June 2019

# East Whiteland Train Station Feasibility Study

## East Whiteland Township, Chester County


Prepared By:

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Michael Baker
INTERNATIONAL

sowinskisullivan
ARCHITECTS

TCA
Thomas Comitta Associates, Inc.
Town Planners & Landscape Architects

Prepared For:

DELAWARE VALLEY
dvrpc
REGIONAL
PLANNING COMMISSION

# TABLE OF CONTENTS




ACKNOWLEDGEMENTS

Amtrak

Chester County Planning Commission

East Whiteland Township

Immaculata University

PennDOT, Bureau of Public Transportation

Sisters, Servants of the Immaculate Heart of Mary

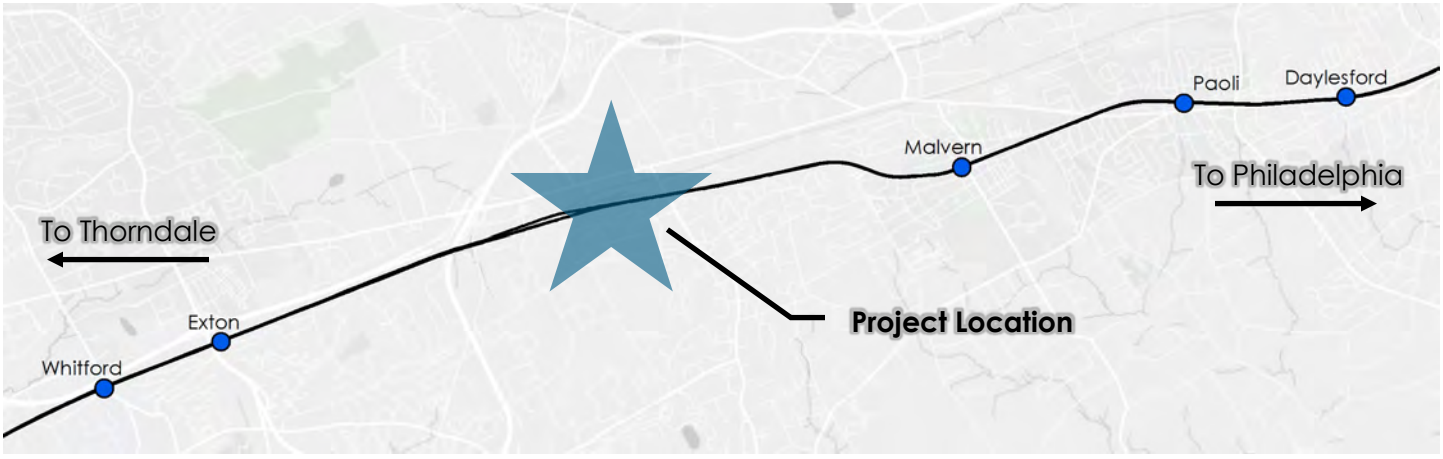
Southeastern Pennsylvania Transportation Authority

Transportation Management Association of Chester County


*Cover Image:* ***Pennsylvania Railroad Frazer Station Ca. 1886***

# Executive Summary

This report provides a comprehensive inventory and assessment of the existing conditions to identify feasible and viable locations for a new Regional Rail station in East Whiteland Township, Chester County, PA. A new train station is a cornerstone of the township's revitalization efforts for Route 30 in the Village of Frazer, and supports Chester County's commitment to expanding public transit options. This project was sponsored by the Delaware Valley Regional Planning Commission.




A train station on SEPTA's Paoli/Thorndale Rail Line has long been proposed for this area of Chester County due to its strategic location and potential to provide an alternative to the busy and constrained Exton, Malvern, and Paoli stations. The study area is located approximately midway between Malvern and Exton and it is in close proximity to regional highways such as US 202 and US 30. East Whiteland Township is home to many potential ridership generating uses, and is expected to see significant growth in population and employment by 2045.

Various factors were considered when identifying feasible and viable locations for a new station. Those considerations included existing conditions, railroad requirements, station program elements, and train service. Taking these, and additional factors, into consideration, two viable train station sites were identified for further evaluation: **Immaculata Station Site** and **Three Tun Station Site**.

Station concept plans, access and circulation improvements, operations and service, ridership forecasts, and cost estimates were developed for both sites.

**Prepared for**

Delaware Valley Regional Planning Commission (DVRPC)

**Consultant Team**

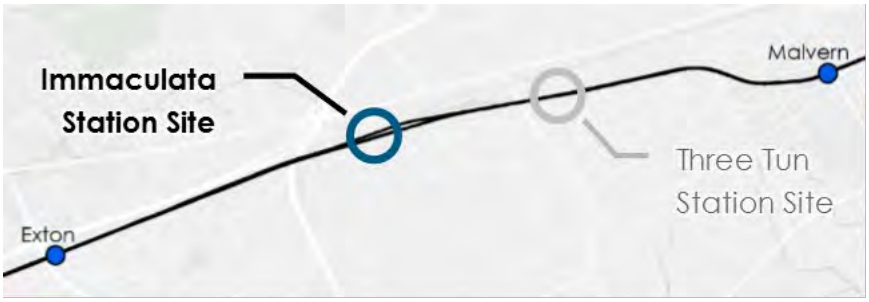
McMahon Associates, Inc.
Michael Baker International
Sowinski Sullivan Architects
Thomas Comitta Associates, Inc.
IBI Group

**Stakeholders**

SEPTA
Amtrak
PennDOT
Chester County
East Whiteland Township
TMACC
Immaculata University
Sisters, Servants of Immaculate Heart of Mary

## Immaculata Station Site Profile

The Immaculata Station Site is located west of Sproul Road (Route 352) on property owned by Amtrak, SEPTA, Norfolk Southern, and the Sister Servants of the Immaculate Heart of Mary  The site is immediately adjacent to the Immaculata University Campus and SEPTA's Frazer Maintenance yard on land that is primarily vacant and wooded.




**Key Characteristics**

- Strongly supports East Whiteland Township's plans for revitalization of the Route 30 Corridor and the Village of Frazer
- Unlikely to be developed in the near term due to property ownership and existing access limitations
- Current track infrastructure supports hourly train service on SEPTA's Paoli/Thorndale Regional Rail Line, but planned track improvements may support half hourly service in the future
- More direct access and shorter walking times to/from Route 30 and Immaculata University

**2035 Ridership Forecasts**

The Delaware Valley Regional Planning Commission developed ridership forecasts for two future operating alternatives involving the Immaculata Station Site. DVRPC forecasted that 530 people will access SEPTA's Regional Rail using the new Immaculata Station on an average weekday in 2035 if service is provided every half hour.  Forecasted weekday ridership decreases to 385 boardings if service is only hourly.  The Immaculata Station is forecasted to support a higher number of non-drivers and a higher number of "new" riders to the regional rail system than the Three Tun site.  Additionally, the site has greater potential for future growth in ridership beyond 2035 given proximity to Immaculata University and the connection to Route 30.

