

Chester Valley Trail

Extension to Downingtown

Feasibility Study/Master Plan



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Feasibility Study / Master Plan



Prepared by the
Chester County Planning Commission

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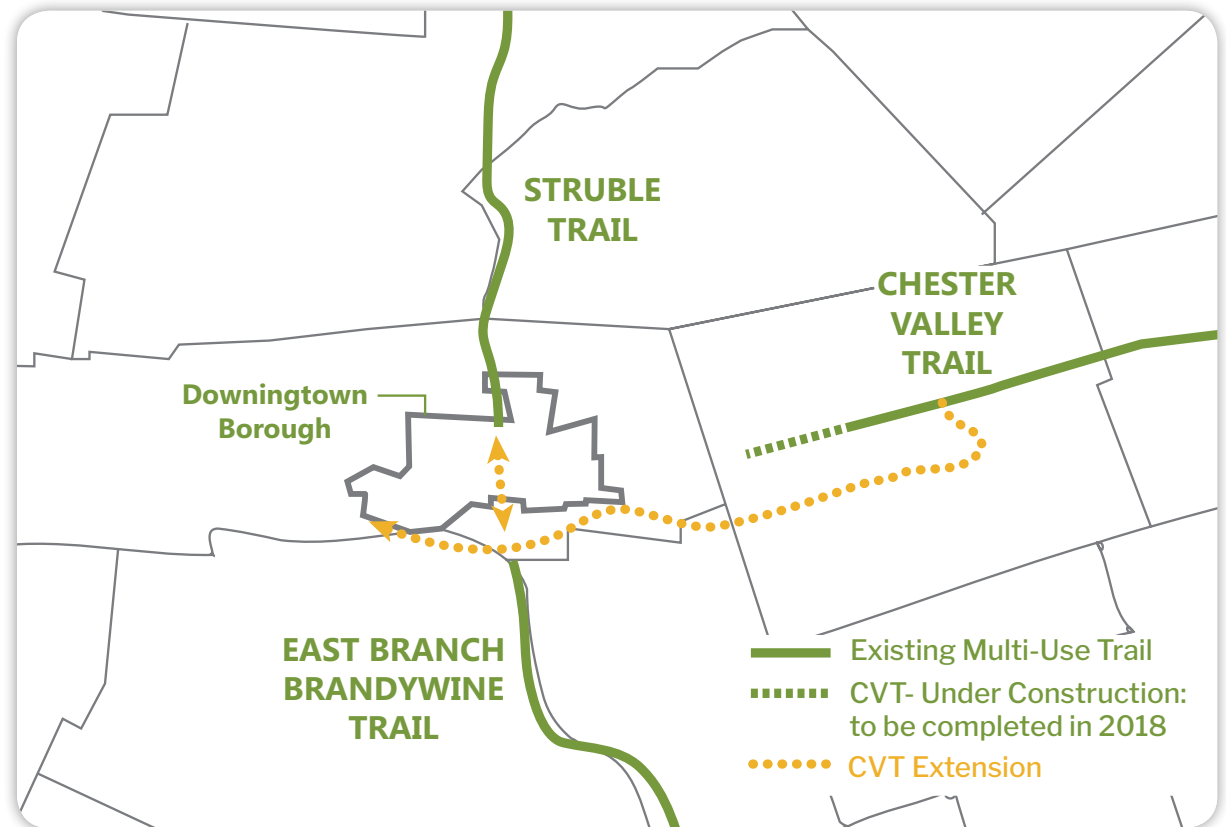
Introduction and Context

Purpose and Goal

The purpose of this Plan is to determine the feasibility of extending the existing 13.5-mile Chester Valley Trail (CVT) from its current terminus in Exton into the Borough of Downingtown.

The goal of the study is to determine a recommended alignment for extension of the CVT that would include connections to the existing Struble and East Branch Brandywine Trails. Accomplishing these connections will provide Chester County residents more access to and further the development of the Circuit, Greater Philadelphia's regional trail network.

Once the recommended alignment and connections are determined through the Feasibility Study, the Master Plan provides an estimate of probable development costs; identifies maintenance and management responsibilities; suggests potential funding sources; and, recommends an implementation strategy.



Study Area Description and Context

The project study area encompasses approximately 10 square miles in central Chester County. It is bounded by Ship Road to the east, PA 340 to the west, Business 30 and the US 30 Bypass to the north, and the Norfolk Southern Corporation's Philadelphia & Thorndale (P&T) Branch rail corridor to the south. Please refer to the Study Area Base Map included in this chapter.

The municipalities

The study area includes all or portions of six (6) municipalities within central Chester County, including:

- Caln Township
- Downingtown Borough
- East Bradford Township
- East Caln Township
- West Bradford Township
- West Whiteland Township

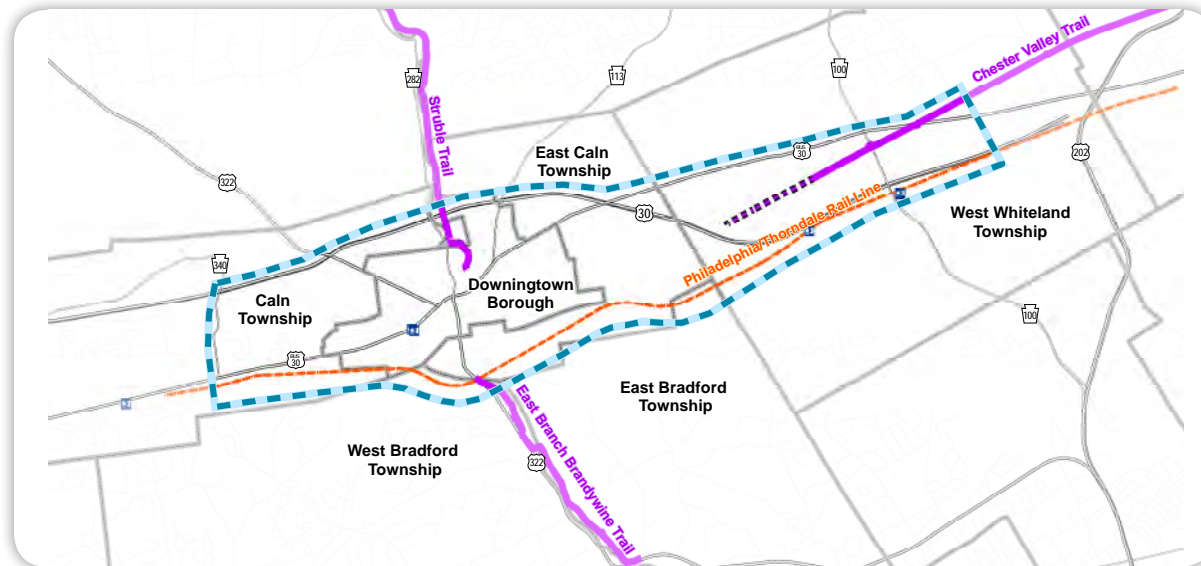
The existing trails

The Chester Valley Trail (CVT) is a regional trail maintained and operated by the Chester County Department of Facilities and Parks. It crosses the Lincoln Highway (US Business 30) in the northeast portion of the study area and

extends to a point approximately $\frac{1}{4}$ mile to the west of PA Route 100 along Commerce Drive. There are plans to extend the CVT from this point another 1 mile +/- westward along the former Chester Valley Railroad corridor to the Oaklands Corporate Center, including a bridge crossing at Whitford Road. This will complete the development of the county-owned right-of-way for the CVT, thus necessitating this study for how the trail may continue westward into Downingtown.

The Struble Trail is owned and maintained by Chester County and is one of the first multi-use trails developed in not only Chester County but also the Philadelphia region. The southern trailhead is located just to the north of Pennsylvania Avenue in the Borough of Downingtown, and extends 2.6 miles northward to Dorlan's Mill Road in Upper Uwchlan Township. The county maintains this trail between Norwood Road and Dorlan Mill Road. The Borough of Downingtown maintains and operates the portion of the trail between Norwood Road and Pennsylvania Avenue.

The East Branch Brandywine Trail is a municipally owned trail by both East Bradford and West Bradford Townships. This multi-use trail parallels the East Branch of the Brandywine Creek and is approximately 2.5 miles in length. The northern trailhead is located just below the Downingtown Trestle, and there is a small southern trailhead at the end of where the trail intersects with US 322. Future plans are to expand the parking lot at the southern trailhead and extend the trail southward along the Brandywine to connect with the Natural Lands' Stroud Preserve.



Public Participation Summary

This study included four elements of public outreach:

- Project Steering Committee
- Public Meetings (3)
- Citizen Survey
- [Project Website](http://chescoplanning.org/transportation/cvte.cfm)

Project Steering Committee

The Project Steering Committee included representatives from the six study area municipalities, and several key community organizations, businesses, county agencies and local interest groups, including:

- Friends of the Chester Valley Trail
- PennDOT District 6-0
- Chester County Department of Facilities and Parks
- Chester County Department of Community Development
- Chester County Health Department
- Chester County Chamber of Business and Industry
- Victory Brewing Company
- Transportation Management Association of Chester County

- PA Department of Conservation and Natural Resources
- Norfolk Southern Corporation
- Bike Chester County
- The Circuit – Greater Philadelphia's regional trail network
- Delaware Valley Regional Planning Commission

Over the course of the study, eight (8) project steering committee meetings were held in order to garner feedback towards various alternatives, suggestions and recommendations towards both the feasibility study and master plan segments of this document.

Public Meetings

Three public meetings were held at the West Whiteland Municipal Building. The first public meeting was held on the evening of October 8, 2015 when nearly 30 participants attended the open house and project overview event. The second public meeting was held on the evening of March 30, 2016 with an open house, presentation of the trail alignment alternatives analysis and DRAFT recommended alignment followed by a question and answer period. A third public meeting was held May 31, 2017 where the DRAFT Feasibility Study/Master Plan recommendations towards implementation and operation were presented, including a short video. All meetings were very well attended with strong support for the trail extension.



Public meeting held at West Whiteland Township on March 30, 2016.

Citizen Survey

In an effort to reach as diverse a group of Chester County citizens as possible, a Trail User Citizen Survey was created and posted online from October 26, 2015 to April 30, 2016. An online surveying tool was used to facilitate and tabulate the survey as well as solicit comments from the public. The survey was available via a link from the project website.

Summary of results

The survey consisted of 9 multiple choice questions and two write-in response questions. Overall, the survey generated 1,136 responses.

96% are in favor of extending the CVT from its current endpoint westward into Downingtown

92% of respondents were Chester County residents

77% of respondents indicated that they use the current CVT alignment at least once a month

69% replied that they would use the new CVT segment more than they currently use the existing CVT

49% Almost half of the respondents lived within one of the study area municipalities

Trail to a destination

Respondents were asked to identify one destination in the project study area (between Exton and Downingtown) to which the CVT should connect.

71% indicated that a connection to a trail or park was a preferred destination

46% of the written responses specifically identified the Struble Trail as a destination

Smaller percentages identified Kerr Park, the East Branch Brandywine / Harmony Hill trail systems and Marsh Creek State Park as destinations. Respondents also answered positively to linking the trail to public transit, downtown centers, businesses such as Victory Brewing and/or the Brandywine Square shopping center, and to civic locations like schools and libraries. Overwhelmingly, the responses indicated the CVT extension as an enhancement to existing recreational assets and business within the study area.

“I would use the trail much more, if I could get to it from Downingtown! How exciting!”

Additional feedback

Respondents were asked to give additional suggestions and / or comments for the extension of the CVT into Downingtown. Of the 1,136 total responses, 446 respondents added additional feedback. Sixty percent were words of encouragement and thanks. One respondent indicated “I would use the trail much more, if I could get to it from Downingtown! How exciting!” while others noted that they would have a safer and more efficient means of commuting via the trail from their homes in the Downingtown area to place of work in the Malvern area. Respondents also offered some valuable suggestions that they felt would enhance the overall trail experience such as restrooms, ample trailhead parking and historic interpretive signs along the trail. Several respondents considered safety and suggested that the trail should avoid vehicular traffic and road crossings as much as possible.

Relevant Planning Documents Summary

Central Chester County Bicycle and Pedestrian Circulation Plan



This plan establishes the Chester Valley Trail extension as a priority project. The proposed alignment recommended within this plan as published in 2013 served as one of the initial alignment alternatives evaluated as part of the feasibility study herein. The alignment extended from the end of the CVT Phase IVa section to be developed in 2017 to connect with Clover Mill / Boot / Quarry Roads before connecting with an abandoned Norfolk Southern owned rail corridor to connect into the heart of Downingtown Borough. The Philadelphia & Thorndale (P&T) Branch was not considered to be an option when the Central Chester County plan was being developed.

Landscapes 2, Chester County Comprehensive Policy Plan



The proposed alignment of the CVT supports several Landscapes 2 initiatives:

- Protect–Enhance the safety of the transportation system for all users—motorized and non-motorized. T1.1
- Connect–Provide efficient multi-modal connections between urban and suburban centers and corridors of regional significance. T1.2
- Provide a safe network of bicycle and pedestrian links within and between residential, employment, commercial, educational, public and recreational land uses. T2.1

Linking Landscapes



The Chester Valley Trail is seen as a key initiative within the County's Linking Landscapes, the county's preceding comprehensive policy document addressing trail development. The Chester Valley corridor is identified in Linking Landscapes as one of the county's key Regional Recreation Corridors and once complete will connect to 11 other key recreational corridors. The proposed extension will directly link to

the Brandywine-Hibernia Corridor, the County Seat Corridor and the Uwchlan Corridor. The following is additional commentary regarding the Chester Valley Trail corridor provided by Linking Landscapes:

“This Corridor also has the potential to become a corridor of statewide importance because it could serve as a link between to an east-west trail proposed by Lancaster County and an extensive network of trails planned for Montgomery County which link to Philadelphia and Bucks Counties.”

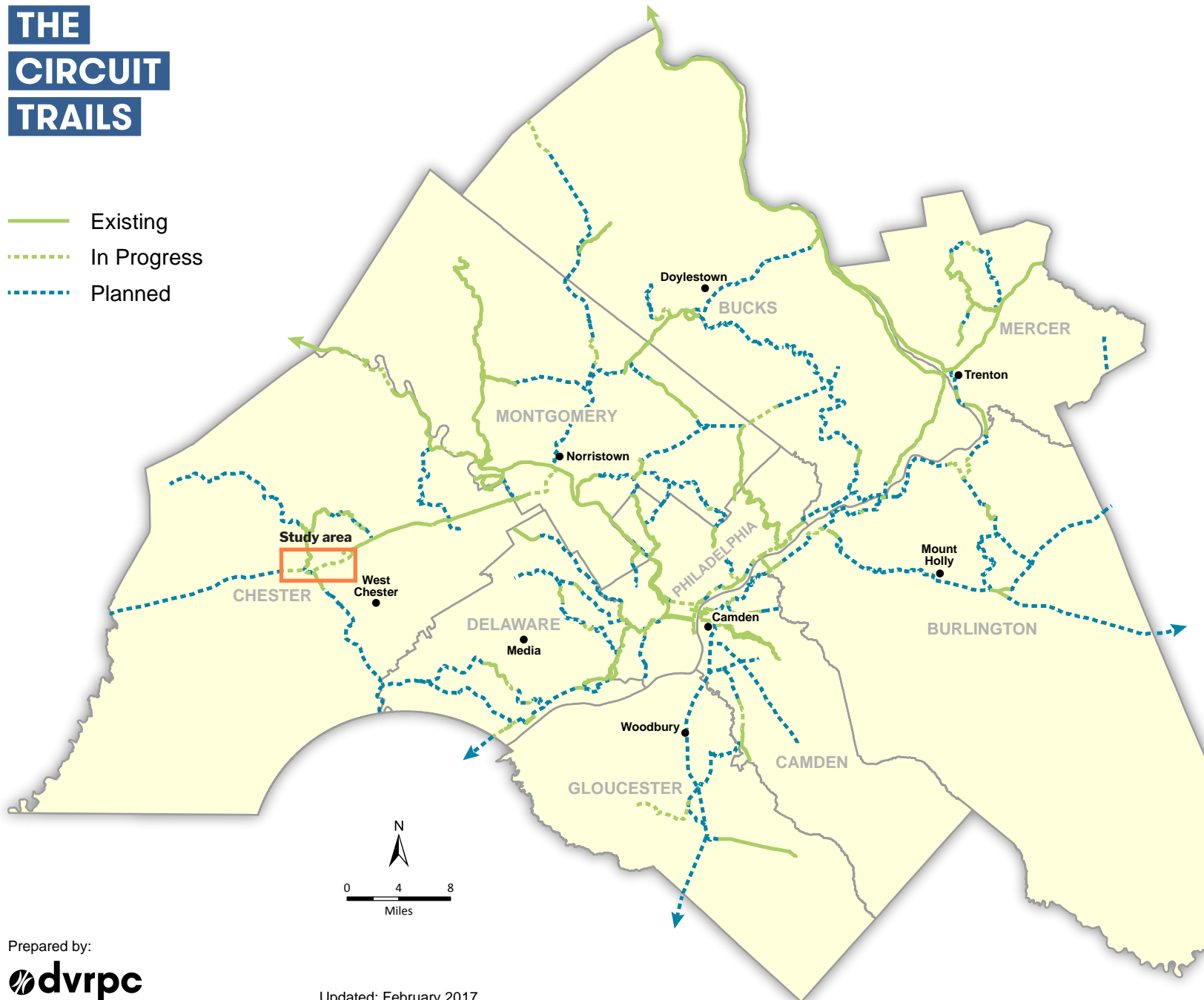
The Circuit

The Circuit is Greater Philadelphia's Regional Trail Network. The vision for The Circuit is to connect 750 miles of off-road multi-use trails through urban, suburban and rural communities in the region.

Chester County's Planning Commission and Facilities and Parks Department are actively working to complete three multi-use trails in The Circuit: the Schuylkill River Trail; the Chester Valley Trail; and the Struble Trail.

THE CIRCUIT TRAILS

- Existing
- - - In Progress
- - - Planned



Prepared by:



Updated: February 2017

Municipal Comprehensive Plans

Downingtown Borough

Goal

Create more pedestrian and bicycle connections among parks, trails, schools and privately-owned properties used for recreation.

Recommendation

The recommended alignment will pass Victory Brewing Company and allow bicyclists and pedestrians to access not only the business district but also allow for connection to the Struble Trail through Kardon Park.

East Caln Township

Goal

Acquire, enhance, and manage an integrated network of protected open spaces that are linked together by greenways or trail corridors.

Recommendation

Connecting the CVT to the Struble Trail will support this policy and significantly expand the open space and trail network available to East Caln residents.

West Bradford Township

Goal

1) Maintain the existing quality of life for which the Township is known; 2) Uphold the stewardship of our environment; and, 3) Ensure a sustainable community into the future.

Recommendation

Complete the network of “core” trails during the next 20 years. The East Branch Brandywine Trail is considered a “Core” trail within the comprehensive plan transportation chapter.

Caln Township

Goal

Support the existing and planned non-motorized trail systems within Caln Township as a method of providing alternative transportation opportunities for pedestrians, bicyclist and horseback riders.

Recommendation

Encourage linkages to public areas and regional trails (existing and planned) along stream valley, scenic vistas, the Coatesville Area School District and other desirable areas.

West Whiteland Township

Goal

A public open space trail along the old Chester Valley Railroad right-of-way.

Recommendation

Form a continuous path system, wherever possible, between areas of differing land use, such as between residential and commercial land uses.

East Bradford Township

Goal

Accessing the greater regional trail and transit hubs.

Recommendations

- Consider promoting access to SEPTA Regional Rail and Chester Valley Trail.
- Support the Brandywine Trail Extension north to Downingtown Train Station (A1).
- Support Chester Valley Trail extension west to Route 322 near Downingtown.

Demand and Potential Use

Demographics Summary

The study area includes six municipalities in central Chester County. The municipalities are Caln Township, Downingtown Borough, East Bradford Township, East Caln Township, West Bradford Township and West Whiteland Township.

Table 1 provides a population breakdown for these six municipalities relative to the county as a whole:



Cyclists on the existing Chester Valley Trail.

Table 1: Population Breakdown, 2013

Geography	Population	% of County Total
Caln Township	13,946	2.77%
Downingtown Borough	7,923	1.57%
East Bradford Township	9,984	1.98%
East Caln Township	4,817	0.96%
West Bradford Township	12,344	2.45%
West Whiteland Township	18,351	3.65%
Study Area Municipalities Total	67,365	13.39%
Chester County Total	503,075	

Data Source: American Community Survey 2013 5-Year Estimates

The total population in the six municipalities is just over 67,000 people which accounts for 13.39% of the total county population. Population forecasts for Chester County anticipate that the county will experience a significant influx of residents with the population swelling by over 28% between 2013 and 2040. A lot of that growth is expected to occur in the study area which incorporates several urban and suburban growth centers. Table 2 illustrates anticipated population change between 2013 and 2040 for the six study area municipalities relative to the county as a whole.

While forecasts anticipate that the whole county will grow by 28.7% between 2013 and 2040, the six study area municipalities are expected to grow by an estimated 29.9% during the same time period. It is worth mentioning that these 2040 population forecasts conducted by the Delaware Valley Regional Planning Commission (DVRPC) found that the DVRPC 9-county Greater Philadelphia Region is only anticipated to grow by an estimated 11.3% between 2010 and 2040. Chester County, and these six municipalities in particular, are projected to see significant population growth over the course of the next 25-30 years.

There is a certain degree of variation in terms of population density throughout the six study area municipalities. Overall, the density in the study area exceeds the average population density for Chester County. This reinforces the concept that these municipalities are anticipated growth areas. Table 3 shows the population density breakdown.

