

state college area
CONNECTOR

**PLANNING AND
ENVIRONMENTAL
LINKAGES**

(PEL) STUDY



June 2023

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EXECUTIVE SUMMARY

Study Overview

The Pennsylvania Department of Transportation (PennDOT), in cooperation with the Federal Highway Administration (FHWA) and in coordination with the Centre County Metropolitan Planning Organization (CCMPO), is preparing this Planning and Environmental Linkages Study (PEL) for the State College Area Connector Study. A PEL Study is a high-level planning approach to transportation decision-making that considers the environment, community, and economic goals early in the transportation planning process. A PEL Study promotes a collaborative and integrated process.

The State College Area Connector PEL Study involves a seven-step process (**Figure ES-1**). Public and agency engagement occurred throughout the PEL process. Engagement took many forms throughout the PEL Study including a website, electronic mailing list, local pop-up meetings, public meetings (both virtual and in-person open house formats), stakeholder workshops, public officials meetings, and resource agency coordination meetings.

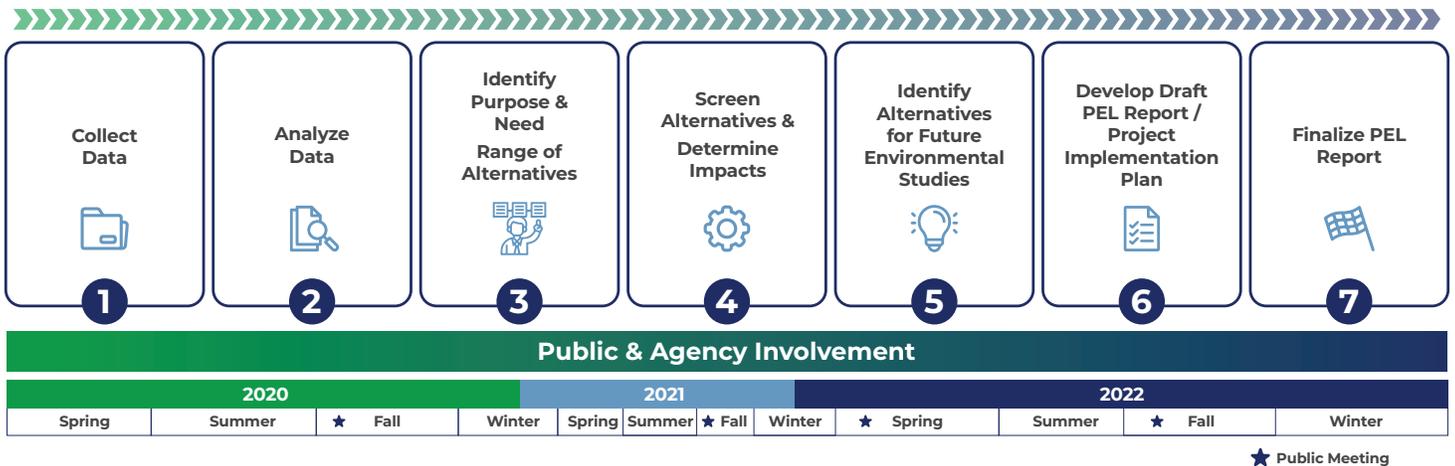


Figure ES-1: State College Area Connector PEL Study Process

State College Area Connector Study Area

The PEL study area extends approximately 70 square miles and encompasses the communities and portions of roadways experiencing transportation problems and the locations of alternative solutions to address those problems in southern Centre County. The key roadways in the study area include I-99, US 322, PA 26, PA 144, PA 45, PA 192, and PA 64 (**Figure ES-2**). I-99, US 322 (Mt. Nittany Expressway), and US 322 (Potters Mills Gap) provide the potential logical termini for which alternative solutions could connect. For more information about the study area, see **Chapter 1**.

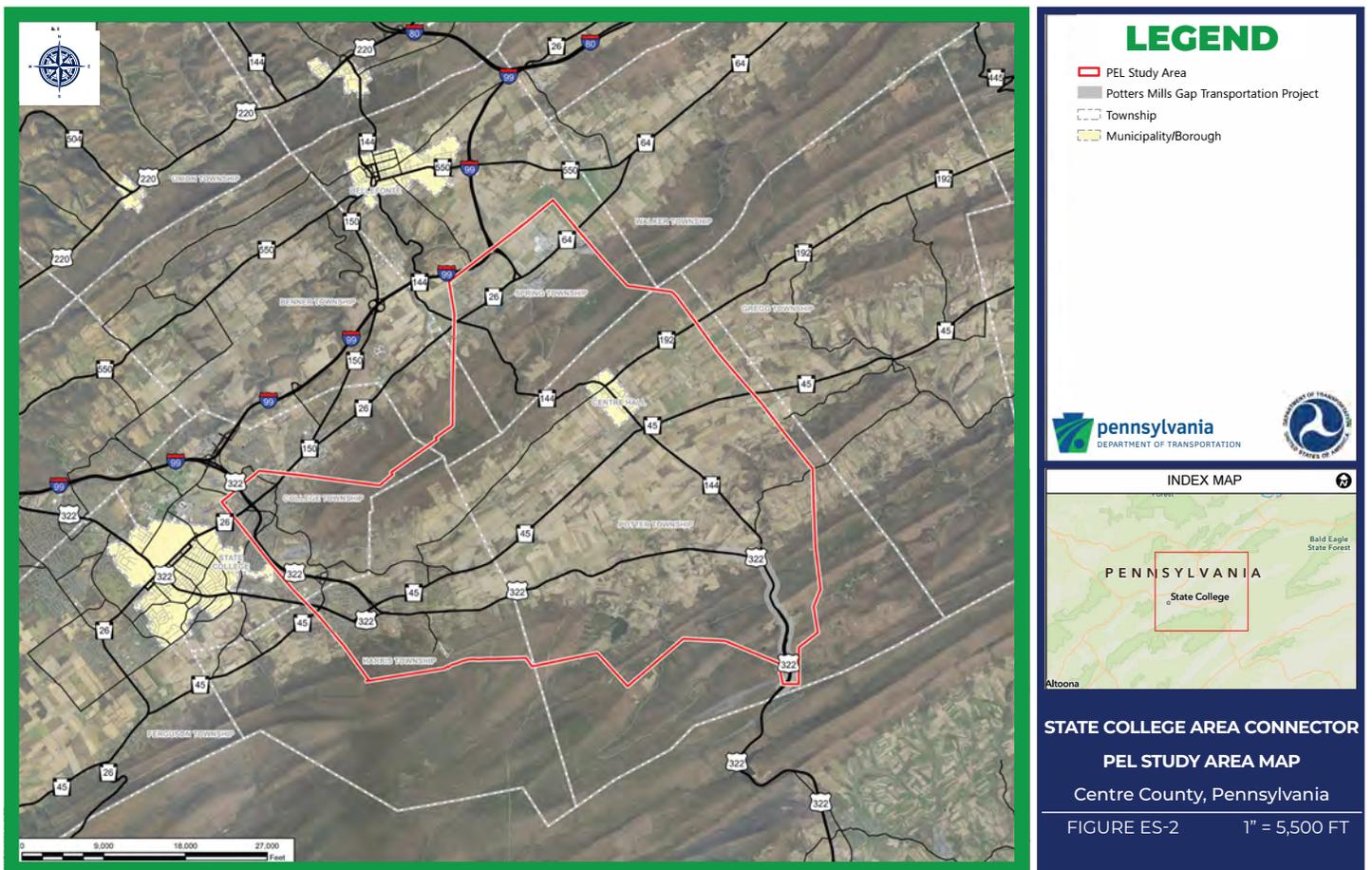


Figure ES-2 can also be found in Appendix A at a larger size.

Figure ES-2: PEL Study Area Map

Purpose and Need

The purpose of this study is to develop and evaluate a range of alternatives to improve mobility and meet the needs of interstate, regional, and local traffic passing through and moving within the study area by reducing congestion, improving safety, and addressing system continuity.

Within the study area, an evaluation of the transportation network identified the following transportation deficiencies which led to the development of specific need statements:

- Existing roadway configurations and traffic conditions contribute to safety concerns in the study area.
- High peak hour traffic volumes cause congestion and result in unacceptable Level of Service (LOS), a measure of traffic flow/congestion, on US 322, PA 45, and PA 144 roadways and intersections within the study area.
- The roadway network configuration in the study area lacks continuity and does not meet driver expectations.

For more information on the PEL Study purpose and need, see **Chapter 3**.

Alternatives Development and Screening

A range of alternatives, typical of transportation studies, was identified and screened. A two-step: qualitative and quantitative screening process was used to systematically evaluate each alternative's ability to meet the identified study purpose and need, minimize environmental impacts, meet required engineering and constructability criteria, and address the identified study goals. During this screening process, any alternative determined not to meet the study's purpose and need was dismissed from further consideration as a viable improvement alternative (**Figure ES-3**).

The screening process also identified "other future independent transportation projects" which did not fully meet the study's purpose and need but could still have independent utility as stand alone projects. These potential projects are identified in **Chapter 8**. PennDOT would work with the CCMPO and local stakeholders to develop an implementation plan and secure dedicated funding for project advancement.

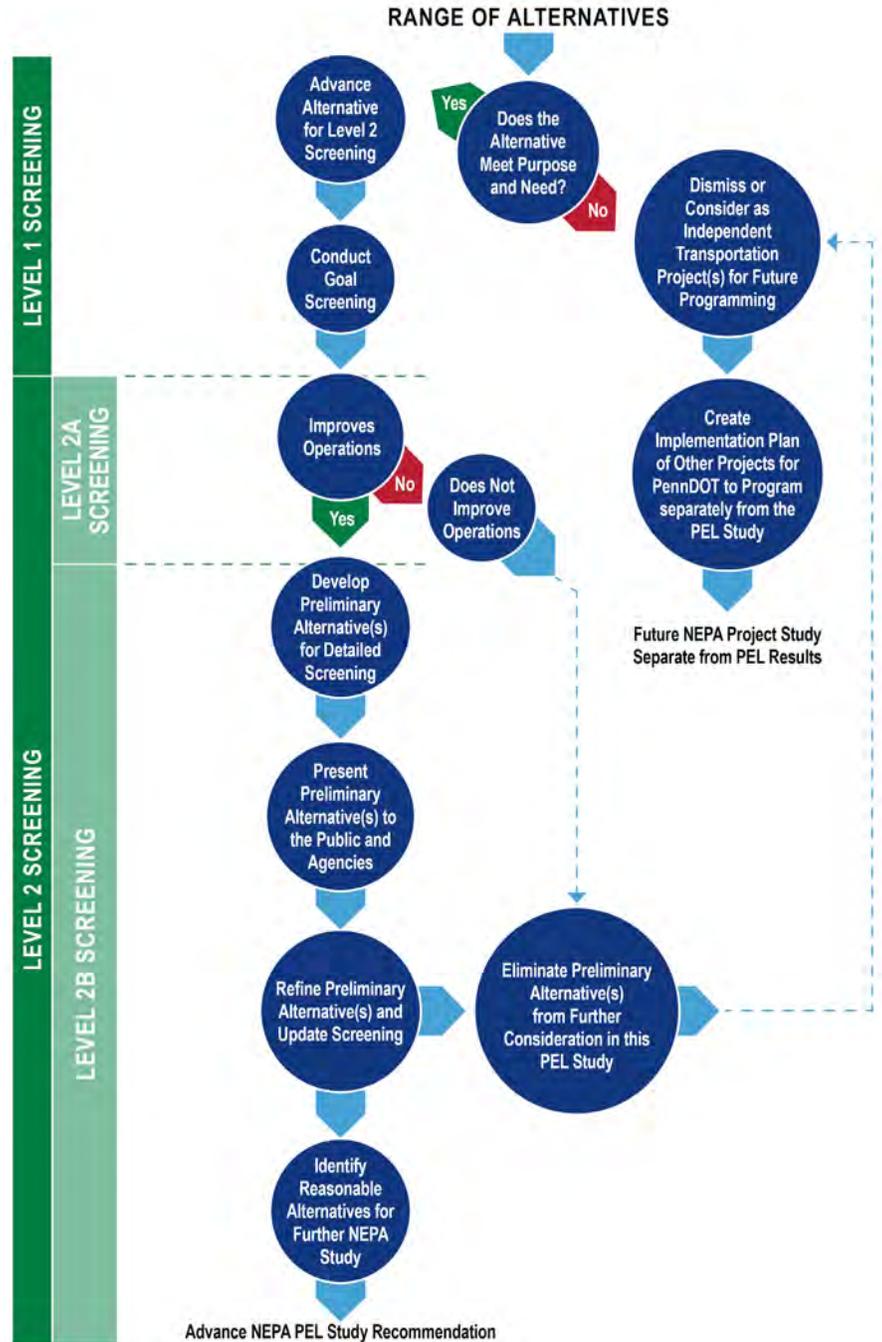


Figure ES-3: Alternative Screening Process

Alternatives Recommended for Further Study

Based on the alternative screening process, the TSM, TCM, Transit, and No Build Alternatives were dismissed from further study during the Level 1 Screening for not meeting the PEL Study purpose and need. The US 322 Upgrade Existing and nine Build Alternative corridors were advanced through the Level 2A Screening and into Level 2B Screening for more detailed analysis. The US 322 Upgrade Existing Alternative was dismissed from further study during the Level 2B Screening, as it did not improve safety on the overall roadway network therefore did not meet the PEL Study purpose and need. **Table ES-1** provides an overview of the alternative screening results.

Upon completion of the traffic, environmental, engineering, and planning screenings, various Build Alternatives were identified as recommended for each of these disciplines. When analyzing the traffic, environmental impacts, engineering parameters, and planning data, the US 322-10EX, US 322-1S and US 322-5 Build Alternative corridors best balanced all of those considerations and were identified as reasonable alternatives to be advanced for further engineering and environmental study in the National Environmental Policy Act (NEPA) phase of the transportation project development process (Figure ES-4).

Table ES-1: Alternative Screening Results

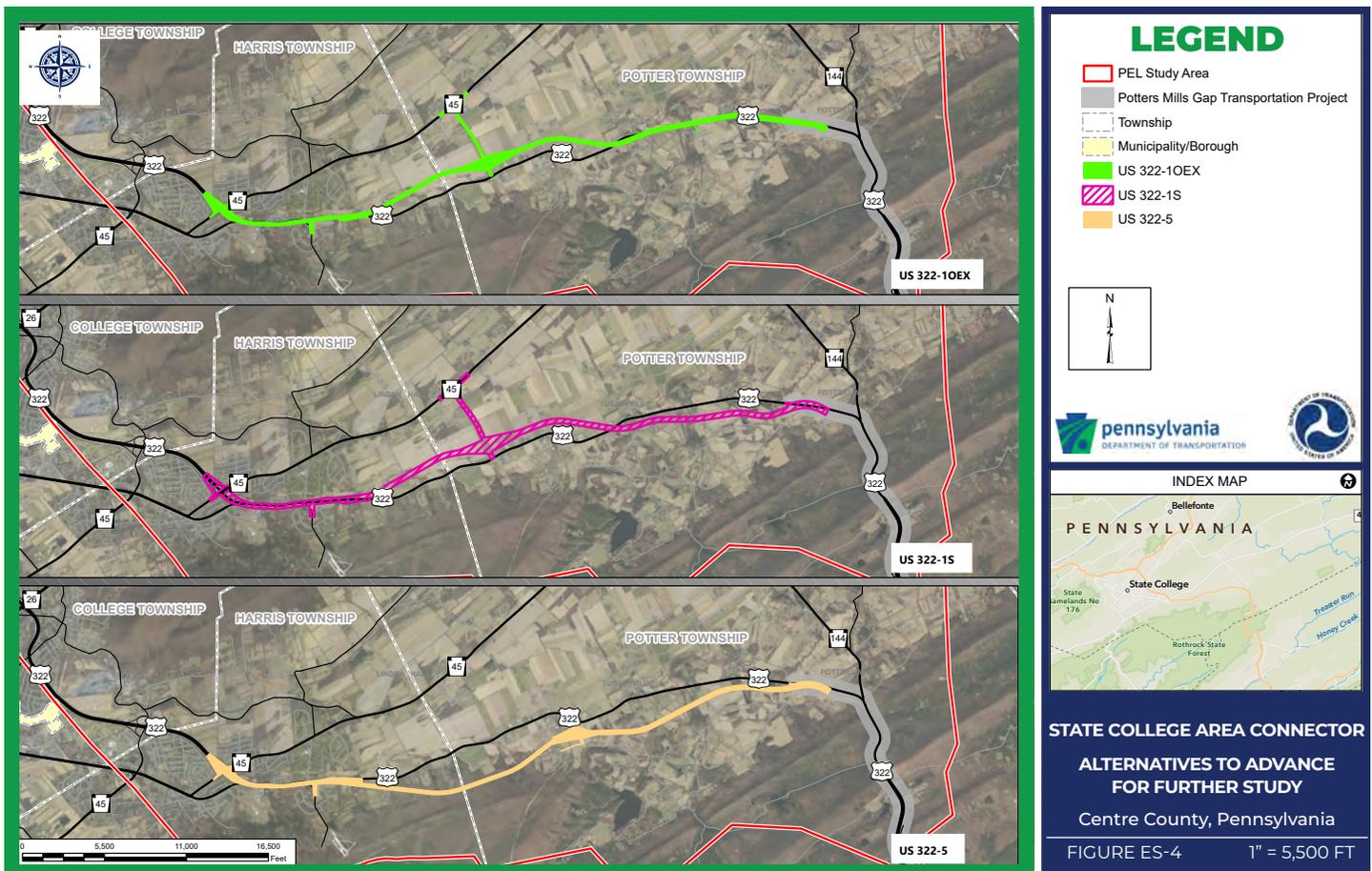
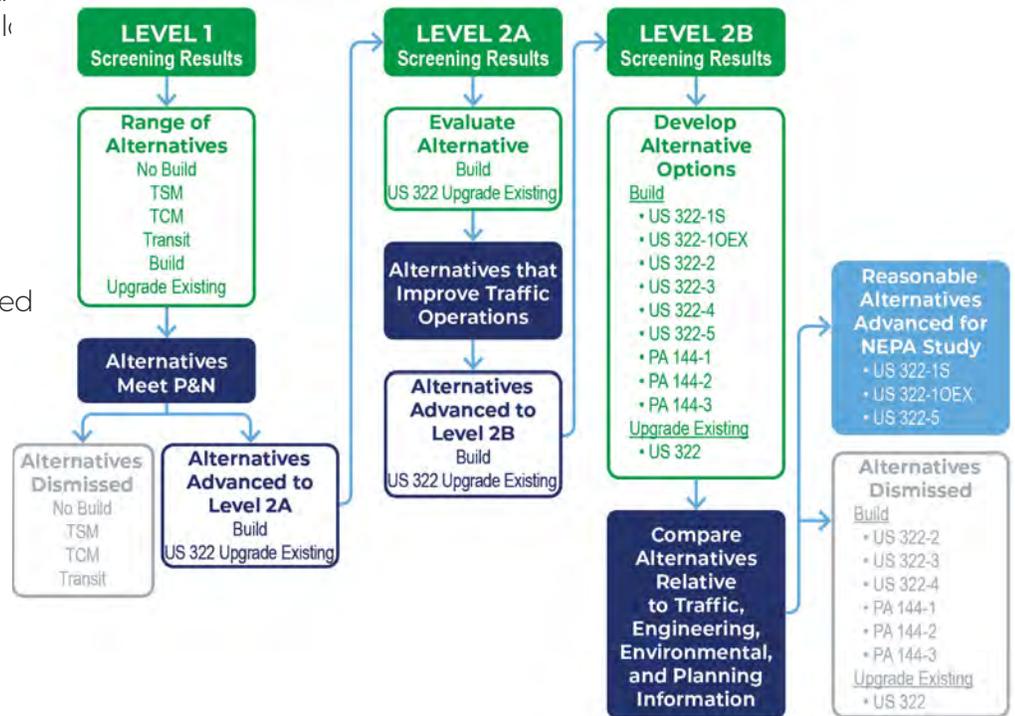


Figure ES-4 can also be found in Appendix A at a larger size.

Figure ES-4: Alternatives to Advance for Further Study

CHAPTER 1: INTRODUCTION

The Pennsylvania Department of Transportation (PennDOT) is dedicated to working with the public and federal, state, and local officials and agencies to provide safe and reliable transportation solutions for Pennsylvania. To assist in accomplishing this objective, PennDOT, in cooperation with the Federal Highway Administration (FHWA) and in coordination with the Centre County Metropolitan Planning Organization (CCMPO), initiated a Planning and Environmental Linkages Study (PEL) for the State College Area Connector Study in 2020.

A. What is a PEL Study?

A PEL Study is a collaborative and integrated decision-making process and is the first of five phases in the transportation project development process. This high-level planning approach considers the environment, community, and economic goals early in the transportation planning process. It also encourages the planning goals to be incorporated throughout later phases of the transportation development process (**Figure 1-1**). PEL studies foster early involvement with the public and regulatory agencies to be more effective. Overall, PEL studies expedite project schedules by identifying and reducing the number of alternatives to be advanced for more detailed environmental study and engineering design. Essentially, the goal of the PEL Study is to create a seamless decision-making process that minimizes duplication of effort, promotes environmental stewardship, and reduces delays from planning through project implementation.

PEL Studies are generally more focused than regional planning efforts, but broader than traditional project-specific environmental analyses typically conducted during the National Environmental Policy Act (NEPA) process. The PEL Studies can be used to produce a wide range of analyses or decisions for FHWA review, consideration, and possible adoption during the NEPA process for an individual transportation project, including:

- Purpose and need or goals statement(s)
- Range of alternatives identification
- Preliminary screening of alternatives and elimination of unreasonable alternatives
- Basic description of the environmental setting
- Preliminary identification of environmental impacts and conceptual environmental mitigation

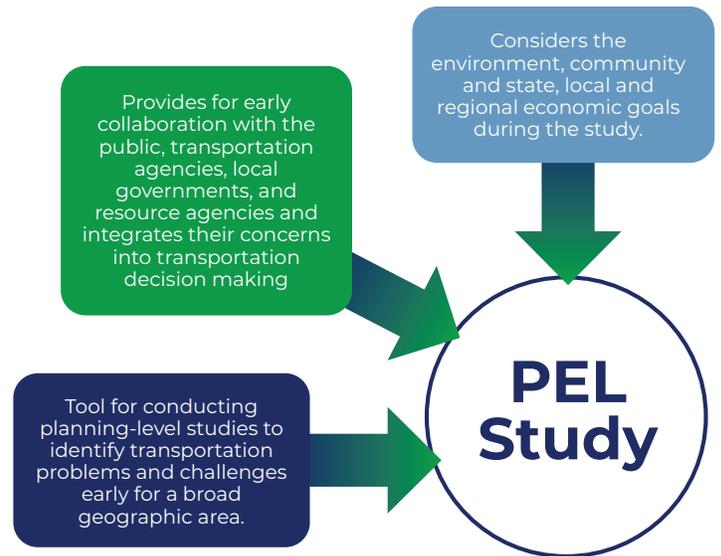


Figure 1-1: PEL Study Overview

This PEL Study must be prepared in accordance with 23 USC Section 168 as well as 23 CFR 450.212. These regulations allow analyses conducted during planning to be incorporated directly or by reference into subsequent environmental documents prepared in accordance with NEPA, provided that the studies were adequately documented; interested Federal, State, local and tribal agencies were involved; a reasonable opportunity for public review and comment on the PEL Study was provided; and the FHWA was engaged.

Some of the key criteria that a federal agency must consider in deciding whether to adopt planning-level analyses or decisions in the NEPA process include:

- Involvement of interested state, local, tribal, and federal agencies.
- Public review
- Reasonable opportunity to comment during the development of the PEL Study
- Documentation of relevant decisions in a form that is identifiable and available for review during the NEPA scoping process and can be appended to or referenced in the NEPA document
- FHWA review

FHWA has developed a PEL Questionnaire to aid the PEL Study in informing the NEPA process. The questionnaire is intended to act as both a guide and summary of the planning process and ease the transition from planning to NEPA analysis. A copy of the PEL Questionnaire is included in the State College Area Connector PEL Study technical files.

Transportation Project Development Process



Planning and Environmental Linkage (PEL) Study – Provides a high-level, early-planning process used in transportation decision-making that considers environmental, community, and economic goals early in the planning stage resulting in projects that can be carried through design and construction. A PEL Study streamlines the project delivery process and serves as a public platform to discuss and prioritize transportation issues.

Preliminary Engineering/Environmental Studies (NEPA) – Includes focused studies about traffic, safety, the environment, and the evaluation of project specific alternatives. This phase ends with the selection of an alternative to advance into final engineering design.

Final Engineering Design – Refines the selected project alternative design plans to identify right-of-way requirements and fulfill environmental commitments. Final engineering design plans are detailed enough to construct the project. Environmental permitting and detailed utility coordination occur during this phase.

Right-of-Way Acquisition – Occurs when project impacts to private property are unavoidable. PennDOT works with the owners to determine the property's Fair Market Value, negotiate the acquisition of the property, and provide relocation assistance, if necessary.

Construction – Occurs once final engineering design is complete and the right-of-way acquired. Depending on the scale of the proposed improvements, multiple construction contracts may be developed to complete the overall project. The newly constructed improvements to the transportation system will address the purpose and need which were identified in the early stages of the process.

B. What is the Study Area?

The State College Area Connector PEL Study is approximately 70 square miles, extends through the southern portion of Centre County, and includes all or parts of six municipalities: Centre Hall Borough and Potter, Spring, Harris, College, and Benner Townships. The study area includes key transportation routes that provide access to regional destinations and beyond via major routes such as U.S. Route (US) 322, Pennsylvania Route (PA) 144, PA 45, and Interstate 99 (I-99) which, in turn, provide access to nearby I-80 (**Figure 1-2**). The study area is also shaped by the topography of the area and primarily encompasses the southwestern portion of Penns Valley that extends between Nittany Mountain to the north and the Seven Mountains area of the Tussey Mountain range to the south. Parts of Nittany Valley on the north side of Nittany Mountain are also included within the study area, as is the more urbanized Centre Region that connects both valleys at the southwestern end of Nittany Mountain. The limits of the study area boundary were defined to ensure that any relevant factors that may influence the study needs (and the development of the range of alternatives that would address these needs) are incorporated, including identification of logical project termini (US 322 Mount Nittany Expressway and Potters Mills Gap and I-99), assessment of environmental impacts, and development of potential mitigation.

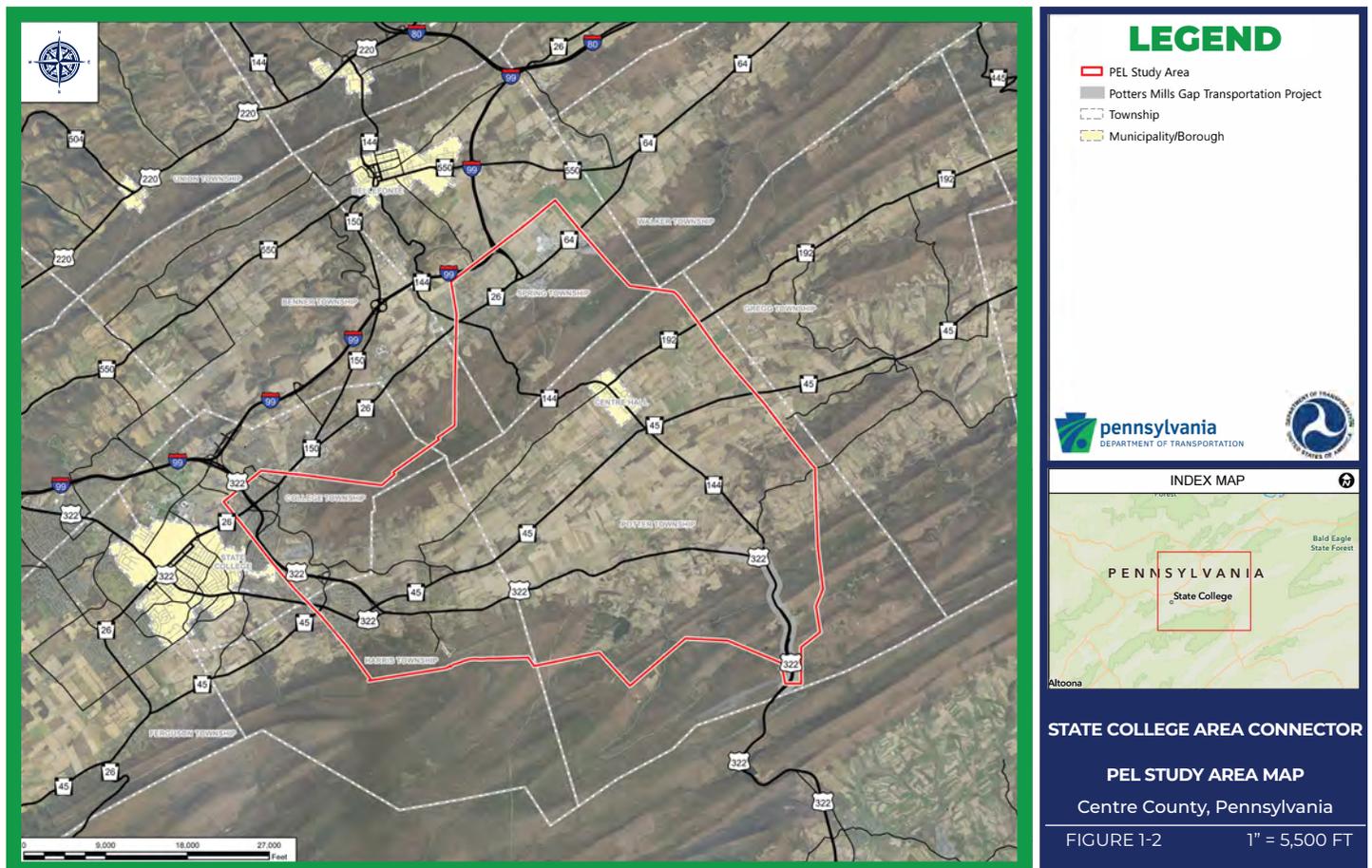


Figure 1-2 can also be found in Appendix A at a larger size.

Figure 1-2: PEL Study Area Map

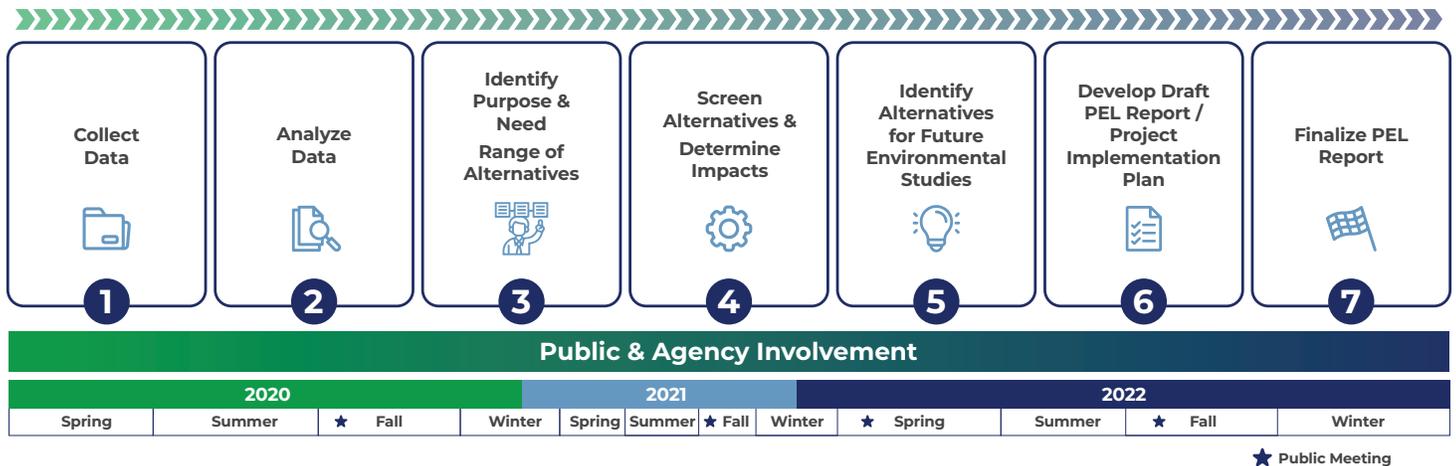


Figure 1-3: State College Area Connector PEL Process

C. What is the PEL Scope?

The scope of the State College Area Connector PEL Study includes a seven-step process (Figure 1-3).

Step 1 collects environmental, engineering, and traffic data to provide a foundation for use in future steps.

Step 2 analyzes the collected data to identify the challenges on the existing transportation system.

Step 3 documents transportation challenges by developing the purpose and need statement that will be used to identify and evaluate a Range of Alternatives.

Step 4 analyzes the alternatives to determine the transportation system benefits/issues and their associated potential natural, cultural, and socio-economic impacts.

Step 5 identifies alternatives to advance for further evaluation in future environmental and engineering studies.

Step 6 documents the results of the PEL Study and develops an implementation plan for future studies or projects.

Step 7 finalizes the PEL Study report and receives study concurrence from the FHWA.

Public and agency engagement extends through the entire PEL process with key milestones for specific public involvement activities.

CHAPTER 2: BACKGROUND

A. What is the Study Area Transportation Network?

The study area has three components to the transportation network; roadways, active transportation facilities, and public transportation.

1. Roadway Network

Centre County, geographically positioned within the center of Pennsylvania, has key transportation routes that serve national and international trade, provide access to regional destinations, and link local trips.

The key roadway network within and adjacent to the study area contains different classifications of roadways that provide different functions. The following is a summary of the key area roadways.

I-80 traverses east and west across the United States from California to New Jersey, and I-99 is a north-south route that links the Pennsylvania Turnpike (I-70/I-76) with I-80. I-80 and I-99 are classified as Interstate Highways. US 322 is an east-west freeway/expressway running from Cleveland to New Jersey. Regionally, it connects Harrisburg to State College and Clearfield. US 322 Business (also known as Atherton Street and Boal Avenue) connects to I-99. It is a major route through State College. US 322, US 322 Business, PA 26, and PA 144 are classified as principal arterial highways; and PA 45 is classified as a minor arterial (**Figure 2-1**). These routes, with the exception of PA 45, are identified as part of the National Highway System.

I-80 and I-99 are considered Primary Federal Freight Corridors, while PA-45 is considered a Critical Urban and Rural Freight Corridor. US 322 is also identified by CCMPO as a key trucking corridor that is a two-lane roadway and does not meet modern design standards desirable to accommodate the high truck volumes (CCMPO LRTP 2044, 2018 Update and LRTP 2050).

There are numerous major/minor collector and local roads that provide connections to these key roadways throughout the study area. **Figure 2-1** illustrates the federal functional classifications for area roadways, which are defined in **Table 2-1**.

More information on the transportation network and local and regional planning can be found in the following documents:

- Final Purpose and Need for the State College Area Connector Planning and Environmental Linkage Study (February 2021)
- Centre County Long Range Transportation Plan 2050 (September 2020)
- 2021-2024 Center County Transportation Improvement Program (November 2021)
- 2023 - 2026 Statewide Transportation Improvement Program (June 2022)
- 2021 Pennsylvania 12-Year Program (August 2020)
- Centre County Unified Planning Work Program (November 2021)



US 322 showing mix of freight and passenger vehicles

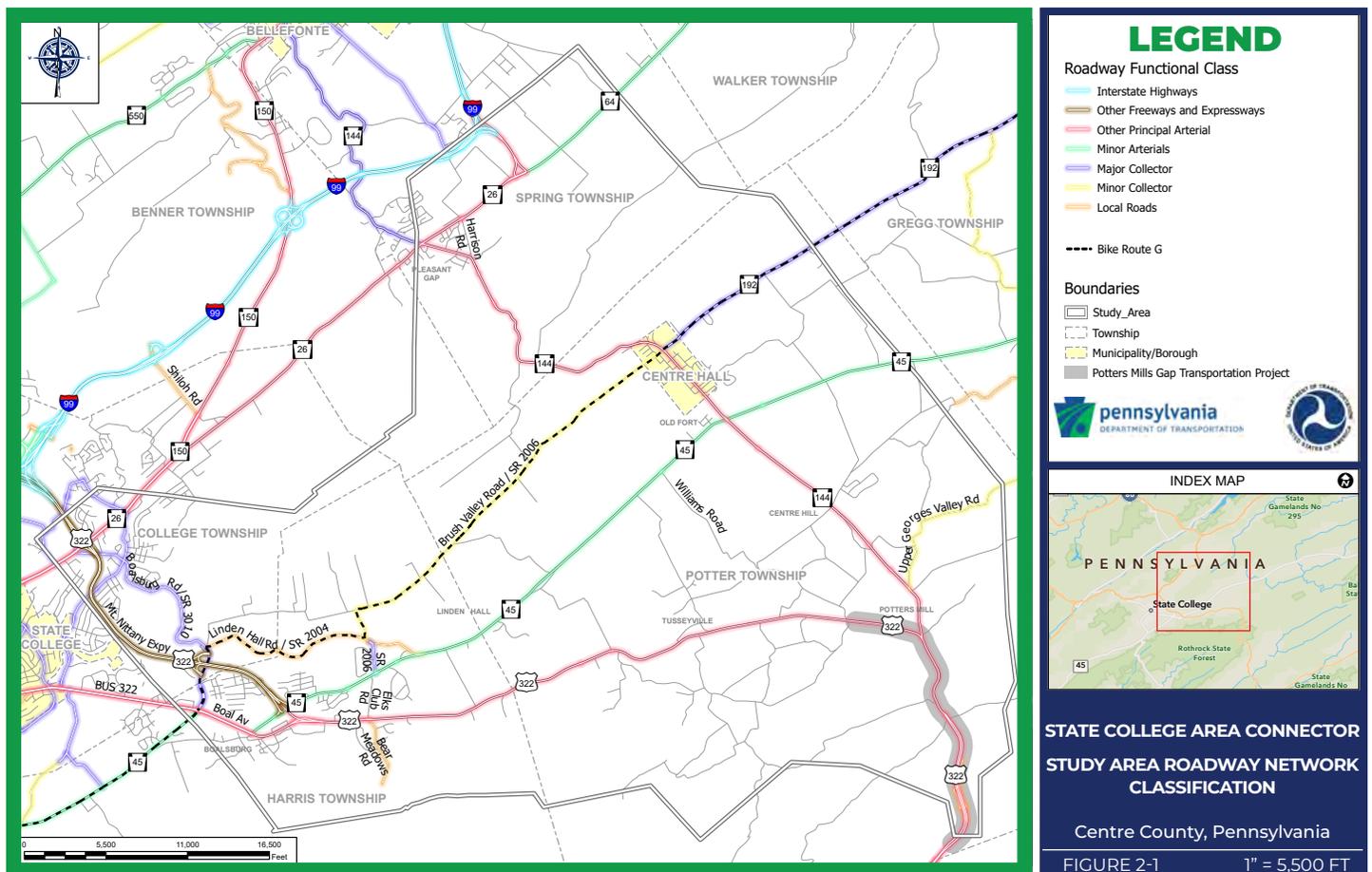


Figure 2-1 can also be found in Appendix A at a larger size.

Figure 2-1: Study Area Roadway Network Classification

2. Active Transportation Network

Pennsylvania Bicycle Route G extends through the study area and is part of the statewide bicycle route system that serves as touring routes for travel, tourism, and recreation. It extends through Potter Township and Centre Hall (using Brush Valley Road, including PA 192), extending into Harris Township (using Brush Valley Road to Rock Hill Road and Linden Hall Road) and then into College Township (using Linden Hall Road to connect to Boalsburg Road and Warner Boulevard) and then out of the study area south by way of PA 45 (**Figure 2-1**). Cycling also occurs along other study area roadways which are not official bike routes.

Throughout the southern portions of the study area, there are trails that are used for recreational cycling and hiking (mountain trails). In the western portion of the study area, there are trails and paths within and adjacent to residential neighborhoods designed for less experienced cyclists. Pedestrian facilities are concentrated in the urban and village areas of the County.

Table 2-1: Federal Functional Roadway Classifications

Federal Functional Classification	Classification Description	Centre County Roadways
Interstate Highway	Network of limited access, divided highways offering high levels of mobility while linking major urban areas	I-80, I-99
Other Freeways and Expressways	Divided highways with partial (expressway) or full (freeway) control of access that serve through traffic and maximize mobility; abutting land uses not directly served	US 322 (Mount Nittany Expressway)
Other Principal Arterial Highways	Serve major metropolitan areas, provide a high degree of mobility, and can also provide mobility through rural areas. Unlike access-controlled roads, abutting land uses can be served directly.	US 322/Business US 322, PA 144, PA 26
Minor Arterial	Provide service for trips of moderate length, serve geographic areas smaller than their higher arterial counterparts and offer connectivity to the higher arterial system. In rural areas are typically designed to provide relatively high overall travel speeds, with minimum interference to through movement.	PA 45
Major Collector	Gather traffic from Local Roads to funnel to the arterial network, generally serves intra-county travel (rather than statewide) – collector that offers more mobility	PA 192, SR 3010 (Boalsburg Road/Warner Boulevard), SR 2006 (Linden Hall Road)
Minor Collector	Gather traffic from Local Roads to funnel to the arterial network, generally serves intra-county travel (rather than statewide) – collector that offers more access	SR 2006 (Brush Valley Road/Rock Hill Road), SR 2010 (Georges Valley Rd)
Local Roads	Not intended for long distance travel, except at the origin or destination end of the trip, due to their provision of direct access to abutting land. Bus routes generally do not run-on Local Roads and they are often designed to discourage through traffic.	SR 2004 (Linden Hall Road/Cedar Run Road), SR 2001 (Bear Meadows Rd)

3. Public Transportation Network

The Centre Area Transportation Authority (CATA) is a joint municipal authority, comprised of State College Borough and College, Ferguson, Harris, and Patton Townships. CATA provides public transportation operations within the boundaries of the participating municipalities and extended service by contract to the areas of Bellefonte Borough, and Benner and Spring Townships.

CATA offers a variety of transportation services including:

- CATARIDE is a demand-response transportation network only for individuals age 65 and over or those eligible for paratransit under the Americans with Disabilities Act (ADA) at reduced fares,
- CATA COMMUTE is a vanpool/rideshare transit,
- CATAGO is an on-demand bus service (similar to Uber),
- CATABUS provides traditional bus service on a fixed route.

Currently, there are no CATABUS fixed routes that extend through the entire study area.

B. What Previous Transportation Projects/Studies Occurred in the Study Area?

Many transportation improvement studies and projects have occurred that influence travel within and immediately adjacent to the study area dating back to 1970s. However, in the 1990s, key regional and study area studies occurred which greatly influenced travel and development within the study area.

1. Interstate 80

- I-80 was completed in Pennsylvania in 1970.
- I-80 through Pennsylvania influenced traffic patterns, particularly an increase in interstate truck traffic. This increase in traffic affected travel conditions within the study area, specifically along PA 144 and US 322.
- Roadway safety and quality of life in Centre County communities traversed by these roadways were influenced by the I-80 completion.