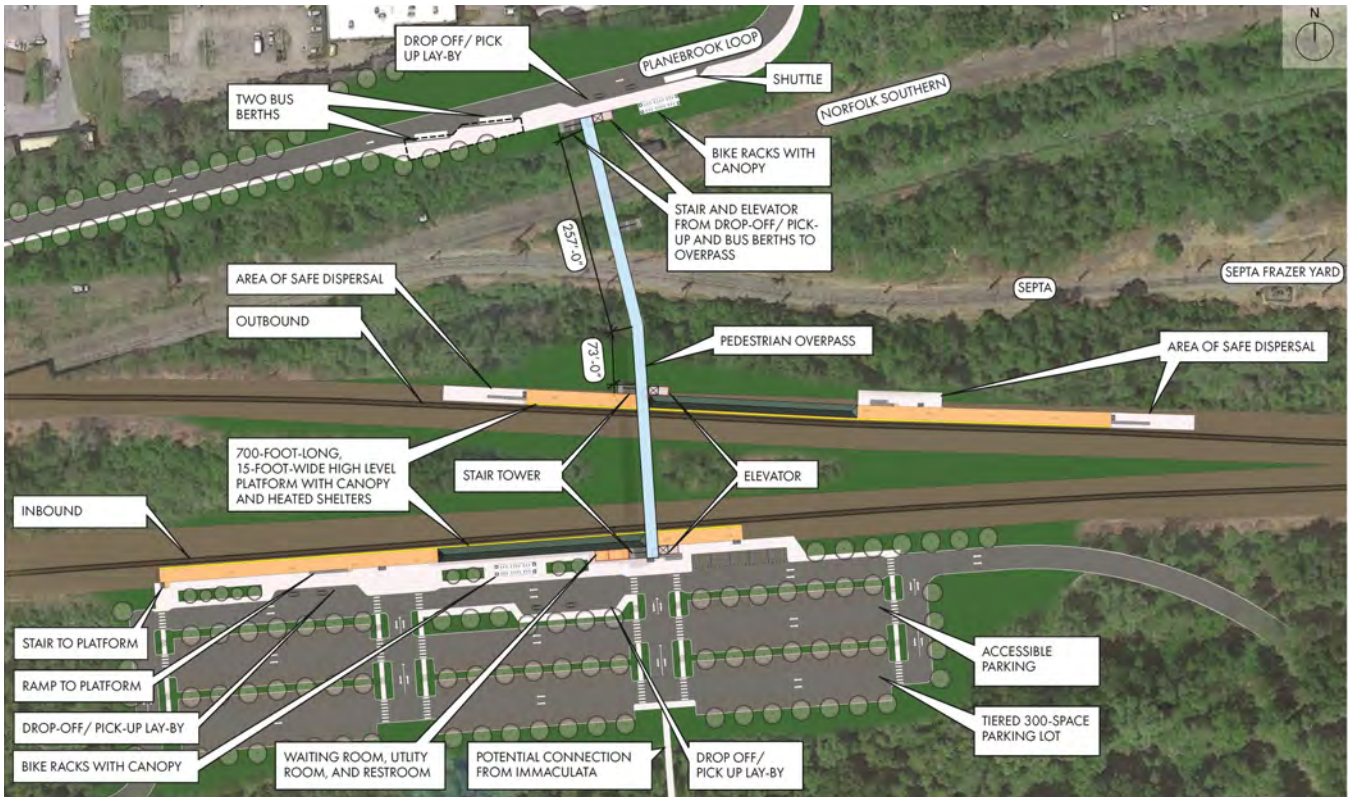
| | # of Trains (Inbound) | Total Weekday Boardings | Park-n-Ride Vehicles |
|---|---|---|---|
| Half Hourly Service | 36 | 530 | 175 |
| Hourly Service | 21 | 385 | 90 |

**Rough Order of Magnitude Cost Estimates**

The estimated total cost for design and construction of the Immaculata Station is $121.5 million in 2019 dollars. This rough order of magnitude cost estimate includes the train station elements, railroad infrastructure, and identified access and circulation improvements.  The access and circulation improvements for the Immaculata site include two new access roadways, intersection improvements at four key intersections, and pedestrian infrastructure to provide connections to Route 30 and Immaculata University's campus.  The cost estimate does not include the cost of additional rail vehicles, crew costs, or railroad infrastructure improvements necessary to provide half hourly service.

| Train Station & Railroad Infrastructure (2019) | Multimodal Access & Circulation (2019) |
|---|---|
| $ 97,518,000 | $ 24,049,000 |

## Immaculata Station Concept Plan




## Immaculata Station Conceptual Aerial Rendering

## Three Tun Station Site Profile

The Three Tun site is located to the east of Sproul Road (Route 352) on undeveloped, private property along Three Tun Road. Existing roadway infrastructure provides a connection to Sproul Road (Route 352). The site is primarily vacant and wooded, but is surrounded by light industrial development with an established residential neighborhood south of Amtrak's tracks.


**Key Characteristics**

- Vehicular access to regional highways including Route 30 via Sproul Road (Route 352) and Three Tun Road
- Land must be assembled from multiple private owners and is likely to be developed with commercial uses in the near future (before a train station can be designed and built)
- Access to Amtrak's tracks and platform configurations are limited due to steep slopes and the nearby Frazer interlocking
- Current track infrastructure supports half hourly service on SEPTA's Paoli/Thorndale Regional Rail Line
- Longer walking times and uncomfortable conditions for walking to/from Route 30, Immaculata University, and nearby residential neighborhoods

**2035 Ridership Forecasts**

DVRPC forecasted that 360 people will access SEPTA's Regional Rail at the new Three Tun Station on an average weekday in 2035, assuming half hourly train service to this new station. The Three Tun Station is attractive for riders driving to the station, but does not attract new riders to the regional rail system.

| | # of Trains (Inbound) | Total Weekday Boardings | Park-n-Ride Vehicles |
|---|---|---|---|
| **Half Hourly Service** | 36 | 360 | 240 |