Table 2: Anticipated Population Change, 2013-2040

Geography	Population 2013	Projected Population 2040	Absolute Change (2013-2040)	Percent Change (2013-2040)
Caln Township	13,946	18,692	4,746	34.0%
Downingtown Borough	7,923	10,814	2,891	36.5%
East Bradford Township	9,984	13,479	3,495	35.0%
East Caln Township	4,817	5,865	1,048	21.8%
West Bradford Township	12,344	16,155	3,811	30.9%
West Whiteland Township	18,351	22,490	4,139	22.6%
Study Area Municipalities Total	67,365	87,495	20,130	29.9%
Chester County Total	503,075	647,330	144,255	28.7%

Data Source: American Community Survey 2013 5-Year Estimates; DVRPC Population Projections, 2012

Table 3: Population Density Breakdown, 2013

Geography	Population	Area (Square Mi)	Population Density (People Per Sq Mi)
Caln Township	13,946	8.91	1,564.51
Downingtown Borough	7,923	2.22	3,562.50
East Bradford Township	9,984	15.15	658.73
East Caln Township	4,817	3.68	1,308.75
West Bradford Township	12,344	18.63	662.29
West Whiteland Township	18,351	12.92	1,419.89
Study Area Municipalities Total	67,365	61.53	1,094.69
Chester County Total	503,075	759	662.81

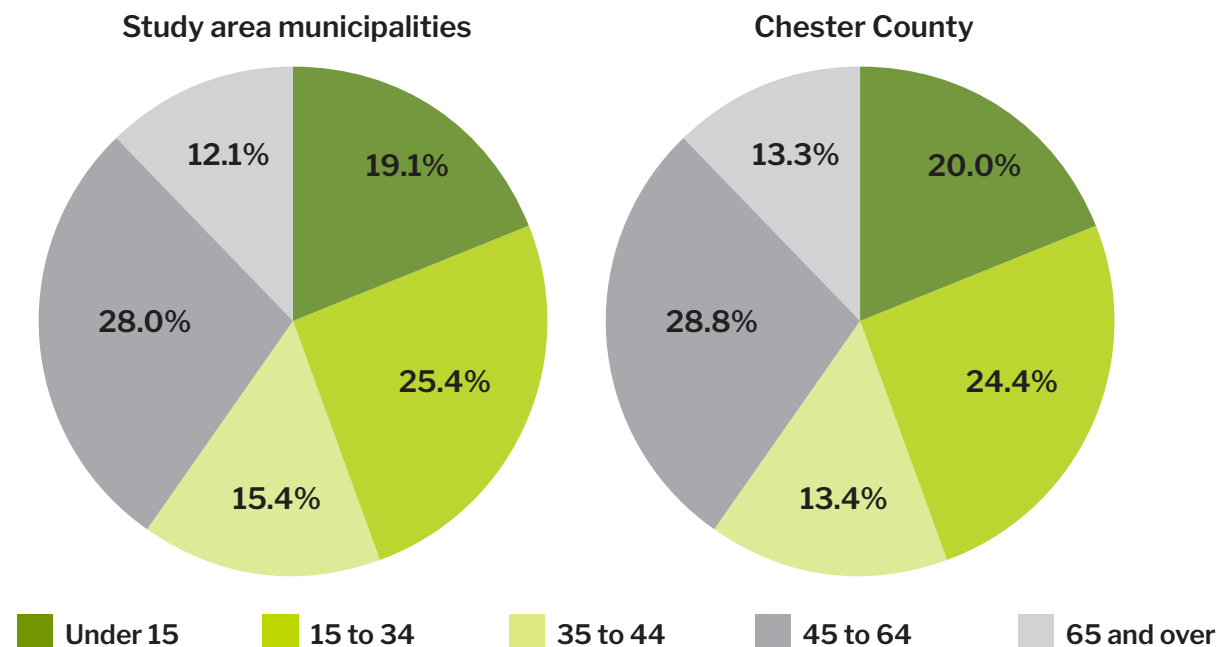
Data Source: American Community Survey 2013 5-Year Estimates; Chester County GIS

Figure 1 illustrates the representation of different age groups in the study area municipalities compared to Chester County.

In both the study area municipalities and Chester County, the two largest age groups are the population between ages 15 and 34 (commonly referred to as Millennials) and the population between ages 45 and 64 (or the Baby Boomers). The study area municipalities have a slightly higher concentration of millennials relative to Chester County. This in large part is due to the high concentration of millennials in Downingtown Borough, where this group accounts for almost 34% of the total population. The concentration of current retirees, 65+ is slightly lower in the study area municipalities compared to other parts of Chester County.

In summary, what this demographic information tells us is that the study area is not only more densely populated, but it also includes a higher percentage of millennials and is expected to grow faster than other areas of Chester County. The CVT extension into Downingtown will therefore serve a significant population of Chester County residents both now and into the future.

Figure 1: Age Group Representation, 2013



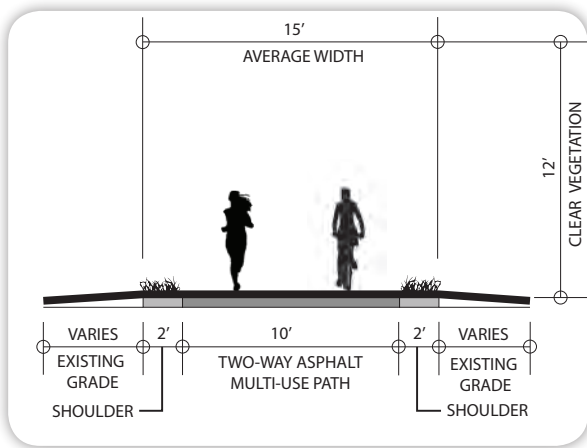
Data Source: American Community Survey 2013 5-Year Estimates.

Proposed Trail Use

The purpose of this study is to determine the feasibility of extending the county's Chester Valley Trail beyond its current terminus in West Whiteland Township to the Borough of Downingtown, and connect with the existing Struble and East Branch Brandywine Trails. The study covers a distance of approximately 3.5 miles.

The existing Chester Valley Trail is a multi-use trail consisting of asphalt paved surface 12 feet wide from the trailhead in Montgomery County to its current terminus along Commerce Drive in West Whiteland, a distance of 14.5 miles (13.5 miles in Chester County). This study looks to extend that standard and potentially expand the trail width to accommodate heavier use.

The following cross section illustrates the proposed 'Multi-Use Trail' standard that will be applied and tested versus the legal and physical feasibility of providing this standard within the proposed alignment alternatives described in



Multi-Use Design Standard. Source AASHTO.

the 'Trail Alignment Alternatives Evaluation' section of the Feasibility Study chapter.

The 'Multi-Use Trail' cross section illustrates the recommended width of 10 feet trail surface with adjacent minimum 2 foot wide improved shoulders along the outside edges. The trail may be reduced in width to an absolute minimum of 8 feet wide, but only in locations where space is limited. The trail may also consider expanding to 12 feet wide or even wider in heavy use areas where the available right-of-way allows. Trail surfacing is recommended to be a continuation of the existing Chester Valley Trail as macadam. Existing vegetation should be cleared to the width of the improved area and a minimum height of 12 feet.

For more information relative to the design and placement of Multi-Use Trails, please refer to the [Shared Use Trails design element](#) within the 'Multimodal Circulation Handbook for Chester County'.

Estimated Trail Usage

The Chester County Facilities and Parks Department installed permanent trail counters in four locations on the existing Chester Valley Trail in August 2014. In 2015 the counters indicated that there have been approximately 350,000 estimated users on the Chester Valley Trail. In 2016, that estimated number rose to 375,000 annual users. With the exception of the Schuylkill River Trail's Schuylkill Banks section in Center City Philadelphia, the Chester Valley Trail is the most heavily used trail in the Circuit, Philadelphia's Regional Trail Network.

2015

350,000

Chester Valley Trail users

2016

375,000

Chester Valley Trail users

**when
section is
complete**

500,000 estimated

Chester Valley Trail users

The projected population growth of central Chester County is to be amongst the highest in the region. The results of a Citizen Survey conducted as part of this study indicated that this trail section may be more frequently used than the existing Chester Valley Trail. The geographic proximity of the Chester Valley Trail to the existing Keystone Corridor rail stations provides the opportunity for additional users from outside the area (including Philadelphia) to use this trail extension in particular. Additionally, the anticipated extension of the CVT in Montgomery County to connect with the Schuylkill River Trail will likely increase the CVT's usage. These factors, when combined, suggest that up to 500,000 annual users can be predicted once this section is completed.

In summary, the projected number of users for the extended trail is significant. While the vast majority of trail users of the trail would be from the local communities, extension of the trail and its improved access along the Keystone Corridor would make it even more attractive for bicyclists and pedestrians alike, thus expanding its regional draw.



Feasibility Study

Physical Inventory and Assessment

The following maps and narrative descriptions evaluate natural and man-made features that may impact the feasibility of a multi-use trail within the study area. Specific locations where the features directly impact specific alignment alternatives are noted within the Trail Alignments Alternatives Evaluation found later in this report.



Aerial view of the Downingtown area.

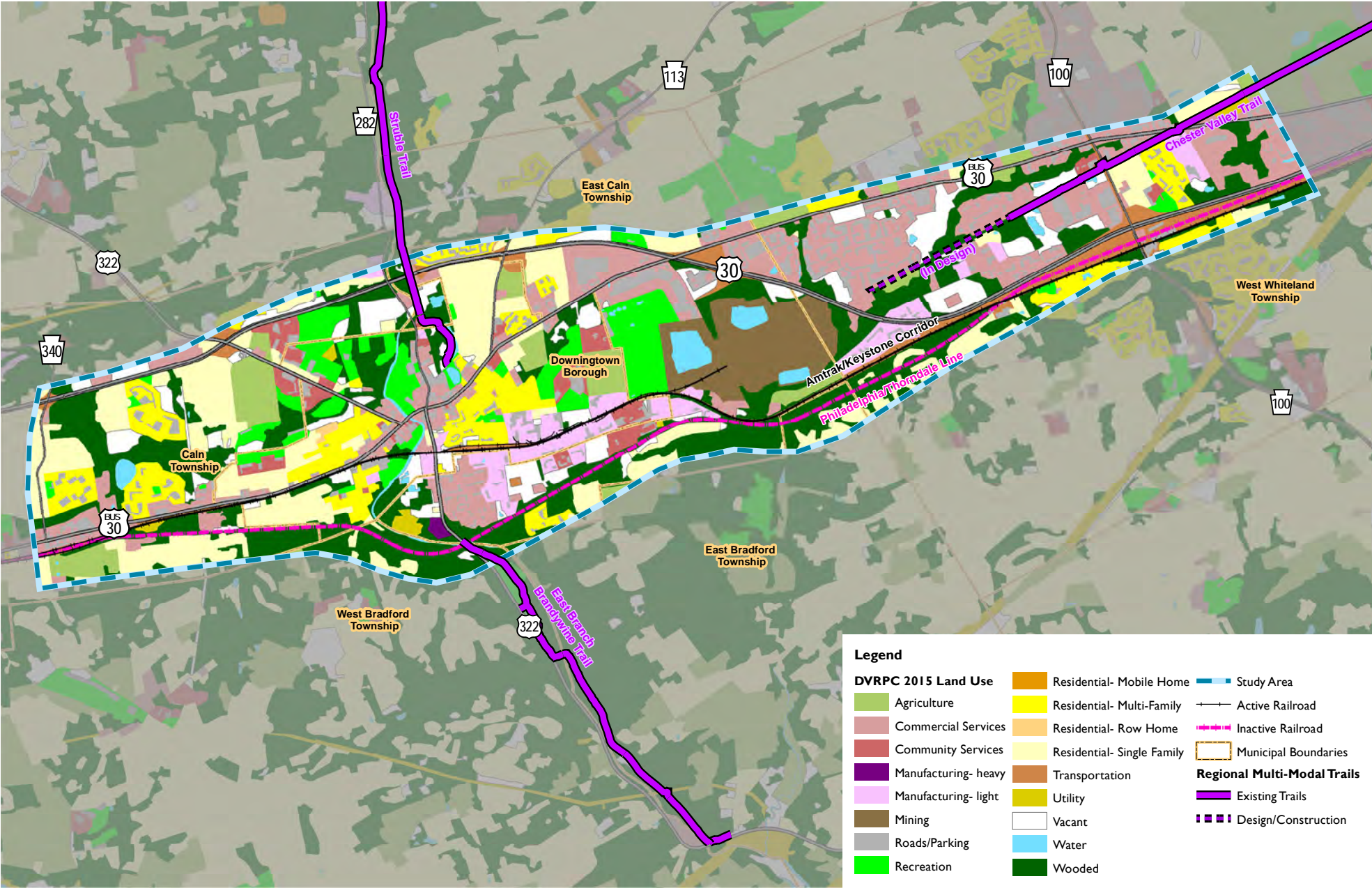
Existing Land Use

According to 2015 land use data from the Delaware Valley Regional Planning Commission (DVRPC), the study area is mostly developed. There is a high concentration of commercial uses in West Whiteland Township with the presence of the Exton Square Mall, Main Street at Exton and the Oaklands Corporate Center. Mining occupies a large footprint in the center of East Caln Township due to the Lehigh Hanson – Downingtown Quarry. Adjacent to the quarry is the Downingtown Country Club, which accounts for the large recreational use just outside Downingtown. Typical of boroughs, there is a wide diversity of land uses within the Borough of Downingtown. In addition to the residential and commercial uses, Downingtown also hosts some stretches of light manufacturing along its southeastern edge. There is also an abundance of parks, recreational uses and wooded areas within the borough boundaries. Caln Township is largely a mix of residential and wooded areas with some strips of commercial use along the Business Route 30 corridor. The southern boundary of the study area between West Bradford and East Bradford mainly consists of woodlands with some pockets of residential development.



Entrance to the Brandywine Square shopping center from Lancaster Highway.

Existing Land Use



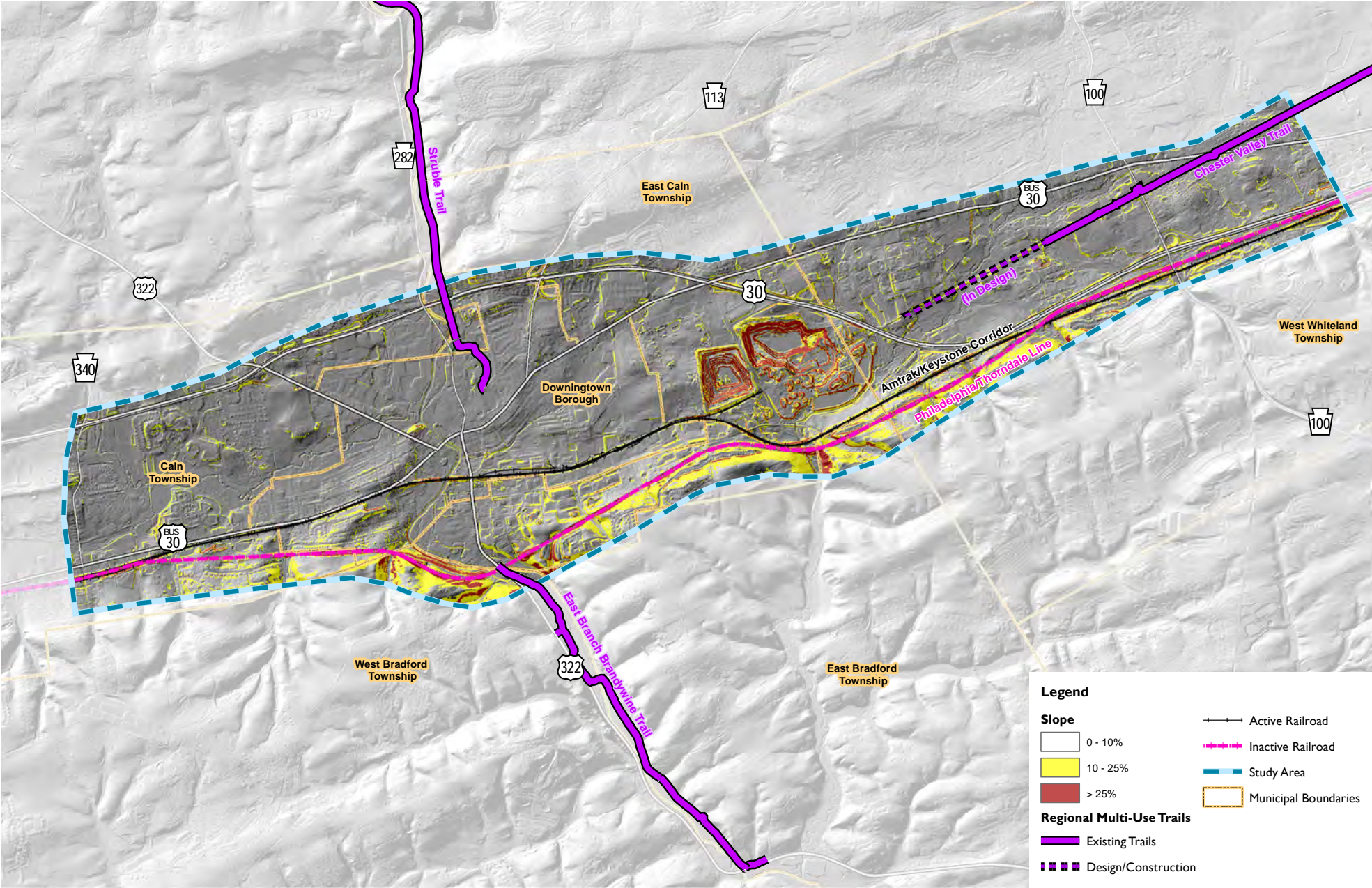
Topographic Features

The majority of the study area lies within the flat, low lying Chester Valley that runs through the center of Chester County. As a result, the majority of the study area reflects slopes less than 10%. The steepest slope areas lie along the southern edge of the study area which begins the ascent out of the valley. The slopes are mostly in the moderate range (10% to 25%), however there are some areas where slopes exceed 25%. These steep slope areas lie along the rail corridors and the creek valleys of the East Branch Brandywine Creek and Valley Creek and provide a visual 'border' to the corridor.



Steep cut slopes along the P&T corridor west of the Downingtown Trestle.

Topographic Features



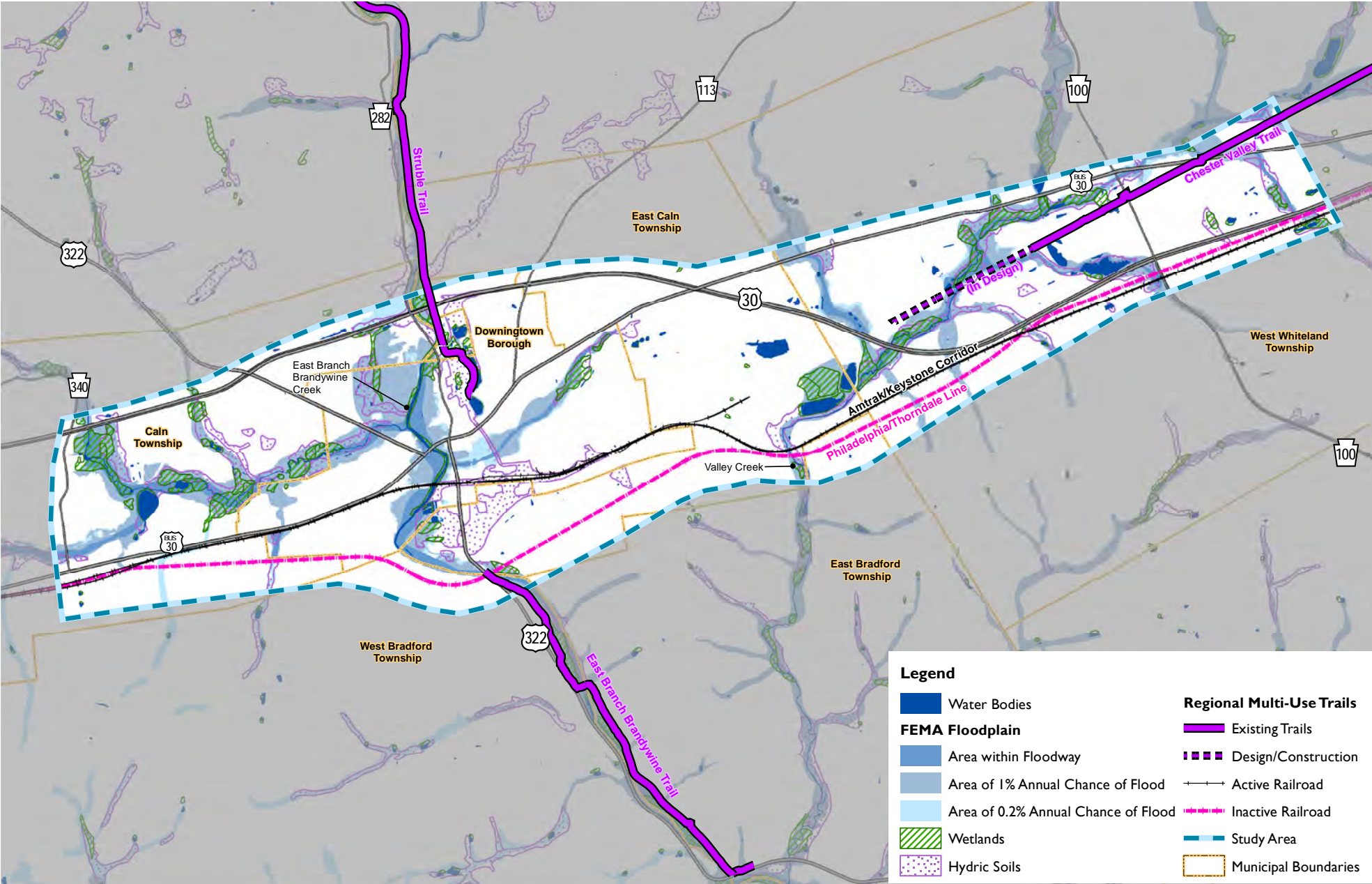
Hydrologic Features

Two main water bodies run through the study area. The East Branch of the Brandywine Creek runs south through Downingtown Borough and forms the boundary between East and West Bradford townships. Valley Creek runs southwest from West Whiteland Township into East Bradford Township eventually connecting to the East Branch Brandywine. Both creeks also have some smaller tributaries feeding into them within the study area. There are also large stretches of wetlands and hydric soils that run adjacent to the creek beds. Floodway areas and areas with a 1% annual chance of flooding are mostly found in West Whiteland Township, Downingtown Borough and Caln Township. Wetlands and hydric soil locations mostly coincide with floodplain areas. There is a relatively large area of hydric soil located in East Caln Township right beyond the southern boundary with Downingtown Borough.



East Branch of the Brandywine Creek nearest the Keystone Corridor bridge crossing.