2. Interstate 99

- US 220 study west of the State College area led to the development of a major improvement project for a new north-south interstate through Centre County that culminated with the construction of I-99 extending from Blair County to US 322 (the Mount Nittany Expressway).
- PA 26 corridor study resulted in the construction of I-99 from US 322 (the Mount Nittany Expressway) north towards I-80.
- I-80 Exit 161 (Bellefonte Interchange) is under development to replace the existing interchange with a new high-speed interchange and complete the I-99/I-80 connection. Construction of the interchange improvements will complete the goal for a major north-south interstate (I-99) through the center of the Commonwealth connecting two major east-west interstates, the Pennsylvania Turnpike (I-76) and I-80.

3. South Central Centre County Transportation Study (SCCCTS)

- SCCCTS was initiated in 1998 to evaluate and address transportation needs along the US 322, PA 144, and PA 45 corridors. The SCCCTS project needs identified specific transportation problems in each of the three corridors and on the local road system, as well as needs associated with regional travel patterns. The regional travel pattern need statement addressed the high percentage of through trips (in particular the high volume of truck traffic), high crash rates (including fatalities), poor Level of Service (LOS) including LOS associated with heavy truck traffic and increases in travel demand associated with local and regional planned development. However, SCCCTS was terminated in 2004 due to funding shortfalls.

4. Safety Improvements

- Following the termination of SCCCTS in 2004, short-term safety improvements along the US 322, PA 144, and PA 45 corridors were conducted between 2006 and 2015. These improvements included general intersection improvements (e.g., turn lanes), safety improvements (e.g., safety dot warning pavement markings, removal of passing zones), minor roadway realignments, and bridge reconstruction. These improvements were initiated to address some of the safety concerns identified during the SCCCTS study.



US 322 at Taylor Hill Road intersection safety improvement project (2014)

5. Potters Mills Gap (PMG) Transportation Project

- PennDOT and FHWA initiated the PMG Transportation Project to improve a 3.75-mile long section of US 322 in Potter Township within the area locally known as “Potters Mills Gap”. This project area encompassed the southeastern portion of the SCCCTS study area. It was determined that this project had independent utility and addressed a defined purpose and need. The project included the construction of a new limited access four-lane roadway section that started at the Sand Mountain Road intersection and extended west, tying back into existing US 322 with a new interchange and roundabout, west of the PA 144/US 322 intersection.



US 322 (Potters Mills Gap) construction project (2016)

6. SCCCTS Data Refresh

- In 2018, PennDOT collected data to update the traffic and environmental information from the former SCCCTS (2004), to identify changes to travel patterns, the transportation network, and environmental conditions. This information supported the 2019 decision by state officials to restart efforts to address regional transportation needs in the US 322, PA 144, and PA 45 area. Nearly, \$15 million in state funding was allocated to advance the State College Area Connector Study.

C. What Planning has Occurred in the Study Area?

1. Regional and State Planning

The CCMPO is responsible for coordinating Centre County's state and federally funded transportation projects. They work with PennDOT and local communities to prioritize the use of transportation funds for active transportation, highway, and transit projects. Funding allocations begin with developing the Long Range Transportation Plan (LRTP), which includes a list of projects to be undertaken within a regulatory minimum planning horizon of 20 years. Of the projects listed in the LRTP, those that are expected to begin within the next 12 years are known as the Twelve-Year Program (TYP).

Funded projects expected to begin within the next four years are included in the Centre County Transportation Improvement Program (TIP). The Unified Planning Work Program (UPWP) lists the transportation planning activities to be completed by the CCMPO between two specified years. In order to be included on the TIP, projects must also be in the CCMPO's adopted LRTP. LRTPs, TYPs, and TIPs are fiscally constrained, meaning the total estimated cost of all the projects listed must not exceed projected funding.

The State College Area Connector is identified in the:

Centre County Long Range Transportation Plan 2050 (September 2020)

The State College Area Connector was identified as one of the highest priority projects for the CCMPO and officials in Centre and surrounding counties.

Transportation Improvement Program

The State College Area Connector is included on the *2023-2026 Centre County Transportation Improvement Program* and the *2023 Statewide Transportation Improvement Program*.

The 2023-2026 TIP includes \$15 million in discretionary funds for the State College Area Connector. Funding is provided for the Preliminary Engineering and Final Design phases.

2021 Pennsylvania 12-Year Program (August 2020)

The State College Area Connector is identified as MPMS No. 112784

Centre County Unified Planning Work Program (November 2021)

The State College Area Connector is identified as a Project Delivery - Key Project in the Fiscal Year 2022-2024 Centre County Unified Planning Work Program

2. Local Planning

a. Centre County and Local Planning Region Initiatives

Centre County includes seven separate planning regions, three of which extend within the study area: Centre Region, Penns Valley Region, and Nittany Valley Region. These three planning regions support the six municipalities within the study area: Spring, Potter, Harris, College, and Benner Townships, and Centre Hall Borough. The review of county and local planning documents and initiatives provides an understanding of the transportation concerns and initiatives along with land use visions and goals in the study area communities. In particular, a review of the following plans was conducted:

Centre County Comprehensive Plan Phase I (2003) and Phase II Implementation Strategies (2016 to 2020) identifies significant growth of residential, office and industrial development has occurred in the County – especially in the Centre Region area where Penn State University has served as a magnet for development. This growth is forecasted to continue. As a result, the need to identify transportation facilities that will accommodate this growth is a key part of the comprehensive planning process. Additionally, the plan identifies safety problem areas along US 322, PA 144, and PA 45 east of State College.

Centre Region Comprehensive Plan (November 2013) covers regional planning initiatives for State College Borough and College, Ferguson, Halfmoon, Harris, and Patton Townships. This plan recommends planning and implementing transportation improvements and investments for all modes to accommodate future land uses and suggests policy to evaluate crash data and traffic operations to identify intersections and roadways that need improvement. The Plan also recognizes the need to use the Capital Improvement Program and CCMPO LRTP and TIP to fund safety-related improvements that reduce the number of crashes, injuries, and fatalities; and use travel demand models and projections of freight movements to identify the need for increased capacity to improve future congestion.

Penns Valley Region Comprehensive Plan (adopted January 2006) covers regional planning initiatives in Centre Hall and Millheim Boroughs and Gregg, Haines, Miles, Penn, and Potter Townships. This plan includes references to the former SCCCTS study and advocates for an improved connection in the US 322 area for the Centre Region. It also recommends transportation improvements to upgrade arterial and collector roads to meet current design standards.

Nittany Valley Region Comprehensive Plan (adopted September 2004) and Plan Update 2020-2030 (adopted October/November 2019) covers regional planning initiatives for Bellefonte Borough and Benner, Marion, Spring, and Walker Townships. The plan recommends transportation improvements to upgrade arterial collector roads and the adoption of uniform road design criteria across the Region.

D. How does the SCAC PEL Study Fit within the Planning Context of the Study Area?

The State College Area Connector PEL Study included an evaluation of previous transportation studies and improvements along with current transportation problems in the PEL study area. It also included a review of county and regional planning documents and initiatives. Together these resources help provide an understanding of the transportation and land use visions and goals in the study area communities for consideration in the development of the PEL Study's purpose and need. This information is important to ensure that environmental and community values are incorporated into transportation decisions early in the planning process so that these considerations can be carried through project development and delivery and ensure that any resulting projects serve the community's transportation needs more effectively. Specifically, this included review of the Centre County Long Range Transportation Plan 2050 and the Regional Comprehensive Plans for Penns Valley, Centre Region, and Nittany Valley; in addition to multiple plans for zoning, bicycle travel, and the Boalsburg community. In summary, the plans document a need to:

- Promote the protection of historic rural communities, preserve the agricultural setting of Penns and Nittany Valleys and be compatible with local and regional land use plans.
- Address safety problems while preserving rural nature and/or villages in the study area communities.
- Address vehicular congestion from high volumes of truck traffic, commuters, and special-event traffic; traveler delays from frequent incidents, and traffic conflicts that result in crashes and safety issues.
- Consider public transit, park-and-ride lots, pedestrian and bicycle facilities, and other non-motorized traffic (e.g., horse and buggy) to address commuter and internal travel needs in the study area.

CHAPTER 3: STUDY PURPOSE AND NEED

PennDOT and FHWA initiated the PEL Study to identify and assess transportation challenges within the study area to provide a foundation for the development and evaluation of a range of alternatives. Through an analysis of the existing infrastructure's ability to effectively serve the existing and projected movement of people and goods, a purpose and need statement defines the direct transportation-related needs within the study area and reflects the regional land use vision and broader goals of the communities surrounding the corridor. The purpose and need statement was developed in coordination with stakeholders, including federal, state, and local jurisdictions that encompass the study area. The purpose and need statement was available for public review at public meetings and on the State College Area Connector Study website and was concurred upon by the Cooperating Agencies (principle environmental regulatory agencies) as discussed in **Chapter 7**.

More information on the transportation network and local and regional planning can be found in the following documents:

- Final Purpose and Need for the State College Area Connector Planning and Environmental Linkage Study (February 2021)
- Alternatives Analysis and Screening Report for the State College Area Connector Planning and Environmental Linkages Study (February 2023)

A. What is the Purpose for Transportation Improvements?

The purpose of this study is to develop and evaluate a range of alternatives to improve mobility and meet the needs of interstate, regional, and local traffic passing through and moving within the study area by reducing congestion, improving safety, and addressing system continuity with consideration for all modes.

B. Why are Transportation Improvements Needed?

An evaluation of the transportation network identified the following deficiencies in the study area.

- Existing roadway configurations and traffic conditions contribute to safety concerns.
- High peak hour traffic volumes cause congestion and result in unacceptable Level of Service (LOS) (LOS D [rural only], E, or F) on US 322, PA 45 and PA 144 roadways and intersections within the study area.
- The roadway network configuration in the study area lacks continuity and does not meet driver expectations.



Peak hour traffic volumes cause congestion and unacceptable Levels of Service

1. Safety Concerns within the Study Area

Crash data collected from January 2014 through December 2018 showed that a total of 396 reportable crashes occurred within the study area over the five-year period. This included five fatal crashes (1%), 168 injury crashes (42%), and 223 property damage only crashes (no injuries or fatalities; 57%). **Table 3-1** summarizes the crash severity by corridor. PA 45 (143 crashes) experienced the highest number of crashes of all the corridors followed by PA 144 (111 crashes) and US 322 (108 crashes). Out of the five total fatalities, four occurred along PA 144. When compared to PA 144 and US 322, the PA 45 corridor experienced a higher percentage (almost 50%) of injury crashes.



Study area highways carry large volumes of regional truck traffic.

Table 3-1: Crash Severity by Corridor¹

Roadway	PDO ²	Injury	Fatal	TOTAL
PA 45	72 (50%)	70 (49%)	1 (1%)	143 (36%)
PA 144	68 (61%)	39 (35%)	4 (4%)	111 (28%)
PA 192	0	1 (100%)	0	1 (0%)
US 322	69 (64%)	39 (36%)	0	108 (27%)
Linden Hall Road/Cedar Hill Road (SR 2004)	1 (100%)	0	0	1 (0%)
Brush Valley Road/Rock Hill Road (SR 2006)	3 (50%)	3 (50%)	0	6 (2%)
Boalsburg Road/Warner Boulevard (SR 3010)	3 (23%)	10 (77%)	0	13 (3%)
Boal Avenue (SR 3014)	5 (45%)	6 (55%)	0	11 (3%)
Brush Valley Road	2 (100%)	0	0	2 (1%)
TOTAL	223 (57%)	168 (42%)	5 (1%)	396 (100%)

1 Crash frequencies represent number of crashes (2014-2018) involving injuries or fatalities and not the number of injuries or fatalities

2 PDO: Property Damage Only (no injuries)

Note: Crash data collection occurred prior to the opening of the Potters Mills Gap Transportation Project

A Highway Safety Manual (HSM) analysis was completed for the year 2017 and future year 2050 to evaluate the safety performance of the existing roadway network. On average, during the future year 2050, crashes were predicted to increase 24% based on the anticipated traffic growth in the study area. However, when looking at the key roadways independently, the predicted crash frequencies varied as follows:

- PA 144 crashes are predicted to increase by 33%.
- US 322 crashes are predicted to increase by 17%
- PA 45 crashes are predicted to increase by 20%.

2. Traffic Operational Analysis

a. Origin and Destination of Traffic

To determine the impact of anticipated changes in traffic volumes on the network roadways, understanding the travel patterns and behavior to predict roadway usage and assign traffic to projected travel paths is crucial. In 2017, an origin and destination study was conducted for passenger vehicles and trucks to understand the travel patterns in the area. US 322, PA 45, and PA 144 were the key roadways considered for travel. The types of travel were categorized as local or regional trips. Regional trips were defined as trips which entered and passed through the study area without stopping. Local trips were defined as trips with the beginning and/or ending within the study area.

The origin and destination study revealed the following travel behaviors for passenger vehicles and trucks.

- US 322 (Truck and Passenger Traffic) – Heavy truck (e.g., tractor trailer) traffic was primarily regional trips. Almost 90% of heavy trucks had a starting and ending point outside the study area. Conversely, only 64% of medium size truck (e.g., delivery vehicles) traffic was regional trips. Passenger vehicles traveled more locally with 74% having either a starting and ending point, or both within the study area.
- PA 144 and PA 45 (Truck Traffic) – These roads carried more medium size trucks thus providing a more even distribution between regional and local trips. Along PA 45, 51% and 46% of all heavy truck and medium truck travel was for regional trips, respectively. Local trips accounted for 49% and 54% of all heavy truck and medium trucks travel, respectively. While PA 144 over Nittany Mountain has posted weight restrictions, the volume of truck traffic clearly indicated that not all truck operators comply with the posted weight limit restrictions.
- PA 144 and PA 45 (Passenger Vehicles) – Passenger vehicle trips along eastbound and westbound PA 45 display different travel patterns. Eastbound PA 45 trips tended to be more local trips, or trips that start and end in the study area (43%), compared to 1% of westbound PA 45 trips. Likewise, 28% of all westbound trips were regional trips, compared to 4% of eastbound trips. Passenger trips along PA 144 were more evenly distributed between the different origins and destinations.

The origin and destination information provided an understanding of how people and freight travel through the study area and aided in understanding traffic conditions and safety concerns.

b. Traffic Volumes

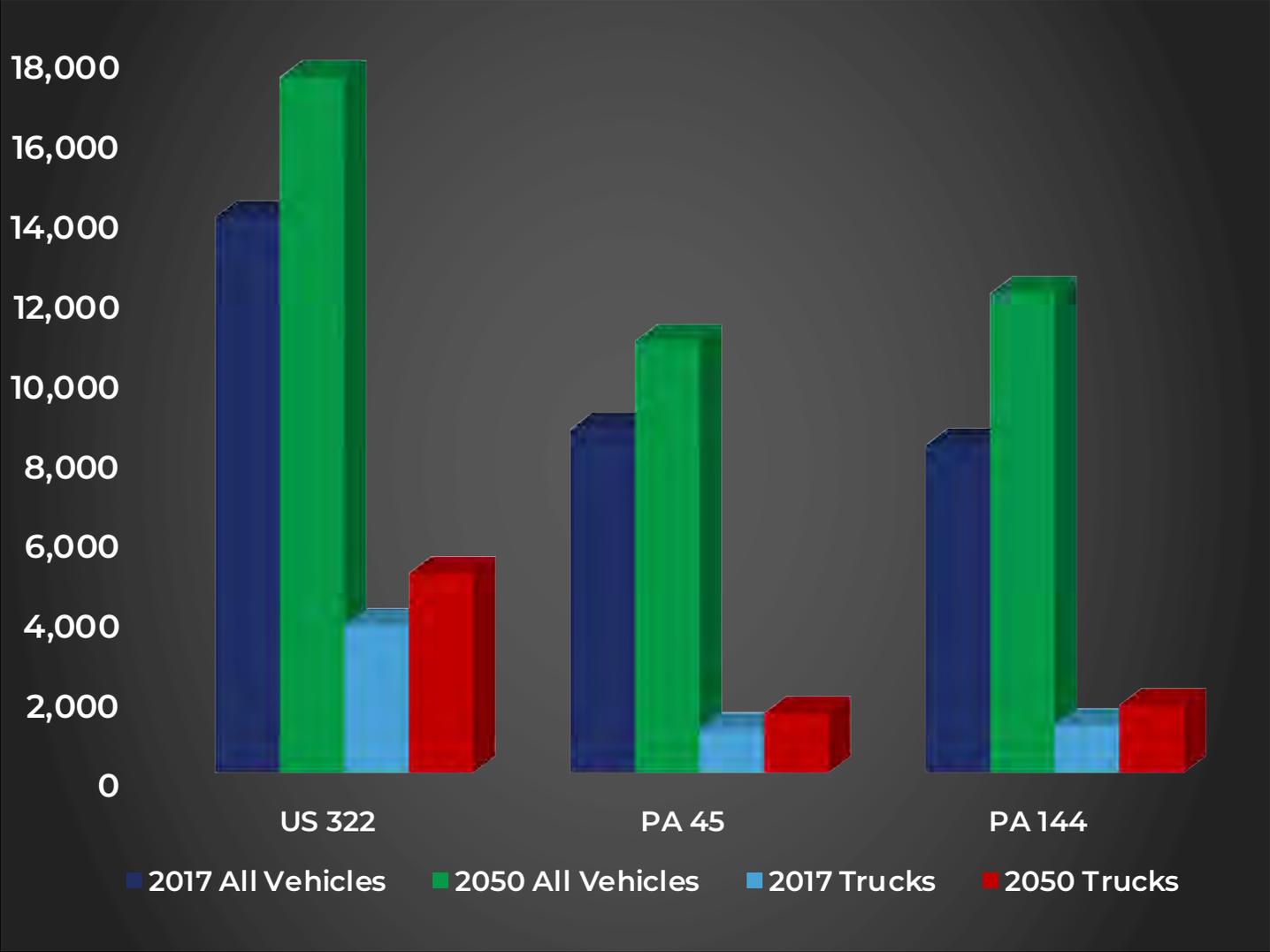
A traffic model that assigns vehicle trips to local roadways and uses the origin and destination information to aid in calibrating the model was used to determine traffic volumes on key roadways within the study area. Traffic data shows that average annual daily traffic (AADT) on the study area roadway network varies between 8,200 to 13,900 vehicles per day of which 13% to 27% of these vehicles were trucks **Figure 3-1**. On average, the percentage of trucks traveling along US 322 within the study area was three times higher than similar roadways throughout the state. PA 45 and PA 144 had less truck traffic than US 322. However, PA 144 still had nearly 15% truck traffic even with the truck ban north of PA 45.

Traffic forecasts show total traffic volumes increasing in the area nearly 31% and truck volumes increasing nearly 35% between 2017 and 2050. **Figure 3-1** documents the current (2017) and anticipated traffic growth through the year 2050 for the key study area roadways. These roadways will be unable to accommodate the additional vehicles thus causing additional congestion, travel delays, and negatively affecting safety.



US 322 transition to Mount Nittany Expressway in Boalsburg

Figure 3-1: Study Area Traffic Growth Comparison – 2017 and 2050



c. Roadway Level of Service

LOS is a rating system that measures congestion for motorized vehicles as quality of service on an A to F scale. “A” represents the best (free-flow) condition while “F” is the worst-possible (congested) condition **(Figure 3-2)**.

The planning level LOS analysis found that in 2017 the majority of study area intersections operate at acceptable LOS with a few exceptions during peak hour travel periods. The unsignalized intersections of US 322 and Elks Club Road, and US 322 westbound on-/off-ramp and Boalsburg Road have unacceptable LOS.

The roadway segment analysis reveals that there are many areas that currently operate at unacceptable LOS. These include:

- US 322 from Red Mill Road/Mountain Back Road to the Mount Nittany Expressway
- PA 45 from US 322 to Elks Club Road
- PA 45 from Harris/Potter Township line to Luse Road (east of PA 144)
- PA 144 from Brush Valley Road to PA 26
Note: This section of PA 144 has poor LOS resulting from the roadway geometry over Nittany Mountain. Achieving acceptable LOS is not practicable in this location.
- PA 26 from Thomas Mountain Road to I-99

LOS affects average travel speed on the roadway network. Under the 2017 conditions, average travel speeds are predicted to be 5% to 15% less than the posted speed limit during peak travel times.

The 2050 analysis reveals that along with the above roadway segments that did not meet LOS criteria, the following roadway segments shown in **Figure 3-3**, were also predicted to operate at unacceptable levels.

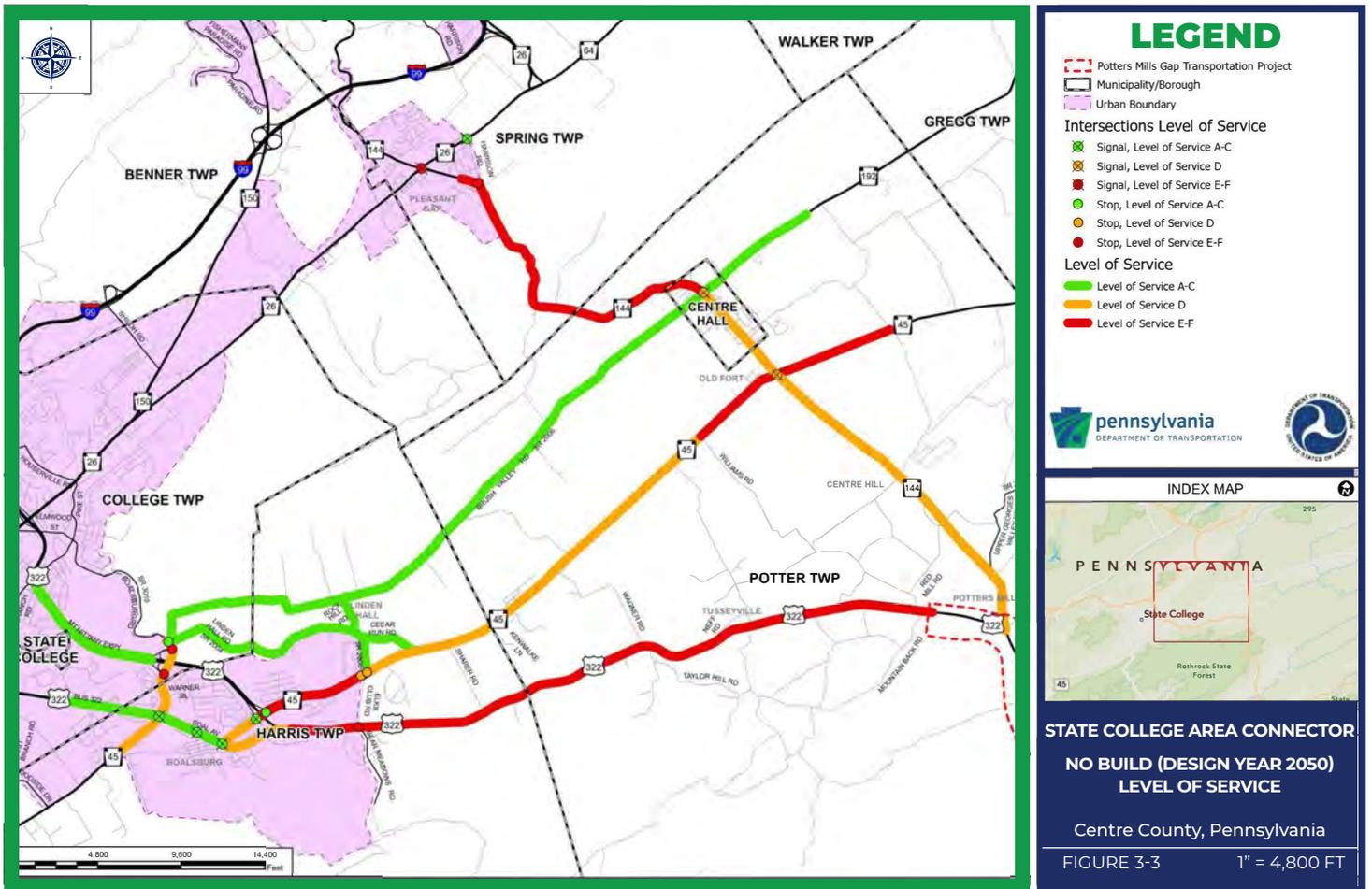
- PA 144 from the US 322 intersection north through the study area to PA 26
- PA 45 from Williams Road to Luse Road
- PA 45 from West Main Street to Boal Avenue

Level of Service Characteristics



Figure 3-2: Level of Service Characteristics

Average travel speeds are projected to further decrease in 2050 to between 15% to 25% less than the posted speed limit during peak travel time with the study area.



Note: Figure 3-3 can also be found in Appendix A at a larger size.

Figure 3-3: No Build (Design Year 2050) Level of Service

d. Bicycle Level of Service

Bicycle Level of Service (BLOS) was conducted to predict the optimal bicyclist experience level for riding on roadways. BLOS rating scale is similar to the analysis conducted for roadways. The analysis specifically evaluates the roadway environment based on its ability to accommodate motor vehicles and bicycle traffic, the roadway’s geometric design, and traffic conditions. The results indicate that the key study area roadways are best suited for very experienced riders and only the Bicycle Pennsylvania Route G is suitable for less experienced riders. By 2050, increased traffic volumes on the roadway network creates a less than ideal riding environment for cyclists and even Bicycle Pennsylvania Route G becomes less attractive to inexperienced riders.

3. Roadway Configuration and Geometry

Within the study area, the roadway configuration is generally consistent, meaning they have the same number of lanes, lane widths, and shoulders. However, US 322 transitions from a four-lane limited access divided highway in the east, to a two-lane roadway with local access through the middle, and back to a four-lane limited access divided highway in the west. This changing roadway configuration can present confusion for motorists when combined with the high-volume of traffic and truck volumes.

US 322, PA 45, and PA 144 also have roadway configuration issues related to the roadway geometry. This includes roadway sections that have horizontal roadway deficiencies, which means the roadway does not meet current design standards for the posted speed limits (e.g., lane or shoulder widths, sharp curves, or slope of roadway). Other roadway sections have vertical roadway deficiencies, which means the roadway is too steep or flat or has dips/sags that do not meet current design standards for the posted speed limits.

The changing roadway configuration combined with the identified geometric deficiencies do not meet driver expectations and may create potential safety concerns. Safety concerns may arise as drivers, who have been traveling at a higher rate of speed appropriate for the design speed in non-deficient sections of the highway, may not recognize the changes and slow to an appropriate speed to navigate changing roadway conditions.

CHAPTER 4: ALTERNATIVES DEVELOPMENT AND SCREENING METHODOLOGY

A range of alternative concepts, typical of corridor studies, was identified and screened for this PEL Study. These alternatives were systematically screened on their ability to meet the identified study purpose and need, minimize environmental impacts, engineering feasibility, and best achieve the project goals. Any alternative determined to not meet the purpose and need was dismissed from further consideration as a reasonable alternative.

A description of the range of alternatives and the detailed screening process is provided in the following sections.

A. What is the Range of Alternatives Considered?

Six alternative concepts are considered in this PEL Study.

1. No Build Alternative

The No Build Alternative consists of taking no action to improve the transportation facilities within the PEL study area, with the exception of regional projects “committed” as a programmed project in the current CCMPO’s Centre County Long Range Transportation Plan 2050 and the Draft 2023-2026 Transportation Improvement Program.

2. Upgrade Existing Alternative

The Upgrade Existing Alternative includes a four-lane, barrier separated alternative that would allow left turns at select intersections. Access to local roads and properties adjacent to the highway would be restricted to right-in and right-out movements with left turns accommodated at jughandle turnarounds spaced throughout the corridor. **Figure 4-1** depicts a typical section for the Upgrade Existing Alternative. For the PEL Study, an Upgrade Existing Alternative was only considered along US 322 with logical termini identified as the west end of the Potters Mills Gap Transportation project and the east end of the Mt. Nittany Expressway in Boalsburg.

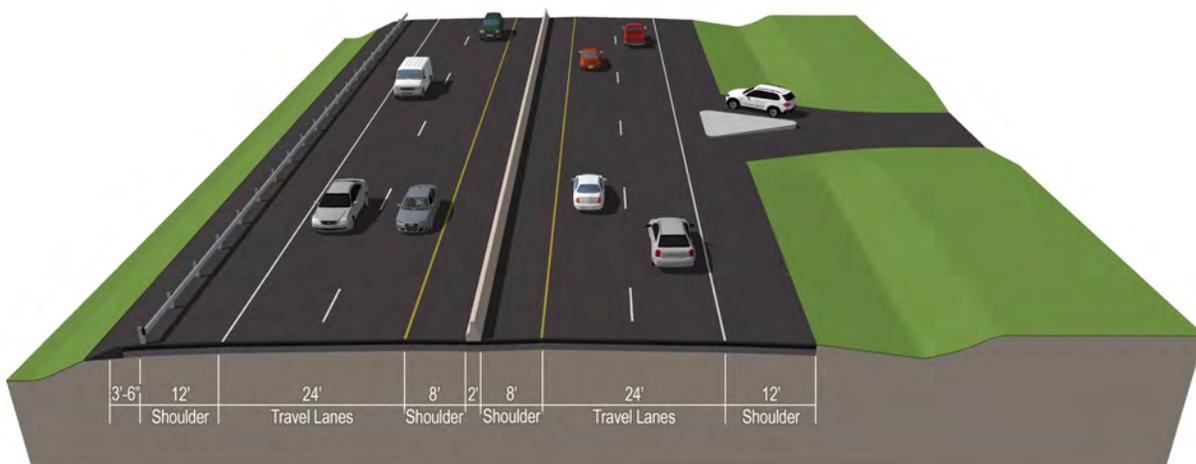


Figure 4-1: Proposed Upgrade Existing Alternative Typical Section

More information on alternatives development and screening can be found in the following documents:

- Alternatives Analysis and Screening Report for the State College Area Connector Planning and Environmental Linkages Study (February 2023)
- Engineering Technical Memorandum for the State College Area Connector Planning and Environmental Linkages Study (February 2023)
- Traffic Analysis Technical Memorandum for the State College Area Connector Planning and Environmental Linkages Study (February 2023)

3. Transportation Control Measures Alternative

The Transportation Control Measures (TCM) Alternative includes identifying measures that focused on reducing the volume of vehicles on the transportation network. This strategy includes areawide programs as well as corridor specific strategies. For the PEL Study, the TCM Alternative considers:

- Creating park-and-ride facilities
- Designating high-occupancy vehicle (HOV) lanes
- Advocating ridesharing services/vanpool programs
- Developing active transportation (pedestrian/bicycle) facilities
- Promoting employer-based travel demand measures (TDM) programs (including telework or flexible work schedules)

Roadway oriented TCM (e.g., HOV lanes, park-and-rides, and active transportation facilities) were considered along key study area roadways: US 322, PA 45, and PA 144. Program oriented measures (e.g., TDM programs, rideshare/van pools) were considered within the overall PEL study area.

4. Transportation Systems Management Alternative

The Transportation Systems Management (TSM) Alternative includes identifying transportation strategies that focus on operational improvements to preserve and even improve the performance of the existing transportation network without additional capacity. For the PEL Study, the TSM Alternative considers:

- Incident and special event management
- Road weather management
- Freight logistics management
- Traffic signal coordination
- Real time traveler information (e.g., PA 511)
- Intelligent Transportation Systems/emerging technology
- Integrated corridor management
- Intersection improvements

Roadway oriented TSM (e.g., intersection improvements and incident and special event management) strategies were considered along the key study area roadways: US 322, PA 45, and PA 144. Program oriented TSM strategies (e.g., freight management, real time traveler information) were considered within the overall study area.

5. Public Transportation Alternative

The Public Transportation Alternative included adding a new CATABUS fixed route that extends from the CATABUS storage at 2081 West Whitehall Road in State College to the Centre Hall area. Potential routes for buses include using PA 26, PA 45, US 322, and PA 144 throughout the study area.

6. Build Alternative

The Build Alternative includes adding capacity to the local roadway network with a limited access roadway on a new location. The Build Alternative provides four travel lanes (two in each direction) with full inside and outside shoulders, and varying median widths in urbanized areas to minimize displacements and in mountainous areas to minimize earthwork. The Build Alternative would meet applicable design criteria for freeways. The top image in **Figure 4-2** represents the urban/mountainous typical section and the bottom image represents the rural typical section for the Build Alternatives. The logical termini for any Build Alternative includes potential connections with:

- US 322 – The four-lane limited access portion of US 322 near Potters Mills Gap
- US 322 – The four-lane limited access portion of US 322 (Mt. Nittany Expressway) at or near Boalsburg
- I-99 – Limited access I-99 facility north of Pleasant Gap

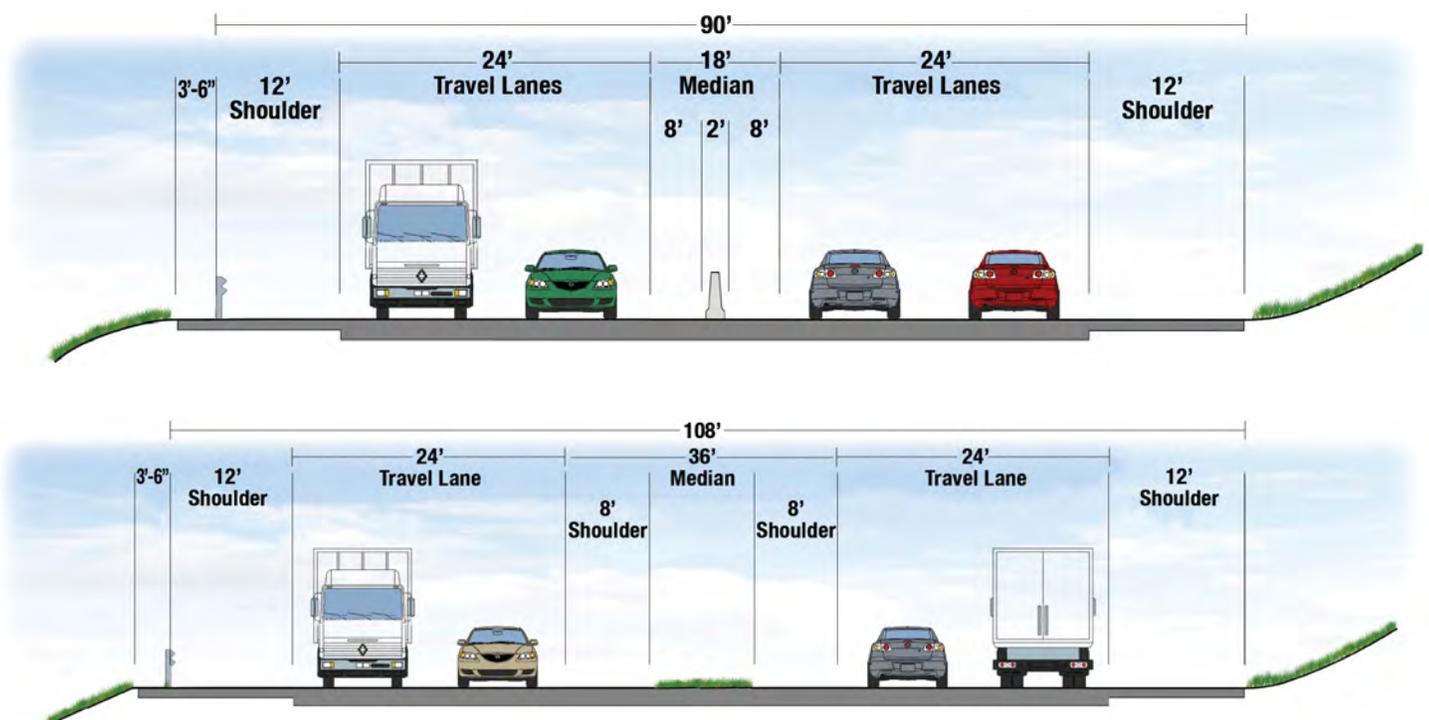
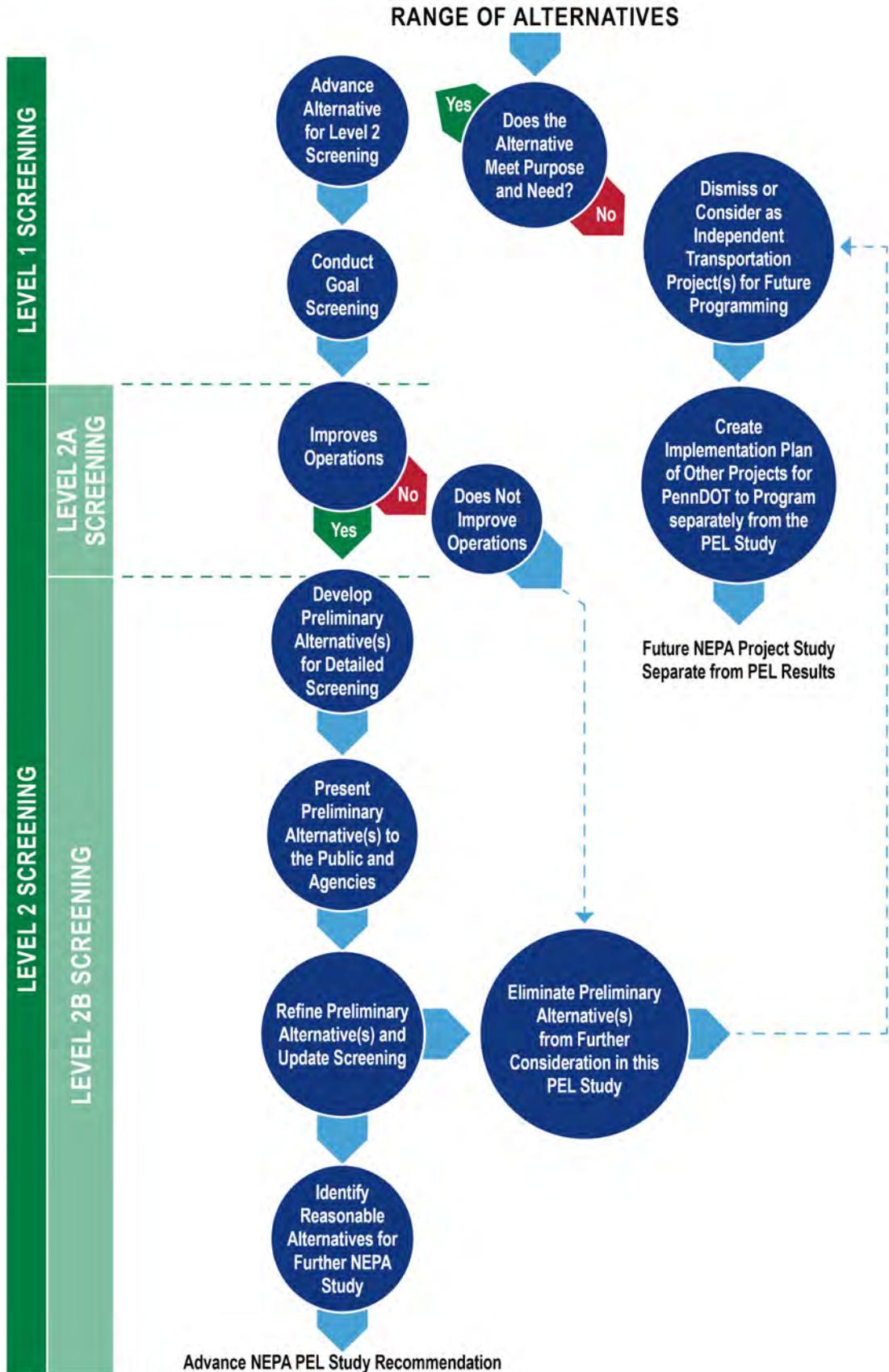


Figure 4-2: Proposed Build Alternative Typical Sections

B. What is the Alternative Screening Process?

The alternative screening process considers a wide array of transportation options initially and then systematically identifies the alternatives that best address the long-term mobility, accessibility, safety needs, and that enhance quality of life. **Figure 4-3** provides an overview of the screening process.



Advance NEPA PEL Study Recommendation

Figure 4-3: Alternative Screening Process

The range of alternatives represent a wide variety of possible concepts for reducing congestion, improving safety, and addressing system continuity throughout the study area. Prior to conducting the alternative screening, study area goals are developed to support the alternative screening. A two-part screening process evaluates the range of alternatives (Level 1 and Level 2).

1. Study Area Goals

Fundamental study goal concepts that support the purpose and need, local transportation and land use planning, transportation mobility, best engineering practices, and environmental stewardship are used as a guide to qualitatively assess the alternatives. The goal concepts are formulated as a series of questions which are assigned a relative value for alternative comparison purposes.

2. Level 1 Screening

Level 1 Screening uses two types of screening. The first screening determines qualitatively if the alternative would meet the study need. The second screening includes an evaluation on how well the alternatives addresses the study goals. Goal screening is only conducted for those alternatives that would meet the study need. Both the first and second screenings are completed by answering a series of questions for each alternative.

The following summarizes the needs criteria screening questions for the Level 1 Screening.

Congestion:

- Could the alternative meet current and future travel demand?
- Could the alternative improve operations along roadway segments and at intersections?

Safety:

- Could the alternative enhance safety for all modes of travel?

System Continuity:

- Could the alternative meet driver expectations?

Application of the needs criteria screening questions is assigned a yes or no. Any alternative that answered “yes” to all screening questions is advanced for the goals screening. The goal criteria screening questions includes:

- To what extent would the alternative improve local and regional mobility?
- To what extent would the alternative address recurring and non-recurring congestion issues?
- To what extent would the alternative promote multimodal opportunities?
- To what extent would the alternative avoid and/or minimize impact to the human, cultural, and/or natural environment?
- To what extent would the alternative be consistent with/accommodate local land use/planning initiatives?

The goals screening criteria provides a relative score based on a range of 1 to 5; where 1 is the worst and 5 is the best in meeting the goal. The goal screening highlights areas where additional alternative refinement, special design considerations, or specific mitigation could aid in better addressing the study goals as the alternative is further developed. All alternatives that will meet the study need are advanced for Level 2 Screening.

Alternatives that are dismissed following the Level 1 screening are considered as independent transportation projects, if appropriate, which could be planned and programmed separately. Potential independent transportation projects are discussed in **Chapter 8**.

3. Level 2 Screening

Level 2 Screening is divided into two parts: Level 2A and Level 2B Screening. Level 2A Screening confirms that the alternative generally reduces traffic on the existing study area roadway network. Level 2B Screening further develops the conceptual alternatives and provides a comparative analysis for planning, engineering, and traffic factors, and potential environmental impacts to determine which alternative best meets the purpose and need while balancing these factors.

a. Level 2A Screening

Conceptual alternatives are created for Level 2A Screening so the planning-level traffic analysis can be conducted. The alternatives connect the identified logical termini but are not designed or engineered. This level of investigation provides sufficient detail to evaluate future traffic volumes and patterns on the transportation network and to consider their impact on the key study area roadways.

The planning-level traffic analysis determines the Average Annual Daily Traffic (AADT), Average Annual Daily Truck Traffic (AADTT), and peak hour traffic volumes on the key study area roadways. The study area roadway network screenings determines generally how traffic changes with the implementation of an alternative compared to the 2050 No Build scenario. The Level 2A Screening intent is to confirm that the alternative generally reduces traffic on the existing study area roadway network (i.e., general premise being that lower traffic volumes could result in improved operations).

Following the planning-level traffic analysis, a qualitative assessment confirms that the proposed alternatives continued to meet the PEL Study's purpose and need. The need screening criteria utilized in the Level 1 analysis are used to complete this assessment.

