape design treatments to reinforce a sense of place in the Village of Eagle
- Support sustainable growth and economic development in the Village of Eagle

Existing Conditions

The study area for the project includes key roadways within the Village of Eagle, focusing on segments of Pottstown Pike, Little Conestoga Road, and Park Road. Based on an evaluation of existing conditions, the following assets/opportunities and constraints/challenges were identified.

Assets and Opportunities

- Mix and cluster of popular destinations for walking and biking trips within the Village
- Significant redevelopment potential
- Well connected roadway network
- Existing bicycle and pedestrian facilities and established streetscapes in some locations
- Striped medians and shoulder areas that provide space for bicycle and pedestrian facilities or other streetscape enhancements

Constraints and Challenges

- High vehicular travel speeds and volumes
- Gaps and missing connections in the bicycle and pedestrian network
- Existing bicycle and pedestrian facilities that do not meet current design requirements and standards
- Inconsistent streetscape treatments
- Limited right of way and physical limitations, such as steep slopes, utilities, and buildings or structures adjacent to the roadway
- Wide and closely spaced commercial driveways

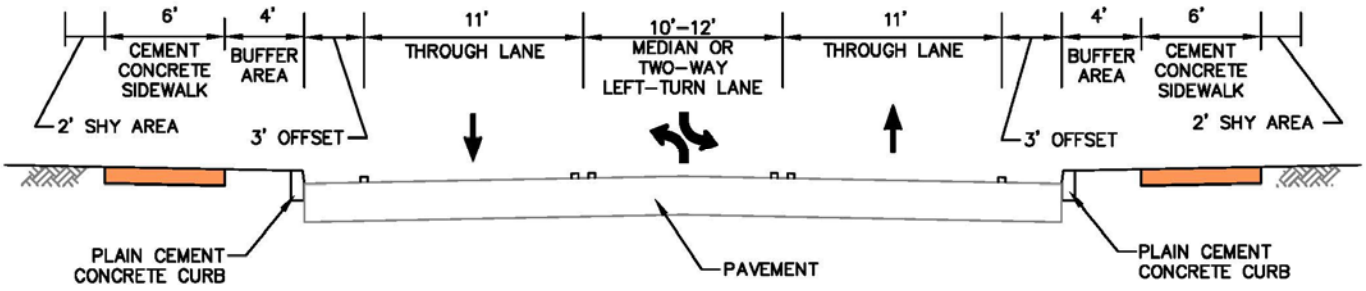
Public and Stakeholder Involvement

The development of this plan was guided by input from key stakeholders, including the Township's Village Concept Committee, PennDOT, Pennsylvania Turnpike Commission, and property owners, business owners, and developers within the Village of Eagle.

Improvement Concepts

Improvement concepts were developed based on project goals, existing conditions, and current design standards and guidelines. Additionally, the improvement concepts incorporate a range of bicycle and pedestrian facilities, traffic calming strategies, access management strategies, and streetscape elements. The desirable typical section for Pottstown Pike in the heart of the Village of Eagle is presented below, and it includes two travel lanes with shoulders to support both vehicular and bicycle travel, as well as sidewalks on both sides of the street.

Desirable Typical Section for Pottstown Pike in the Heart of the Village

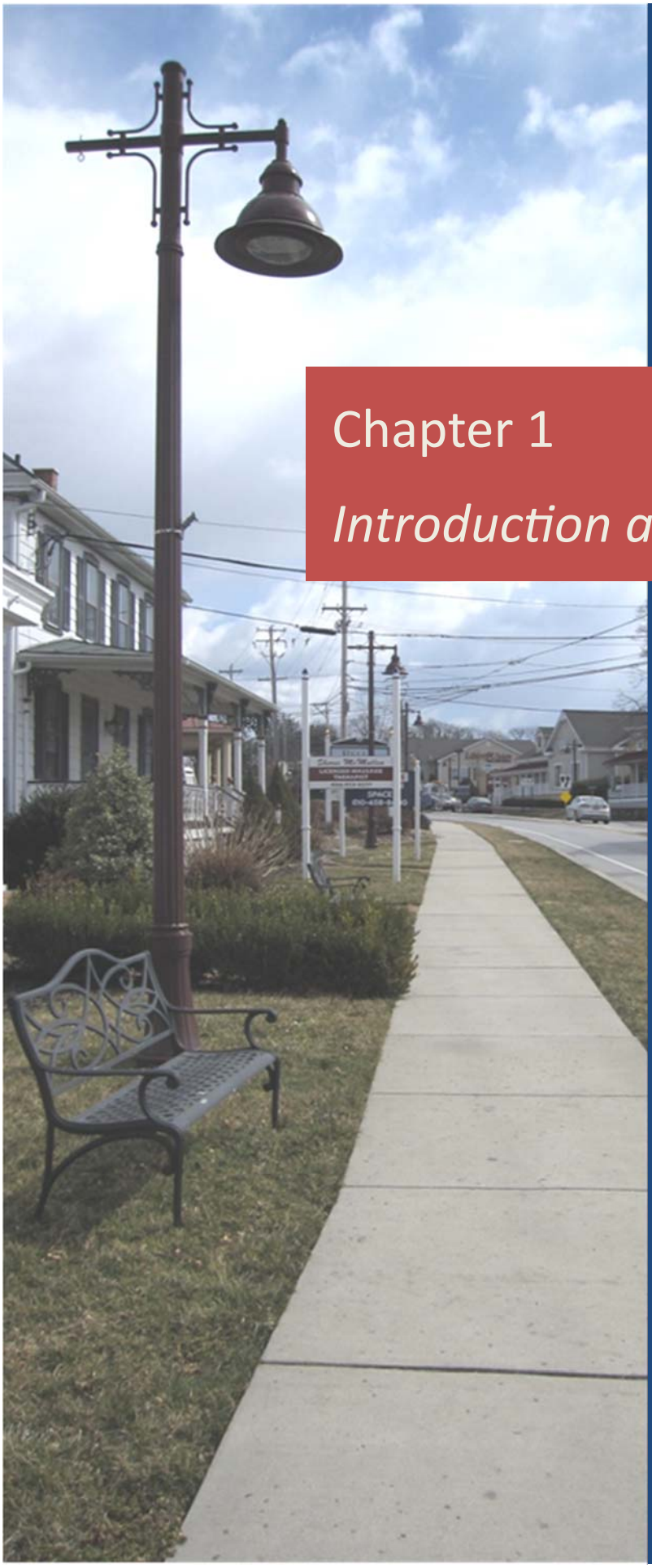


A key focus of the project was the northern gateway to the Village, including the intersections of Pottstown Pike and Graphite Mine Road (northern), Pottstown Pike and Darrell Drive, and Graphite Mine Road and Darrell Drive. Five alternatives were developed for these intersections, which include a combination of traffic signals, roundabouts, and roadway realignments. The alternatives were preliminarily evaluated based on future traffic conditions, but additional analysis is required to select the preferred improvements.

Implementation

The improvements will likely be implemented in a phased approach over time, depending on the availability of funding and other factors. The concept improvements have been grouped into eighteen projects based on existing conditions, feasibility, and the anticipated means of implementation. Design is underway for two projects and the remaining projects will likely be implemented as capital improvements or incorporated into adjacent land development projects. Conceptual opinions of cost are presented for each project, with a breakdown of costs for transportation infrastructure and streetscape elements.

There are a number of key next steps for implementation of the transportation improvements identified in the Village Transportation Plan. For capital projects, the most critical next step is to identify funding for design and construction. Another critical next step is to continue coordination with key project partners, including the Pennsylvania Turnpike Commission, PennDOT, as well as property owners, business owners, and developers within the study area. These project partners are critical for the implementation of both capital and redevelopment projects.



Chapter 1

Introduction and Existing Conditions

A. Introduction

The Village of Eagle is the center of activity in Upper Uwchlan Township and it includes a mix of commercial and institutional land uses with residential developments on the eastern and western edges. In the last decade, significant growth and development has occurred in the Village; however, there remain additional opportunities for development and redevelopment within the core of the Village. Upper Uwchlan Township has worked proactively to plan and support new development and redevelopment, while maintaining the Village's historic character.

Some of the most prominent recent changes include the completion of Graphite Mine Road (also known as the Eagle Loop Road) and Station Boulevard (also known as the Park Road extension) in 2009. The expanded roadway network has reduced traffic volumes and congestion along Pottstown Pike (PA Route 100) through the heart of the Village of Eagle, which has created an opportunity to improve walking and biking within the Village. As a result, the Township has undertaken this Village Transportation Plan to identify a transportation engineering concept for Pottstown Pike and adjacent roadways that is consistent with the vision for the Village, supports development and redevelopment, and includes improvements that accommodate all users of the transportation system. This plan builds upon the transportation related recommendations from previous plans and studies, including the *Village Concept Plan*, *Village Design Guidelines*, *Walkability Study* and *Trail Network Master Plan*.

Study Area

The study area, as shown in Figure 1.1, includes the areas within or adjacent to public right-of-way for the following roadway segments:

- Pottstown Pike between Graphite Mine Road to the north and Pennsylvania Drive to the south
- Park Road/Station Boulevard between Graphite Mine Road and Ticonderoga Boulevard
- Little Conestoga Road between Pottstown Pike and 500 feet west of Park Road
- Byers Road between Graphite Mine Road and Pottstown Pike

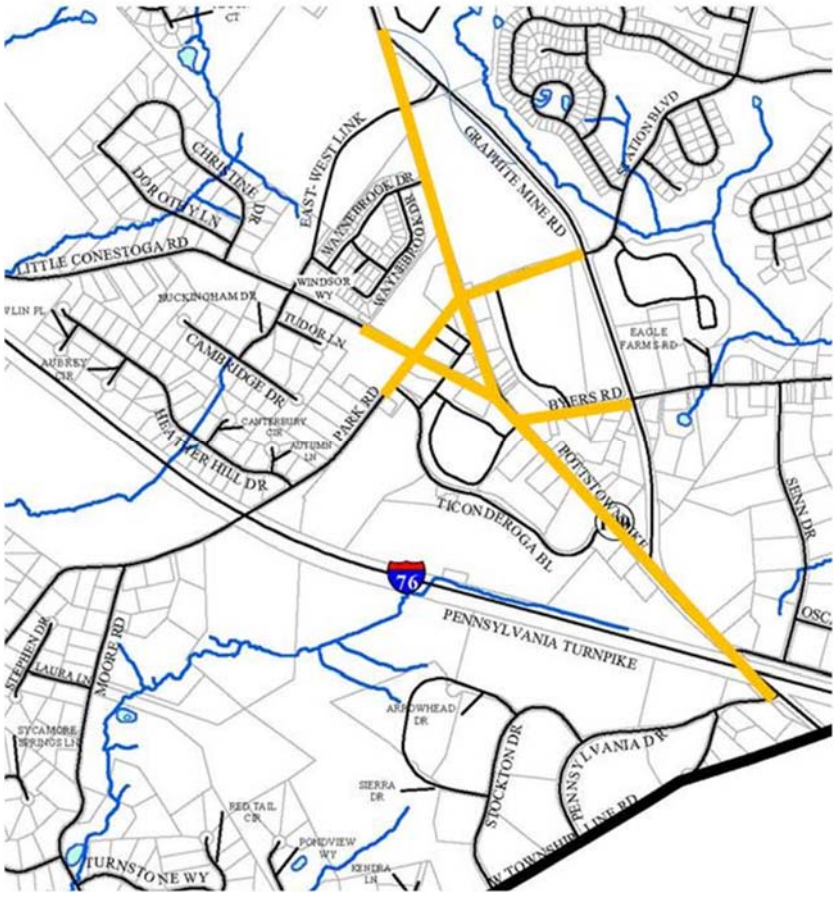


Figure 1.1: Study Area Map

B. Project Goals

The following project goals were developed based on previous planning efforts, analysis of existing conditions, and input from project stakeholders.

➢ Provide a well connected bicycle and pedestrian network that supports non-vehicular travel within the Village of Eagle and to other key destinations

A well connected network includes pedestrian facilities on both sides of the roadways and bicycle facilities for various skill levels.

➢ Create a safe and comfortable walking and biking environment within the Village of Eagle

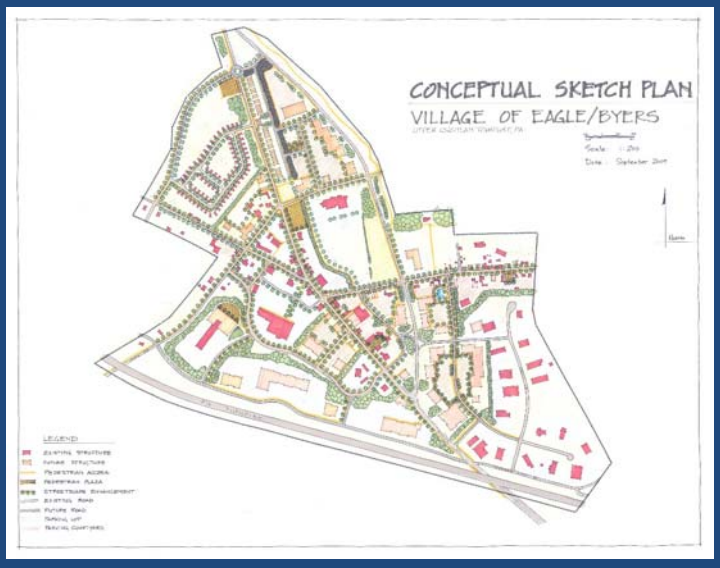
A safe and comfortable environment for bicyclists and pedestrians includes appropriate amenities, such as landscaping/street trees, lighting, benches, and bicycle parking. Additionally, the environment can be enhanced by applying traffic calming and access management strategies to reduce vehicular speeds and balance the needs of all users of the transportation system.

➢ Develop consistent streetscape design treatments to reinforce a sense of place in the Village of Eagle

A consistent streetscape will create a unified identity within the Village of Eagle.

➢ Support sustainable growth and economic development in the Village of Eagle

A concept plan for multi-modal transportation improvements will support development and redevelopment that is consistent with the vision and character of the Village of Eagle.



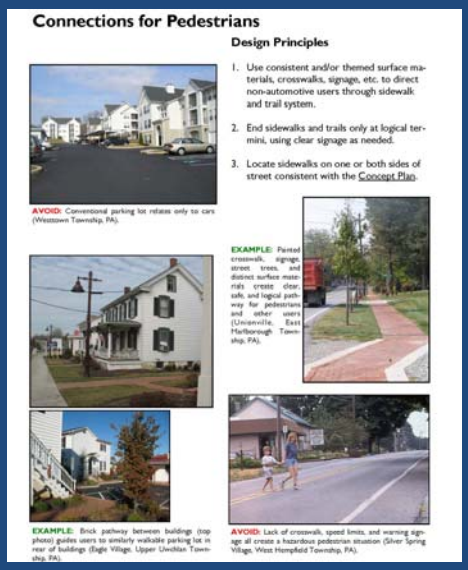


Figure 1.2: Images from the *Village Concept Plan* and *Village Design Guidelines* prepared by the Village Concept Committee with assistance from the Brandywine Conservancy to guide and promote future development in the Village

C. Previous Plans and Studies

Upper Uwchlan Township has completed numerous plans and studies to establish a clear vision for the Village of Eagle and identify concepts for improving walking and biking within the Village and throughout the Township. In particular, the Township established a Village Concept Committee to evaluate the impact of Graphite Mine Road on the transportation network and the villages of Eagle and Byers. The Village Concept Committee undertook several planning initiatives to identify issues, establish planning and design principles, and present concepts for improvements specifically for the Village of Eagle. The following plans and studies provided background information, goals and principles, and planning concepts that served as the basis for this feasibility analysis:

- *Trail Network Master Plan* (2005)
- *Upland Farm Master Plan* (2009)
- *Village Concept Plan for Eagle/Byers* (2010)
- *Village of Eagle Design Guidelines (2011)*
- *Walkability Study* (2012)
- *Comprehensive Plan Update* (2013)

Several of the previous planning documents included specific recommendations and improvement concepts within the study area. The following plan summaries highlight these recommendations and considerations for evaluating the feasibility of implementing the improvement concepts.

Walkability Study (2012)

The Village Concept Committee, with technical support and assistance from the Brandywine Conservancy, completed a *Walkability Study* for the Village of Eagle in 2012. Based on field observations and other information, the study identified existing trails and gaps in the bicycle and pedestrian network within the village planning area. As part of the study, the Village Concept Committee prioritized the missing connections and identified order of magnitude cost estimates to design and construct the priority trail segments. Figure 1.3 shows the existing sidewalks and trails in yellow and the priority missing connections in red.

The *Walkability Study* focused on identifying and closing key gaps in the sidewalk and trail network. It did not include identification of existing sidewalk and trail segments that do not meet current design and Americans with Disabilities Act (ADA) standards.

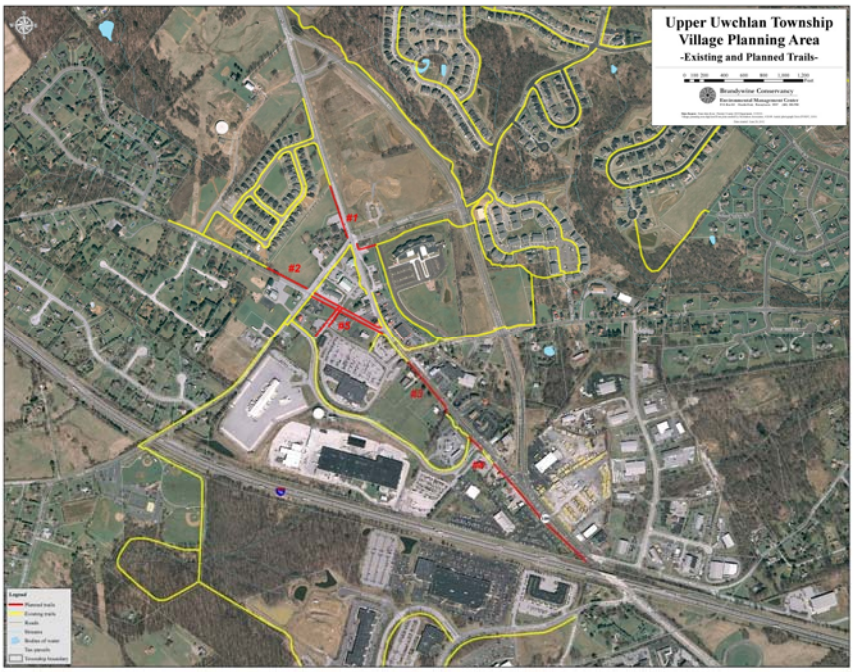


Figure 1.3: Walkability Study Map

Trail Network Master Plan (2005)

The *Trail Network Master Plan* recommends a network of pedestrian routes and bicycle routes to connect key destinations throughout the Township. As shown in Figures 1.4 and 1.5, the *Trail Network Master Plan* includes the following recommendations for specific bicycle and pedestrian facilities within the study area.

Multi-Use Trails (8' minimum width asphalt trail)

- Pottstown Pike (west side)
  - Between Pennsylvania Drive and Ticonderoga Boulevard
  - Between Park Road/Station Boulevard and municipal border to the north
- Park Road (south side) between Pottstown Pike and Little Conestoga Road

Side Paths (6' minimum width asphalt trail)

- Byers Road
- Little Conestoga Road

Bicycle Lanes (4' minimum width both sides of the road)

- Pottstown Pike between Ticonderoga Boulevard and Park Road/Station Boulevard
- Byers Road
- Little Conestoga Road

Since the *Trail Master Plan* was adopted in 2005, several federal and state design standards and guidelines have been revised and updated. In particular, the American Association of State Highway Officials (AASHTO) recommends 5' as the minimum width for bicycle lanes and 10' as the minimum width for multi-use trails (with 8' permissible in certain situations.) Additionally, PennDOT's *Smart Transportation Guidebook* and *Design Manual 2* also recommend 5' as the minimum width for on-road bicycle lanes. These new standards and other design considerations will be taken into account during the development of the preferred improvement concept.

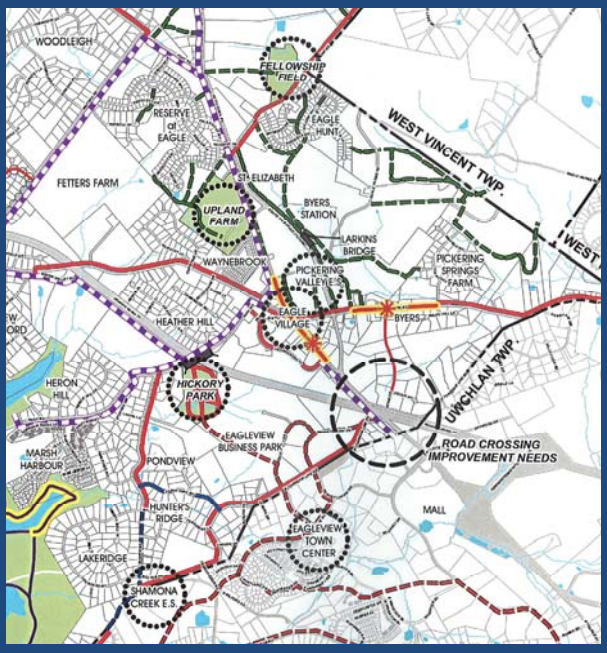


Figure 1.4: Pedestrian Routes from the *Trail Network Master Plan* prepared by Ray Ott & Associates

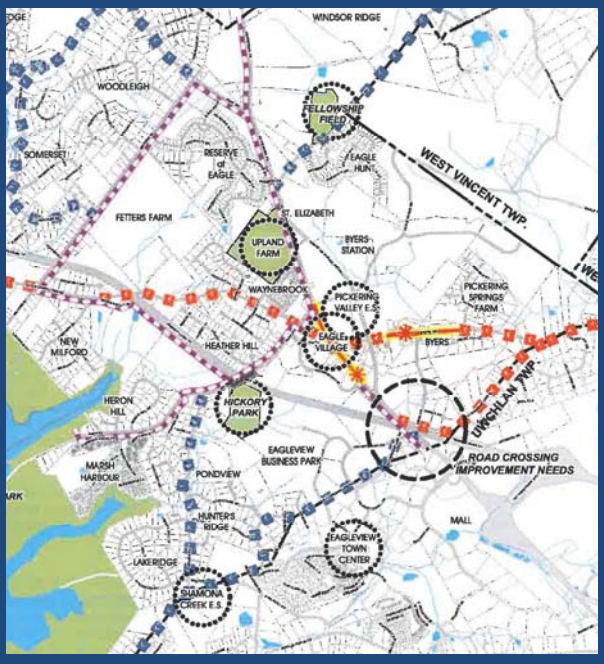


Figure 1.5: Bicycle Routes from the *Trail Network Master Plan* prepared by Ray Ott & Associates

Village of Eagle Streetscape Concept

The *Trail Network Master Plan* also includes specific recommendations for streetscape improvements on Pottstown Pike within the Village of Eagle (between Ticonderoga Boulevard and Park Road/Station Boulevard). As shown in Figure 1.6, the streetscape concept in the *Trail Network Master Plan* included a travel lane in each direction and a center-turn lane, as well as sidewalks and bicycle lanes on both sides of Pottstown Pike. This concept requires an overall right-of-way width of 63', which exceeds the existing right-of-way along the corridor. In addition to the need to acquire right-of-way, potential feasibility issues with implementing this concept include utility relocations, impacts to existing buildings and businesses, and steep slopes.

PA Turnpike Underpass Concept

Figure 1.7 shows a concept for the PA Turnpike underpass from the *Trail Network Master Plan*. It includes a barrier separated sidepath on the west side of Pottstown Pike. This concept supports a pedestrian connection, but the 6' sidepath is not wide enough to be considered a multi-use facility for both bicyclists and pedestrians.