Hydrologic Features



Natural Heritage Features

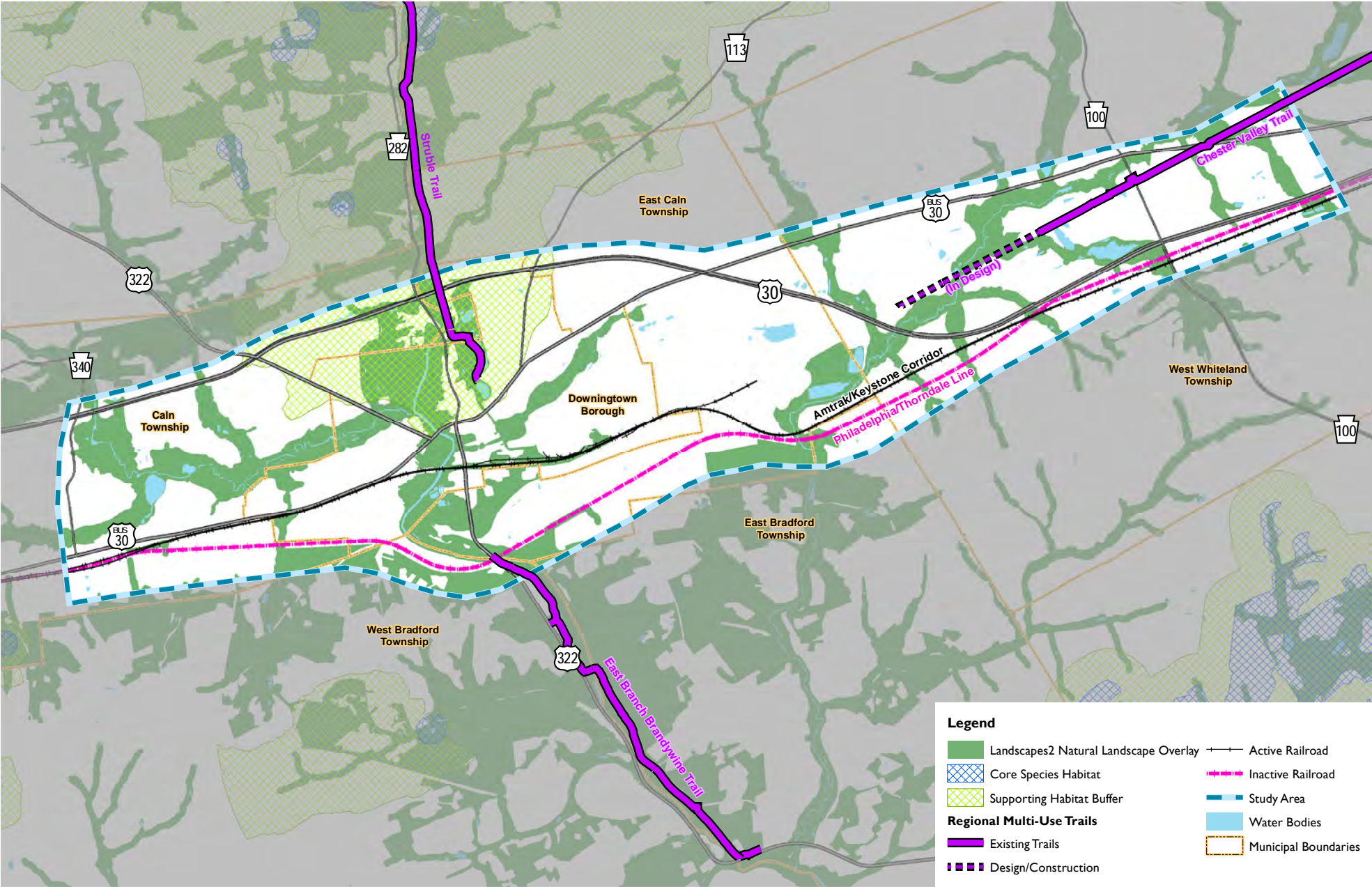
Natural landscapes (woodlands, undeveloped land) are woven throughout the study area and can be found concentrated primarily around the East Branch Brandywine Creek, Valley Creek and their tributaries. Natural heritage areas that are included in the Chester County Natural Heritage Inventory (CNHI) are displayed on this map. Natural heritage areas consist of sensitive ecological habitats and the locations of animal and plant species of concern (endangered, threatened, or rare). The study area does not include any natural heritage core habitats, which are defined as areas that cannot absorb significant levels of activity without substantial negative impacts to elements of concern. However, there is a section of the study area in Downingtown and Caln Township that has been identified as a natural heritage supporting landscape. A supporting landscape is considered an area directly connected to



Aerial view of the Valley Creek looking south from the P&T corridor.

core habitat that maintains vital ecological processes and/or secondary habitat. These areas are able to withstand some lower level of activity without substantial negative impacts to species of concern. The supporting landscape in Downingtown and Caln Township is associated with core habitat areas found around Marsh Creek State Park, which is located approximately 2 miles north of the study area's northern boundary.

Natural Heritage Features



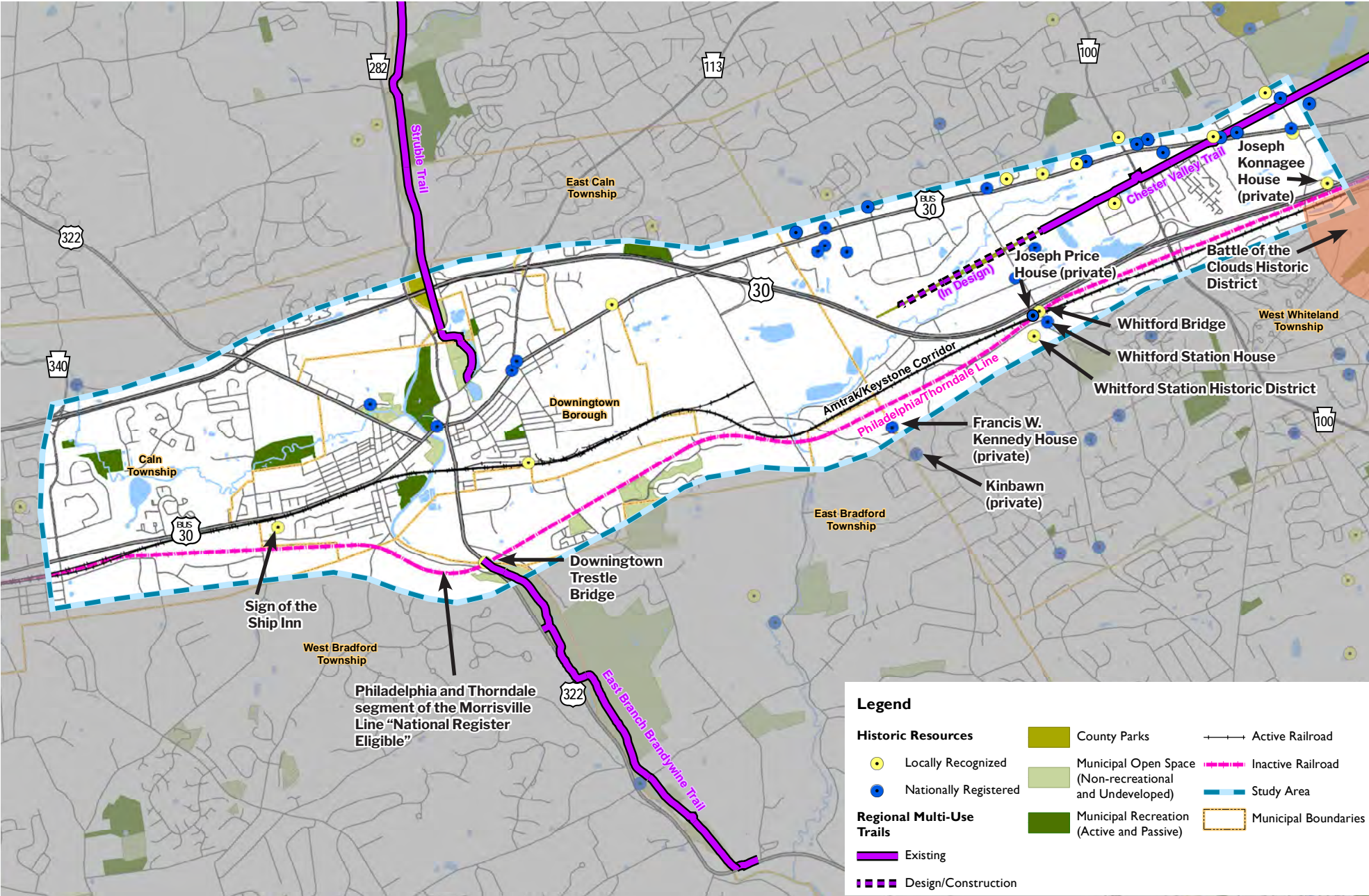
Cultural Features

There are 37 local and nationally recognized historic resources within the study area boundaries. 23 locations are listed on the National Register of Historic Places while the remaining 14 are locally recognized historic sites that may be eligible for the national registry. Many of the nationally registered sites are located along Business Route 30 in West Whiteland Township and into Downingtown. One of the widely recognized local historic resources is the Downingtown Trestle Bridge that carries the now abandoned Philadelphia/Thorndale rail line across the East Branch Brandywine Creek.



Looking west from beneath the Downingtown Trestle.

Cultural Features



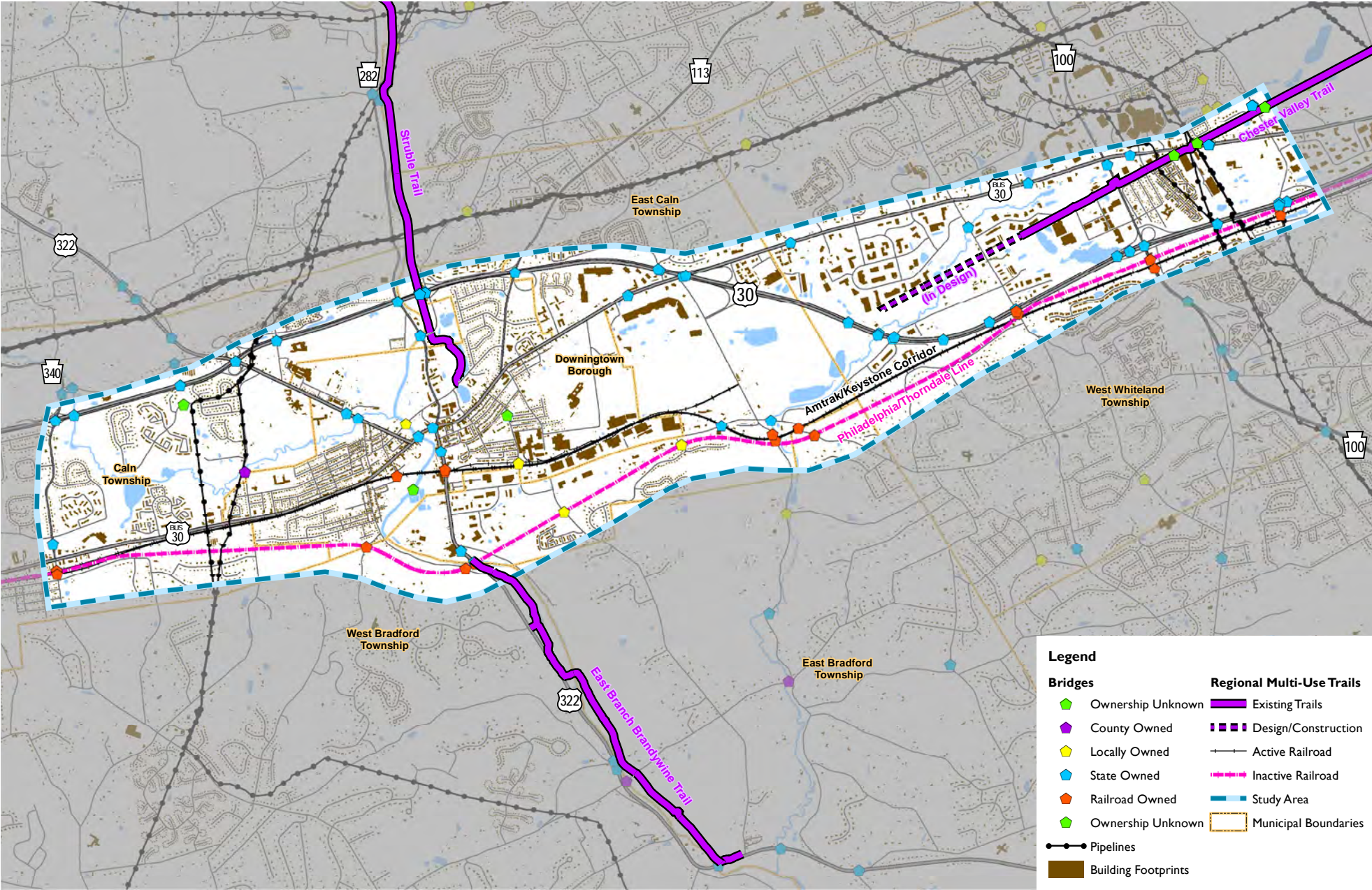
Structures and Utilities

With the abundance of creeks and roadway infrastructure, there are numerous bridges throughout the study area. The bridges along major roadways (US 30 Bypass, Business Route 30, US 322) are state owned facilities. Several municipal bridges and one county bridge are also located in the study area. Gas pipelines - which may provide opportunities for trail alignments - can be found running north/south in Caln Township on the western end of the study area as well as through the eastern half of West Whiteland Township. Railroad owned bridges can be found along the active Amtrak Keystone Corridor as well as the inactive Philadelphia/Thorndale line. Buildings in the study area are concentrated most heavily in Downingtown Borough with some additional residential subdivisions in the suburban townships. There are large tracts of land without any structures scattered throughout the study area.



The Whitford railroad bridge.

Structures and Utilities



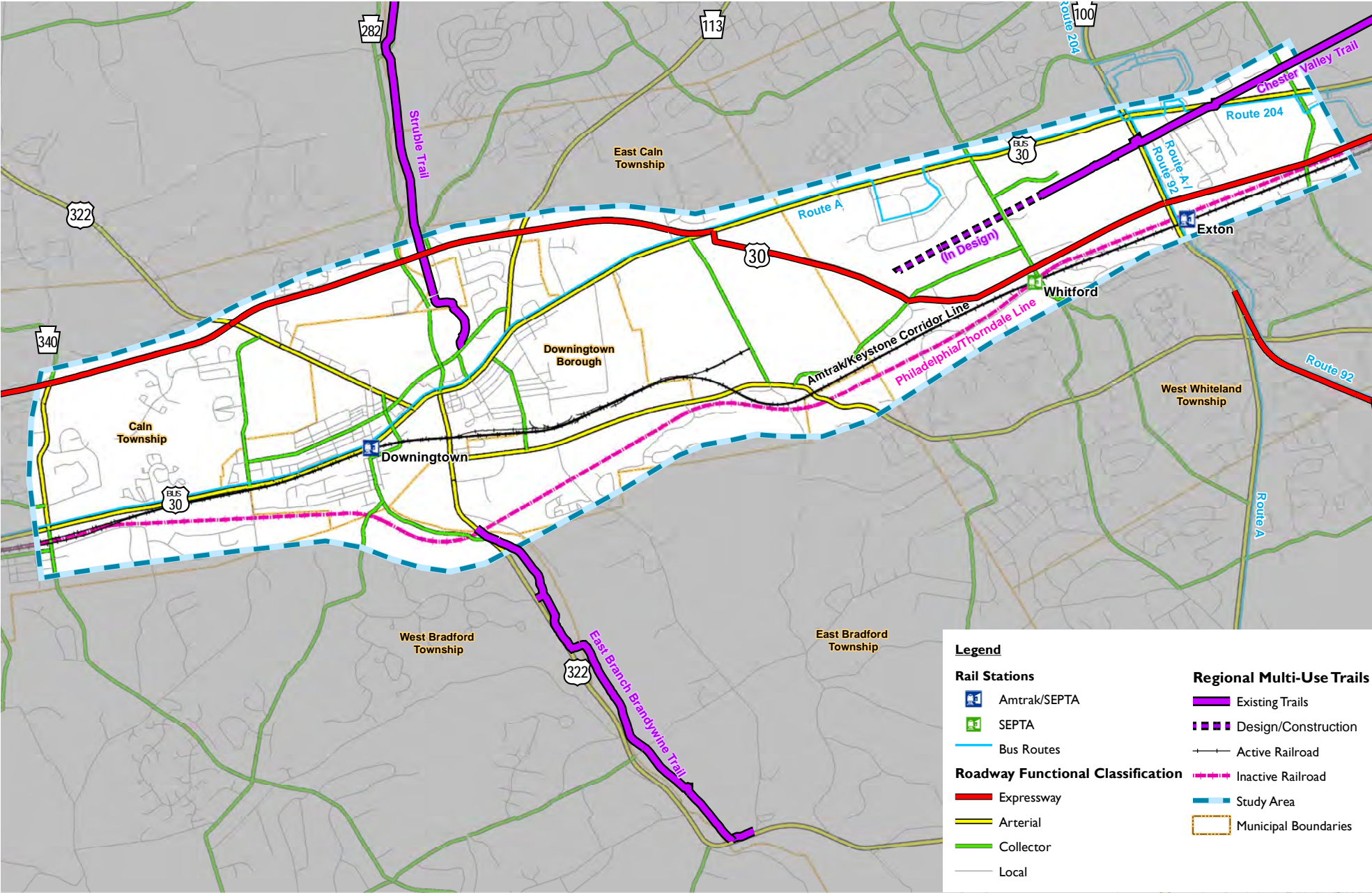
Transportation Features

The US 30 Bypass is the only major expressway running through the study area. Several major arterial roadways can also be found in the study area including US 322, Business Route 30, PA 100, PA 113 and PA 340. The study area is served by both regional rail and bus service. The Amtrak Keystone Corridor service and the SEPTA Paoli-Thorndale regional rail service run along the active railroad that spans the length of the study area. SEPTA/Amtrak train stations include Downingtown and Exton train while the Whitford train station is SEPTA only. The Krapf's Route A bus connects Downingtown and Exton with West Chester Borough, located south of the study area. SEPTA bus routes 204 and 92 service the eastern end of the study area in West Whiteland Township.



View from the P&T railroad bridge over Route 100 looking north towards Exton.

Transportation Features



Summary of Opportunities and Constraints

Opportunities

- The Keystone Corridor and the major highways traversing the study area provide many opportunities for people located within and from outside the study area to access the Chester Valley Trail (CVT). The Keystone Corridor stations provide an opportunity for access to the trail extension. This could lead to significant tourism and economic development potential.
- The study area topography poses few limitations towards providing for Americans with Disabilities Act (ADA) accessible trail connections. While there may be some site specific locations where additional earthwork may be necessary to accomplish full ADA accessibility, the majority of the terrain within the study area is fairly level and suitable for trail development.
- There is a concentration of natural, cultural and historic features within the study area. These features may serve as destinations to and/or from trail related improvements and provide multiple opportunities for historical interpretation.

Constraints

- Physical barriers posed by existing transportation corridors could limit trail development. While the study area is blessed with tremendous access, those same corridors provide significant barriers to trail development. Multi-use trails cannot share rights-of-way with limited access highways such as the US 30 Bypass, and there are only a few locations where the Keystone Corridor may be crossed via existing bridges or underpasses.
- Existing roadway rights-of-way have limited space availability to allow for the addition of a continuous multi-use trail or sidepath. Additional right-of-way is the primary need for the advancement of the Chester Valley Trail westward into Downingtown.
- Conflicting land uses could pose barriers to trail development, particularly in the commercial and industrial areas within the study area. Commercial areas create higher traffic volumes, and industrial areas have a higher concentration of truck and/or heavy equipment traffic which increases the potential for conflict with trail users.

Trail Alignment Alternatives Evaluation

This chapter summarizes the analysis of trail alignment alternatives towards accomplishing the primary goal of extending the Chester Valley Trail (CVT) as a continued multi-use trail into the Borough of Downingtown. Alignments evaluated for providing connections between the CVT and the existing Struble Trail and East Branch Brandywine Trail (EBBT) are described later in the Master Plan chapter of this report.



Looking west over the P&T Corridor at Exton Station.

Methodology

The evaluation criteria used to determine the physical and legal feasibility of the trail alternatives include the following:

Safety. Safety considerations included separating trail users from vehicular traffic as much as possible, reducing the number of times trail users must cross streets, and ensuring that safe sight distances can be achieved. Alignment alternatives that provide fewer at-grade road crossings and the most separation between pedestrian and vehicular traffic were considered favorable. Alignments with greater frequencies of bicycle/pedestrian conflicts with vehicular traffic would require installation of more safety measures, thus increasing trail development costs.

Continuity. Maintaining a continuous multi-use trail standard as a natural extension of the existing CVT was an important factor. A multi-use trail is defined as a facility that is physically separated from the roadway and typically accommodates bi-directional travel by both bicyclists and pedestrians. The trail can be located within a publicly owned right-of-way, an exclusive right-of-way, or an easement. Shared use trails typically have an improved

surface (e.g., asphalt, concrete, compacted gravel, etc.) and have a recommended width of 10 feet, although a minimum width of 8 feet may be used where space is constrained or when located in environmentally sensitive areas. Multi-use trails provide the most benefit to the most people as they allow users of all ages and abilities and are the most universally ADA accessible. Variations of a multi-use trail include a sidepath (a multi-use trail that parallels a roadway), and a cycle track (two-way travel lane for non-motorized vehicles with a physical barrier to other traffic). Bike lanes or share the road facilities may be possible in proposed alignments where multi-use trails are not physically feasible or possible due to the existing conditions, however alignments that allow for multi-use trail development are more favorable.

Connectivity. The ability of connection between existing trails and proposed alignments was considered. Trails that are circuitous or do not offer direct routes to key destinations may not only deter trail use, but also result in additional trail development costs due to increased length. Trails with limited connectivity can require trail users to deviate from the trail and use roads and sidewalks that are less safe for pedestrian and bicycle traffic. Routes that provide the most opportunity for connections to adjacent or nearby attractions such as schools, parks, commercial centers, community amenities, recreation uses and local businesses provide for a walkable and pedestrian friendly place as well as the potential for trail related economic development opportunities are considered to be more favorable.

User Experience. What one may experience on a trail plays a major role in determining the ultimate success of the trail. A trail that is noisy, has negative views, or feels unsafe for pedestrians may exclude recreational users and families and only attract those who use it for transportation. Alignments that efficiently and safely created direct routes to key destinations were considered to be more favorable, as were routes that traversed the most scenic environments.