Alternatives that would not improve network operations and/or would not continue to meet the study need are then dismissed from further evaluation. If any of the dismissed alternatives meet other transportation needs in the study area, they could be considered as independent transportation projects, if they have independent utility and logical termini. Potential independent transportation projects are discussed in **Chapter 8**.

b. Level 2B Screening

The Level 2B Screening develops various options for the alternative concepts that advanced from the Level 2A Screening. Alternative options are developed by applying current design standards, engineering criteria, and standard engineering practices, while avoiding or minimizing environmental impacts, to the extent possible. Once the alternatives options are developed, a quantitative and qualitative assessment is conducted to determine:

- How the alternatives improved congestion/mobility/safety and impacted/benefitted natural/cultural/socioeconomic resources. Select engineering factors such as planning-level construction cost, planning-level right-of-way costs, local access, constructability, etc. are also considered.
- How the alternative meets the study goals.

The Level 2B Screening concludes by comparing the remaining alternatives options against one another to determine which alternative(s) best meets the study purpose and need while minimizing overall environmental impacts and best addressing the study goals. The assessment concluded with identification of the reasonable alternatives to advance for future NEPA study.

Level 2B Screening Criteria

The following summarizes the quantifiable and qualitative evaluation criteria for the Level 2B Screening.

Quantitative Evaluation Criteria

Safety Analysis

- Reduce crash frequency
- Reduce crash severity

Congestion and Traffic Mobility

- Obtain acceptable levels of service (segments and intersections)
- Reduce truck traffic on local roadway network

Bicycle Facilities

- Improve bicycle levels of service

Environmental

- Minimize potential impacts to the natural, cultural, and socio-economic environment, to the extent practicable

Qualitative Evaluation Criteria

The qualitative assessment is conducted based on information received during public and agency engagement, and from additional input from local stakeholders. These criteria evaluate how the alternatives generally meet the study goals. The Level 1 and 2 study goals are the same goals considered for this PEL Study.

4. Summary

The alternatives development and screening leads to the identification of reasonable alternatives that are recommended to be advanced for further study in NEPA. The screening results of the alternatives are presented in **Chapter 6**. For those alternatives that get dismissed from further study, they are considered, as appropriate, as other future independent transportation projects which could be planned and programmed separately if a local transportation need exists. The independent transportation project evaluation is discussed in **Chapter 8**.

CHAPTER 5: ENVIRONMENTAL OVERVIEW

The study area covers approximately 70 square miles (about 45,000 acres) and extends from Seven Mountains (Tussey Mountain) near Potters Mills to Nittany Mountain near Pleasant Gap, and from Centre Hall west towards Boalsburg (**Figure 1-1**).

The topography is characterized by well-defined steep mountains and two broad, gently sloping valleys, Penns Valley that lies between the two mountain ranges, and Nittany Valley that lies along the northside of Nittany Mountain. Both the valleys and ridges are oriented northeast to southwest. Environmental features in the study area have been identified through secondary sources, select site reconnaissance, coordination with government agencies and private organizations, and outreach to the public. These features have been mapped using a Geographic Information Systems (GIS) database. **Figures 5-1, 5-2, and 5-3** identify environmental features used during the Level 2B Screening process to aid in the identification of reasonable alternatives to be carried forward for detailed study as part of the NEPA phase. The following summary provides an overview of the natural, agricultural, cultural, and social environmental resources identified within the study area.

A. Natural Resources

Two main drainage basins, Bald Eagle Creek and Penns Creek, are the ultimate receiving waters for most watercourses identified within the study area. There are three primary watersheds within the study area, including:

- Sinking Creek – drains primarily the eastern portion of the study area
- Spring Creek – drains primarily the west portion of the study area and includes Cedar Run, a tributary that flows west, through the middle of Penns Valley
- Little Fishing Creek – drains the northeastern portion of the study area

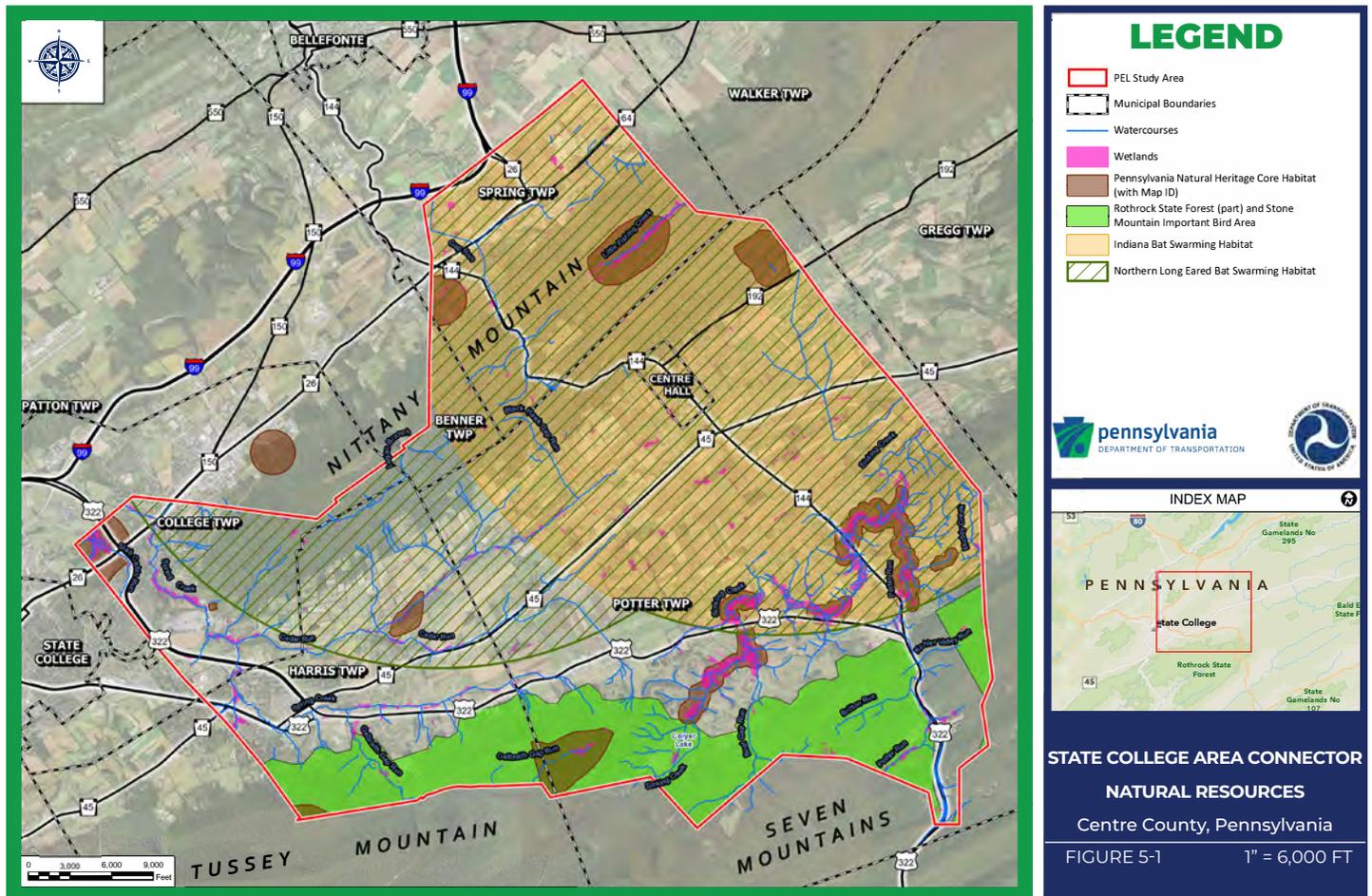
More information on the natural and built environment can be found in the:

- Agricultural Resources Technical Memorandum for the State College Area Connector Planning and Environmental Linkage Study (December 2021)
- Wetland and Watercourses Technical Memorandum for the State College Area Connector Planning and Environmental Linkage Study (August 2021)
- Archaeological Resources Technical Memorandum for the State College Area Connector Planning and Environmental Linkage Study (May 2021)
- Socioeconomic Technical Memorandum for the State College Area Connector Planning and Environmental Linkage Study (June 2021)
- Historic Resources Survey Technical Memorandum for the State College Area Connector Planning and Environmental Linkage Study (July 2021)
- Threatened and Endangered Species Technical Memorandum for the State College Area Connector Planning and Environmental Linkage Study (May 2021)
- Terrestrial Habitat Technical Memorandum for the State College Area Connector Planning and Environmental Linkage Study (May 2021)
- Hazardous and Residual Wastes Technical Memorandum for the State College Area Connector Planning and Environmental Linkage Study (May 2021)
- Webmap www.penndot.gov/SCAC



Spring Creek near Oak Hall

The majority of the streams in the study area consist of small unnamed tributaries. Laurel Creek, a fourth watershed, is the receiving waters for a small area (approximately 0.35 square mile) at the southeastern limit of the study area and is part of the Lower Juniata River Drainage Basin.



Note: Figure 5-1 can also be found in Appendix A at a larger size.

Figure 5-1: Natural Resources

Terrestrial habitat resources identified within the study area are considered to be sensitive in nature and have the potential to support numerous species of plants and animals, including threatened and endangered species. Sensitive habitats of note include:

- Old Growth Forest (approximately 1,350 acres in the study area, along the upper reaches of Nittany Mountain and Tussey Mountain)
- Rothrock State Forest (part) and Stone Mountain Important Bird Area (approximately 6,620 acres along the study area's southern limits)
- Pennsylvania Natural Heritage Core Habitat areas (approximately 2,684 acres identified in the study area through the County Natural Heritage Inventory survey at various locations, in particular, along streams and wetland areas) **(Figure 5-1)**.

These specific sensitive ecosystems are home to various species of plants and animals having specific habitat needs and requirements. In addition, habitats containing pollinator plants and animals, invasive species, wildlife crossing areas, and Northern Goshawk habitat (species listed in 2021 as a PA endangered species and previously identified breeding buffer area is located in the forested areas of the southern portion of the study area) are identified as potential concerns in the study area. Other Federal and State Threatened and Endangered (T&E) Species and their associated habitats are present in numerous localized areas. A minimum of two known bat hibernacula are located within the study area and one is located to the south in Mifflin County. A majority of the study area is encompassed by summer roost and fall swarming habitat for bats. T&E plant species are potentially located in numerous localized areas. Conditions in those areas are suitable for sensitive species based on ecological conditions that can support numerous species of plants and wildlife. Sensitive species and their habitats identified through secondary sources and review of the Pennsylvania Natural Diversity Inventory (PNDI), can potentially be found across the entirety of the study area.

Approximately 1,545 acres of Palustrine Emergent (PEM), Palustrine Scrub Shrub (PSS), and Palustrine Forested (PFO) wetlands and approximately 220 acres of Palustrine Open Water (POW) wetlands are within the study area based on a review of secondary sources (**Figure 5-1**). The POW wetlands include multiple privately-owned farm and residential ponds in addition to the 76-acre Colyer Lake, which is owned by the Commonwealth and managed by the PA Fish and Boat Commission (PFBC). It is located within the south-central portion of the study area along Sinking Creek and is used for recreational activities such as fishing, boating, and hiking. The lake is a result of a man-made dam constructed in the 1960s, which intercepted and impounded Sinking Creek. According to PA Code, Title 25, Chapter 105.17(1)(iii), all wetlands in or along the floodplain of a Wild Trout Stream and the floodplain of streams tributary are considered Exceptional Value (EV) wetlands. Lastly, the ClearWater Conservancy has identified multiple areas where riparian restoration treatments, planting, and channel enhancements have been completed and/or facilitated through their Riparian Conservation Program.



View of Colyer Lake looking north

B. Geologic Resources

The study area is situated within the Appalachian Mountain Section - Ridge and Valley Province. The Appalachian Mountain Section is a physiographic section that occurs as a northeast-southwest band. It consists of numerous, long narrow mountain ridges separated by narrow to wide valleys (lowlands). Very tough sandstone occurs at the crests of the ridges. The PA DCNR Geological Survey identifies several of the ridge top formations to contain acid-producing minerals, primarily pyrite. These formations are known for containing in-situ pyrite as well as vein pyrite and may present difficulties associated with acid drainage when exposed by excavation.

The steeply wooded ridges of Nittany and Seven Mountains are separated by broad limestone valleys, including Nittany Valley and Penns Valley, that offer favorable settings for agricultural activities and human settlements. Relatively soft shales and siltstones occur in most of the lowlands. Some of the lowlands are underlain by limestone and dolomite, which is particularly true within the study area.

The valleys are comprised of geologic formations that are characterized with limestone, dolomite, and various other imbedded materials. These low-lying formations yield an abundance of groundwater through frequent joint and solution channels and cavities. These same water-carrying features also have karst and sinkhole potential that present the opportunity for groundwater contamination.

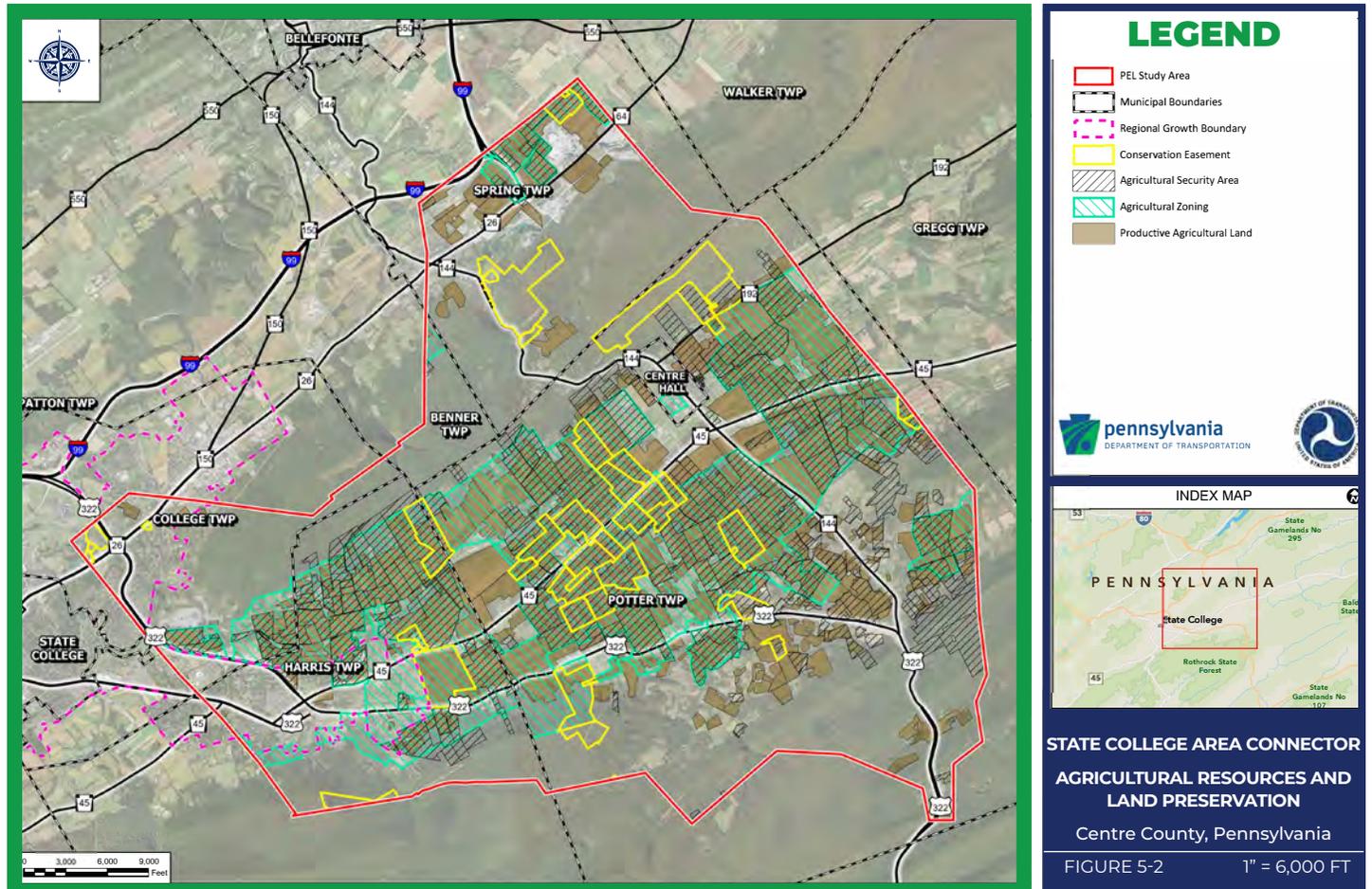
C. Agricultural Resources

Centre County is known for its rich agricultural resources and is the home of the Centre County Grange Fair, located in Centre Hall. Agricultural lands comprise the second-largest (approximately 36%) land use in the study area. Within Centre County, 1,023 farms exist with a total of 149,858 acres in farmland according to the USDA 2017 Census of Agriculture. The average farm size is 146 acres for Centre County, while the average farm size for Pennsylvania is 137 acres (USDA 2017). Within the study area, agricultural lands are extensive, including 16,502 acres of productive agricultural land with:



Aerial view of agricultural lands in the study area.

- 81% of the productive agricultural land within Agricultural Security Areas (ASAs); and
- 23% preserved in Agricultural Conservation Easements (ACEs) (**Figure 5-2**).



Note: Figure 5-2 can also be found in Appendix A at a larger size.

Figure 5-2: Agricultural Resources and Land Preservation

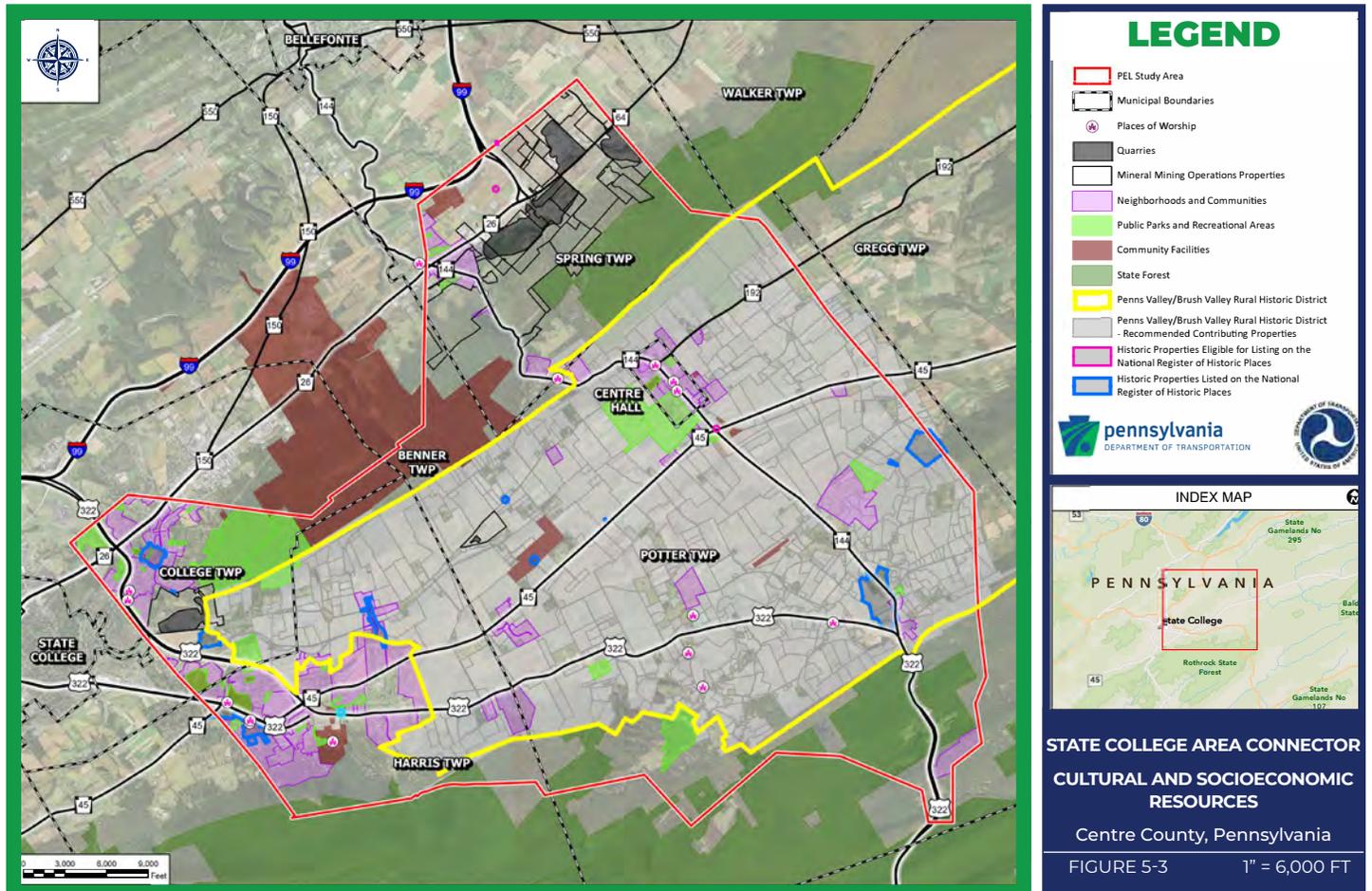
The ACEs in Centre County are primarily purchased through the Centre County Farmland Trust (private, non-profit) and Centre County Agricultural Land Preservation Board (public). The ClearWater Conservancy, a non-profit organization, also has conservation easements on seven agricultural and non-agricultural properties within the study area. The ClearWater Conservancy easements that include productive agricultural land within the study area include Tussey View Farm, Nittany Farms, Rhoneymeade Arboretum and Sculpture Garden, and Potter Farm.

Approximately 75 agricultural operations have been identified within the study area. Based on field observations, primary crops include corn, soybeans, wheat, hay, produce, and Christmas trees. In addition to crops, cattle and horse livestock operations also exist within the study area.

Unique to the study area is the 264-acre Centre County Grange Fair Grounds, located near Centre Hall Borough, where an annual 9-day event, the Centre County Grange Encampment and Fair, has been held since 1874. This facility serves as a long-standing symbol of the agricultural history of the area. The annual fair involves approximately 1,000 tent campers and 1,500 recreational campers in attendance. Livestock competitions, equine events, tractor pulling, along with amusement rides and nearly 7,000 exhibitors can be found at the Grange Fair.

D. Cultural Resources

Over half of the study area (58%) is located within the Penns/Brush Valley Rural Historic District (RHD) which is listed in the National Register of Historic Places (NRHP). The RHD is eligible for its agricultural patterns and associated landscape features established during the nineteenth and



Note: Figure 5-3 can also be found in Appendix A at a larger size.

Figure 5-3: Cultural and Socioeconomic Resources

twentieth centuries as well as its architecture. Properties and features that contribute to the RHD include active farmland as well as farmsteads and buildings constructed during the period of significance (before 1950) **(Figure 5-3)**.

The study area also includes multiple historic properties that have been individually listed in, or determined eligible for listing in the NRHP, including, but not limited to the:

- Boalsburg Historic District
- Lemont Historic District
- Oak Hall Historic District
- Linden Hall Historic District
- State Correctional Institute (SCI)-Rockview Historic District
- Centre Hall Historic District

In addition to the historic districts, there are 13 listed or eligible historic properties including the Neff Round Barn, Major John Neff Homestead, Leonard Rhone House, Jack Michael Estate, and the Potter-Allison Farm to name a few.

A Reconnaissance level survey was conducted on the main transportation corridors within the project area (US 322, PA 144, and PA 45) to identify additional individual properties and historic districts that have the potential to be individually eligible for listing in the NRHP, including the Pleasant Gap Historic District. Properties that contributing to the RHD were also identified within these corridors.



Grace United Methodist Church in Centre Hall Borough

E. Socioeconomic Resources

The study area is primarily rural with many productive farming operations and small villages such as Potters Mills, Centre Hall, Linden Hall, Lemont, Tusseyville, and Pleasant Gap; which are typically positioned along well-established travel ways. Forest cover is the largest land cover/use and encompasses approximately 42% of the study area and is primarily located on the mountains. Much of the large expanses of mountain forested areas are protected by zoning that limit the type of development allowed. In addition, small portions of the forested lands along Tussey Mountain are part of the Rothrock State Forest. The forested lands along Nittany Mountain are also protected, including the forested trail system at the western tip of the mountain (includes 322 acres owned by Mount Nittany Conservancy and 433 acres owned by the Penn State Lions Paw Alumni Association), the forested headwaters of Logan Run within the boundaries of the Rockview State Correctional Institution (SCI) property, and areas within the Bald Eagle State Forest to the northeast.

Analysis of U.S. Census Data determined that the population in Centre County has steadily increased over the past 30 years and County projections indicate that population and employment will continue to increase in the future. According to the Center for Rural Pennsylvania Population Projections 2010-2040, Centre County population in 2030 is projected to be 180,148, a greater than 11% increase from the 2019 estimated population. A major part of this growth is associated with

the economic strength of the County's top employers which include The Pennsylvania State University, Mount Nittany Health System, State and County Governments, and the Geisinger Health System.

Through secondary sources, field reconnaissance, and public outreach, 77 residential neighborhoods, communities, and subdivisions have been defined within the study area. Also, there are multiple housing complexes identified as accepting Section 8 Vouchers, which is a federally funded rental assistance program for low and very-low-income households. The complexes include: Huntington Park and Centre Estates along U.S. 322 in Harris Township, and Limerock Court along PA 26 in College Township. Pleasant Hills Apartments along PA 144 in Spring Township is located just outside of the study area.



View of residential development (Elksview Townhouses and Bear Meadow Village) near US 322 looking south

Penns and Brush Valleys also include a large Old Order (Amish) community primarily outside the study area. However, the Amish community has thrived, and a school and farms are within the study area in the northeastern part of Potter Township, just east of Centre Hall, along PA 192 and PA 45. Nittany Valley also includes a large Amish community, primarily within Marion and Walker Townships, outside and north of the study area. Given the proximity of these large Amish communities, the study area roadways frequently have horse-and-buggy traffic.

More modern development, including residential subdivisions, are scattered throughout the study area but are primarily concentrated in the western portion, within the Centre Region planning area and closer to State College. Modern commercial and industrial land uses are found primarily along the major road corridors (US 322, PA 45, and PA 144), including the PA 144/PA 26/PA 64 intersection area to the north in the vicinity of I-99 that has large areas of industrial development supporting active quarry and mining operations. These operations include large underground mines within the study area, which are located under Nittany Mountain and accessed from the north facing slopes. The acreages of developed areas are minimal, making up only 9% of the study area in residential land use and 1% in commercial and industrial land uses (excludes active quarries).

Of special note is the Regional Growth Boundary (RGB) located within the western portion of the study area. The Centre Regional Planning Agency defined the RGB to encompass the more developed areas encircling State College Borough with the intent to use it during the approval process for public sewer service extensions and influence where development occurs. The adopted RGB extends into the western end of the study area and includes the village of Lemont in College Township to the north then follows US 322, extending eastward to encompass the residential subdivisions along both PA 45 and US 322 in Harris Township. Only 7% of the study area lies within the RGB, and the availability of public sewer service within the study area is limited as well.



View of industrial development supporting mining near Pleasant Gap

Protection zones for public water supply wells have also been identified in the study area. The “Potter Township Regional Source Water Protection Plan” (April 2016) was completed as part of PA DEP’s source water assessment and protection program as a cooperative effort with four community groundwater systems in Potter Township and Centre Hall Borough. Source Water Protection Zones were identified within the mid and eastern portions of the study area along with existing and potential sources of contamination.

Influences related to potential future land use and development include the following:

- Proximity to State College Borough and the Pennsylvania State University. The employment and educational opportunities of the University, along with the relatively high quality of living standard, make the area attractive for planned development.
- The County’s active preservation program for protecting farmland from development in Penns and Nittany Valleys comprise a large part of the study area. This not only includes the ASAs created by local municipalities to extend benefits to farmers to ensure the viability of their operations, it also includes ACEs that preserve the land for farming uses in perpetuity.
- RGB that the County uses to approve public sewer service extensions and influence where growth occurs in the Centre Region and the presence of smaller community sewer service systems outside the RGB that may also affect the location and extent of future development in the study area but with limitations associated with the capacity of the respective treatment facilities.

The study area also includes multiple community facilities and services, including the following:

- Fire, Emergency Medical Systems (EMS), Police and Medical Facilities – the study area is serviced by the State College Police Department, Spring Township Police Department, the Pennsylvania State Police, the Centre Hall Fire Company, Pleasant Gap Fire Company, Boalsburg Fire Company and Alpha Fire Company as well as the Penns Valley EMS, Centre Life Link, and Pleasant Gap Ambulance. The Mount Nittany Medical Center is the major hospital in the region, which is located just outside the study area.
- Schools – Three public school districts include Penns Valley Area School District (Potter Township and Centre Hall Borough), State College Area School District (Harris Township and College Township) and Bellefonte Area School District (Spring Township and Benner Township). Public school facilities are Centre Hall-Potter Elementary School, Mount Nittany Elementary School, Mount Nittany Middle School, Pleasant Gap Elementary School, and Central PA Institute of Science and Technology. In addition, there are three private schools – the St. Joseph’s Catholic Academy in Harris Township at the former Boalsburg Elementary School, the Windy Poplars Amish Schoolhouse just east of Centre Hall, and New Story Schools - State College.

- Places of Worship – There are many churches throughout the study area. The Amish community worship in church members' homes and do not own or maintain separate buildings for worship. A synagogue in State College Borough and an Islamic Society Mosque located in College Township are just outside of the study area.



*One of the places of worship in the study area -
Calvary Church - Harvest Fields.*

- Cemeteries – There are multiple cemeteries, which are mostly associated with churches; however, one small private, family cemetery was observed during field reconnaissance near Colyer Lake. It is possible that other small family cemeteries exist within the study area given the rural and historic nature of the area.
- Parks and Recreation Areas – There are 31 public parks and recreational areas within the study area as well as 10 recreation areas maintained by non-profit and other organizations. In addition, portions of Bald Eagle and Rothrock State Forests exist along Nittany Mountain and Tussey Mountain, respectively, and hiking and mountain bike trails exist within these areas for recreation.
- There are a variety of other facilities and services in the study area that serve community needs, including municipal buildings and maintenance facilities, post offices, retirement communities, the Centre Airpark (a small public airport that is privately owned and averages 31 aircraft operations per week), the SCI Rockview prison facility, an US Army Reserve Center, Rock Hill School (used for community events), and the Penns Valley Livestock auction.

Figure 5-3 provides an overview of the socioeconomic resources in the study area.

F. Potential Waste Areas

A Preliminary Waste Site Assessment level of investigation identified a total of 207 potential waste sites, including 199 potential waste sites within the study area and eight potential waste sites in the area immediately surrounding the study area. These eight sites include leaking underground storage tank sites, landfills, and voluntary cleanup program sites, all which have the potential to impact the study area. Of the 207 potential waste sites, there are 36 identified as having current, previous, or suspected underground storage tanks; 46 automotive repair related sites; nine spills; seven cemeteries; seven landfills, dumps or junkyards; three electrical substations/compressor stations; two railroads; and one airport. The remaining 96 sites are identified as commercial properties/businesses that have the potential for using hazardous materials, generating hazardous wastes, unknown hazardous material and/or waste handling practices, or previous unknown business uses.

All the environmental data is located on the Study Webmap located on the study webpage at www.PennDOT.gov/SCAC.

CHAPTER 6: ALTERNATIVE SCREENING RESULTS

The range of alternative concepts were identified and evaluated. These alternatives were systematically screened on their ability to meet the identified study purpose and need, minimize environmental impacts, satisfy required engineering and constructability criteria, and address the study goals. Any alternative determined during this screening process that did not meet the purpose and need was dismissed from further consideration.

The screening process is outlined in **Chapter 4** of this PEL report and a description of the range of alternatives and the results from the screening process is summarized in the following sections.

A. What were the Level 1 Screening Results?

The range of alternatives identified in **Chapter 4** were initially evaluated in the Level 1 Screening. The Level 1 Screening was a qualitative assessment to determine if the alternative met the study need. The Level 1 Screening was completed by answering a series of questions to evaluate how or if each alternative met the identified need of the study.

If the alternative met the needs, it was then evaluated to assess the extent to which the alternative addressed the fundamental study goals. Each alternative was scored accordingly.

Table 6-1 provides an overview of the alternative screening results and scoring.

Table 6-1: Level 1 Alternative Screening Criteria Results

Level 1 Criteria			Range of Alternatives					
			No Build	Upgrade Existing	TCM	TSM	Public Transit	Build
Study Needs	Congestion	Could the alternative meet current and future travel demand?	No	Yes	No	No	No	Yes
		Could the alternative improve operations along roadway segments and at intersections?	No	Yes	Yes	Yes	No	Yes
	Safety	Could the alternative enhance safety for all modes of travel?	No	Yes	Yes	Yes	No	Yes
	System Continuity	Could the alternative meet driver expectations?	No	Yes	No	No	No	Yes
Study Goals (1=worst scenario and 5=best scenario)		To what extent would the alternative improve local and regional mobility?	NA	4	NA	NA	NA	5
		To what extent would the alternative address recurring and non-recurring congestion issues?	NA	4	NA	NA	NA	5
		To what extent would the alternative promote multimodal opportunities?	NA	4	NA	NA	NA	3
		To what extent would the alternative avoid and/or minimize impacts to the human, cultural, and natural environment?	NA	2	NA	NA	NA	1
		To what extent would the alternative be consistent with/accommodate local land use/planning initiatives? ¹	NA	3	NA	NA	NA	3
Goal Score Total				17				17

More information on alternatives development and screening can be found in the following documents:

- Alternatives Analysis and Screening Report for the State College Area Connector Planning and Environmental Linkages Study (February 2023)
- Engineering Technical Memorandum for the State College Area Connector Planning and Environmental Linkages Study (February 2023)
- Traffic Analysis Technical Memorandum for the State College Area Connector Planning and Environmental Linkages Study (February 2023)

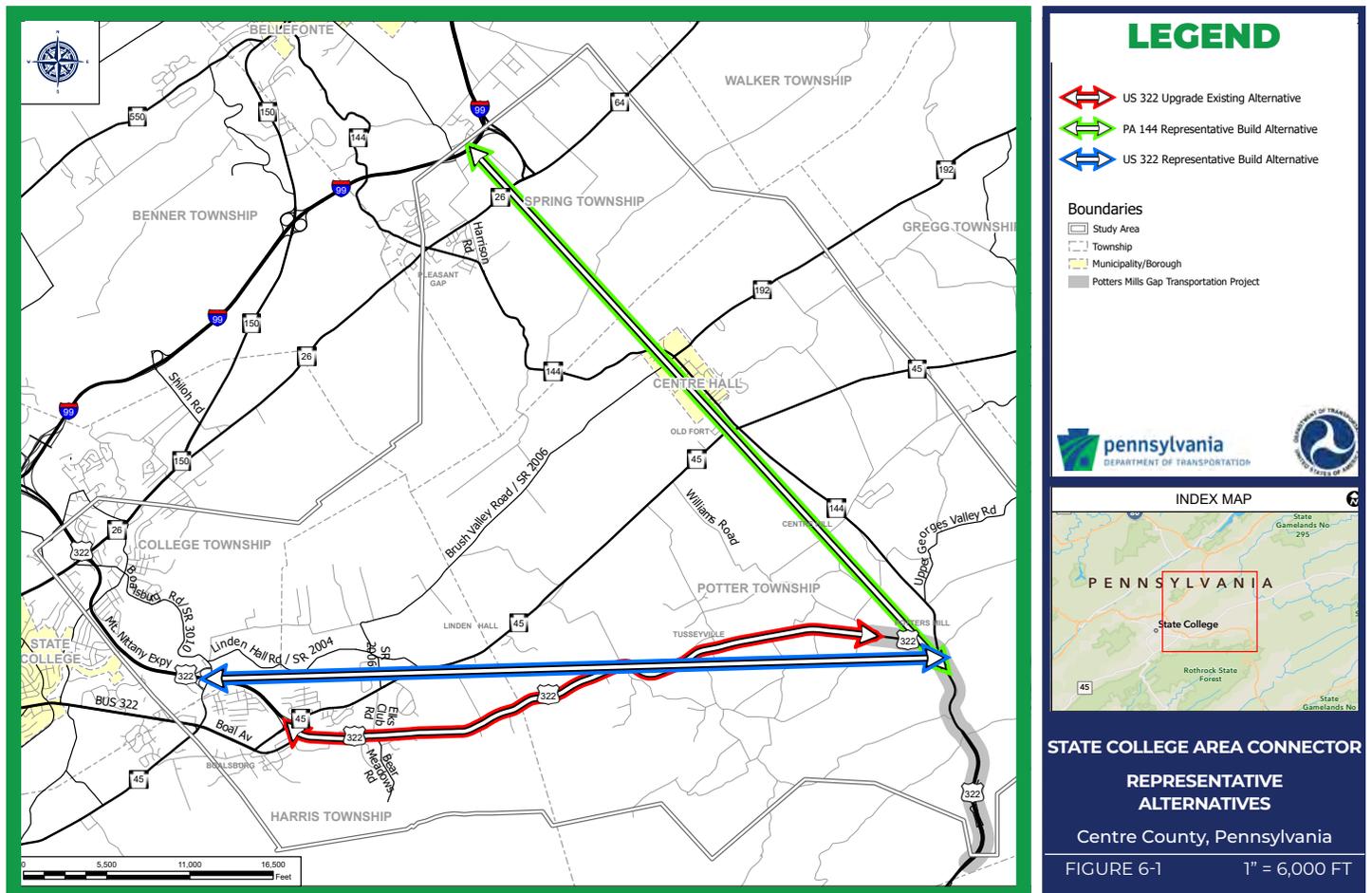
Based on the Level 1 Screening of the study's need criteria, only the Upgrade Existing Alternative and the Build Alternative were recommended for advancement to Level 2 Screening. Level 1 Screening also identified areas where these alternatives could consider engineering methods and mitigation strategies to better address the study goals.

B. What were the Level 2 Screening Results?

Level 2 Screening was divided into two parts: Level 2A and Level 2B. In the Level 2A Screening, each alternative carried forward from Level 1 was evaluated to confirm that the alternative would remove traffic from the study area roadway network. During Level 2B Screening, the alternatives were developed in more detail to determine which best met the study purpose and need, and considered public, agency and stakeholder input, while minimizing potential impacts on the natural and built environments. The alternatives that met these criteria were considered reasonable alternatives and recommended to be advanced for further environmental and engineering study in the NEPA phase of the transportation project development process.

1. Level 2A Screening

The Level 2A Screening developed Upgrade Existing Alternative and Build Alternatives representative corridors. For purposes of the planning-level traffic analysis necessary to complete the Level 2A Screening, alternatives were assumed to provide a straight-line connection between the identified logical termini without consideration of engineering criteria or environmental constraints. This level of investigation provided sufficient detail to evaluate future traffic volumes and patterns on the transportation network and to consider their impact on key study area roadways.



Note: Figure 6-1 can also be found in Appendix A at a larger size.

Figure 6-1: Representative Alternatives

An Upgrade Existing Alternative consisted of a four-lane barrier divided highway with local access limited to right turns in and out of local streets, and driveways with full access limited to select locations along the US 322 corridor from the identified logical termini of US 322 at Potters Mills to US 322 (Mt. Nittany Expressway) near Boalsburg (**Figure 6-1**). This Upgrade Existing Alternative would allow for a highway that was predominately on alignment, with no major relocations of the roadway required.

The Build Alternative consisted of a four-lane, divided, limited access highway that would connect to the logical termini locations via a straight line. Detailed engineering design was not specifically developed for this alternative and no local access, in the form of intermediate interchanges, were included in this planning-level analysis. Two Build Alternative options were developed. The first Build Alternative (US 322 Build Alternative) would provide connection between the identified logical termini of US 322 at Potters Mills Gap and US 322 (Mt. Nittany Expressway) near Boalsburg. The second Build Alternative (PA 144 Build Alternative) would provide connection between the identified logical termini of US 322 at Potters Mills Gap and I-99 north of Pleasant Gap (**Figure 6-1**).

Based on the Level 2A Screening, representative alternatives provided sufficient detail to conduct a preliminary planning-level assessment to determine the extent of traffic removed from the key study area roadway network. This confirmed that the alternative continued to meet the planning needs of the PEL Study.

a. US 322 Upgrade Existing Alternative

The Level 2A Screening showed that the US 322 Upgrade Existing Alternative would be expected to have 16% of total traffic (AADT) and 25% of truck traffic (AADTT) migrate to the upgraded section of US 322. **Figure 6-2** and **Figure 6-3** show the projected change in the 2050 traffic volumes for the local roadway network in the study area with the US 322 Upgrade Existing Alternative. As the figures show, most of the local roadway network in the study area would have a reduction in total traffic and truck traffic volumes. It should be noted that since this alternative involves upgrading of existing US 322 roadway, US 322 was excluded from the analysis as it would intentionally increase in traffic as a result of the improvements, thus negatively skewing the results. However, the increase in traffic volumes for US 322 is provided in **Figure 6-2** and **Figure 6-3** for comparison purposes. With the reductions in traffic volume on local roadway network in the study area, the US 322 Upgrade Existing Alternative would improve overall study area traffic operations and continue to meet the purpose and need based on the planning-level traffic analysis.

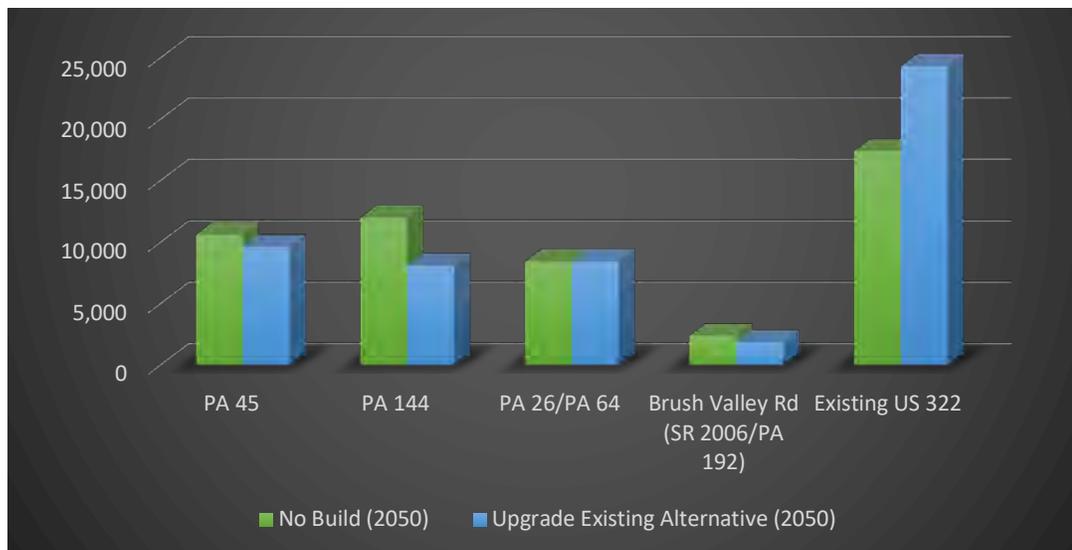


Figure 6-2: Upgrade Existing US 322 & No Build Alternatives 2050 Total Traffic Comparison

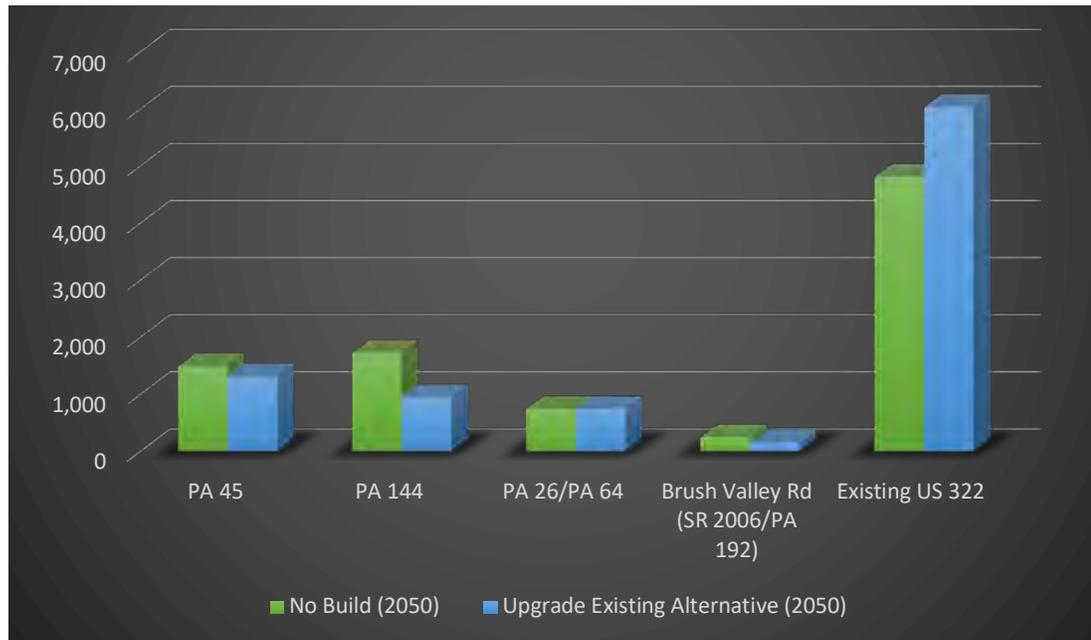


Figure 6-3: Upgrade Existing US 322 & No Build Alternative 2050 Truck Traffic Comparison

b. Build Alternatives

Two representative Build Alternatives (US 322 Build Alternative and PA 144 Build Alternative) were evaluated independently for the planning-level traffic analysis and as an alternative concept for the study needs assessment.

