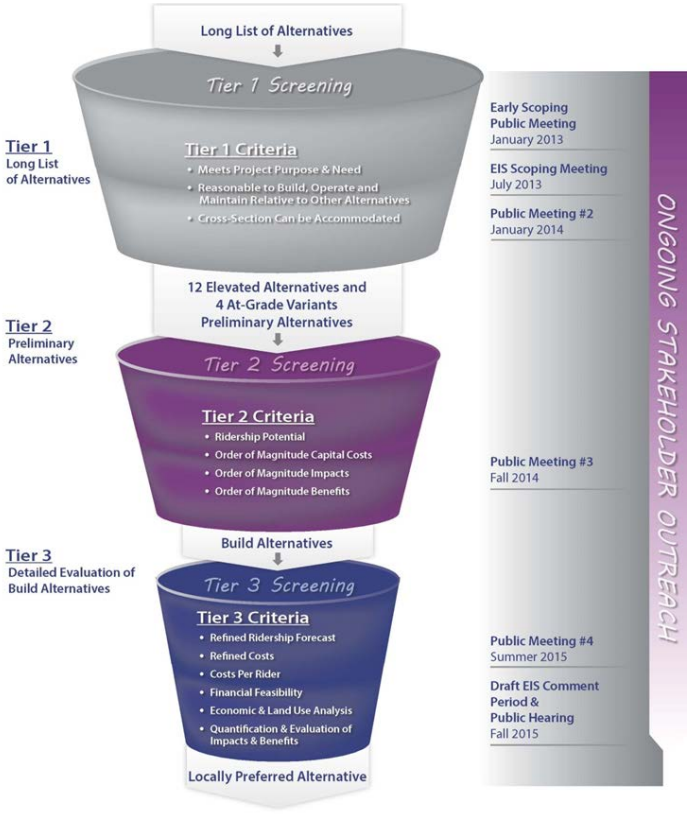
Introduction

The Federal Transit Administration (FTA), in coordination with the Southeastern Pennsylvania Transportation Authority (SEPTA), initiated the preparation of a Draft Environmental Impact Statement (Draft EIS) to evaluate alternative transit alignments that make the connection between the Norristown High Speed Line (NHSL) and destinations in King of Prussia, Upper Merion Township, Pennsylvania. The King of Prussia Rail project, also known as the NHSL extension, is intended to provide faster, more reliable transit service, improve transit connections between major destinations in the area, better serve existing transit riders, and accommodate new transit patrons.

FTA and SEPTA are undertaking a three-step (tiered) process of developing and evaluating alternative transit alignments for the project. The tiered process is represented by the funnel shown in **Figure E-1**. Ideas for alignments enter the top of the funnel and are examined at progressively finer levels of detail. Along the way, some alignments are eliminated, so that by the end of the third tier of analysis, the best alternative for the project emerges from the bottom of the funnel.

Figure E-1: KOP Rail Screening Process



A key element of the alternatives development and evaluation process is input from agencies, stakeholders and the public. From the beginning of the project, FTA and SEPTA have engaged agencies and stakeholders (individuals with an interest in or potentially affected by the project) through periodic meetings to discuss issues related to the project and work toward mutually beneficial solutions. Likewise, FTA and SEPTA have reached out to the public by means of presentations and open houses to encourage two-way dialogue about the project. In each step of the screening process, FTA and SEPTA have sought input and then considered that input in their decision-making.

This summary briefly describes the Tier 1 and Tier 2 screening FTA and SEPTA have completed. Readers interested in more detail may review SEPTA's 2015, ***Tier 1 and 2 Screening Results Technical Memorandum.*** This summary is organized by the following elements: project background, purpose and need, the Tier 1 and Tier 2 screening approaches and findings, and the next steps FTA and SEPTA will undertake in Tier 3 analysis.

Background

The greater King of Prussia (KOP)/Valley Forge area is the largest employment center outside of Philadelphia, hosting several corporate headquarters and major regional employers. . Approximately 57,100 jobs are found within Upper Merion Township, including 19,000 jobs in the King of Prussia Business Park and 12,500 jobs in and around the Mall. The King of Prussia Mall and surrounding retail development form a regional destination, with 25 million annual visitors to the mall, and 1.7 million annual visitors to the Valley Forge National Historical Park.. King of Prussia is also growing with a Mall expansion of 155,000 square feet underway; other redevelopment such as the Village at Valley Forge (adding 1.5 million square feet of office, 500 hotel rooms and 2,000 residential units); and recent re-zoning to enable mixed use development in the Business Park.