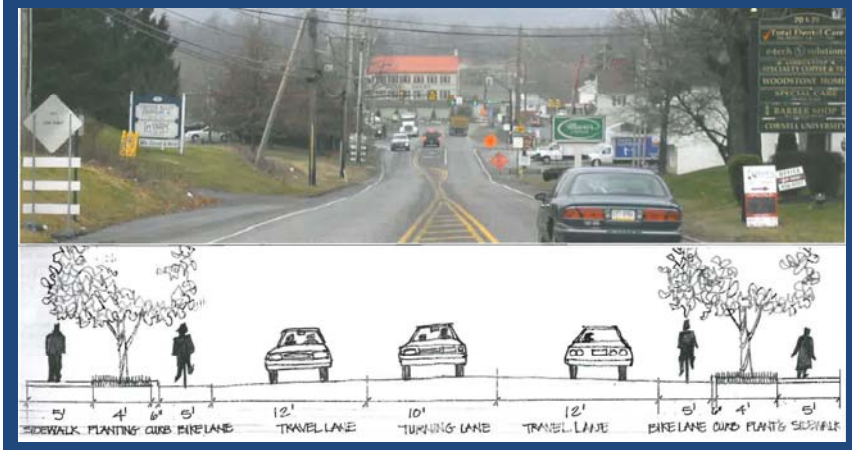


Figure 1.6: Village of Eagle Streetscape Concept from the *Trail Network Master Plan* prepared by Ray Ott & Associates

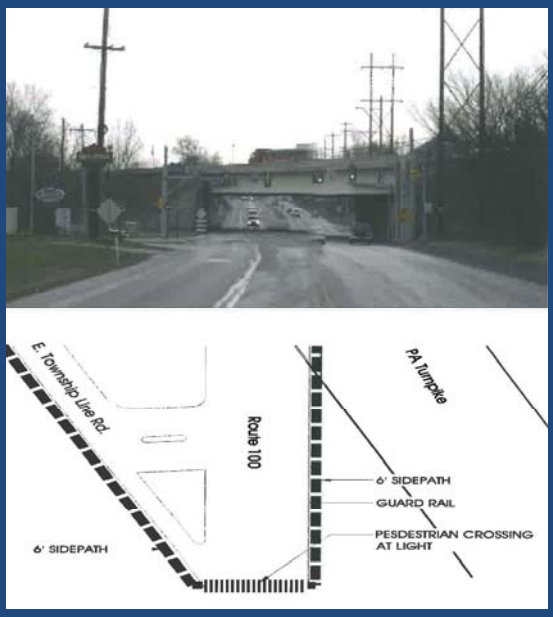


Figure 1.7: Turnpike Underpass Concept from the *Trail Network Master Plan* prepared by Ray Ott & Associates

Upland Farm Master Plan (2009)

The Upland Farm site is located on the west side of Pottstown Pike near the northern intersection with Graphite Mine Road. The Township completed the *Upland Farm Master Plan* in 2009 to provide a concept design for the future public use of the 56-acre property for recreational purposes. As the Upland Farm site develops into a recreational and community center, it will become a key destination within the Township, particularly for walking and biking trips. The site master plan identifies a multi-use trail on the west side of Pottstown Pike and the north side of Darrell Drive. The plan was specific to the Upland Farm property, and therefore does not address coverall connectivity with the Township's trail network, such as the trail on the east side of Pottstown Pike.

County and Regional Plans and Studies

In addition to the local plans focused on Upper Uwchlan Township and the Village of Eagle, there are several county and regional plans that further support the project goals from a broader policy perspective. The consistency between the project's goals and relevant county and regional plans are highlighted below.

Landscapes2 (2009)

Landscapes2 is Chester County's comprehensive policy plan. In the plan, the Village of Eagle is identified as a suburban center within the growth area for Chester County. Additionally, Pottstown Pike (PA Route 100) is identified as a key multi-modal corridor. Figure 1.8 shows the County's multi-modal corridors, highlighting key elements of the transportation system, such as the Pennsylvania Turnpike Interchanges, rail stations, and regional multi-use trails. The multi-modal corridors are priorities for investments in the County's transportation system.

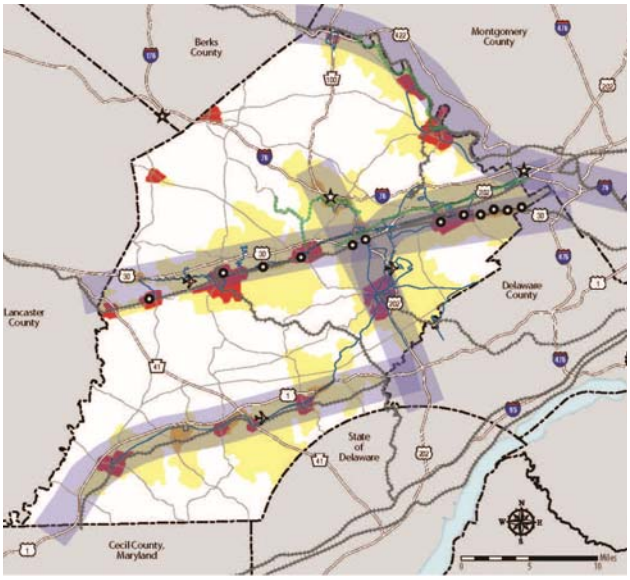


Figure 1.8: Multi-Modal Transportation Corridors from *Landscapes2* prepared by Chester County Planning Commission

Transportation Improvements Inventory (TII) - 2013

The Transportation Improvements Inventory (TII) is a comprehensive list of transportation needs in Chester County developed by the Chester County Planning Commission based on input from municipalities and other planning partners. The TII—2013 includes the following transportation projects within or near the Village of Eagle:

- East/West Link: Little Conestoga to PA 100 (NC 11) - New Collector Road
- Eagle Loop Road - Phase 2 (RW 40) - Widening/Add Turn Lanes
- Eagle Village: Pottstown Pike/Park/Little Conestoga Road—Traffic Calming and Bicycle and Pedestrian Improvements

Connections 2040 (2013)

Connections 2040 is the Delaware Valley Regional Planning Commission's (DVRPC) long range plan for the Greater Philadelphia region. In the plan, Upper Uwchlan Township is identified as a growing suburb and the Village of Eagle is identified as an emerging growth area in the land use vision. Policies for growing suburbs, such as Upper Uwchlan, are focused on improving the form of development, reducing congestion, and supporting alternative transportation modes.

Congestion Management Process (CMP) (2012)

DVRPC maintains the region's federally required Congestion Management Process (CMP) by identifying congested corridors and recommending a range of strategies to minimize congestion and enhance mobility of people and goods. In the CMP, Pottstown Pike (PA Route 100) is identified as a congested corridor (16) between US 202 (to the south) and PA 73 (to the north). Very appropriate

strategies for this corridor include signal improvements, turning movement enhancements, and walking and biking improvements.

The Circuit (2012)

The Greater Philadelphia Regional Trail Network, known as the Circuit, includes several significant regional trails that are located just south of the Village of Eagle. Figure 1.9 shows the close proximity of the Uwchlan Trail and Struble Trail to the Village, and how these trails connect with the Chester Valley Trail and the broader regional trail network. The Uwchlan Trail currently terminates on Pennsylvania Drive, less than a mile from the intersection of Pottstown Pike and Little Conestoga Road at the heart of the Village. Additionally, there may be opportunities to identify a connection to the Schuylkill River Trail to the north.

Connecting the Village of Eagle with the regional trail network will provide non-vehicular access to major employment centers, shopping centers, and recreational facilities. Additionally, regional trail connections can support commercial activity and economic development within the Village, especially for businesses that cater to trail users, including bicycle shops and restaurants.

Figure 1.9: The Circuit Greater Philadelphia Regional Trail Network Map
Source: Delaware Valley Regional Planning Commission (DVRPC)

D. Study Area Characteristics

The characteristics of the existing transportation system in the Village of Eagle influences the travel conditions and shapes the current environment for walking and biking within the study area. The analysis and evaluation of existing conditions is used to identify key opportunities, constraints, and guide the development of improvement concepts. Key study area characteristics that were evaluated include traffic volumes, travel speeds, safety issues, and roadway functional classification and road typology.

Traffic Volume Estimates

Current 2013 Average Daily Traffic (ADT) volume estimates are displayed in Figure 1.10. The traffic volumes show that Graphite Mine Road and Ticonderoga Boulevard provide alternatives to traveling on Pottstown Pike through the Village of Eagle. The improved roadway connectivity has relieved pressure and congestion on Pottstown Pike. Lower traffic volumes on Pottstown Pike within the heart of the Village of Eagle also present an opportunity to balance the needs of all users of the roadway and provide a more comfortable environment for walking and biking. Based on the current volumes and available roadway capacity, there is also an opportunity to further encourage use of Graphite Mine Road for through traffic with improved signage and formal designation of Graphite Mine Road as PA 100.

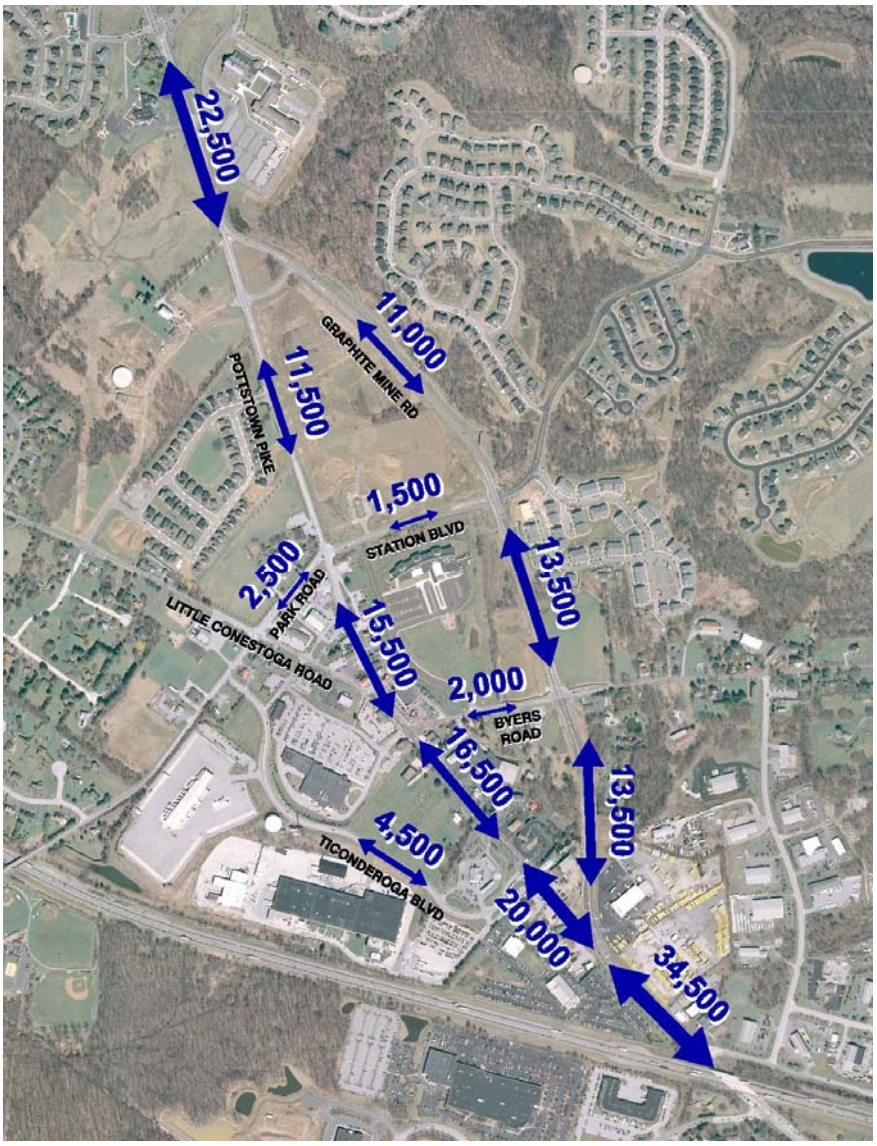


Figure 1.10: Average Daily Traffic Volume Estimates, 2013 (vehicles per day) (rounded)

Travel Speeds

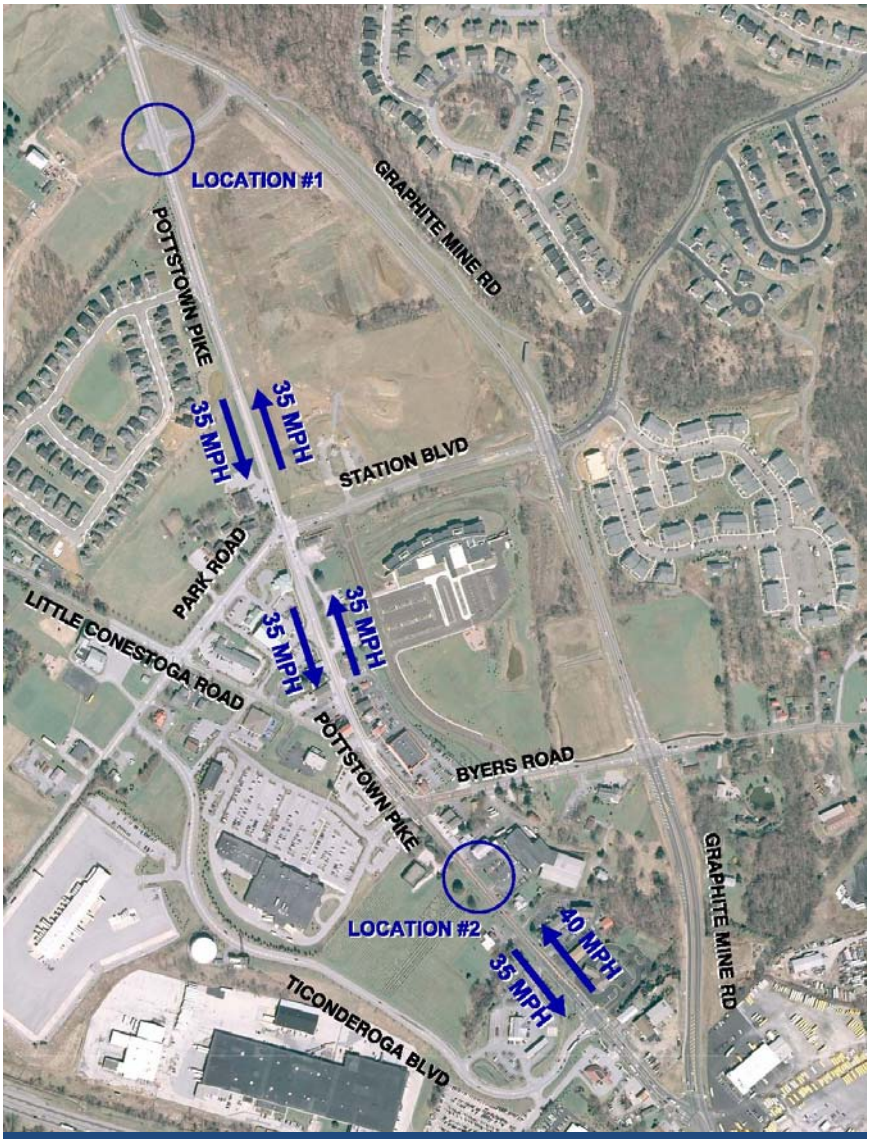
As displayed in Figure 1.11, the posted speed limits along the section of Pottstown Pike parallel to Graphite Mine Road within the Village of Eagle are 35 MPH and 40 MPH. Two speed studies were performed along Pottstown Pike on April 8, 2013. Each study recorded the speed of vehicles in the northbound and the southbound directions. From this data, the 85th percentile speed was determined, which is the speed at or below which 85 percent of vehicles travel. The 85th percentile speed was then compared to the speed limit within the area.

Location 1: Pottstown Pike south of Graphite Mine Road (northern intersection)

The first speed study was conducted near the northern intersection of Pottstown Pike and Graphite Mine Road. The posted speed limit for both directions of travel is 35 MPH. The 85th percentile speed in the northbound and southbound directions were determined to be 46 MPH and 47 MPH, respectively.

Location 2: Pottstown Pike south of Byers Road

The second speed study was located just south of the Pottstown Pike and Byers Road intersection. This segment of roadway is a speed limit transition zone. The speed limit transitions between 35 MPH and 40 MPH. However, at the location that the speed study was completed, the speed limit in the northbound and southbound directions were 40 MPH and 35 MPH, respectively. The 85th percentile speed in the northbound and southbound directions were determined to be 41 MPH and 37 MPH, respectively.



Location #1

Speed Limit
- 35 MPH

85th Percentile Speed
- Northbound – 46 MPH
- Southbound – 47 MPH

Location #2

Speed Limit
- Northbound – 40 MPH
- Southbound – 35 MPH

85th Percentile Speed
- Northbound – 41 MPH
- Southbound – 37 MPH

Figure 1.11: Posted Speed Limits and Speed Study Locations

Overall, vehicles are traveling above the posted speed limit on Pottstown Pike through the Village of Eagle. Speeds are higher at the northern end of the corridor, likely due to the wider cross section, topography, and limited development and street level activity. Reducing traffic speeds can help to provide a safer and more comfortable environment for bicyclists and pedestrians.

Safety Issues

Overall

Analysis of crash data and trends was used to identify key safety issues along the corridor. Crash data for the study area was obtained from PennDOT for the most recent five (5) years of available data (2007 to 2011). The crash data consists of reportable crashes only, which is defined as a crash in which there are personal injuries or a vehicle must be towed from the scene. A total of eighty-nine (89) reportable crashes were observed in the study area from 2007 to 2011. None of these crashes resulted in fatalities. There were also no crashes involving pedestrians or bicyclists.

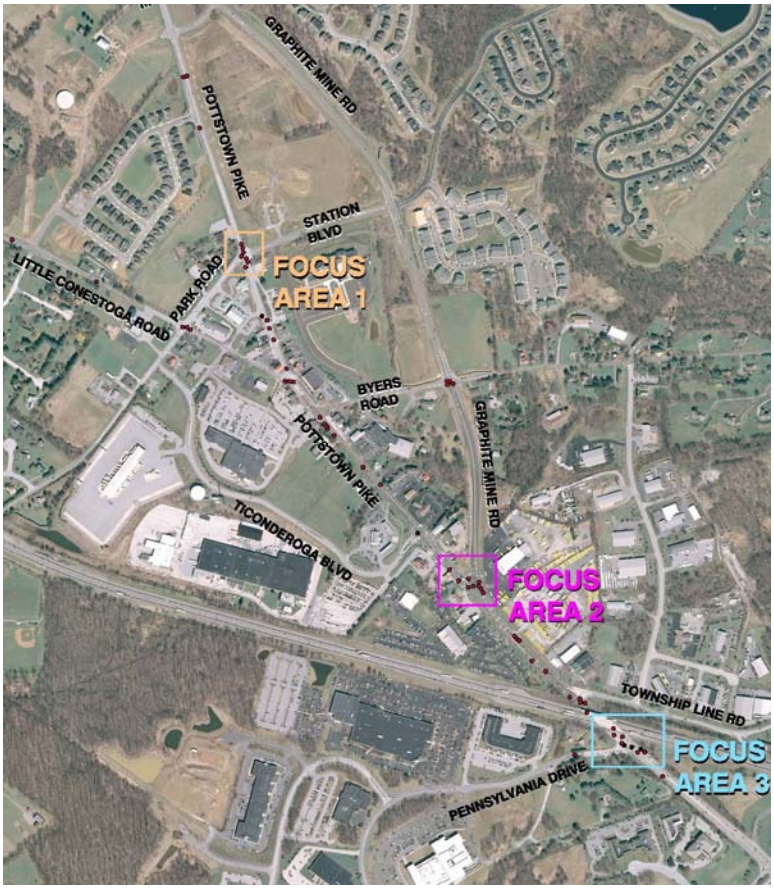
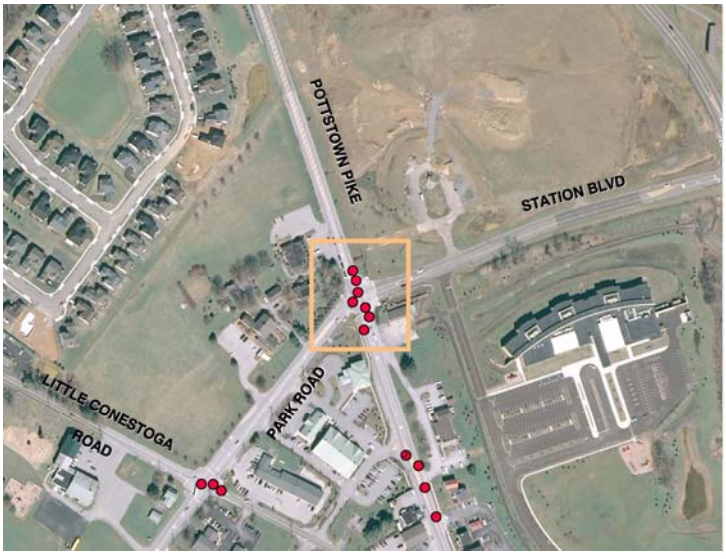


Figure 1.12: Crash Cluster Analysis

As shown in Figure 1.12, three focus areas were identified based on clustering of reportable crashes. Further analysis of the crash data for each of the crash focus areas is presented below. The peak period for the analysis includes weekdays from 7 AM to 9 AM and 4 PM to 6 PM, as well as Saturdays between 11 AM and 2 PM.

Focus Area 1: Pottstown Pike and Park Road/Station Boulevard

A total of seven (7) reportable crashes were observed at this location. These crashes that occurred over a five-year period result in an annual average crash rate of 1.4 crashes per year. The majority (four of seven) of the incidences resulted in minor injuries and driver error was the contributing factor for all crashes.



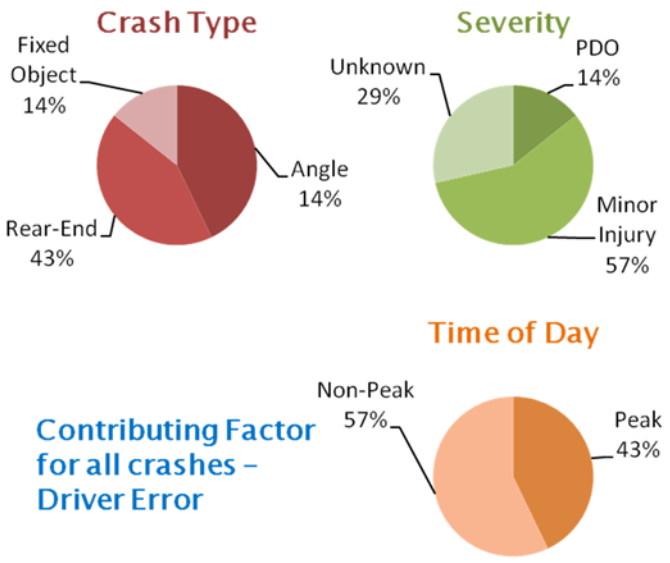
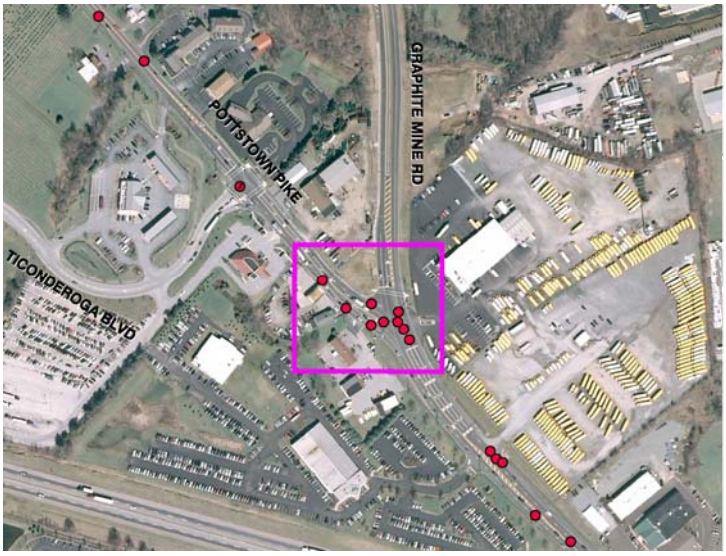


Figure 1.13: Focus Area 1 Crash Cluster Map and Crash Statistics

Focus Area 2: Pottstown Pike and Graphite Mine Road (southern intersection)

A total of nine (9) reportable crashes were observed at this location with three (3) crashes reported prior to the completion of Graphite Mine Road in 2009. The crashes that occurred over a five-year period result in an annual average crash rate of 1.8 crashes per year. The majority (seven of nine) of the incidences resulted in property damages only and occurred in the non-peak period.



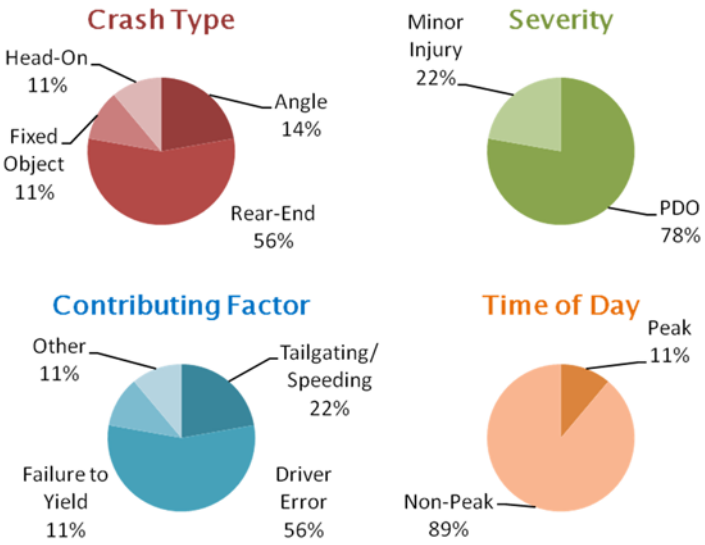
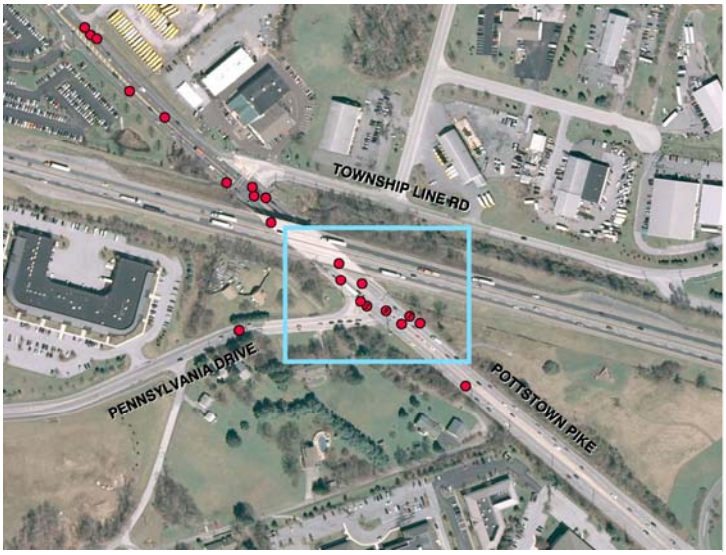


Figure 1.14: Focus Area 2 Crash Cluster Map and Crash Statistics

Focus Area 3: Pottstown Pike and Pennsylvania Drive

A total of eighteen (18) reportable crashes were observed at this location. These crashes that occurred over a five-year period result in an annual average crash rate of 3.6 crashes per year. The majority (eleven of eighteen) of the incidences resulted in property damages only and occurred in the non-peak period. Crashes may have occurred during the non-peak period due to increased traffic for nearby generators in the early morning (6 AM to 7 AM) and mid-day (12 PM and 2 PM).