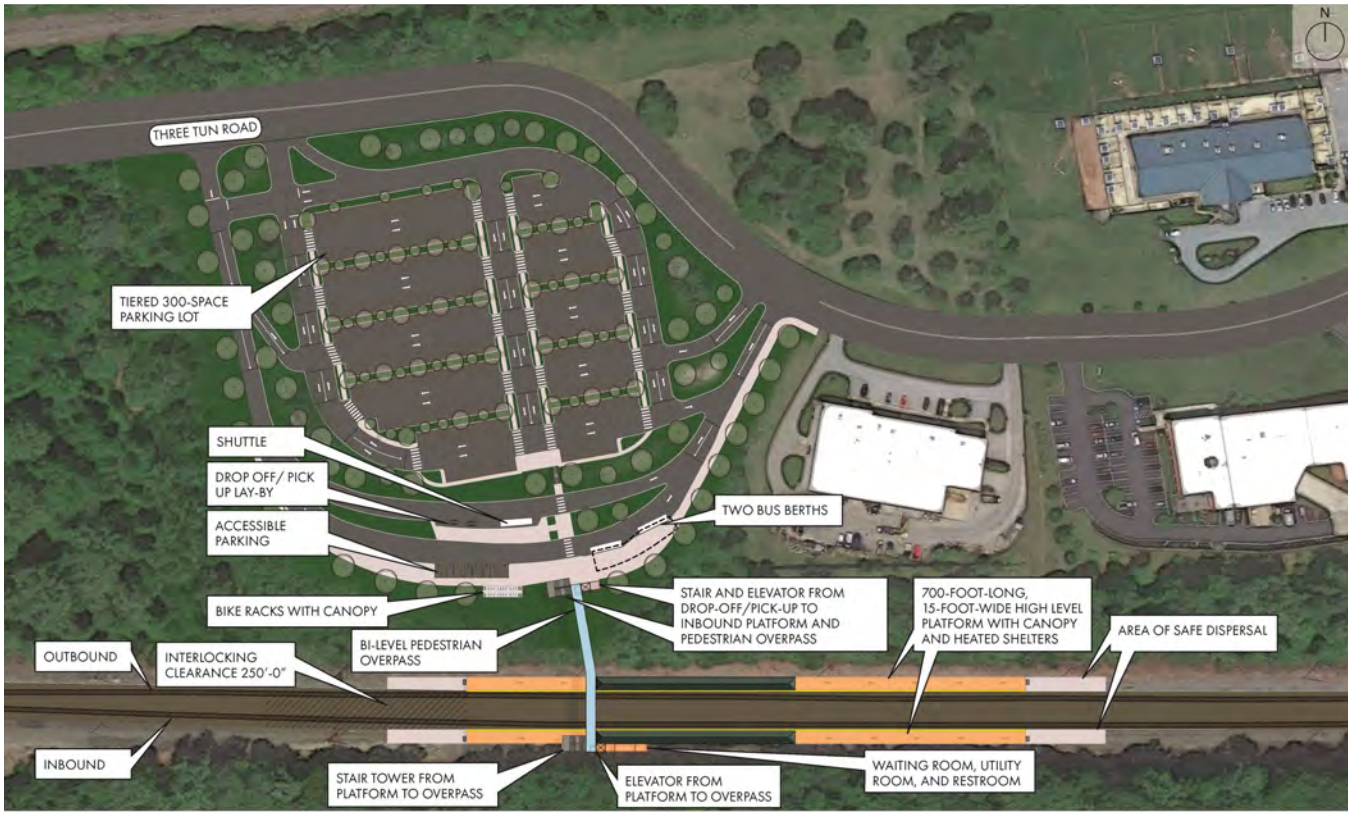
**Rough Order of Magnitude Cost Estimates**

The estimated total cost for design and construction of the Three Tun Station is $92.8 million in 2019 dollars. This cost estimate includes the train station elements, railroad infrastructure, and identified access and circulation improvements. The access and circulation improvements for the Three Tun site include intersection improvements at Route 30/Sproul Road (Route 352) and Sproul Road (Route 352)/Three Tun Road, as well as sidewalk connections along Sproul Road (Route 352) and Three Tun Road. The cost estimates do not include operational or vehicle purchase costs.

| Train Station & Railroad Infrastructure (2019) | Multimodal Access & Circulation (2019) |
|---|---|
| $ 79,512,000 | $ 13,340,000 |

See Part 2| Findings and Recommendations and Part 3 | Ridership Forecasts for more details on station concept plans, access improvements, cost estimates, and ridership forecasts

## Three Tun Station Concept Plan




## Three Tun Station Conceptual Aerial Rendering

## Alternative Site Comparison

This study determined that there are two feasible locations for a train station in East Whiteland Township, Chester County: Immaculata and Three Tun. Each of the two station sites have their distinct benefits and disadvantages. The Three Tun Site has a lower capital cost and more direct vehicular access to Route 30, but would divert existing regional rail riders from other stations rather than attracting new riders. The Immaculata Site provides direct multimodal access between the station, Route 30, and Immaculata University. Additionally, the Immaculata site has higher forecasted ridership and greater potential for future ridership growth.

## Factors for Success—Preferred Station Site

While a variety of factors need to fall in line in order for a new station in East Whiteland to become a reality, one of the key factors for success is local and regional support. Project support and leadership is critical for identifying, advocating, and securing funding for continued planning, design and construction of the train station. During this study process, all of the local stakeholder organizations and institutions involved expressed their strong support and preference for the Immaculata Station site. With strong local support for the Immaculata Station site and lack of clear and distinct advantages for the Three Tun Station site, continued planning efforts should focus on advancing the Immaculata Station site.

## Implementation

A new train station in East Whiteland Township is a long-term capital project that will require significant investment of time and resources. Notably, local and regional support needs to be built, a funding strategy needs to be developed, and key supportive infrastructure projects need to be advanced. High levels of local and regional support are required for a project of this scale and magnitude to succeed.

## Next Steps

- Form a Train Station Coalition to lead implementation of next steps
- Evaluate funding options
- Complete additional plans and studies
- Advance design/construction for early-action access and circulation improvements
- Support track and railroad infrastructure improvements along the Keystone Corridor/Paoli-Thorndale line

See Part 4 | Conclusions for more details about next steps


# Part 1 | Existing Conditions & Preliminary Station Siting

## Introduction

The Village of Frazer in East Whiteland Township, Chester County, gets its name from the former post office and train station, which were both located near the intersection of Route 30 and Sproul Road (Route 352). Though loosely defined, the village roughly encompasses the area along Route 30 from Phoenixville Pike to Malin Road. In 2018, East Whiteland Township completed the Route 30 Corridor Master Plan, which calls for revitalizing Frazer as a place that people know and want to visit. A new train station is the cornerstone of the township's vision for transforming Route 30 and the Village of Frazer.

Funding for this project was provided by the Delaware Valley Regional Planning Commission (DVRPC) through the FY2019 Unified Planning Work Program. SEPTA and Chester County Planning Commission, with support from East Whiteland Township and other stakeholders, requested a technical feasibility study to evaluate adding a new SEPTA regional rail station in East Whiteland Township on the Amtrak Keystone Corridor/SEPTA Paoli Thorndale line.

This section provides a comprehensive inventory and assessment of the existing conditions in Frazer to identify feasible locations for a new regional rail station in East Whiteland Township. This assessment builds upon the preliminary evaluation included in East Whiteland Township's Route 30 Corridor Master Plan (2018) and other previous planning documents.

The following tasks were completed under Part 1 of this study.