These facts combined with growing congestion on area roadways point to the need for better transit service to King of Prussia. The King of Prussia area is within SEPTA's existing bus service network; however, riders often experience delays due to buses operating in congested traffic conditions on the Schuylkill Expressway and other roadways. Existing bus routes in King of Prussia experience on-time performance as low as 62% compared with SEPTA's service standard for suburban bus service of 85% and NHSL performance of 99%.

For all of these reasons, FTA and SEPTA have determined that the King of Prussia area should be served by rail transit. Rail transit operates on dedicated tracks and is not subject to roadway congestion; typically, it better serves transit riders by providing faster and more reliable connections. SEPTA examined its closest rail lines to the King of Prussia area, and determined that the NHSL provides the best service in terms of frequency and hours of operation necessary to serve major trip generators like the King of Prussia Mall and the business park. Thus, FTA and SEPTA are examining the ability to make the connection between the NHSL and destinations in King of Prussia.

Purpose and Need

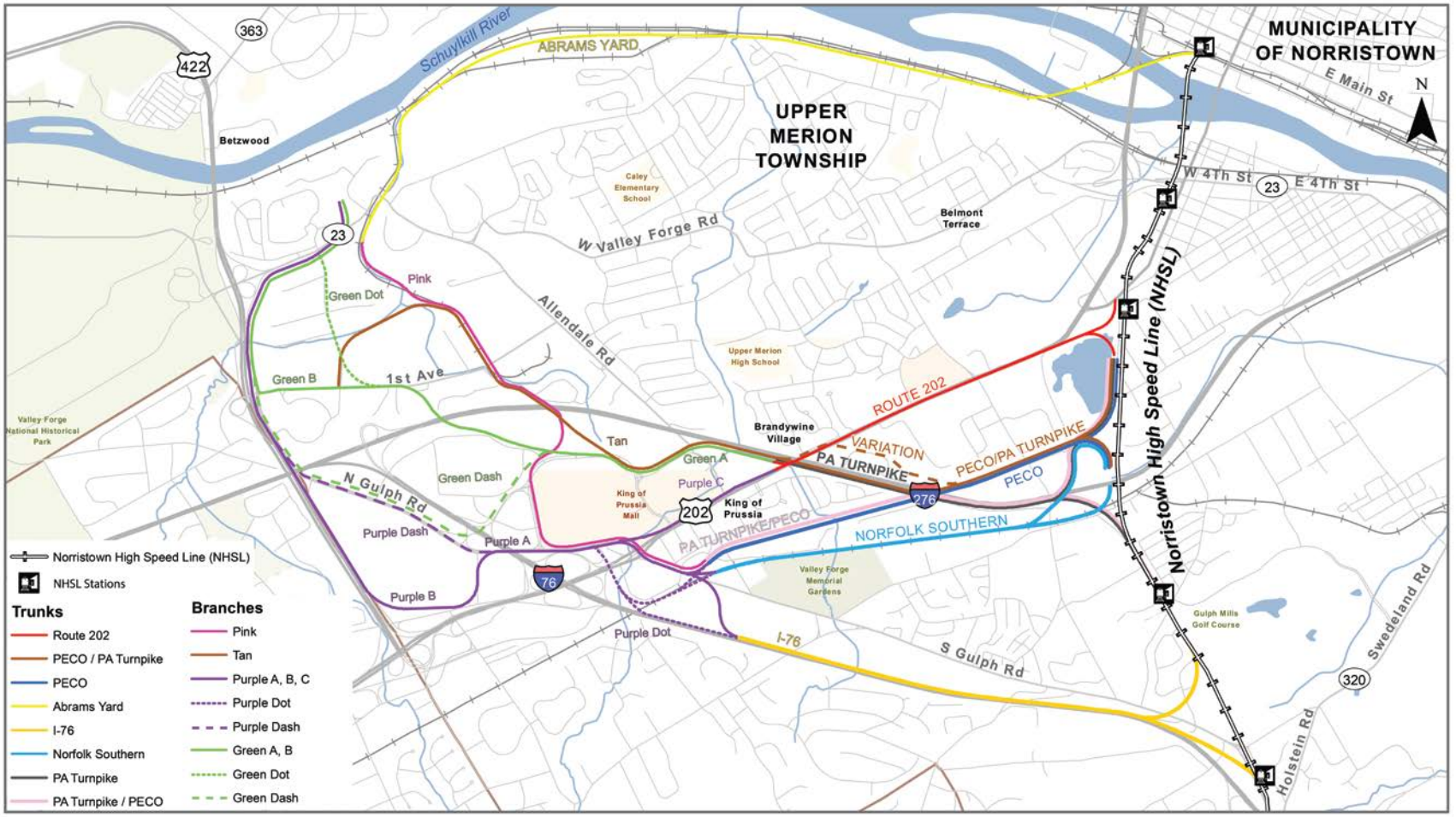
Given the factors described in the Background section above, the purposes of the King of Prussia Rail project are to provide faster, more reliable, public transit service that:

- Offers improved transit connections to King of Prussia/Valley Forge area from communities along the existing Norristown High Speed Line, Norristown and Philadelphia;
- Improves connectivity between major destinations within the King of Prussia/Valley Forge area; and
- Better serves existing transit riders and accommodates new transit patrons.

Tier 1 Screening

FTA and SEPTA initiated the alternatives development and evaluation process by building a "long list" of alternatives. The long list included alternatives resulting from SEPTA's 2003 ***Route 100 Extension Alternatives Analysis***, new concepts SEPTA and its engineering consultants developed, and ideas identified through agency, stakeholder and public outreach activities in early 2013. **Figure E-2** shows the long list of alternatives.

Figure E-2: KOP Rail Long List of Alternatives for Tier 1 Screening



Each alternative in the long list was put through an evaluation process:

- ***Step #1: Does the alternative meet the project's Purpose and Need?*** If not, the alternative was considered fatally flawed and was eliminated from further consideration. Those that met Purpose and Need moved on to Step #2.
- ***Step #2: Is the alternative reasonable to build, operate and maintain relative to the other alternatives? Can the cross-section be reasonably accommodated?*** If any of the Step #2 criteria could not be met, the alternative was considered fatally flawed and was eliminated.

Of the 30 alternatives in the long list, 18 were eliminated and 12 were advanced for further study. Among the 12 were some common segments that SEPTA grouped for further comparative analysis. Specifically, alternatives were named for the "trunk" corridor each uses between the existing NHSL and the Mall: U.S. Route 202, the PECO electric utility corridor, and the Pennsylvania (PA) Turnpike (TP). Each alternative extends west beyond the Mall along one of three corridors, defined in this project as "branches:" North Gulph Road, Moore Road or the NS Industrial Track. A total 12 alternatives were advanced to Tier 2 screening; they were:

- PECO - 3 alignments
- PECO/TP – 3 alignments
- 202 – 6 alignments

Additional Preliminary Alternatives with At-Grade Segments

Due to the fully electrified Third Rail power source for the NHSL, as well as the highly developed nature of the study area, the 12 alternatives advanced for Tier 2 screening were assumed to be constructed as fully elevated rail; that is, the track would be overhead on a structure supported by piers. During SEPTA's July 2013 public meetings regarding the project, SEPTA heard concerns about the elevated nature of the proposed rail and was asked about the potential to build some parts of the project on the ground surface (at-grade). After studying this issue, SEPTA determined that at-grade rail was only feasible along North Gulph Road and a short section in the PECO corridor. As a result of this finding, SEPTA added four at-grade alignments to the Tier 2 screening for a total of 16 preliminary alternatives. Figures **E-3, E-4 and E-5** show the alternatives to be advanced to the Tier 2 screening. They were:

- PECO - 4 alignments (3 fully elevated, 1 with at-grade segments)
- PECO/TP – 4 alignments (3 fully elevated, 1 with at-grade segments)
- 202 – 8 alignments (6 fully elevated, 2 with at-grade segments)

Tier 2 Screening

The Tier 2 screening process took a closer look at the preliminary alternatives by focusing on five categories of criteria:

- Engineering/right-of-way needs – e.g., number of intersections affected, order of magnitude capital costs
- Market served – e.g., existing residential and non-residential areas served, ridership
- System connectivity – e.g., existing number of bus service connections
- Support for transit-oriented development – e.g., number of stations in transit-supportive zoning areas
- Community and environmental impact assessment – e.g., linear feet of streams