For the US 322 Build Alternative, the Level 2A Screening showed that the US 322 Build Alternative would be expected to have 47% of total traffic (AADT) and 70% of truck traffic (AADTT) migrate to the Build Alternative. **Figure 6-4** and **Figure 6-5** show the projected change in the 2050 traffic volumes for the local roadway network in the study area with the US 322 Build Alternative. As the figures show, most of the local roadway network in the study area would have a reduction in total traffic and truck traffic volumes.

With the reductions in traffic volume on the local roadway network in the study area, the US 322 Build Alternative would improve overall study area traffic operations and continue to meet the purpose and need based on the planning-level traffic analysis.

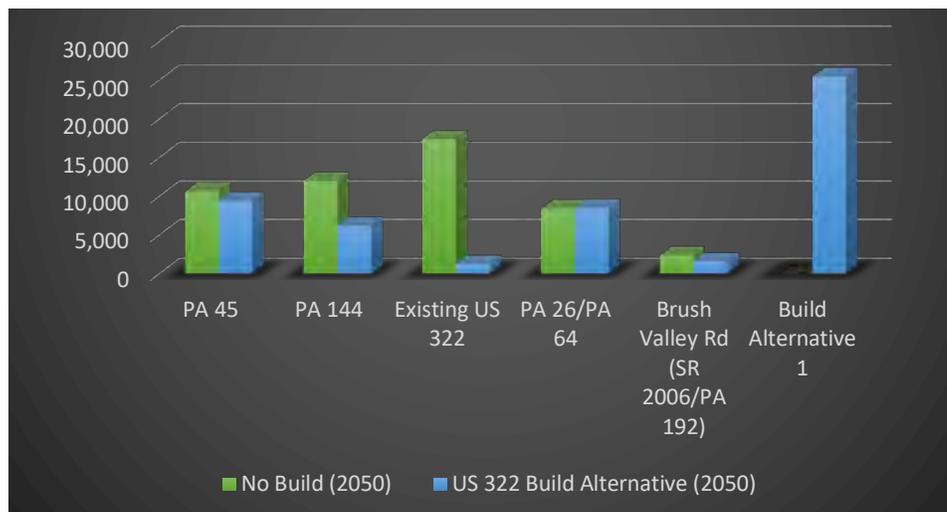


Figure 6-4: US 322 Build Alternative 1 & No Build Alternative 2050 Total Traffic Comparison

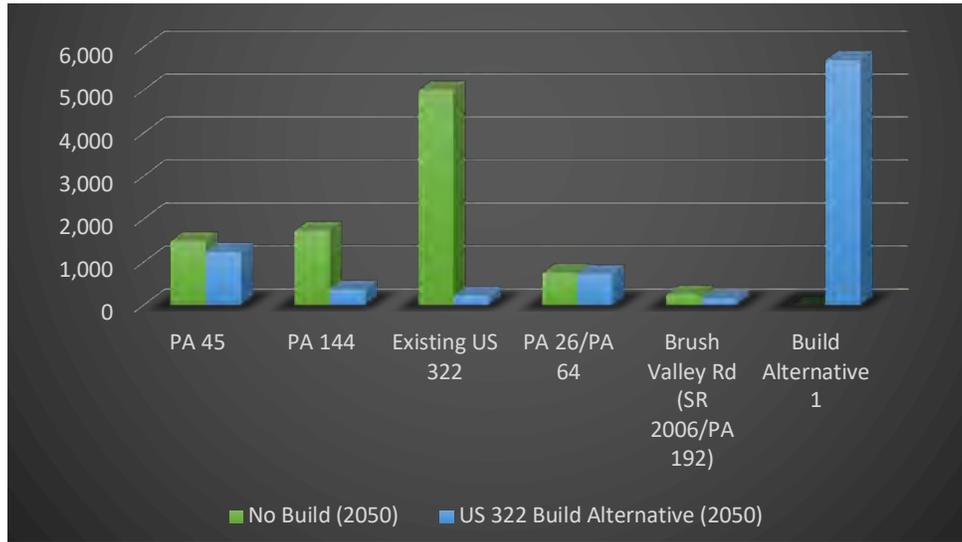


Figure 6-5: US 322 Build Alternative 1 & No Build Alternative 2050 Truck Traffic Comparison

For the PA 144 Build Alternative, the Level 2A Screening showed that the PA 144 Build Alternative would be expected to have 33% of total traffic (AADT) and 60% of truck traffic (AADTT) migrate to the Build Alternative. **Figure 6-6** and **Figure 6-7** show the projected change in the 2050 traffic volumes for the local roadway network in the study area with the PA 144 Build Alternative. As the figures show, most of the local roadway network in the study area would have a reduction in total traffic and truck traffic volumes.

With the reductions in traffic volume on the local roadway network in the study area, the PA 144 Build Alternative would improve overall study area traffic operations and continue to meet the purpose and need based on the planning-level traffic analysis.

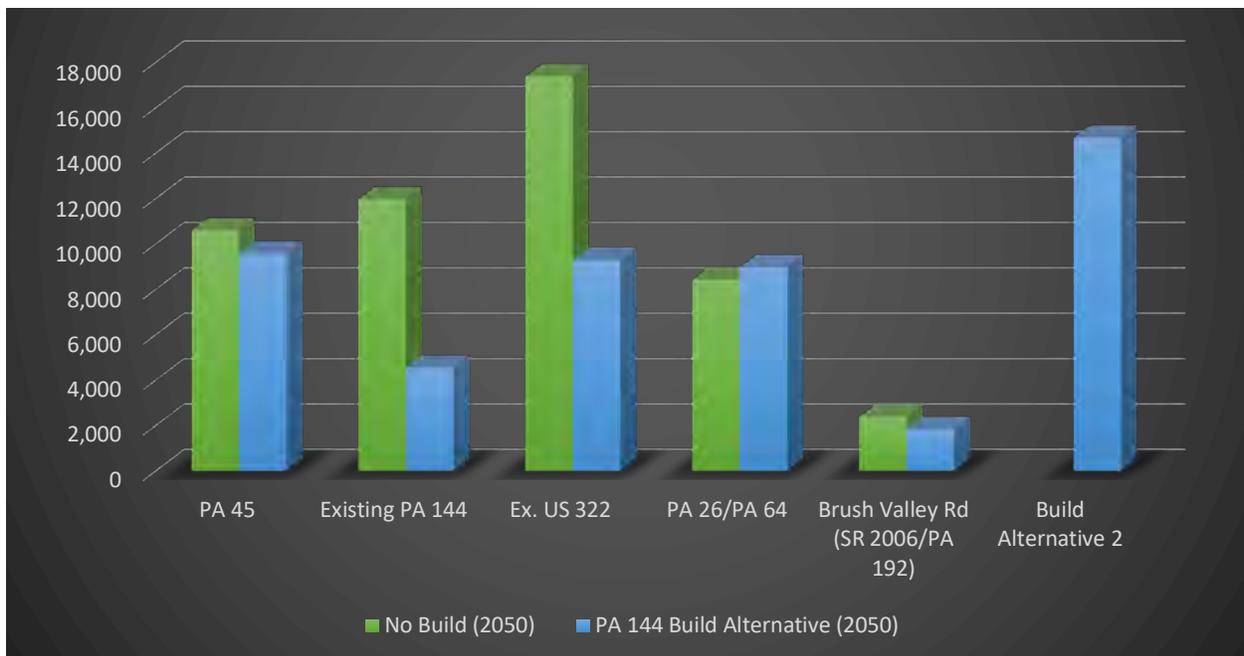


Figure 6-6: PA 144 Build Alternative 2 & No Build Alternative 2050 Total Traffic Comparison

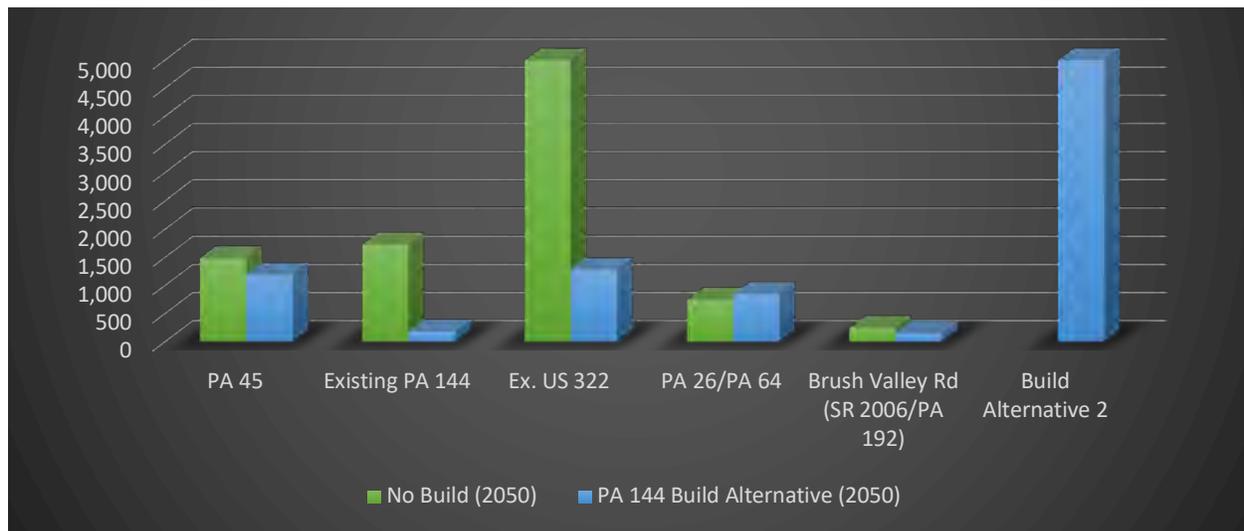


Figure 6-7: PA 144 Build Alternative 2 & No Build Alternative 2050 Truck Traffic Comparison

Based on the Level 2A Screening, the US 322 Upgrade Existing, the US 322 Build Alternative, and the PA 144 Build Alternative were recommended for advancement to Level 2B Screening. These alternatives showed reductions in traffic volumes on the existing local roadway network within the study area, which could improve the traffic operation on the existing roadway network compared to the No Build scenario. Therefore, these alternatives were advanced for Level 2B Screening which considered additional evaluation criteria for traffic, engineering, and environmental resources.

2. Level 2B Screening

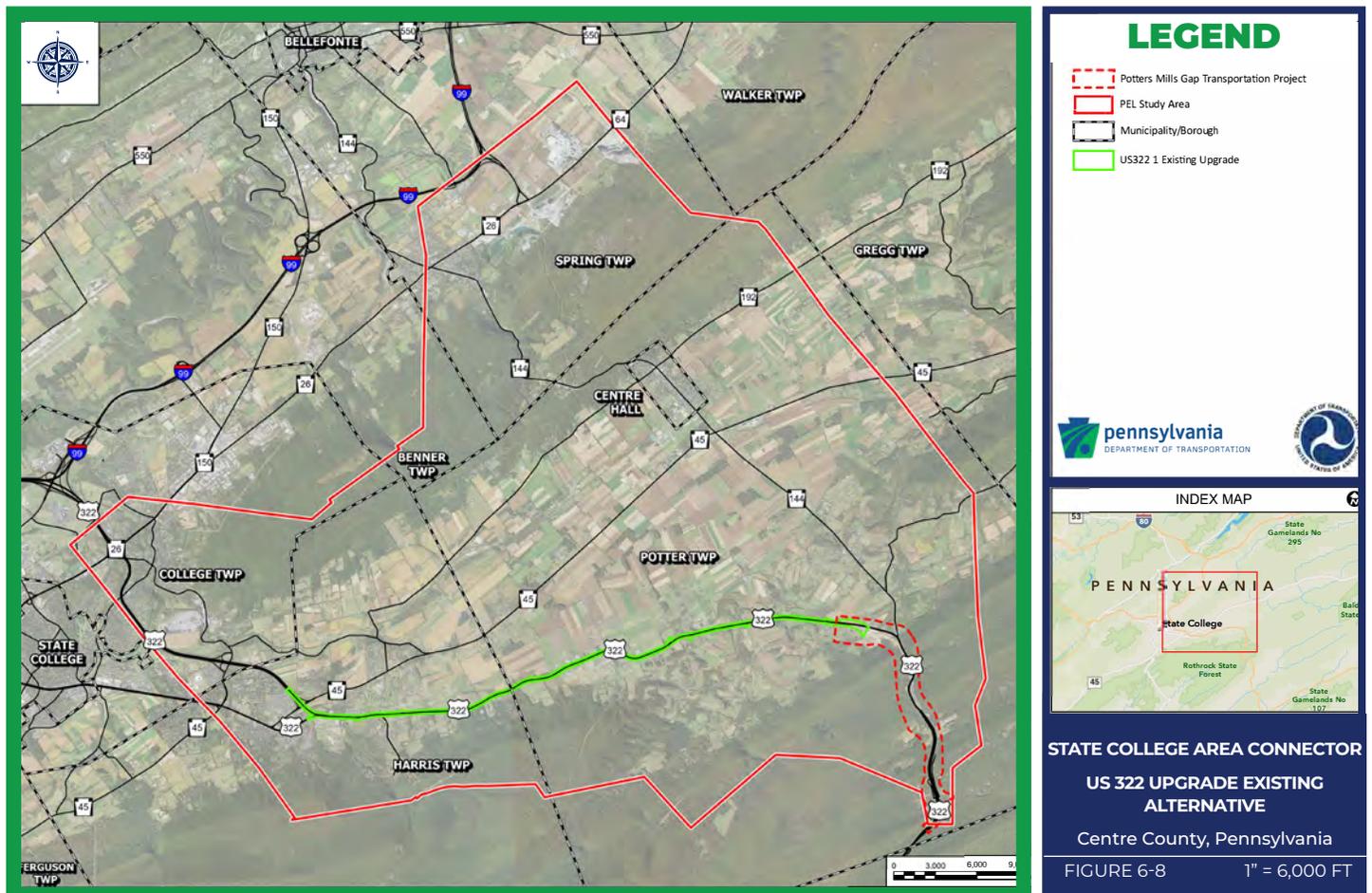
The Level 2B Screening developed conceptual engineering of preliminary alternatives for the US 322 Upgrade Existing Alternative and Build Alternatives (US 322 and PA 144). Once the preliminary alternatives were developed, a quantitative traffic analysis was conducted to determine traffic volumes, LOS, and safety projections (i.e., predicted crash frequencies), for the various alternatives and the local roadway network. An analysis was conducted to develop planning-level construction and right-of-way cost estimates for each alternative. The cost analysis incorporated major construction components including roadway pavement, drainage, bridges, earthwork volumes, local road connections/access, and other ancillary construction costs including erosion and sediment control and temporary traffic control during construction. The environmental analysis documented the natural, cultural, and socioeconomic resources within each of the Build Alternatives. Lastly, a qualitative planning analysis evaluated how each alternative met the study goals that support the purpose and need, local transportation and land use planning, transportation mobility, best engineering practices, and environmental stewardship. At the conclusion of the Level 2B Screening, reasonable alternatives to advance for future environmental and engineering studies in the NEPA phase of the transportation development process were identified.

Preliminary alternatives for the US 322 Upgrade Existing and Build Alternatives (US 322 and PA 144) were developed to evaluate the potential environmental impacts and traffic influences. The location of the US 322 Upgrade Existing and Build Alternatives (US 322 and PA 144) were developed by updating previous study corridors and creating new corridors that met design standards and with shifts to minimize impacts on critical environmental resources. For the US 322 Upgrade Existing Alternative, the roadway typical section was used to identify a corridor width. Additional space was included to accommodate jughandles for the left turning traffic movement in key areas.

Each of the conceptual Build Alternative corridors used a common roadway template to establish the typical footprint required. A consistent 350' width was applied across most of the Build Alternative corridors and expanded to accommodate interchange locations. The width was established to contain the roadway template, embankment slopes, drainage swales, bridge structures, and local roadway network modifications. The width was modified in two locations, the mountainous terrain over Nittany Mountain and the more developed areas of Harris Township. On the PA 144 Build Alternatives, the width was expanded to 900' to provide space for the additional earthwork needed to accommodate the proposed roadway over Nittany Mountain. On the US 322 Build Alternatives that follow the western portion of the existing US 322 corridor in Harris Township, the width was reduced to 250' to minimize the corridor footprint in this urbanized area.

a. US 322 Upgrade Existing Alternative

The US 322 Upgrade Existing Alternative would extend from the logical termini at the US 322 (Mt. Nittany Expressway) in Boalsburg to the newly constructed US 322/PA 144 interchange at Potters Mills Gap (**Figure 6-8**). This alternative includes four lanes, a paved median with concrete barrier separation, and full-width shoulders. The alternative would include access-controlled lanes, with at-grade intersections and jughandle turnarounds strategically located to maintain local road network connectivity. The US 322 Upgrade Existing Alternative would be 7.2 miles.



Note: Figure 6-8 can also be found in Appendix A at a larger size.

Figure 6-8: US 322 Upgrade Existing Alternative

b. US 322 Build Alternative

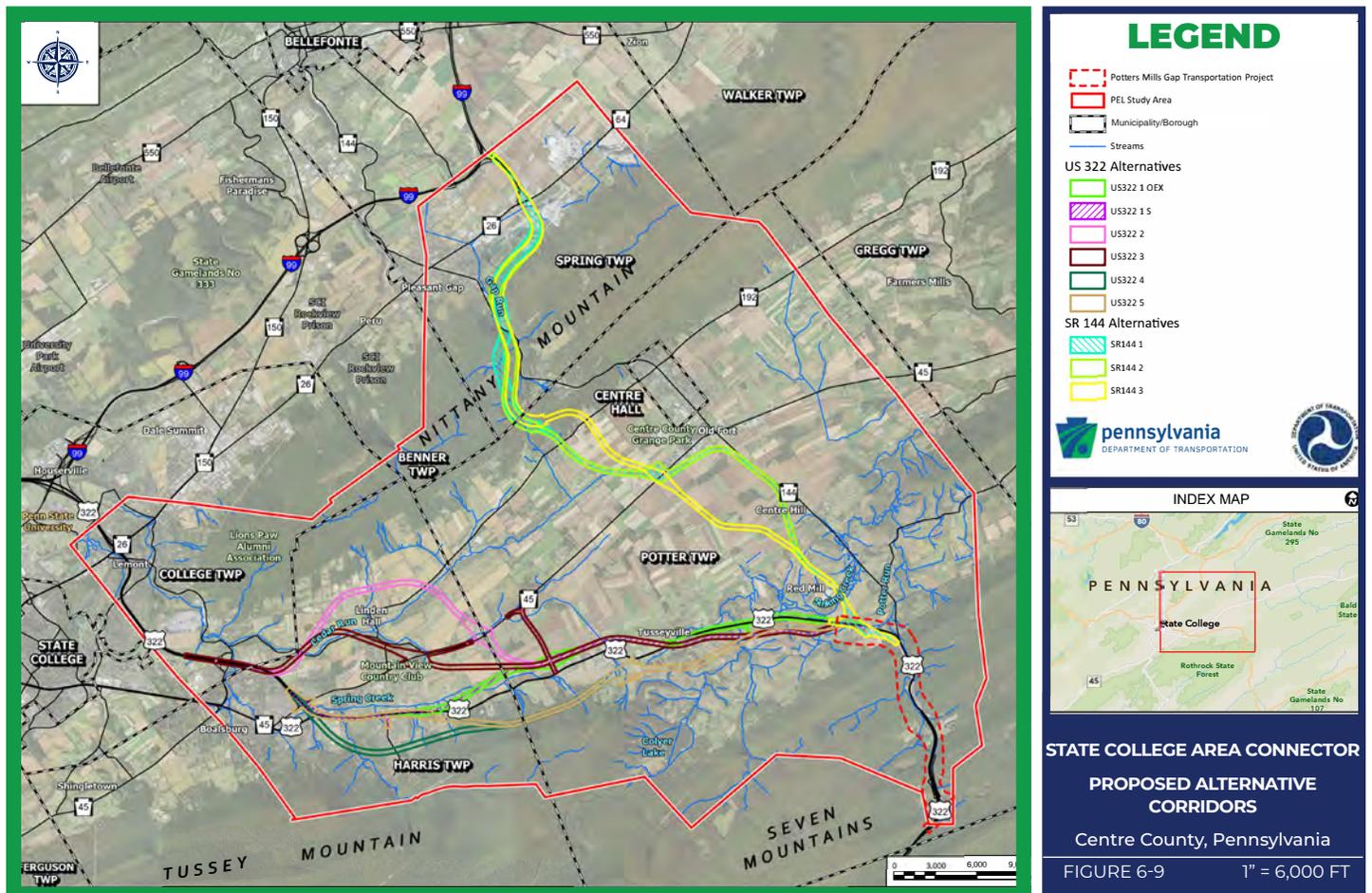
Six US 322 Build Alternative corridors were developed for evaluation.

US 322-1S Build Alternative

The US 322-1S Build Alternative (US 322-1S) would have logical termini at the US 322 (Mt. Nittany Expressway) in Boalsburg and US 322 at Potters Mills Gap (**Figure 6-9**). US 322-1S would begin at the existing US 322 interchange with PA 45 near Boalsburg and follow existing US 322 to a point east of the Elks Club Road/Bear Meadows Road intersection. In this area, a two-lane service road would be provided on the north side of the limited access highway to provide connectivity to the local road network. US 322-1S would shift off existing US 322 to the north until it crosses south over US 322 near Neff Road in Tusseyville. An interchange with a connector road between PA 45 and US 322 would be proposed near Iron Horse Lane and the Harley Davidson Center. The alternative would parallel US 322 to the south before connecting to the newly constructed US 322/PA 144 interchange at Potters Mills Gap. The Build Alternative US 322-1S would be 8.3 miles.

US 322 - 1OEX Build Alternative

The US 322-1OEX Build Alternative (US 322-1OEX) is a hybrid of US 322-1S that attempts to maximize the use of the existing US 322 right-of-way (**Figure 6-9**). US 322-1OEX would have logical termini at the US 322 (Mt. Nittany Expressway) in Boalsburg and US 322 at Potters Mills Gap. US 322-1OEX would begin at the existing US 322 interchange with PA 45 near Boalsburg and follow existing



Note: Figure 6-9 can also be found in Appendix A at a larger size.

Figure 6-9: Proposed Alternative Corridors

US 322 to a point east of the Elks Club Road/Bear Meadows Road intersection. In this area, a two-lane service road would be provided on the north side of the limited access highway to provide connectivity to the local road network. US 322-1OEX would shift off existing US 322 to the north until it crosses back to US 322 near Neff Road in Tusseyville. An interchange with a connector road between PA 45 and US 322 would be proposed near Iron Horse Lane and the Harley Davidson Center. Near Neff Road, US 322-1OEX would follow existing US 322 to the newly constructed US 322/PA 144 interchange at Potters Mills Gap, with the inclusion of a two-lane service road to maintain local access for properties adjacent to the new limited access facility. US 322-1OEX would be 8.3 miles long.

US 322-2 Build Alternative

The US 322-2 Build Alternative (US 322-2) would have logical termini at the US 322 (Mt. Nittany Expressway) near Boalsburg and US 322 at Potters Mills Gap (**Figure 6-9**). US 322-2 would begin at existing US 322 interchange with the existing PA 45 (Boalsburg Pike), proceed past the Oak Hall Regional Park property and continue north and east of Linden Hall where it would turn southward cross Lower Brush Valley Road and PA 45. An interchange would be proposed at PA 45 near Kenwalke Lane with a connector road that extends from existing US 322 to PA 45. The corridor would parallel existing US 322 to the north until it crosses over US 322 near Neff Road in Tusseyville. Paralleling US 322 to the south, it would connect the newly constructed US 322/PA 144 interchange at Potters Mills Gap. US 322-2 would be 10.0 miles long.

US 322-3 Build Alternative

The US 322-3 Build Alternative (US 322-3) would have logical termini at the US 322 (Mt. Nittany Expressway) near Boalsburg and US 322 at Potters Mills Gap (**Figure 6-9**). US 322-3 would begin at US 322 interchange at the existing PA 45 (Oak Hall interchange) full access interchange, proceed past the Oak Hall Regional Park property and proceed through the northern portion of Linden Hall. It would parallel Linden Hall and Cedar Run Roads when approaching a PA 45 interchange, with a connector road that extends from existing US 322 to PA 45. The corridor would parallel existing US 322 to the north until it crosses over US 322 near Neff Road in Tusseyville. It would then parallel US 322 to the south before it would connect to the newly constructed US 322/PA 144 interchange at Potters Mills Gap. US 322-3 would be 9.7 miles.

US 322-4 Build Alternative

The US 322-4 Build Alternative (US 322-4) would have logical termini at the US 322 (Mt. Nittany Expressway) in Boalsburg and US 322 at Potters Mills Gap (**Figure 6-9**). US 322-4 would begin at the existing US 322 interchange with PA 45 near Boalsburg, diverge south over US 322 until it would turn eastward generally along the base of Tussey Mountain, paralleling US 322. An interchange is proposed near Taylor Hill Road with a connection to US 322. The corridor would continue paralleling US 322 to the south crossing over Church Hill Road, Dogtown Road, and Red Mill Road and connect to the newly constructed US 322/PA 144 interchange at Potters Mills Gap. US 322-4 would be 8.6 miles long.

US322-5 Build Alternative

The US 322-5 Build Alternative (US 322- 5) would have logical termini at the US 322 (Mt. Nittany Expressway) in Boalsburg and US 322 at Potters Mills Gap (**Figure 6-9**). US 322-5 would begin at the existing US 322 interchange with PA 45 near Boalsburg and follow existing US 322 to a point east of the Elks Club Road/Bear Meadows Road intersection. A two-lane service road on the north side of the limited access highway would connect to the local road network. US 322-5 would turn

southeast off existing US 332 corridor near Tait Road, connect with US 322-4, and proceed east along the lower slope of Tussey Mountain, paralleling US 322. An interchange is proposed near Taylor Hill Road with a connection to existing US 322. The corridor would continue paralleling US 322 to the south crossing over Church Hill Road, Dogtown Road, and Red Mill Road and connecting to the newly constructed US 322/PA 144 interchange at Potters Mills Gap. US 322-5 would be 8.4 miles long.

c. PA 144 Build Alternative

PA 144-1 Build Alternative

The PA 144-1 Build Alternative (PA 144-1) would have logical termini at the newly constructed US 322/PA 144 interchange at Potters Mills Gap and I-99 north of Pleasant Gap (**Figure 6-9**). PA 144-1 would proceed in a northerly direction from the US 322/PA 144 interchange at Potters Mills Gap, paralleling Goodhart Road to the east. At Airport Road, PA 144-1 would head northeast and parallel PA 144 before it turns west to parallel PA 45. An interchange would be provided at PA 45 between Rudy Lane and Williams Road to provide local access. PA 144-1 would then proceed to the north and bridge Upper Brush Valley Road to the east of Black Hawk Village mobile home park. The corridor would proceed north through the Black Hawk Gap and curve to the east crossing over PA 144 to the north of Lower Greens Valley Road. PA 144-1 would continue in a northeasterly direction across Mount Nittany. PA 144-1 would terminate at the existing PA 26/ I-99 interchange. PA 144-1 would be 10.3 miles long.

PA 144-2 Build Alternative

The PA 144-2 Build Alternative (PA 144-2) would have logical termini at the newly constructed US 322/PA 144 interchange at Potters Mills Gap and I-99 north of Pleasant Gap (**Figure 6-9**). PA 144-2 would proceed in a northerly direction from the US 322/PA 144 interchange at Potters Mills Gap, paralleling Goodhart Road to the east. At Airport Road, PA 144-2 would head northeast and parallel PA 144 before it turns west to parallel PA 45. An interchange would be provided at PA 45 between Rudy Lane and Williams Road to provide local access. PA 144-2 would then proceed to the north and bridge Upper Brush Valley Road to the east of Black Hawk Village mobile home park. The corridor would proceed north through the Black Hawk Gap staying west of PA 144-1 before it would curve to the east crossing over PA 144 to the north of Lower Greens Valley Road. PA 144-2 would continue in a northeasterly direction across Mount Nittany. PA 144-2 would terminate at the existing PA 26/ I-99 interchange. PA 144-2 would be 10.5 miles long.

PA 144-3 Build Alternative

The PA 144-3 Build Alternative (PA 144-3) would have logical termini at the newly constructed US 322/PA 144 interchange at Potters Mills Gap and I-99 north of Pleasant Gap (**Figure 6-9**). PA 144-3 would proceed in a northerly direction from the US 322/PA 144 interchange at Potters Mills Gap, paralleling Goodhart Road to the east. As PA 144-3 approaches Airport Road, the corridor would head in a northwest direction to a perpendicular crossing of PA 45. An interchange would be provided at PA 45 between Rudy Lane and Williams Road to provide local access. From the PA 45 crossing, PA 144-3 would proceed north crossing over Brush Valley Road before turning west to cross Mount Nittany through the Black Hawk Gap. The corridor would proceed north staying just east of PA 144-2 before it would curve to the east crossing over PA 144 to the north of Lower Greens Valley Road. PA 144-3 would continue in a northeasterly direction across Mount Nittany. PA 144-3 would terminate at the existing PA 26/I-99 interchange. This corridor would be 9.7 miles long.

d. Traffic Screening Results

The representative Upgrade Existing Alternative and Build Alternative corridors developed for the Level 2A Screening were utilized for the Level 2B Screening to initiate the planning-level traffic analysis. As in Level 2A, the alternatives connected the identified logical termini but were not designed or engineered.

Based on the Level 2B Screening, the representative alternatives provided sufficient detail to conduct a preliminary planning-level assessment to determine the effectiveness of the various alternatives at meeting the purpose and need for the PEL Study in the future design year of 2050.

Future year (2050), planning-level, traffic volume forecasts were developed for these representative alternatives. Since access/connections with the existing roadway network are similar for all six US 322 Build Alternative corridors (US 322-1 OEX, US 322-1S, US 322-2, US 322-3, US 322-4, US 322-5) and the three PA 144 Build Alternative corridors (PA 144-1, PA 144-2, PA 144-3), two representative corridors were developed to forecast the planning-level traffic, one for the US 322 Build Alternative corridors and one for the PA 144 Build Alternative corridors. Therefore, a single traffic analysis was conducted for each family of alternatives as opposed to separate analyses for each individual corridor since the results for corridors would be similar at the planning level of analysis. The US 322 Upgrade Existing Alternative was modeled independently.

From a traffic analysis perspective, the alternatives developed for traffic screening, included:

- US 322 Upgrade Existing Alternative consisted of geometric advancements of the current corridor following the existing US 322 corridor from logical termini at the US 322 (Mt. Nittany Expressway) in Boalsburg to the newly constructed US 322 at Potters Mills Gap. This four-lane, barrier separated alternative would allow left turns from US 322 at select intersections. Access to local roads and properties adjacent to the highway would be restricted to right-in and right-out movements with left turns accommodated at jughandles turnarounds spaced throughout the corridor.
- US 322 Build Alternative provided a new limited access roadway connection between logical termini at the US 322 (Mt. Nittany Expressway) in Boalsburg to the US 322 at Potters Mills Gap with an option for an intermediate interchange in the vicinity of the Harris Township/Potter Township border connecting to PA 45.
- PA 144 Build Alternative provided a new limited access roadway connection between logical termini at the US 322 at Potters Mills Gap to I-99 north of Pleasant Gap with an intermediate interchange at PA 45.

US 322 Upgrade Existing Alternative

The Level 2B Screening showed that the US 322 Upgrade Existing Alternative would be expected to have 17% of total traffic (AADT) and 21% of truck traffic (AADTT) migrate to the upgraded section of US 322. **Figure 6-10** and **Figure 6-11** show the projected change in the 2050 traffic volumes for the local roadway network in the study area with the US 322 Upgrade Existing Alternative. As the figures show, most of the local roadway network in the study area would have a reduction in total traffic and truck traffic volumes. It should be noted that since this alternative involves upgrading of existing US 322 roadway, US 322 was excluded from the analysis as it would intentionally increase in traffic as a result of the improvements, thus negatively skewing the results. However, the increase in traffic volumes for US 322 is provided in **Figure 6-10** and **Figure 6-11** for comparison purposes. With the reductions in traffic volume on local roadway network in the study area, the US 322 Upgrade Existing Alternative would improve overall study area traffic operations and continue to meet the purpose and need based on the planning-level traffic analysis.



Figure 6-10: Upgrade Existing US 322 & No Build Alternatives 2050 Total Traffic Comparison

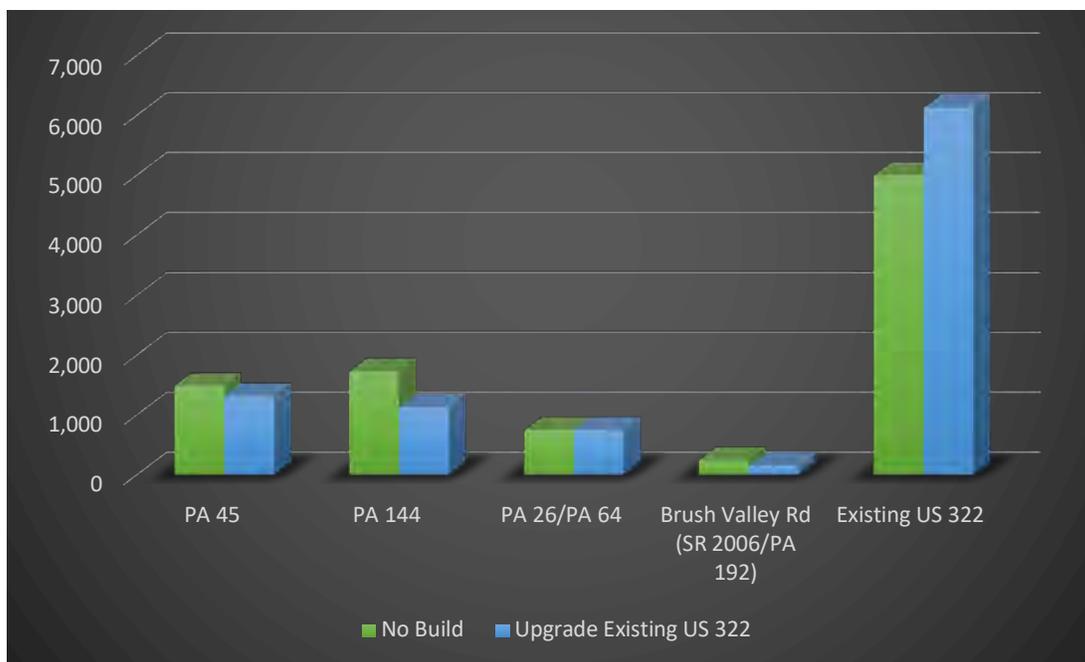


Figure 6-11: Upgrade Existing US 322 & No Build Alternatives 2050 Truck Traffic Comparison

Build Alternatives

For the US 322 Build Alternative, the intermediate interchange included, the Level 2B Screening showed that the US 322 Build Alternative would be expected to have 53% of total traffic (AADT) and 73% of truck traffic (AADTT) migrate to the Build Alternative. **Figure 6-12** and **Figure 6-13** show the projected change in the 2050 traffic volumes for the local roadway network in the study area with the US 322 Build Alternative. As the figures show, most of the local roadway network in the study area would have a reduction in total traffic and truck traffic volumes.

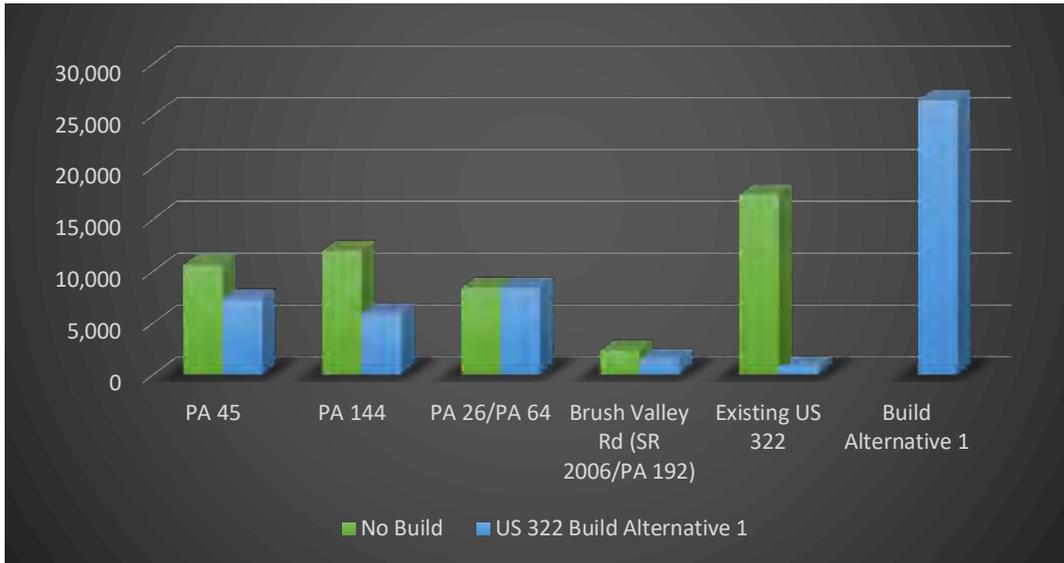


Figure 6-12: US 322 Build Alternative 1 & No Build Alternative 2050 Total Traffic Comparison

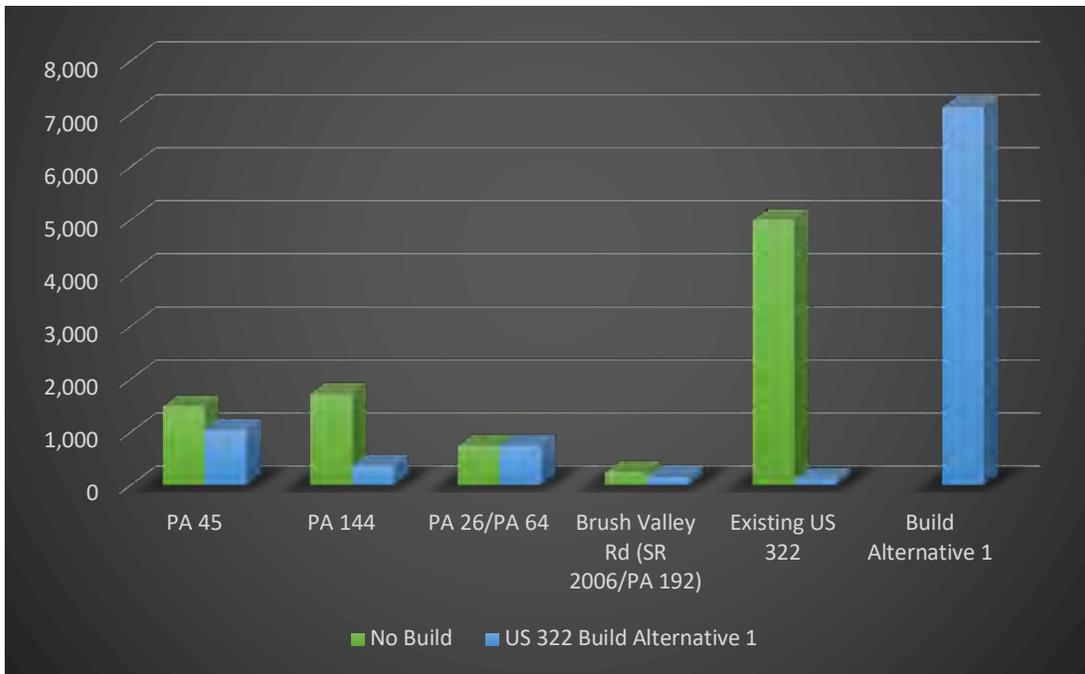


Figure 6-13: US 322 Build Alternative 1 & No Build Alternative 2050 Truck Traffic Comparison

For the PA 144 Build Alternative, the intermediate interchange included, the Level 2B Screening showed that the PA 144 Build Alternative would be expected to have 46% of total traffic (AADT) and 57% of truck traffic (AADTT) migrate to the Build Alternative. **Figure 6-14** and **Figure 6-15** show the projected change in the 2050 traffic volumes for the local roadway network in the study area with the PA 144 Build Alternative. As the figures show, most of the local roadway network in the study area would have a reduction in total traffic and truck traffic volumes.