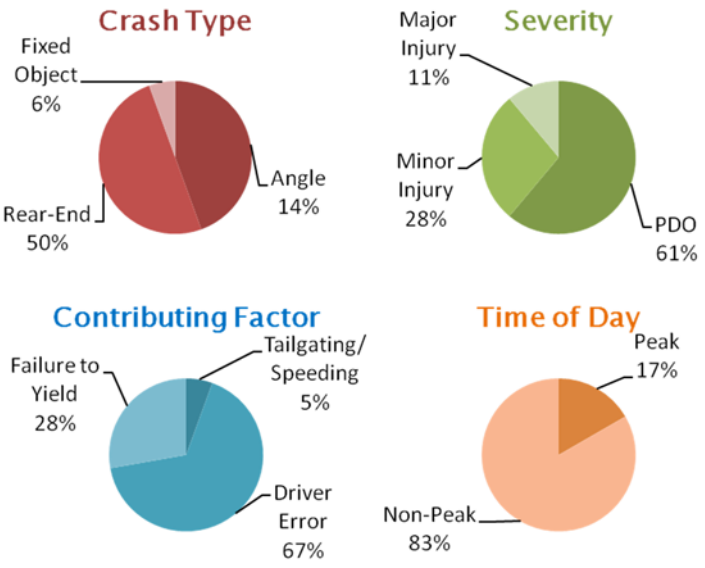


Figure 1.15: Focus Area 3 Crash Cluster Map and Crash Statistics

Functional Classification and Road Typology

The traditional roadway functional classification and PennDOT's road typology are two ways to categorize roads based on the function they serve and key characteristics, such as access, mobility and speed. These roadway categories are used to establish design guidelines or standards and other transportation policies. In particular, PennDOT's *Design Manual 2* utilizes the road typology and land use context to identify appropriate design values.

Figure 1.16 presents the traditional functional classification and road typology based the Upper Uwchlan Township Comprehensive Plan (Draft 2014). These categorizations reflect the future vision of the Township, rather than the current function of the roadways. The three state owned roadways (Pottstown Pike, Little Conestoga Road, and Byers Road) are identified as Major or Community Collectors. Park Road and Station Boulevard are categorized as Minor or Neighborhood Collectors.

The land use context for the study area is "Town/Village Center," which recognizes the Township's vision for the Village of Eagle.

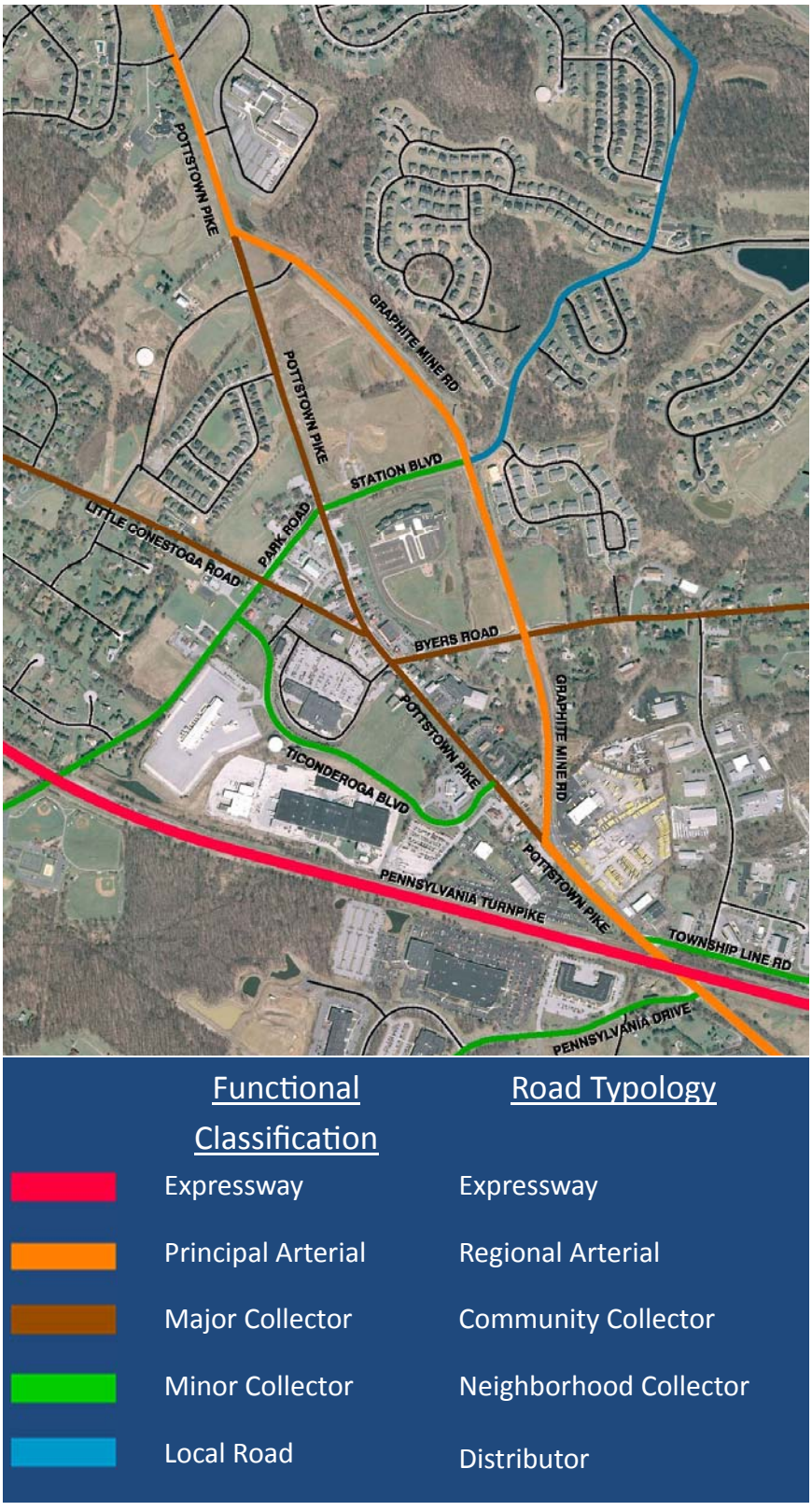


Figure 1.16: Functional Classification and Road Typology

E. Opportunities and Constraints

Based on issues identified in previous plans and studies, as well as the evaluation of current existing conditions of the transportation system, the following assets/opportunities and constraints/ challenges were identified for the overall study area. The section that follows provides further details regarding the opportunities and constraints for specific roadway segments in the study area.

Overall Assets and Opportunities

- **Mix and cluster of popular destinations for walking and biking trips, including community facilities, schools, shops, and restaurants within the Village**
- **Significant redevelopment potential**
- **Well connected roadway network**
- **Existing bicycle and pedestrian facilities and established streetscapes in some locations, including connections to other Township and regional destinations**
- **Striped medians and shoulder areas that provide space for bicycle and pedestrian facilities or other streetscape enhancements**

Overall Constraints and Challenges

- **High vehicular travel speeds and volumes**
- **Gaps and missing connections in the bicycle and pedestrian network**
- **Existing bicycle and pedestrian facilities that do not meet current design requirements and standards**
- **Inconsistent streetscape treatments**
- **Limited right of way and physical limitations, such as steep slopes, utilities, and buildings or structures adjacent to the roadway**
- **Wide and closely spaced commercial driveways**

Pottstown Pike

Graphite Mine Road (northern intersection) to Park Road/Station Boulevard

This segment of Pottstown Pike is the northern gateway to the Village of Eagle. The roadway cross section is wider and includes a striped center turn lane and shoulders. This presents an opportunity for future improvements, such as a landscaped median. There is also significant potential for land use changes on both the east and west sides of Pottstown Pike in this area. On the west side near Graphite Mine Road, the Township has plans to develop the Upland Farm property to provide active and passive community and recreation facilities. On the east side of Pottstown Pike, a future land development is planned for Byers Station Parcel 5C. As land development projects advance, there may be opportunities to implement transportation improvements as part of the projects, particularly to provide bicycle and pedestrian connections.

There is an existing 6' wide asphalt sidepath and 4' wide sidewalk at the entrance for the Reserve at Waynebrook development on the west side of Pottstown Pike. However, the sidewalk/sidepath is not continuous and the sidepath does not meet design criteria for a multi-use (bicycle and pedestrian) facility.

This segment includes several physical barriers and challenges to constructing a well connected and continuous bicycle and pedestrian network, such as steep topography, utility poles, and drainage structures and facilities (including drip irrigation fields) in the area adjacent to the roadway. Additionally, there are access management issues near the intersection of Pottstown Pike and Park Road/Station Boulevard. Finally, this segment has the highest travel speeds, which creates an uncomfortable environment for walking and biking.

Potential connections to existing sidewalks and sidepath at Reserve at Waynebrook

Drainage structures and drip irrigation field along the Upland Park property

Poorly managed access on the west side of Pottstown Pike near Park Road

Pottstown Pike

Park Road/Station Boulevard to Byers Road

This segment of Pottstown Pike can be considered the heart of the Village of Eagle. The area has a higher concentration of commercial destinations for bicyclists and pedestrians, including several restaurants, a drug store, and the Upper Uwchlan Township building. The cross section includes one travel lane in each direction with narrow shoulders and a concrete median near the Little Conestoga intersection to restrict turning movements. The streetscape is well established on the east side of Pottstown Pike between Byers Road and the Township building and includes features such as concrete sidewalks, pedestrian scale lighting, and marked crosswalks.

Although this segment has significant sidewalk linkages and well established streetscapes, there are missing connections and inconsistencies. The existing sidewalk segments vary in width between 3' to 5'. Many of the sidewalk segments and crossings at intersections do not meet the current standards for ADA compliance. Additionally, there are steep slopes adjacent to the roadway on the east side of Pottstown Pike in front of the Township building and on the west side of Pottstown Pike approaching Byers Road. Also on the west side of Pottstown Pike, there are access management issues and limited right-of-way near the Little Conestoga Road intersection. These are some of the key challenges to providing a continuous and well-connected sidewalk network and consistent streetscape within the heart of the Village of Eagle.

Established streetscape in the heart of the Village

Uncontrolled access and limited right-of-way on the west side of Pottstown Pike

Steep topography on the east side of Pottstown Pike near the Upper Uwchlan Township Building

Little Conestoga Road

Pottstown Pike to 500' west of Park Road

Little Conestoga Road provides an important connection between Park Road and Pottstown Pike and the heart of the Village of Eagle. Additionally, it provides access to several shops and businesses, including the Acme shopping center. However, the roadway cross section includes a narrow cartway with no shoulders or sidewalks. Additionally, near the intersection with Pottstown Pike, there are steep slopes and utility poles adjacent to the roadway (on the south side) and access management issues (on the north side). West of Park Road, there is an existing sidepath on the north side of the roadway that connects to the Reserve at Waynebrook development. However, the sidepath is only 4' to 5' wide and it ends in a wooded area across from the Windsor Baptist Church. There is no connection to the sidepath/trail on Park Road or to the other destinations in the Village of Eagle.

Narrow cartway with limited shoulders and no sidewalks

Uncontrolled access on the north side near the intersection with Pottstown Pike

Potential connection to existing sidepath near the Reserve at Waynebrook development

Park Road and Station Boulevard

Graphite Mine Road to Ticonderoga Boulevard

One of the key features in this area is the existing asphalt sidepath on the south side of Park Road and Station Boulevard. The sidepath connects residential areas with key destinations, such as Pickering Valley Elementary School and Hickory Park. Additionally, design is underway for an extension of the Park Road trail to Marsh Creek State Park. Overall, the trail will provide an important link between the Village of Eagle, Byers Village and Eagleview.

Within the Village of Eagle, the sidepath is well connected, except for a short gap between Pottstown Pike and the Pickering Valley Elementary School. However, there is a potential opportunity to complete this connection through re-use of a Township owned property near the Pottstown Pike/ Station Boulevard intersection. Additionally, the existing sidepath can be further enhanced to meet design requirements for a multi-use trail and comply with current ADA standards.

Redevelopment potential and a wide roadway cross section with the striped center turn lane offer additional opportunities to provide a safe and comfortable environment for walking and biking on the north side of Park Road and Station Boulevard.

Existing asphalt sidepath on the south side of Park Road will provide a connection to Marsh Creek State Park

Potential trail connection to Pottstown Pike from the existing trail on the south side of Station Boulevard

Existing center turn lane and redevelopment opportunities on the north side of Station Boulevard

Pottstown Pike

Byers Road to Ticonderoga Boulevard

Pottstown Pike narrows to one lane in each direction in this segment, and both traffic volumes and travel speeds decrease north of Ticonderoga Boulevard. There are limited existing bicycle and pedestrian facilities, including ADA compliant pedestrian crossing facilities at the intersection of Pottstown Pike and Ticonderoga Boulevard and a sidepath along the Wawa property. Although the sidepath in front of Wawa continues along Ticonderoga Boulevard, it is set above the grade of the roadway and it is difficult to access from Pottstown Pike. Overall, this segment lacks continuous and connected bicycle and pedestrian facilities and amenities.

One of the most significant opportunities in this section of the study area is the potential for redevelopment and implementation of bicycle and pedestrian facilities as part of future land development projects. In particular, the Uwchlan Farm Nursery property on the west side of Pottstown Pike is for sale and is poised for redevelopment. Redevelopment of the property could address some of the key challenges in this segment, including steep topography and utility poles adjacent to the roadway.

One key challenge in this section is uncontrolled and open commercial driveways on the east side of Pottstown Pike and south of the Byers Road intersection. There is a lack of well defined driveways or entrances for several businesses along this stretch of the roadway. Poorly managed access creates an unsafe and uncomfortable walking environment.

Existing sidepath fronting the Wawa property

Steep topography and utility poles on the west side of Pottstown Pike

Uncontrolled access on the east side of Pottstown Pike

Pottstown Pike

Ticonderoga Boulevard to Pennsylvania Drive

This segment of Pottstown Pike carries the highest traffic volumes and has the highest posted speed limit of 45 MPH. It can be considered the southern gateway to the Village of Eagle. The cross section generally includes two travel lanes in each direction and no bicycle or pedestrian facilities. Also, at the Pottstown Pike and Graphite Mine Road (southern) intersection, there are limited pedestrian crossing facilities. The traffic volumes, speeds, and lack of bicycle and pedestrian facilities create a challenging environment for walking and biking. However, there is an opportunity to provide a connection to the existing trail on Pennsylvania Drive and provide access to the Eagleview development and the Uwchlan Trail and other regional trails.

The PA Turnpike Bridge over Pottstown Pike is the dominate feature in this segment and presents a significant challenge due to the limited space available under the bridge to accommodate bicyclists and pedestrians. However, there is a near-term opportunity to restripe the travel lanes and alter the median to provide an area dedicated for walking or biking. In the long-term, there are plans to replace the bridge as part of a PA Turnpike widening project. The bridge replacement will present an opportunity to provide a dedicated area for bicycle and pedestrian facilities.

Another opportunity is available space on the west side of Pottstown Pike between East Township Line Road and Graphite Mine Road, including an easement on the Car Sense property for a trail facility. This area is relatively flat and could be utilized for bicycle and pedestrian facilities. Existing utility poles and drainage structures will need to be addressed during the design process.

Lack of pedestrian crossings at Graphite Mine Road (southern) intersection

Limited space for bicycle and pedestrian facilities under the PA Turnpike Bridge

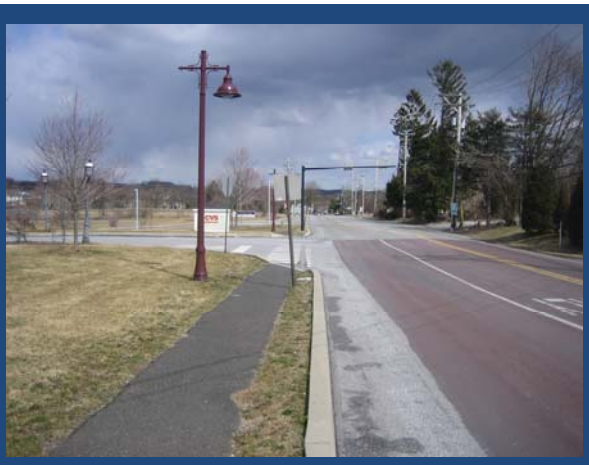
Space available on the west side of Pottstown Pike for future bicycle and pedestrian facilities

Byers Road

Graphite Mine Road to Pottstown Pike

Byers Road is an important east-west connector within the Village of Eagle between Pottstown Pike and Graphite Mine Road, and it also provides connections to Byers Village and PA Route 401. Within the Village, it provides access to the main entrance for the Pickering Valley Elementary School. The cross section includes a striped center turn lane and a 4' wide asphalt sidepath on the north side that connects to the elementary school and other trails.

There are several constraints for implementing a continuous bicycle and pedestrian network. The existing sidepath on the north side does not meet design criteria for a multi-use trail and there is an abrupt transition to a concrete sidewalk near Pottstown Pike. The area near the intersection of Pottstown Pike and Byers Road is the most challenging, with a significant change in grade, access management issues, and utility poles on the south side of Byers Road. Additionally, there are several buildings and structures that are close to the roadway on the south side of Byers Road, providing limited space for new bicycle or pedestrian facilities.



Existing asphalt sidepath on the north side provides a connection to the Elementary School

Transitions between the type of pedestrian facility near Pottstown Pike

Utility poles and a lack of bicycle and pedestrian facilities on the south side

F. Public and Stakeholder Involvement

Stakeholder and public input was sought throughout the planning process to develop and refine the improvement concepts. Below is a summary of the Village Concept Committee Meetings, Technical Review Meetings, and Stakeholder Coordination Meetings that were held. Detailed minutes from these meetings are included in Appendix A.

Village Concept Committee Meetings

This project was guided by the Upper Uwchlan Township Village Concept Committee. The committee includes representatives from the Planning Commission and Historic Commission and is supported by Township staff. The Village Concept Committee met five times throughout the planning process to provide input and guidance and review deliverables.

Technical Review Meetings

A first technical review meeting was held with representatives from PennDOT District 6-0 and the Chester County Planning Commission on July 17, 2013. This meeting included a presentation and discussion of the initial draft concept plans.

A second technical review meeting was held with representatives from PennDOT District 6-0, Chester County Planning Commission, and Pennsylvania Turnpike Commission on October 10, 2013. This meeting included an overview and discussion of changes to the concept plans since the first technical meeting. Another focus of the meeting was coordination regarding the planned reconstruction and widening of the Turnpike between mileposts 298 and 312, including the Downingtown Interchange. This included a discussion of the future cross section for PA Route 100 under the Turnpike to accommodate three travel lanes in each direction, as well as bicycle and pedestrian facilities. The cross section and plans for bicycle and pedestrian facilities for other Turnpike crossings within Upper Uwchlan Township were also discussed.

Stakeholder Coordination Meetings

A stakeholders' meeting was held on October 7, 2013 and twelve people attended representing study area business and property owners. The meeting included a project overview presentation and time for attendees to review the draft concept plans in detail and provide comments.

Additional small group meetings were held with business and property owners who are directly affected by the proposed improvements and could not attend the October stakeholders' meeting. These additional small group meetings were held on November 5, 12, and 25, 2013. These meetings included an overview discussion of the project and detailed review of the concept plans.

Chapter 2

Improvement Concepts

A. Design Guidelines

B. Pottstown Pike Vision and Typical Section

C. Bicycle and Pedestrian Facilities

D. Traffic Calming Strategies

E. Access Management Strategies

F. Streetscape and Amenities

G. Overview of Improvement Concepts

A. Design Guidelines

The development of transportation improvement concepts for the Village of Eagle were based on current design standards and guidelines, including the following key publications:

- *Design Manual 2 (DM-2),* PennDOT, 2009
- *A Policy on Geometric Design of Highways and Streets, 6th Edition,* American Association of State Highway and Transportation Officials (AASHTO), 2011
- *Guide for the Development of Bicycle Facilities, 4th Edition,* American Association of State Highway Officials (AASHTO), 2012
- *Manual on Uniform Traffic Control Devices*, Federal Highway Administration, 2009
- *National Cooperative Highway Research Program (NCHRP) Report 672: Roundabouts: An Informational Guide, 2nd Edition,* Transportation Research Board (TRB), 2010

Figures 2.2—2.6 provide applicable design values based on PennDOT 's DM-2, as well as existing conditions and proposed treatments for various elements of the roadway and roadside design. (Refer to DM-2 for additional notes and details regarding the design values.)

Appropriate design criteria were selected based on the road typology and land use context, as presented in Chapter 1. The roadway typologies are consistent with the Township's Comprehensive Plan (Draft 2014) and reflect the Township's vision for the function of the roadways.

Designation of PA Route 100

Graphite Mine Road, also known as the Eagle Loop Road, was designed and built to support regional travel on the Route 100 corridor. As such, it is identified as a regional arterial in the Township's Comprehensive Plan (Draft 2014). The parallel segment of Pottstown Pike, which is currently designated as PA Route 100, is envisioned to be a community collector that supports local traffic and provides access to the Village's commercial core.

The designation of Graphite Mine Road as PA Route 100 would help to achieve the Township's vision for the Village of Eagle. The change in state designation and the accompanying signage would guide and direct motorists to utilize Graphite Mine Road for regional trips, thereby reducing traffic volumes on Pottstown Pike within the Village. The change would also create an opportunity to provide bicycle and pedestrian enhancements along Pottstown Pike, consistent with the village/ town center character.

The design guidelines used to develop the concept improvement plans are based on the Township's vision for both Graphite Mine Road and Pottstown Pike, including the designation of Graphite Mine Road as PA Route 100. Based on previous coordination with PennDOT, the change in designation may require a change in ownership for Graphite Mine Road and Pottstown Pike. Continued coordination with PennDOT regarding PA Route 100 designation and roadway ownership for Graphite Mine Road and Pottstown Pike is identified as a key next step (See Chapter 3).

B. Pottstown Pike Vision and Typical Section

Figure 2.1 shows the vision for Pottstown Pike or desirable typical section, particularly for the heart of the Village of Eagle (between Park Road/Station Boulevard and Ticonderoga Boulevard). This was developed based on the project goals and the design guidelines for a community collector in a town/village center (See Figure 2.2). It includes 6' sidewalks on both sides of the street to provide consistent and well connected pedestrian facilities. The 4' buffer area between the sidewalk and travel lane provides space for streetscape amenities, such as trees and streetlights, as well as signage and utilities. Additionally, it includes 11' travel lane with the 3' shoulders to provide space for vehicles and bicycles to share the road. Striped 11' travel lanes help calm traffic. The center turn lane or median supports safe access to properties and businesses, reduces congestion, and calms traffic. Finally, a 2' "shy" zone is shown on the back edge of the sidewalk to provide an offset between obstructions and the area designated for walking. As stated in PennDOT's Publication 13M (DM-2), roadside design values should be considered and implemented as feasible and reasonable. Given existing conditions and constraints, this vision can be implemented over time through a combination of capital improvement projects and redevelopment opportunities.