Potentially Affected Privately-Owned Land.

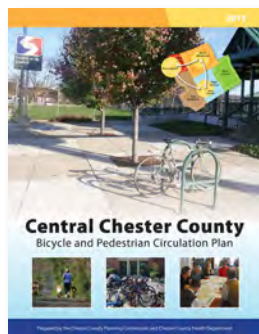
The number of potentially impacted privately-owned parcels was considered with each alignment. The greater the number of impacts, the less legally feasible a particular alignment or route will be whereas alignments with fewer impacted parcels are more legally feasible for trail development. This is due to the relative difficulty of assembling a continuous trail over multiple potential land acquisitions and all of the legal administration and acquisition costs necessary towards achieving that goal. In short, fewer impacted privately owned parcels result in better legal feasibility.

Environmental and Cultural Impacts. The potential effects on the natural and man-made features described in the physical inventory and assessment of the study area. These impacts include both opportunities such as historical interpretation of cultural features, and constraints such as potential negative impacts on environmentally sensitive areas.

Alignment Alternatives

This study began with two initial alignments:

- The recommended CVT extension alignment from the Central Chester County Bicycle and Pedestrian Circulation Plan of 2013 (the 2013 Plan) that recommended ways to make the central part of the county more walkable and pedestrian-friendly. This alignment was identified by the 2013 Plan as a priority implementation project with proposed improvements to include a multi-use trail, bike boulevard, bike lanes, three new bridges, three at-grade trail crossings, and signage.



The 2013 Plan.



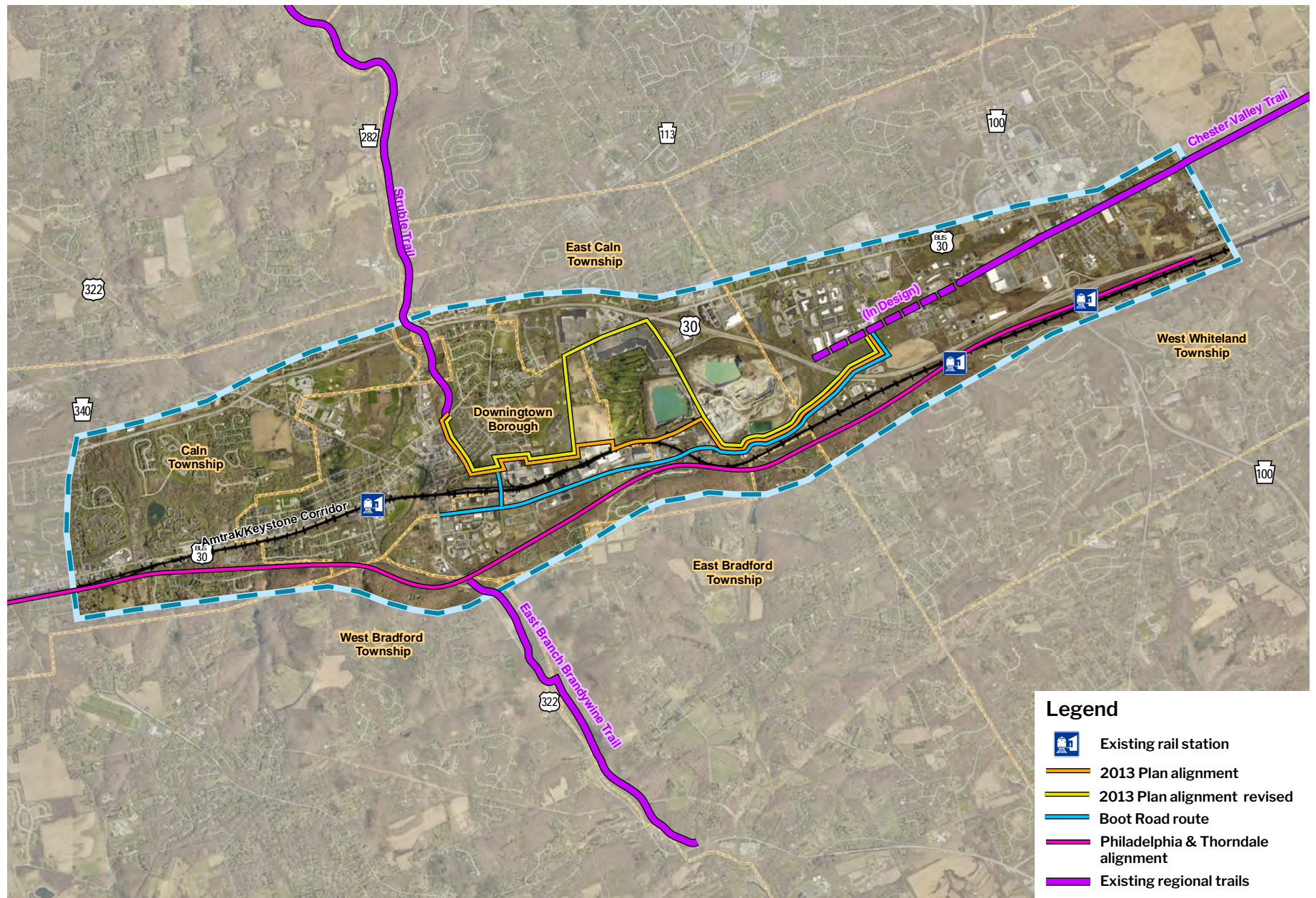
The iconic Downingtown Trestle and East Branch Brandywine Trail parking area (upper left).

- Norfolk Southern owned Philadelphia & Thorndale Branch railroad corridor – a currently inactive low grade high speed freight line constructed in 1903-1906 by the Pennsylvania Railroad Company as a bypass to reduce conflicts between freight and passenger trains on what is now the Amtrak Keystone Corridor.

Collection of additional trail alignments and potential connectors were identified through the public participation process, coordination with the project Steering Committee, review of existing GIS info available for the study area, and field reconnaissance.

In the western most section of the study area is an alignment for a proposed multi-use trail along the Beaver Creek. Caln Township had sought funding for a study towards determining the feasibility of this route connecting US 322 (Manor Ave.) in Downingtown with GO Carlson Boulevard in Caln along the Beaver Creek. This alignment will be reviewed as an alternative in the future CVT West study which will investigate the feasibility of completing the CVT alignment westward through the county towards the goal of connecting with the Enola Low Grade Trail in the Borough of Atglen.

Potential Alignments



Routes Analysis

The trail alignment alternatives were grouped into four separate routing options towards achieving the goal of extending the CVT into the Downingtown area and providing connections to the Struble and East Branch Brandywine trails. Two of these are the initial alignments identified earlier: the recommended alignment from the Central Chester County Bicycle and Pedestrian Circulation Plan (2013 Plan); and, the Norfolk Southern owned Philadelphia and Thorndale Branch rail corridor. The other two routes include a variation of the 2013 Plan alignment that would connect to the borough through the Brandywine Square commercial area, and another more direct connection along Boot Road.

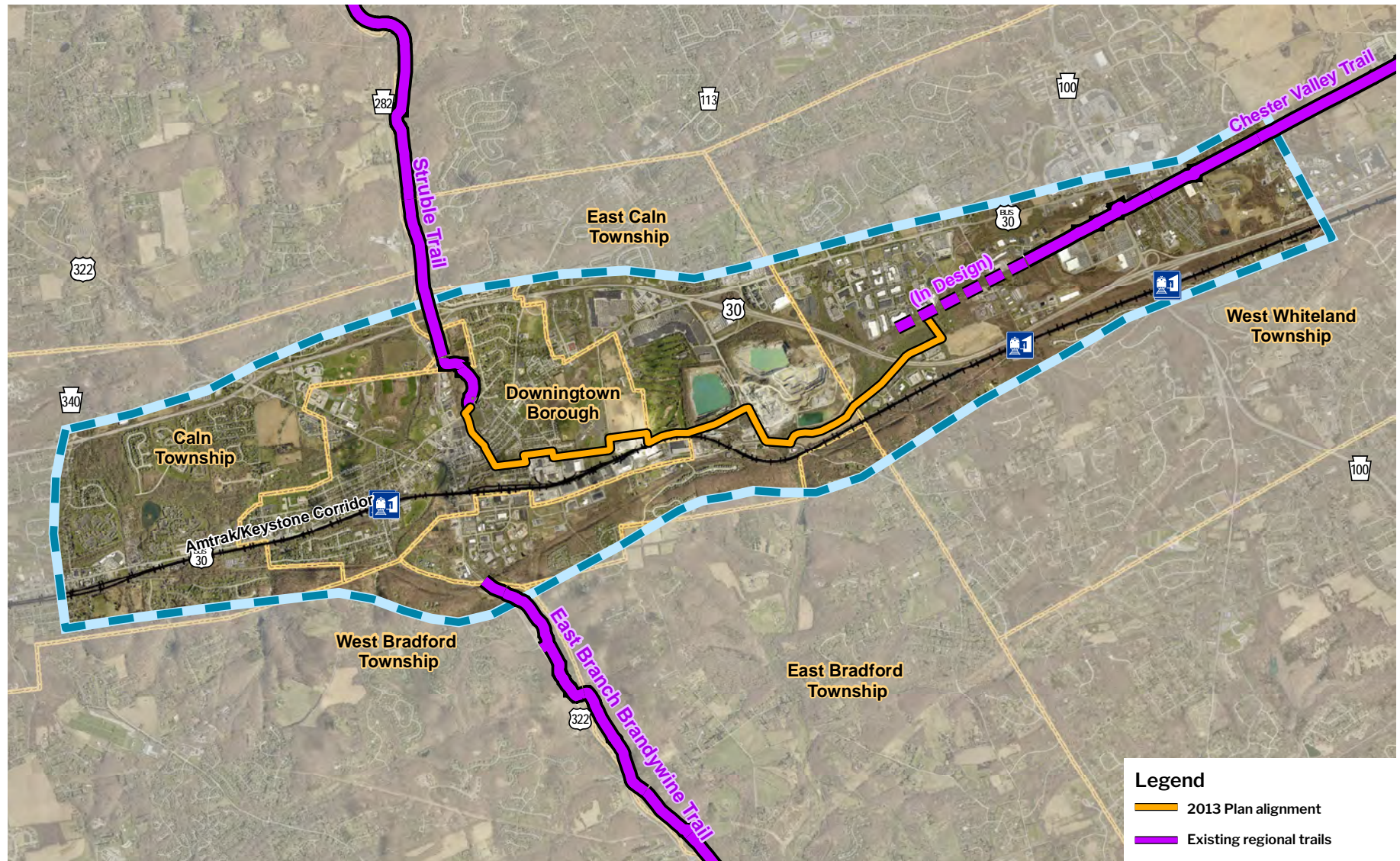
- 1 Central Chester County Bicycle and Pedestrian Circulation Plan Alignment (2013 Plan)**
- 2 Central Chester County Bicycle and Pedestrian Circulation Plan Alignment - (2013 Plan) Revised**
- 3 Boot Road Route**
- 4 Philadelphia & Thorndale (P&T) Branch Route**

Routes Analysis Summary

	Route	Facility Type	Roadway/Driveway Grade Crossings	Impacted Parcels
1	2013 Plan	Various on and off-road facilities	15	13
2	2013 Plan revised	Various on and off-road facilities	23	17
3	Boot Road	Side-path	33	21
4	P&T Branch*	Multi-use	0	1

* Indicates preferred route

1 Central Chester County Bicycle and Pedestrian Circulation Plan Alignment (2013 Plan)



Evaluation

The alignment proposed in the 2013 Plan has many merits and would efficiently connect trail users to parks, a school, downtown Downingtown, the Struble Trail, and other points of interest within the borough:

- The route's proposed multi-use trail segments east of Woodbine Road would be considered sidepaths to the adjacent roadways and would impact privately owned land in locations where it would not be able to fit within the road right-of-way.
- Bridges would be required in two locations to cross the Valley Creek, and some wetlands are potentially impacted in the segment between Clover Mill and Quarry Roads where it would parallel Boot Road.
- A proposed mid-block crossing of Quarry Road located just to the north of the active quarry's entrance would require a creative solution to address safety concerns. The speed limit and traffic volumes along Quarry Road exceed PennDOT criteria for allowing a mid-block crossing, and the heavy amount of truck traffic entering and leaving the quarry would need to cross the proposed trail creating safety and user experience concerns.
- West of Quarry Road, the route would use a Norfolk Southern Corporation owned rail corridor that connects with the Amtrak Keystone Corridor approximately ½ mile to the west before the route would travel north along the western boundary of the Downingtown Country Club golf course then west to meet with Woodbine Road. From there the trail would be split mode with

bicyclists sharing the road and pedestrians using the sidewalks within the borough to connect with the southern end of the Struble Trail.

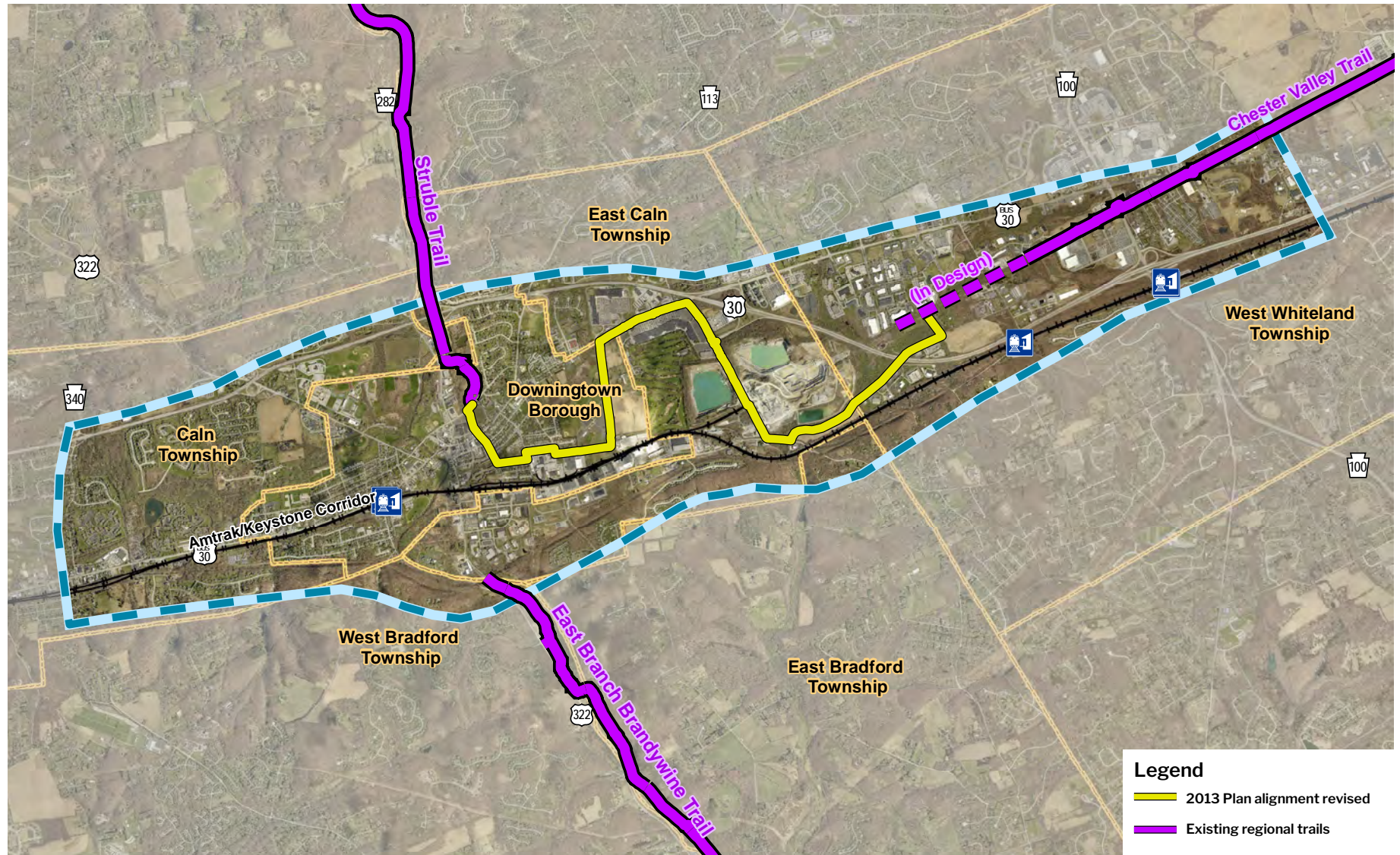
Summary

This route is a viable option but has some safety and user experience concerns, particularly at the proposed mid-block crossing of Quarry Road. There are also some concerns regarding environmental impacts with the proposed bridges and segment paralleling Boot Road between Clover Mill and Quarry Roads. This alignment would impact 13 land owners and require 15 roadway/driveway crossings.



Heavy truck traffic near proposed trail crossing along Quarry Road. Source: Pictometry.

2 Central Chester County Bicycle and Pedestrian Circulation Plan Alignment (2013 Plan) Revised



Evaluation

The second route studied is an alternate version of the 2013 Plan route that avoids the crossing of Quarry Road nearest the quarry entrance and extends the alignment north towards the destination of the Brandywine Square shopping center. A variation of this route would use an existing underpass of the US 30 Exton Bypass at Valley Creek then parallel the bypass along the northern boundary of the quarry. This variation was soon dismissed from consideration because it: passes by an existing junkyard before going through the underpass; would be located within the US 30 Exton Bypass which is not permitted by PennDOT policy due to it being a limited access highway; and, would be a security concern due to the attractive nuisance of the quarry and its pools.



Potential crossing location at shopping center entrance and US 30 Exton Bypass on/off ramps.

The route would stay along the eastern side of Quarry Road between Boot Road to the south and the ramps connecting to the US 30 Exton Bypass to the north where a road crossing would be allowed by right with the

proper safety improvements. The route could repurpose existing islands for bicycle/pedestrian refuge at the shopping center entrance then travel within the green space that serves as a buffer between the roadway and development along its eastern and northern borders.



Green buffer area between the shopping center and roadway.

There is adequate space within the green buffer for placement of a multi-use trail; however the traffic volumes entering and leaving the development at its main central entrance from Business 30 would be a safety concern. While the existing islands could be repurposed for bike/ped use here as well, there are no traffic signals and traffic is in constant flow at this intersection leaving few opportunities for a safe crossing of this very busy intersection.

West of this intersection, the potential route would cross Country Club Road and require easements from two business locations including driveway crossings with the potential for loss of parking. The route would then continue west to and follow Woodbine Road along a proposed multi-use trail development



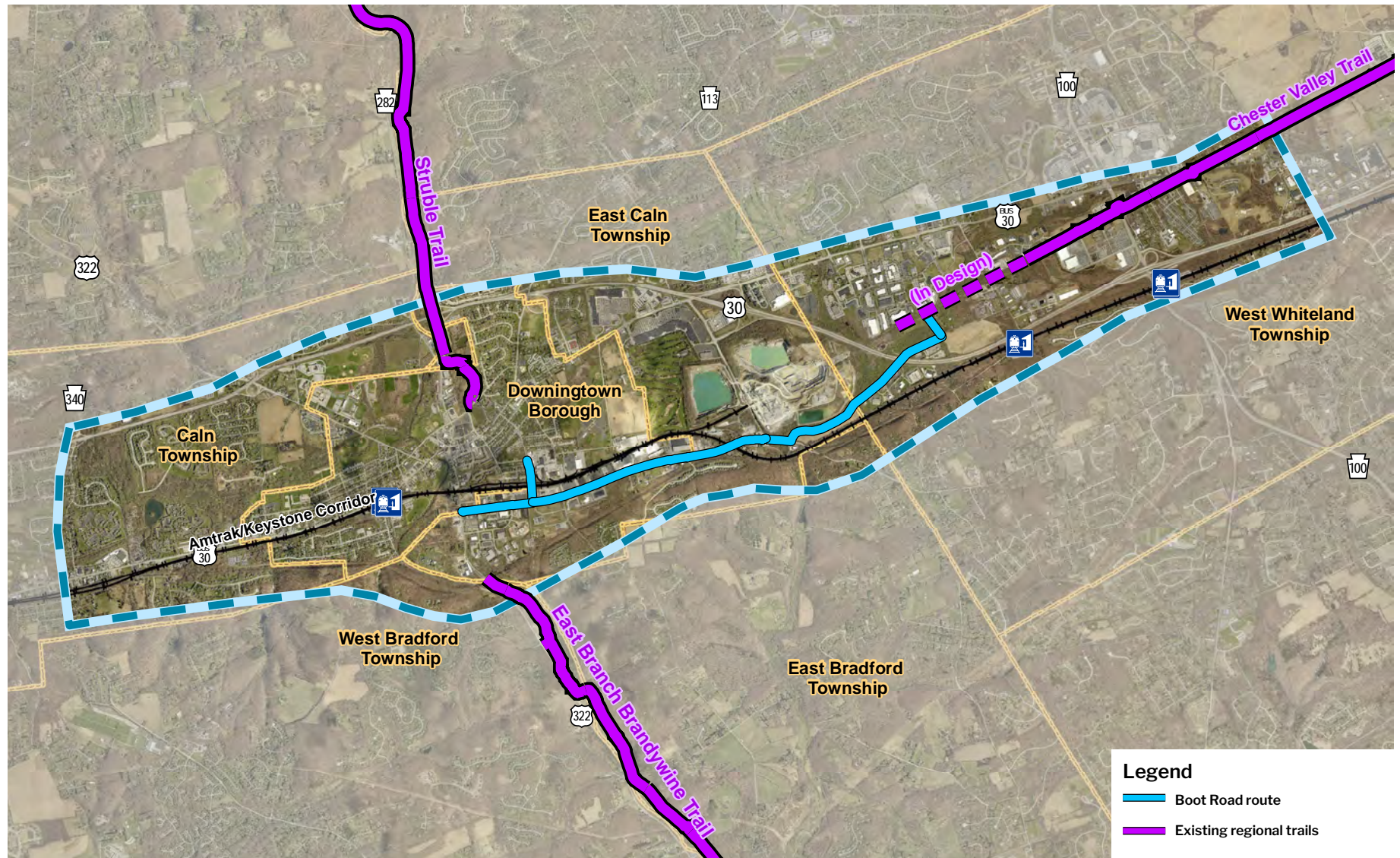
Main entrance to the Brandywine Square shopping center from Business 30.

that recently acquired both Multimodal Transportation Fund and Transportation Alternatives Program (TAP) funding. The Woodbine Road trail development will end at the western entrance to the Bishop Shanahan High School where it would then transition to a split mode facility and connect with the Struble Trail in the same way as the original 2013 Plan alignment.