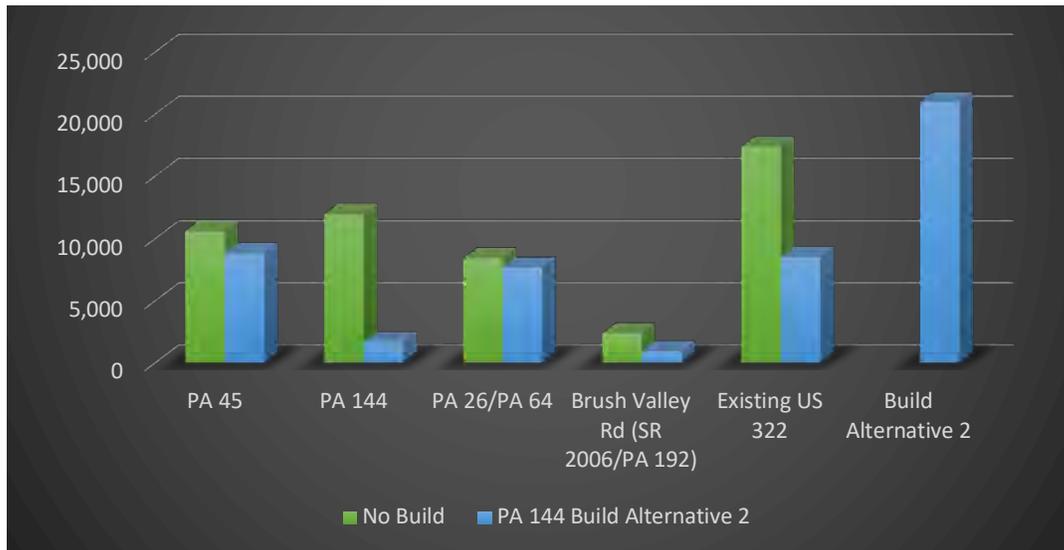


Figure 6-14: PA 144 Build Alternative 2 & No Build Alternative 2050 Total Traffic Comparison

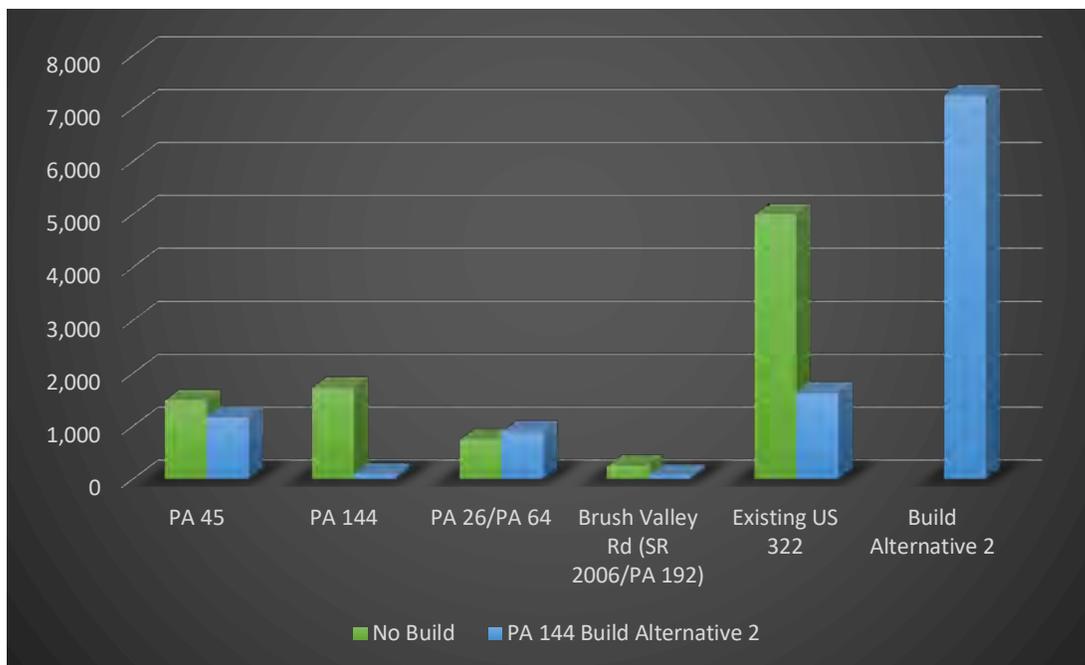


Figure 6-15: PA 144 Build Alternative 2 & No Build Alternative 2050 Truck Traffic Comparison

When evaluating LOS compared to a No Build scenario, all alternatives improved operations at most key study intersections and approximately 20 miles of key local roadway within the study area. However, all alternatives still had segments on the local roadway network and at least one intersection with a predicted LOS that did not meet current acceptable criteria.

- The US 322 Upgrade Existing Alternative and the US 322 Build Alternative had slightly less lane miles (6.6 miles) of unacceptable LOS when compared to a PA 144 Build Alternative (8.5 miles). None of the alternatives would improve the 3.5-mile section of existing PA 144 over Mount Nittany, which is an issue related to roadway geometry (**Table 6-2**).

- The US 322 Upgrade Existing Alternative and the PA 144 Build Alternative have one intersection that would be at an unacceptable LOS compared to two intersections on the US 322 Build Alternative; these are unsignalized ramp intersections on Boalsburg Road at its interchange with US 322 (Mt. Nittany Expressway) (**Table 6-2**).

A Bicycle Level of Service (BLOS) analysis was also conducted for the US 322 Upgrade Existing, US 322 Build, and PA 144 Build Alternatives. Slight improvement in BLOS would be realized on those existing roadway links that have a reduction in traffic volumes associated with an alternative; however, the US 322 Upgrade Existing Alternative would essentially eliminate the use of US 322 as a viable bicycle route. Appreciable improvement in BLOS would not be realized without upgrades to existing shoulders or provisions for separate bicycle facilities throughout the study area.

A safety analysis was performed using the crash predictive model of the Highway Safety Manual (HSM) analysis to quantitatively evaluate the safety benefits associated with each alternative. The safety analysis evaluated the existing key study area roadways (US 322, PA 144 and PA 45) and the alternatives with the 2050 traffic volume projections to calculate a predicted crash frequency for each alternative by summing the predicted crash frequencies of the roadways for comparison of each alternative to a No Build scenario. This comparison determined the quantitative reduction in crash frequencies (of all crashes and of fatal and injury crashes).

The results of the HSM analysis showed the following compared to a No Build scenario:

- Under the US 322 Upgrade Existing Alternative, the number of total crashes is predicted to decrease along PA 144 and PA 45 due to decreased volumes on these roadways. However, predicted crashes nearly doubled along US 322 due to increased volumes and the introduction of several jughandle intersections. Within the study area, overall crashes were predicted to increase by approximately 10% for the Upgrade Existing Alternative, although the overall number of fatality/injury crashes is predicted to decrease (approximately 3%). This alternative did not improve safety.
- Under US 322 Build Alternative predicted crashes decreased on study area roadways due to the diverted traffic volumes, with existing US 322 having the largest decrease. Within the study area, the overall number of crashes would be reduced by approximately 18% and fatality/injury crashes were reduced by approximately 22%. This alternative improved safety.
- Under PA 144 Build Alternative, predicted crashes decreased on study area roadways due to the diverted traffic volumes on these roadways, existing PA 144 had the largest decrease. Within the study area, the overall number of crashes was reduced by approximately 25% and fatality/injury crashes were reduced by approximately 28%. This alternative improved safety.

While the US 322 Upgrade Existing Alternative improved traffic operations on the roadway network, it decreased safety on the study area network over the existing facility. As a result, the US 322 Upgrade Existing Alternative did not meet the purpose and need of the PEL Study to improve safety, nor did it provide network continuity. For these reasons, the US 322 Upgrade Existing Alternative was not advanced for further evaluation in this PEL Study.

The US 322 and PA 144 Build Alternatives would meet the purpose and need. As summarized in the list below and supported by **Table 6-2**, from a traffic operations and safety perspective, both Build Alternatives substantially improved mobility, congestion, and safety on the study area roadways and all the Build Alternative corridors were recommended to be advanced for further study from a traffic perspective.

- Either Build Alternative would be acceptable from a traffic operations and safety perspective.
- Both Build Alternatives would meet the projected traffic and safety need.
- Both Build Alternatives would carry the majority of through car and truck traffic.
- Both Build Alternatives would improve overall safety on study area roads by virtue of removing through traffic and shifting heavy truck traffic to the new limited access road.
- Both Build Alternatives would leave some residue traffic concerns related to congestion on the existing road network. In the case of the US 322 Build Alternative approximately 6.6 miles of unacceptable LOS in the future; PA 144 (3.5 miles) and PA 45 (3.1 miles). For the PA 144 Build Alternative, approximately 8.5 miles of unacceptable LOS would remain (the same 3.5 miles of PA 144 and 5 miles of US 322).
- US 322 Build Alternative options would carry more total traffic than PA 144 Build Alternative options by virtue of attracting more traffic destined to the State College area including Boalsburg, Ferguson Township and certain downtown sites. Car and truck traffic destined to those areas would not follow a PA 144 Build Alternative option and be faced with driving through State College to get to points west of the Mount Nittany Expressway. As a result, the PA 144 Build Alternative options leave more residue traffic on US 322; conversely due to the interchange at PA 45, the PA 144 Build Alternative options carry more State College destined traffic from the valley. 50% to 60% of all traffic would migrate from the local roadway network in the study area for the US 322 Build Alternative options and 40% to 50% of all network traffic would migrate from the local roadway network in the study area for the PA 144 Build Alternative options. This reflects the State College destinations and the likelihood that traffic destined to those areas would follow existing US 322 rather than proceed over the mountain on a PA 144 option and then traversing south on I-99.

Table 6-2: Level 2B Screening LOS and Safety Summary

Traffic Analysis	US 322 Upgrade Existing	US 322-1 OEX	US 322-1 S	US 322-2	US 322-3	US 322-4	US 322-5	PA 144-1	PA 144-2	PA 144-3
Level of Service – Segment Miles Unacceptable (miles)	6.6	6.6						8.5		
Level of Service – Intersections Unacceptable (number of intersections)	1	2						1		
Improves BLOS	Yes*	Yes						Yes		
Safety Improvements – Improves Predicted Total Crashes	No	Yes						Yes		
Safety Improvements – Improves Predicted Fatal & Injury Crashes	No	Yes						Yes		

* US 322 would be unusable by bikes without the inclusion of dedicated bicycle facility.

e. Environmental Screening Results

The alternative screening process included a preliminary analysis of potential environmental impacts based on the best available secondary source information, limited verification, and coordination with local, state, and federal officials/agencies as summarized in **Chapter 5**. During the PEL Study, the alternatives screening considered all federal, state, and local regulations, as appropriate, in the evaluation of alternatives to ensure that all regulatory requirements would be met in future NEPA studies. A summary of all the environmental resources which could potentially be impacted by Build Alternative corridors is included in **Table 6-3** (located in **Appendix B**).

While federal regulations require that impacts to all resources be balanced with engineering considerations, ability to meet need, public input and agency consultation, other regulations require examination of avoidance alternatives or pose strict requirements for any impact. Following the initial identification of potential impacts, a refined analysis was conducted to focus on those resources with statutory or implementing regulations with specific requirements for the evaluation and advancement of alternatives. The refined screening provided a comparative analysis for each of the Build Alternatives and provided a foundation for identifying which alternative provided the best opportunity to minimize overall environmental impacts. The key statutes and regulations included:

- Section 4(f) of the U.S. DOT Act of 1966: Section 4(f) properties include publicly owned public parks, recreational areas, wildlife or waterfowl refuges, and any significant historic sites. Section 4(f) allows the use (impact) of such land for a transportation project only when:
 - There is no feasible and prudent alternative to the use of the Section 4(f) property.
 - The project includes all possible planning to minimize harm (as defined in 23 CFR §774.17) to the Section 4(f) property resulting from the use.

Or

- The use, including any measures to minimize harm (such as any avoidance, mitigation, minimization, or enhancement measures) will have a de minimis impact on the property as defined in 23 CFR 774.17.
- Section 404 of the Clean Water Act (CWA) and Chapter 105 of 25 PA Administrative Code permitting process: These statutes require examination of practicable alternatives to avoid wetlands and streams. If the proposed projects cannot avoid impacts to wetlands and streams, they require the issuance of a Section 404 Permit by the USCOE (and the corresponding Section 401 Water Quality Certification [WQC] from the PA DEP). As part of the permit application, a 404(b)(1) Alternatives Analysis is completed along with the identification of avoidance, minimization, and compensatory mitigation measures.
- Agricultural Land Condemnation Approval Board (ALCAB): If productive agricultural land will need to be acquired for a project and the project does not meet the exemption clauses in PA Act 1979-100 or PA Act 1981-43, a project may need an ALCAB Hearing for approval to condemn agricultural property. This includes the taking of productive agricultural land enrolled in preserved farmland, such as agricultural conservation easements, as well as productive agricultural lands enrolled in Agricultural Security Areas. Where amicable settlement cannot be reached for acquisition of productive agricultural land, including lands protected under PA Act 1979-100 and PA Act 1981-43, ALCAB approval that the selected alternative is the most reasonable and prudent alternative must be obtained before condemnation proceedings can begin.

- Endangered Species Act (ESA): This statute requires consultation with the USFWS to seek ways to avoid jeopardizing the continued existence of Federally threatened and endangered species and their habitats. (In addition, there are similar requirements associated with applicable State codes, such as the Game and Wildlife Code, the Fish and Boat Code, and the Conservation of Natural Wild Plants Code for state species). Section 7 does not require selection of the alternative that causes “least harm” to listed species, but its requirements are nonetheless stringent. Impacts to listed species can play a role in the alternative analyses under the guidelines. For example, significant adverse impacts to listed species could result in the rejection of an alternative that has the least impact on another environmental resource.
- Section 106 of the National Historic Preservation Act (as amended): This statute requires that consideration be given to the effects of a project on historic and archaeological resources. Requirements include consultation with the State Historic Preservation Officer (SHPO) and other appropriate consulting parties in addition to the assessment of effects on historic properties, districts, and structures listed in or eligible for the NRHP. Requirements for archaeological studies and reports also include consultation with federally recognized tribes as part of the investigation of prehistoric/pre-contact sites. Historic and archaeological resources listed or determined eligible for listing in the NRHP are considered Section 4(f) resources except archaeological sites that are determined to be important chiefly for what can be learned by data recovery and have minimal value for preservation in place. These archaeological sites would not be considered Section 4(f) resources per 23 CFR 774.13(b).
- Community Impact Assessment: Community and socioeconomic impacts must also be considered. Federal regulations require that an activity or project receiving federal funding or requiring federal approval undergo an analysis of the effect on natural and human environments. The effects to be assessed include but are not limited to ecological, social, economic, aesthetic, historic, cultural, and health. There are also many other federal and state statutes, regulations, executive orders, and guidance documents that establish the legal basis to address impacts to the community that may be affected by proposed transportation improvements. These include, but are not limited to, the Uniform Relocation Assistance and Real Property Acquisition Policies Act, Title VI of the Civil Rights Act, Executive Order (EO) 12898 on Federal Actions to Address Environmental Justice, EO 13985 on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government, and PA Section 2002 of the Administrative Code of 1929.

Table 6-4 (located in **Appendix B**) provides a summary of a comparative environmental screening of the alternatives that meet the purpose and need based on their proposed impacts to select resources that would be considered in the evaluation processes required for implementation. This assessment was used to assist in identifying the alternatives to be carried forward in the NEPA environmental review process. The following provides a comparative analysis for each build alternative that aided in the determination of whether an alternative was environmentally recommended to be carried forward for further study.

- US 322-10EX Build Alternative – Environmentally preferred to be carried forward into the NEPA review process

- Minimizes potential impacts to water resources that would facilitate obtaining a Section 404/Chapter 105 Joint Permit.
- Minimizes potential impacts to terrestrial habitat for wildlife and plant species protected under Section 7 of the ESA.
- The comparatively high potential impacts to PA Natural Heritage Core Habitat Areas are associated with the eastern section and include acreage of existing US 322 roadway and other developed property.
- Moderate potential impacts to productive agricultural land to be considered during the ALCAB Approval Process.
- Minimizes potential impacts to public parks/recreational areas and significant historic properties considered for the Section 4(f) Evaluation.
- Includes high number of residential and commercial displacements due to the extent of the proposed corridor's use of the existing US 322 roadway alignment that includes developed lands immediately adjacent to the roadway.
- Meets the study purpose and need.
- US 322-1S Build Alternative – Environmentally preferred to be carried forward into the NEPA review process
 - Minimizes potential impacts to water resources that would facilitate obtaining a Section 404/Chapter 105 Joint Permit.
 - Minimizes potential impacts to terrestrial habitat for wildlife and plant species protected under Section 7 of the ESA.
 - Moderate potential impacts to productive agricultural land to be considered during the ALCAB Approval Process.
 - Minimizes potential impacts to public parks/recreational areas and significant historic properties considered for the Section 4(f) Evaluation.
 - Minimizes the number of residential and commercial displacements and the impacts to other community resources.
 - Meets the study purpose and need.
- US 322-2 Build Alternative – Not environmentally preferred to be carried forward into the NEPA review process
 - Highest potential impacts to productive agricultural land to be considered during the ALCAB Approval Process.
 - Highest potential impacts to the Penns Valley/Brush Valley Rural Historic District's contributing properties that would be considered for the Section 4(f) evaluation.
 - High number of residential displacements.
 - Meets the study purpose and need.
- US 322-3 Build Alternative – Not environmentally preferred to be carried forward into the NEPA review process
 - High potential impacts to productive agricultural land, including high impacts to land within conservation easements to be considered during the ALCAB Approval Process.

- High potential impacts to significant historic properties (include displacement of a historic farmstead) and high potential impacts to the Penns Valley/Brush Valley Rural Historic District's contributing properties that would be considered for the Section 4(f) Evaluation.
 - Highest number of residential displacements.
 - Meets the study purpose and need.
- US 322-4 Build Alternative – Not environmentally preferred to be carried forward into the NEPA review process
 - High potential impacts to water resources that are considered during the permit application process for a Section 404/Chapter 105 Joint Permit.
 - High potential impacts to the “Rothrock State Forest (part) & Stone Mountain” Important Bird Area (IBA) that would include habitat for wildlife and plant species protected under Section 7 of the ESA. However, these potential impacts are along the edge of the 89,736-acre IBA and outside of the actual Rothrock State Forest property.
 - High potential impacts to the Penns Valley/Brush Valley Rural Historic District's contributing properties that would be considered for the Section 4(f) Evaluation.
 - Highest potential impacts to Harris Township's only industrial zoned land with potential displacements.
 - Meets the study purpose and need.
- US 322-5 Build Alternative – Environmentally preferred to be carried forward into the NEPA review process
 - High potential impacts to water resources that would need to be reviewed during detailed studies and efforts undertaken to avoid and minimize impacts during the permit application process for a Section 404/Chapter 105 Joint Permit.
 - Moderate potential impacts to terrestrial habitat for wildlife and plant species protected under Section 7 of the ESA. The potential impacts to the “Rothrock State Forest (part) & Stone Mountain” IBA are along the edge of the 89,736-acre IBA and outside of the actual Rothrock State Forest property. The potential impact area also includes some existing deforested areas.
 - Minimizes potential impacts to productive agricultural land to be considered during the ALCAB Approval Process.
 - Minimizes potential impacts to public parks/recreational areas and significant historic properties considered for the Section 4(f) Evaluation.
 - Minimizes the number of residential and commercial displacements and the impacts to other community resources.
 - Meets the study purpose and need.
- PA 144-1 Build Alternative – Not environmentally preferred to be carried forward into the NEPA review process
 - High potential impacts to wetlands that are considered during the permit application process for a Section 404/Chapter 105 Joint Permit.

- High potential impacts to terrestrial habitat for wildlife and plant species protected under Section 7 of the ESA, including high potential impacts to forest land and bat swarming areas.
 - High potential impacts to productive agricultural land, including high potential impacts to land within conservation easements to be considered during the ALCAB Approval Process.
 - High potential impacts to significant historic properties (include displacement of a historic farmstead) that would be considered for the Section 4(f) Evaluation.
 - High potential impacts to public water supply well protection areas and quarry and mineral mining operations that are valuable community resources that cannot be easily replaced.
 - Meets the study purpose and need.
- PA 144-2 Build Alternative – Not environmentally preferred to be carried forward into the NEPA Review Process
 - High potential impacts to wetlands that are considered during the permit application process for a Section 404/Chapter 105 Joint Permit.
 - High potential impacts to terrestrial habitat for wildlife and plant species protected under Section 7 of the ESA, including high impacts to forest land and bat swarming areas.
 - High potential impacts to productive agricultural land, including high impacts to land within conservation easements to be considered during the ALCAB Approval Process.
 - High potential impacts to significant historic properties (include displacement of a historic farmstead) that would be considered for the Section 4(f) Evaluation.
 - High potential impacts to public water supply well protection areas and quarry and mineral mining operations that are valuable community resources that cannot be easily replaced.
 - Meets the study purpose and need.
 - PA 144-3 Build Alternative – Not environmentally preferred to be carried forward into the NEPA Review Process
 - High potential impacts to wetlands that are considered during the permit application process for a Section 404/Chapter 105 Joint Permit.
 - Highest potential impacts to terrestrial habitat for wildlife and plant species protected under Section 7 of the ESA, including high impacts to forest land and bat swarming areas.
 - High potential impacts to productive agricultural land, including high impacts to land within conservation easements to be considered during the ALCAB Approval Process.
 - High potential impacts to public water supply well protection areas and quarry and mineral mining operations that are valuable community resources that cannot be easily replaced.
 - Meets the study purpose and need.

While all the Build Alternatives would meet the purpose and need, US 322-1OEX, US 322-1S, and US 322-5 Build Alternative corridors were recommended to be advanced for further study from an environmental perspective as they provided the best balance and opportunity to minimize overall environmental impacts.

f. Engineering Screening Results

Following the development of the preliminary alternatives, engineering studies were conducted to quantify the major engineering features which contribute to the overall cost of each of the Build Alternatives. Key items considered included roadway costs (e.g., pavement, barriers, drainage, stormwater, etc.), earthwork costs (e.g., excavation/placement of materials, relocation/acquisition of borrow material), structures (e.g., bridges), and major utility relocations. Allowances were also included for maintenance of traffic during construction, erosion control, stormwater management, and contractor mobilization during construction. These items were then used to develop a planning-level construction cost estimate. As this is a planning study, a 20% contingency fee was applied to the cost estimate for each of the Build Alternatives corridors.

A planning-level investigation was also conducted to determine an estimated right-of-way cost for each of the Build Alternatives corridors. These estimates considered residential and commercial relocation and partial land acquisition, geography of the relocations, current market averages in the geographies, and potential mineral right losses. As the proposed Build Alternatives only had conceptual engineering and full right-of-way plans were not developed, the planning-level right-of-way analysis provided a baseline cost for comparing the Build Alternatives corridors during the PEL Study.

Table 6-5 (located in **Appendix B**) provides a summary of the comparative screening for the alternatives based on various engineering features identified at the planning-level. The planning-level right-of-way and construction cost estimates were the key engineering features used to recommend an alternative for further study from an engineering perspective, as they provided a summation of the other engineering features identified. At this planning-level, the costs were depicted as a dollar value range. Build Alternatives with an overall lower cost were recommended to advance for further evaluation from an engineering perspective. As a result, while all the Build Alternatives met the purpose and need, the US 322-1OEX, US 322-1S, US 322-4, and US 322-5 Build Alternative corridors were recommended to be advanced for further study from an engineering perspective.

g. Planning Screening Results

Fundamental study goals that support the purpose and need, local transportation and land use planning, transportation mobility, best engineering practices, and environmental stewardship were identified for use in screening the alternatives. Five questions were developed to qualitatively assess how each of the Build Alternative corridors addressed the study goals. They included:

- To what extent would the alternative improve local and regional mobility?
- To what extent would the alternative address recurring and non-recurring congestion issues and reduce delay?
- To what extent would the alternative promote multimodal opportunities?
- To what extent would the alternative avoid and/or minimize impacts to the human, cultural, and natural environment?
- To what extent would the alternative be consistent with/accommodate local land use/planning initiatives?

The information developed during the traffic, environmental, and engineering screenings along with public and agency input were used to provide a relative planning score for each of the Build Alternatives. Using a scoring scale of 1 to 5, with 5 being the best and 1 being the worst, a score was assigned to each of the five planning questions to aid in assessing how well the alternative would meet the planning goal. A rationale for each score was also provided. More information regarding the planning analysis and scoring criteria, can be found in the Alternatives Analysis and Screening Report.

It was determined that all of the Build Alternatives would generally meet the planning goals; however, some of the Build Alternatives may better meet the study planning goals. For the US 322 Build Alternative options, all US 322 corridors scored a 5 for traffic related planning goals as they would improve regional mobility by shifting nearly 53% of the total traffic and 73% of truck traffic from the key local road network to the Build Alternative. The US 322 Build Alternative options would improve operations at most key study area intersections and along approximately 20 miles of key local roadways, leaving 6.6 miles of roadway and 2 intersections at unacceptable LOS as discussed in the traffic analysis section of this document. All of the US 322 Build Alternative options received a 3 for promoting multimodal opportunities. From a multi modal perspective, each of the alternatives would improve bicycling and even pedestrian activity, as traffic would migrate from the local road network to the Build Alternative, thus improving BLOS. Additionally, each of the US 322 Build Alternatives would provide some opportunity for connecting to existing multimodal infrastructure in the Boalsburg area.

Using the environmental analysis conducted for the PEL Study, the environmental scores ranged from 2 to 5 for the US 322 Build Alternative. Environmentally, US 322-1S had the highest score (5) as none of the five environmental review process categories (**Table 6-4 in Appendix B**) evaluated exceeded the 110% of the average impact. Specifically, this alternative minimized impacts to productive agricultural lands, water resources, terrestrial habitat, public recreation facilities, and community impacts associated with residential and commercial relocations. US 322-2 and US 322-3 had the lowest scores (2) as they exceeded the 110% of the average impact for three of the environmental review process categories (**Table 6-4 in Appendix B**) including productive agricultural, the Section 4(f) Resources (Penn Valley/Brush Valley Rural Historic District), and community impacts associated with residential relocations. Additionally, specific public concerns were expressed for Cedar Creek watershed and associated streams in the area specifically impacted by these alternatives. US 322-4 also scored a 2 as this alternative also exceeded the 110% of the average impact for three of the environmental review process categories (**Table 6-4 in Appendix B**). However, this alternative had higher impacts to water resources, the Endangered Species Act area associated with the “Rothrock State Forest & Stone Mountain” important bird area, and community impacts associated with residential relocations. Additionally, specific public concerns were expressed regarding impacts to the community resources associated with the Calvary Church and Harvest Fields area.

US 322-1OEX and US 322-5 received a score of 3 as this alternative exceeded the 110% of the average impact for two of the environmental review process categories (**Table 6-4 in Appendix B**). US 322-1OEX had fewer impacts to water resources, and Section 4(f) recreational facilities and opportunities, but had higher impacts on endangered species potential terrestrial habitat associated with the PA Natural Heritage Core Habitat Areas and community impacts associated with residential and commercial relocations. US 322-5 had fewer impacts to productive agriculture, Section 4(f) public parks, and community impact, but had higher impacts on water resources and endangered species potential terrestrial habitat. Detailed information on the potential environmental impacts can be found in **Appendix B**.

Each of the US 322 Build Alternatives would impact local land use and zoning initiatives to varying degrees. The required right-of-way would cause zoning conversions from rural residential/residential, agricultural, and commercial zoned areas to transportation. While each of the Build Alternative options have interior interchange access, it is anticipated that local land use and zoning regulations and development requirements would limit the potential indirect development in the interchange areas. US 322-1S and US 322-5 received a score of 3 as they would convert area land use and zoning to transportation uses. Additionally, these alternatives would have an impact on the only remaining industrial zoned area of Harris Township but would not significantly impact the access or ability to develop remaining parcels in the industrial park. US 322-IOEX, US 322-2, and US 322-3 received a score of 2 as they would convert area land use and zoning to transportation uses. These US 322-2 and US 322-3 were determined to have a greater impact on area zoning and land use as they would be further removed from the main regional roadways and existing travel corridors. US 322-IOEX would also convert area land use and zoning to transportation uses, have an impact on the only remaining industrial zoned area of Harris Township without significantly impacting the access or ability to develop remaining parcels in the industrial park, but would have higher commercial relocations along the corridor potentially further impacting zoning and economic activity. US 322-4 received a score of 1. While this alternative would convert area land use and zoning to transportation uses, it is further removed from the main regional roadways and would cause the relocation of existing businesses and eliminate future development opportunities in the only remaining industrial zoned area of Harris Township, with no relocation ability in that area.

For the PA 144 Build Alternative options, all PA 144 corridors scored a 5 for traffic related planning goals as they would improve regional mobility by shifting nearly 46% of the total traffic and 57% of truck traffic from the key local road network to the Build Alternative. The PA 144 Build Alternative options would improve operations at most key study area intersections and along approximately 20 miles of key local roadways, leaving 8.5 miles of roadway and 1 intersection at unacceptable LOS as discussed in the traffic analysis section of this document. All of the PA 144 Build Alternative options received a 3 for promoting multimodal opportunities. From a multi modal perspective, each of the alternatives would improve bicycling and even pedestrian activity, as traffic would migrate from the local road network to the Build Alternative, thus improving BLOS. Additionally, each of the PA 144 Build Alternatives would provide some opportunity for connecting to existing multimodal infrastructure in the Centre Hall area.

Using the environmental analysis conducted for the PEL Study, all of the PA 144 Build Alternatives exceeded the 110% of the average impact for all of the five environmental review process categories (**Table 6-4 in Appendix B**). Therefore, each of the PA 144 Build Alternatives were scored a 1, as that is the lowest possible score. Specifically, these alternatives had high impacts on productive agricultural, water resources, endangered species terrestrial habitat, and Section 4(f) (NRHP properties). Additionally, from a community impact perspective, each of the Build Alternative options would impact the public water supply well protection zones for Potter Township and Centre Hall Borough area and current and future area mining operations.

Each of the PA 144 Build Alternatives would impact local land use and zoning initiatives in a very similar manner and as a result were scored a 1. This scoring is a result of the potential impact to the runway and associated flight patterns at the Centre Airpark, current and future mining operations, and the potential impact to the public water supply well protection zones discussed above.

As shown in **Table 6-6**, the scores for the Build Alternative corridor options range from 15 to 21 with US 322-IOEX, US 322-1S, and US 322-5 having a slightly better opportunity to meet the planning goals and were the recommended corridors to be advanced into NEPA phase of the project development process from a planning perspective.

Table 6-6: Build Alternative Planning Screening Summary

Build Alternative	Planning Topic	Planning Score	Corridor Total Planning Score
US 322-1OEX	Improve Mobility	5	18
	Address Congestion	5	
	Provide Multimodal	3	
	Minimize Environmental Impacts	3	
	Planning Initiatives	2	
US 322-1S	Improve Mobility	5	21
	Address Congestion	5	
	Provide Multimodal	3	
	Minimize Environmental Impacts	5	
	Planning Initiatives	3	
US 322-2	Improve Mobility	5	17
	Address Congestion	5	
	Provide Multimodal	3	
	Minimize Environmental Impacts	2	
	Planning Initiatives	2	
US 322-3	Improve Mobility	5	17
	Address Congestion	5	
	Provide Multimodal	3	
	Minimize Environmental Impacts	2	
	Planning Initiatives	2	
US 322-4	Improve Mobility	5	16
	Address Congestion	5	
	Provide Multimodal	3	
	Minimize Environmental Impacts	2	
	Planning Initiatives	1	

Build Alternative	Planning Topic	Planning Score	Corridor Total Planning Score
US 322-5	Improve Mobility	5	19
	Address Congestion	5	
	Provide Multimodal	3	
	Minimize Environmental Impacts	3	
	Planning Initiatives	3	
PA 144-1	Improve Mobility	5	15
	Address Congestion	5	
	Provide Multimodal	3	
	Minimize Environmental Impacts	1*	
	Planning Initiatives	1	
PA 144-2	Improve Mobility	5	15
	Address Congestion	5	
	Provide Multimodal	3	
	Minimize Environmental Impacts	1*	
	Planning Initiatives	1	
PA 144-3	Improve Mobility	5	15
	Address Congestion	5	
	Provide Multimodal	3	
	Minimize Environmental Impacts	1	
	Planning Initiatives	1	

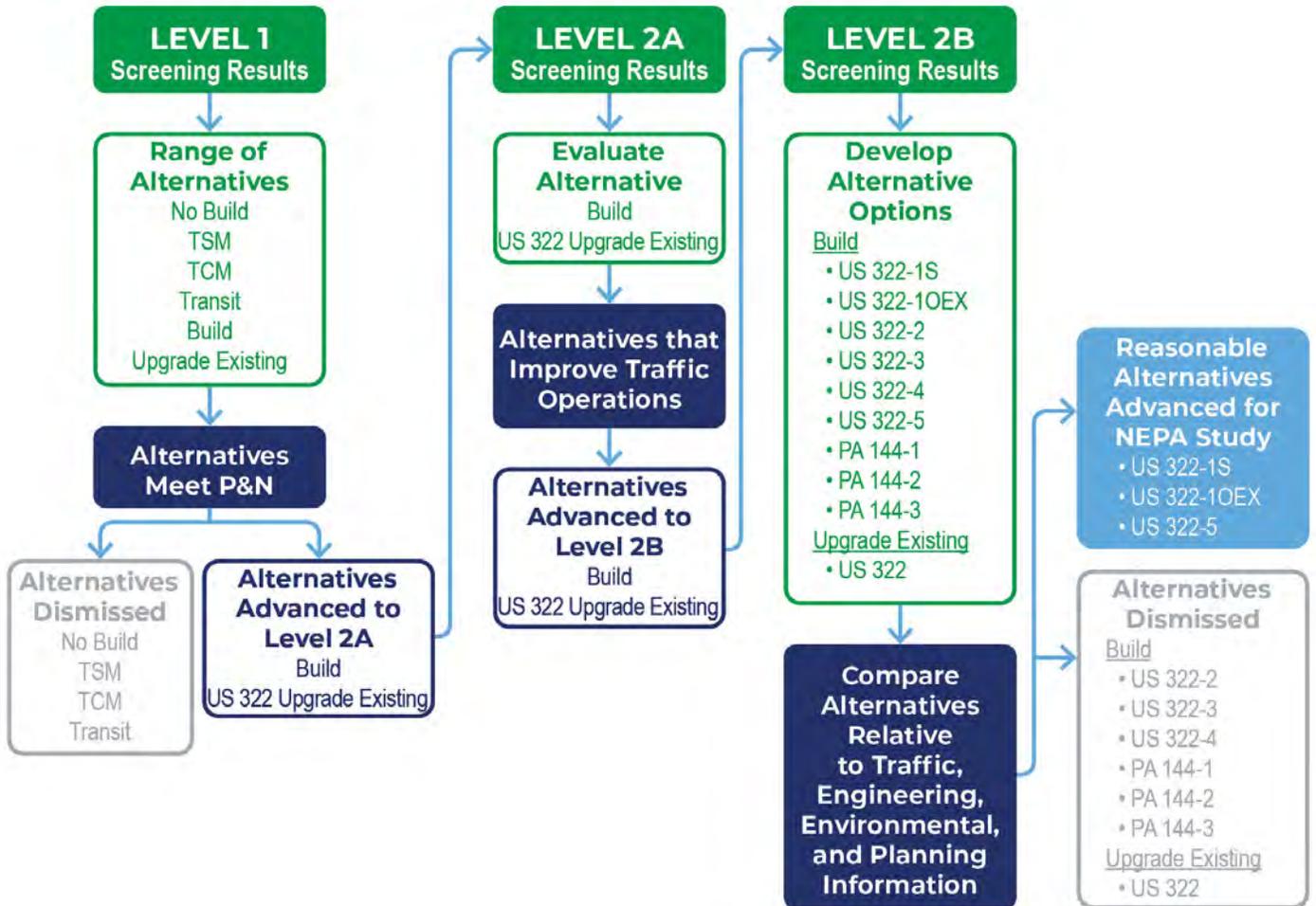
* This alternative recorded a higher comparative impact in each of the five statutory resources considered but was scored a 1 as that is the lowest possible ranking in this analysis (Table 6-4).

C. What Alternatives Will Advance for Further Study?

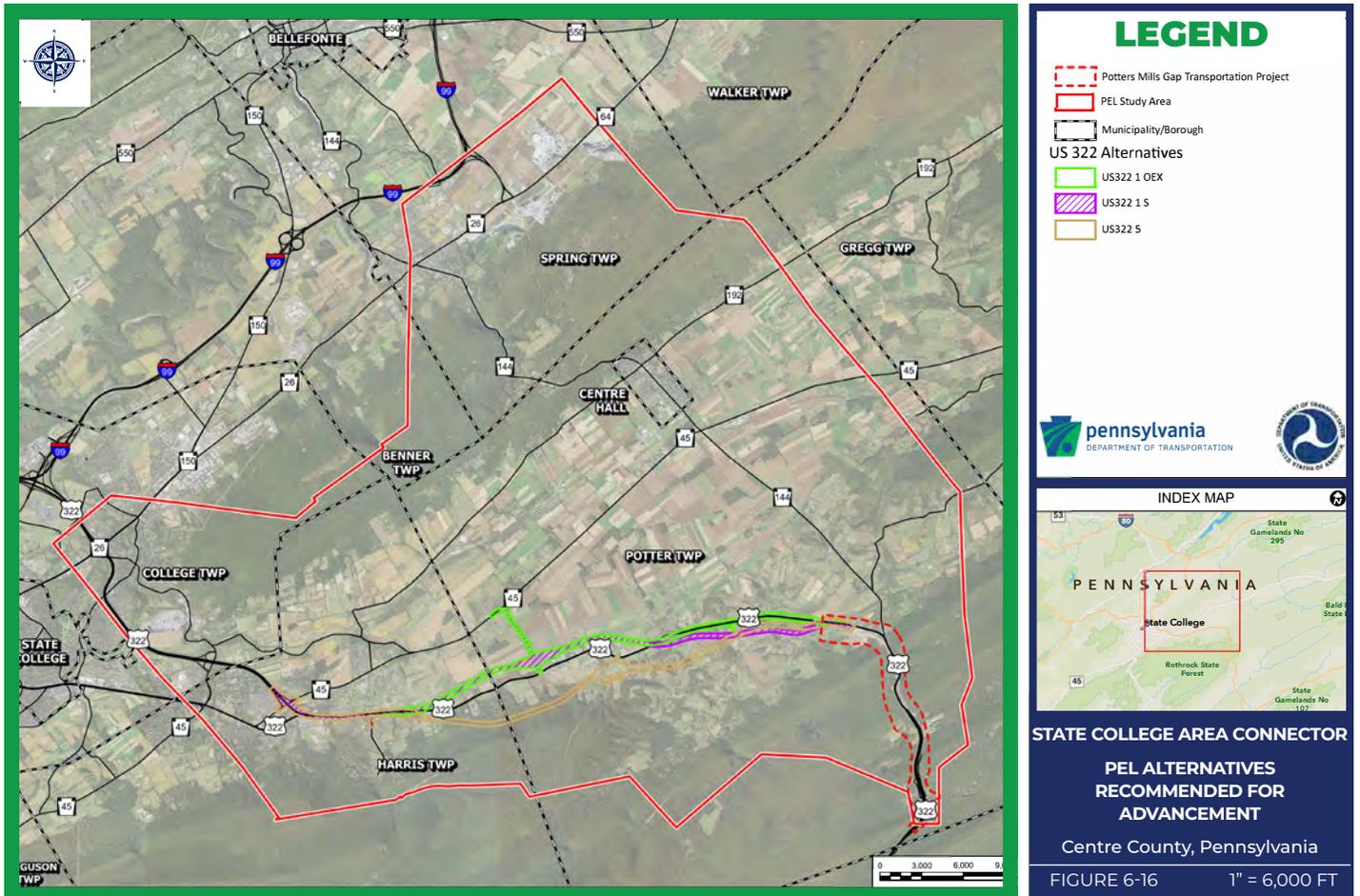
Based on the Alternative Screening process (**Chapter 4**), a range of alternatives were evaluated and advanced based on their ability to meet PEL Study purpose and need and screened from a traffic, engineering, planning and environmental perspective. **Table 6-7** provides an overview of the alternative screening process and the result at each level of analysis. In summary, the following determinations were made during the screening process:

- The TSM, TCM, Transit, and No Build Alternatives were dismissed from further study during the Level 1 Screening for not meeting the PEL Study purpose and need.
- The US 322 Upgrade Existing and Build Alternatives were advanced through the Level 2A Screening and into Level 2B Screening for more detailed analysis.
- The US 322 Upgrade Existing Alternative was dismissed from further study during the Level 2B traffic screening as it did not improve safety on the overall roadway network therefore, it did not meet the PEL Study purpose and need.

Table 6-7: Alternative Screening Results



- Throughout the traffic, environmental, engineering, and planning screenings, various Build Alternatives were identified as recommended for each discipline. When balancing the overall traffic, environmental, engineering, and planning data and analyses, the US 322- 1OEX, US 322-1S, and US 322-5 Build Alternative corridors were identified as reasonable alternatives and recommended to be advanced for further engineering and environmental study in the NEPA phase of the transportation project development process (**Figure 6-16**).



Note: Figure 6-16 can also be found in Appendix A at a larger size.

Figure 6-16: PEL Alternatives Recommended for Advancement

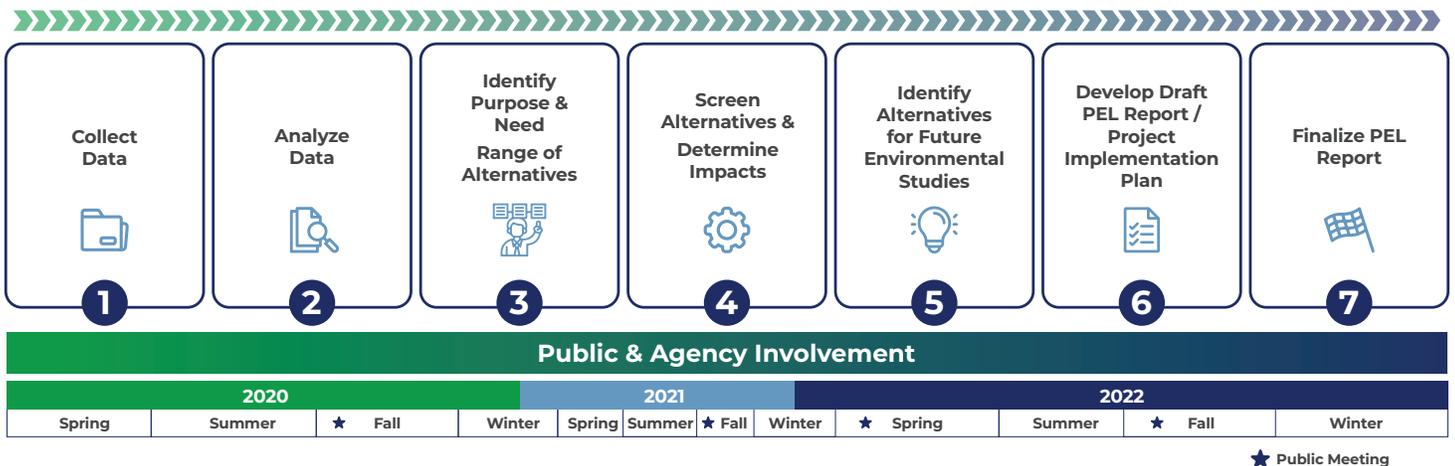
CHAPTER 7: PUBLIC AND AGENCY OUTREACH

The State College Area Connector PEL Study included a Public and Agency Coordination Plan that was developed as a robust outreach plan, which:

- Identified the overall public involvement/agency coordination approach.
- Identified interested and affected stakeholders (e.g., elected/local officials, institutions, civic and neighborhood associations, industry, community/business organizations, and the general public) and expectations for their involvement.
- Identified the federal lead, cooperating, and participating agencies.
- Established strategies to achieve the goals of the public involvement and agency coordination program.
- Identified specific tools and techniques to support the coordination strategies.
- Determined timing and format for the public involvement.
- Established the timing and format for agency involvement and collaboration throughout the PEL Study.
- Identified protocol for concurrence and coordination efforts with Cooperating Agencies.

Public and agency involvement was integral and continuous throughout the PEL process

(Figure 7-1).