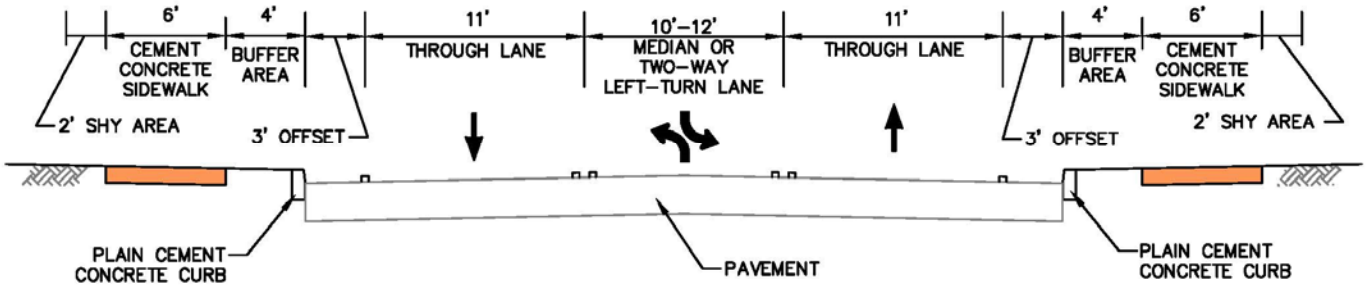


Figure 2.1: Desirable Typical Section for Pottstown Pike (between Park Road/Station Boulevard and Ticonderoga Boulevard)

Consistent and Appropriate Speed Limit

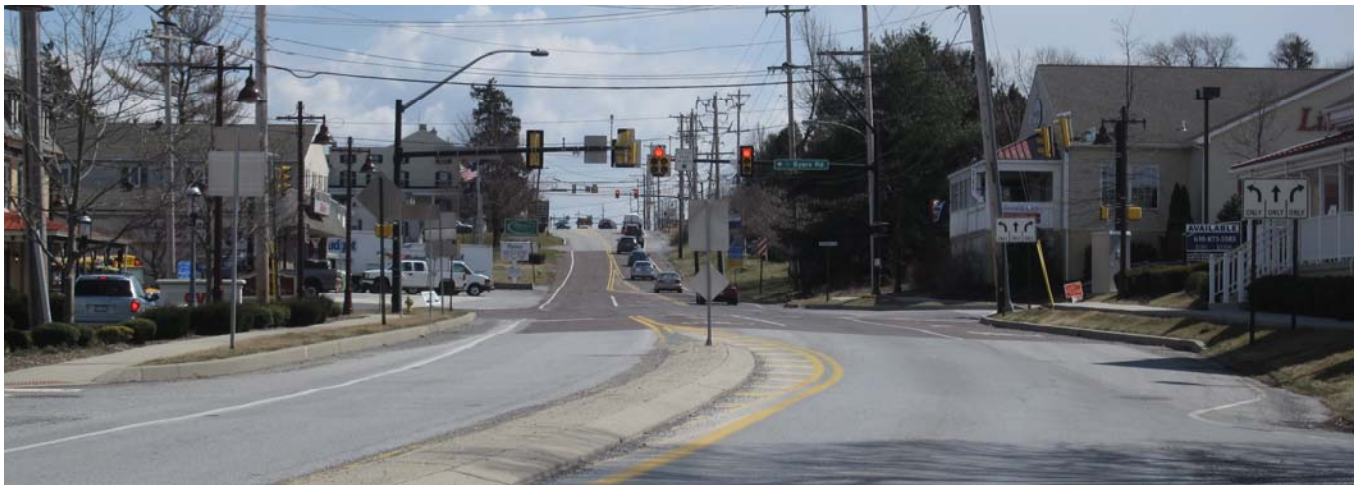
As presented in Chapter 1, the current speed limit on Pottstown Pike between Graphite Mine Road (South) and Graphite Mine Road (North) ranges from 35 MPH to 40 MPH. However, current travel speeds along the corridor exceed the speed limits. Concept improvements were developed to encourage motorists to travel at slower speeds and create a more walkable and bikeable environment. Based on input from the Village Concept Committee and stakeholders, the desired travel speed in the core of the Village of Eagle is 25 MPH. As improvements are implemented, travel speeds on Pottstown Pike should be monitored. If and when it is appropriate, the posted speed limit should be reduced and posted consistently within the Village.

Pottstown Pike: Graphite Mine Road (northern intersection) to Graphite Mine Road (southern intersection)

Roadway Typology: Community Collector ***Land Use Context: Town/Village Center***

Design Element	Applicable Design Value	Existing	Proposed
Lane Width	10′ to 11′	11′ to 12′	11′
Shoulder Width	4′ (if No Parking or Bike Lane)	0′ to 9′	3′ (curb offset)
Parking Lane	7′ to 8′ Parallel	N/A	N/A
Bike Width	5′ to 6′	N/A	N/A
Median (if needed)	12′ to 16′ for Left Turn; 6′ for Pedestrians Only	0′ to 12′ (Left Turn Lane)	6′ to 12′
Travel Lanes	2 to 4	2 (1 in each direction)	Match Existing
Clear Sidewalk Width	6′ to 8′	0′ to 7′	6′
Buffer	4′ to 5′	0′ to 6′	4′
Total Sidewalk Width	12′ to 15′	0′ to 13′	12′
Clear Zone Width	14′	14′ (6′ Min.)	Match Existing
Desired Operating Speed (Design Speed)	25 to 30 MPH	35 to 40 MPH	35 MPH (Max.)

Figure 2.2: Design Guidelines for Pottstown Pike as a Community Collector
Source: Design Manual 2 (DM-2), PennDOT (See DM-2 for additional notes and details)

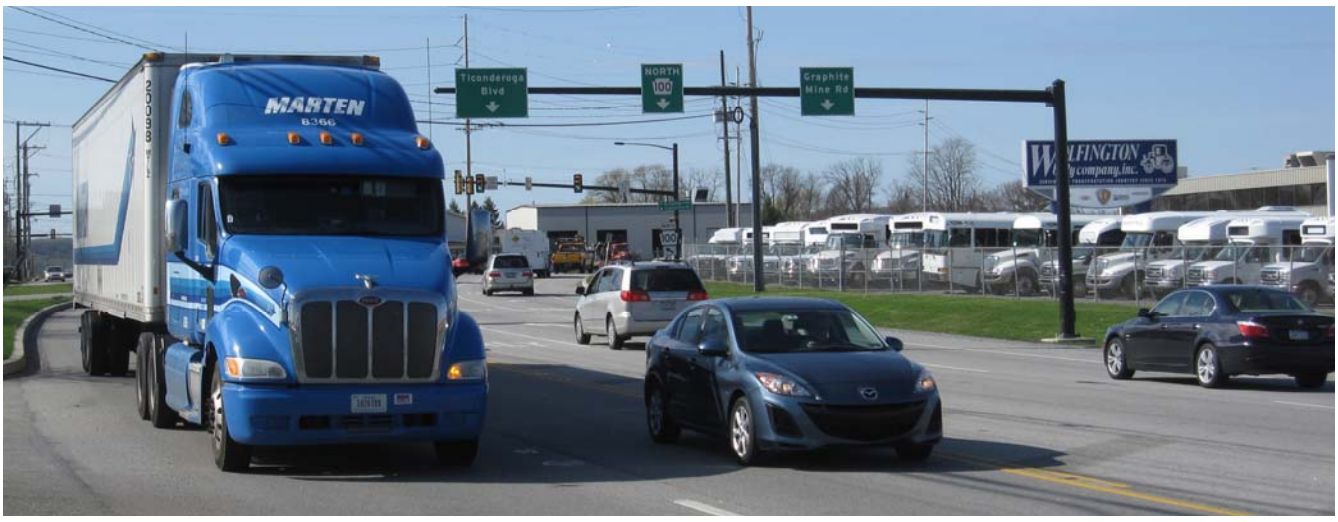


Pottstown Pike: Graphite Mine Road (southern intersection) to Pennsylvania Drive

Roadway Typology: Regional Arterial ***Land Use Context: Town/Village Center***

Design Element	Applicable Design Value	Existing	Proposed
Lane Width	10′ to 12′	11′ to 12′	12′-14′
Shoulder Width	4′ to 6′ (if No Parking or Bike Lane)	0′ to 9′	Match Existing
Parking Lane	8′ Parallel	N/A	N/A
Bike Width	5′ to 6′	N/A	N/A
Median (if needed)	16′ to 18′ for Left Turn; 6′-8′ for Pedestrians Only	10′ (Left Turn Lane)	Match Existing
Travel Lanes	2 to 4	4 (2 in each direction)	Match Existing
Clear Sidewalk Width	6′ to 10′	N/A	6′
Buffer	4′ to 6′	N/A	4′
Total Sidewalk Width	12′ to 18′	N/A	12′
Clear Zone Width	14′	14′	Match Existing
Desired Operating Speed (Design Speed)	30 to 35 MPH	40 to 45 MPH	Match Existing

Figure 2.3: Design Guidelines for Pottstown Pike as a Regional Arterial
Source: Design Manual 2 (DM-2), PennDOT (See DM-2 for additional notes and details)



Little Conestoga Road : Pottstown Pike to 500' west of Park Road

Roadway Typology: Community Collector ***Land Use Context: Town/Village Center***

Design Element	Applicable Design Value	Existing	Proposed
Lane Width	10′ to 11′	10′	11′
Shoulder Width	4′ (if No Parking or Bike Lane)	N/A	3′ (curb offset)
Parking Lane	7′ to 8′ Parallel	N/A	7′
Bike Width	5′ to 6′	N/A	N/A
Median (if needed)	12′ to 16′ for Left Turn; 6′ for Pedestrians Only	N/A	N/A
Travel Lanes	2 to 4	2 (1 in each direction)	Match Existing
Clear Sidewalk Width	6′ to 8′	N/A	6′
Buffer	4′ to 5′	N/A	4′
Total Sidewalk Width	12′ to 15′	N/A	12′
Clear Zone Width	12′	12′ Typ., 3′ Min.	12′ Typ., 4′ Min.
Desired Operating Speed (Design Speed)	25 to 30 MPH	35 MPH	Match Existing

Figure 2.4: Design Guidelines for Little Conestoga Road as a Community Collector
Source: Design Manual 2 (DM-2), PennDOT (See DM-2 for additional notes and details)

Park Road and Station Boulevard: Graphite Mine Road to Ticonderoga Boulevard

Roadway Typology: Neighborhood Collector *Land Use Context: Town/Village Center*

Design Element	Applicable Design Value	Existing	Proposed
Lane Width	9′ to 11′	12′	Match Existing
Shoulder Width	N/A	N/A	N/A
Parking Lane	7′ to 8′ Parallel	N/A	N/A
Bike Width	5′	N/A	N/A
Median (if needed)	8′ to 10′ Landscaping; 6′ to 8′ for Pedestrians	11′ Center Left Turn	Match Existing
Travel Lanes	2	2 (1 in each direction)	Match Existing
Clear Sidewalk Width	6′	0′ to 6′	6′
Buffer	3′ to 5′	0′ to 6′	4′
Total Sidewalk Width	11′ to 13′	0′ to 12′	12′
Clear Zone Width	12′	12′	Match Existing
Desired Operating Speed (Design Speed)	25 to 30 MPH	30 to 35 MPH	Match Existing

Figure 2.5: Design Guidelines for Park Road/Station Boulevard as Neighborhood Collector
Source: Design Manual 2 (DM-2), PennDOT (See DM-2 for additional notes and details)

Byers Road: Graphite Mine Road to Pottstown Pike

Roadway Typology: Community Collector ***Land Use Context: Town/Village Center***

Design Element	Applicable Design Value	Existing	Proposed
Lane Width	10′ to 11′	12′	Match Existing
Shoulder Width	4′ (if No Parking or Bike Lane)	N/A	N/A
Parking Lane	7′ to 8′ Parallel	N/A	N/A
Bike Width	5′ to 6′	N/A	N/A
Median (if needed)	12′ to 16′ for Left Turn; 6′ for Pedestrians Only	11′	Match Existing
Travel Lanes	2 to 4	2	Match Existing
Clear Sidewalk Width	6′ to 8′	4′ to 10′	Match Existing
Buffer	4′ to 5′	2′ to 6′	Match Existing
Total Sidewalk Width	12′ to 15′	6′ to 16′	Match Existing
Clear Zone Width	12′	12′	Match Existing
Desired Operating Speed (Design Speed)	25 to 30 MPH	35 MPH	Match Existing

Figure 2.6: Design Guidelines for Park Road/Station Boulevard as Neighborhood Collector
Source: Design Manual 2 (DM-2), PennDOT (See DM-2 for additional notes and details)

C. Bicycle and Pedestrian Facilities

Since one of the main goals of the project is to provide a well connected bicycle and pedestrian network in the Village of Eagle, identifying appropriate bicycle and pedestrian facilities is a key step in the development of improvement concepts. The following bicycle and pedestrian facilities were considered and evaluated based on the types of users supported, design requirements, safety and aesthetic features, connections to existing facilities, and other existing conditions:

- Sidewalks
- Sidepaths
- Multi-use Trails
- Bicycle Lanes
- Shared Lanes

The three types of existing bicycle and pedestrian facilities in the Village of Eagle are sidewalks, sidepaths, and multi-use trails. Although there are no existing examples within the Village, bicycle lanes and shared lanes were also considered for improving access and mobility for bicyclists. The improvement concepts focused on ways to promote connectivity and consistency based on these facility types.

Key characteristics and design guidelines for sidewalks, sidepaths, multi-use trails, and shared lanes are summarized in Figure 2.7. The recommended widths for the facilities are based on the design guidelines, PennDOT's Design Manual 2 (DM-2), and ADA requirements.

Sidewalks and sidepaths are both pedestrian facilities, but offer different aesthetic qualities. Sidewalks are typically concrete and installed with a curb to separate the travel lanes from the pedestrian facility. Sidewalks were selected as the preferred pedestrian facility within the heart of the Village, along Pottstown Pike between Park Road/Station Boulevard and Ticonderoga Boulevard and along Little Conestoga Road between Park Road and Pottstown Pike. In this area, the sidewalks are a key component of the streetscape and help to define the village context. Sidepaths typically have an asphalt surface material and are often used in suburban or rural contexts. Sidepaths were identified as the preferred facility along the west side of Pottstown Pike between Graphite Mine Road (northern intersection) and Park Road/Station Boulevard and along Park Road to connect with existing facilities.

Bicycle lanes were identified in the *Trail Network Master Plan* and considered specifically for Pottstown Pike between Graphite Mine Road (northern intersection) and Ticonderoga Boulevard. American Association of State Highway Officials (AASHTO) and PennDOT design guidelines require 5' minimum width for on-road bicycle lanes. Implementing bicycle lanes for both directions on Pottstown Pike would have significant cost and right-of-way impacts, particularly within the heart of the Village between Park Road/Station Boulevard and Ticonderoga Boulevard. Given the potential impacts, dedicated on-road bicycle lanes were dismissed for Pottstown Pike. As an alternative to bicycle lanes, a combination of multi-use trails and shared lanes were identified to provide bicycle connectivity along Pottstown Pike.

Characteristics of Key Bicycle and Pedestrian Facilities

	Users	Width	Surface Material
Sidewalk 	Pedestrians	5’ to 6’ 4’ permissible if passing areas are provided	Concrete
Sidepath 	Pedestrians	6’ to 8’	Asphalt
Multi-Use Trail 	Pedestrians and Bicyclists	10’ to 12’ 8’ permissible in certain situations	Asphalt
Shared Lane 	Bicyclists and Motorized Vehicles	14’ curb lane	Asphalt *Special signage and striping can be used to alert motorists to bicycle traffic*

Figure 2.7: Key Bicycle and Pedestrian Facilities

D. Traffic Calming Strategies

Given issues with speeding traffic, as well as the desire to create a safe and comfortable environment for bicyclists and pedestrians, several traffic calming measures were considered during the development of the improvement concept plan. Traffic calming strategies can improve safety by reducing vehicular travel speeds. Additionally, several strategies provide improvements for pedestrians, such as shorter crossing distances. Key traffic calming strategies incorporated into the concept improvement plan are highlighted in Figure 2.8.

Roundabouts

Roundabouts are alternative intersection designs that reduce conflict points and slow traffic. Traffic approaching the intersection yields to traffic circulating around the roundabout. Splitter islands at the entries help to slow and direct traffic and serve as pedestrian refuge areas. In some situations, roundabouts can provide increased capacity and reduced delay when compared with traffic signals.

Medians, Gateway Treatments, Pedestrian Refuge Islands

Medians or raised islands between travel lanes can be designed with landscaping, welcome signs, or provide a mid-point refuge for pedestrian crossings. Medians also help to slow traffic by defining travel lanes and can be used to reduce conflict areas by physically preventing left turns and restricting turning movements to specific locations.

Reduced Lane Widths

Reduced lane widths can help to slow traffic by providing a defined area for travel. Also, a reduction in lane widths can provide additional space for bicyclists and pedestrians. Lane widths can be defined by edge line striping, curbing, or other physical roadside treatments.

Curb Extensions

Extensions of the sidewalk and curb can be used to narrow travel lanes and reduce the pedestrian crossing distance. Also, curb extensions can define on-street parking areas.

Figure 2.8: Key Traffic Calming Strategies

E. Access Management Strategies

Access management is particularly critical for commercial corridors, such as Pottstown Pike, where access to businesses must be provided safely and efficiently. Currently, there are a number of wide and undefined driveways, as well as closely spaced commercial driveways, along segments of Pottstown Pike. Upper Uwchlan Township adopted an Access Management Ordinance in 2010 to promote safety by limiting conflict points, providing standards for driveway spacing, and encouraging shared access between adjacent properties. The requirements of the Access Management Ordinance were reviewed and applied during the development of the improvement concepts. In particular, the concept improvement plan identifies access management improvements for several existing commercial driveways, including the Eagle Village shops and the Eagle Tavern. The plan also identifies a center left-turn lane and potential shared driveway locations (to be implemented upon redevelopment) for the segment of Pottstown Pike between Byers Road and Ticonderoga Boulevard. Key access management strategies are highlighted in Figure 2.9.

Driveway Spacing

Adequate spacing and aligning of driveways reduces conflict points and preserves roadway capacity. Upper Uwchlan Township's Access Management Ordinance includes standards for desirable driveway spacing based on roadway functional classification.

Joint and Cross Access

Joint or cross access between adjacent properties allows circulation between the properties and reduces the number of driveways and conflict areas along a roadway. Joint or cross access can be used in combination with shared parking. There are several examples of joint access in Upper Uwchlan Township, including the shared driveway for CVS and adjacent businesses on Pottstown Pike near Byers Road.

Two-Way Left Turn Lane

Two-way left turn lanes separate left turning vehicles from through traffic, which can reduce congestion and rear-end collisions. A two-way center turn lane can also improve access for businesses along a commercial corridor, such as Pottstown Pike.

Figure 2.9: Key Access Management Strategies

F. Streetscape and Amenities

Establishing a consistent streetscape and providing a comfortable environment for walking and biking are two project goals. Streetscape elements, particularly street trees, can also help to calm traffic, reduce travel speeds, and improve safety. The Village Concept Committee developed *Village Design Guidelines* to provide guidance on streetscape treatments and materials within the village. The *Village Design Guidelines* were reviewed and applied during the development of improvement concepts. In particular, the concept improvement plan identifies the location of street lighting, bicycle racks and street trees, as well as the surface materials for pedestrian facilities. Streetscape amenities were placed on the concept plan with consideration of the *Village Design Guidelines*, clearance to the adjacent travel lanes, sight distance for driveways, and clearance to utilities. Additional design details for streetscape elements will be developed in the next phase of engineering.

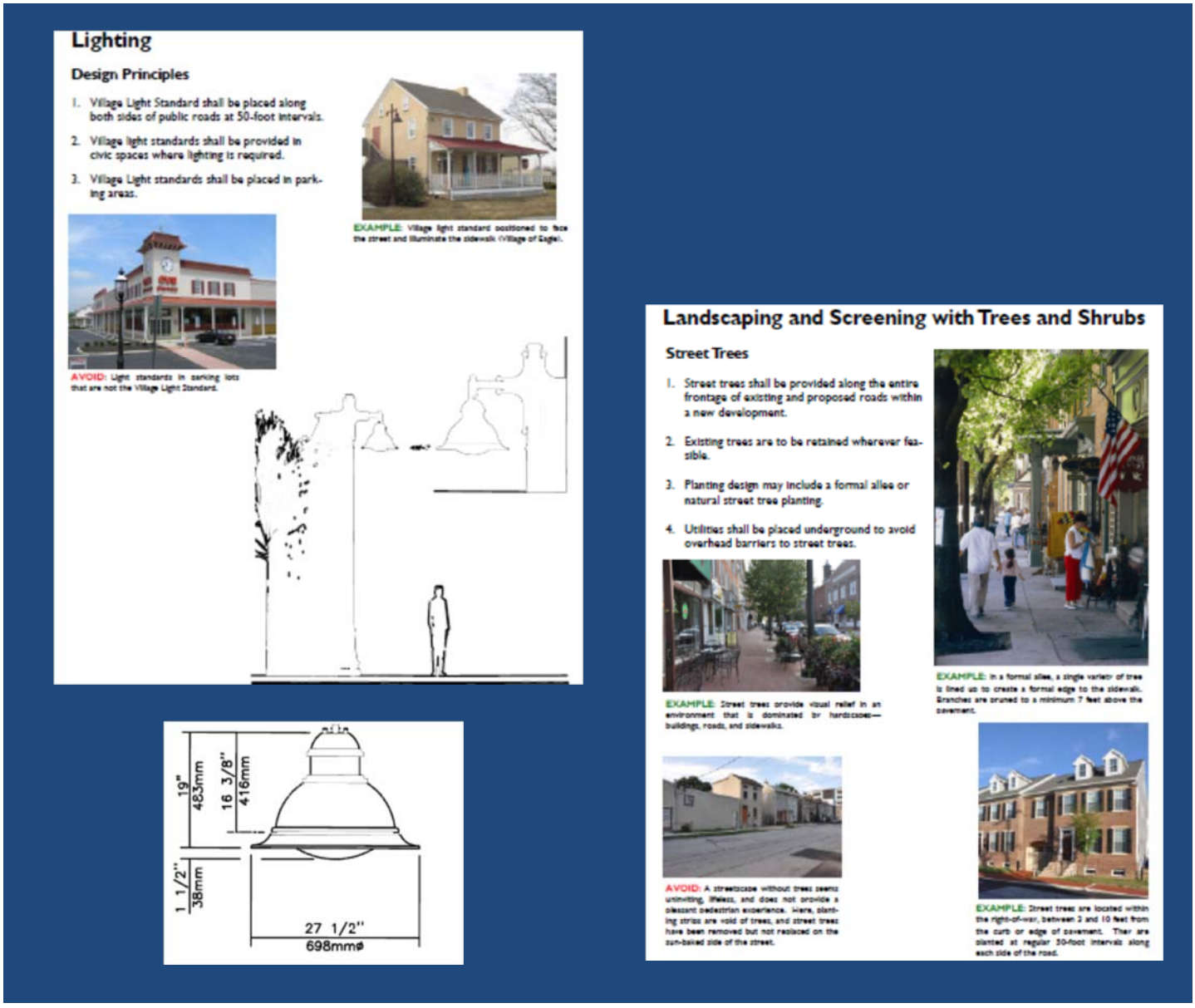


Figure 2.10: Excerpts on lighting and street trees from the Upper Uwchlan Township *Village Design Guidelines*

Crosswalk Treatments

Crosswalks are an important element of the streetscape design and are used to indicate pedestrian crossing locations for both pedestrians and motorists. Crosswalk designs can also reflect the context and identity of an area. As shown in Figure 2.11, there are a number of crosswalk materials, including paint/thermoplastic, stamped asphalt, and bricks/pavers. In addition to surface materials, crosswalks can be raised to also serve as a traffic calming device.

The *Village Design Guidelines* do not include a specific crosswalk material or design. Based on input from the Village Concept Committee and stakeholders, there is a desire for a consistent crosswalk design that reflects the character of the Village of Eagle. Therefore, different design treatments are preferred over the traditional white striped crosswalks. However, the specific design treatment for crosswalks will be selected in future design phases. Additionally, the option of providing a raised crosswalk for mid-block crossings will be considered during the next phase of engineering. Finally, crosswalk designs should also consider and incorporate ADA compliant curb ramps.

Figure 2.11: Examples of crosswalk designs

G. Overview of Improvement Concepts

For development of the concept improvement plan, the study area was divided into four sections. The sections are based changes in character, other existing conditions, and planned improvements. Figure 2.12 below shows the general limits for each section. Section 1 also includes a focus on three intersection located at the northern end of the study area and additional concept improvement alternatives were developed for these intersections.

This chapter presents an overview of the concept plans. More detailed concept plans are included in Appendix D.