Figure E-3: PECO Alternatives

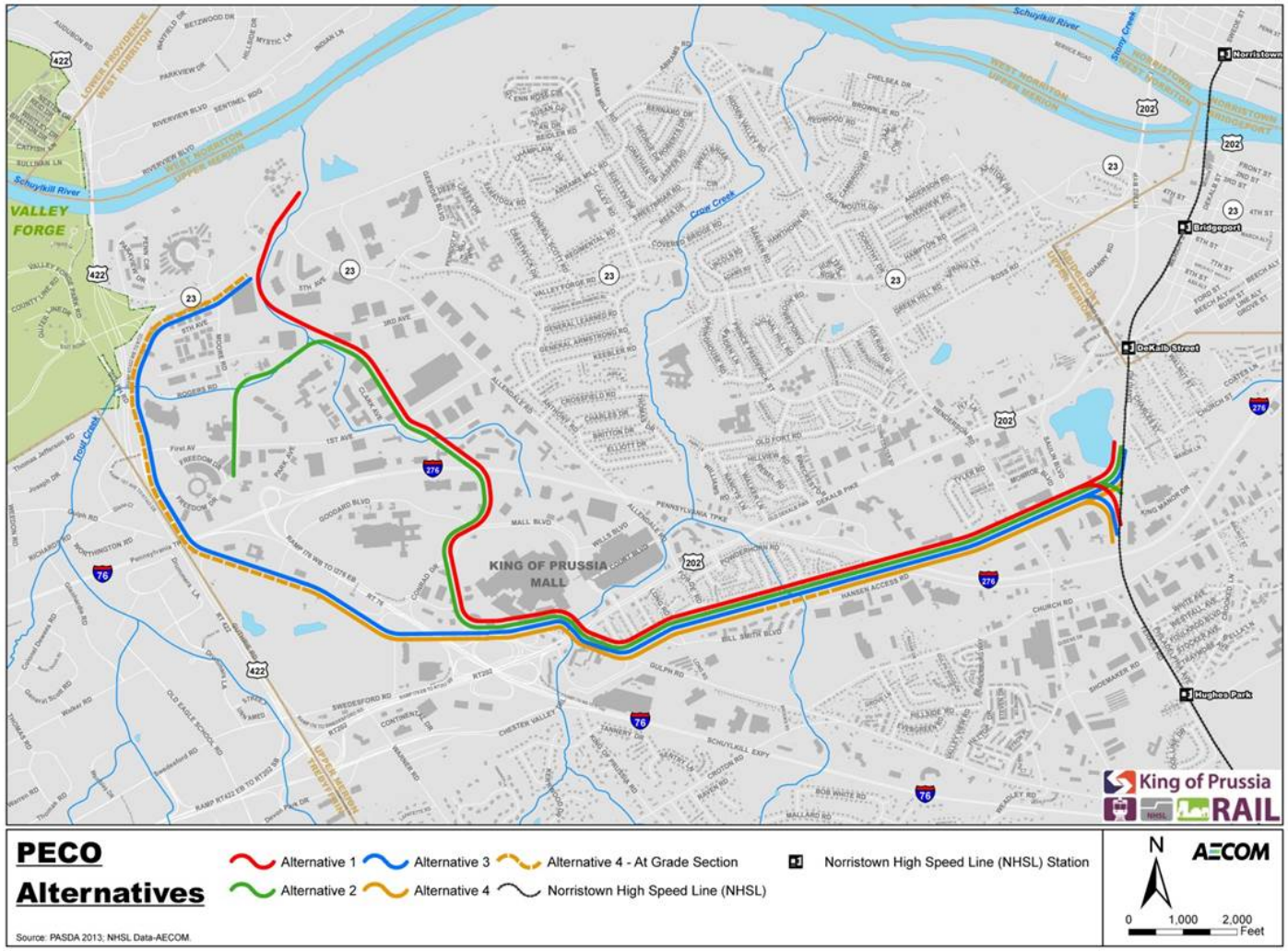


Figure E-4: PECO/PA Turnpike