More information on the public meetings can be found in the following documents:

- Virtual Public Meeting Summary Report for the State College Area Connector Planning and Environmental Linkage Study (February 2021)
- September 2021 Open House Public Meeting Summary Report for the State College Area Connector Planning and Environmental Linkage Study (April 2022)
- April 2022 Open House Public Meeting Summary Report for the State College Area Connector Planning and Environmental Linkage Study (October 2022)
- Draft Public and Agency Coordination Plan for the State College Area Connector Planning and Environmental Linkage Study (September 2022)
- October 2022 Open House Public Meeting Summary Report for the State College Area Connector Planning and Environmental Linkages Study (February 2023)

Figure 7-1: State College Area Connector PEL Process

A. How was the Public Engaged?

Public engagement took many forms throughout the PEL Study including a website, electronic mailing list, local pop-up meetings, public meetings (virtual and open house), and stakeholder workshops.

1. Website

A study specific website (www.PennDOT.gov/SCAC) was developed to keep the public informed. The website includes general information on the study, study area maps, the PEL schedule, public and agency outreach information, frequently asked questions, and a comment page. The comment page allowed visitors to provide input and ask questions related to the study. Additionally, notifications of upcoming public meetings were posted on the website. Prior to public meetings, the display boards were available on the website and summaries were added after each meeting.

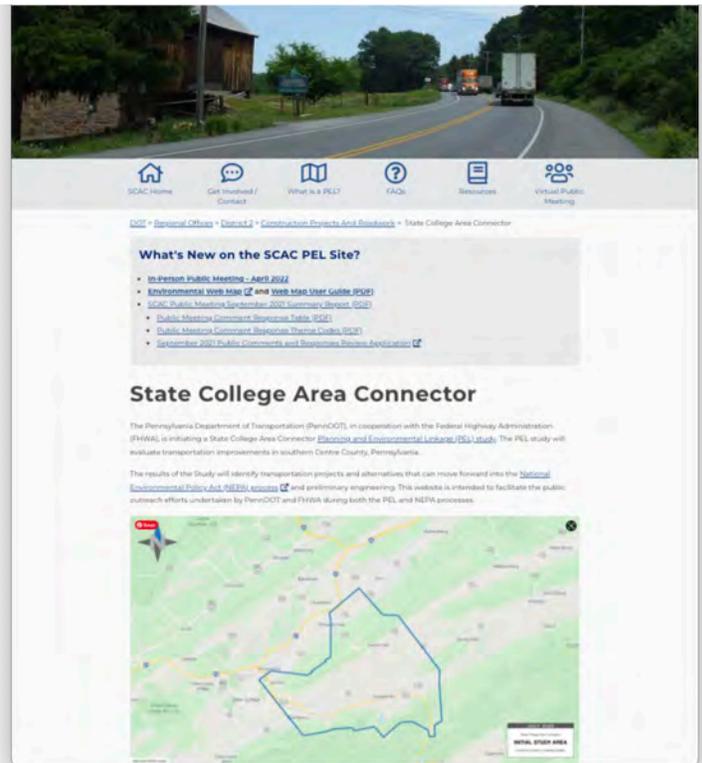
A key feature of the website was the Study WebMap. The WebMap is an interactive map depicting natural, cultural, and socio-economic data along with the study alternatives.

2. Mailing List

To keep all stakeholders informed on the study, a master stakeholder database was developed and utilized to disseminate information concerning the PEL Study. The stakeholder database included:

- Local, state, and federal elected officials
- Agency officials
- Civic organizations
- Neighborhood and homeowner associations
- Businesses
- Faith-based organizations
- Chambers of commerce
- Public Transportation Agencies
- Freight carriers
- Utility providers
- Special interest groups, including historic preservation groups and consulting parties
- Centre County MPO and SEDA-Council of Governments (SEDA-COG)
- Individuals that request to be informed about the PEL Study via the website or public meetings

Email blasts, via Constant Contact® were sent to the mailing list to inform the stakeholders of upcoming events, new website content, and reminders for closing comment periods.



3. Local Pop-Up Meetings

While COVID-19 limited pop-up events during much of the PEL Study timeframe, the SCAC PEL Study hosted a booth at the 2021 Centre County Grange Fair. Fair attendees were provided study information, encouraged to sign up for the mailing list, and invited to the September 2021 public meetings.

4. Public Meetings

Four public meetings, virtual and in-person, were held during the PEL Study:

- October 2020
- September 2021
- April 2022
- October 2022



Information collected during the public meetings aided in resource identification, alternative refinement, impact assessment, and potential mitigation. Public comments regarding the location and format of subsequent public meetings were also considered and implemented, as appropriate.



a. Virtual Public Meeting - October 2020

Due to COVID-19, the October 2020 public meeting adapted and was held virtually. The meeting was housed on the study website (www.PennDOT.gov/SCAC), and presented an overview of the transportation development process, the SCAC PEL process, study area environmental resources, engineering and traffic data, study purpose, and study need.

b. Open House Public Meeting - September 2021

The September 2021 public meetings were held at the Wyndham Garden Inn State College in Boalsburg on September 21 and 22. The meeting information was available from 1 p.m. to 8 p.m. The meetings introduced the PEL Study process; presented the range of alternative concepts, alternative screening process, and preliminary environmental and traffic analysis; and solicited public feedback.



c. Open House Public Meeting – April 2022

The April 2022 public meetings were held at the Calvary Church in Boalsburg, Pennsylvania on April 5 and Centre Hall Fire Station in Centre Hall on April 6. The same information was presented at both locations and was available from 3 p.m. to 8 p.m. The meetings provided an update on the PEL Study environmental data collection efforts, traffic analyses, Upgrade Existing and Build Alternative corridor refinements, and solicited public feedback. A video was shown at the meeting that provided a summary of key study changes since the September 2021 meetings.



d. Open House Public Meeting – October 2022

The October 2022 public meetings were held on October 19 and October 20 at the Mount Nittany Middle School in State College, Pennsylvania. The meetings began with an open house at 5 p.m. where the study boards were available along with staff to answer individual questions. At 6:15 p.m., a presentation that provided an overview of the PEL Study and the draft recommendations for alternatives to move forward into the NEPA process was given by project staff. Following the presentation, the public was afforded an opportunity to ask specific questions of the study team. The same information and format were presented and utilized at both meetings.



Table 7-1 provides a summary of meeting participation data from each of the public engagement efforts.

Table 7-1: Summary of Public Meetings

Location	Public Comment Period	Virtual Attendees	In Person Attendees	Comments Rec'd from In Person	All Comments	Website Visits
<i>October 2020</i>						
Virtual: Oct 28 to Nov 4	2 weeks: Oct 28 to Nov 11	78	N/A	N/A	30	358
<i>September 2021</i>						
Boalsburg: Sept 22 + 23	1 month: Sept 5 to Oct 7	N/A	859	168	419	27,721
<i>April 2022</i>						
Boalsburg: Apr 5 Centre Hall: Apr 6	2 weeks: Mar 31 to Apr 16	N/A	859	71	148	12,516
<i>October 2022</i>						
State College: Oct 19 + Oct 20	3 weeks: Oct 18 to Nov 11	N/A	502	15	36	N/A

5. Stakeholder and Interested Parties Workshops

Local community and stakeholder workshops were conducted by request. Publicly available study information was shared and discussed at the workshops and input was received. Information collected aided in the resource identification, alternative refinement, impact assessment, and consideration of potential mitigation. **Table 7-2** provides a summary of the workshops with stakeholders.

Table 7-2: Stakeholder Workshop Summary

Date	Stakeholder	Topics Discussed
Dec. 13, 2021	Doug Rimmey and Jeff Wiest (Rimmey Farm)	Alternatives, tour of farm, and potential business impacts
Dec. 13, 2021	Bonnie and Jesse Darlington (Darlington Farm)	Alternatives tour of farm, and potential business impacts
Dec. 17, 2021	Tait Tree Farm	Alternatives and potential business impacts
Feb. 24, 2022	Cedar Run Community	Water resource concerns and truck traffic survey
March 25, 2022		
May 17, 2022		
April 18, 2022	Somerset Drive Residents	Alternatives and community quality of life
June 2, 2022	State College Rotary	Overview of the study and traffic issues and projections

Targeted outreach was made to the local Amish community due to their limited or no internet access. Three Amish church districts are located within the SCAC study area: West Penns Valley Church District, West Brush Valley Church District, and Nittany Valley Church District. Paper copies of the meeting notifications, study newsletters, and flyers were distributed to each of the church districts.

B. How are Federal, State, and Local Agencies Involved?

Federal, state, and local officials were provided an opportunity to be engaged in the PEL Study to varying degrees. The following sections provide an overview of the coordination activity.

1. Cooperating and Participating Agencies

Coordination with federal, state, and local agencies was integral to the PEL Study. Based on federal regulation and guidance, agencies involved in the PEL and NEPA processes are invited to participate based on their overall role and responsibilities relating to regulatory environmental resources. **Table 7-3** lists the agencies that were invited to participate in the PEL Study. Invitations were sent to each agency and those that formally accepted their offers to participate are bolded in **Table 7-3**. More details regarding agencies and their role in the PEL Study is outlined in the Coordination Plan.

Table 7-3: Agency Type, Definition, and Agency Name

Type	General Definition	Agency Name
Lead Agency and Joint Lead Agency	Federal agency that will supervise the PEL Study and prepare future environmental documentation.	Lead Federal Agency: Federal Highway Administration Joint Lead State Agency: Pennsylvania Department of Transportation
Cooperating Agency	Any federal agency that has jurisdiction by law or special expertise on an environmental resource that could be impacted by a federal action (federally funded project/legislation). It should be noted that the Lead Agency may include relevant state, local, or tribal agencies with regulatory approval (e.g., environmental permit approval) to be a cooperating agency.	Federal Agencies: U.S. Army Corps of Engineers U.S. Environmental Protection Agency U.S. Fish and Wildlife Service National Park Service State Agencies: PA Department of Environmental Protection (Northcentral Region)
Concurring Cooperating Agency	A subset of Cooperating Agencies that have future authorities over projects developed from this PEL Study (e.g., permitting).	Federal Agencies: U.S. Army Corps of Engineers U.S. Environmental Protection Agency U.S. Fish and Wildlife Service State Agencies: PA Department of Environmental Protection (Northcentral Region)

Type	General Definition	Agency Name
<p>Participating Agency</p>	<p>Federal, state, tribal, regional, and local government agencies that have an interest in the project could serve on the project as a participating agency. (Note: Nongovernmental organizations (NGOs) and private entities cannot serve as participating agencies; they are considered part of the public and are involved in the public participation process).</p>	<p>Federal Agencies: US Coast Guard</p> <p>State Agencies:</p> <p>PA Fish and Boat Commission</p> <p>PA Historical and Museum Commission (PA State Historic Preservation Office)</p> <p>PA Department of Conservation and Natural Resources (Rothrock State Forest and Mira Lloyd Dock Resource Conservation)</p> <p>PA Game Commission</p> <p>PA Department of Agriculture</p> <p>Local Agencies:</p> <p>Centre County Conservation District</p> <p>Centre County Board of Commissioners</p> <p>Potter Township Board of Supervisors</p> <p>Spring Township Board of Supervisors</p> <p>Benner Township Board of Supervisors</p> <p>Harris Township Board of Supervisors</p> <p>College Township Council</p> <p>Centre Hall Borough Council</p> <p>Federally Recognized Tribes:</p> <p>Absentee-Shawnee Tribe of Indians in Oklahoma</p> <p>Delaware Nation</p> <p>Eastern Shawnee Tribe of Oklahoma</p> <p>Onedia Nation</p> <p>Seneca Nation of Indians</p> <p>Seneca-Cayuga Nation</p> <p>Shawnee Tribe</p> <p>Delaware Tribe of Indians</p>

Cooperating agencies were requested to specifically concur on the study findings at specific concurrence points which extended over the PEL Study. Concurrence from the agencies had to be provided in writing. Each participating agency reviewed the purpose and need, range of alternatives, and alternatives to be carried forward for evaluation in NEPA.

a. Agency Coordination Meetings

PennDOT holds monthly Agency Coordination Meetings (ACM) and field views for projects and studies across the Commonwealth. Transportation projects and studies can be placed on the agenda by request to PennDOT's Central Office. Federal and state resource agencies have a standing invitation to the ACMs. For the PEL Study, special invitations to attend the ACM were provided to local agencies and federally Recognized Tribes that requested participating agency status. Additionally, special meetings were held with the Cooperating Agencies to discuss detailed questions on concurrence points. **Table 7-4** summarizes the ACM and cooperating agency outreach.

Table 7-4: Agency Coordination Meeting and Cooperating Agency Outreach Summary

Date	Meeting	Information Presented	Concurrence Point
Feb. 26, 2020	ACM	Introduce PEL Study	
July 22, 2020	ACM	PEL Study Process Environmental Features Purpose and Need Coordination Plan Agency participation	
Nov. 6, 2020	Cooperating Agency Meeting	Study Update Coordination Plan Comments Consensus Process Concurrence Process PEL Process and Schedule	
Dec. 9, 2020	ACM	Study update Purpose and Need Cooperating and Participating Agency Status Draft Coordination Plan and Consensus Virtual Public Meeting Overview Environmental Features	Purpose and Need
May 26, 2021	ACM	Environmental Overview Range of Alternatives Alternative Screening Process Methodology	Range of Alternative

Date	Meeting	Information Presented	Concurrence Point
Aug. 25, 2021	ACM	PEL Process Recap Environmental WebMap and Technical Memos Range of Alternatives Alternatives Screening Other Potential Future Project Concepts Public Engagement Next steps	
Dec. 8, 2021	ACM	September Public Meeting Summary Environmental Data Update Technical Memos Update Build Alternative Update Revised Agency Coordination Plan Schedule	
March 23, 2022	ACM	September Public Meeting Overview Environmental Mapping Updates Traffic Updates Build Alternative Updates Next Steps	
May 25, 2022	ACM	April 2022 Public Meeting Summary Range of Alternatives and Alternative Screening Process Alternatives Review PEL Process Next Steps	
July 19, 2022	Cooperating Agency Field view	Alternative Review Preliminary Recommendation for Alternatives to advance in NEPA Environmental concerns Potential Mitigation Concepts	
August 1, 2022	Cooperating Agency (USEPA) Coordination Meeting	Alternative Review Preliminary Recommendation for Alternatives to advance in NEPA Environmental concerns Potential Mitigation Concepts	
August 24, 2022	ACM	Alternative Screening Process Environmental Resources Potential Impacts and Comparative Analysis Traffic, Engineering and Planning Comparative Analysis Next Steps	
February 22, 2023	ACM	October 2022 Public Meeting Summary Draft PEL Findings Next Steps	

2. Public Officials Meetings

As part of the agency engagement, outreach and coordination with local officials was critical to the PEL Study process. To provide local elected officials the opportunity to learn about the PEL Study and discuss study results in advance of public meetings, pre-meetings for public officials took place.

The first public officials pre-meeting was held on August 31, 2021, from 6:00 p.m. to 8:00 p.m. at the Wyndham Garden Inn State College in Boalsburg. Letter invitations were sent via email to 21 public officials and government partners. A presentation was provided to the officials that depicted the proposed exhibits which would be utilized at the September 2021 open house public meeting. Key exhibits were displayed at this meeting for more detailed review and discussion. General concerns communicated during the meeting included traffic and safety concerns with the alternative corridors, and impacts to communities, agriculture, and natural resources.

The second public officials pre-meeting was held on March 30, 2022, from 6:30 p.m. to 8:30 p.m. at the Wyndham Garden Inn State College in Boalsburg. Letter invitations were sent via email to 59 public officials and government partners. A presentation was provided to the officials that depicted the proposed exhibits which would be utilized at the April 2022 open house public meeting. The public meeting video, which was utilized as the introduction at the open house public meeting, was also presented. Additionally, key exhibits were displayed at this meeting for more detailed review and discussion. General concerns communicated during the meeting included traffic and safety; community impacts related to various alternative corridors; truck traffic related to other ongoing PennDOT projects; and public well locations and their associated potential impacts.

The third public officials pre-meeting was held on September 7, 2022, from 6:00 p.m. to 8:00 p.m. at the Wyndham Garden Inn State College in Boalsburg. Letter invitations were sent via email to 59 public officials and government partners. A presentation was provided to the officials that reviewed the draft PEL Study recommendations and proposed October 2022 open house public meeting public meeting exhibits. Key exhibits were also displayed at this meeting for more detailed review and discussion. General concerns communicated during the meeting included property owners communication regarding the future project; specific resource features and associated concerns; truck traffic; and next steps after completion of the PEL Study to name a few.

3. Local Community – Officials Meetings

While each of the local communities were invited to be an official participating agency, individual coordination and outreach efforts were conducted to inform them of the study and solicit feedback.

In summer/fall of 2020, an introductory presentation was provided to each of the municipalities within the PEL study area during their regularly scheduled monthly meetings. The meetings included municipal officials, municipal staff, and members from the public. The presentations provided:

- An introduction to the PEL Study
- Explanation of Planning and Environmental Linkage (PEL) studies
- A review the PEL Study process
- An introduction to the Draft Public and Agency Coordination Plan and ways to engage in the study
- A review of next steps in the PEL Study

At each meeting, PennDOT offered to provide future updates to the officials at their request.

In May 2021, coordination with the study area municipalities was conducted with an offer to provide a study presentation at their regularly scheduled meetings, or an update letter. Four of the municipalities accepted the offer for a presentation (**Table 7-5**). Each municipal presentation provided the following:

- Overview of the October/November 2020 Virtual Public Meeting
- Results of the purpose and need studies
- Environmental overview
- Review a GIS WebMap
- Range of alternatives
- Alternative screening process
- Key environmental features
- Study schedule

The Potter Township Planning Commission requested a PEL Study update at their July 13, 2021 meeting. The presentation provided the following:

- Overview of the October/November 2020 Virtual Public Meeting
- Results of the purpose and need studies
- Range of alternatives
- Alternative screening process

Harris Township and Potter Township requested a joint meeting on the PEL Study. This joint meeting was held on February 14, 2022. The presentation provided the following:

- Goal of the PEL Study
- Environmental updates
- Traffic updates
- Build alternative updates
- Next steps in the PEL process

Table 7-5 provides an overview of the meetings held with local officials.

Table 7-5: Local Official Meeting Summary

Date	Entity
Aug. 10, 2020	Harris Township Board of Supervisors Meeting
Aug. 13, 2020	Centre Hall Borough Council Meeting
Aug.17, 2020	Potter Township Board of Supervisors Meeting
Aug. 20, 2020	College Township Meeting
Sept. 3, 2020	Benner Township Council Meeting
Sept. 8, 2020	Spring Township Supervisors Meeting
Nov. 24, 2020	Center County Commissioner's
May 10, 2021	Harris Township Board of Supervisors Meeting
May 13, 2021	Centre Hall Borough Council Meeting
May 17, 2021	Potter Township Board of Supervisors Meeting
May 20, 2021	College Township Meeting
July 13, 2021	Potter Township Planning Commission
Feb. 14, 2022	Harris Township/Potter Township

4. Centre County Metropolitan Planning Organization

Centre County Metropolitan Planning Organization (CCMPO) provides planning and programming funding authority for transportation projects within the region. The Coordination Plan identifies CCMPO as a key local agency and planning partner in the State College Area Connector Study. Since September 2020, the State College Area Connector Study has been a standing agenda item on the CCMPO's Coordinating and Technical Committee meetings.

The Coordinating Committee is the decision-making body responsible for meeting CCMPO's federal regulations and requirements. The Technical Committee is an advisory committee responsible for providing technical recommendations and advice to the Coordinating Committee. Both committees are comprised of 18 voting members that represent Centre County's six planning regions, Centre County, six municipalities, two PennDOT offices, Centre Regional Planning Commission, and Centre Area Transportation Authority. Non-voting members include FHWA, Federal Transit Administration, and the Pennsylvania State University.

CHAPTER 8: OTHER FUTURE INDEPENDENT TRANSPORTATION PROJECTS

While the PEL Study identifies several Build Alternatives to address the regional transportation purpose and need, there may still be other localized projects that would benefit other existing less-than-desirable conditions throughout the study area. These projects could include improvements to roadway intersections and segments, as well as accommodations for bikeways and other modes of travel, which could be advanced as separate transportation projects with independent funding mechanisms. If any of the independent projects are identified for further development, PennDOT would work with the CCMPO to plan and program these new projects accordingly. A conceptual planning analysis was conducted to determine where potential independent transportation projects may still be needed following the implementation of the Build Alternative and identify potential solutions to address these local needs. The following sections provide an overview of potential projects that could incorporate various aspects of the range of alternatives including TSM and TCM strategies and measures, Upgrade Existing Alternative concepts, and non-motorized improvements that have been dismissed from further study to address local needs. It should be noted that any study area roadway substantially impacted as a result of a Build Alternative would be addressed as part of the Build Alternative for the future State College Area Connector project. Future local roadway impacts are anticipated to be relatively minor and would not change the conclusion of this PEL Study.

A. Roadway Intersections

Roadway intersection projects could include improvements such as realignments, dedicated turn lanes, or road diets to improve sight distance and other geometric deficiencies, enhance safety, optimize traffic operations, and slow traffic. The identification of intersections for potential improvements was based on deficiencies identified from analyses/evaluation performed for the PEL Study and/or public comments provided through the public engagement process (**Figure 8-1**). Prior to implementing any additional project, PennDOT and CCMPO will further evaluate these locations and determine their continued need following the implementation of a Build Alternative.

The following eight intersections were considered in this analysis:

1. PA 45 at Willowbrook Drive / Rockey Ridge Road
2. PA 45 at SR 2006 (Linden Hall Road)
3. PA 45 at SR 2004 (Cedar Run Road)
4. US 322 at Bear Meadows Road / Elks Club Road
5. US 322 and Church Hill Road
6. US 322 and Red Mill Road / Mountain Back Road
7. PA 144 and Bible Road / Short Road
8. PA 144 and Airport Road / Sinking Creek Road

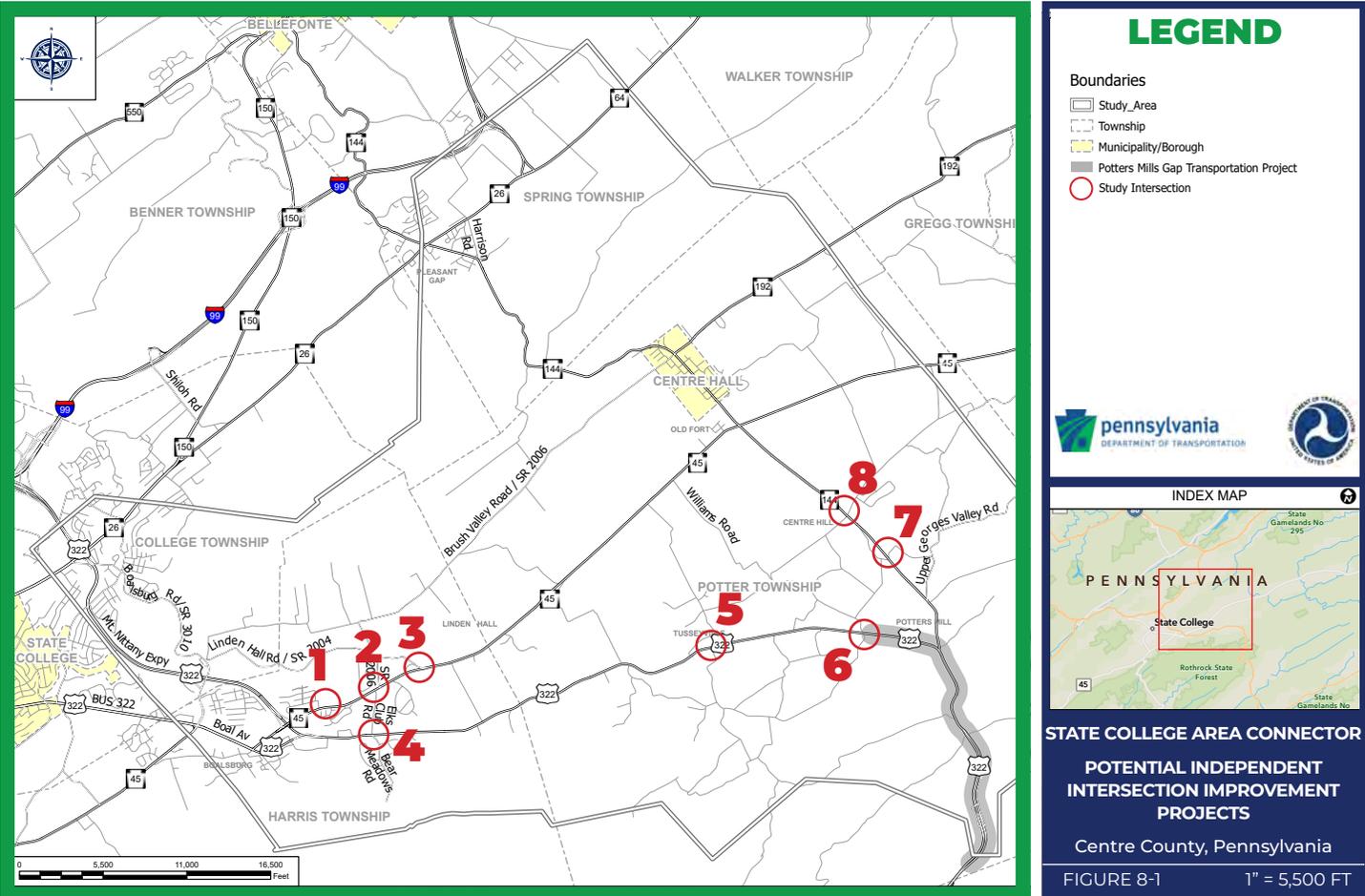


Figure 8-1: Potential Independent Intersection Improvement Projects

1. PA 45 at Willowbrook Drive / Rockey Ridge Road

Willowbrook Drive and Rockey Ridge Road are stop-controlled local roads at PA 45 (**Figure 8-2**). The PEL Study analysis noted that the vertical alignment does not meet current design criteria but did not identify a need for safety specific improvements at the intersection based on 2016 to 2020 crash data.



Figure 8-2: PA 45 / Willowbrook Drive / Rockey Ridge Road Intersection

2. PA 45 at SR 2006 (Linden Hall Road)

SR 2006 is stop-controlled at PA 45 and intersects with PA 45 at a less than desirable angle (**Figure 8-3**). The PEL Study analysis noted that the vertical alignment does not meet current design criteria. Between 2016 and 2020, a total of four crashes were reported at or near the intersection all resulting in injuries.



Figure 8-3: PA 45 / SR 2006 (Linden Hall Road) Intersection

3. PA 45 at SR 2004 (Cedar Run Road)

SR 2004 (Cedar Run Road) is a local road that is stop-controlled at PA 45 (**Figure 8-4**). The geometric analysis conducted as part of the PEL Study noted that the vertical alignment does not meet current design criteria which can make left turn ins and right turns out difficult to navigate. The slope at SR 2004 approaching PA 45 also limits the sight distance for turning vehicles and the roadway width does not meet current PennDOT standards.



Figure 8-4: PA 45 / SR 2004 (Cedar Run Road) Intersection

4. US 322 at Bear Meadows Road / Elks Club Road

Bear Meadows Road and Elks Club Road are stop-controlled local roads at US 322 (**Figure 8-5**). The analysis conducted as part of the PEL Study evaluated the intersection and concluded that improvements could be made to further improve safety. The intersection was also mentioned as an intersection of concern during the public engagement activities. A speed limit change on US 322 westbound occurs roughly $\frac{1}{2}$ mile from the intersection from 55 MPH to 45 MPH. Vehicles approaching Boalsburg from this direction are likely still travelling at or near that speed.

US 322 is also four lanes wide at the intersection. Crossing maneuvers and left hand turns from Bear Meadows and Elks Club Roads are difficult to navigate. There is a high crash history in the area with a total of 6 crashes occurring at or near the intersection between 2016 and 2020.



Figure 8-5: US 322 / Elks Club Road and Bear Meadows Road Intersection

5. US 322 at Church Hill Road

Church Hill Road is a stop-controlled local road at US 322. Analysis conducted as part of the PEL Study did not identify the need for specific geometric or safety improvements at the intersection (**Figure 8-6**). However during public engagement it was specifically mentioned as an intersection of concern. The existing intersection is skewed with noted sight distance concerns, which makes left turns in or out of Church Hill Road more difficult to navigate.

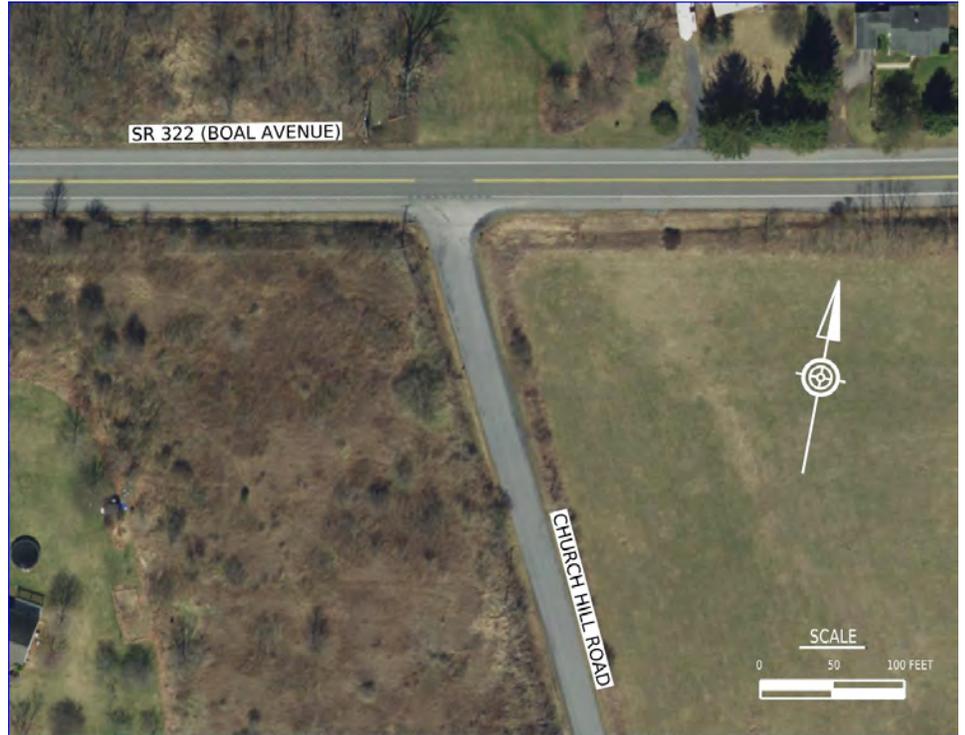


Figure 8-6: US 322 / Church Hill Road Intersection

6. US 322 at Red Mill Road / Mountain Back Road

Red Mill Road and Mountain Back Road are two-lane, stop-controlled roads at US 322. Mountain Back Road intersects US 322 at a skewed angle, which makes left turns in and right turns out of Mountain Back Road more difficult to navigate. Red Mill Road also intersects US 322 at a skew, which does not meet current design criteria. Analysis conducted as part of the PEL Study did not identify the need for specific geometric or safety improvements at the intersection (**Figure 8-7**). However, the intersection was specifically mentioned as an intersection of concern during the public engagement activities. Between 2016 and 2020, a total of eight crashes were reported at or near the intersection, including one reported injury.



Figure 8-7: US 322 / Mountain Back Road and Red Mill Road Intersection

7. PA 144 at Bible Road / Short Road

Bible Road and Short Road are both stop-controlled local roads. Analysis conducted as part of the PEL Study did not identify the need for specific geometric or safety improvements at the intersection (**Figure 8-8**). However, the intersection was specifically mentioned as an intersection of concern during public engagement activities. Bible Road and Short Road intersect PA 144 at offset angles. This layout hinders sight distance. A total of three crashes were reported at or near the intersection, one of which resulted in a fatality.

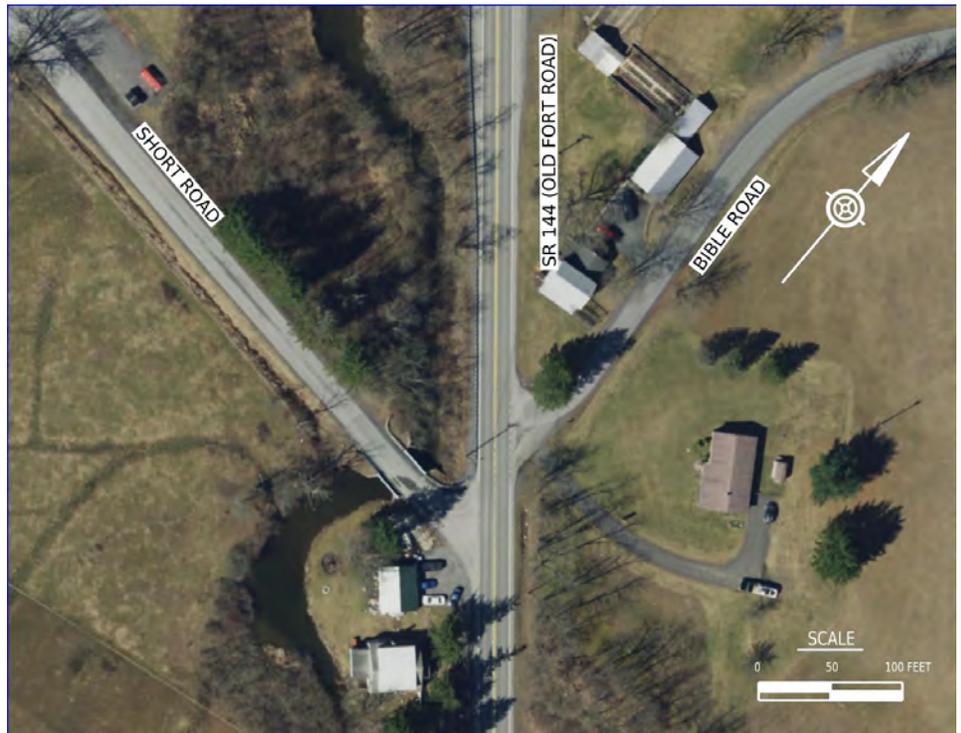


Figure 8-8: PA 144 / Bible Road and Short Road Intersection

8. PA 144 at Airport Road / Sinking Creek Road

The intersection of PA 144 with Airport Road and Sinking Creek Road is a slightly staggered intersection with stop-controls on both side road approaches (**Figure 8-9**). Analysis conducted as part of the PEL Study concluded that improvements could be made in this location to improve safety. The southbound approach of PA 144 experiences a downgrade which may attribute to higher vehicle speed through the intersection. An existing embankment on either side of the road limits driver visibility when approaching the PA 144 intersection. Two angle-type collisions occurred at the intersection.



Figure 8-9: PA 144 / Airport Road and Sinking Creek Road Intersection

B. Roadway Segments

1. PA 45 (Earlstown Road)

In the development and evaluation of alternatives including potential upgrades to existing facilities, an engineering review was conducted along the PA 45 corridor to compare the existing conditions to current engineering design standards for both horizontal and vertical geometry as established in PennDOT's Publication 13M, Design Manual Part 2, and the AASHTO publication, A Policy on Geometric Design of Highways and Streets.

Although all horizontal curves through the corridor within the study area meet current design criteria, this engineering review did identify several areas along the PA 45 corridor as "deficient" or "substandard", reflecting locations where the existing vertical curvature or steepness of grade were not within the allowable range defined in these current design regulations based on the posted speed of the highway. The identified substandard conditions included 3 vertical curves which did not meet current criteria, as well as numerous stretches of the highway where the existing vertical alignment is flatter than the desired minimum grade of 0.50% which is primarily established to facilitate efficient drainage of the roadway pavement and prevent icing during winter months.

In the evaluation of alternatives, it was determined that upgrades to PA 45 did not fully meet the study's purpose and need; therefore, this concept was not advanced for further development and analysis. However, throughout the PEL process, safety concerns have continued to be raised regarding travel conditions along PA 45 (See Appendix E for Township letters of specific concern.) Although geometric elements which do not meet current design criteria do not necessarily indicate unsafe conditions, a full safety analysis including an evaluation to determine possible correlations between crash history and geometric conditions could be conducted as an independent stand-alone project. This potential safety study along PA 45 could also be expanded to evaluate the need for other improvements involving other design elements such as shoulder widths, intersection geometry, sight distance, pedestrian/bicycle accommodations, and access management.

2. US 322 (Mount Nittany Expressway)

The "S-Curve" along US 322 (Mount Nittany Expressway) immediately to the east of the PA 26 interchange was identified as a concern by the public at public outreach events (**Figure 8-10**). In general, concerns focused on the increase in traffic volume projections for the area, particularly with the US 322 Build Alternative, and how the increase in traffic volumes may affect safety.

The "S-Curve" of US 322 carries nearly 20,000 vehicles per day (20% trucks) and is classified as a limited access roadway. The "S-Curve" is approximately 4000-feet long and connects two reverse horizontal curves. A total of 18 crashes were reported in the area between the years 2016 and 2020.

In recent years, PennDOT has implemented mitigation measures, including Dynamic Message Signs to improve safety by alerting drivers of the approaching curves in attempt to slow travel speeds approaching the "S-Curve". Other safety improvement measures are currently programmed under separate contract and PennDOT will continue to evaluate performance of these improvements. As innovation in technology advances, PennDOT will look to implement additional measures to enhance the safety of the highway in this area, as needed.

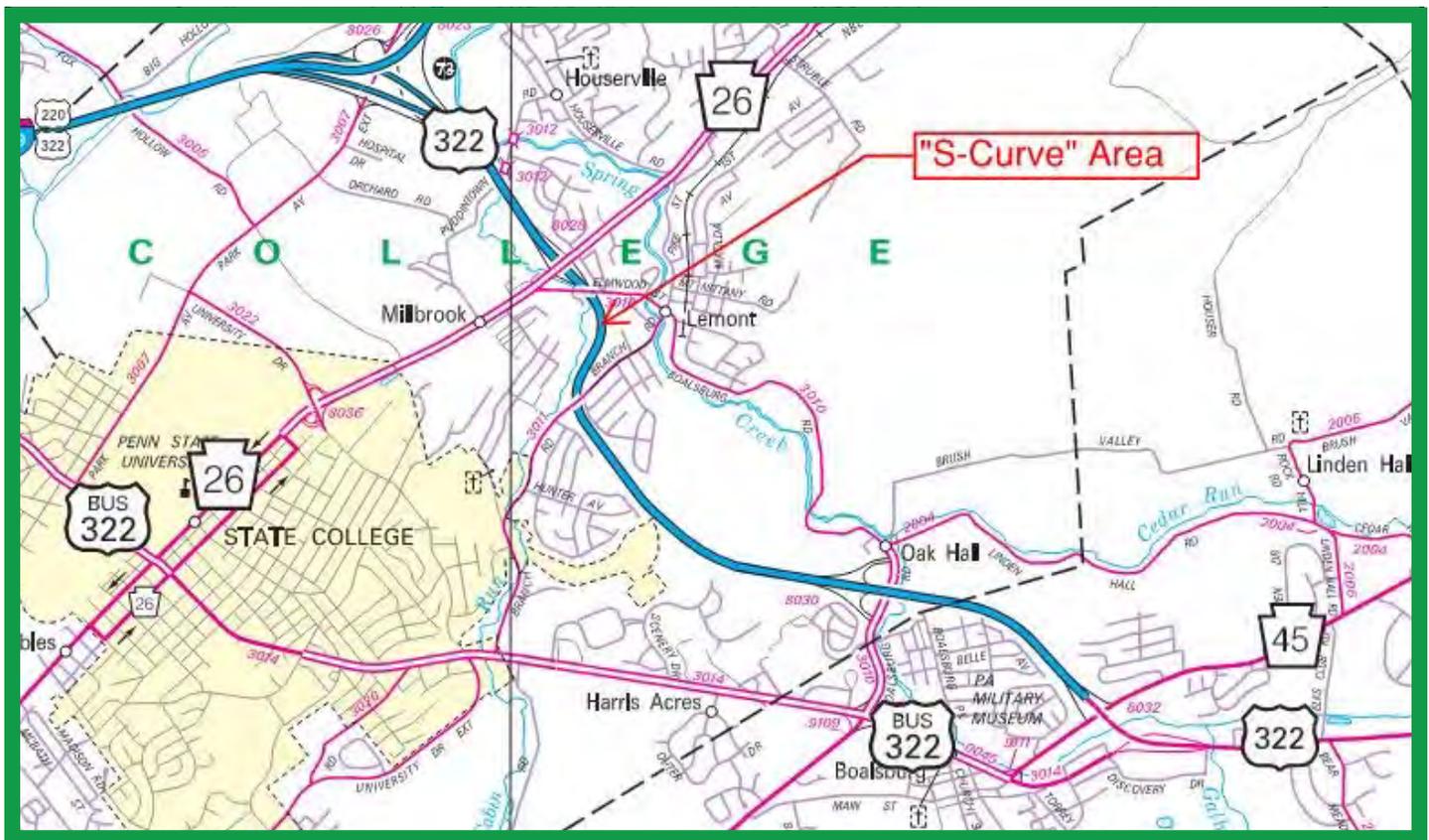


Figure 8-10: “S-Curve Location”

C. Multi-Modal Improvement Projects

Multi-modal improvements could be included as part of the Build Alternative, where appropriate, or programmed as new projects or upgraded facilities to improve multi modal connectivity throughout the study area. Specific improvements could include park-n-ride lots with electric vehicle charging stations, dedicated bikeways or bike lanes, pedestrian trails, shared use paths, widened shoulders along project area roadways, or other improvements to allow pedestrians, bicycles, and other non-motorized modes of travel to move safely throughout the area. Locations of these improvements would need to be coordinated between planning partners, local officials, stakeholders, and PennDOT to ensure that the improvements are consistent with both local and state-wide active transportation plans, and provide connectivity between communities, community facilities and other destinations such as parks, employment centers, or other multi-modal facilities.