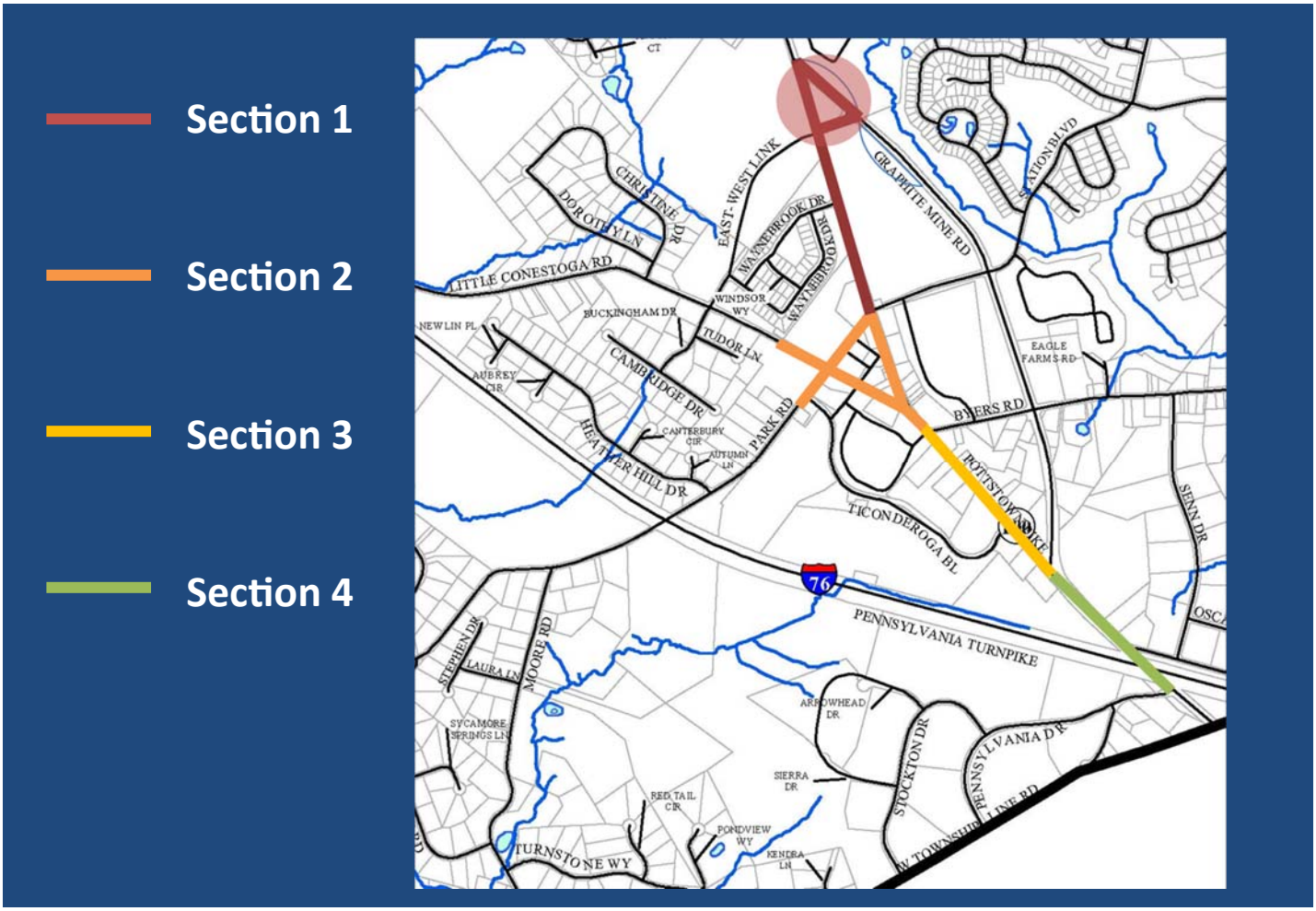


Figure 2.12: Map of Sections for Improvement Concept Plan

Section 1

Pottstown Pike *Graphite Mine Road (northern intersection) to Park Road/Station Boulevard*

Section 1 is the northern gateway to the Village and a transitional area between the rural context to the north and the village/town center context to the south. As shown in Figure 2.13, the proposed typical section for Pottstown Pike in Section 1 includes 11′ travel lanes (restriped from 12′ wide lanes) and center median islands to calm traffic and create the gateway features. Additionally, several improvements options were developed for the Pottstown Pike/Graphite Mine Road/Darrell Drive intersections and are described in more detail in the next section of the report. Key elements of the Section 1 improvement concept include raised medians as gateway treatments, sidepath and multi-use trail connections, and access management improvements.

Gateway Treatments

The Section 1 concept improvement plan includes raised medians at several locations along Pottstown Pike to formalize and define the areas that are currently painted medians with gore striping for no traffic. In addition to channelizing and defining travel lanes, the medians can also serve as gateways with signage to identify Upper Uwchlan Township or the Village of Eagle. The medians are proposed to have low-maintenance design features, such as grass, river rock, or other plantings.

Since Section 1 is a transitional area for the village context, the improvement plan shows 80′ spacing for street lights, which is a greater interval than the 50′ spacing recommended in the *Village Design Guidelines.* The increased spacing is expected to adequately illuminate the bicycle and pedestrian facilities and serve as a visual cue for the gateway to the village. Furthermore, new street trees are shown at 100′ spacing within Section 1, due to the transitional nature of the area.

Sidepath and Trail Connections

The concept plan includes both sidepath and multi-use trail connections to existing facilities. On the west side of Pottstown Pike, a 6′ wide sidepath

Existing striped median to become a raised median

Existing sidepath to be extended to Upland Farm

will be extended from the existing sidepath near the entrance of the Reserve at Waynebrook development. This sidepath will provide an important connection between Upland Farm and the Township's Park Road trail. The 8' wide sidepath along the frontage of Upland Farm is consistent with the *Upland Farm Master Plan* and provides a 5' minimum clearance from the drip irrigation fields. On the east side of Pottstown Pike, a 10' wide multi-use trail is proposed to circle Byers Station Parcel 5C and connect with the existing multi-use trail on the east side of Graphite Mine Road.

Shared driveway and access management

Shared Access

The Eagle Village shops currently has two wide driveways in close proximity to the Pottstown Pike and Park Road intersection. The concept plan includes access management improvements to close the existing driveways and install a new shared driveway. This improvement could be implemented in conjunction with future development in this area.

Section 1—Intersection Alternatives

Pottstown Pike, Graphite Mine Road (northern intersection), Darrell Drive

A key focus of the project was the northern gateway to the Village, including the intersections of Pottstown Pike and Graphite Mine Road (northern), Pottstown Pike and Darrell Drive, and Graphite Mine Road and Darrell Drive. The current configuration of the Pottstown Pike and Graphite Mine Road (northern) intersection does not provide a free-flow southbound movement to Graphite Mine Road. Southbound traffic utilizing Graphite Mine Road must make a left turn and yield to northbound traffic on Pottstown Pike. Additionally, future changes in land uses and the transportation network in the immediate vicinity will impact traffic operations. In terms of land use, the Township is developing the Upland Farm property as a park and recreational facility with Darrell Drive serving as the main entrance to the park. Additionally, Byers Station Parcel 5C will likely be developed. In terms of the transportation system, the completion of Darrell Drive between Pottstown Pike and Little Conestoga, also known as the East-West Connector, and the designation of Graphite Mine Road as PA Route 100 will shift travel patterns and alter traffic volumes. Given these issues, several improvement options for the three intersections were developed. Figure 2.14 summarizes key elements of the various improvement alternatives. Additionally, Figures 2.17—2.20 present the concept plans for the alternatives.

Alternative	Pottstown Pike and Graphite Mine Road (northern) Intersection	Pottstown Pike and Darrell Drive Intersection	Graphite Mine Road and Darrell Drive Intersection	Pottstown Pike between Graphite Mine Road and Darrell Drive Roadway Segment
1A	Medians	Signal (when warranted)	Maintain existing intersection (Signal when warranted)	Maintain existing northbound and southbound connections
1B	Medians	Roundabout (when warranted)	Maintain existing intersection (Signal when warranted)	Maintain existing northbound and southbound connections
1C	Realignment	Roundabout* or Signal (when warranted)	Signal (when warranted); Crosswalk for trail connection	Eliminate northbound connection; Retain southbound connection
1D	Realignment	Roundabout* or Signal (when warranted)	Signal (when warranted); Crosswalk for trail connection	Eliminate northbound and southbound connections
1E	Multi-Lane Roundabout			

*Improvement option shown on concept plan

Figure 2.14: Summary of Section 1 Intersection Improvement Options

Alternatives 1B—1D include an option of a roundabout or traffic signal at Pottstown Pike and Darrell Drive. A roundabout at this intersection can serve as a gateway feature and traffic calming measure. Additionally, PennDOT's *Policies and Procedures for Transportation Impacts* require that roundabouts be evaluated in lieu of a traffic signal, when warranted. Selection of a signal or roundabout will require additional traffic analysis. In particular, a more detailed review of traffic operations and queuing will be crucial when determining the appropriate traffic control at these closely spaced intersections.

Additionally, depending on the selected alternative, it may be possible to phase the construction of the improvements as they are warranted. However, consideration should be given to the total cost of implementing multiple phases of improvements and the environmental and right-of-way impacts of phased projects. It may be more cost effective to construct the "ultimate" intersection configuration in lieu of phasing improvements. Chapter 3 includes a more detailed discussion of project implementation.

Future Traffic Analysis

In order to evaluate the intersection improvement alternatives, traffic counts were collected during the weekday AM and PM peak periods. To analyze future traffic conditions, the following factors were applied to the traffic counts.

- Traffic was increased by 1.91% per year to the year 2035 based on PennDOT's Bureau of Planning and Research growth factors for similar roadways in Chester County
- Anticipating the designation of Graphite Mine Road as PA Route 100, it was assumed that 60% of traffic will use Graphite Mine Road and 40% will use Pottstown Pike.
- Anticipating the completion of Darrell Drive, future traffic volumes for Darrell Drive were estimated based on the Traffic Impact Analysis for the East-West Road (December 2005).

Figure 2.15 summarizes the 2035 weekday AM and PM peak period overall level of service for the five improvement alternatives. Traffic counts and additional details of the traffic analysis are included in Appendix B. The peak hour traffic volumes were analyzed in accordance with the standard techniques contained in the *Highway Capacity Manual (HCM)* (2010), which is consistent with NCHRP Report 672 recommendations for planning-level analysis of roundabouts. In accordance with NCHRP Report 672, additional traffic analysis using deterministic and/or simulation software will be necessary to evaluate queuing and traffic operations for roundabout alternatives.

Through the preliminary traffic analysis, it was determined that upon the realignment of Graphite Mine Road (Alternatives 1C and 1D), it may necessary to provide one additional northbound and

	1A	1B	1C	1D	1E
Pottstown Pike and Graphite Mine Road (northern) Intersection	D(C)*	D(C)*	Free-Flow	Free-Flow	D(A)***
Pottstown Pike and Darrell Drive Intersection	A(B)**	B(C)***	B(C)***	B(C)***	
Graphite Mine Road and Darrell Drive Intersection	A(A)*	A(A)*	B(B)**	B(C)**	

AM Peak Level of Service (PM Peak Level of Service)

Traffic Control Method Analyzed:
*Unsignalized **Signalized ***Roundabout

Figure 2.15: 2035 Overall Level of Service for Section 1 Intersection Improvement Alternatives

southbound through lane (resulting in a 5-lane cross section) at the Graphite Mine Road and Darrell Drive intersection in the future. The provision of a 5-lane roadway has always been the ultimate vision for Graphite Mine Road, however converting this entire roadway from the existing 3-lane cross section to a 5-lane cross section will require further traffic analysis and engineering study. Planning for the future of the Graphite Mine Road Corridor should also include evaluation of a 5-lane cross section north along PA Route 100 through and beyond Fellowship Road.

In addition to the results of the traffic analysis, Figure 2.16 presents a qualitative evaluation of the five improvement alternatives based how well each alternative satisfies the project goals and following objectives:

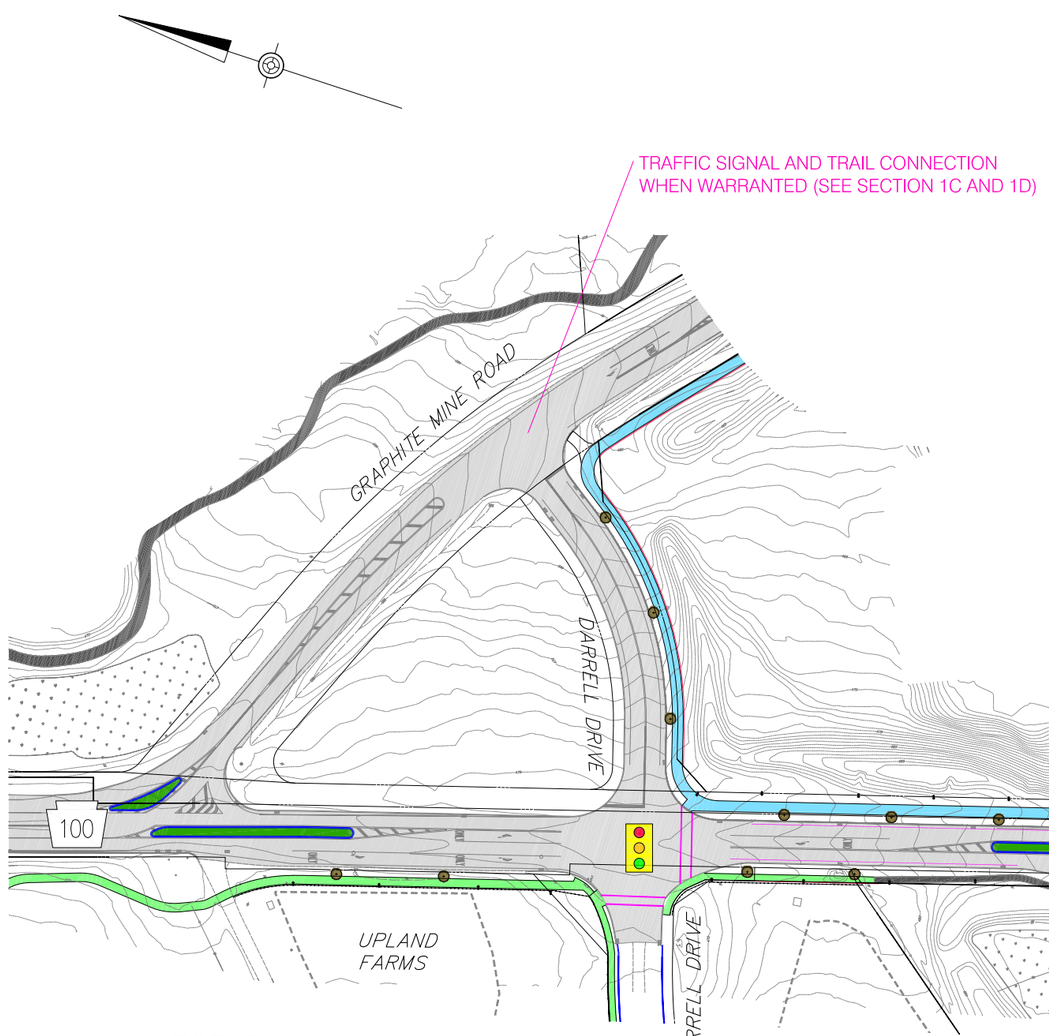
- **Village Gateway:** Visual and physical gateway treatments to identify the Village and calm traffic
- **Regional Mobility:** Connections and limited delay for regional trips through the Village
- **Local Village Access:** Connections and limited delay for local trips to the Village
- **Bicycle and Pedestrian Connections:** Sidewalk, sidepath, and trail connections for bicycle and pedestrian access and safety
- **Resource and Property Preservation:** Limited impacts to sensitive environmental resources (such as wetlands) and limited use of additional property for transportation improvements
- **Capital Costs:** Cost for constructing the improvements (See Chapter 3 for more detailed cost estimates.)

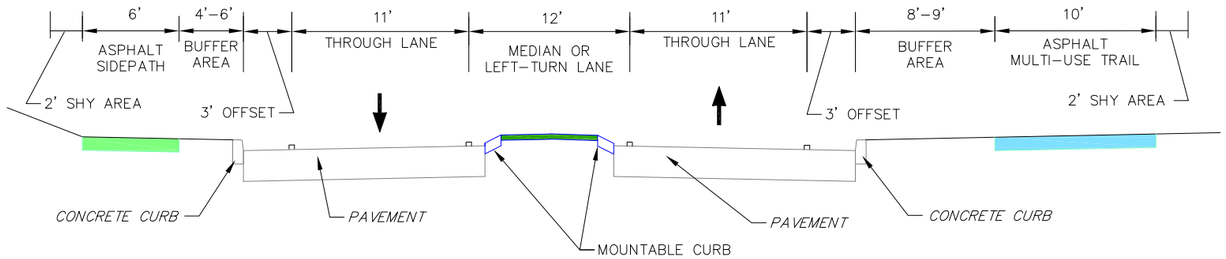
	1A	1B	1C	1D	1E
Village Gateway	✓	✓✓	✓✓	✓✓	✓✓✓
Regional Mobility	✓	✓	✓✓✓	✓✓✓	✓✓
Local Village Access	✓✓✓	✓✓✓	✓✓	✓	✓✓
Bicycle and Pedestrian Connections	✓	✓✓	✓✓✓	✓✓✓	✓✓
Resource and Property Preservation	✓✓✓	✓✓	✓	✓	✓
Capital Cost	$	$ $	$ $ $	$ $ $	$ $ $

✓ Low Satisfaction of Objective
✓✓ Medium Satisfaction of Objective
✓✓✓ High Satisfaction of Objective

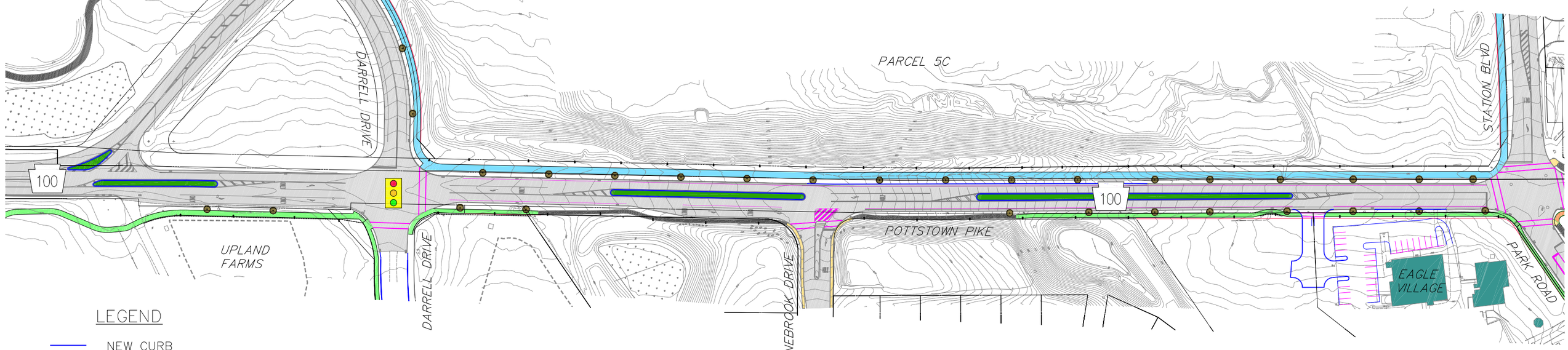
Figure 2.16: Qualitative Evaluation of Section 1 Intersection Improvement Alternatives

SECTION 1A: POTTSTOWN PIKE FROM GRAPHITE MINE ROAD (NORTH) TO PARK ROAD: GATEWAY TREATMENT OPTION





DESIRABLE TYPICAL SECTION



LEGEND

- NEW CURB
- NEW EDGE OF PAVEMENT
- NEW PAVEMENT MARKINGS
- ESTIMATED REQUIRED RIGHT–OF–WAY/EASEMENT
- EXISTING CURB
- EXISTING EDGE OF PAVEMENT
- EXISTING PAVEMENT MARKINGS
- EXISTING CONTOUR (1 FOOT INTERVAL)
- EXISTING CONTOUR (5 FOOT INTERVAL)
- EXISTING RIGHT–OF–WAY LINE
- EXISTING PROPERTY LINE

- PROPOSED MULTI–USE TRAIL
- PROPOSED SIDE PATH
- PROPOSED CONCRETE SIDEWALK
- EXISTING ASPHALT PEDESTRIAN FACILITY
- EXISTING CONCRETE PEDESTRIAN FACILITY

STREETSCAPE LEGEND

- STREETLIGHT
- STREET TREE

Figure 2.13

SECTION 1B: POTTSTOWN PIKE AND DARRELL DRIVE ROUNDABOUT

LEGEND

- NEW CURB
- NEW EDGE OF PAVEMENT
- NEW PAVEMENT MARKINGS
- ESTIMATED REQUIRED RIGHT-OF-WAY/EASEMENT
- REMOVED EXISTING ROADWAY
- PROPOSED MULTI-USE TRAIL
- PROPOSED SIDE PATH
- PROPOSED CONCRETE SIDEWALK
- EXISTING ASPHALT PEDESTRIAN FACILITY
- EXISTING CONCRETE PEDESTRIAN FACILITY
- EXISTING CURB
- EXISTING EDGE OF PAVEMENT
- EXISTING PAVEMENT MARKINGS
- EXISTING CONTOUR (1 FOOT INTERVAL)
- EXISTING CONTOUR (5 FOOT INTERVAL)
- EXISTING RIGHT-OF-WAY LINE
- EXISTING PROPERTY LINE