- Review Relevant Plans and Studies
- Produce Base Mapping
- Define Evaluation Criteria
- Evaluate Railroad Configuration and Operations
- Conduct Field Inventory
- Assess Station Needs and Program Elements

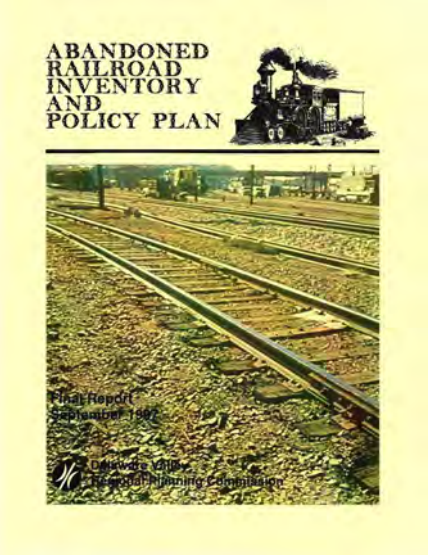
Part 1 also included stakeholder coordination. Stakeholders identified for this project included representatives from SEPTA, PennDOT's Multimodal Deputate, Amtrak, Chester County, East Whiteland Township, Transportation Management Association of Chester County, Immaculata University, and Sisters, Servants of Immaculate Heart of Mary (Sisters IHM). Agendas from all stakeholder and technical coordination meetings are included in Appendix 1.1 and 1.2.

**Stakeholder Meeting #1—Kickoff (December 4, 2018):** The first stakeholder meeting hosted by Immaculata University included a discussion of the vision for a future train station, station elements, and identification of potential station sites.

**SEPTA Technical Coordination #1—Workshop (December 18, 2018):** A technical coordination meeting with SEPTA representatives included discussion of potential train station locations given SEPTA's operating parameters.

## Background

Frazer has long been an area with abundant rail activity, and today, it is the convergence of two active passenger and freight rail lines. Amtrak's Keystone Line provides passenger service between Harrisburg, Philadelphia and Penn Station NYC, and is also used by SEPTA to provide regional rail service on the Paoli-Thorndale Line. Norfolk Southern's Trenton Cut-off is a freight bypass for center city Philadelphia and exits Amtrak's mainline in Frazer before continuing to Morrisville, PA and beyond.




Much of the history of rail service in Frazer is documented in the Abandoned Railroad Inventory and Policy Plan (DVRPC, 1997). In addition to the active rail lines, Frazer was the convergence point for three additional rail lines. The Philadelphia & Thorndale (P&T) Line provided service between Frazer and Coatesville. According to DVRPC's report, that line was abandoned in 1994 and is now owned by Norfolk Southern. The P&T line was studied by Chester County for future use as a regional trail. A line between Frazer and West Chester was operated by the Pennsylvania Railroad; with a small station serving Immaculata University. This line was abandoned between Frazer and Fern Hill in 1969. The railroad property for this line has reverted back to the adjacent property owners, and is no longer available for rail use. Much of the property that this line occupied adjacent to Amtrak's Keystone Corridor was acquired by the Sisters of IHM for the use of Immaculata University. Another railroad line

existed between Frazer and Phoenixville. Known today as the Devault Line, a portion of this line between Frazer and Swedesford Road was abandoned around 1936. Beyond Swedesford Road, the line remained active into the early 2000's, but has since fallen out of use and has now been identified as a potential trail corridor. Some of that railroad corridor is still owned by Norfolk Southern.

In addition, East Whiteland Township is home to SEPTA's Frazer Maintenance Facility. At this 40 acre site, SEPTA services their fleet of locomotives and cars for the regional rail system. Trains may access the facility from Amtrak's Keystone Line at two locations. One switch on the eastern end of the facility is located near Sproul Road (Route 352), and on the western end, a second switch is located between Phoenixville Pike and Ravine Road. (This is important because it impacts possible future station locations and railroad operations as will be discussed in more detail later in this section.) SEPTA's expansion project to increase the facility capacity and modernize equipment began in the Spring of 2016; completion is expected in the Fall of 2019. The Frazer Maintenance Facility is integral to SEPTA's operations and vehicle maintenance on the corridor.


In the Early 1900's, Immaculata College housed the Immaculata Train Station, located on a siding. Initially, this station provided for the delivery of materials for the construction of Villa Maria Hall. Later the station was used for transportation of riders to the Paoli Train Station and the ongoing delivery of merchandise.

Passenger rail service to the original Frazer train station located near Sproul Road (Route 352) was discontinued some time in the early twentieth century. All that remains of the original station is a shuttered pedestrian tunnel. Since then, the desire to bring passenger service to Philadelphia back to East Whiteland Township has been highlighted in various planning documents.

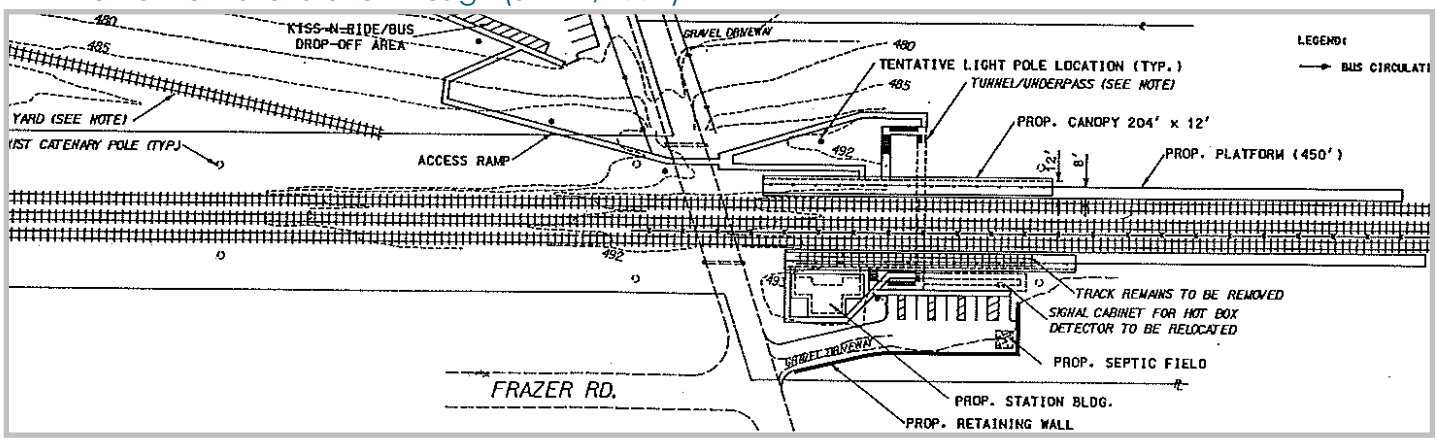
### Railroad Terminology

*Siding: a short stretch of railroad track used to store railcars or enable trains on the same line to pass*

## Relevant Plans and Studies

In the late 1980's, SEPTA had plans to build a train station in East Whiteland Township utilizing the former Pennsylvania Railroad station site near Sproul Road (Route 352). Documents show that SEPTA procured professional engineering services to prepare conceptual design plans. However, formal plans to restore service to Frazer were abandoned in 1993 as SEPTA move forward with plans for the Frazer Rail Yard on the west side of Sproul Road (Route 352).