Summary

This route is also a viable option for providing a connection into Downingtown Borough. Although it does connect key destinations within the Borough, it takes an inefficient route, which may turn off those using it for transportation. The route has the same environmental impacts as the original 2013 Plan alignment east of Quarry Road, and would require 23 roadway/driveway crossings and impact 17 landowners.

3 Boot Road Route



Evaluation

The Boot Road Route would provide the most direct connection between the end of the soon to be completed CVT phase 4a extension to the Oaklands Corporate Center and the Borough of Downingtown. The route would follow the same alignment as the original 2013 Plan to Quarry Road. Rather than follow it would cross Quarry Road and extend westward along the north side of Boot Road. The segment between Quarry Road and the bridge crossing of the Amtrak Keystone Corridor may need to be developed as a two-way cycle track rather than a sidepath due to the existing grades. West of the bridge crossing the route could be developed as a sidepath that would impact privately owned land in locations where it would not be able to fit within the road right-of-way.

Summary

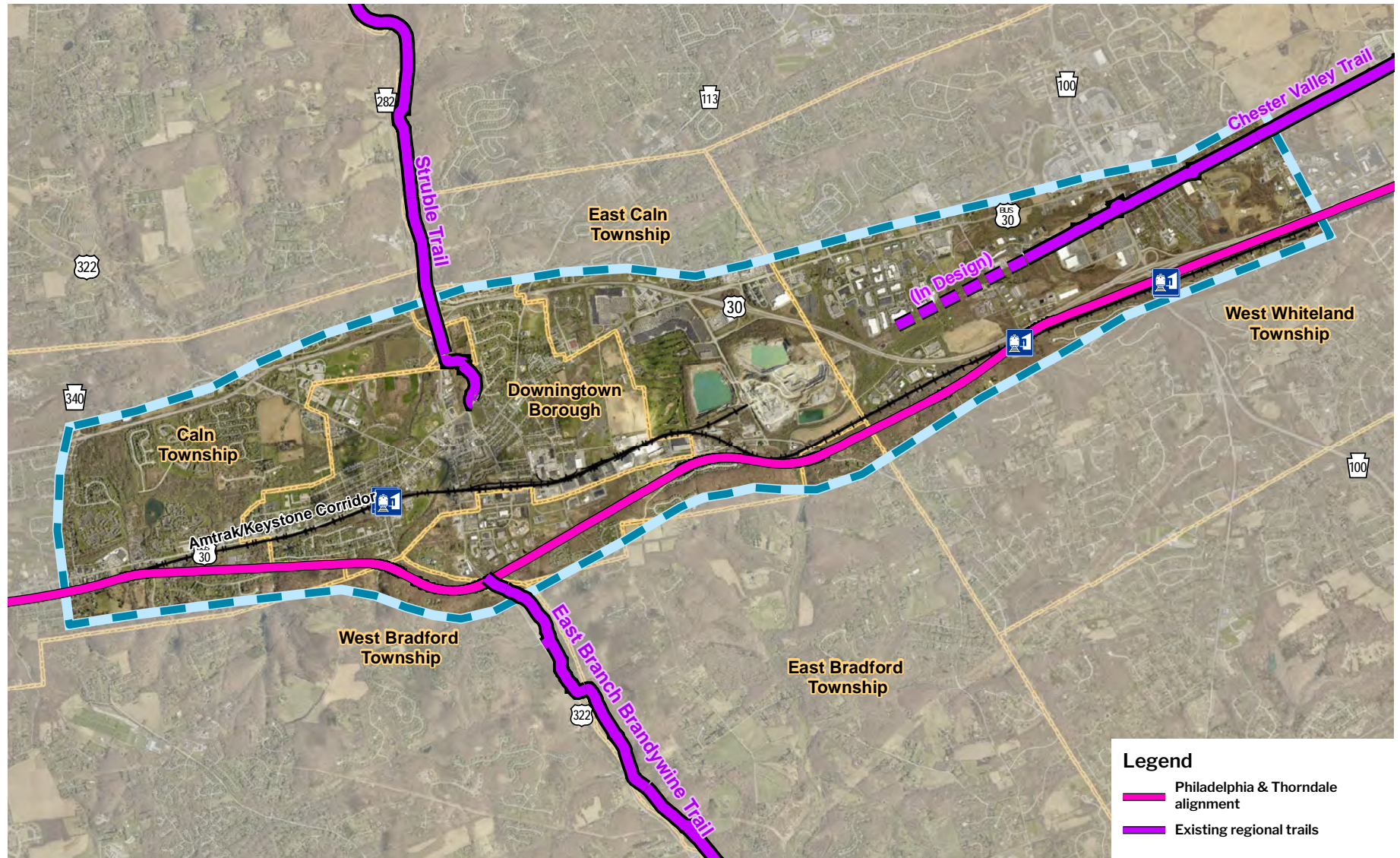
This route may be the second best alternative of the routes investigated in terms of providing a direct connection and overall development costs as it would be significantly less expensive than either the 2013 Plan and 2013 Plan revised routes due to its shorter length. The number of roadway/driveway crossings (33) and potentially impacted parcels (21) is the highest of all the routes investigated, however

many of the crossings would require signage rather than signalization and the property impacts may be reduced if a two-way cycle track within the roadway right-of-way is applied rather than a sidepath. This route may also be considered a cycling route only option to provide a connection the borough as a 'share the road facility', which would require little physical improvements beyond some shoulder repairs and signage.



Boot Road looking east from Southwind Drive.

4 Philadelphia & Thorndale (P&T) Branch Route



Evaluation

The Philadelphia & Thorndale (P&T) Branch route was not considered to be available for public use when the Central Chester County Bicycle and Pedestrian Circulation Plan was prepared in 2013. The potential to use this route as a trail alignment arose when it was revealed that PennDOT and the Norfolk Southern Corporation were discussing the potential sale/purchase of this railroad corridor shortly after the 2013 Plan was completed. Chester County was then asked by both parties if there was any interest in developing the corridor as a trail which led to the inclusion of the P&T corridor in this feasibility study.

The P&T Branch is a 10.5 mile railroad corridor that parallels the Amtrak Keystone Corridor between Gallagherville in the west and Frazer to the east. For purposes of this study, it was determined that the corridor east of Ship Road would not be conducive for trail use as it lies between the Keystone Corridor and the US 30 Exton Bypass and does not provide any potential connections to residential neighborhoods or employment centers.

The P&T was constructed between 1903 -1906 at a cost of \$3M and involved over 2.6 million cubic yards of earthwork and 100,000 cubic yards of masonry for the underpasses and culverts to maintain a low grade and complete separation from the roadways to achieve

high speed movement of freight through the corridor. The P&T includes significant engineering accomplishments including: the Brandywine Valley Viaduct – aka the Downingtown Trestle Bridge; the Whitford Bridge which traverses the Keystone Corridor at SEPTA's Whitford Station; and, the Valley Creek Tunnels which were constructed when the low grade line created an earthen embankment 120+ feet high above the Valley Creek. Both the Whitford Bridge and Downingtown Trestle along with the rail corridor itself are eligible for the National Register of Historic Places as determined by the Pennsylvania Historical and Museum Commission / Bureau for Historic Preservation.



Bird's eye view of the Downingtown Trestle and P&T Branch looking north towards Downingtown.

There are no at-grade crossings of roadways making this route significantly safer than the other routes investigated. The longitudinal grade of the corridor is 2% or less providing the opportunity for complete ADA accessibility. Furthermore, the existing ballast that remains in the corridor may be used towards construction of a new trail surface which will reduce construction costs versus the other routes investigated in this study.

The P&T Branch passes by the Exton SEPTA/Amtrak Station, the Whitford SEPTA station, and will be in close proximity to the future Downingtown SEPTA/Amtrak Station and existing SEPTA Thorndale Station which gives it great accessibility for those living outside the study area. The historical aspects of the corridor create excellent historic interpretation opportunities. The route is also very direct and efficient towards providing connectivity between destinations thus enhancing the trail user experience.

The corridor is comprised of multiple parcels, but all of them are owned by a single entity making this by far the most legally feasible if the landowner is agreeable to allow for trail use. Indications from the PennDOT/Norfolk Southern negotiations have been positive, and if PennDOT should acquire this corridor, it is believed that an agreement could be reached between PennDOT and Chester County to allow for trail use of the rail corridor.



View towards Exton from the elevated P&T Branch west of PA 100.



The existing Norfolk-Southern owned Philadelphia & Thorndale Branch as it passes by Exton Station.

Summary

The physical aspects of the rail corridor and the scale of its original construction present unique opportunities for trail development and the adaptive reuse of this inactive corridor. The man-made landform elevating the corridor, the significant cut through the southern hills of the Great Valley, and the historic engineering structures make this corridor a significant element of the landscape and creates a tremendous opportunity for place making in the central part of Chester County.

Recommended Alignment

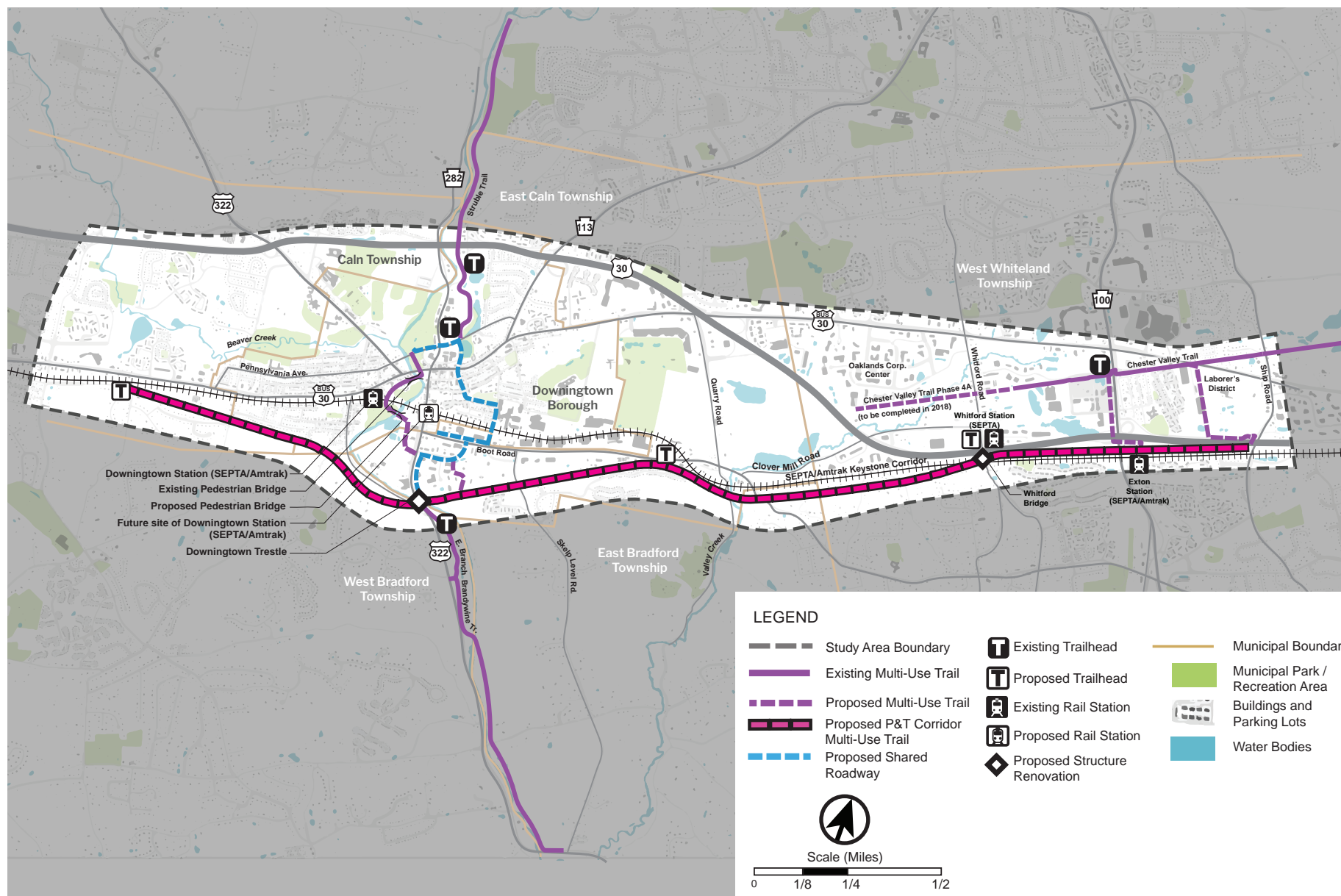
Of the routes reviewed in this study, the P&T Branch is hands down the best route for extending the Chester Valley Trail into Downingtown. All of the factors associated with the P&T Branch have the potential to provide for a one of a kind user experience versus the other routes investigated. The elevated P&T corridor has potential to create a haven for cyclists and pedestrians as trail users can travel through the forested trail corridor past exposed geology that forms canyon-like walls in places and traverse historic bridges with amazing views.

The following Master Plan chapter of this study provides more detailed descriptions of the P&T Branch as the recommended alignment, including how it will connect to the existing Chester Valley Trail and the existing Struble and East Branch Brandywine Trails.



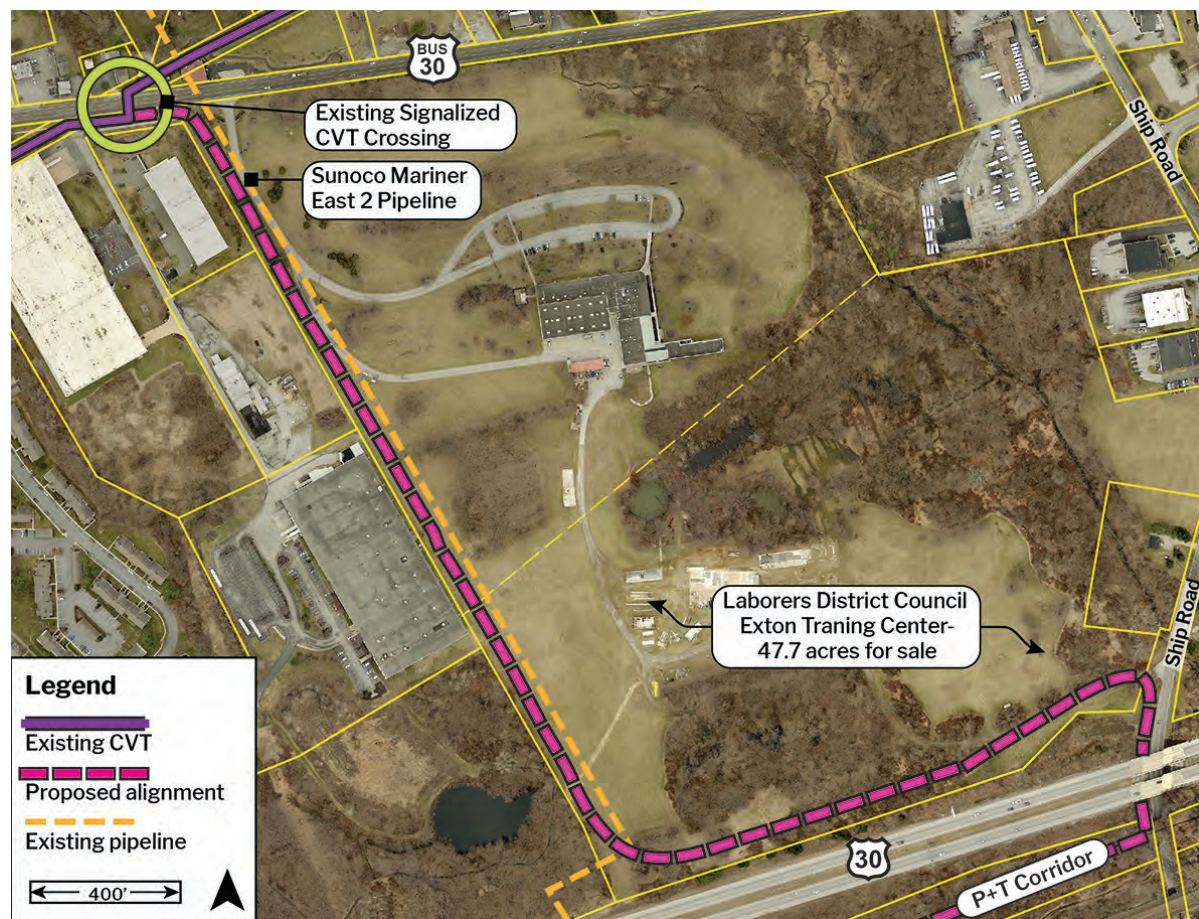
Master Plan

This chapter provides a detailed description of the recommended alignments towards extending the Chester Valley Trail (CVT) into Downingtown and connecting with the Struble and East Branch Brandywine trails, including: design standards; proposed improvements and amenities; operation, maintenance, and security responsibilities; an estimate of probable development and acquisition costs; and, implementation recommendations.



Chester Valley Trail Extension

As described in the previous Feasibility Study chapter, the Philadelphia & Thorndale (P&T) Branch railroad corridor is the recommended alignment for extending the CVT westward into Downingtown. Since this alignment is disconnected from the existing CVT and Downingtown Borough, connections must be made between them. Chester County Planning and Facilities & Parks staff contacted and/or met with the landowners at both the eastern end of the study area nearest Ship Road and in the Downingtown area to inform them of this study, and to gauge their willingness to work with the county to allow for these connections to pass through their properties. The results of those meetings and correspondence are included in the following description of the proposed trail alignment.

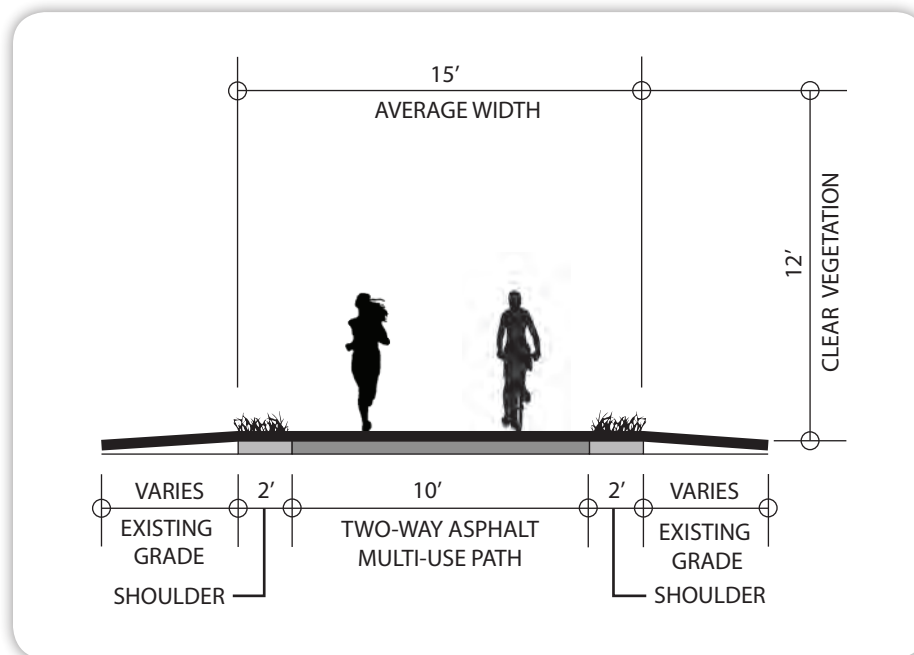


Starting in the eastern end of the study area the existing CVT crosses Lincoln Highway/ Business Route 30 just east of Tabas Lane via a signalized crossing. South of the Lincoln Highway, trail users would have the option to continue west on the existing CVT or go east towards the P&T Branch. The proposed multi-use connection would traverse the south side of Business Route 30 eastward a short distance, then turn south to traverse the western boundary of the Laborer's District Council (LDC) parcel that abuts both the Lincoln Highway to the north and Ship Road to the east. This alignment along the western boundary would parallel or be placed within an existing easement for the Sunoco Marine East 2 gas pipeline. The trail would turn east in the southwestern corner of the LDC parcel and proceed eastward along its southern boundary until it meets Ship Road.

Chester County contacted the LDC to make them aware of the current study and to assess their willingness to allow for an easement through their property to make the connection to the P&T corridor. The LDC informed the county that they are accepting proposals towards selling and redeveloping the southern portion comprising approximately 48 acres of the parcel that abuts Ship Road and the US 30 Exton Bypass. As this process unfolds, West Whiteland Township is aware of the County's interest in obtaining an easement through this parcel and will look to include a trail alignment in any future land development plans that are submitted for their review. There may be an opportunity for a trailhead or small parking area at the south eastern end of this parcel where it would be accessed from Ship

Road. The existing Exton Park trailhead is approximately 1 mile to the east of the CVT Lincoln Highway crossing, thus making a full trailhead at this location unnecessary. However, additional parking may be useful considering the popularity of the CVT.

The trail design standard to be used for the connections both through the LDC parcel and in the Downingtown area is that of a standard multi-use trail. The existing CVT east of the Lincoln Highway is 12 feet wide and wider in certain locations. Continuing a 12 foot width with these connections would be desirable.



Multi-use trail standard for connections to the P&T Branch alignment. Source: AASHTO.

South of the LDC parcel there is an opportunity to use the existing Ship Road underpass to gain access to the P&T Branch which lies between the US 30 Exton Bypass and the Amtrak Keystone Corridor.

Ship Road is a heavily traveled roadway where the minority of traffic adheres to the existing 35 MPH speed limit. The P&T Branch is an elevated rail corridor approximately 30 feet above the Ship Road cartway surface. There is limited space between the US 30 Bypass and the P&T for making the transition from Ship Road to the existing grade of the P&T alignment. Options were considered on both sides of Ship Road towards making this transition. One option was to provide a mid-block crossing to the eastern side of the roadway where the existing grades between the Bypass and the P&T would make this transition easier. The project steering committee advised against providing for any grade crossing due to the actual speed of traffic and lack of good sight distance at this location.