Alternatives

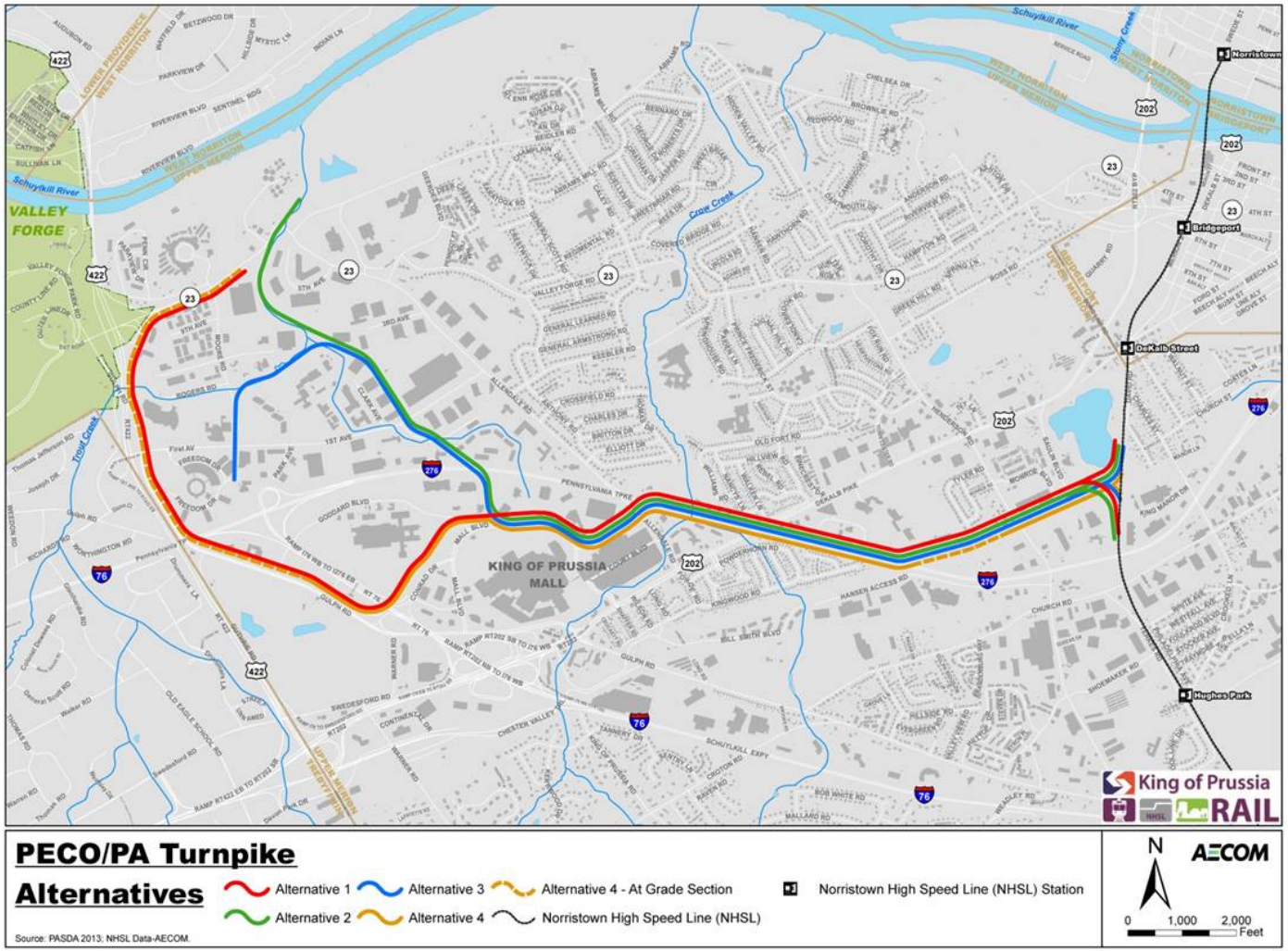
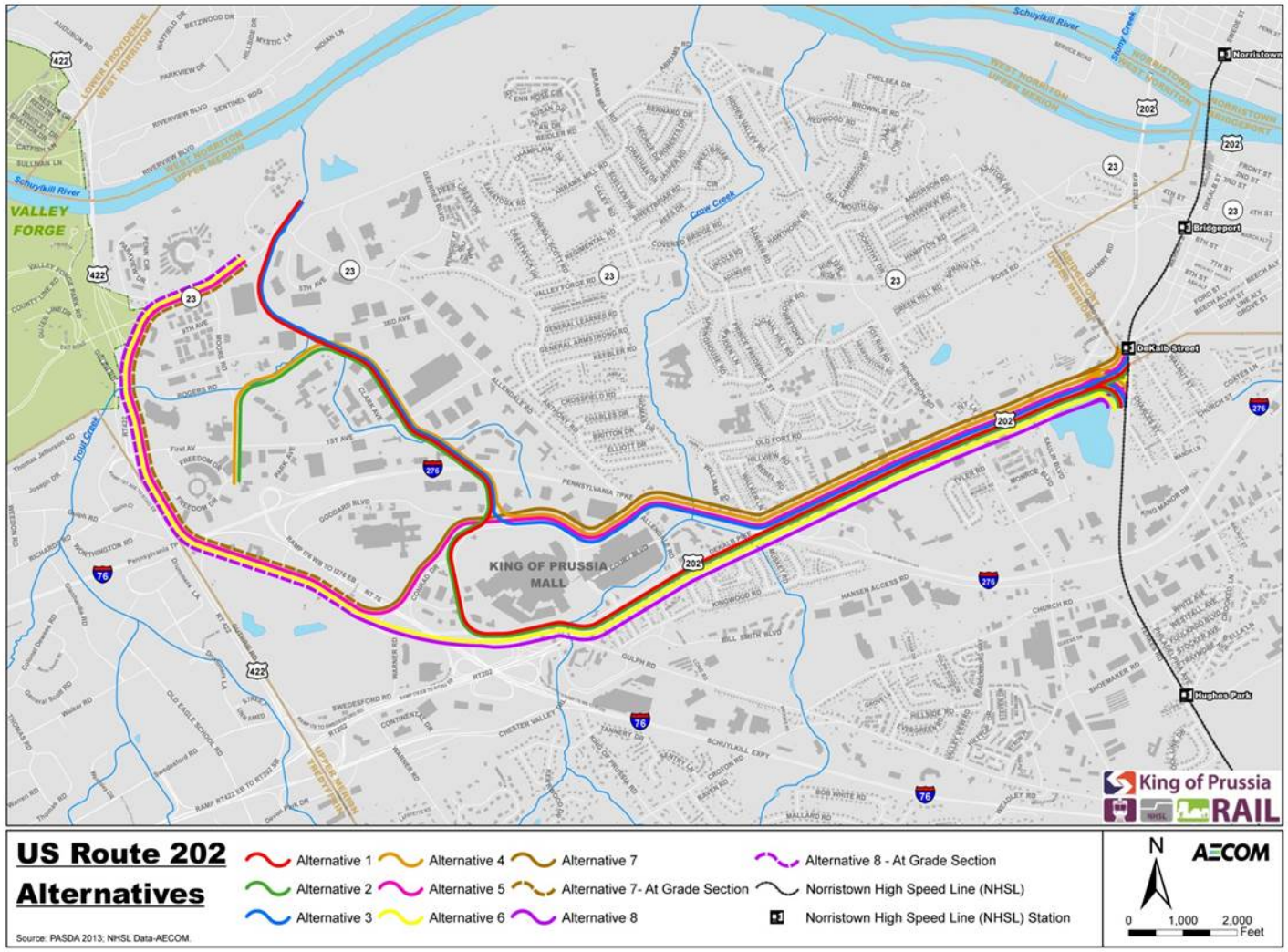