Alternative Frazer Station Design (SEPTA, 1992)




In conjunction with SEPTA's conceptual design for a new station, DVRPC completed the Frazer Train Station Traffic Study in 1992. The traffic study evaluated a proposed passenger station in Frazer, located near Sproul Road (Route 352), with a 250 stall parking lot on the north side of the tracks on SEPTA's Frazer Yard property. However, this location is no longer viable, because it is within an interlocking area that did not exist at the time.

**Additional station concepts from 1992 can be found in Appendix 1.3.*

Although SEPTA did not move forward with the new station, benefits of a potential train station in East Whiteland were documented in the East Whiteland Township Comprehensive Plan (2001). Stating, "A stop on the R5 (Paoli-Thorndale) line would offer significant support for office, retail, and mixed-use activities in this vicinity." The plan also references the township's strategic location should the Cross County Metro be implemented in the future. The Cross County Metro was a planned commuter rail line between Frazer and Morrisville, Bucks County, PA that did not advance due to a lack of funding.

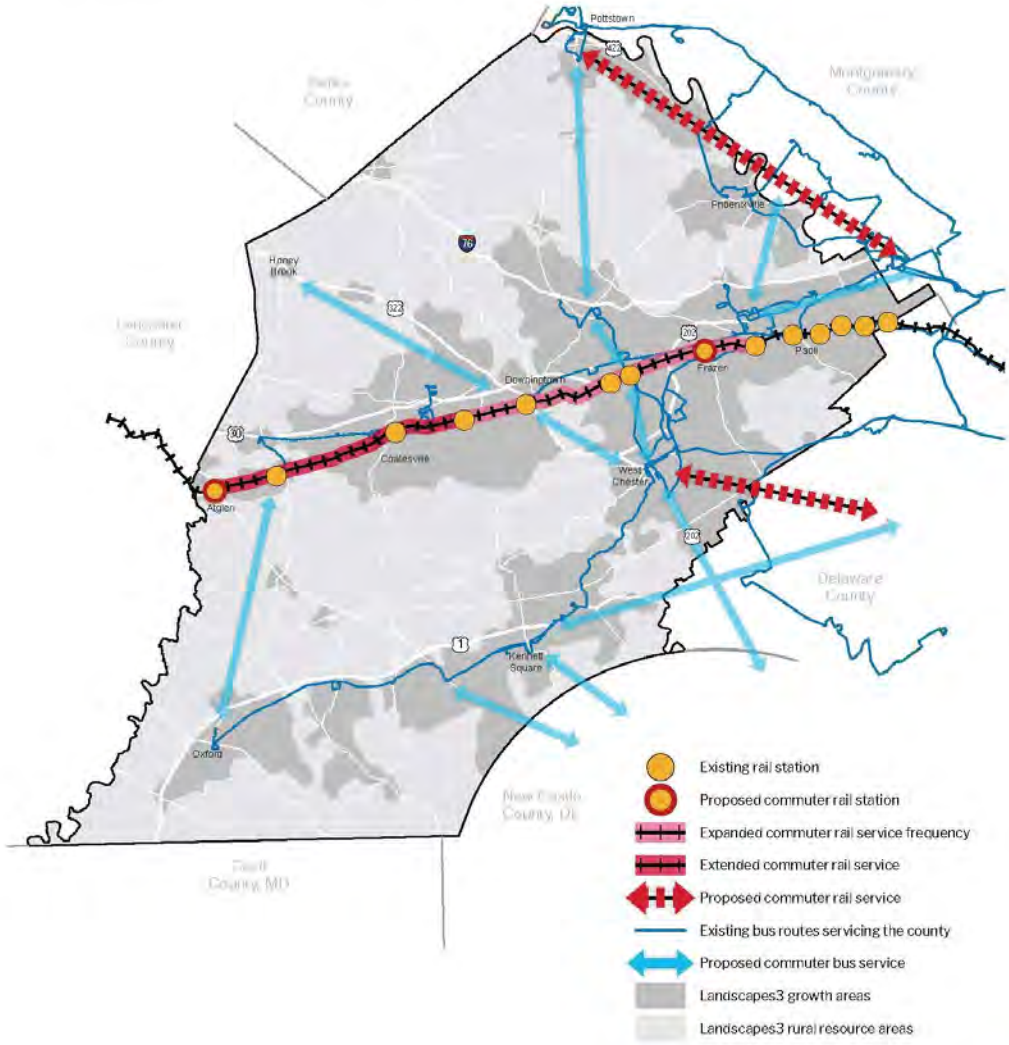
Previous efforts were not forgotten when East Whiteland Township prepared its Comprehensive Plan Update in 2016. The Comprehensive Plan Update recognized that the rail line created a barrier to circulation and that it provided no direct access to regional passenger rail service within the township. The plan also cited the idea of a new regional rail station in Frazer and identified some of the next steps to achieve this. A new train station would support two of the guiding principles from the plan: balance the pace of growth with infrastructure capacity and improvements, and promote Route 30 as a vibrant and attractive thoroughfare that reflects the diversity and vitality of the Township. Additionally, it recommended the implementation of a master plan for Route 30.

As a follow-up to the Comprehensive Plan Update, the Route 30 Corridor Master Plan (2018) identified ways to improve mobility and spur economic redevelopment along the Route 30 Corridor. A new

regional rail station was identified as a strategy to alleviate parking and access pressures at nearby stations, provide access to nearby employment centers, and energize development interest in Frazer – a concept that was overwhelmingly supported by the community. The report lists several reasons why a new train station in the area should be considered, as well as potential obstacles to constructing and providing service to a new station. The report also identifies focus areas for a new station location, next steps, and key project stakeholders.

The Chester County Public Transportation Plan (2014) does not mention any specific plans for a train station in East Whiteland Township. However, as an overarching policy plan, it generally supports the need for increased access to public transportation. Landscapes3 (2018), Chester County's Comprehensive Plan, also supports increased access to public transportation, and specifically identifies a new train station in Frazer.

Public Transit Enhancements Map (CCPC, 2018)



## Study Area

The area depicted on the Study Area Map was identified because of its strategic location midway between the Malvern and Exton regional rail stations. This is the longest stretch of track (approximately six miles) on SEPTA's Paoli-Thorndale regional rail line without a train station. The study area encompasses the properties immediately adjacent to the Amtrak Keystone Corridor/SEPTA Paoli-Thorndale rail line between Malin Road to the east and Phoenixville Pike to the west. There is strong community support for establishing a train station in this area of East Whiteland Township based on feedback received during the development of the Comprehensive Plan Update and the Route 30 Corridor Master Plan. However, the study area does not include the well established residential neighborhoods on the south side of the tracks east of Sproul Road (Route 352), because this area provides limited access to the rail line, which could not be improved without greatly impacting local residents.

Due to surrounding land uses and access issues, the rail line outside of the selected study area is similarly constrained. Sites further east are too close to the Malvern station to provide efficient spacing between stations, and that area has steep topography and curved railroad tracks which limit the feasibility of a station. Areas further west are constrained by the US 30 Exton Bypass to the north of the tracks and single-family residences to the south of the tracks.