The proposed solution is to take advantage of the angled concrete slopes towards the overpass abutments to create a grade separated cycle track on the western side of Ship Road that would maintain the roadway shoulder and provide for grade separation and the width necessary to allow for a two way trail.



Ship Road looking north towards the P&T Branch.



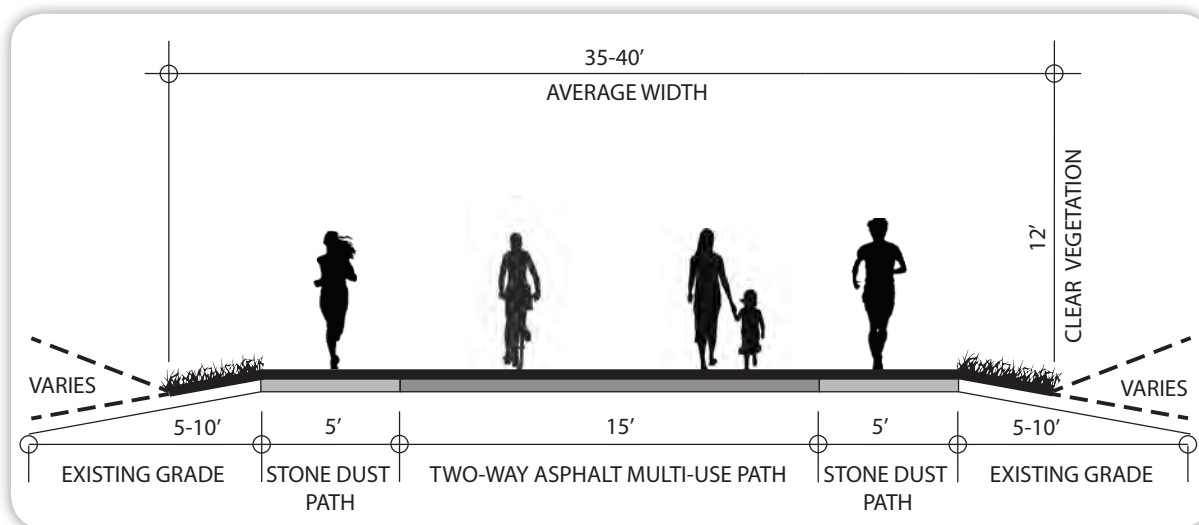
Photo-simulation of proposed trail improvements beneath the US 30 Exton Bypass.

Once the trail passes beneath the US 30 Exton Bypass, the trail must make the grade transition at 5% slope or less to be ADA compliant and climb to the level of the existing P&T alignment. One option would be to gradually cut into the northern slope face of the P&T and slope the trail gradually westward to meet back up with the existing grade atop the corridor. Another option would be to remove the existing stone arch underpass that carries the P&T corridor over Ship Road. The P&T corridor east of Ship Road is not considered to be a viable trail option as it does not connect to any residential neighborhoods, commercial/employment centers, or any other destinations. Therefore, removal of the stone arch underpass may be considered as its removal would provide for better sight distance along the roadway and allow for a much improved connection for bicyclists who would access the P&T from the south who must now travel through the narrow underpass along with vehicular traffic.

Once on the P&T corridor, trail users would have access to 7.4 miles of bicycle / pedestrian-only multi-use facilities completely separated from vehicular traffic. The proposed design standard for this multi-use trail is considerably wider than what is proposed for the connecting trails. This is due to the consistent 35-40 feet of available width within the former two track railroad corridor, and a response to many trail users who have suggested the existing CVT be wider.



The narrow stone arch underpass of the P&T along Ship Road, looking north.



Multi-use trail standard for the P&T Branch corridor. Source: Chester County Planning Commission.

The P&T corridor continues westward as an elevated man-made landform all the way to the Whitford Bridge and train station. Approximately 2/3 mile west of Ship Road it passes by the existing SEPTA/Amtrak Exton Station, the first of four regional rail stations located directly adjacent to or within a short distance of the recommended CVT alignment. Exton Station is currently undergoing a planning study by the Delaware Valley Regional Planning Commission (DVRPC) to develop a conceptual site plan for its ultimate build out. Program elements for this planning effort include expanded surface parking, better bicycle/pedestrian connectivity, a bus turnaround/drop off area, and eventually structure parking. The main reason behind PennDOT's desire to acquire the P&T Branch from the Norfolk Southern Corporation has to do with the ability to expand the site plan development at the Exton Station, primarily since the P&T now forms a landform barrier between existing parking areas. Chester County Planning is participating in the DVRPC study and conceptual plan to ensure that the Chester Valley Trail is an integral part of the multimodal vision for Exton Station.



P&T rail corridor looking west between Ship Road and Exton Station.

Directly adjacent to Exton Station the P&T crosses over Walkertown Road with a stone arch underpass and then across PA Route 100 via an overhead bridge. The bridge over PA 100 is an art deco style reinforced concrete deck bridge which provides trail users with excellent views north towards Exton and south towards the station and Amtrak's Keystone Corridor. In addition to the multiple stone arch underpasses and other bridge structures associated with the P&T Branch, this PA 100 bridge is the first major structure that will require additional structural review. Very few renovations will be required for trail installation, assuming this bridge is in the good condition that it appears to be on the surface. The existing ballast on the bridge may be surfaced in the same way as the rest of the corridor and additional fencing and/or railings may be necessary to provide additional security.



View looking north towards Exton from the P&T bridge over PA Route 100.



P&T bridge over PA Route 100 looking west.



View looking south towards the Amtrak Keystone Corridor from the P&T bridge over PA Route 100.

Once beyond the PA 100 Bridge the elevated landform continues west towards Whitford Station in one of the more elevated sections of the Corridor. This landform creates a unique space for trail users as they pass high above and between the Amtrak Keystone Corridor and the US 30 Exton Bypass. Users will experience constant traffic noise from the US 30 Bypass with cars and tractor trailers passing by to the north and the occasional swoosh of a train hurling along the Amtrak line to the south. The alignment in this segment is elevated 40 to 60 feet above the existing adjacent grades offering trail users filtered views north towards Exton and the Great Valley as one approaches the bridge at Whitford.

The Whitford Bridge is the first major structure renovation that will be required for trail development. It is also a very significant link in making the P&T corridor a viable option as it is the only location where the P&T Branch safely crosses the Amtrak line from north to south. The 400 foot long Parker Truss (also known as a Pennsylvania Truss) bridge passes over the Keystone Corridor at the existing SEPTA Whitford Station. Renovation costs for this bridge will be significant primarily due to its passage over the Amtrak line and the additional labor force that is required for flagging along this active passenger railroad. The existing catenary lines that power the trains below are directly attached to the bridge. These catenary connections will need to be relocated to allow for trail use overhead on the bridge surface and will add to the renovation costs. Please refer to the financial feasibility section of this chapter for estimated renovation costs for this and other structures located along the recommended P&T line.



View towards Exton from the elevated P&T Branch west of PA 100 looking north.



The existing Whitford Bridge looking east.



The existing ad hoc parking area on Norfolk Southern property west of the Whitford Bridge.

At the western end of the Whitford Bridge lies the potential for a trailhead facility. Currently, regional rail riders park in this area (to avoid paying the parking fee charged by SEPTA for use of their lots located directly adjacent to the station.) This location is also one of the few spots along the P&T Branch where the adjacent grades match the grade of the former railroad, thus limiting the places where emergency access can be provided.

Future plans for trailhead development should include a walking path on the south side of the Keystone Corridor to allow people to traverse between the trailhead and the existing SEPTA

station. A significant grade difference of approximately 45 feet between the Whitford Bridge and Whitford Road below on the north side of the Amtrak line make the south side of the bridge the only real option for providing a pedestrian connection between the trail and the station.



Photo-simulation of proposed trail improvements at the Whitford Station.



Catenary structures remain in the P&T Corridor west of the Whitford Bridge.

Westward past the Whitford Bridge, the landscape of the former rail line changes significantly. Here trail users will notice that the catenary structures that provided the power for the former freight line have remained. These structures have the potential to be reused for either signage, lighting, or simply as a remnant for character. Trail users will also notice that they are now passing into segments where the line has been cut into the hillside as the noise recedes with a noticeable change in temperature or wind, pending on the time of year.



Photo-simulation of the trail as it passes by the exposed reflective mica schist geology.

Heading west the trail passes segments of both cut and fill as it crosses Burgoyne Road twice as the roadway serves residences between the Amtrak line and P&T, and loops back around through stone arch underpasses towards the residential area to the south. As the P&T Branch heads west towards Boot Road it enters into another cut area where the existing geology is exposed. This mica schist metamorphic rock has a very reflective quality as seen in the photo simulation above.

The alignment continues west towards the Boot Road and Valley Creek area. This location includes one of the more impressive engineering feats associated with the P&T line. During construction, this valley was filled in by a man-made landform that replaced a former bridge crossing of the Valley Creek along what is now the Amtrak line. The finish grade of the P&T alignment atop this man-made landform sits 120 feet over the Valley Creek and tunnels were created for Boot Road, Valley Creek Road, and the Valley Creek itself to allow for passage through the landform. This elevated area offers filtered views to the active quarry site and glimpses of the Amtrak line located directly below to the north and to the tranquil natural pristine character of the Valley Creek to the south.



Existing roadway bridge carrying Southwind Lane over the P&T Branch.



The P&T Branch atop the man-made landform spanning the Valley Creek, looking east.



Potential trailhead location along Boot Road near Southwind Lane.

The alignment begins to cut back into the hillside westward beyond the Valley Creek. Before reaching Southwind Lane there is a vacant parcel located just to the north along Boot Road that has a matching grade to that of the P&T Branch offering an opportunity for a future trailhead to provide additional parking and an opportunity for emergency access. Southwind Lane passes over the P&T via an overhead roadway bridge towards a residential development located just south of the P&T.



Abutment of a former overhead bridge located in between Southwind Lane and Skelp Level Road.

In addition to the significant earthwork and engineering feats found within this corridor, there are other unique opportunities for historic interpretation. Between Southwind Lane and Skelp Level Road is a former overhead roadway bridge that once connected to what is now the Devereux foundation property located between Boot Road and the P&T corridor.



Skelp Level Road bridge over the P&T.

At Skelp Level Road trail users will notice that this bridge sits much higher above the trail and that the canyon appears to get deeper as one travels west. The cuts immediately west of this location approach 60 to 80 feet deep into the adjacent landscape and create a cathedral or canyon like space for trail users.



Oak Ridge development (right in photo) to the south of the P&T 'canyon'.



Photo-simulation of the proposed trail through the Skelp Level 'canyon' area

Westward beyond the Oak Ridge residential development, the adjacent grades begin to transition back to a spot approximately 100 yards east of the Downingtown Trestle where there is yet another opportunity to provide emergency access. This is also the location where trail users may connect between Downingtown Borough and the P&T line. Chester County Planning and Facilities & Parks staff met with the landowners in the Trestle Bridge business center to get their feedback on the potential for creating a trail connection to the existing roadway system through the business park. The suggested alignment for this connection has been selected due to its direct connection and minimal impact on the operations of the businesses through which it passes. Each of the affected landowners have offered their suggestions and concerns but agreed in principle to work with the County moving forward to develop this trail connection. Once trail users meet Robbins Road they will have the option to travel to either the East Branch Brandywine Trail or to the Struble Trail via improvements described later in this chapter.



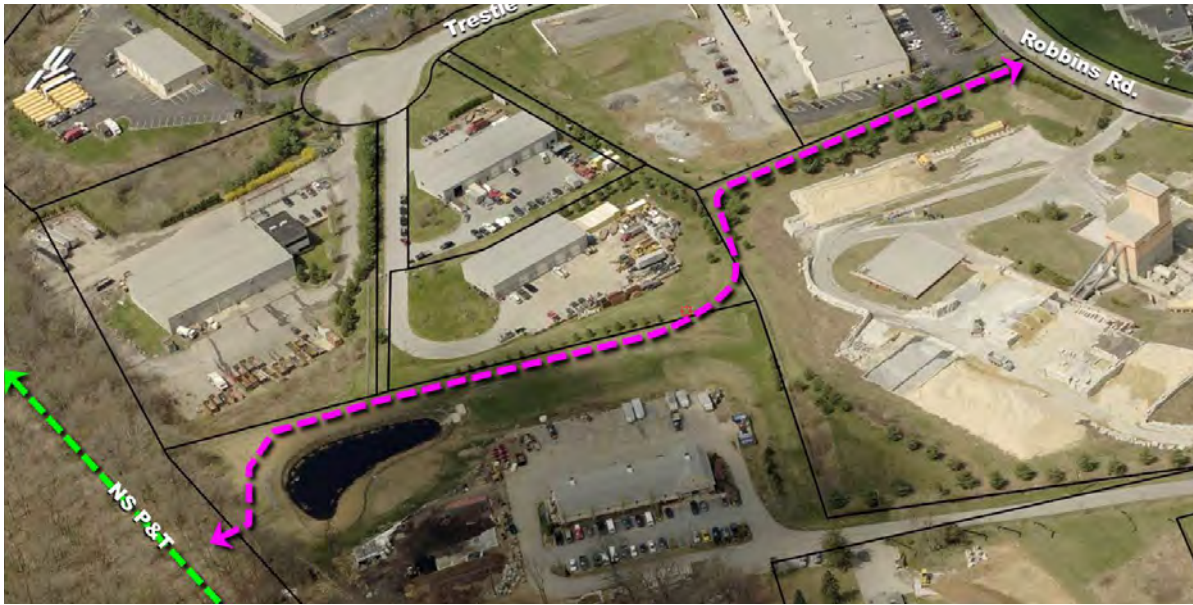
Location for the trail connection to Downingtown and emergency access to the P&T.



View of potential connector alignment in the Trestle Business Park, looking north towards Downingtown.



View of potential connector alignment in the Trestle Business Park, looking south towards the P&T.



Oblique aerial of proposed connection between the P&T corridor and Robbins Road.

The most significant feature and perhaps the biggest question mark of the P&T Corridor is the condition of the 110+ year old, 1450' long and 125' high Downingtown Trestle, also known as the Brandywine Valley Viaduct. Renovation of the structure would create a huge regional draw for trail users and represents a major place making opportunity for economic development in the Downingtown area. This structure would offer significant views both north towards Downingtown and south towards the Brandywine Creek valley.

The structural condition of this bridge (and other major structures in this corridor) is unknown at time of the study. Upon acquisition of the line from the Norfolk Southern Corporation, PennDOT will perform full inspection of the structures. Norfolk Southern recently wrapped the Trestle in netting to protect the US 322 roadway below and catch debris falling from the structure caused by rotting of the deteriorating wood flooring that holds up the ballast within the structure.

The Downingtown Trestle is very similar in both design and dimensions to the Safe Harbor Bridge located along the Susquehanna that carries the Enola Low Grade Trail through Lancaster County. The Safe Harbor Bridge has been identified by the Pennsylvania Department of Conservation and Natural Resources as one of the top 10 trail gaps in the state of Pennsylvania and was recently awarded funding towards its renovation. The most recent estimates for renovation of the Safe Harbor Bridge have been between six and \$8 million.



The Downingtown Trestle, looking west.



Photo-simulation of the Downingtown Trestle renovated for trail use.

Westward beyond the Downingtown Trestle the former rail corridor enters into its deepest cut area where 80 to 100 feet of earth have been removed on either side to make room through the ridge for the former freight line. Here the existing geology provides for additional interpretive opportunities. This segment of the corridor exhibits signs of local use as pathways have been created through and around the north face of the cut slope. These hiking trails - although outside of the main rail corridor - provide excellent views northward towards Downingtown and the Johnsontown neighborhoods. Beyond the valley through which Glenside Road passes beneath the corridor, the trail turns and continues westward towards Lloyd Avenue.



The P&T corridor segment in the Glenside Road area.



Looking west towards Lloyd Avenue.



Exposed geology west of the Downingtown Trestle.



Looking north from the P&T Corridor over Lloyd Avenue.

The Trestle Woods residential neighborhood is located in the southwest quadrant of the Lloyd Avenue / P&T Branch intersection. Houses in this neighborhood are the closest to the P&T corridor of any adjacent residential development. Screening in the form of fencing or additional plant material may be desired by a few residents located closest to the alignment for privacy. This development includes a parcel owned by Caln Township along Deer Drive opposite Katie Lane that may be used to provide public access to the corridor for local residents. Emergency access may be possible west of Lloyd Ave from an existing self storage business located on the north side of the corridor where the existing grades closely match.

The alignment continues west through a final cut segment towards its terminus at Gallagherville where ultimately to the line rejoins the Amtrak Keystone Corridor. The Gallagherville Flyover carries the P&T Branch over the eastbound Amtrak line and gradually descends the P&T into the center of the Keystone line between the eastbound and westbound Amtrak lines. Since the trail will not have any connectivity from the center of the Keystone Corridor, use of the P&T Branch will end before approaching the Gallagherville flyover. A short segment of the P&T Branch from the Gallagherville flyover east provides access to an existing substation that powers the Keystone Corridor. The westernmost trailhead could be developed in this segment and access to the substation will need to remain as the trailhead is developed in the future.



Entrance to the Trestle Woods residential development south of the P&T corridor at Lloyd Avenue..



Substation providing power to the Keystone Corridor located north of the P&T Branch.



Cleared segment of the P&T Branch between the Gallagherville Flyover and substation.



The Gallagherville Flyover looking northwest.

Trailheads and Amenities

Based on public commentary and the experience of park rangers, restrooms and water fountains at trailheads are in high demand. These amenities will be incorporated at the proposed trailheads wherever possible based on availability of existing public water and sewer connections. Each trailhead will have to be designed to accommodate stormwater management facilities in accordance with current regulations. Such facilities could include green infrastructure such as rain gardens and/or subsurface detention areas.

Additionally, benches could be placed approximately every $\frac{1}{2}$ mile along the trail and within a $\frac{1}{4}$ mile in either direction from a trailhead facility. Their placement would correspond with interpretive signage, points of interest, and other scenic locations along the trail wherever possible.

East Branch Brandywine Trail Connection

The 2.1-mile East Branch Brandywine trail currently terminates at the end of the newly constructed Route 322 bridge over the Brandywine Creek just south of Downingtown in Caln Township. This bridge includes a six foot wide separated pedestrian lane on the east side of the bridge that may be used for extension of the trail northward. This plan proposes a multi-use trail connection beginning at the north end of the bridge that extends northward along Brandywine Avenue with a continuous physical barrier to protect trail users from vehicular traffic. To accommodate the trail in this narrow section of roadway, this plan proposes a road diet along US 322 to reduce the lane widths and shift them westward to allow enough space for placement of the trail along the eastern edge of the roadway.

Please refer to the plan and associated cross sections for the conceptual design for this trail connection between the US 322 bridge and Robbins Road.



Trail connecting the EBBT trailhead to the US 322 bridge over the Brandywine, looking south.



Existing walkway on the newly constructed US 322 bridge over the Brandywine Creek, looking south.

The proposed trail would begin as a multi-use path (see section A-A'), but as the available width narrows to a pinch point approaching the intersection of Old Trolley Road, the multi-use trail will narrow to a minimum width of 9'. Between the intersections of Old Trolley Road and Robbins Road, the northbound traffic splits into two lanes. As the road widens, the clear width of the proposed trail widens from 9' to 10.5'.

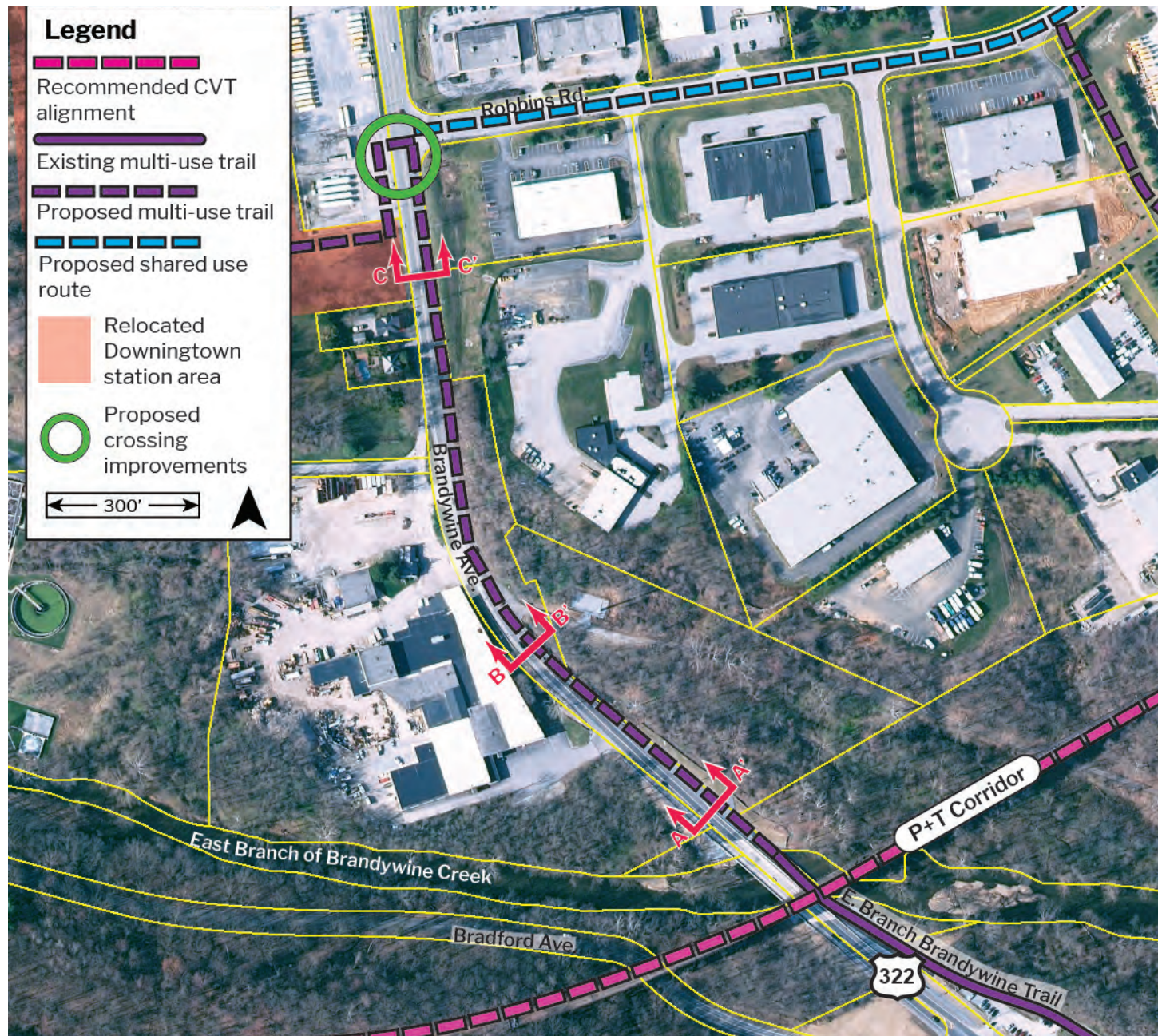
The proposed two-way cycle track / sidepath will end once it meets Robbins Road and the proposed connector route will follow Robbins Road. Robbins Road is wider and has considerably less traffic volume than US 322. Trail users can travel Robbins Road west the junction of the trail to/from the P&T Branch just west of the Silvi concrete plant, or continue along to Boot Road then Chestnut Street into Downingtown Borough and on towards the Struble Trail.