Figure E-5: US Route 202 Alternatives



Whereas most criteria distinguished performance between the preliminary alternatives, ridership and capital costs were found to be similar among the alternatives. Therefore, the focus of Tier 2 analysis was on the remaining criteria. Of the remaining criteria, SEPTA identified three of the criteria: traffic, other affected structures and environmental effects, in which the impacts were significant enough for SEPTA to conclude that they should be considered fatal flaw criteria.

Regarding traffic effects, the at-grade alternatives would cross 11 intersections along North Gulph Road. These intersection crossings would have to be gated, thereby stopping traffic operations every time a train was present. With anticipated 6-minute intervals between trains during peak travel periods, the traffic impact would be significant at all 11 intersections and unlikely to be mitigatable. In regard to the other affected structures criteria, the underpass of North Gulph Road and US 422 under the Pennsylvania Turnpike would require reconstruction to accommodate the track alignments of the at-grade alternatives along North Gulph Road. For these reasons and with the support of stakeholders, the four at-grade alternatives were eliminated from further study.

Regarding environmental effects, the four preliminary alternatives that are aligned on the northern portion of the NS Industrial Track, north of East 8th Avenue, have the potential for substantially higher stream impacts compared with the other preliminary alternatives. Given that other preliminary alternatives would have comparatively fewer stream impacts and the fact that SEPTA will have to obtain a permit from the U.S. Army Corps of Engineers (USACE) for the project, these alternatives with the highest impacts are unlikely to be approved by the USACE, as they cannot meet the Corps' definition of the least environmentally damaging practicable alternatives. For this reason, and with the support of stakeholders, the four preliminary alternatives using the northern portion of the Industrial Track were eliminated from further study.