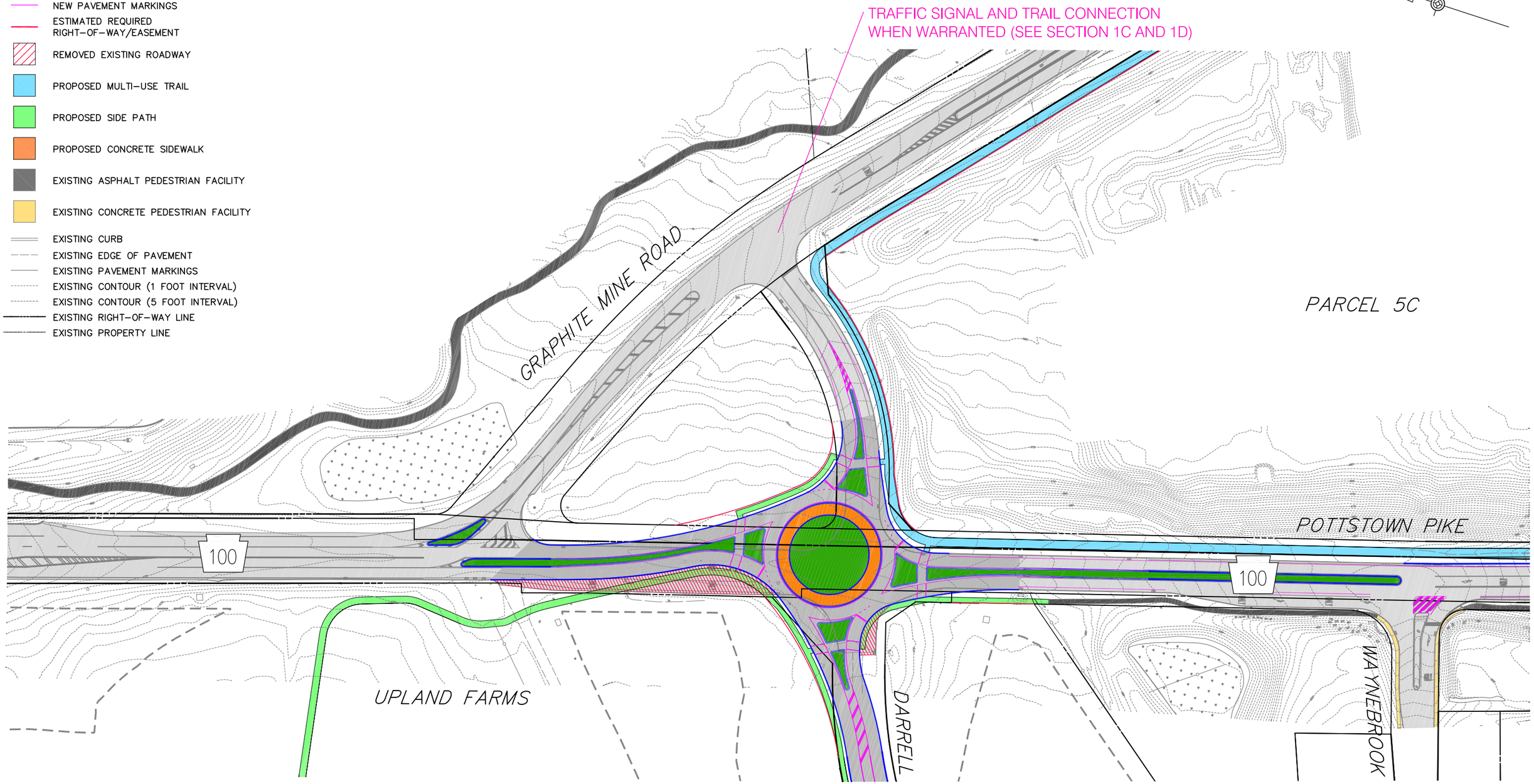


Figure 2.17

SECTION 1C: POTTSTOWN PIKE AND GRAPHITE MINE ROAD REALIGNMENT

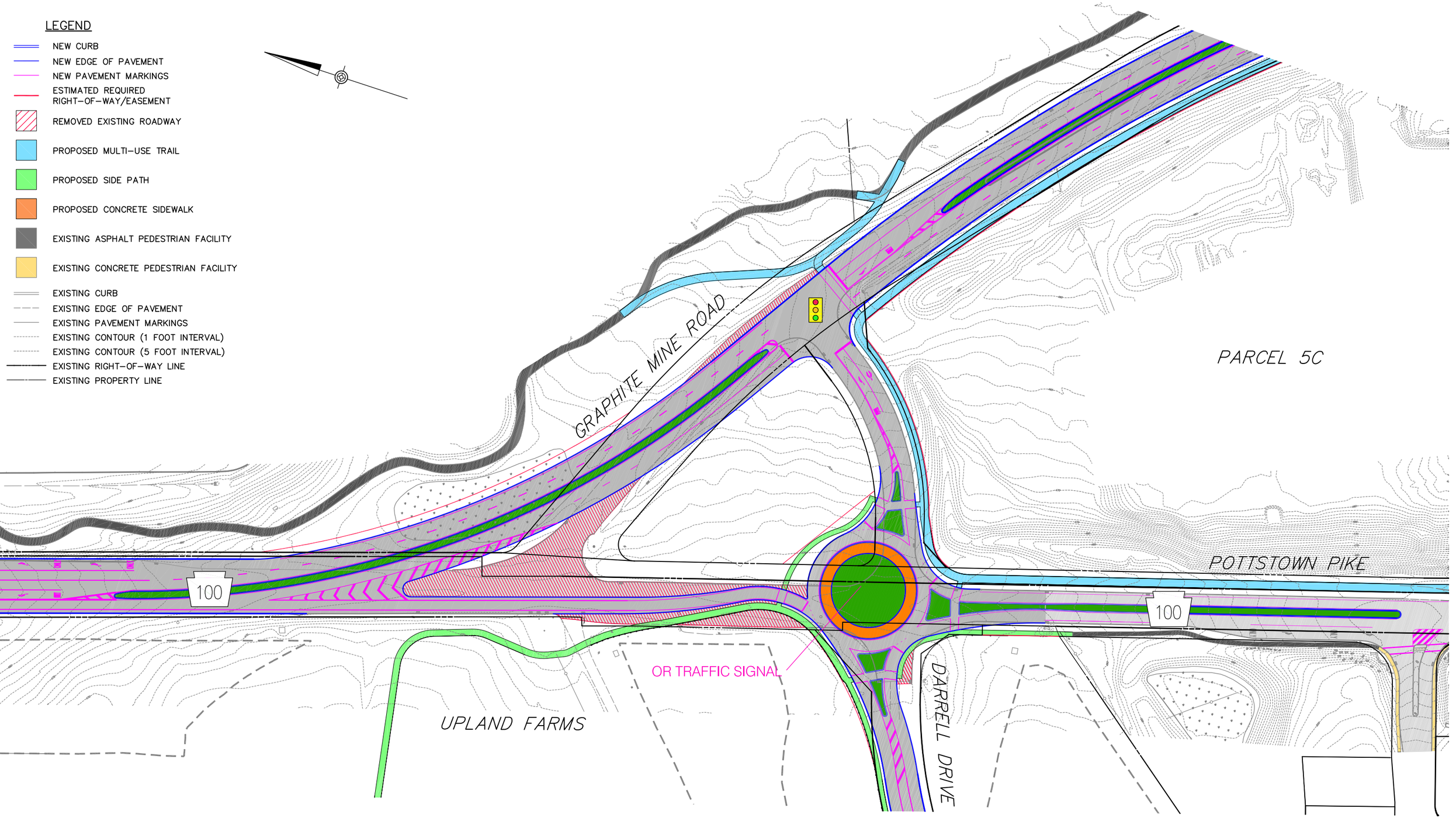


Figure 2.18

SECTION 1D: POTTSTOWN PIKE AND GRAPHITE MINE ROAD REALIGNMENT

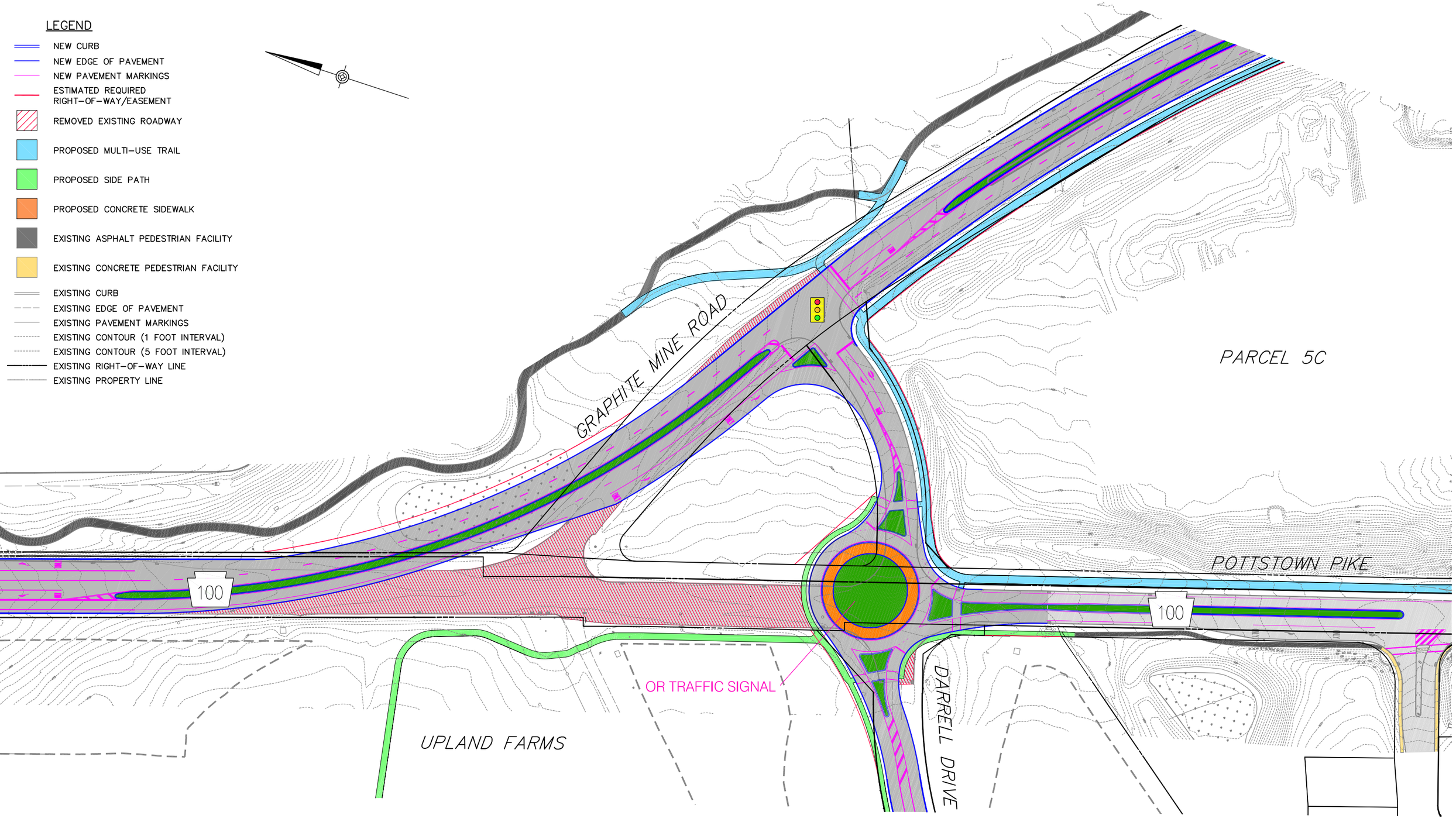


Figure 2.19

SECTION 1E: POTTSTOWN PIKE, GRAPHITE MINE ROAD AND DARRELL DRIVE ROUNDABOUT

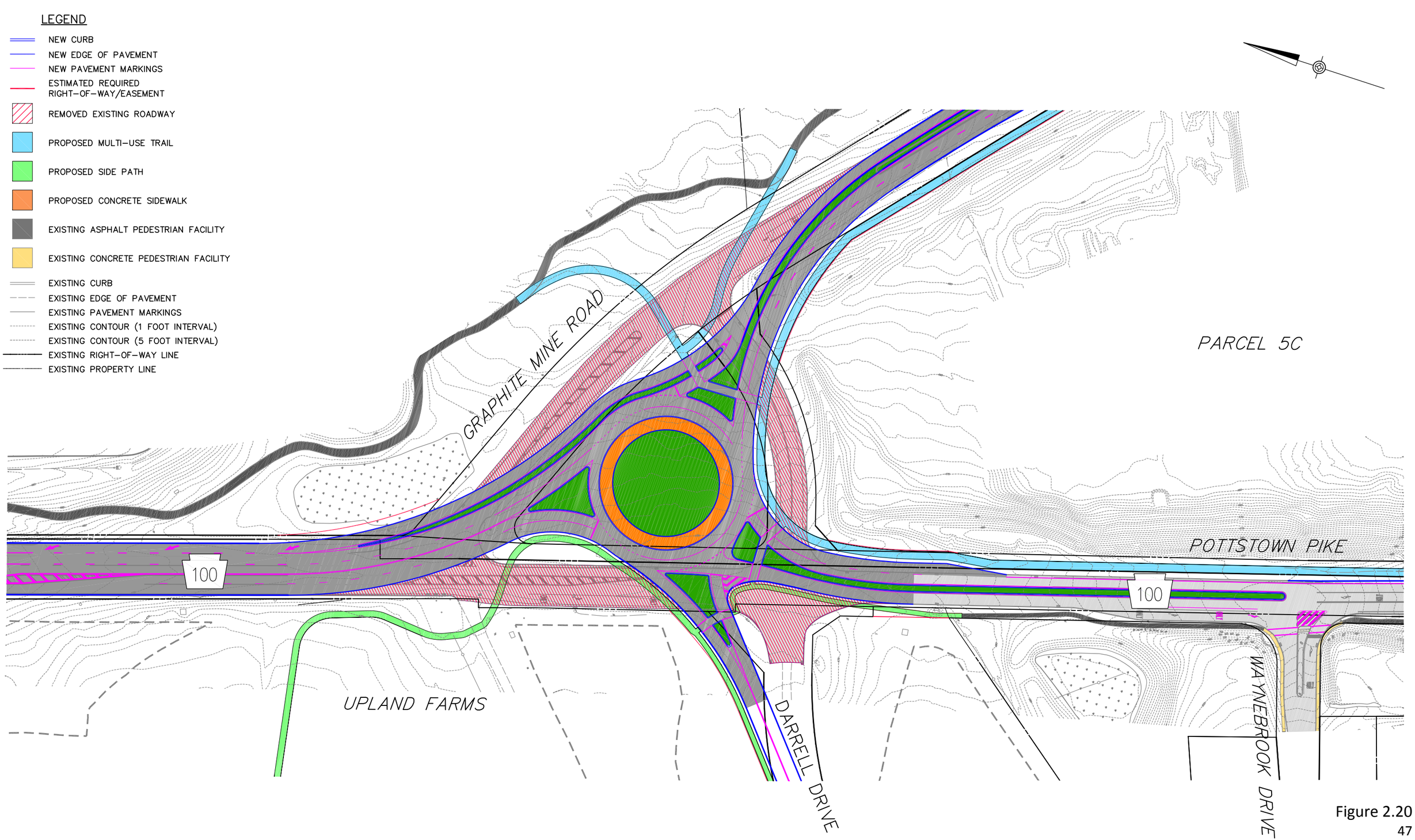


Figure 2.20

Section 2

Pottstown Pike	***Park Road/Station Boulevard to Byers Road***
Park Road	***Little Conestoga Road to Pottstown Pike***
Little Conestoga Road	***500' west of Park Road to Pottstown Pike***

Section 2 is the heart of the Village of Eagle and the improvement concept extends and enhances the existing village streetscape in this area. As shown in Figure 2.21, key elements of the improvement concept for this section include continuous sidewalk connections on Pottstown Pike, transforming Little Conestoga Road with sidewalks and limited on-street parking, access management improvements near the Eagle Tavern, and sidepath connections along Little Conestoga and Park Road.

Continuous Sidewalk Connections along Pottstown Pike

As shown in Figure 2.21, the Section 2 improvement concept includes continuous sidewalks and streetscape elements on both sides of the street along Pottstown Pike between Park Road/Station Boulevard and Byers Road. The improvement concept closes key gaps in the existing sidewalk network, including the east side of Pottstown Pike in front of the Upper Uwchlan Township Building and the west side of Pottstown Pike in front of Meade Appliance, Gordon's Sports Supply, and Eagle Tavern.

For the segment in front of the Township Building, a retaining wall will most likely be required at the back of the sidewalk due to the steep grassy slope adjacent to Pottstown Pike. The retaining wall and modifications to the slope may impact the existing trees and the Township's War Memorial. Specific impacts will be determined through further design of the sidewalk and retaining wall. The Township is currently developing plans for a small public gathering space on the former salt shed site at the southeast corner of Pottstown Pike and Park Road/ Station Boulevard. The design of the driveway reconfiguration and Station Boulevard trail connection will be incorporated and refined during the design of the public gather space on this corner.

Sidewalk and driveway reconfiguration in front of the Upper Uwchlan Township Building

Sidewalk and access management improvements proposed for Pottstown Pike fronting Meade Appliance, Gordon's Sports Supply, and Eagle Tavern

For the segment in front of Meade Appliance, Gordon's Sports Supply, and Eagle Tavern, the proposed sidewalk does not have a buffer area due to limited right-of-way and other physical constraints Additionally, the existing median on Pottstown Pike at Little Conestoga Road will be modified to maintain 11' travel lanes.

In addition to closing gaps in the sidewalk network, the concept plan includes replacing the sidewalk on the west side of Pottstown Pike between Little Conestoga Road and Byers Road. The existing sidewalk is elevated above Pottstown Pike with a short and steep slope in the buffer area. This configuration has created stormwater management and sidewalk maintenance issues. The Section 2 concept includes removing the deceleration or right-turn lane for southbound Pottstown Pike at Byers Road and reconstructing the sidewalk and buffer area at street level. Based on the traffic analysis, this right-turn lane is not warranted under existing conditions, and its removal will have a minimal effect on the delay of the southbound through traffic.

Finally, given the length of the block between Park Road/Station Boulevard and Byers Road and the concentration of businesses in this area, the improvement concept includes a mid-block pedestrian crossing on Pottstown Pike. The median refuge island is a safety enhancement and a traffic calming device that will help to slow traffic and alert motorists to the presence of pedestrians.

Right turn lane to be removed and the sidewalk to be relocated at street level along southbound Pottstown Pike at Byers Road

Sidewalk connections, on-street parking, and one-way operations proposed at the intersection of Little Conestoga Road and Pottstown Pike

Transforming Little Conestoga Road

The concept plan includes continuous sidewalks and curbing along Little Conestoga Road between Park Road and Pottstown Pike, which is an area without any pedestrian facilities today. Generally, the proposed typical section for Little Conestoga Road includes 11' travel lane, 3' shoulder, 4' buffer area, and 6' sidewalk. The addition of sidewalks will transform the context and extend the village identity along Little Conestoga Road. A typical section of Little Conestoga Road is presented in Figure 2.21.

For a short segment of Little Conestoga Road, near the intersection of Pottstown Pike, current

restrictions limit traffic to one-way southbound. The concept plan formalizes the one-way southbound operation by transforming the northbound travel lane into a sidewalk with bump-outs, or sidewalk extensions, and on-street parking. Also, given the steep slope on the west side of Little Conestoga Road in this area, a retaining wall will most likely be necessary to install the sidewalk across the AT&T property.

Reconfiguration of parking lot for the Eagle Tavern

Existing sidepath to be extended along Little Conestoga Road to Park Road

Defining Access

In conjunction with the proposed sidewalks, the concept plan includes access management improvements on Pottstown Pike and Little Conestoga Road. For example, driveways and access for the Eagle Tavern is defined with new curbing and striping. Additionally, the existing parking lot is reconfigured to provide 42 parking spaces with one-way directional aisles for circulation. Although for public use, the six on-street parking spaces along Little Conestoga Road can also serve the Eagle Tavern. The proposed parking lot reconfiguration eliminates the three existing parking spaces located in the island in front of the Tavern, and it creates an area that could be used for outdoor café seating, other public gathering space, or stormwater management facilities.

Sidepath Connections

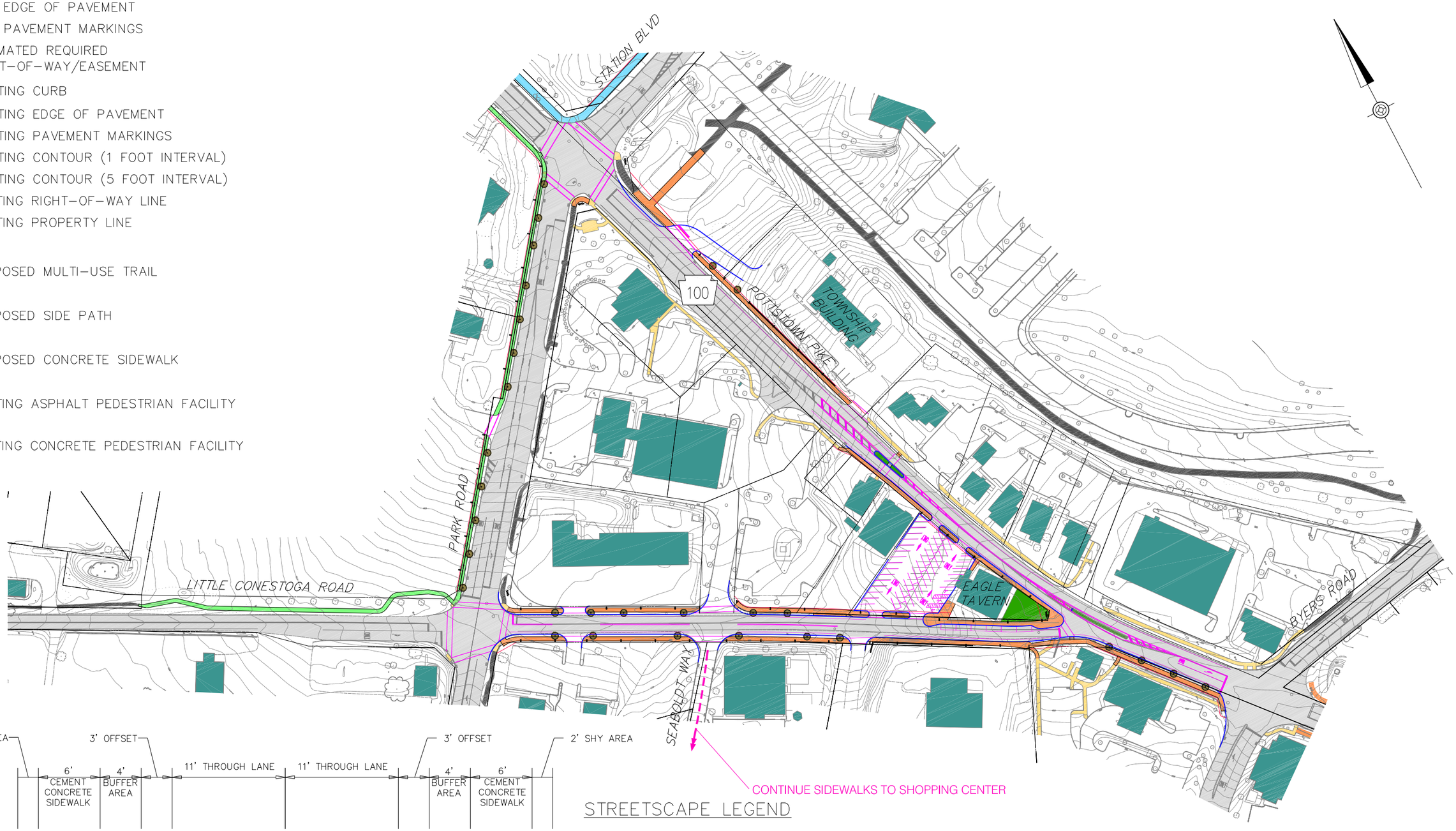
The concept plan includes new sidepath connections on Little Conestoga Road and Park Road. The sidepaths will be consistent and connect with existing sidepaths to expand the Township's trail network. Additionally, the sidepaths will support and enhance access to the Village. The two key connections in Section 2 include extending the sidepath on the east side Little Conestoga Road from the current terminus near Marsh Creek Signs to Park Road and implementing a sidepath on the north side of Park Road between Little Conestoga Road and Pottstown Pike.

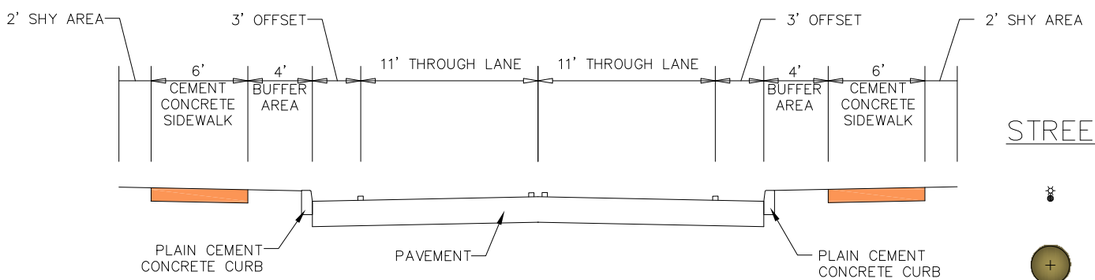
SECTION 2: POTTSTOWN PIKE FROM PARK ROAD TO BYERS ROAD

LEGEND

- NEW CURB
- NEW EDGE OF PAVEMENT
- NEW PAVEMENT MARKINGS
- ESTIMATED REQUIRED RIGHT-OF-WAY/EASEMENT
- EXISTING CURB
- EXISTING EDGE OF PAVEMENT
- EXISTING PAVEMENT MARKINGS
- EXISTING CONTOUR (1 FOOT INTERVAL)
- EXISTING CONTOUR (5 FOOT INTERVAL)
- EXISTING RIGHT-OF-WAY LINE
- EXISTING PROPERTY LINE

- PROPOSED MULTI-USE TRAIL
- PROPOSED SIDE PATH
- PROPOSED CONCRETE SIDEWALK
- EXISTING ASPHALT PEDESTRIAN FACILITY
- EXISTING CONCRETE PEDESTRIAN FACILITY





TYPICAL SECTION
LITTLE CONESTOGA ROAD
WEST OF EAGLE TAVERN TO PARK ROAD

STREETSCAPE LEGEND

- STREETLIGHT
- STREET TREE
- BICYCLE PARKING

Figure 2.21

Section 3

Pottstown Pike *Byers Road to Ticonderoga Boulevard*

Section 3 is part of the commercial core of the Village of Eagle, but has limited existing bicycle and pedestrian facilities and lacks a center turn lane. As shown in Figure 2.22, the proposed typical section for Pottstown Pike includes 11' travel lanes, a 10' median or center turn lane, 3' shoulders, 4' buffer areas, and 6' sidewalks.

Consistent Sidewalks and Center Turn Lane

Sidewalks are proposed on both sides of the roadway, except for a short segment on the east side of Pottstown Pike between the Todd House and Ticonderoga Boulevard. A sidewalk connection is not feasible in this area due to physical constraints, namely steep grade differences. As a result, the concept plan includes a mid-block pedestrian crossing with a median refuge island. This island will serve as a gateway treatment, as well as a traffic calming device. On the west side of Pottstown Pike steep slopes adjacent to the roadway will need to be regraded (or supported with a retaining wall) in order to accommodate the improvements. The center left turn lane improves access for businesses, but also creates a consistent cross section for Pottstown Pike within the Village of Eagle.