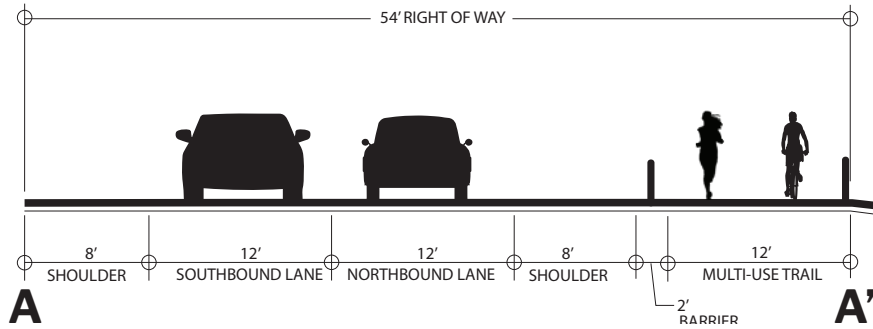
Looking north from the US 322 bridge.



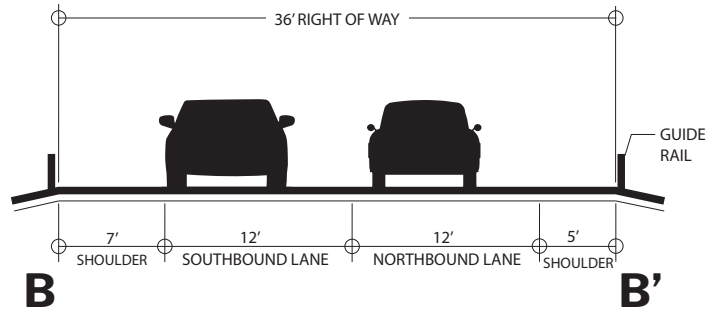
Pinch point for the proposed trail extension nearest Old Trolley Road.



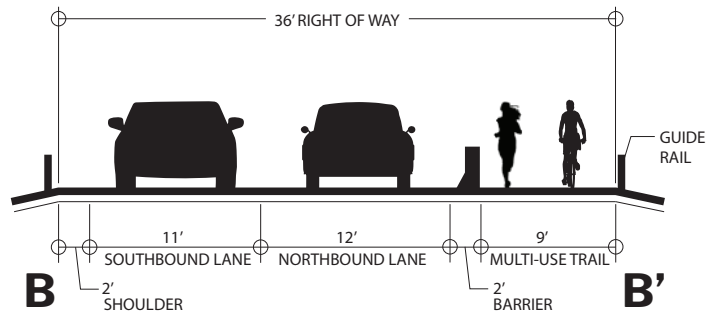
Existing Roadway with Proposed Trail



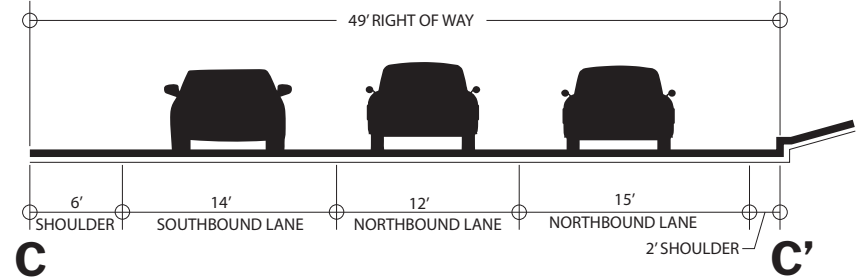
Existing



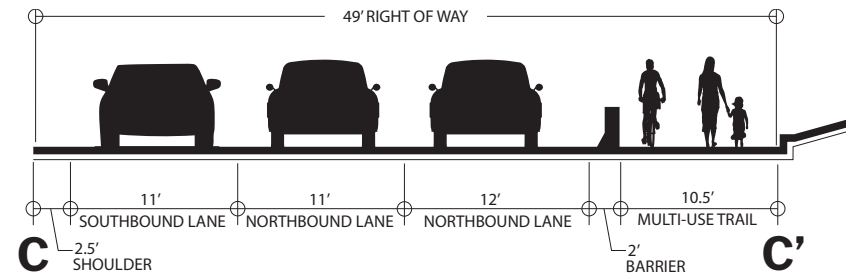
Proposed



Existing



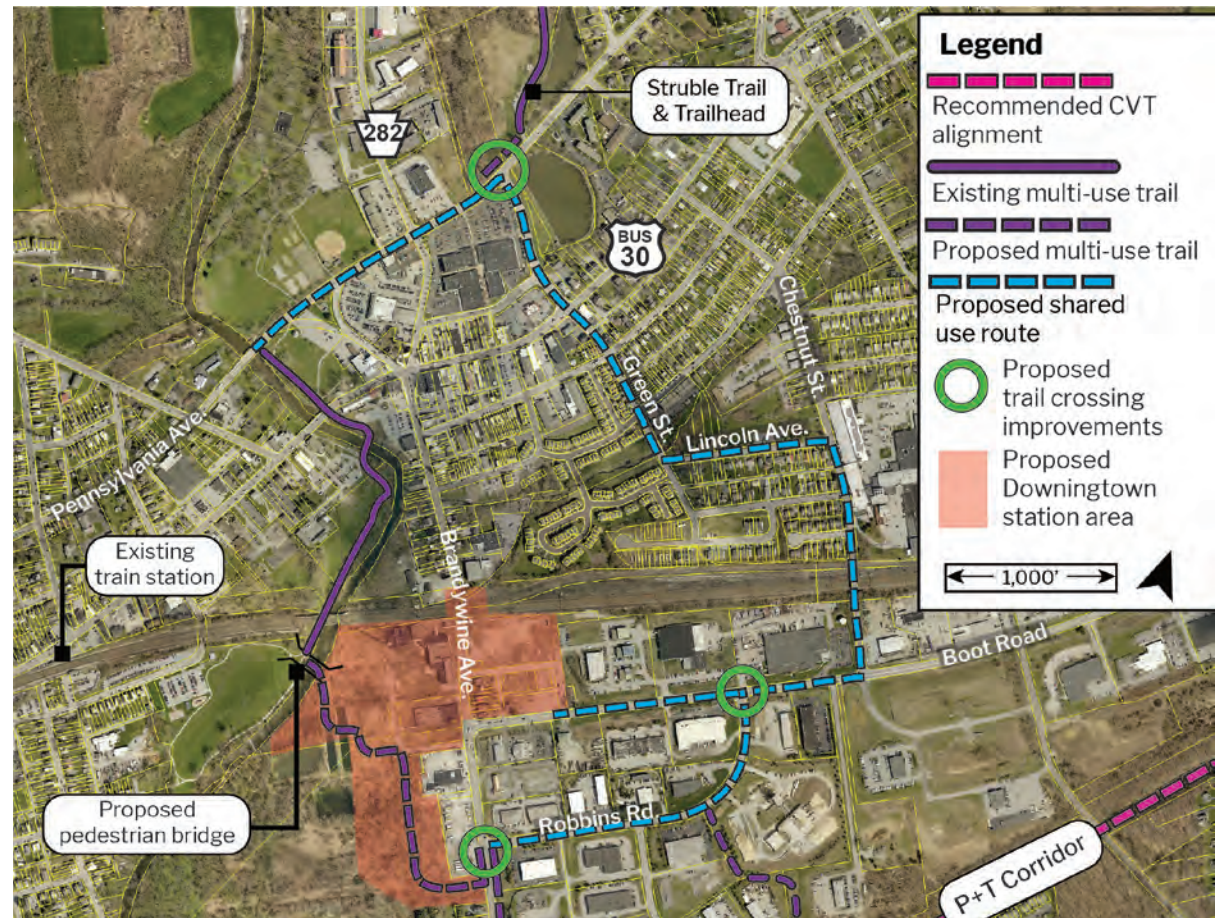
Proposed



Source: Chester County Planning Commission

Struble Trail Connection

From the future junction of the P&T trail connector and Robbins Road, trail users will ultimately have two choices for making a connection to the Struble Trail – an existing 2.6 mile county-owned trail that heads north out of Downingtown. The near term route will be to go north and east along Boot Road towards Chestnut Street and the center of the Borough. Once the new Downingtown Station is installed at Brandywine Avenue, a multi-use trail connection should be considered along the north side of Boot Road westward from Robbins Road to provide a continuous connection from Chestnut Street. The future long term route will give trail users the option to go west along Robbins Road, cross US 322/ Brandywine Avenue, and enter what is now the redevelopment area for the future site of the relocated Downingtown SEPTA/Amtrak train station.



The latter long term route will include a new pedestrian bridge crossing of the Brandywine Creek that will be part of the new station development and will allow trail users to pass beneath the Amtrak line on the west side of the creek and head north using the existing trail system to connect to the Struble Trail and existing parks.

There is an existing pedestrian bridge located north of the Amtrak line that provides crossing of the Brandywine. The existing trail continues north where another grade separated crossing is provided by an underpass of the Lincoln Highway and will allow trail users to head towards the existing parks and Pennsylvania Avenue from where the Struble Trail and existing park lands may be accessed.



Existing pedestrian bridge crossing of the Brandywine north of the Amtrak Keystone Corridor.



Existing trail underpass of the Amtrak line on the western bank of the Brandywine Creek, looking north.



Existing trail underpass of the Lincoln Highway, looking north.

Until the Downingtown SEPTA/Amtrak train station is relocated to the eastern side of the Brandywine, the near term solution for making the connection to the Struble Trail will have trail users cross the Amtrak line at Chestnut Street and follow the existing PA Bicycle Route L through the borough to Pennsylvania Avenue.

To make this near term connection from Robbins Road, crossing improvements are proposed at the intersection of Robbins and Boot Roads. On the north side of Boot Road a short sidepath (multi-use) connection is proposed to connect eastward to Chestnut Street. The Chestnut Street Bridge over the Amtrak line is scheduled to be replaced in 2018-19 and will include a pedestrian connection to Boot Road. Once across the Chestnut Street Bridge trail users will continue through the borough along what will be a split mode route. Bicyclists will share the road with vehicular traffic and pedestrians will use the existing sidewalks.

ADA accessible curb ramps will be necessary for pedestrians to make the connection across both Kennedy Drive and Jackson Avenue before continuing north to Lincoln Avenue. Trail users will then follow Lincoln Avenue west to the intersection with Green Street.



Chestnut Street / Kennedy Drive intersection looking north.



Chestnut Street / Jackson Avenue intersection, looking north.

Lincoln Avenue is a relatively low traffic volume residential street with existing sidewalks on both sides and provides access to Marinelli Park located north of the roadway.

Signage for PA Bicycle Route 'L' is consistent along its route through the borough, and affords a potential opportunity to add Chester Valley Trail and/or Circuit signage to the same posts, thus providing trail users with a visual cue for how to connect to the trails at either end of the route.



Lincoln Avenue, looking west.



Lincoln Avenue approaching Green Street, looking west.

Pavement markings – or sharrows – could be installed along the route to alert motorists that they should share the road with bicyclists, as shown in the photo-simulation below.



Photo-simulation showing proposed signage and pavement marking improvements along Lincoln Ave.

At the western end of Lincoln Avenue, trail users will then head north along Green Street towards the signalized crossing at Business 30 / Lincoln Highway. Trail users may also take advantage of the existing bike shop at the southeast corner of the intersection to make some repairs or get trail information.



Green Street, looking north.



Signalized crossing of Business 30 / Lincoln Highway with ADA curb ramps, looking north.

North of Business 30 / Lincoln Highway, Green Street becomes a four lane width roadway as it passes by the Mill Town Square shopping center along its west side. Most cyclists should feel comfortable sharing the road with cars along this roadway, but those with children cyclists may want to dismount and use the existing walkways due to the many turning movements in and out of the shopping center.

The existing sidewalk on the eastern side of Green Street ends opposite the Mill Alley entrance to the commercial center. The lands on the far north and eastern side of Green Street are owned by the Borough of Downingtown. This study recommends the installation of a sidewalk that will complete the pedestrian connection northward to Pennsylvania Avenue. This new walkway could be wider than the existing walkway to allow space for people to pass one another when there may be an event held in the Borough-owned space adjacent to the pond.

Crossing improvements are proposed at the northern end of Green Street to allow trail users to safely cross Pennsylvania Avenue. These improvements will at the minimum include signage, pavement markings (ladder bars), and ADA accessible curb ramps.

Once across Pennsylvania Avenue, pedestrian trail users will then be able to use the existing sidewalk to travel east to the Downingtown trailhead of the Struble Trail. Bicyclists may continue to share the road along Pennsylvania Avenue to make this connection.



The sidewalk along Green Street ends opposite the Mill Alley entrance to the shopping center.



Northeast corner of the Green Street / Pennsylvania Avenue intersection.



Access to the Struble Trail parking area in Downingtown.

Trail Operation, Maintenance and Security

Operations and maintenance tasks for the proposed P&T section of the Chester Valley Trail extension and connector trails will be similar to those already performed by Chester County facilities personnel on existing parts of the county's trail system. Some of these tasks will include:

- Annual raking and replenishment of gravel trailheads
- Regular refreshing of stone dust sidepaths along the main trail
- Monitoring the asphalt path for degradation and repairing as necessary
- Mowing the edges of the trail regularly during the growing season
- Restriping the path where necessary
- Emptying trash receptacles

The existing Chester Valley Trail is maintained year-round, therefore maintenance crews also plow and salt the trail surface and trailheads in winter as necessary.

The existing Chester Valley trail is patrolled by Chester County Park Rangers. Their efforts are supported by the police departments of municipalities through which the trail is located. Some municipalities, such as Tredyffrin and West Whiteland, have bicycle police patrols to augment the services provided by the County's Rangers. As the proposed trail extension and connectors will add significant mileage to what is currently patrolled, it is estimated that the County will need to hire at least one additional Ranger. The County will also look to establish a maintenance and security relationship with the municipalities through which the recommended alignment passes.

Providing adequate emergency access to the P&T trail, which has limited access opportunities due to its unique construction will require careful consideration and design as the trail is being engineered. There are select few locations along the existing rail corridor where the adjacent grades match those of the corridor. The following locations (from west to east) are evenly distributed along the corridor:

1. The Gallagherville flyover at the proposed trail's western terminus
2. Nearest the intersection of the P&T trail with Lloyd Avenue
3. The east side of the Downingtown Trestle (currently used by municipal authorities and emergency crews to access the Trestle)
4. East of the Boot Road and Southwind Lane intersection
5. The Whitford Train Station
6. The Exton Train Station
7. Ship Road

These locations are included in the trail mapping found at the end of this chapter.

Financial Feasibility

Trail Development Costs

An estimate of probable development costs was developed for the recommended alignment based on recent trail development projects administered by the Chester County Facilities & Parks Department. Actual construction cost data from recently constructed sections of the Chester Valley and Schuylkill River Trails along with historical unit prices applicable to trail development from PennDOT's construction and bidding

database were used to approximate potential development costs for trail connections and trailhead facilities.

Estimates for the Downingtown Trestle and Whitford Bridge renovations are based on historical and current estimated costs for other like structures that have been rehabilitated for trail and/or park use. Many of those examples are from within the Commonwealth of Pennsylvania, including the following:

- Kinzua Skywalk – Kinzua Bridge State Park, McKean County, PA - \$4.3M renovation
- Schuylkill Banks Boardwalk – Philadelphia, PA - \$17M new construction
- Manayunk Bridge – Philadelphia, PA - \$6M renovation
- Sullivan's Bridge – Valley Forge NHP, King of Prussia, PA - \$9.3M new construction
- Safe Harbor Bridge – Enola Low Grade Trail, Lancaster County, PA - \$6-8M estimate



Sullivan's Bridge, King of Prussia, PA



Safe Harbor Bridge, Lancaster County, PA



Kinzua Skywalk, McKean County, PA.



Manayunk Bridge, Philadelphia, PA.

The following summary estimate of probable development costs in the categories of trail connections, structure renovations, and trailhead development include all design, construction, inspection, and land or easement acquisition costs:

A	Trail Connections	10.10 miles	\$9.5M+/-
	P&T Corridor	7.40 mi.	
	LDC/Ship Road Connection	0.80 mi.	
	Trestle Business Park Connection	0.25 mi.	
	East Branch Brandywine Trail Extension	0.50 mi.	
	Struble Trail Connection	1.15 mi.	
B	Structure Renovations		\$12.0M+/-
	Downingtown Trestle	\$8M+/-	
	Whitford Bridge	\$3M+/-	
	Other	\$1M+/-	
C	Trailhead Development		\$1.5M+/-
	Whitford	\$400,000	
	Boot/Southwind	\$600,000	
	Gallagherville	\$500,000	

Source: Chester County Planning Commission

Annual Maintenance and Security Costs

The Chester County Facilities and Parks department is responsible for maintaining the 13.5 miles of Chester Valley Trail already constructed and will be responsible for maintaining future segments. The county's 2017 maintenance budget for the Chester Valley Trail is \$215,919, or approximately \$16,000 in annual maintenance costs per mile of trail. This figure includes all grounds, maintenance and supply costs, including the salary and benefits for one full-time maintenance worker assigned to this facility. This figure is fairly high in comparison with other similar trails; however, the Chester Valley Trail is one of the most complex trails in the county system in terms of its number of signalized and non-signalized roadway crossings, bridges and culverts that are regularly maintained. Additionally, the Chester Valley Trail is maintained all year long which incurs costs for plowing and salting atypical of other trails.

In addition to maintenance, patrolling is also a cost necessary to safely operate the Chester Valley Trail. Chester County park rangers patrol all of the county's open space and trails, and their work patrolling the CVT is augmented by municipal police forces. The Chester County Facilities and Parks department believes the addition of the P&T segment of the Chester Valley Trail will warrant hiring an additional ranger, raising the County's current patrol budget by approximately \$50,000.

Annual Maintenance Costs: \$144,000+/-

- 2017 Chester County CVT Maintenance Budget = \$16,000/mile+/-
- Total 9.0 miles of multi-use trail

Annual Security Costs \$50,000+/-

- Chester County Park Rangers patrol county trails with assistance from municipal police forces
- Additional mileage would warrant an additional Park Ranger and an increase to the patrol budget

Source: Chester County Facilities and Parks

Implementation Steps

Moving forward towards developing a trail on the recommended alignment of the P&T Branch will occur once the negotiations between PennDOT and the Norfolk Southern Corporation have been completed. Since there is no defined schedule for when these negotiations will be complete, the following are the general steps that Chester County should take towards making this vision a reality:

1. **Coordinate with PennDOT regarding obtaining an easement for trail use within the P&T corridor.** This initial step is most important as the acquisition of right of way is absolutely necessary before any trail development could begin. This coordination will take place once the successful negotiations between PennDOT and Norfolk Southern have completed and the corridor is in PennDOT ownership. Once an agreement is made between the County and PennDOT, then the County can begin to work with the landowners through which the connectors trails will pass in order to make the critical connections from the existing Chester Valley Trail to the P&T Branch and from the P&T Branch into the Borough of Downingtown;
2. **Determine the structural integrity of all corridor structures** (Downingtown Trestle, Whitford Bridge, Route 100 Bridge, stone arch underpasses). The proposed structural renovations of the Downingtown Trestle and the Whitford Bridge are critical to providing access to the large segments of the P&T Branch. The Whitford Bridge links the north and south sides of the Amtrak Keystone Corridor and is necessary to create a continuous trail from Ship Road in Exton to just east of the Downingtown Trestle. A structural assessment of the more complex Downingtown Trestle will determine whether or not the corridor segment west of the Trestle will be viable for trail use as the Trestle provides the only real means to access this segment of the corridor;
3. **Perform complete topographic/boundary survey and prepare design documents.** This step should begin after it is determined by the structural evaluations which segments of the P&T Branch will be developed, if not the entire recommended stretch from Ship Road to the Gallagherville flyover;
4. **Prepare phasing plans for implementation based on available funding.** This step is best suited for near the end of the design phase once the real costs and status of any right of way acquisitions for the connector trails are more defined; and,
5. **Bid and construct proposed improvements.**

The timing of implementation will mostly be affected by the availability of funding and to what level of engineering and potential additional study will be required as determined by the funding source. Another factor in the schedule of improvements will involve agency coordination. In addition to PennDOT and Chester County, SEPTA and Amtrak will need to be involved in the renovation of the Whitford Bridge and the proposed improvements associated with the future development of the Exton Station.