The Tier 2 screening analysis for the eight remaining preliminary alternatives was quantitative, allowing FTA and SEPTA to clearly compare the differences among the alternatives. Specific scores were determined for each preliminary alternative and criteria. The results of Tier 2 screening showed that several preliminary alternatives had a high number of superior performing measures in each of the criteria listed above compared to the other alternatives.

FTA and SEPTA also examined these results by looking at the preliminary alternatives by trunk and branch group. Using this approach, they identified the alternatives that best represent each trunk and branch combination. Ultimately, FTA and SEPTA with the support of agencies and stakeholders, decided to retain a diversity of trunks and branches as the project advances to Tier 3 analysis. This decision enriches the comparative evaluation process and provides the agencies with flexibility in future decision-making. By taking these steps, FTA and SEPTA were able to arrive at a reasonable range of alternatives retained for detailed analysis in Tier 3.

In their evaluation of the preliminary alternatives, FTA and SEPTA learned more about the alternatives themselves, the potentially affected environment, and the views of the stakeholders and agencies involved. Each of these factors pointed toward the need to refine the alternatives before entering Tier 3 analysis to avoid or minimize impacts, to reduce costs, or to respond to on-going agency or stakeholder input. As a result, the retained alternatives were refined to shorten the length of the alignments and/or to modify or adjust short sections of the alignments. Specifically, alternatives using North Gulph Road, as a branch, were truncated or shortened. Shortening the length of this branch translated into substantial savings in estimated capital costs with minimal decreases in forecasted ridership. Also, the Moore Road branches were realigned to follow First Avenue to complement the planned "Road Diet" and "Complete Streets" initiative of Upper Merion Township on First Avenue as well as to reduce impacts to private property and

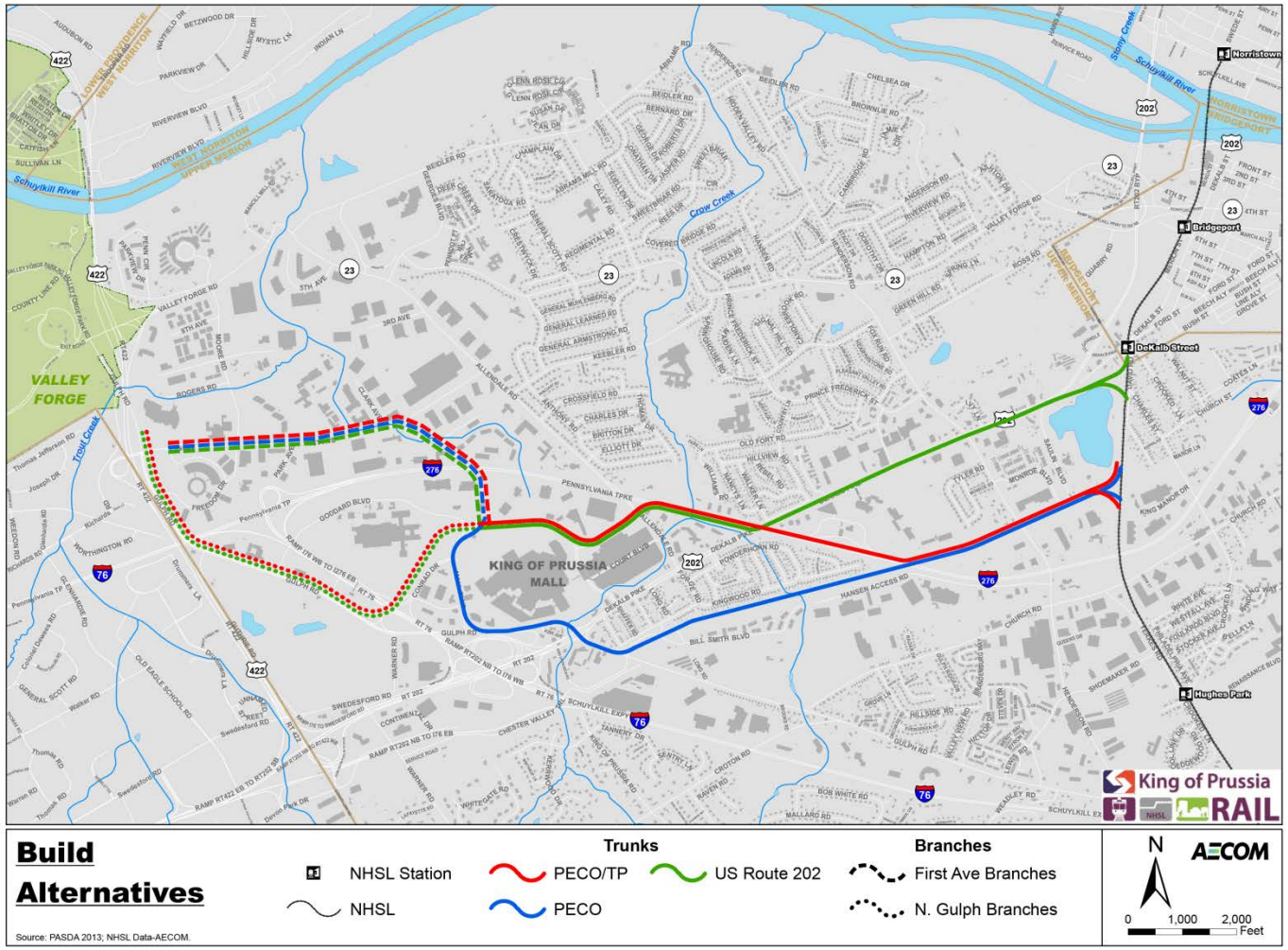
waterways and to lower estimated capital costs. Additionally, trunks that use the PA Turnpike were shifted from placement in the median to placement on the south side to address agency concerns regarding stormwater management, utility relocations, construction staging, maintenance and protection of traffic during construction and then during on-going maintenance of the rail extension. In turn this helps reduce estimated capital costs and offers a wider range of construction methods for the rail extension for PA Turnpike trunks.