## Evaluation of Potential Station Sites

A comprehensive evaluation process was undertaken to identify potential locations for a new train station. At the outset, all locations within the study area were considered and evaluated. Each step in the evaluation process involved eliminating sites that were not feasible for a variety of factors, including:

- Site constraints;
- Ability to support required and desirable station elements and features; and
- Railroad operations and service.

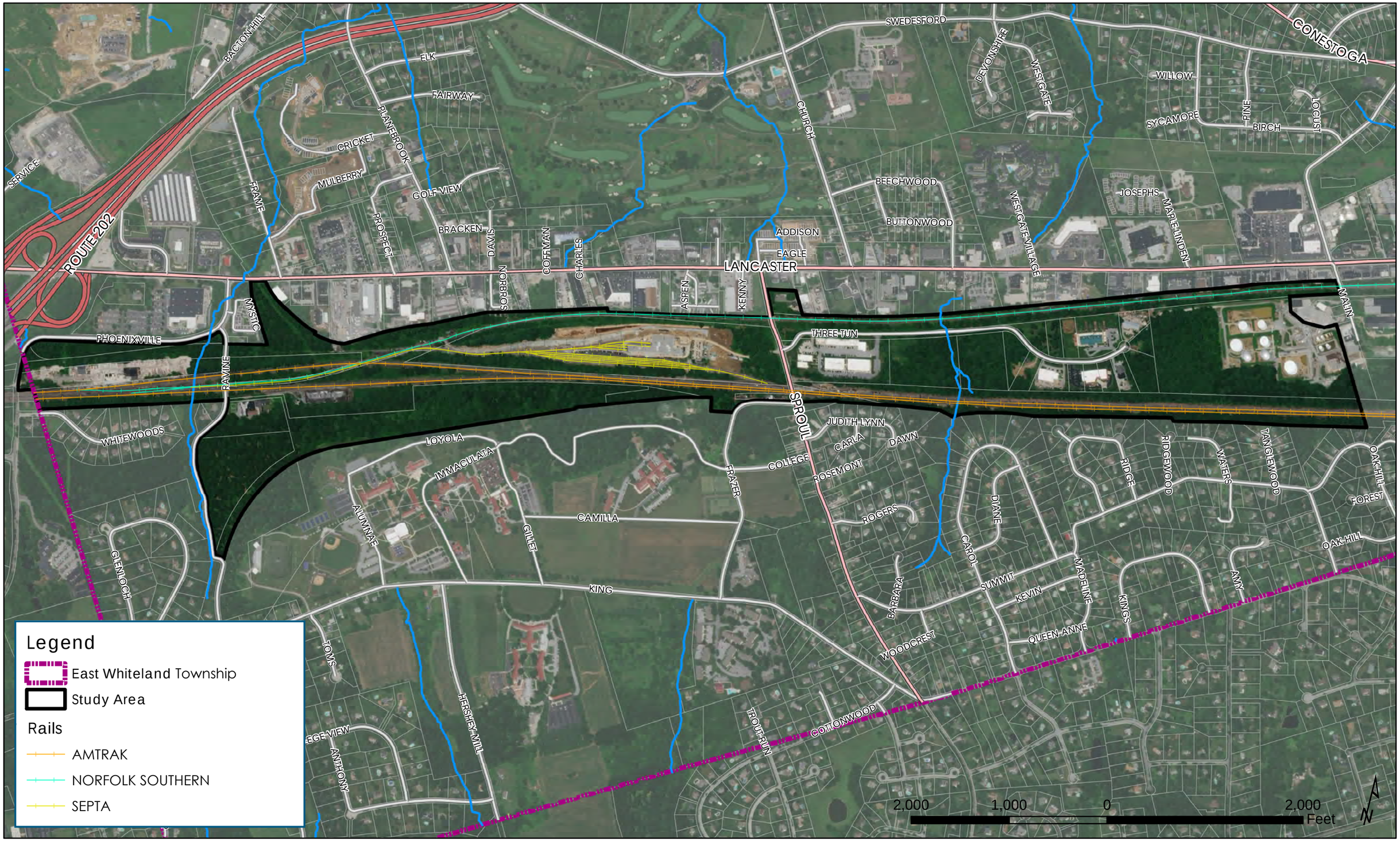
The following steps were taken to eliminate sites from further consideration and identify sites that could potentially support the necessary and desirable train station elements and operations.

### Base Maps

The first step in the evaluation process involved compiling available GIS and other data and developing several base maps to provide a high level overview of the study area. The data was provided by a variety of

# EWT Train Station Feasibility Study

*Study Area Map*



sources, including DVRPC, Chester County, and East Whiteland Township. The data examined and base maps developed include:

- Existing Land Use
- Potential Land Development: *Proposed/Approved Development, Potential Development/Redevelopment, Vacant-Nonresidential, Vacant-Residential*
- Property Ownership
- Environmental Features: *Streams, Wetlands, Floodplain, Steep Slopes, Moderate Slopes, Historic Resources*
- Existing Transportation Features: *State Roads, Local Roads, Railroads, Traffic Signals, Bridges, Park and Ride Lots, Current SEPTA Bus Routes, SEPTA Bus Stops, Sidewalks*
- Proposed Transportation Features (based on East Whiteland Township's Act 209 Study, Route 30 Corridor Master Plan, and other local plans): *Road Widening, New Roadway Connections, Multiuse Trails, Paths, Striped Shoulders, Bike Lanes, Intersection Improvements*

The base maps are included in Appendix 1.4. Based on these maps, some areas were eliminated from further consideration for the new train station. In particular, well developed parcels along Three Tun Road were dismissed due to the high cost and impact of siting a station on developed properties. Additionally, SEPTA's Frazer Maintenance Yard was eliminated due to the importance of this facility for SEPTA's operations and the limited available space to provide station elements without conflicting with maintenance and operations on the site.