Sidewalk connection not feasible on the east side of Pottstown Pike due to the grade difference

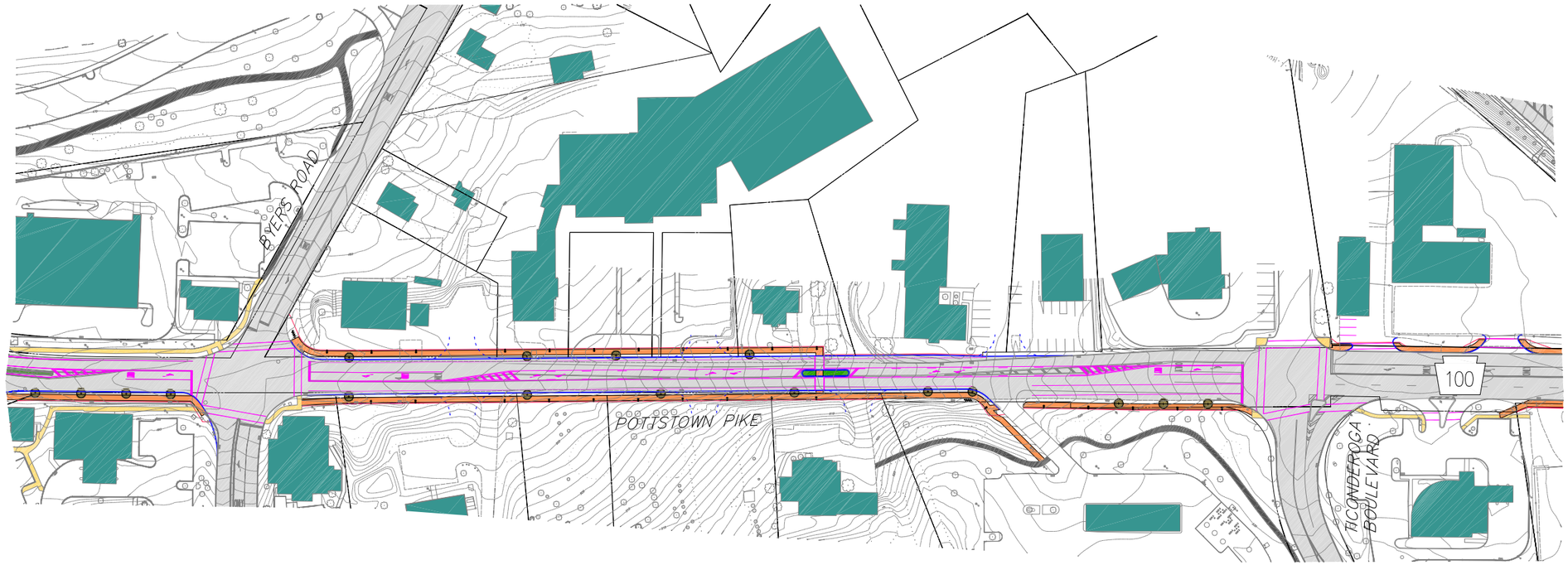
Future Access Management

The concept plan also outlines potential access management improvements by identifying future driveway locations if redevelopment were to occur. The shared or combined driveway locations are based on the Township's Access Management Ordinance and will help to reduce congestion and improve safety along the corridor.

Opportunity for shared driveways and access management improvements

Retaining wall may be needed on the west side of Pottstown Pike to install the sidewalk

SECTION 3: POTTSTOWN PIKE FROM BYERS ROAD TO TICONDEROGA BOULEVARD: TANGENT ALIGNMENT OPTION



LEGEND

- NEW CURB
- NEW EDGE OF PAVEMENT
- NEW PAVEMENT MARKINGS
- ESTIMATED REQUIRED RIGHT-OF-WAY/EASEMENT
- EXISTING CURB
- EXISTING EDGE OF PAVEMENT
- EXISTING PAVEMENT MARKINGS
- EXISTING CONTOUR (1 FOOT INTERVAL)
- EXISTING CONTOUR (5 FOOT INTERVAL)
- EXISTING RIGHT-OF-WAY LINE
- EXISTING PROPERTY LINE

- PROPOSED MULTI-USE TRAIL
- PROPOSED SIDE PATH
- PROPOSED CONCRETE SIDEWALK
- EXISTING ASPHALT PEDESTRIAN FACILITY
- EXISTING CONCRETE PEDESTRIAN FACILITY

STREETSCAPE LEGEND

- STREETLIGHT
- STREET TREE
- BICYCLE PARKING

TYPICAL SECTION

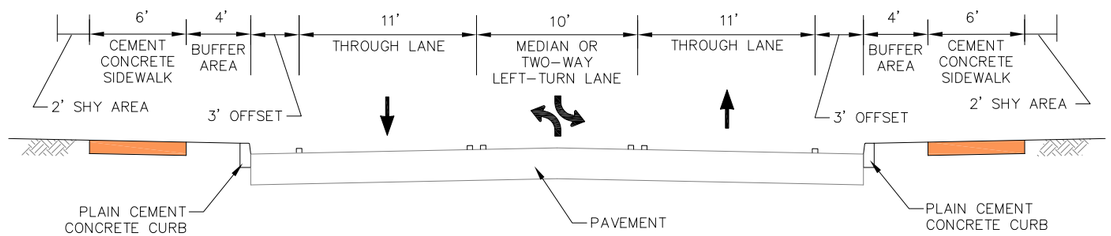


Figure 2.22

Section 4

Pottstown Pike *Ticonderoga Boulevard to Pennsylvania Drive*

Section 4 is the southern gateway to the Village of Eagle and is a transitional area between the suburban context to the south and village/town center context to the north. As shown in Figure 2.23, the improvement concept for Section 4 reflects and marks this transition with the addition of 10' wide multi-use trails for both sides of Pottstown Pike south of Graphite Mine Road. At the intersection of Pottstown Pike and Graphite Mine Road, the multi-use trails transition to 6' wide sidewalks and connects to existing pedestrian facilities at the intersection of Pottstown Pike and Ticonderoga Boulevard. New streetlights are not shown within Section 4, based on direction from the Village Concept Committee. Two key elements of the Section 4 improvement concept include regional trail connections and the replacement of the PA Turnpike Overpass.

Regional Trail Connections

The multi-use trails proposed along Pottstown Pike in Section 4 will provide an important regional trail connection, linking the Village of Eagle and the Upper Uwchlan Township trail network with Eagleview and the Uwchlan Trail. Particularly for cyclists, this connection can provide links to significant regional trails, such as the Chester Valley Trail to the south and the Schuylkill River Trail to the north.

The trail on the west side of Pottstown Pike is more feasible in the near term and provides the most direct connection between the Village of Eagle and the Uwchlan Trail on Pennsylvania Drive. As a condition of a prior land development approval, the Township has an agreement for a trail easement across the Car Sense frontage. Public right-of-way is also available for the trail fronting the Penske and Enterprise facilities. Additionally, the available right-of-way on the west side is relatively flat with few utilities or other constraints. Whereas, on the east side of Pottstown Pike, right-of-way is not available and the existing stormwater management facilities make the trail more challenging to design and construct. Therefore, the trail on the east side of Pottstown Pike is identified for implementation

Regional trail connection to the Uwchlan Trail on Pennsylvania Drive

Future multi-use trail on the west side of Pottstown Pike

through future redevelopment.

Business driveways and access points would be maintained with the implementation of the multi-use trails and sidewalks. On the west side, the trail alignment south of Graphite Mine Road is offset from Pottstown Pike to provide space for a vehicle to stop for bicyclists and pedestrians on the trail without interfering with traffic on Pottstown Pike.

Multi-use trail connection on the west side of Pottstown Pike with the future replacement of the PA Turnpike Overpass

PA Turnpike Overpass Replacement

The Pennsylvania Turnpike Commission is planning to reconstruct and widen the Turnpike through Upper Uwchlan Township. This project will require replacement of all of the Turnpike bridges and overpasses, including the PA Turnpike Bridge over Pottstown Pike. This presents an opportunity to widen Pottstown Pike and provide a multi-use trail connection under the Turnpike. Figure 2.24 shows a desirable typical section for Pottstown Pike under the Turnpike, including three travel lanes in each direction, a median, and a 10' wide barrier separated on the west side. This typical section can only be achieved when the PA Turnpike Bridge is replaced. The Turnpike expansion project is currently in preliminary engineering and the Turnpike anticipates construction beginning between 2016 and 2018.

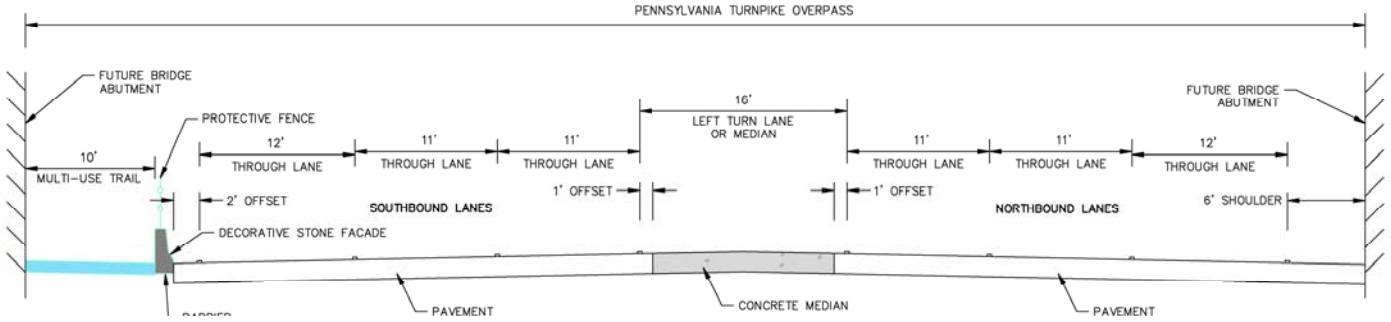


Figure 2.24: Long Term Typical Section for Pottstown Pike under the PA Turnpike Bridge

If the Turnpike's schedule is significantly delayed, the trail connection can be provided in the near term with modifications to the existing cross section of Pottstown Pike. The short term improvement option includes a 4' (minimum) to 6' wide barrier-separated sidewalk on the west side of Pottstown Pike. Implementing this improvement would require minor modifications to the travel lane widths and median on Pottstown Pike. Figure 2.25 shows a typical section of the short term improvement option without the replacement of the Turnpike Overpass.

Sample barrier separated sidewalk under an existing roadway overpass.

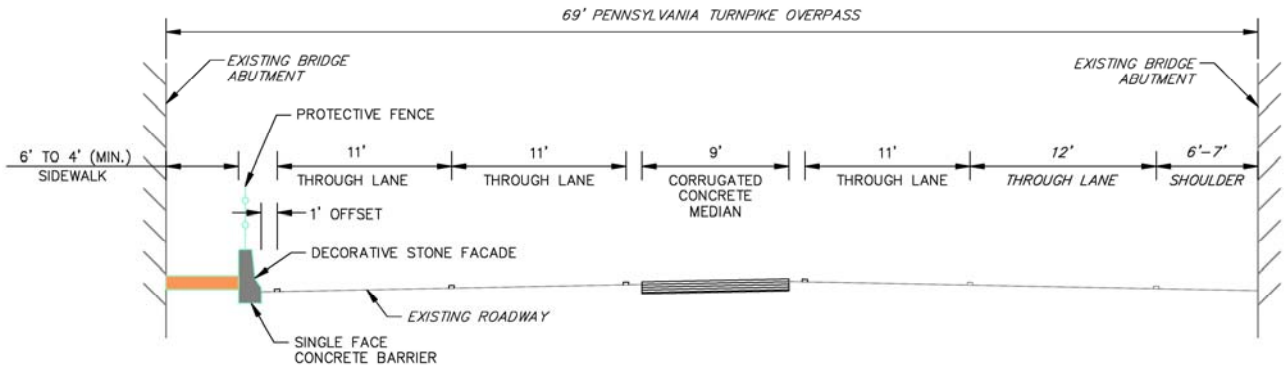
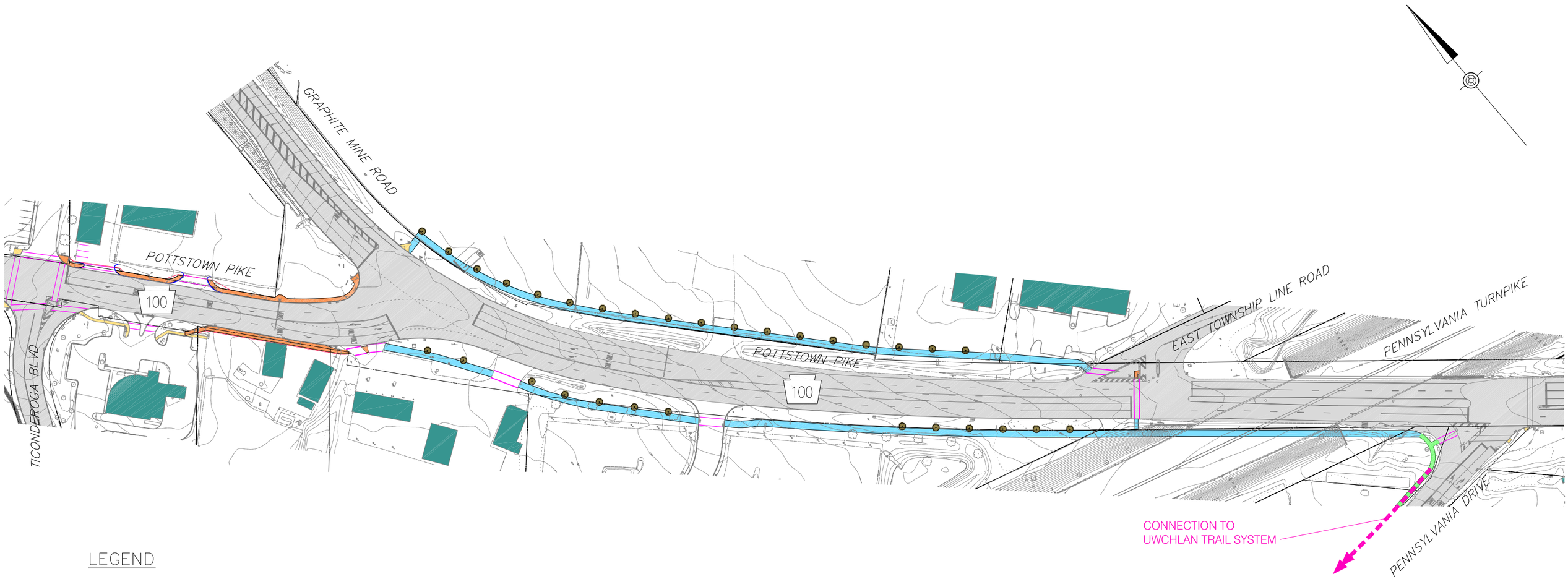


Figure 2.25: Short Term Typical Section for Pottstown Pike under the PA Turnpike Bridge

SECTION 4: POTTSTOWN PIKE FROM TICONDEROGA BOULEVARD TO PENNSYLVANIA DRIVE



LEGEND

- NEW CURB
- NEW EDGE OF PAVEMENT
- NEW PAVEMENT MARKINGS
- ESTIMATED REQUIRED RIGHT-OF-WAY/EASEMENT
- EXISTING CURB
- EXISTING EDGE OF PAVEMENT
- EXISTING PAVEMENT MARKINGS
- EXISTING CONTOUR (1 FOOT INTERVAL)
- EXISTING CONTOUR (5 FOOT INTERVAL)
- EXISTING RIGHT-OF-WAY LINE
- EXISTING PROPERTY LINE

- PROPOSED MULTI-USE TRAIL
- PROPOSED SIDE PATH
- PROPOSED CONCRETE SIDEWALK
- EXISTING ASPHALT PEDESTRIAN FACILITY
- EXISTING CONCRETE PEDESTRIAN FACILITY

STREETSCAPE LEGEND

- STREETLIGHT
- STREET TREE

Figure 2.23

Chapter 3

Implementation Plan

A. Overview of Projects

B. Engineer's Conceptual Opinion of Cost

C. Section 1 - Intersection Alternatives Implementation and Cost

D. Key Next Steps

A. Overview of Projects

The transportation improvements identified for the Village of Eagle will likely be implemented in a phased approach over time, depending on the availability of funding and other factors. The two main means of implementation are "Capital" projects and "Redevelopment" projects. For "Capital" projects, the critical next step is identifying funding for both design and construction. In locations where development or redevelopment is likely to occur, the improvements can be constructed during the land development process by the developer. Also, if an unanticipated development project should occur, than a previously classified "Capital" project should be considered a possible "Redevelopment" project. Regardless of the classification in this report, improvements should be implemented as opportunities arise and through close coordination with property owners.

For each section, the concept improvements have been grouped into projects based on existing conditions, feasibility, and the anticipated means of implementation. The projects are described and shown in Figures 3.1 – 3.4. A further explanation of the Pottstown Pike/Graphite Mine Road/Darrell Drive improvements is included in Section C this Chapter. The projects can be combined when conditions allow. Combining projects can be particularly advantageous when considering operational delays created by roadway construction projects, and could provide "economies of scale" in certain instances. When considering projects that can be implemented together, it is important to consider project continuity, funding and scheduling.

Based on ease of implementation and input from the Village Concept Committee, the following areas are high priorities for "Capital" improvement projects.

- **Sidepath connection on the west side of Pottstown Pike and median gateway treatments in Section 1 (Projects 1.1 and 1.2)**
- **Sidewalk and access management improvements on both sides of Little Conestoga Road and Pottstown Pike in Section 2 (Projects 2.1 and 2.2)**
- **Multi-use trail connection on the west side of Pottstown Pike in Section 4 (Projects 4.1 and 4.4)**

Furthermore, it is noted that within each section it is logical for certain projects to precede others.

- Project 1.3: Intersection improvements at Pottstown Pike/Graphite Mine Road/Darrell Drive should be implemented when traffic operational warrants are met.
- Project 3.3: Center-turn lane, mid-block pedestrian crossing, and other roadway improvements (including final milling, overlay, and pavement markings) should be implemented after Projects 3.1 and 3.2, which will involve roadside construction of curbs and sidewalks.
- Project 4.2: Sidewalk connections should be implemented in concert or after Project 4.3, which includes a multi-use trail connection on the east side of Pottstown Pike between Graphite Mine Road and East Township Line Road

SECTION 1: POTTSTOWN PIKE FROM GRAPHITE MINE ROAD (NORTH) TO PARK ROAD

Project	Description	Implementation
1.1	Sidepath on the west side of Pottstown Pike between Graphite Mine Road (northern intersection) and 150' south of Darrell Drive, including Upland Farm frontage Median gateway treatments at the intersection of Pottstown Pike and Graphite Mine Road (northern intersection)	Capital Project
1.2	Median gateway treatments and lane restriping on Pottstown Pike between Darrell Drive and Park Road/Station Boulevard	Capital Project
1.3	Refer to **Figure 2.13**	Capital Project
1.4	Sidepath on the west side of Pottstown Pike from current terminus of Reserve at Wyanebrook sidepath to Park Road/Station Boulevard	Capital Project (Design Underway by Township)
1.5	Shared driveway and access management improvements for Eagle Village shops	Redevelopment
1.6	Multi-use trail circling Parcel 5-C	Redevelopment

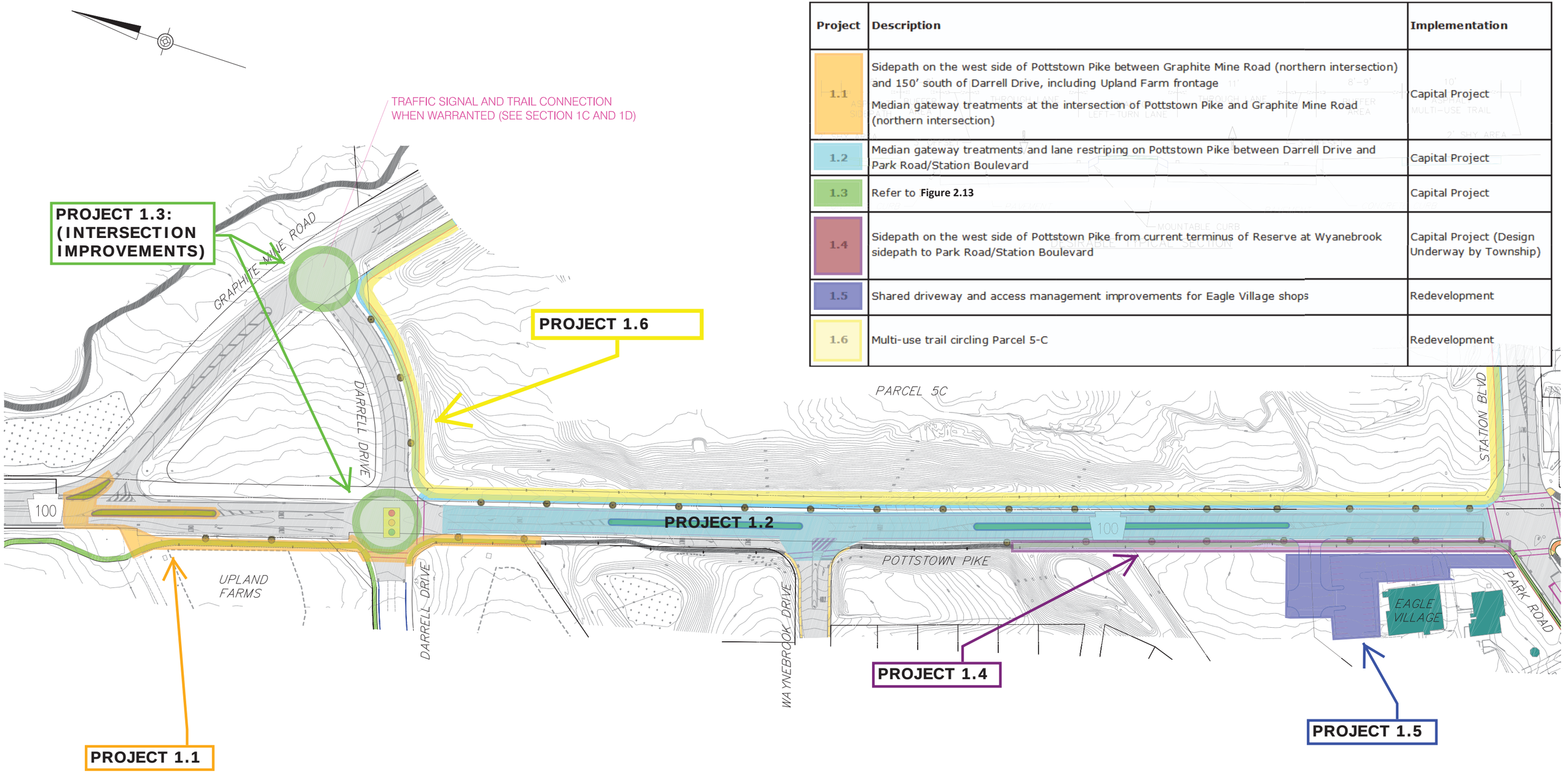


Figure 3.1

SECTION 2: POTTSTOWN PIKE FROM PARK ROAD TO BYERS ROAD

Project	Description	Implementation
2.1	Sidewalk and streetscape on the west side of Pottstown Pike 350' north of Little Conestoga Road to Little Conestoga Road Sidewalk and streetscape on both sides of Little Conestoga Road between Park Road and Pottstown	Capital Project
2.2	Sidewalk and streetscape and driveway reconfiguration on the east side of Pottstown Pike in front of Upper Uwchlan Township Building	Capital Project
2.3	Sidepath on the north side of Park Road between Little Conestoga Road and Pottstown Pike	Redevelopment
2.4	Sidepath on the east side of Little Conestoga Road between the current terminus of sidepath and Park Road	Capital Project (Design Underway by Township)
2.5	Sidewalk and streetscape on the west side of Pottstown Pike between Little Conestoga Road and Byers Road, including the removal of the southbound right-turn lane at Byers Road	Capital Project