D. Transportation Control Measures and Transportation System Management Projects

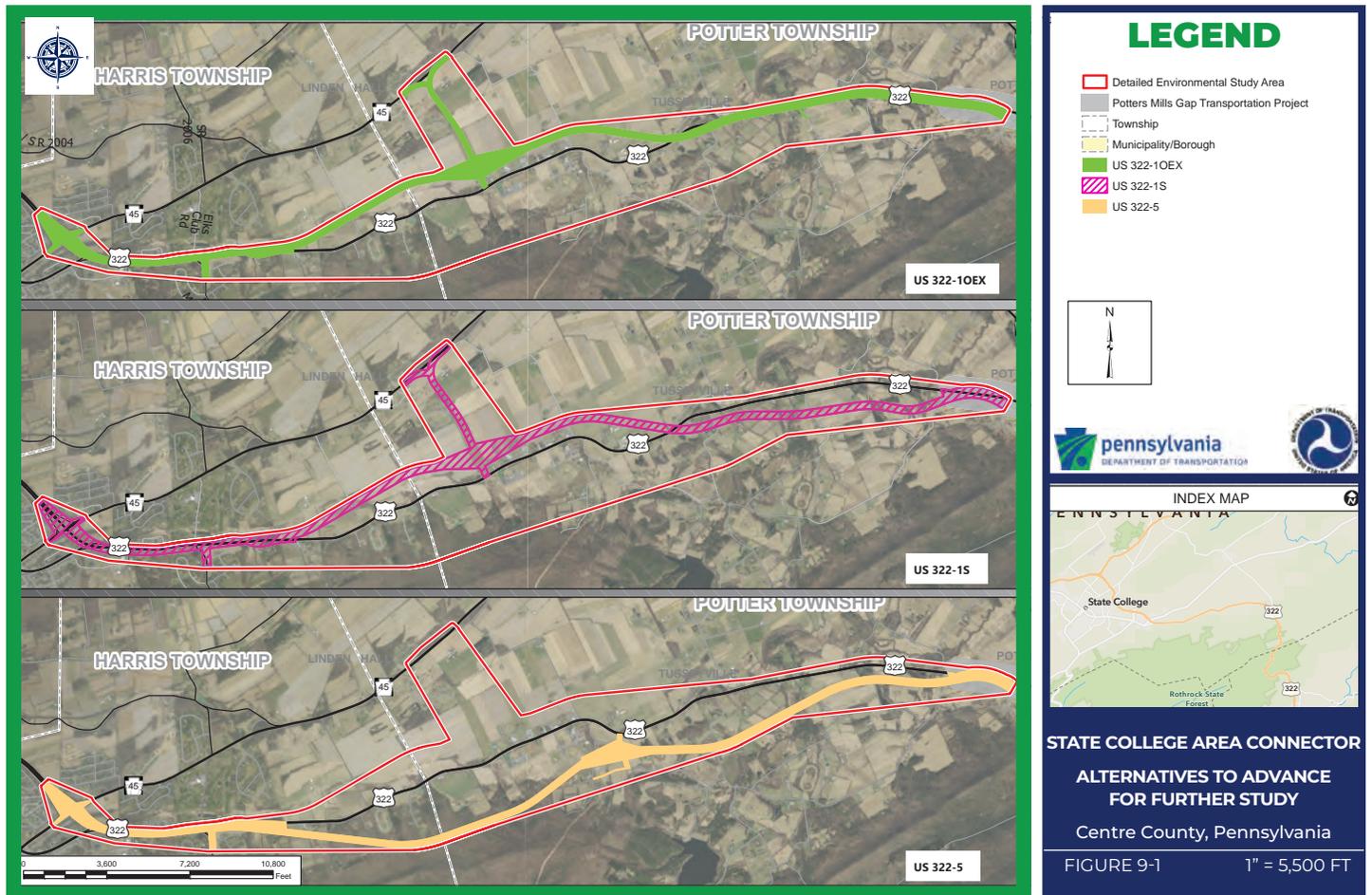
TCM and TSM Alternatives could also be included as part of the Build Alternative, where appropriate, or programmed as new projects or upgraded facilities. The locations and implementation of any strategy or measure would need to be coordinated between planning partners, local officials, stakeholders, and PennDOT to ensure that the improvements are consistent with both local and state-wide transportation initiatives. Consideration of TCM measures, such as park-and-rides, would be included as part of the Build Alternative during final design. Similarly, TSM strategies could include traffic signal coordination, Intelligent Transportation Systems (ITS), and integrated corridor management.

CHAPTER 9: NEXT STEPS

This PEL Study has been prepared to identify the transportation needs within the study area and evaluate a range of alternatives to determine if and to what level each alternative addressed the study's purpose and need, balanced impacts to the natural and built environment, addressed traffic concerns within the overall study area, and met engineering considerations such as constructability, cost, and considered planning goals.

A. PEL Alternatives Advanced for NEPA Study

Based on the results of the alternatives screening process detailed in **Chapter 6**, the implementation of a Build Alternative was recommended to address the study purpose and need. The screening further recommended three Build Alternative corridors – US 322-1S, US 322-1OEX and US 322-5 be advanced as reasonable alternatives, for detailed environmental study and engineering design in accordance with the NEPA (**Figure 9-1**). Upon acceptance of the PEL Study by FHWA, a refined study area will be developed that encompasses the Build Alternative corridors and detailed



Note: Figure 9-1 can also be found in Appendix A at a larger size.

Figure 9-1: Alternatives to Advance for Further Study

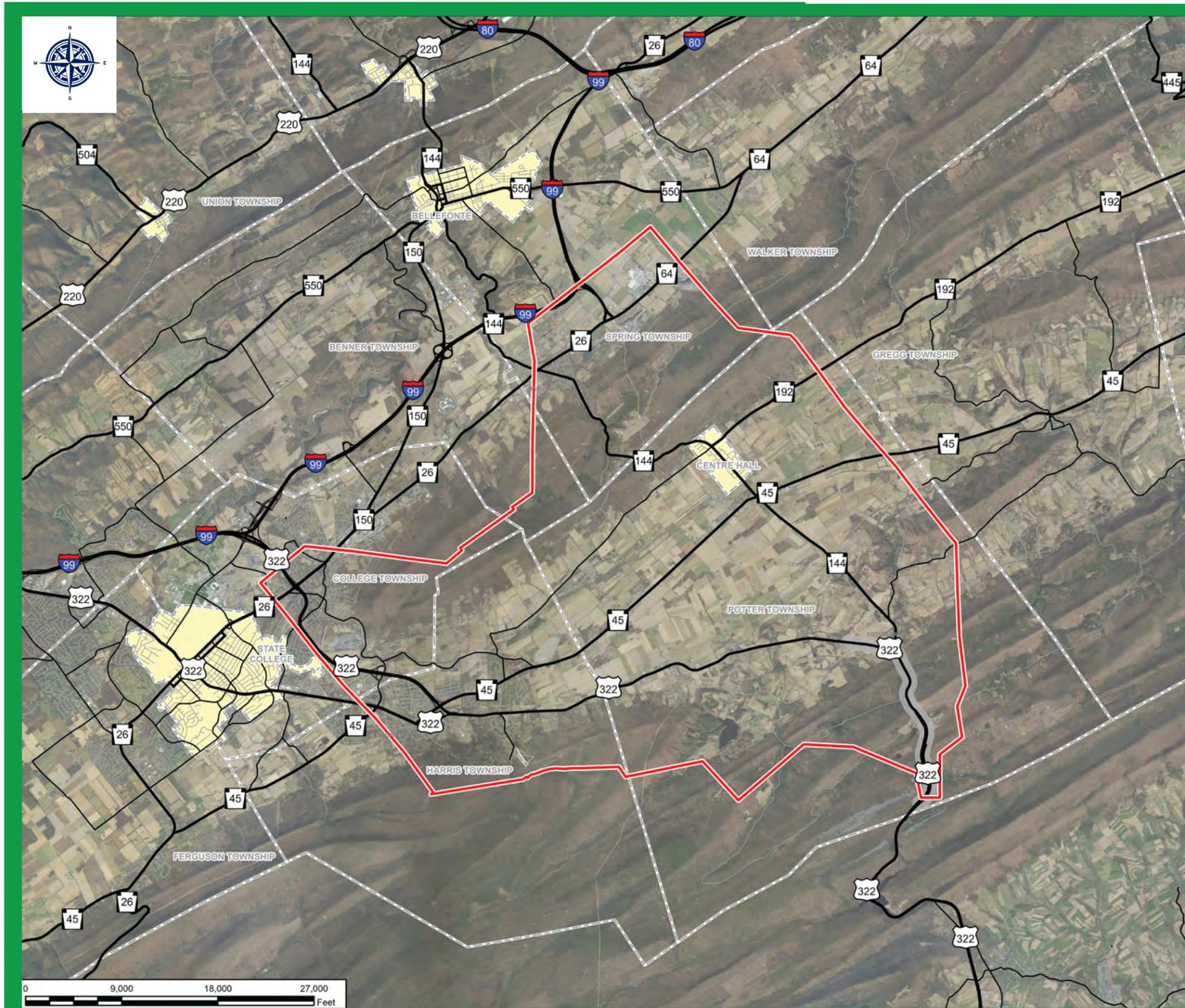
field investigations, that will be conducted to:

- Confirm, refine, and update the preliminary environmental resource information collected during the PEL Study; perform preliminary noise assessments, assess potential impacts to groundwater resources; delineate streams, wetlands and floodplains; perform a Phase I environmental site assessment to identify potential hazardous waste sites; complete an agricultural resources evaluation and prepare a Farmlands Assessment Report; conduct archaeological and historic resource surveys; and assess potential effects on historic properties and districts.
- Develop preliminary engineering designs to minimize impacts to environmental resources, balance earthwork, address the need for local access along each alternative, generate a more precise footprint of the likely limits of disturbance, and establish preliminary right-of-way needs.
- Perform more detailed traffic analysis and modeling of each alternative including operational analysis of freeway segments, interchanges and intersections.
- Identify mitigation commitments to mitigate any unavoidable environmental impacts.

B. Other Future Independent Transportation Projects

While the PEL Study identified a Build Alternative to address the regional transportation purpose and need, other localized transportation needs were identified during the development of the study. As identified in Chapter 8, these localized improvements could include bikeways, roadway intersections, and roadway segments within the study area, each of which could be advanced as a separate transportation project with independent funding mechanism. If any of the independent projects are identified for further development, PennDOT would work with the Centre County MPO and local stakeholders to develop an implementation plan to advance these projects based on funding availability. These new projects would all require their own NEPA decision.

APPENDIX A MAPS



LEGEND

- ▭ PEL Study Area
- Potters Mills Gap Transportation Project
- Township
- Municipality/Borough



INDEX MAP



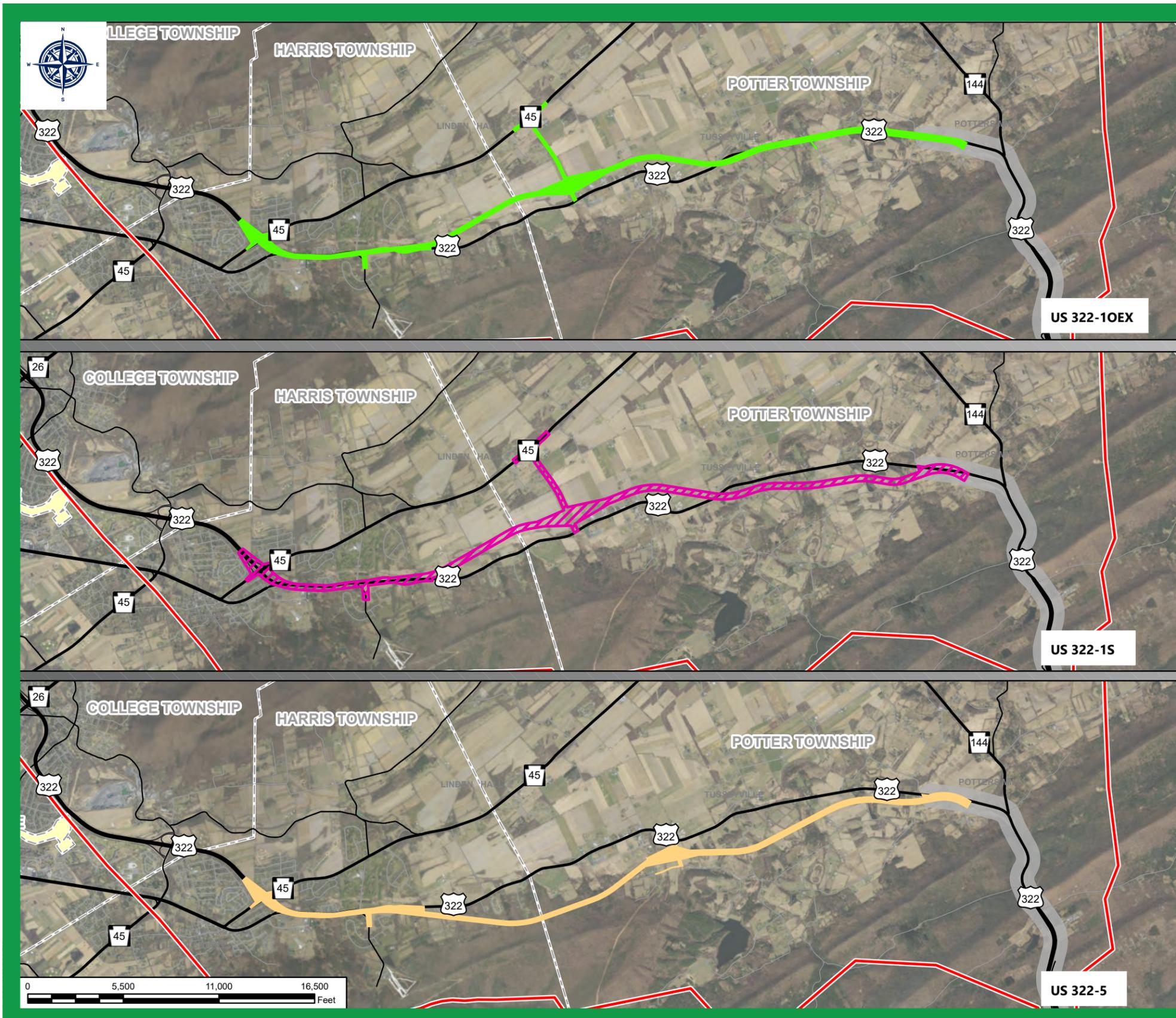
STATE COLLEGE AREA CONNECTOR

PEL STUDY AREA MAP

Centre County, Pennsylvania

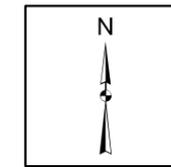
FIGURE ES-2

1" = 5,500 FT



LEGEND

-  PEL Study Area
-  Potters Mills Gap Transportation Project
-  Township
-  Municipality/Borough
-  US 322-10EX
-  US 322-1S
-  US 322-5



INDEX MAP

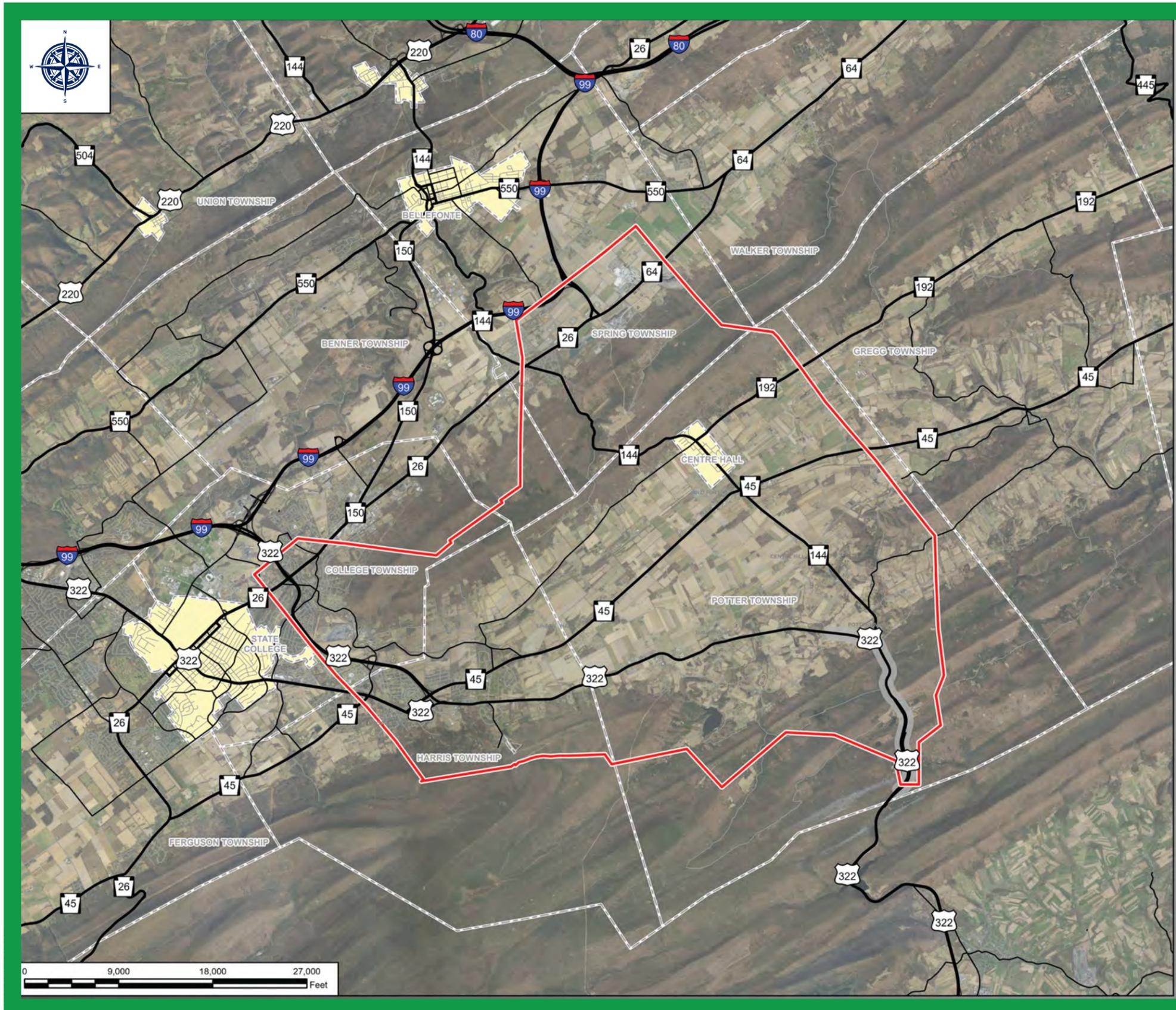


**STATE COLLEGE AREA CONNECTOR
ALTERNATIVES TO ADVANCE
FOR FURTHER STUDY**

Centre County, Pennsylvania

FIGURE ES-4

1" = 5,500 FT



LEGEND

- PEL Study Area
- Potters Mills Gap Transportation Project
- Township
- Municipality/Borough



INDEX MAP



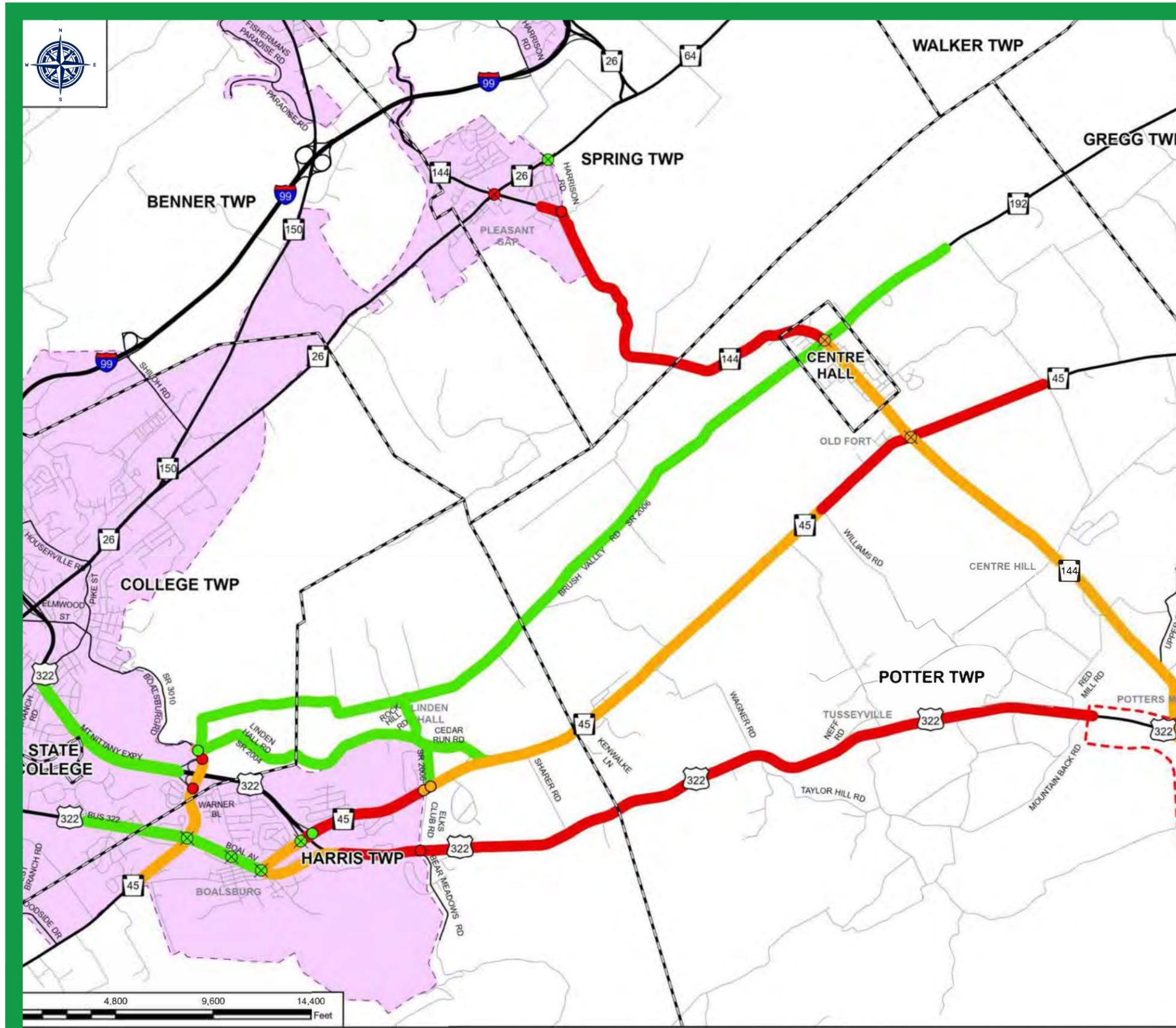
STATE COLLEGE AREA CONNECTOR

PEL STUDY AREA MAP

Centre County, Pennsylvania

FIGURE 1-2

1" = 5,500 FT



LEGEND

- Potters Mills Gap Transportation Project
 - Municipality/Borough
 - Urban Boundary
- Intersections Level of Service**
- Signal, Level of Service A-C
 - Signal, Level of Service D
 - Signal, Level of Service E-F
 - Stop, Level of Service A-C
 - Stop, Level of Service D
 - Stop, Level of Service E-F
- Level of Service**
- Level of Service A-C
 - Level of Service D
 - Level of Service E-F



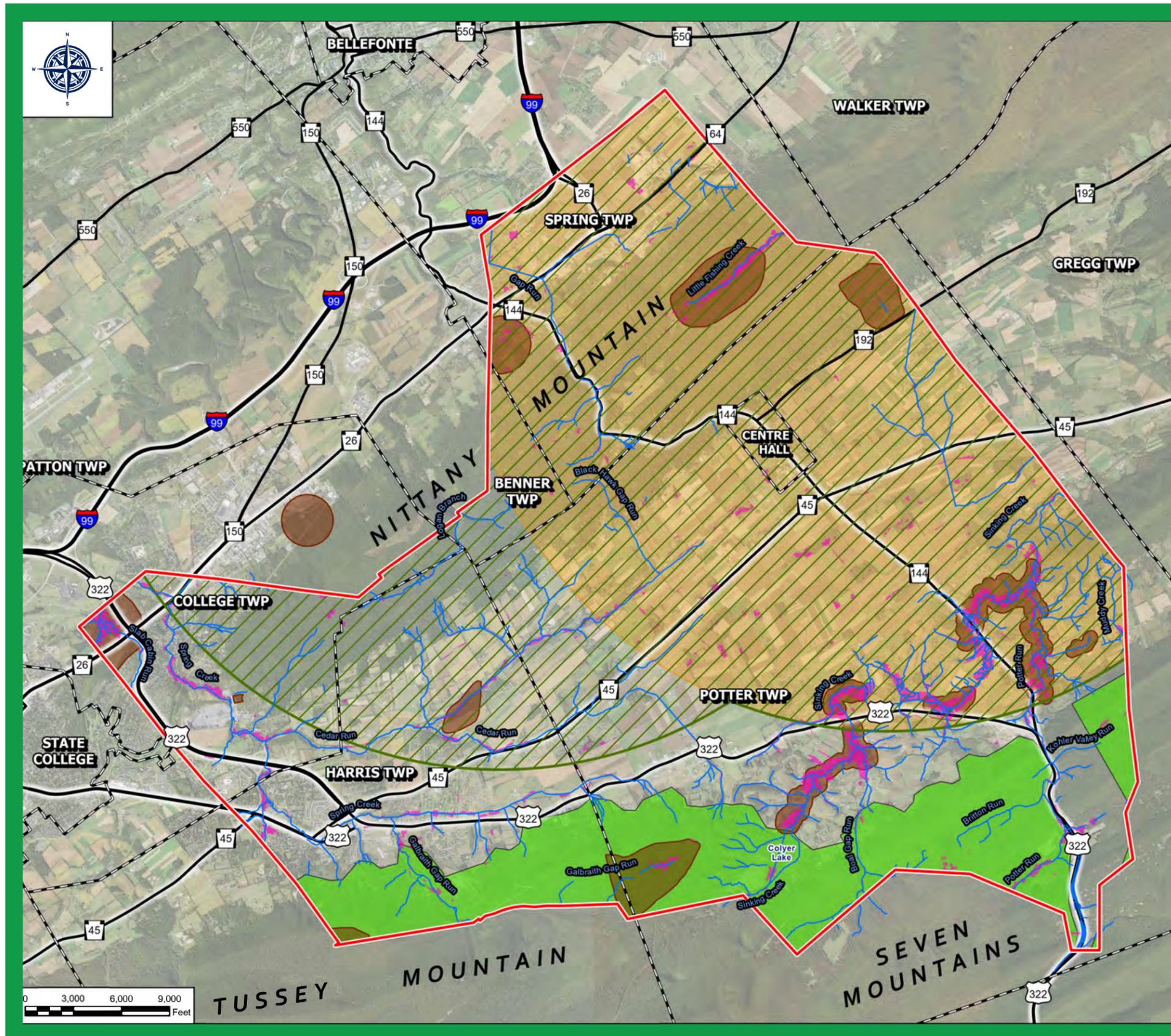
INDEX MAP



**STATE COLLEGE AREA CONNECTOR
NO BUILD (DESIGN YEAR 2050)
LEVEL OF SERVICE**

Centre County, Pennsylvania

FIGURE 3-3 1" = 4,800 FT



LEGEND

-  PEL Study Area
-  Municipal Boundaries
-  Watercourses
-  Wetlands
-  Pennsylvania Natural Heritage Core Habitat (with Map ID)
-  Rothrock State Forest (part) and Stone Mountain Important Bird Area
-  Indiana Bat Swarming Habitat
-  Northern Long Eared Bat Swarming Habitat



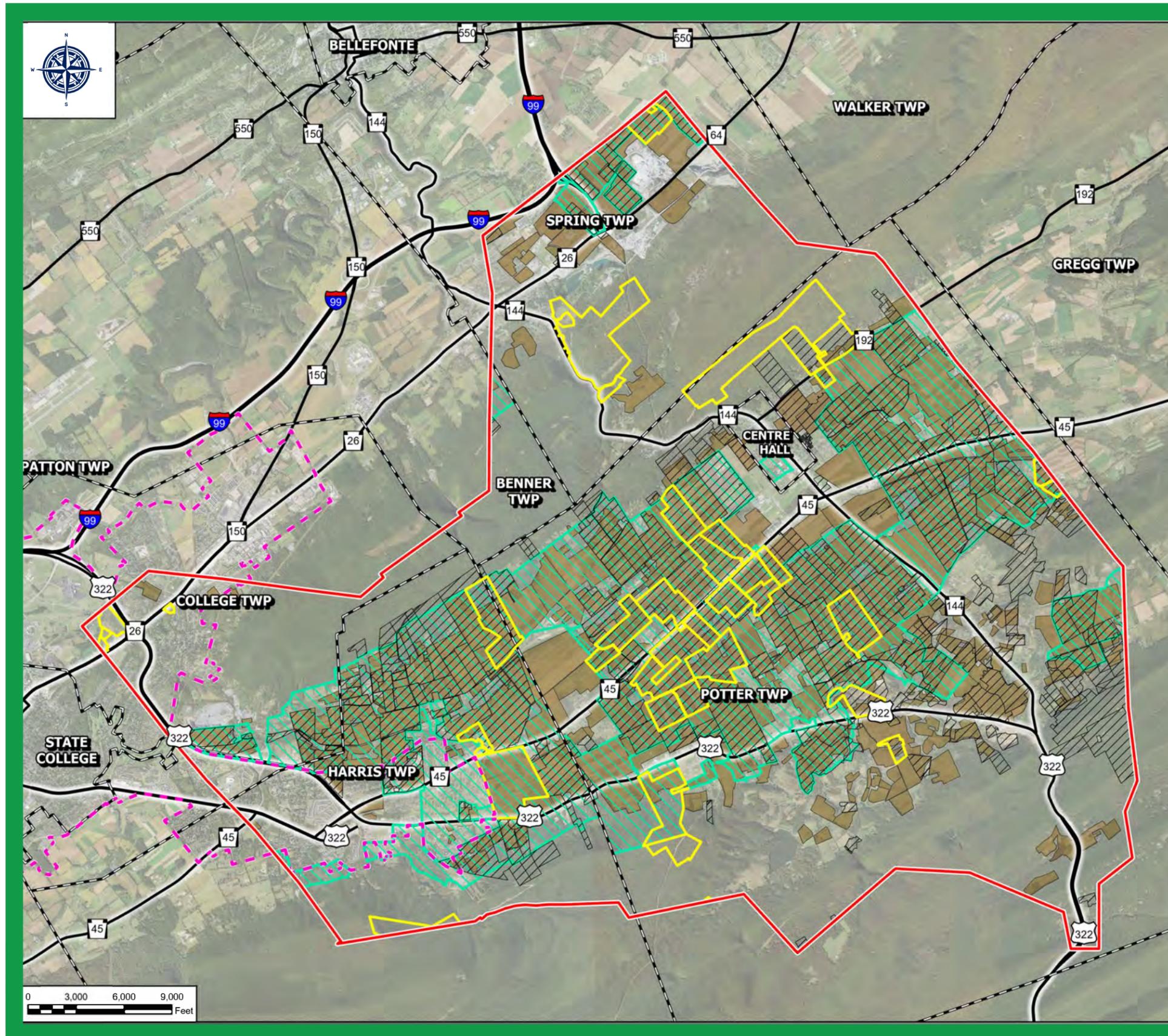
STATE COLLEGE AREA CONNECTOR

NATURAL RESOURCES

Centre County, Pennsylvania

FIGURE 5-1

1" = 6,000 FT



LEGEND

- PEL Study Area
- Municipal Boundaries
- Regional Growth Boundary
- Conservation Easement
- Agricultural Security Area
- Agricultural Zoning
- Productive Agricultural Land



INDEX MAP

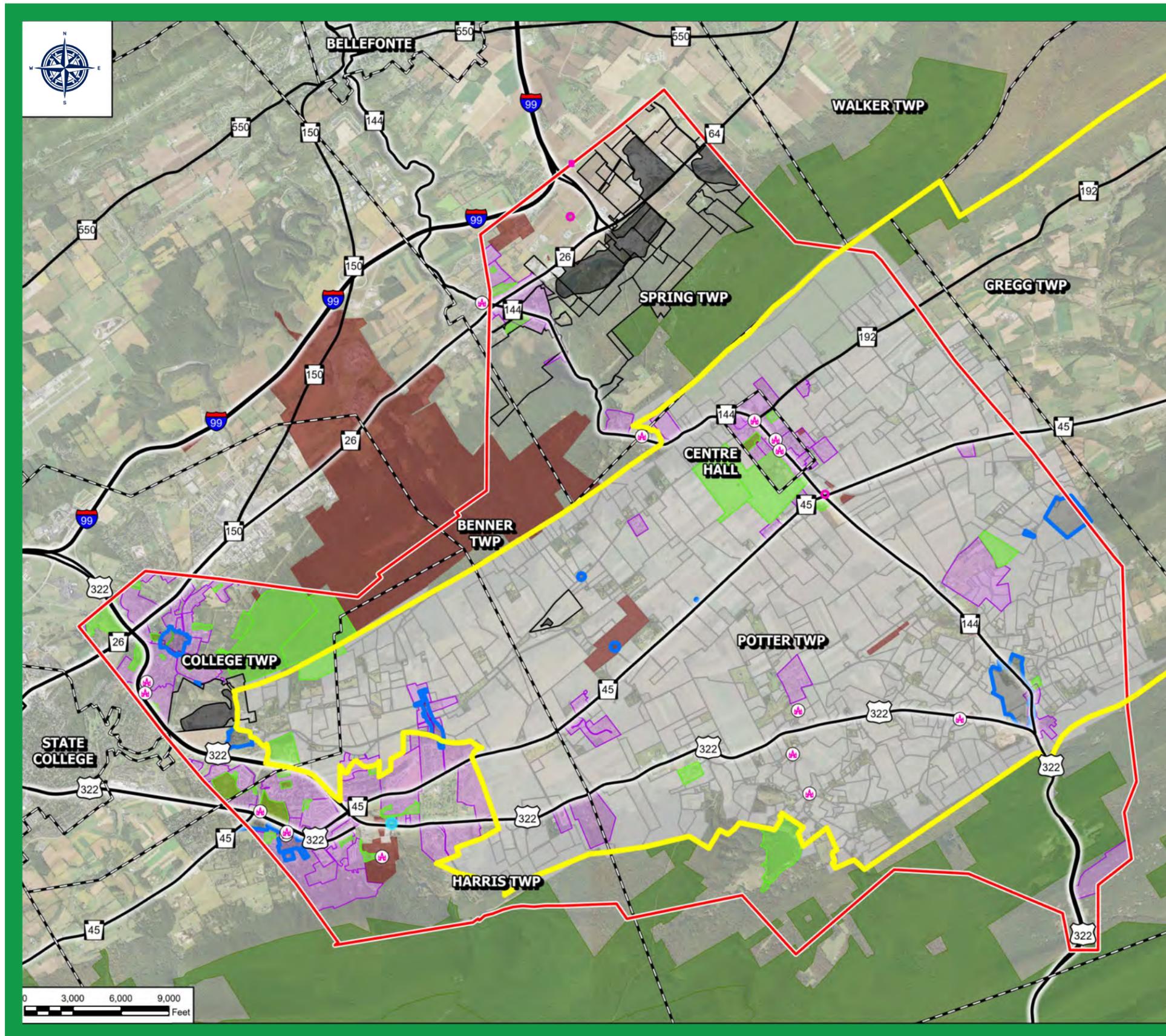


**STATE COLLEGE AREA CONNECTOR
AGRICULTURAL RESOURCES AND
LAND PRESERVATION**

Centre County, Pennsylvania

FIGURE 5-2

1" = 6,000 FT



LEGEND

- PEL Study Area
- Municipal Boundaries
- ✠ Places of Worship
- Quarries
- Mineral Mining Operations Properties
- Neighborhoods and Communities
- Public Parks and Recreational Areas
- Community Facilities
- State Forest
- Penns Valley/Brush Valley Rural Historic District
- Penns Valley/Brush Valley Rural Historic District - Recommended Contributing Properties
- Historic Properties Eligible for Listing on the National Register of Historic Places
- Historic Properties Listed on the National Register of Historic Places



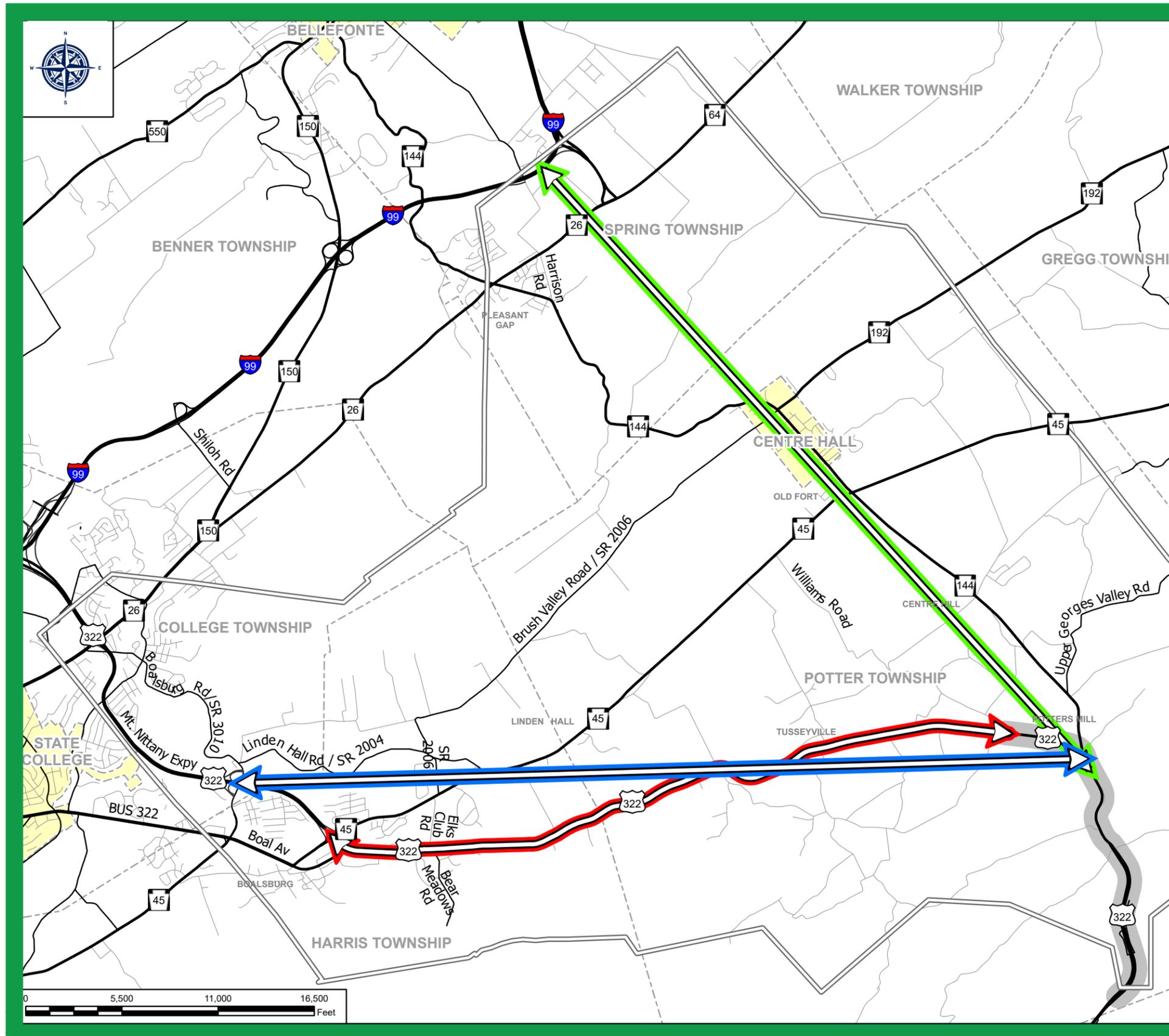
INDEX MAP



**STATE COLLEGE AREA CONNECTOR
CULTURAL AND SOCIOECONOMIC
RESOURCES**

Centre County, Pennsylvania

FIGURE 5-3 1" = 6,000 FT



LEGEND

- US 322 Upgrade Existing Alternative
- PA 144 Representative Build Alternative
- US 322 Representative Build Alternative

Boundaries

- Study Area
- Township
- Municipality/Borough
- Potters Mills Gap Transportation Project



INDEX MAP



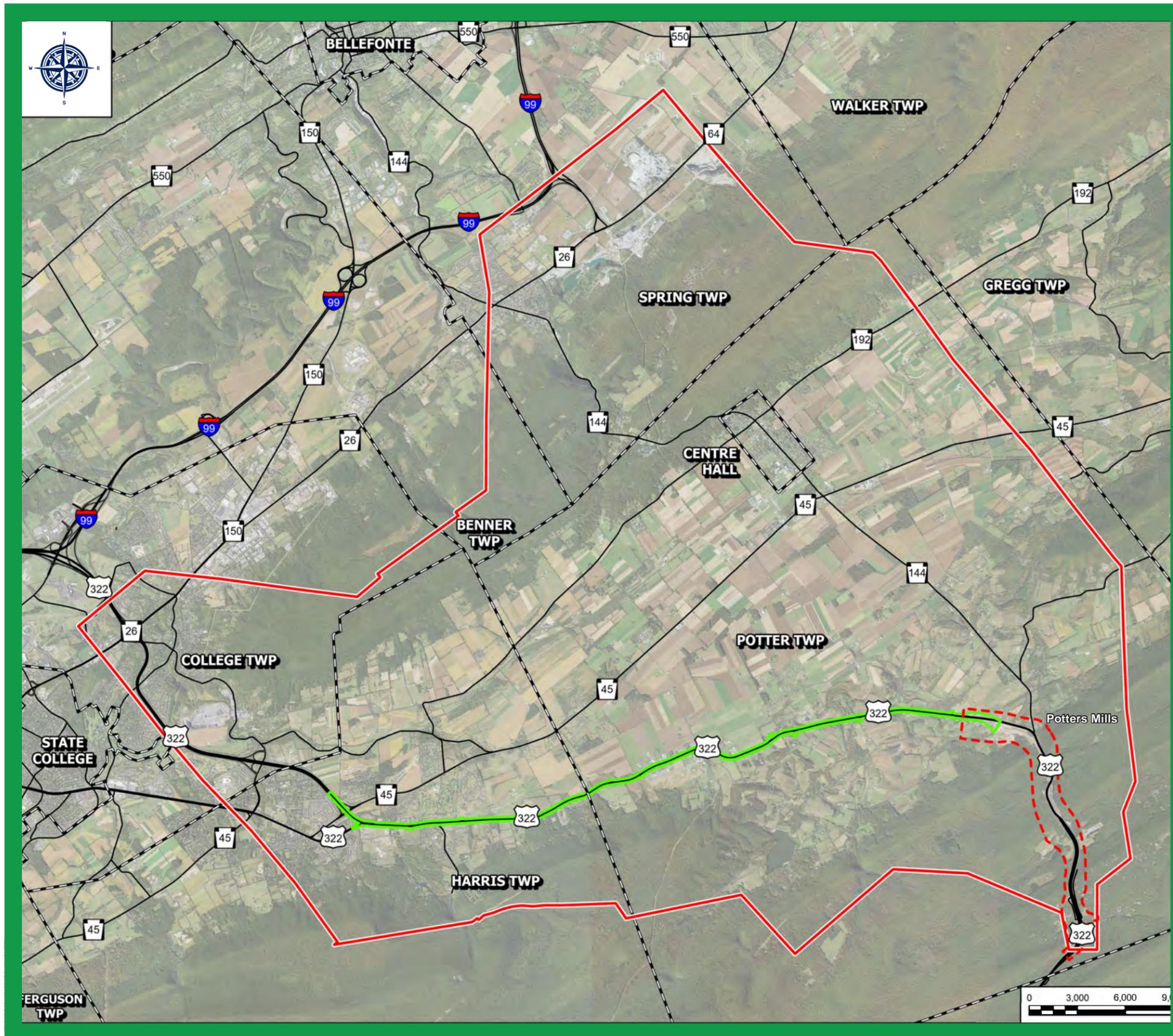
STATE COLLEGE AREA CONNECTOR

REPRESENTATIVE ALTERNATIVES

Centre County, Pennsylvania

FIGURE 6-1

1" = 6,000 FT



LEGEND

-  Potters Mills Gap Transportation Project
-  PEL Study Area
-  Municipality/Borough
-  US322 1 Existing Upgrade