The five alternatives that warrant further study in Tier 3 are shown in **Figure E-6** and represent the following trunks and branches:

- PECO trunk
- PECO/TP trunk
- US Route 202 trunk
- North Gulph Road branch
- First Avenue branch

FTA and SEPTA will provide agencies, stakeholders and the public with more details on these alternatives in the Spring 2015 and anticipate receiving additional, valuable input to carry into the Tier 3 screening and evaluation process.

Figure E-6: KOP Rail Build Alternatives for Tier 3 Analysis



Next Steps – Tier 3 Analysis

Tier 3 analysis is the third step in developing and evaluating alternatives. FTA and SEPTA will examine, evaluate and compare the five build alternatives in detail during Tier 3, reporting their findings in the Draft EIS. The Draft EIS is required for FTA and SEPTA to comply with the National Environmental Policy Act (NEPA), and will be available for public review and comment in late 2015.

The following activities will occur during Tier 3 screening:

- Assess environmental impacts – FTA and SEPTA will undertake detailed analysis of the benefits and effects of each alternative on the natural and built environment. This activity will occur at the same time as refining the alternatives. In this way, FTA and SEPTA will work to avoid or minimize impacts.
- Coordinate with resource agencies – FTA and SEPTA will continue to engage resource agencies as they refine and analyze the benefits and impacts of the alternatives during Tier 3. Coordination will be important to addressing other environmental laws in compliance with NEPA and anticipating future agency permit requirements.
- Identify potential mitigation strategies – In the Draft EIS, FTA and SEPTA will identify potential strategies that could be applied to address the impacts of the alternatives. Specific mitigation commitments will be determined by FTA and SEPTA in the Final EIS after a preferred alternative is selected.
- Prepare refined operating and service plans – FTA and SEPTA will develop specific plans for the alternatives.
- Update ridership projections – FTA and SEPTA will develop ridership projections for the alternatives.
- Estimate capital and operating costs - FTA and SEPTA will develop estimated costs for the alternatives.
- Continue stakeholder and public outreach – FTA and SEPTA will continue to discuss the project with and seek input from stakeholders and the public in Tier 3. The input FTA and SEPTA hears will continue to be important to shaping the project and informing the project decision-making process.

The following terms are used in the Tier 3 screening:
Avoid: To keep away from something or someone.
Minimize: To reduce the severity of impacts.
Mitigate: One or more measures taken to alleviate impacts that remain after minimization.