## Railroad Operational Requirements

The Federal Railroad Administration (FRA), Amtrak, and SEPTA each have requirements associated with maintaining their current operations, as well as locating and designing new stations. This is particularly important and challenging within the study area due to SEPTA's Frazer Maintenance Yard, Norfolk Southern freight service, and both SEPTA and Amtrak passenger rail service. The following key station siting criteria based on railroad requirements were identified through coordination with Amtrak and SEPTA representatives:

- Platforms cannot be within 250' of an interlocking
- Platforms must be in a location with less than 1 degree, 40 minutes track curve and less than 1" of super elevation
- Minimum high-level platform length is 528' with potential to expand to 700'
- Provide access to service in both directions

### Railroad Terminology

*Interlocking: An arrangement of signals and tracks with their controls so interconnected as to prevent conflicting movements between trains. May be operated manually or automatically, and also by remote control*

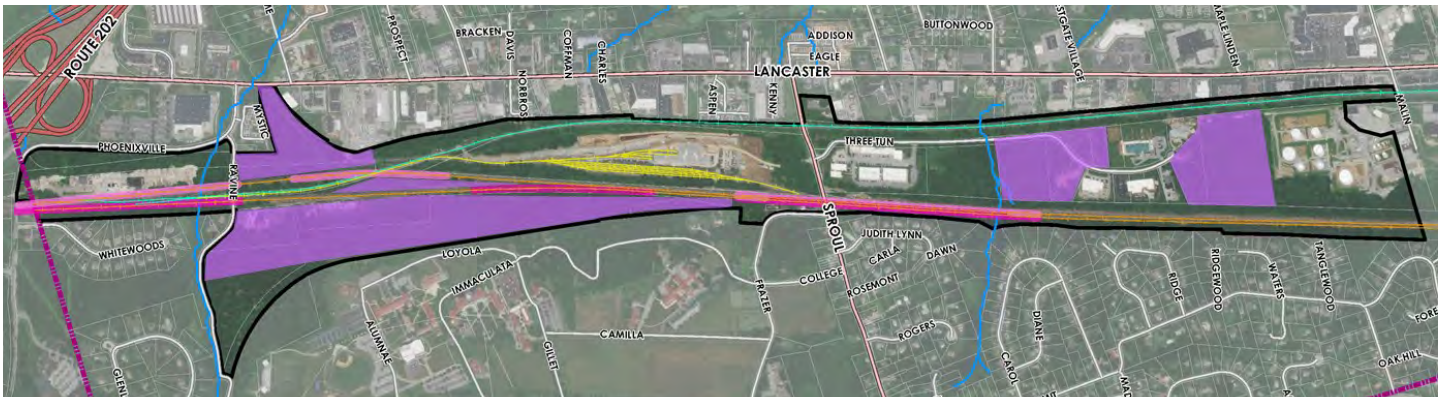
*Super Elevation: the amount by which the outer edge of a curve is banked above the inner edge*

- Consider the potential for a future third track and freight service through the station area
- Balance the distance between stations

The Track Restrictions Map shows locations along Amtrak's existing Track 4 (outbound) and Track 1 (inbound) where the railroad requirements for platforms are not met. This includes the area for two interlockings, one centrally located in the study area near Sproul Road (Route 352) and one at the western end of the study area near Phoenixville Pike and Ravine Road. It also includes areas where the track curvature or super elevation does not meet the requirements for platforms. There are restrictions relative to the placement of platforms along approximately 11,000 linear feet of the existing Amtrak tracks (out of 27,000 total linear feet of Amtrak tracks within the study area). This leaves approximately 60% of the total track length within the study area available for platforms; however this does not account for the need to provide access to service in both directions. The combined restriction on platform placement and requirement for access in both directions significantly narrowed the areas available for a train station.

The review of the base maps and evaluation of railroad requirements narrowed the potential sites for further consideration to the areas highlighted in purple on the map below. These sites became the focus for the remaining steps in the evaluation process.

### Potential Sites for Further Evaluation

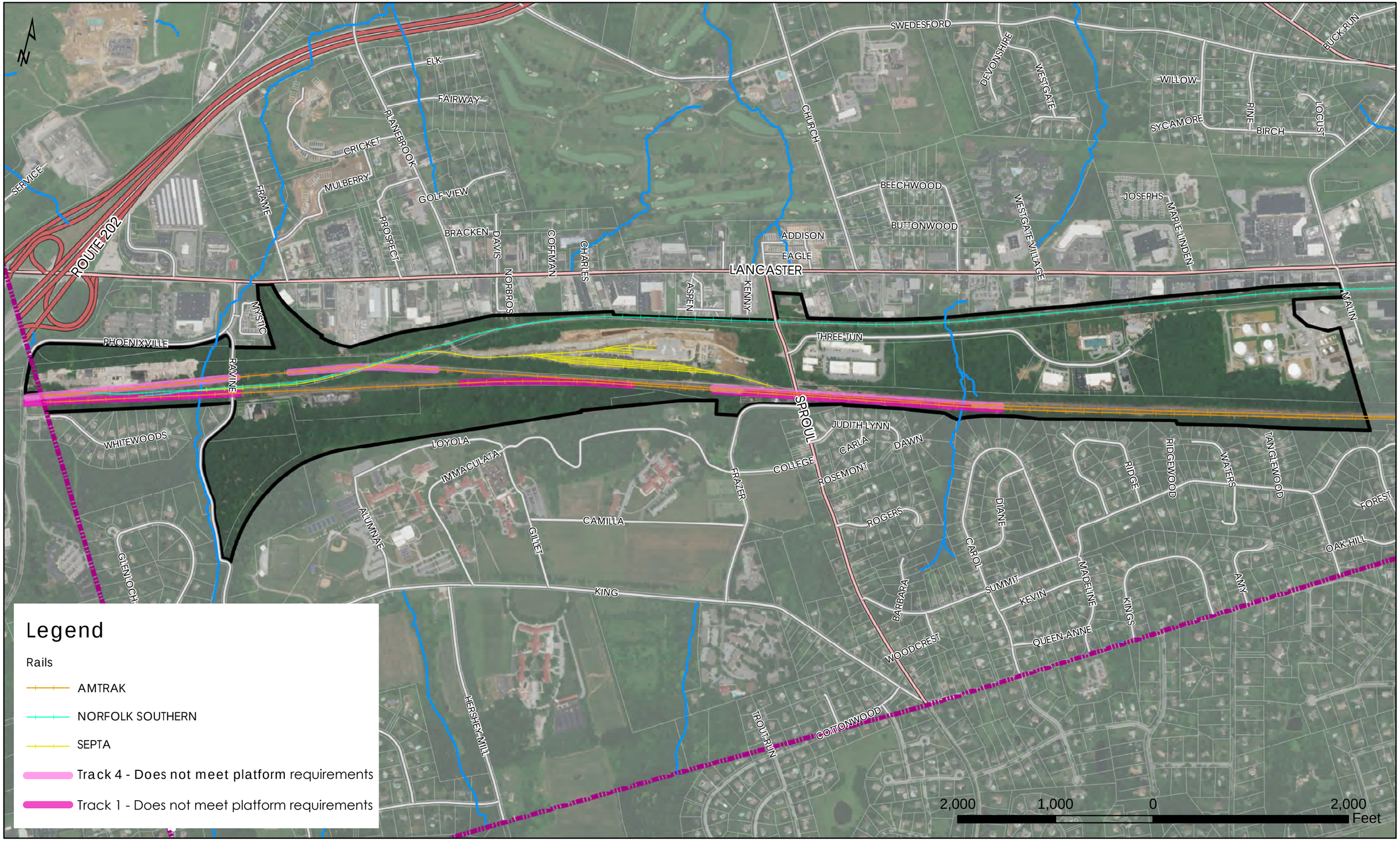



## Station Program Elements

In addition to the railroad operational requirements, a viable site for the new train station must provide sufficient space and opportunities to support the necessary and desirable station elements. Key elements can be classified in two categories: Waiting and Boarding Area Features and Site Access and Circulation. Required and desirable station elements were discussed with project stakeholders and SEPTA representatives at the two coordination meetings. Stakeholders

# EWT Train Station Feasibility Study

*Track Restrictions*



provided input regarding important elements of their vision for the future train station that should be accommodated on the preferred site. The following summary of key station elements reflect input from stakeholders, as well as features of similar SEPTA regional rail station.