Potential Funding Sources

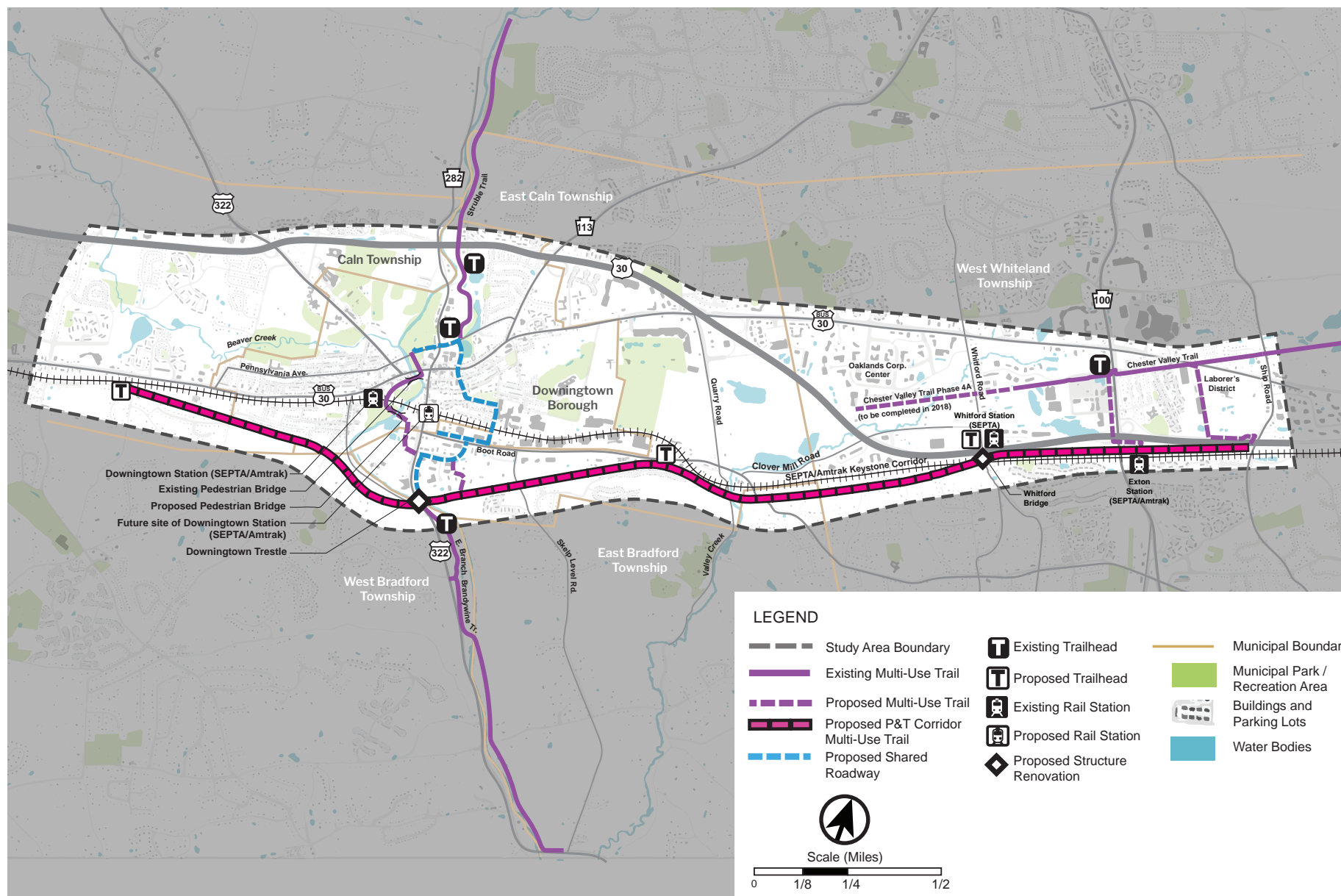
The following is a list of funding sources available at the time of this study for which trail development and the proposed improvements outlined herein are eligible.

- [PA DCNR Community Conservation Partnerships Program \(C2P2\)](#)
- Multimodal Transportation Fund Programs offered by [PennDOT](#) and the [PA Department of Community and Economic Development \(DCED\)](#)
- [PennDOT Transportation Alternatives Set Aside Program](#) (formerly TAP, Transportation Enhancements)
- [PA DCED Greenways, Trails, Recreation Program \(GTRP\)](#)
- [DVRPC Regional Trails Program](#)
- The Circuit TIP line item
- Public / Private Partnerships
- Private Foundations
- Chester County

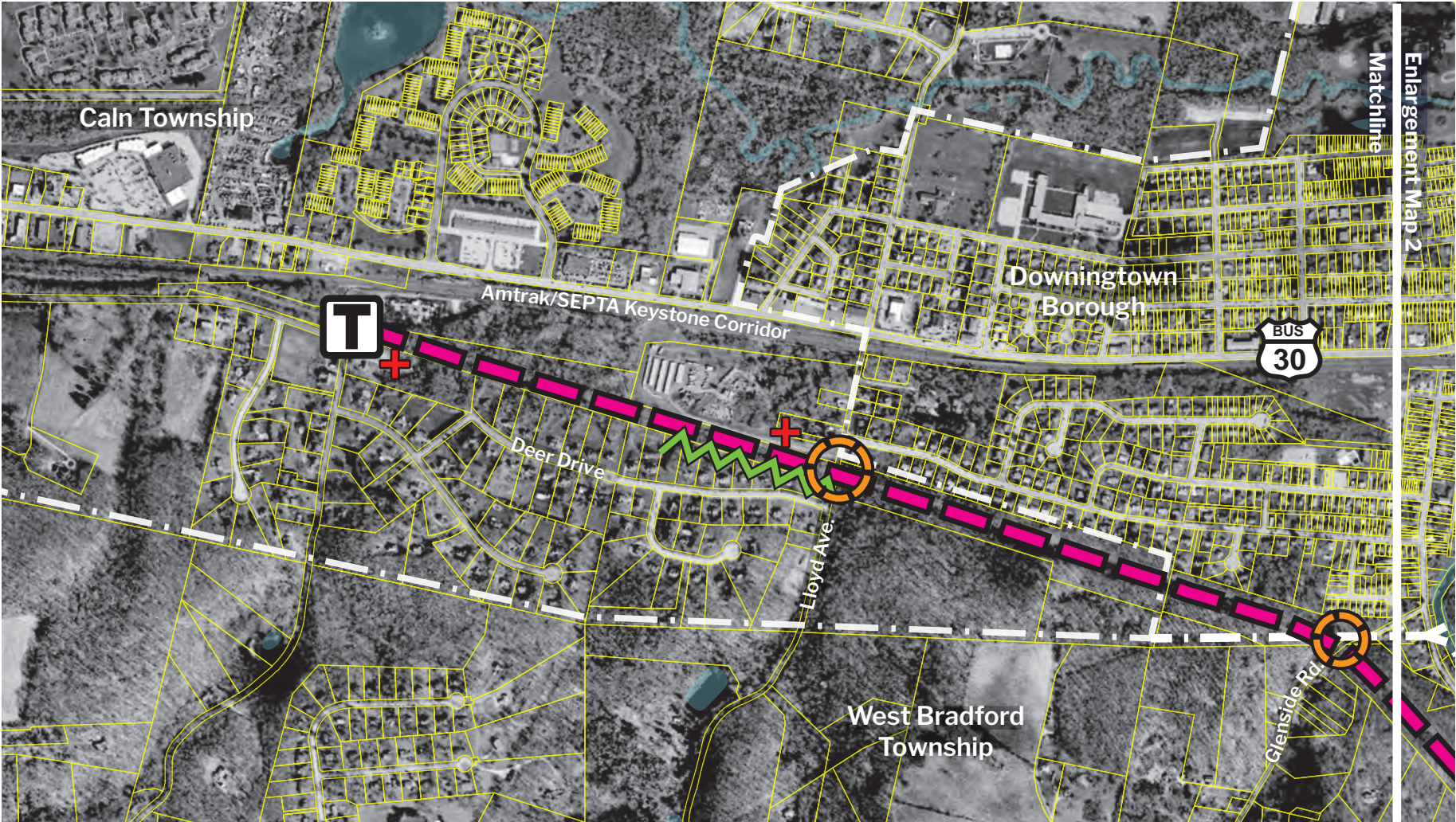
Applications and/or funding requests to these programs will be coordinated with the phased implementation strategy to be developed with PennDOT as the project moves forward.

Trail Mapping

The initial overview map provides a high level summary of the recommended alignment for extension of the Chester Valley Trail and its connections to the Struble and East Branch Brandywine Trails. The more detailed maps associated with the P&T Branch alignment indicate the location of proposed improvements, existing corridor structures, historical interpretation opportunities, emergency access points, photo-simulation rendering locations, and other existing features within the mapping area.

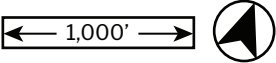


Enlargement Map 1

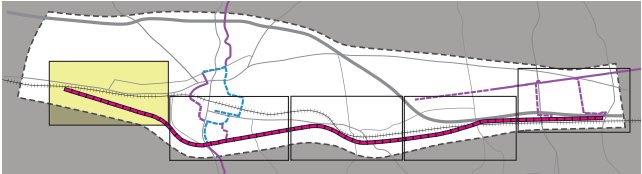


Legend

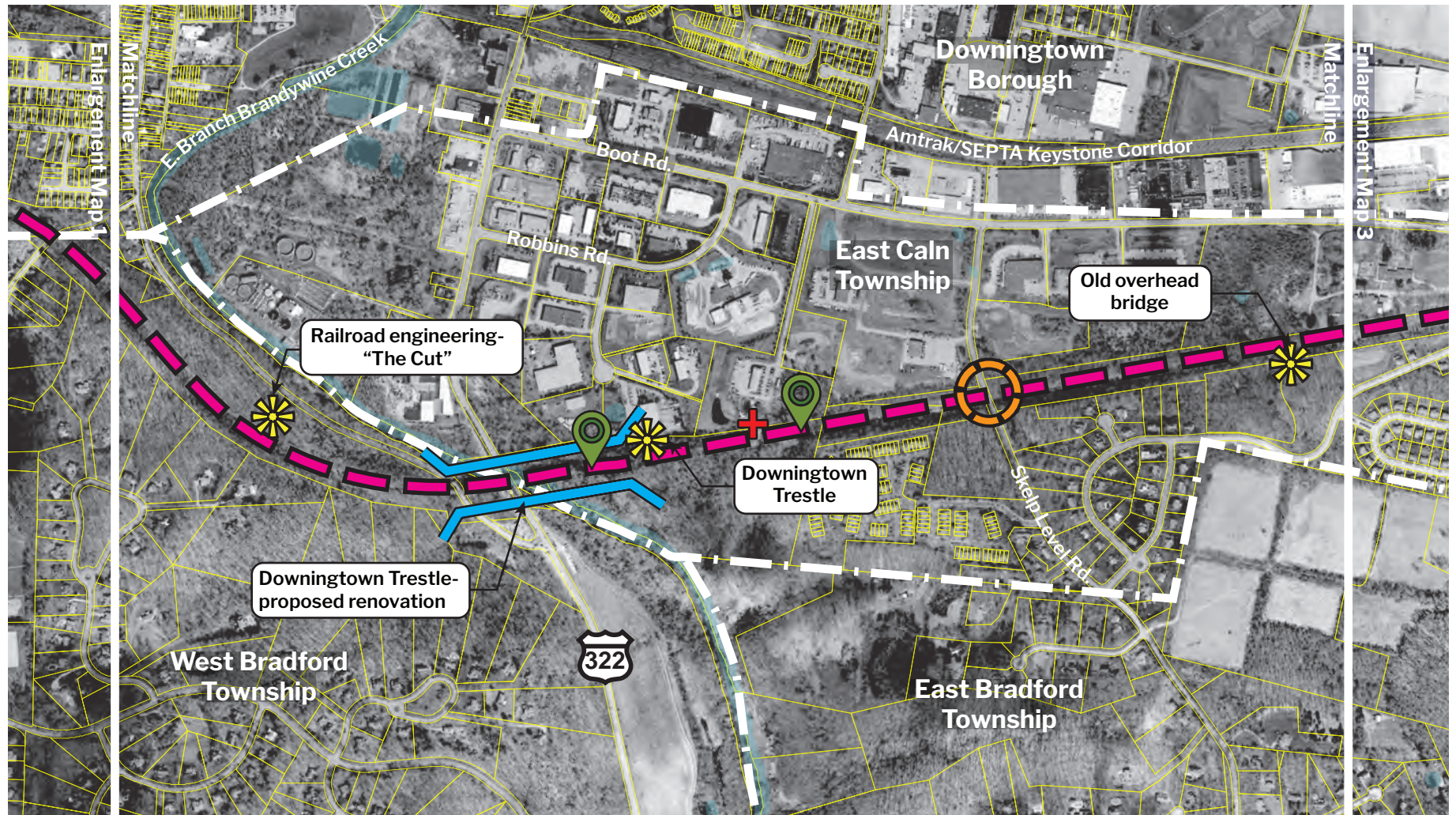
- Recommended CVT alignment
- Municipal Boundaries
- Parcels
- Emergency access location
- Existing stone arch underpass or overhead bridge
- Proposed trailhead
- Potential screening



Key Map



Enlargement Map 2



Legend

- Recommended CVT alignment
- Municipal Boundaries
- Parcels

- Existing CVT
- Proposed multi-use connector
- Existing Pipeline

- Bridge
- Existing stone arch underpass or overhead bridge

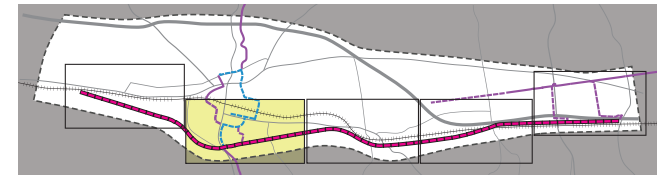
- Cultural/Historic Interpretation Opportunity
- Emergency access location

- Photosimulation location

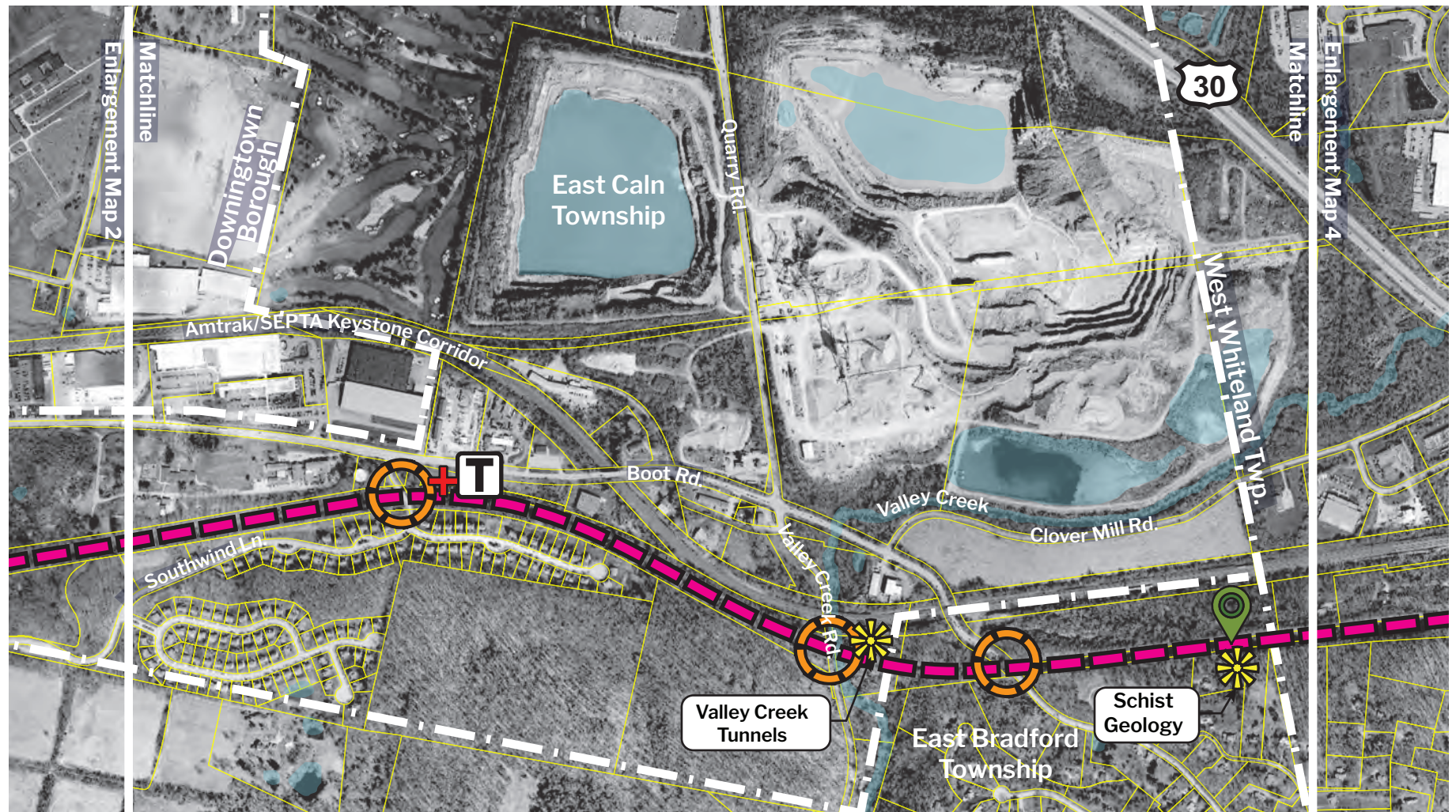
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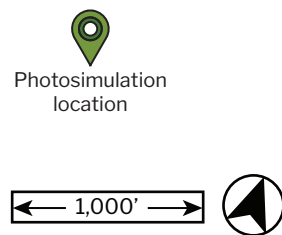
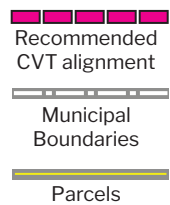
Key Map



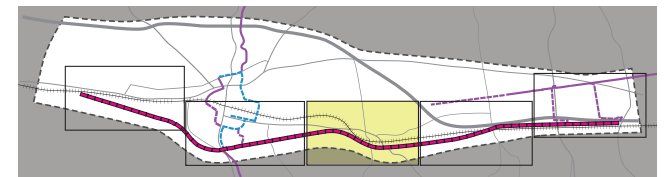
Enlargement Map 3



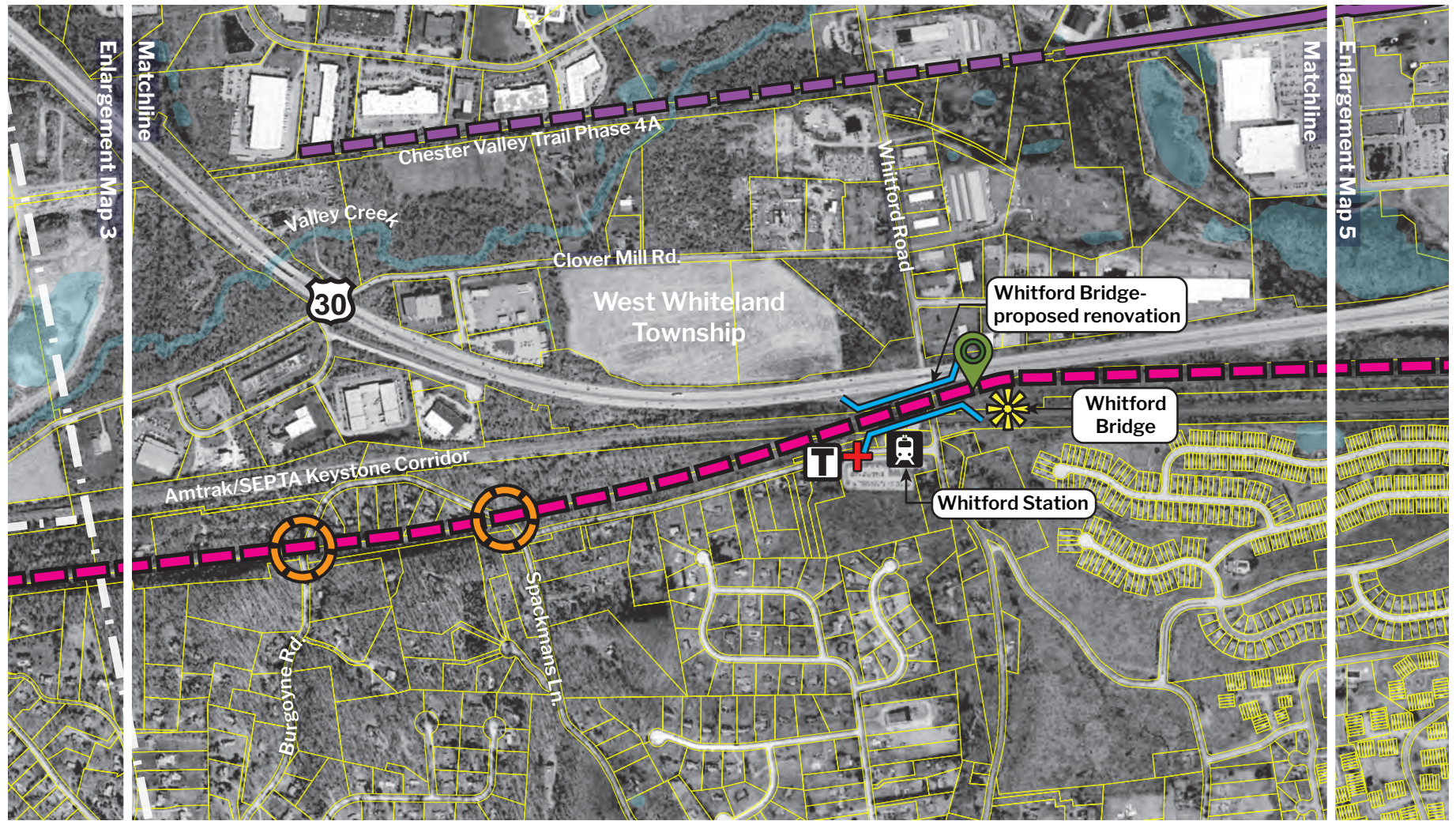
Legend



Key Map



Enlargement Map 4



Legend

- Recommended CVT alignment
- Existing CVT
- Proposed multi-use trail

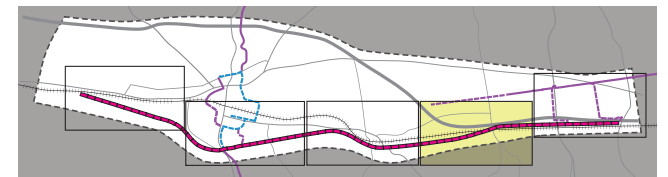
- Municipal Boundaries
- Parcels
- Emergency access location

- Bridge
- Existing stone arch underpass or overhead bridge

- Cultural/Historic Interpretation Opportunity
- Proposed trailhead

- Photosimulation location
- 1,000'
-

Key Map



Enlargement Map 5



Legend

- Recommended CVT alignment
- Existing CVT
- Proposed multi-use connector
- Existing Pipeline
- Municipal Boundaries
- Parcels

- Existing stone arch underpass or bridge overpass
- Existing Trailhead

- Photosimulation location
- 1,000'

Key Map