INDEX MAP



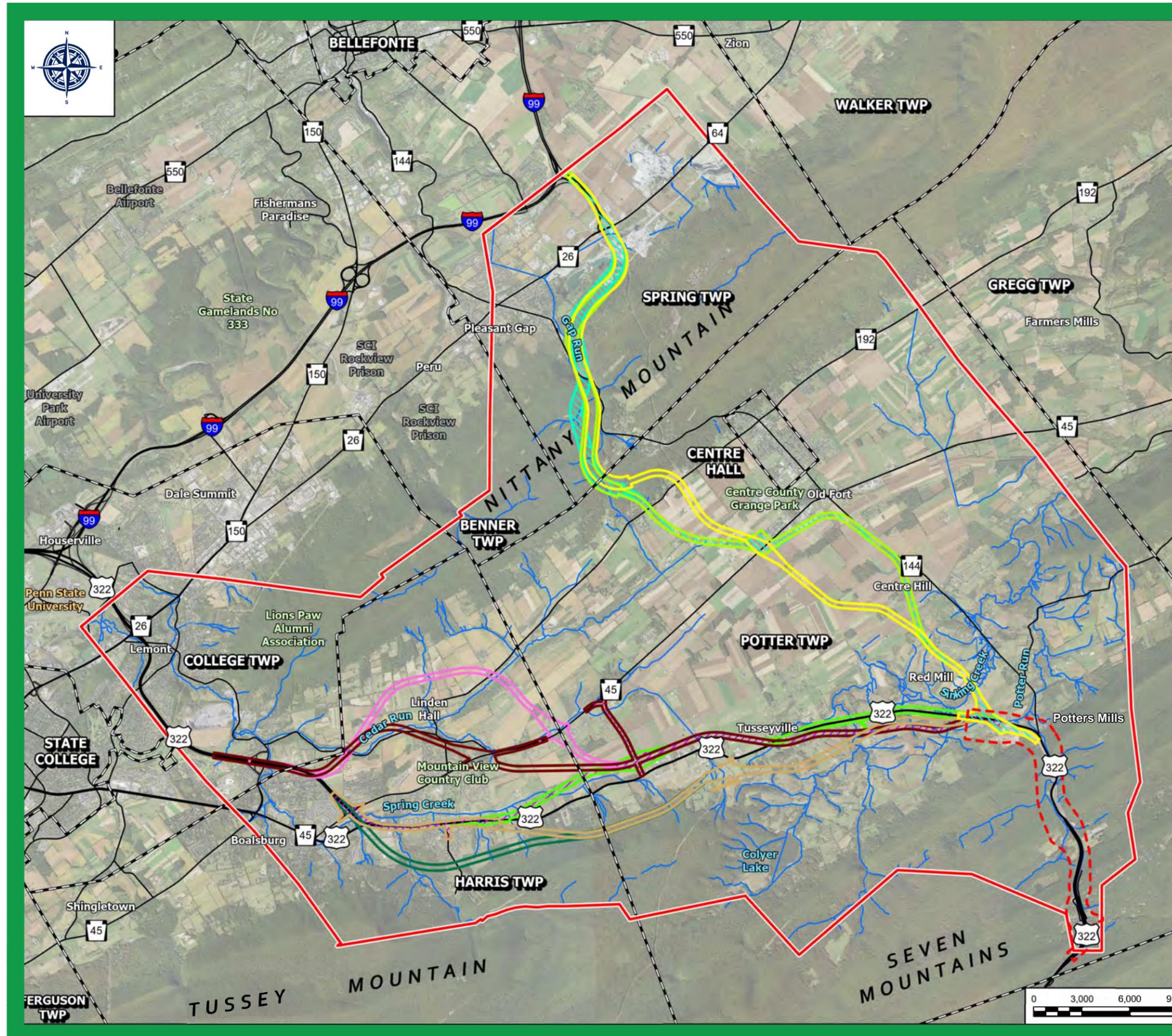
STATE COLLEGE AREA CONNECTOR

US 322 UPGRADE EXISTING ALTERNATIVE

Centre County, Pennsylvania

FIGURE 6-8

1" = 6,000 FT



LEGEND

- Potters Mills Gap Transportation Project
- PEL Study Area
- Municipality/Borough
- Streams

US 322 Alternatives

- US322 1 OEX
- US322 1 S
- US322 2
- US322 3
- US322 4
- US322 5

SR 144 Alternatives

- SR144 1
- SR144 2
- SR144 3




INDEX MAP

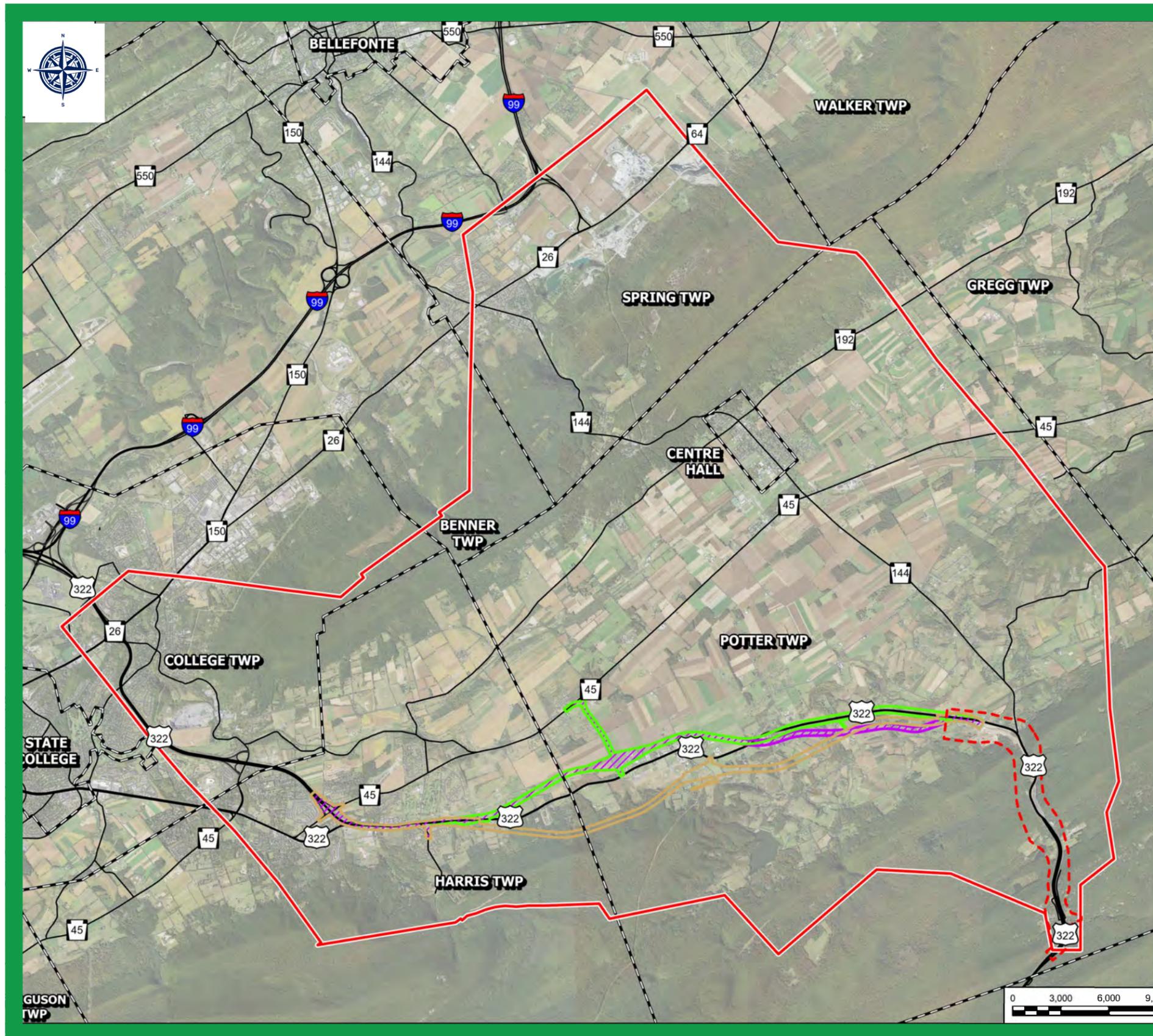


STATE COLLEGE AREA CONNECTOR

PROPOSED ALTERNATIVE CORRIDORS

Centre County, Pennsylvania

FIGURE 6-9 1" = 6,000 FT



LEGEND

- Potters Mills Gap Transportation Project
- PEL Study Area
- Municipality/Borough
- US 322 Alternatives**
 - US322 1 OEX
 - US322 1 S
 - US322 5



INDEX MAP



STATE COLLEGE AREA CONNECTOR
PEL ALTERNATIVES
RECOMMENDED FOR
ADVANCEMENT

Centre County, Pennsylvania

FIGURE 6-16

1" = 6,000 FT

LEGEND

Boundaries

-  Study_Area
-  Township
-  Municipality/Borough
-  Potters Mills Gap Transportation Project
-  Study Intersection



INDEX MAP



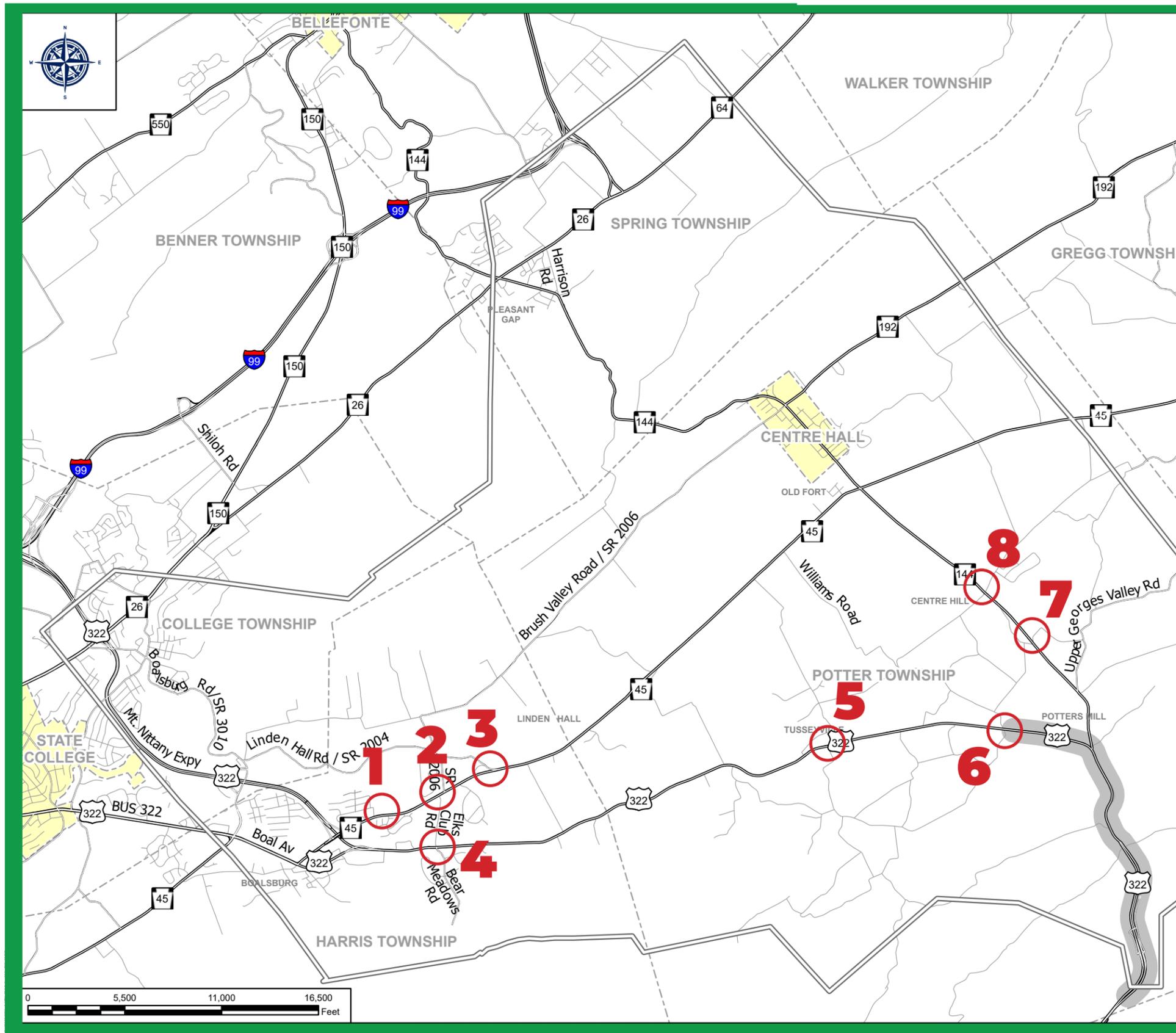
STATE COLLEGE AREA CONNECTOR

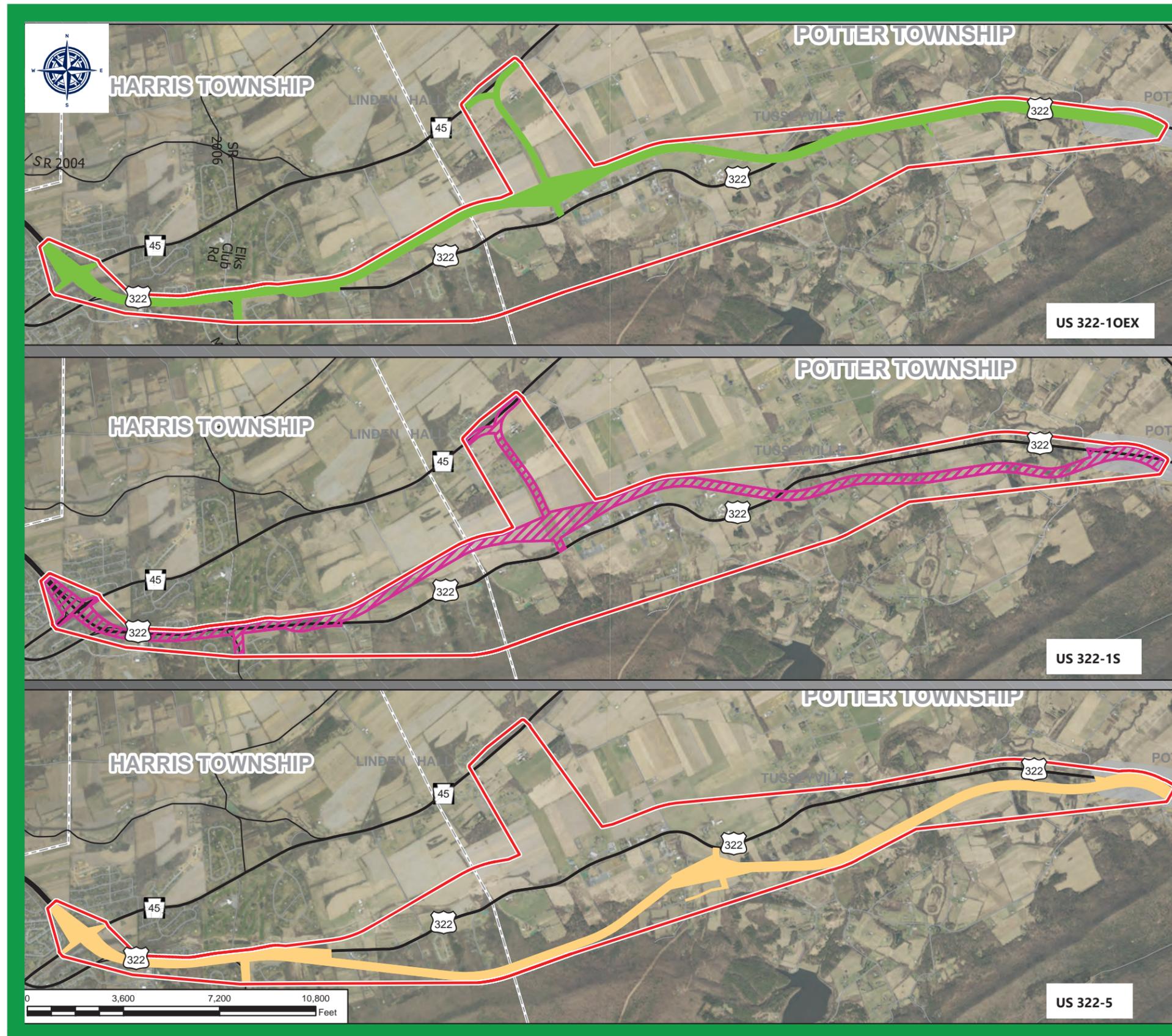
**POTENTIAL INDEPENDENT
INTERSECTION IMPROVEMENT
PROJECTS**

Centre County, Pennsylvania

FIGURE 8-1

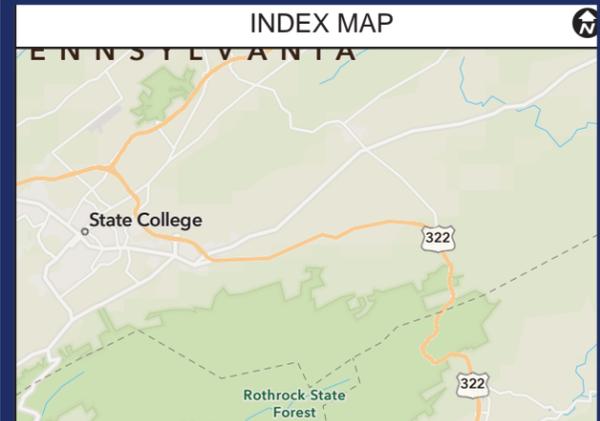
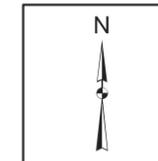
1" = 5,500 FT





LEGEND

- Detailed Environmental Study Area
- Potters Mills Gap Transportation Project
- Township
- Municipality/Borough
- US 322-10EX
- US 322-1S
- US 322-5



**STATE COLLEGE AREA CONNECTOR
ALTERNATIVES TO ADVANCE
FOR FURTHER STUDY**

Centre County, Pennsylvania

FIGURE 9-1

1" = 5,500 FT

APPENDIX B IMPACT TABLES

Table 6-3: Summary of Environmental Resources for the Build Alternative Corridors

Feature	US 322 Corridor						PA 144 Corridor						Impact Comparison								
	US322 - 1 OEX		US322 - 1 S		US322 - 2		US322 - 3		US322 - 4		US322 - 5		144-1	144-2	144-3	Average Impact Value	Lower Magnitude of Impact	Higher Magnitude of Impact			
Potential Limit of Disturbance Area (acres)	463		446		482		493		429		432		696	699	670	534	429	699			
Agricultural Resources																					
Productive Agricultural Land (acres)	251		278		361		313		180		181		294	296	268	269	180	361			
Agricultural Security Areas (within Productive Agricultural Land) (acres)	111		112		192		146		70		57		165	166	183	134	57	192			
Agricultural Zoning Districts (within Productive Agricultural Land) (acres)	152		160		246		212		99		97		133	135	132	152	97	246			
Soil Capability Classes I-IV (within Productive Agricultural Land) (acres)	240		265		331		296		168		168		291	292	259	257	168	331			
Other Land Preservation																					
Conservation Easements (acres)	24		16		0		50		17		15		108	111	110	50	0	111			
Conservation Easements (within Productive Agricultural Land) (acres)	22		15		0		39		0		0		40	40	37	22	0	40			
Act 319 Clean and Green Areas (within Productive Agricultural Land) (acres)	189		213		281		258		146		137		192	193	203	201	137	281			
Water Resources																					
Wetlands (bridges) (acres)	4		3		2		3		6		8		7	6	8	5	2	8			
Total Streams (bridges) (# of crossing linear feet)	20	5,576	21	6,681	14	5,965	15	6,265	16	9,124	20	10,331	11	7,070	11	7,067	10	5,265	7038	5265	10331
CWF-HQ/CWF Streams (bridges) (# of crossings linear feet)	16	5,129	21	6,681	14	5,965	14	5,066	16	9,124	19	9,046	9	6,275	11	7,067	8	4,481	6537	4481	9124
Ponds/Lakes (# acres)	8	3	8	5	2	0	2	0	8	1	9	1	2	0	2	0	2	0	1	0	5
100 Yr. Floodplains (acres)	21		9		10		15		12		13		10	11	10	12	9	21			
Terrestrial Habitat and Threatened and Endangered Species																					
Forested/Wooded Habitats (acres)	25		23		26		59		149		111		248	261	269	130	23	269			
PA Natural Heritage Core Habitat (acres)	25		11		11		11		15		15		8	8	8	12	8	25			
Karst Features (#)	26		26		47		26		2		2		53	52	61	33	2	61			
Bat Swarming Area (Combined) (acres)	134		90		266		234		71		71		658	660	631	313	71	660			
Bat Swarming Area (Combined) (Forested) (acres)	15		7		20		52		7		7		248	261	269	98	7	269			
NLE Bat Swarming Area (acres)	134		90		266		234		71		71		658	660	631	313	71	660			
NLE Bat Swarming (Forested) (acres)	15		7		20		52		7		7		248	261	269	98	7	269			
Indiana Bat Swarming Area (acres)	100		56		56		56		71		71		658	660	631	262	56	660			
Indiana Bat Swarming (Forested) (acres)	13		6		6		6		7		7		248	261	269	91	6	269			
Rothrock State Forest (acres)	0		0		0		0		0		0		0	0	0	0	0	0			
Stone Mountain Important Bird Area (acres)	0		0		0		0		125		78		1	1	1	23	0	125			

Table 6-3: Summary of Environmental Resources for the Build Alternative Corridors

Feature	US 322 Corridor										PA 144 Corridor						Impact Comparison				
	US322 - 1 OEX		US322 - 1 S		US322 - 2		US322 - 3		US322 - 4		US322 - 5		144-1		144-2		144-3		Average Impact Value	Lower Magnitude of Impact	Higher Magnitude of Impact
Historic Resources																					
NRHP Listed Property (#)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
NRHP Eligible Property (#)	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Potentially Individually NRHP Eligible Property (#)	3	2	0	1	0	1	0	2	2	2	2	2	2	2	2	1	1	0	0	3	
Penns Valley/Brush Valley Rural Historic District Contributing Property (# acres)	67	263	45	266	64	372	54	331	49	301	48	254	38	279	38	276	33	263	289	254	372
Archaeological Resources																					
Known Archaeological Sites (#)	3	3	1	1	2	4	3	4	3	4	3	4	3	4	3	3	1	1	4	4	
Historic Period Archaeological Sensitivity Area (acres)	16	10	21	22	13	14	22	23	19	18	10	23	18	10	23	18	10	23	18	10	23
Statewide Prehistoric/Pre-Contact Model - High Probability Area (acres)	245	211	295	282	190	199	208	222	237	232	190	295	232	190	295	232	190	295	232	190	295
Statewide Prehistoric/Pre-Contact Model - Medium Probability Area (acres)	176	188	165	181	167	160	271	272	250	203	160	272	203	160	272	203	160	272	203	160	272
Socioeconomic Resources																					
Residential Units (#)	25	8	21	29	8	11	13	13	9	15	8	29	15	8	29	15	8	29	15	8	29
Commercial (non-ag operations) (#)	6	3	1	1	4	2	3	3	2	3	1	6	3	1	6	3	1	6	3	1	6
Places of Worship (#)	1	1	1	1	1	1	0	0	0	1	0	1	1	0	1	1	0	1	1	0	1
HUD Subsidized Housing Units (#)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Community Facilities (acres)	2	2	1	1	18	2	36	22	9	10	1	36	10	1	36	10	1	36	10	1	36
Neighborhood/Community (# acres)	12	26	12	26	4	9	8	52	3	18	12	39	1	0	2	1	1	0	6	1	12
Conservation/Forest Conservation/Natural Area Zoning Districts (acres)	0	0	0	0	37	20	192	196	189	70	0	196	70	0	196	70	0	196	70	0	196
Parks (# acres)	0	0.00	0	0.00	0	0.00	1	0.35	1	0.31	1	0.31	0	0.00	0	0.00	0	0.00	0.11	0.00	0.35
Developable Area within Regional Growth Boundary (acres)	29	29	7	7	15	30	0	0	0	13	0	30	13	0	30	13	0	30	13	0	30
Waste Sites (#)	12	9	5	3	5	8	9	9	7	7	3	12	7	3	12	7	3	12	7	3	12
Quarry and Mineral Mining Operations (surface quarry acres property acres)	0	0	0	0	0	0	0	0	0	0	0	0	69	170	60	171	60	172	57	0	172
SWP Area TMP - Zone 2 (#, acres)	0	0	0	0	0	0	0	0	0	0	0	0	3	41	3	41	3	43	14	0	43
SWP Area - Zone 2 (#, acres)	0	0	0	0	0	0	0	0	0	0	0	0	5	89	5	88	3	60	26	0	89
<small>data</small> Impacts that are higher than 110% of the average Impacts that are less than 90% of the average																					

Table 6-4: Comparative Environmental Screening

Environmental Review Process	US 322-1 OEX	US 322-1 S	US 322-2	US 322-3	US 322-4	US 322-5	PA 144-1	PA 144-2	PA 144-3
CWA Section 404 Analysis									
Wetlands (acres)	4	3	2	3	6	8	7	6	8
CWF-HQ/CWF Stream (linear feet)	5,129	6,681	5,965	5,066	9,124	9,046	6,275	7,067	4,481
ESA Section 7 Consultation									
“Rothrock State Forest (part) & Stone Mountain” Important Bird Area (acres)	0	0	0	0	125 ²	78 ²	1	1	1
PA Natural Heritage Core Habitat (acres)	25 ³	11	11	11	15	15	8	8	8
Bat Swarming Area (acres of forested land only)	15	7	20	52	7	7	248	261	269
ALCAB Approval Process⁴									
Productive Agricultural Land (acres)	251	278	361	313	180	181	294	296	268
Conservation Easements (within Productive Agricultural Land, acres)	22	15	0	39	0	0	40	40	37
Agricultural Security Areas (within Productive Agricultural Land, acres)	111	112	192	146	70	57	165	166	183
Agricultural Zoning (within Productive Agricultural Land, acres)	152	160	246	212	99	97	133	135	132
Section 4(f) Evaluation									
NRHP Listed/Eligible/Potentially Eligible Property (# involving historic structure displacements) ⁵	0	0	0	1	0	0	1	1	0
Penns Valley/Brush Valley Rural Historic District Contributing Property (acres)	263	266	372	331	301	254	279	276	263
Public Parks (acres) ⁶	0	0	0	0.4	0.3	0.3	0	0	0
Community Impact Assessment⁶									
Residential Displacements (# of resident units)	25	8	21	29	8	11	13	13	9
Commercial Operations Displacements (# of operations) ⁷	6	3	1	1	4	2	3	3	2
Places of Worship Displacements (# of primary structures used for worship)	1	1	1	1	1	1	0	0	0
Community Facilities (acres of property only)	2	2	1	1	18	2	36 ⁸	22 ⁸	9 ⁸
Public Water Supply Well Protection Zone Area (acres)	0	0	0	0	0	0	130	129	103
Quarry and Mineral Mining Operations (property acres)	0	0	0	0	0	0	170	171	172
Recommended Environmental Corridors (Preferred Corridor for at least 3 of the 5 Environmental Review Processes)	X	X	---	---	---	X	---	---	---

Table 6-4: Comparative Environmental Screening

Environmental Review Process	US 322-1 OEX	US 322-1 S	US 322-2	US 322-3	US 322-4	US 322-5	PA 144-1	PA 144-2	PA 144-3
<p>¹ Higher potential impacts per resource category in comparison to other corridors (above 110% of average impact estimate) =</p> <p>² The total IBA includes 89,736 acres that extend through three counties: Centre, Huntingdon, and Mifflin Counties. The impacts include only the lower slopes of the Seven Mountains area of the Tussey Mountain range at the edge of the IBA and outside of the Rothrock State Forest property. The potential impact area also includes some existing deforested areas.</p> <p>³ Includes acreage of existing US 322 roadway and other developed property in the potential impact estimate that previously converted the natural area to developed land use.</p> <p>⁴ Information gathered for the PEL Study does not include potential impacts to individual farm operations that will be required for the ALCAB farmland assessment and gathered during the NEPA review phase, including farm operator interviews.</p> <p>⁵ Other alternatives that impact NRHP properties include land encroachments but no structure displacements. Corridors US 322-3, PA 144-1, and PA 144-2 potential impacts include the displacement of historic farmstead structures.</p> <p>⁶ Potential impacts to public parks associated with Corridors US 322-3, 322-4, and 322-5 would be minor (less than 1 acre at the edge of the impacted park and no facilities affected) that would most likely be avoided or minimized during more detailed design efforts to the extent that the Section 4(f) use would either be avoided or result in De Minimis findings; therefore, these potential impacts are not factored into the Section 4(f) evaluation process for this planning study.</p> <p>⁷ Includes only commercial enterprises that are not agricultural nor quarry/mineral mining operations.</p> <p>⁸ These community facility potential impacts are associated with forested areas at the other edge of the SCI Rockville property that is outside the prison grounds and facility areas and therefore considered minor.</p>									

Table 6-5: Engineering Screening Results

Engineering Features	US 322-10EX	US 322-1 S	US 322-2	US 322-3	US 322-4	US 322-5	PA 144-1	PA 144-2	PA 144-3
Length of Main Line Construction (miles)	8.3	8.3	10.0	9.7	8.6	8.4	10.3	10.5	9.7
Total Excavation (Cut) (cubic yards)	3,170,000	3,648,000	4,611,000	4,822,000	3,458,000	2,593,000	16,263,000	6,152,000	8,989,000
Total Embankment (fill) (cubic yards)	2,023,000	2,521,000	3,554,000	3,901,000	5,340,000	6,699,000	6,512,000	10,900,000	7,678,000
Bridge Deck Area (square feet)	501,575	486,810	617,530	763,530	387,850	366,940	344,468	411,130	325,030
Planning-Level Right-of-Way Cost Estimate (in 2021 dollars)	\$58M to \$63M	\$42M to \$47M	\$37M to \$42M	\$47M to \$52M	\$40M to \$45M	\$32M to \$37M	\$60M to \$65M	\$60M to \$65M	\$55M to \$60M
Planning-Level Construction Cost Estimate (in 2021 dollars)	\$405M to \$430M	\$390M to \$415M	\$475M to \$500M	\$545M to \$570M	\$390M to \$415M	\$455M to \$480M	\$550M to \$575M	\$680M to \$705M	\$455M to \$480M
Planning-Level Total Cost Estimate (in 2021 dollars)	\$468M to \$493M	\$432M to \$462M	\$512M to \$542M	\$592M to \$622	\$430 to \$460	\$487M to \$517M	\$610M to \$640M	\$740M to \$770M	\$510M to \$540M
Recommended Engineering Alternatives	X	X			X	X			

APPENDIX C

GLOSSARY OF TERMS

GLOSSARY OF TERMS

A

Agricultural Conservation Easements – US Department of Agriculture-Natural Resource Conservation Service (USDA-NRCS) works with eligible partners who purchase Agricultural Land Easements that protect the agricultural use and conservation values of eligible land. The easements can help farmers and ranchers preserve their land for agriculture use. The program also protects grazing land by conserving grassland, rangeland, pastureland and shrubland. Eligible partners include Native American tribes, state and local governments, and nongovernmental organizations, such as Land Trusts that have farmland or grassland protection programs. USDA-NRCS does not work directly with landowners; instead NRCS provides financial assistance to entities that have existing land trust or protection programs. These entities include the Centre County Farmland Trust (private, non-profit), the ClearWater Conservancy (private, nonprofit), and the Centre County Agricultural Land Preservation Board (public) in Centre County.

Agricultural Land Condemnation Approval Board (ALCAB) – An independent administrative board with approval authority over the condemnation of land being used for productive agricultural purposes for certain types of transportation projects.

Agricultural Security Area (ASA) – Special areas created at the municipal level, comprising of at least 250 acres of viable agricultural land, which may include noncontiguous tracts that are at least 10 acres in size, or a farm parcel less than 10 acres that has an anticipated yearly gross income from agricultural production of at least \$2000. An ASA may exist in more than one local government unit for the same parcel. An ASA protects farmland by prohibiting municipalities from enacting laws or ordinances that would unreasonably restrict farm use.

Amish – A group of traditionalist Christian church fellowships that form a subgroup of the Mennonite churches. The Amish are known for simple living, plain dress, and reluctance to adopt many conveniences of modern technology.

Average Annual Daily Traffic (AADT) – The total number of vehicles, including both directions of travel, that use a roadway segment on a typical day. Expressed as vehicles per day (VPD).

Average Annual Daily Truck Traffic (AADTT) – The total number of trucks, including both directions of travel, that use a roadway segment on a typical day. Expressed as vehicles per day (VPD).

B

Bicycle Level of Service (BLOS) – BLOS is measure of an on-road bicyclist's comfort level using a roadway's geometric and operational characteristics such as lane width, vehicle speed, and traffic volume.

Bike Lanes/Bike Way – A section of road marked/designated for use by cyclists.

C

Chapter 93 – Refers to 25 Pennsylvania Code of Regulations Chapter 93 which sets forth water quality standards for surface waters of the Commonwealth, including wetlands. These standards are based on water uses which are to be considered in order to protect surface water quality.

Clean Water Act (Section 404) – This act establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands.

Cold Water Fishes (CWF) – Streams that support fish species that are indigenous to a cold-water habitat.

Community – A community is comprised of people having common interests, and the places where these people live, work, shop, socialize, conduct business, and recreate. Communities can be identified based on geographical, natural, physical, social, racial, ethnic, religious, economic relationships or characteristics that members have in common with one another.

Community Resource – A broad term used to identify facilities that are used by local communities and include schools, places of worship, emergency services facilities, libraries, parks and recreation facilities, and museums.

Congestion – The level at which transportation system performance is no longer acceptable due to traffic interference. The level of acceptable system performance may vary by type of transportation facility, geographic location (metropolitan area or subarea, rural area) and/or time of day.

Construction Phase – The last phase of PennDOT's Transportation Program Development and Project Delivery Process (encompassing Mitigation Follow-Through), in which a contractor selected by PennDOT constructs the improvement alternative selected in the Design Phase.

Cultural Resource - A broad term that is used to cover architectural, cultural, and archaeological resources. Cultural resources include bridges, buildings, archeological sites, cemeteries, sacred or religious landmarks, agricultural sites and landscapes, and historical objects such as sculptures and roadside markers.

D

Design Year – The future year specified and used by planners and engineers to assess the conditions (population, number of vehicles, etc.) which are to be the basis for the design of a proposed improvement. The design year of a transportation facility is typically 20 years after the facility has been opened for use. For this study, the design year is 2050.

F

Federal Highway Administration (FHWA) – An agency within the United States Department of Transportation that supports State and local governments in the design, construction, and maintenance of the Nation's highway system and various federally and tribal owned lands and roadways.

Final Engineering Design – The third of the five phases of Transportation Project Development Process. It includes the development of detailed plans, specifications, and estimates for approved transportation projects. This phase includes right-of-way property acquisition, utility relocation, and construction contract advertisement and award.

Floodplain – The area directly adjacent to and outside of the watercourse channel that conveys and attenuates flow associated with high-water flooding events (such as 1-, 10-, 100-, and 500-year storm events).

G

Geographic Information System (GIS) – A computer-based system that links the geographic location of map features to text information or databases.

H

Highway Safety Manual (HSM) – The Highway Safety Manual, developed by the American Association of State Highway and Transportation Officials (AASHTO), is the guidance document for incorporating quantitative safety analysis into the highway transportation project planning and development processes.

Historic District – a concentration or group of sites, buildings, structures, or objects that are linked through shared history or aesthetics.

Historic Resource – A building, structure, site, district, or object which is significant in American history, architecture, engineering, and culture.

Horizontal Roadway Deficiency – Roadway features (including lane or shoulder width, cross slope, and curve radii) which do not meet current State and national design standards for the posted speed limit and classification of the highway.

I

Implementation Plan – A plan that identifies the priority of individual tasks, actions, or projects that can be advanced as a result of the PEL Study Results when funding is available.

L

Level of Service (LOS) – A performance rating system for motorized vehicles that represents quality of service on an A to F scale. With “A” representing the best (free-flow) condition while “F” is the worst-possible (congested) condition.

M

Mitigation Measures – Measures taken to eliminate or reduce the negative impacts of a project. Specific to transportation projects, these commitments are made during the environmental evaluation and study process and serve to moderate or lessen impacts deriving from the proposed action. These measures may include planning and development commitments, environmental measures, right-of-way improvements, and agreements with resource or other agencies to affect construction or post construction action.

N

National Environmental Policy Act of 1969 (NEPA) – The federal law that was created to ensure federal agencies consider the environmental impacts of their actions and decisions and requires the preparation of specific environmental documents for any undertakings that use Federal funds. To comply with NEPA, PennDOT has developed a process to address all potential environmental, social, cultural, and economic impacts of a proposed highway project before design decisions are reached. Public involvement is an integral component of the NEPA process.

National Historic Preservation Act of 1966 (NHPA) (Section 106) – This act requires federal agencies to consider the effects on historic properties of projects they carry out, assist, fund, permit, license, or approve throughout the country. If a federal or federally-assisted project has the potential to affect historic properties, a Section 106 review will take place.

National Register of Historic Places (NRHP) – The official national list of historic buildings, districts, sites, structures, and objects worthy of preservation. It was established as part of the National Historic Preservation Act of 1966 and is overseen by the National Park Service.

Natural Heritage Core Habitat Areas (NHA) – Areas that support rare plants or animals, exemplary ecological communities, and Pennsylvania’s native species biodiversity. PA Natural Heritage Program inventories and reports the critical biological resources found within each NHA and throughout each county in Pennsylvania.

Natural Resources – Land, fish, wildlife, air, water, and other natural assets belonging to, maintained by, or otherwise regulated by federal, state, or local governments.

O

Origin and Destination Study – A study used to determine travel patterns of traffic on a roadway network during a typical day providing valuable insight for assisting long-range traffic planning especially when there may be substantial changes anticipated within a region.

P

Pennsylvania Department of Environmental Protection (PA DEP) – PA DEP’s mission is to protect Pennsylvania’s air, land and water from pollution and to provide for the health and safety of its citizens through a cleaner environment.

Pennsylvania Fish and Boat Commission (PFBC) – PFBC purview is to protect, conserve, and enhance the Commonwealth’s aquatic resources and provide fishing and boating opportunities.

Pennsylvania Natural Diversity Inventory (PNDI) - PNDI is a dynamic inventory system of Pennsylvania rare and threatened species maintained in a cooperative effort between the Western Pennsylvania Conservancy, the Pennsylvania Bureau of Forestry, and The Nature Conservancy.

Pennsylvania Department of Natural Resources (PA DCNR) – DCNR works to conserve and sustain Pennsylvania’s natural resources for present and future generations’ use and enjoyment. They manage 121 state parks, 2.2 million acres of state forest land, provide information on ecological and geological resources, and establish community conservation partnerships with support grants and technical assistance to be benefit local parks, open space and natural areas.

Pennsylvania Department of Transportation (PennDOT) – PennDOT oversees transportation in the Commonwealth of Pennsylvania. For this study, PennDOT will act as the lead state agencies.

Planning and Environmental Linkage Study (PEL) – A PEL is a high-level, early-planning study process that represents an approach to transportation decision making that considers environmental, community and economic goals early in the planning stage (Pre-NEPA). Decisions made during the PEL study will be advanced through project development, including the NEPA, design and construction phases.

Potters Mills Gap Project – A transportation improvement project located along Route 322 from the Centre County/Mifflin County line to west of the Route 322/Route 144 intersection at Potters Mills. The project is being advanced to improve safety, reduce congestion, and alleviate access concerns along the section of Route 322.

Preliminary Engineering Phase – Preliminary engineering includes focused studies about traffic, safety, the environment, and the development of project alternatives. The information collected helps FHWA and PennDOT make decisions about the specific improvements that are needed to improve the transportation network. Assessments are also conducted to determine the benefits and impacts the alternatives would have on natural, cultural, and socio-economic environments. Public and agency involvement is conducted through this phase. The preliminary engineering/environmental studies phase ends with the selection of an alternative to advance into final design. Approval from FHWA must be received at the end of the preliminary engineering (PE)/ environmental studies phase prior to advancing into final engineering design.

Productive Agriculture – Any land used for commercial production of crops, livestock, and livestock products, including the processing or retail marketing of such crops, livestock, or livestock products, if more than 50 percent of such processed or merchandised products are produced by the farm operator.

Public Involvement – A process to ensure that citizens have a direct voice in public decisions. In this situation public involvement is focused on ensuring public input through the transportation decision-making process that will accompany this project. Public input can be gathered in many ways including in-person meetings, comment cards or letters, online surveys, websites, mailed newsletters, or email communications.

Public Meeting – An announced open meeting conducted by transportation officials designed to facilitate public participation in the decision-making process and to assist the public in gaining an informed view of a proposed study or project. Such a gathering may also be referred to as a Public Open House Meeting.

R

Range of Alternatives – Different transportation solutions that can be considered in environmental and engineering studies to address the transportation purpose and need within a defined geographic area.

Resource Agencies – Federal, state, and local agencies that have regulatory oversight of features (e.g. wetlands, farmland, zoning, historic structures).

Right-of-Way (ROW) Acquisition – The purchase of land from a private landowner by the state to build or maintain a public road.

Roadway Classification – The categorical classification of our nation's urban and rural roadways by road function, as determined by the U.S. DOT's FHWA. Each functional class is based on the type of service the road provides to the public. Each class has a range of allowable lane widths, shoulder widths, curve radii, etc. The roadway classification designation is used for data and planning purposes, with design standards also tied to functional class.

Rural Historic District (RHD) – A concentration or group of sites, buildings, structures, or objects that are linked through shared history or aesthetics in a rural setting.

S

State Correctional Institution – Rockview State Correctional Institution is medium security prison for adult males located in the northern portion of the study area. The facility is eligible for listing in the National Register of Historic Places.

Study Area – A geographic area, selected and defined at the outset of planning, engineering, or environmental evaluations to address all pertinent project matters and impacts.

Study Need – The study needs are statements that identify and document specific transportation problems or issues within in defined area. The need statements provide the foundation for the study to identify potential alternatives that can be evaluated to address the transportation problems. The needs are typically based on technical information and analyses.

Study Purpose – A broad statement of the overall goals or objectives to be achieved by a proposed transportation improvement.

T

Threatened or Endangered Species (T&E) – Threatened or Endangered species are those plants and animals that are likely to become endangered within the foreseeable future throughout all or a significant portion of its range or have become so rare they are in danger of becoming extinct.

Trout Stream – Waters that have significant portions open to public fishing and are stocked with trout by the PA Fish and Boat Commission.

U

United States Department of Agricultural (USDA) – Federal agency that is tasked with providing leadership on food, agriculture, natural resources, rural development, nutrition, and related issues based on public policy, the best available science, and effective management. Their vision is to provide economic opportunity through innovation, helping rural America to thrive; to promote agriculture production that better nourishes Americans while also helping feed others throughout the world; and to preserve our Nation's natural resources through conservation, restored forests, improved watersheds, and healthy private working lands.

V

Vertical Grade Deficiency – Vertical grades (steepness) and vertical curves (crests and sags) which do not meet current State and national design standards for the posted speed and classification of the highway.

W

Watershed – An area of land that drains all the streams and rainfall to a common outlet such as the outflow of a reservoir, mouth of a bay, or any point along a stream channel.

Wetland – Areas inundated or saturated by surface water or groundwater at a frequency or duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

APPENDIX D REFERENCES

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PLANNING AND ENVIRONMENTAL LINKAGES (PEL) STUDY

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