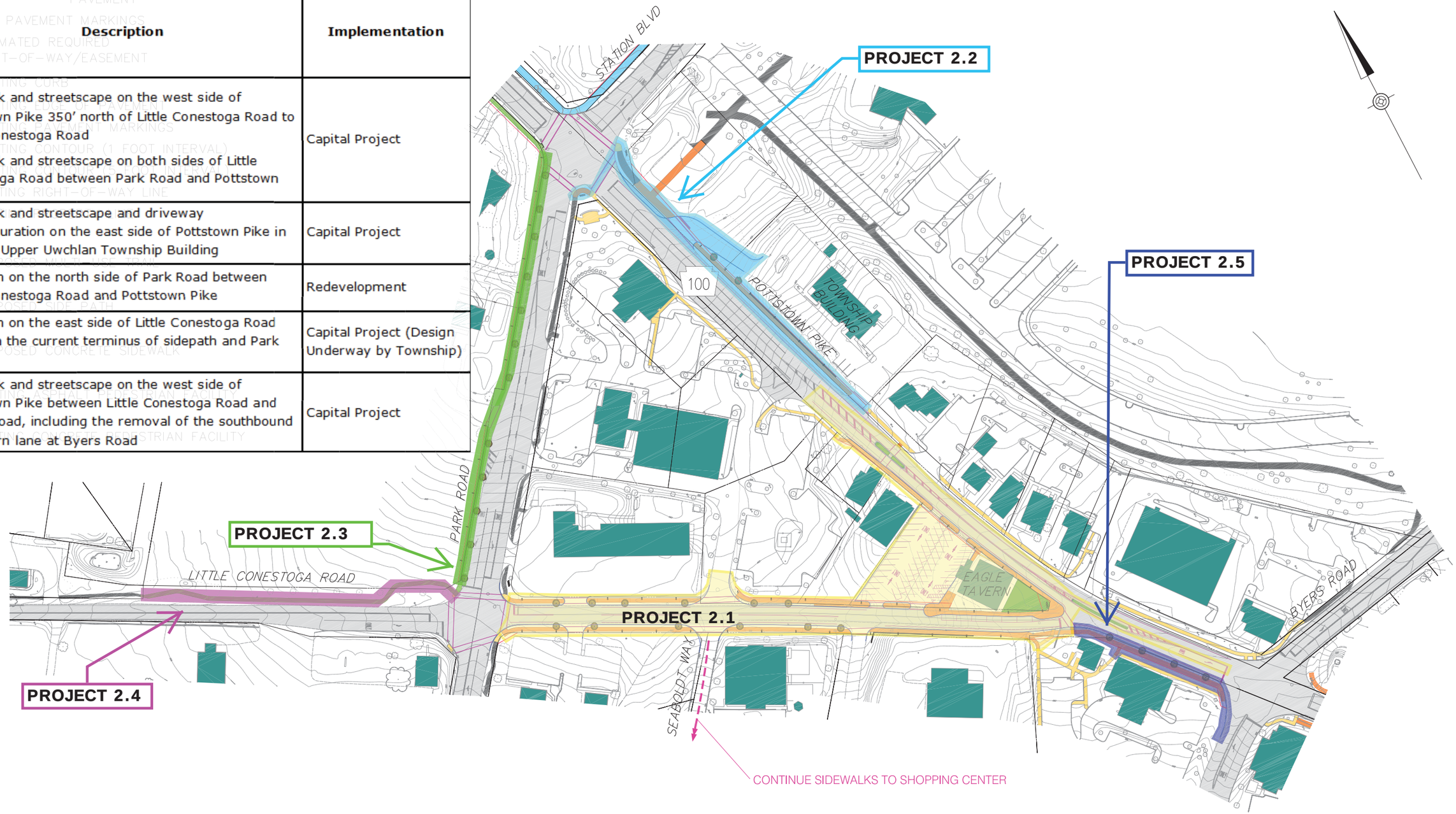
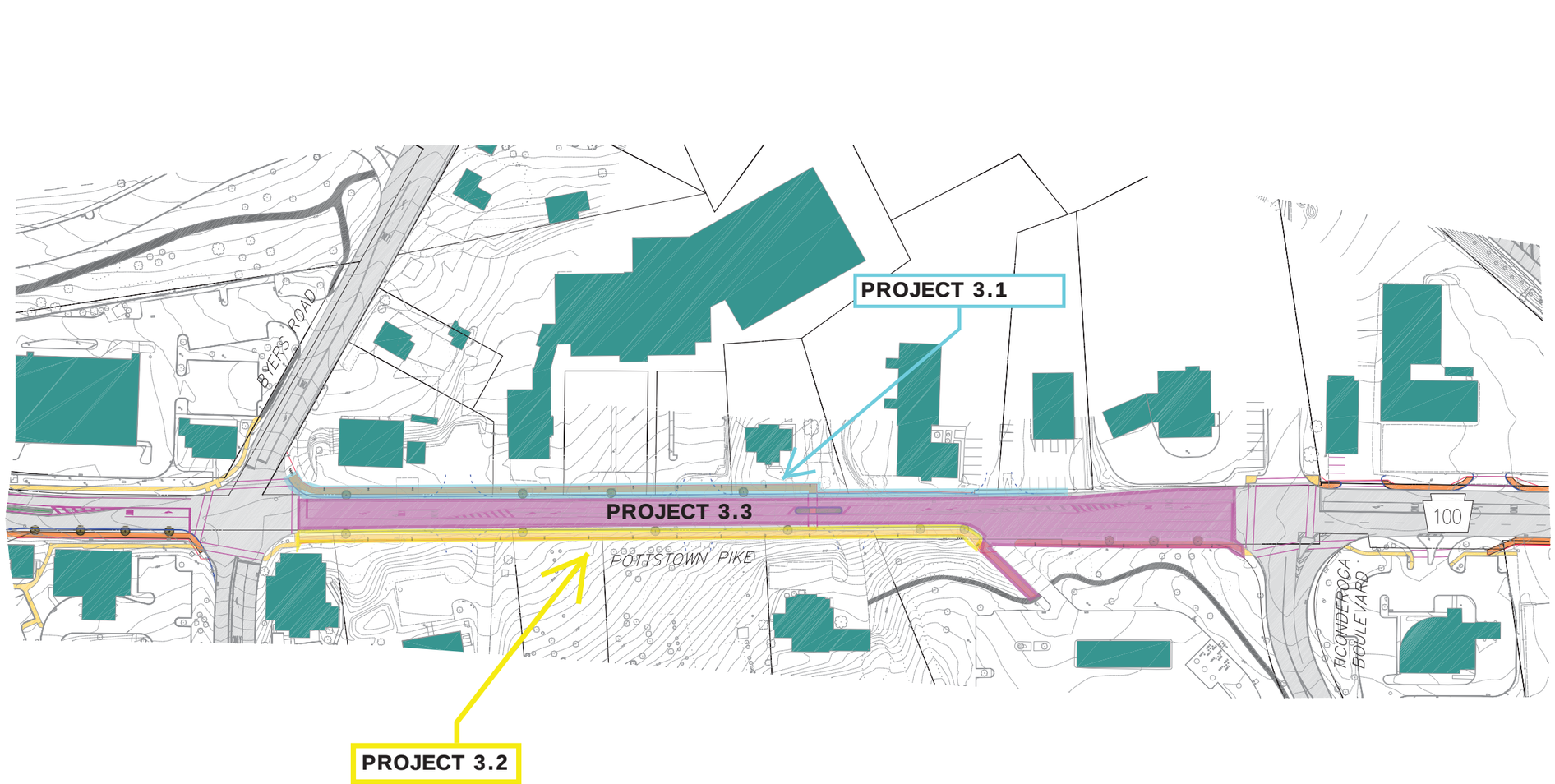


Figure 3.2

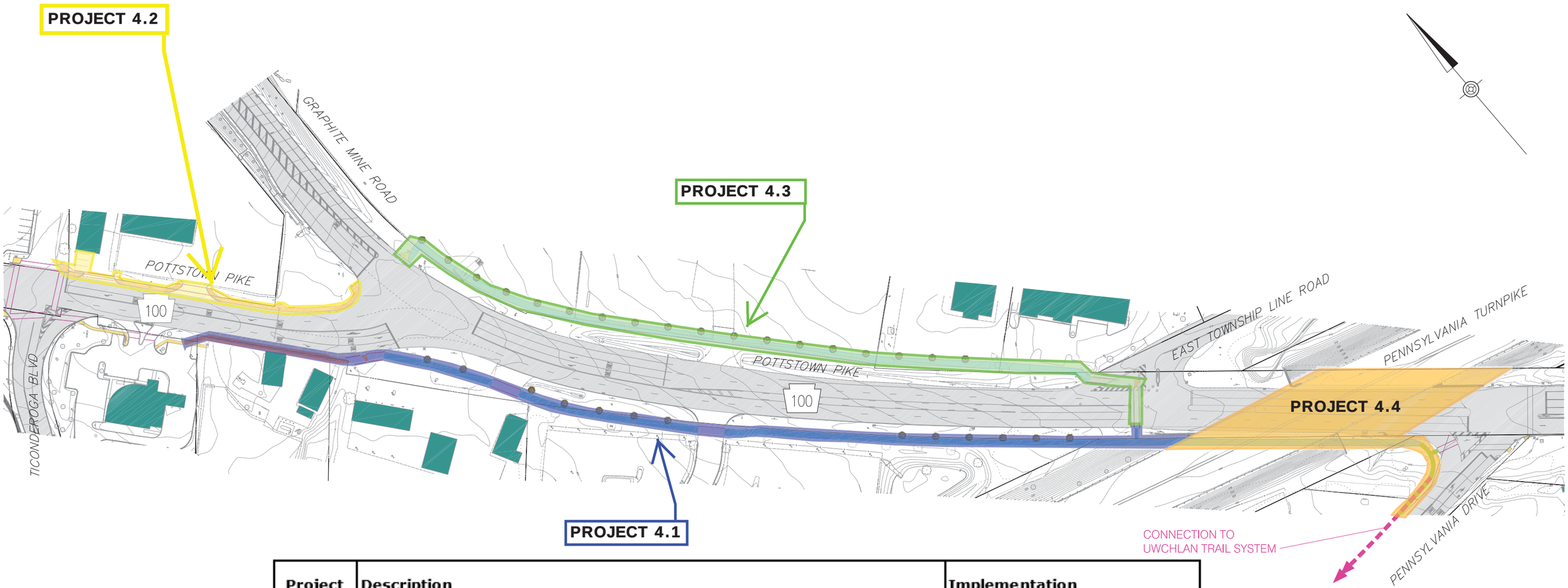
SECTION 3: POTTSTOWN PIKE FROM BYERS ROAD TO TICONDEROGA BOULEVARD



Project	Description	Implementation
3.1	Sidewalk and streetscape on the east side of Pottstown Pike between	Redevelopment
3.2	Sidewalk and streetscape on the west side of Pottstown Pike between Byers Road and Wawa driveway	Redevelopment
3.3	Center-turn lane, mid-block pedestrian crossing, and other roadway improvements between Byers Road and Ticonderoga Boulevard	Capital Project (to be coordinated after implementation of 3.1 and 3.2)

Figure 3.3

SECTION 4: POTTSTOWN PIKE FROM TICONDEROGA BOULEVARD TO PENNSYLVANIA DRIVE



Project	Description	Implementation
4.1	Multi-use trail on the west side of Pottstown Pike from the termination of the sidewalk for Citadel Bank to East Township Line Road	Capital Project
4.2	Sidewalk on the east side of Pottstown Pike between Ticonderoga Boulevard and Graphite Mine Road (southern intersection)	Capital Project
4.3	Multi-use trail on the east side of Pottstown Pike between Graphite Mine Road	Redevelopment
4.4	Multi-use trail (barrier separated) on the west side of Pottstown Pike under the PA Turnpike Overpass (from East Township Line Road to Pennsylvania Drive)	Capital Project (to be coordinated with PA Turnpike Widening and Reconstruction Project)

Figure 3.4

B. Engineer's Conceptual Opinion of Cost

An engineer's conceptual opinion of cost is provided for each of the individual projects and presented in Figure 3.5. The costs are based on the concept plan presented in Chapter 2. A detailed cost breakdown for each section is provided in Appendix C. Inclusions or exclusions specific to each project are listed in the Appendix. However, all project cost estimates include improvement item costs, cost for maintenance and protection of traffic, construction inspection, permanent right-of-way acquisition costs or aerial utility relocation costs (if anticipated to be required), a contingency percentage and an inflation percentage. Contingency, construction inspection, and inflation costs are based on the PennDOT *Estimating Manual* (Publication 352). An estimate for engineering, permitting or legal fees is not included in the cost estimates.

Projects which are identified as "Capital" include known and anticipated costs associated with the construction of the improvements. Projects which are identified as "Redevelopment" include only costs associated with the construction of that specific improvement, and do not include work that would be done by the development, regardless of the transportation improvement. For example, for Project 2.3, mobilization is not included in the roadway construction subtotal, because it is assumed that the cost to mobilize for construction would be part of the cost of the development project.

Additionally, the conceptual opinion of cost provided for each project is broken into three categories: Transportation Facilities, Streetscape Amenities, and Total Project. The Transportation Facilities includes the costs necessary to complete the construction of the transportation improvement (excavation, curbing, sidewalks, etc.) and the Streetscape Amenities includes the cost necessary to complete the construction of the streetscape improvement (street lights, street trees, etc.) only. The Total Project is simply the sum of these two items.

There are two projects within the study area which are currently scheduled for design and construction by the Township: Project 1.4 and Project 2.4. It is the intent of the Township to complete the design and construction of these two projects in the near future. The cost estimates for these projects were provided by the Township's design engineer and are preliminary budget construction costs only. Neither project includes any streetscaping elements or ADA curb ramps, and the inclusion or exclusion of contingency, inflation, construction inspection, engineering, permitting, legal fees is not indicated.

Due to the uncertain scheduling of many the projects listed in this report (except for those currently under design by the Township) an inflation factor is included for all of the cost estimates listed in the following tables. Generally, the inflation factor was compounded over 5 years for "Capital" projects and 10 years for "Redevelopment" projects, unless it was deemed logical that a "Capital" project would only be completed after a "Redevelopment" project was constructed.

Conceptual Opinion of Costs for Implementation Projects [1]

Project	Transportation Facilities	Streetscape Amenities	Total Project	Implementation
1.1	$320,400	$164,300	$484,700	Capital Project
1.2	$398,200	$290,200	$688,400	Capital Project
1.3	Refer to Chapter 3.C for Intersection Improvement Alternatives			Capital Project
1.4	$ 35,600 [2]	$0.00	$ 35,600	Capital Project (Design Underway by Township)
1.5	$240,200 [3]	$208,100	$448,300	Redevelopment
1.6	$523,600	$602,600	$1,126,200	Redevelopment
2.1	$1,724,100 [3]	$886,400	$2,610,500	Capital Project
2.2	$440,900	$163,700	$604,600	Capital Project
2.3	$75,200	$360,600	$435,800	Redevelopment
2.4	$25,500 [2]	$0.00	$25,500	Capital Project (Design Underway by Township)
2.5	$214,000	$8,500	$222,500	Capital Project
3.1	$453,100	$318,700	$771,800	Redevelopment
3.2	$601,200	$350,900	$952,100	Redevelopment
3.3	$313,800	$158,000	$471,800	Capital Project
4.1	$366,000	$27,100	$393,100	Capital Project
4.2	$203,600	$0.00	$203,600	Capital Project
4.3	$188,700	$40,100	$228,800	Redevelopment
4.4	To be determined, based on PA Turnpike Bridge Project			Capital Project

[1] *Values are rounded and a more detailed cost breakdown is presented in Appendix C.*

[2] *Township Engineer's cost estimates for budgeting purposes. Streetscape amenities and ADA curb ramps not included.*

[3] *Project requires coordination with property owners regarding the share of costs and implementation for parking and access management improvements on private property.*

Figure 3.5: Engineer's Conceptual Opinion of Cost

C. Section 1—Intersection Alternatives Implementation and Cost

As presented in Chapter 2, there are several alternatives for the intersection improvements at Pottstown Pike, Graphite Mine Road (northern intersection), and Darrell Drive. The intersection improvements are identified as Project 1.3 in the implementation plan. Figure 3.6 presents the conceptual opinion of costs for Alternatives 1A—1E.

As stated in Chapter 2, improvements to these intersections should be implemented when they are warranted by traffic operational conditions and could potentially be phased or constructed over time. If phased, specific combinations of traffic control devices and roadway improvements should be carefully studied and selected so that the operation of one improvement will not preclude the installation of another improvement desired to be constructed in a later phase. If and when it is determined that improvements to these intersections are necessary, it may be prudent to construct the "ultimate" improved condition for the intersections. Since the timing and phasing of intersection improvements is unknown, the inflation factor for all intersection improvement projects was compounded over 10 years.

All conceptual opinions of cost for the intersection improvement alternatives include the completion of Darrell Drive from Pottstown Pike to the current terminus approximately 800' east of Little Conestoga Road. Additionally, as determined necessary through the traffic analysis, alternatives 1C and 1D include the cost of an additional northbound and southbound through lane on Graphite

Project 1.3

Intersection Improvement Alternatives for Pottstown Pike, Graphite Mine Road (northern intersection), and Darrell Drive

Project	Project Description	Total Roadway
1A	Pottstown Pike/Darrell Drive Traffic Signal	$1,066,397.65
1B	Pottstown Pike/Darrell Drive Roundabout	$2,982,132.48
1C	Partial Realignment of Graphite Mine Road, Pottstown Pike/Darrell Drive Roundabout* or Traffic Signal	$8,410,781.45
1D	Realignment of Graphite Mine Road, Pottstown Pike/Darrell Drive Roundabout* or Traffic Signal	$8,745,232.38
1E	Multi-lane Roundabout for Graphite Mine Road/Darrell Drive/Pottstown Pike	$7,393,678.67

**Improvement option shown on concept plan and estimated in Engineer's Conceptual opinion of Cost*

Figure 3.6: Summary of Section 1.3 (Intersection Improvement) Project Costs

Mine Road from Darrell Drive to Station Boulevard, resulting in a 5-lane cross section. Finally, alternative 1E includes the cost of an additional southbound through lane on Graphite Mine Road from Darrell Drive to Station Boulevard.

If and when it is desired to widen Graphite Mine Road to provide additional through lanes, careful coordination with the adjacent property (Parcel 5-C) will be required in order to ensure that additional right-of-way can be provided for the roadway's post-construction stormwater management (PCSWM) facilities, as well as the trail planned to circulate Parcel 5-C. Consideration could be given to providing PCSWM sized to accommodate both the site development and the widened Graphite Mine Road. Likewise, other key stakeholders to coordinate with would be the adjacent church property (for wetland remediation), PECO (for utility pole relocation) and PennDOT, due to the intended roadway ownership change.

D. Key Next Steps

There are a number of key next steps for implementation of the transportation improvements identified in the Village Transportation Plan. For capital projects, the most critical next step is to identify funding for design and construction. Potential funding sources are highlighted below. Another critical next step is to continue coordination with key project partners, including the Pennsylvania Turnpike Commission, PennDOT, as well as property owners, business owners, and developers within the study area. These project partners are critical for the implementation of both capital and redevelopment projects.

Identify Funding Opportunities

Federal

Moving Ahead for Progress in the 21st Century Act (MAP-21) is the federal transportation bill that was signed into law in July 2012 for fiscal years (FY) 2013 and 2014. The Village Transportation Plan improvements are eligible for federal funding through several core highway funding programs highlighted below. Programming of federal transportation funds for specific projects is done at a regional level, with some projects awarded federal funds through completive grant processes. Most federal funding program require 20% of the project costs to be funded through non-federal sources, such as state and local funds.

- **National Highway Performance Program (NHPP):** The NHPP program provides funding for improvements to the National Highway System (NHS), which includes Pottstown Pike (PA Route 100) in Upper Uwchlan Township. Eligible activities include roadway reconstruction and improvements, safety improvements, and bicycle transportation and pedestrian walkway improvements along NHS corridors.
- **Congestion Mitigation and Air Quality Improvement Program (CMAQ):** The CMAQ program provides funding to reduce emissions and improve air quality to meet National Clean Air Act standards. Projects must demonstrate emissions benefits either directly or by reducing congestion. Eligible projects include traditional traffic flow improvements, including roundabouts, left-turn or other managed lanes, bicycle and pedestrian facilities that are not exclusively recreational and reduce vehicle trips. A portion of the region's CMAQ funds have historically been awarded through a competitive grant process.
- **Surface Transportation Program (STP):** The STP program provides flexible funding for improvements on federal-aid highways, bridges and tunnels on any public road, bicycle and pedestrian infrastructure, and transit capital projects. STP funds are programmed on the region's Transportation Improvement Program (TIP). A portion of the STP funds are set aside for the Transportation Alternatives program described below.
- **Transportation Alternatives Program (TAP):** The TAP program provides funding to support a variety of alternative modes of transportation, including walking and bicycling. Eligible activities include planning, design, and construction of on-road and off-road trail facilities for pedestrians, bicyclists, and other non-motorized forms of transportation, including sidewalks, bicycle infrastructure, pedestrian and bicycle signals, traffic calming techniques, lighting and other safety-related infrastructure, and transportation projects to achieve compliance with the

Americans with Disabilities Act of 1990.

State

- **Transportation Funding Bill:** Pennsylvania's Transportation Funding Bill, known as Act 89 of 2013, was signed into law in November 2013 and provides stable and long-term funding for Pennsylvania's transportation system, including highways, roads, bridges, mass transit and other modes. Overall, it will provide an additional $2.3 billion per year by Fiscal Year 2017-2018. It will provide a 60% increase in Liquid Fuels allocations to municipalities for local roads and bridges by the fifth year. Additionally, a new multi-modal fund was created to provide dedicated funding for multi-modal transportation projects which may include freight rail, passenger rail, ports/waterways, aviation, pedestrian, and bicycle facilities. The multimodal fund will provide a minimum of $2 million annually statewide for programs related to bicycle and pedestrian facilities. Grants will be awarded on a competitive basis and require a local match of at least 30% of the non-federal share of the project costs.
- **Automated Red Light Enforcement (ARLE) Grant Program:** PennDOT administers a grant program to distribute a portion of the revenue generated by Automated Red Light Enforcement (ARLE) in the state. The ARLE grant program is focused on improving safety and mobility and there is an annual application period. Eligible projects include roadway capacity upgrades, such as auxiliary turning lanes, and pedestrian safety and mobility improvements. The ARLE grant program does not require a local match, but all project funding must be identified at the time of the application.
- **Community Recreation and Conservation Program:** The Department of Conservation and Natural Resources (DCNR) provides grants for trail and greenway projects through two Community Conservation Partnerships Program (C2P2) grant programs. The C2P2—Community Recreation and Conservation Program requires a 50% match and eligible projects include land acquisition for trails and new development and rehabilitation of parks, trails and recreation facilities. The C2P2—Recreational Trails Program requires 20% match (except for land acquisition projects, which require a 50% match) and eligible projects include construction of new recreational trails and acquisition of easements/right-of-way for trails. There is an annual application period for all C2P2 grants.
- **Act 13 (Marcellus Shale Impact Fee) - Greenways, Trails and Recreation Program (GTRP):** The Commonwealth Financing Authority (CFA) administers the Greenways, Trails, and Recreation Program (GTRP) for the development, rehabilitation and improvements to public parks, recreation areas, greenways, and trails utilizing Act 13—Marcellus Shale Impact Fees. Grants are awarded annually and most projects require a 50% local match for the total project cost.

Regional

The Delaware Valley Regional Planning Commission (DVRPC) has historically sponsored several competitive grant programs for municipalities and other entities in the Greater Philadelphia region based on federal, state, and private funding programs. Two anticipated regional competitive grant programs that are applicable for the Village Transportation Plan improvements are the Transportation Alternatives Program (TAP) and the Congestion Mitigation and Air Quality

(CMAQ) program. Both programs utilize a portion of the region's share of federal funds for TAP and CMAQ projects and general eligibility for projects are described in the Federal funding section above.

DVRPC announces specific grant rounds when funding is available and coordinates project applications and selection. In previous funding rounds, grants have required local matching funds and/or local funding for all pre-construction activities. Applications are often more competitive if the sponsor can provide additional matching funds and if the design is advanced or complete.

Coordinate with PennDOT

As various projects are prioritized and funding is identified, additional coordination with PennDOT will be required regarding the design and permits for improvements within the right-of-way of state owned roadways, including Pottstown Pike, Little Conestoga Road, and Byers Road. Coordination with PennDOT is important for both capital projects and redevelopment projects, which may both require a Highway Occupancy Permit (HOP) from PennDOT. Also, the Township will continue to coordinate with PennDOT regarding the designation of Graphite Mine Road as PA Route 100.

Coordinate with the Turnpike

Additional coordination will be required with the PA Turnpike Commission regarding the design of the new Turnpike overpass of Pottstown Pike (PA Route 100), as well as other Turnpike crossings in Upper Uwchlan Township. The Township will continue to coordinate with the Turnpike Commission to ensure bridge and overpass designs support and accommodate future bicycle and pedestrian facilities. For the Pottstown Pike (PA Route 100) overpass, providing additional width for three through lanes of travel in each direction, a center turn lane, and a 10' barrier separated multi-use trail will reduce congestion and improve safety.

Coordinate with Property Owners, Business Owners, and Developers

Property owners, business owners, and developers are key partners for implementation, particularly because one of the project goals is to support economic development within the Village. For capital projects, it will be important to coordinate with property and business owners on design details, temporary construction easements, and construction schedules. Additionally, for redevelopment projects, it will be important to coordinate with developers regarding the integration of transportation improvements and land development plans.

Further Studies and Analysis

Further studies and traffic analysis may be necessary to advance the design of improvements, monitor the effect after improvements are constructed, and address other transportation issues in the Village. Additional traffic analysis for the roundabout concepts at the northern gateway will be required to evaluate queuing and other traffic operations. Once improvements are constructed, particularly along Pottstown Pike, a follow-up speed study should be conducted to evaluate whether the speed limit postings should to be adjusted. Finally, parking supply and demand in the Village were not evaluated as part of this project. A parking inventory and analysis could guide the development of policies, as well as capital improvements, to address parking needs in the Village of

Eagle. In addition to supporting the business needs within the Village of Eagle, parking facilities could also be used to support carpooling and/or transit (if it bus service is extended to Upper Uwchlan Township.) A parking study could also consider future vehicular needs, such as electric vehicle charging stations, as well as parking for a variety of types of motorized vehicles.

Additional Conceptual Engineering

Based on preliminary traffic analysis and stakeholder input, there is a need to widen segments of Pottstown Pike and Graphite Mine Road to accommodate future traffic growth. Additional conceptual engineering is required to further evaluate the feasibility of these improvements, select design features, identify right-of-way needs, consider stormwater management, and develop accurate cost estimates.

Widening Pottstown Pike between Eagleview Boulevard and Graphite Mine Road (southern intersection) to three through lanes in each direction, plus turn-lanes/medians, will relieve current bottlenecks and congestion in this area. As noted previously, the design of the new Turnpike overpass may accommodate three through lanes in each direction; however, further evaluation and detailed design is necessary to with respect to the wider cross-section along Pottstown Pike. This design should be closely coordinated with PennDOT.

Widening of Graphite Mine Road as well as Pottstown Pike north of Graphite Mine Road and through Fellowship Road to two lanes in each direction, plus a center turn-lane/median will support future traffic volumes, particularly regional pass-through utilizing the PA Route 100 corridor. This widening should be closely coordinated with improvements to the northern gateway intersections of Graphite Mine Road/Pottstown Pike/Darrell Drive.