Waiting and Boarding Area Features

Overall, stakeholders expressed a desire for the station to help create a sense of place and be a landmark within the Township. Stakeholders discussed an opportunity for architectural design treatments to be used for the pedestrian overpass/elevator structure to help with placemaking, particularly if a station building is not provided.

- High Level Platforms

  A minimum platform length of 540' is needed to support access to six car trains, which currently operate on the Paoli-Thorndale rail line. Additionally, SEPTA would like to plan for future eight car train service, which will require platforms totaling 710' in length. Therefore, an ideal station site has adequate space to provide 710' platforms. Platforms can either be located along each side, with a preferred width of 10-12' or within the center of the inbound and outbound tracks with a preferred width of 24'. Other desirable features would include canopies and heated shelters for passenger waiting.
- Cross Track Circulation

  Access to the platforms can be provided either with a pedestrian tunnel or overpass. Due to requirements associated with the Americans with Disabilities Act (ADA) and conditions within the study area, a pedestrian overpass with elevators is likely to be the preferred form of cross track circulation. At least one elevator must be provided, with potential for a second at each stairwell.
- Station Building and Ticketing Kiosks

  Stakeholders agreed that a traditional station building may not be necessary, especially since ticketing counters are no longer needed given new payment technology and the use of electronic ticketing kiosks. However, stakeholders identified the need for restroom facilities at the station. If a station building is required to meet code, it would likely be consistent with SEPTA's current standard station design.
- Transit Oriented Development (TOD)

  Private development at the station site could present an opportunity to offset initial development and ongoing station maintenance costs. Stakeholders discussed the potential for customer driven retail (coffee shop, or other food and amenities) or

Infrastructure Terminology

*Pedestrian Overpass: structure that carries pedestrians over transportation infrastructure (railroad or roadway)*

*Pedestrian Tunnel: feature that allows pedestrians to pass under transportation infrastructure (railroad or roadway)*

*Bridge: structure that carries transportation infrastructure (railroad or roadway) over another feature (manmade or natural)*

office uses within the station site. Additionally, there was agreement that other opportunities for transit oriented development should not drive the site selection; however, TOD potential should be evaluated based on selected sites, market demand, and consistency with local plans.

Site Access and Circulation

Overall, stakeholders expressed a strong desire for the new train station to have a connection or relationship to Route 30 and East Whiteland Township's plans for revitalization of the corridor. In addition, access to Immaculata University was a key destination for direct and convenient access to the train station. Stakeholders also noted the importance of providing vehicular access to the station, particularly connections to the nearby regional highways, including US 202, US 30, and the PA Turnpike.

Access and circulation was a concern for stakeholders, particularly because the railroads act as barriers to north-south circulation today. There are a limited number of roadways that cross the Amtrak and Norfolk Southern tracks, namely Phoenxiville Pike, Ravine Road, and Sproul Road (Route 352). All of the railroad and roadway bridges for these corridors are constrained in terms of width and/or height. These constraints limit mobility for drivers, bicyclists, pedestrians, and emergency vehicles, and also contribute to congestion. Stakeholders noted that roadway or bridge improvements will be needed to accommodate access to the new station or possibly a new roadway connection will need to be provided. East Whiteland Township's Route 30 Corridor Master Plan included the concept of extending Planebrook Road to Gillet Drive/King Road and extending Three Tun Road to Malin Road, which was also documented in the Malin Road Extension Feasibility Study (2010). Stakeholders noted the need for improved access between Route 30 and King Road, especially for emergency vehicles, and suggested these potential roadway connections could be considered and evaluated further depending upon the selected train station site. (Part 2 of this report provides a summary of access and circulation options evaluated after two feasible sites for the train station were selected.)

- Parking

  Stakeholders expressed a desire to maximize parking provided at the station, particularly to help relieve parking constraints at neighboring stations on the Paoli-Thorndale Line and to take advantage of nearby access to the regional highways. However, stakeholders also agreed that a parking garage is not essential and should be evaluated depending upon the site selected, available

footprint for parking, and potential cost. Additionally, a garage could be considered as an opportunity for Transit Oriented Development or Public-Private Partnership in the future. However, this feasibility study will assume that parking at the future station would be limited to surface lots.

Based on a cursory analysis of current license plate survey data (provided by DVRPC) and travel patterns to neighboring stations, it was initially estimated that approximately 100 to 150 current train station users may elect to use a new station in East Whiteland over an existing neighboring station, such as Paoli, Malvern, or Exton. The analysis was based on riders electing to drive and park at a station that is closer to home. This cursory analysis did not account for growth in ridership and was not based on ridership forecasts for the new station. Given the anticipated growth in both population and employment in East Whiteland Township alone, it was estimated that a viable station site must be able to support 250 to 300 parking spaces at a minimum. Additionally, there is a desire to have capacity for expansion to 350 to 400 spaces in the future. This supply of parking is generally consistent with other stations along the Paoli-Thorndale rail line. A map summarizing this analysis can be found in Appendix 1.5. These determinations were used to help identify potential minimum site requirements for a train station in East Whiteland Township. Typical best practices dictate that parking needs analyses account for projected ridership. However, that information was not available at this stage in the East Whiteland Train Station Feasibility Study. (Part 3 of this report provides a summary of ridership forecasts developed after two feasible sites for the train station were selected.)

### Parking Analysis

*License plate survey data was used to determine that the average distance that people are currently driving to park at adjacent stations along the corridor (Paoli, Malvern, Exton, Whitford) was 1.86 miles (however, many are traveling much further). Based on this information, it is reasonable to assume that someone would travel up to 2.5 miles to a new station in East Whiteland Township unless their origin was within one mile of another station. A spatial analysis determined that approximately 120 automobiles meet that basic criteria.*

- Bus, Private Shuttles, and Vehicle Pick-up/Drop-off

  Stakeholders agreed that the station site should include space for SEPTA bus access, private shuttle access, and area for other vehicular pick-up and drop-off. SEPTA currently operates two bus routes near the study area. Depending upon the selected site, one or both of these bus routes could provide access to the station, if warranted. Currently, several private corporate shuttles serving employers in the Great Valley area of Chester County (included Great Valley Corporate Center) operate from the Paoli Station, where there is limited space for staging. The new station could help to relieve pressure at the Paoli Station and provide similar access to destinations in Great Valley. Finally, areas for pick-up and drop-off should incorporate planning for the future of mobility and particularly ridesharing services and autonomous vehicles. (Part 2 of this report includes station concept plans that incorporate pick-

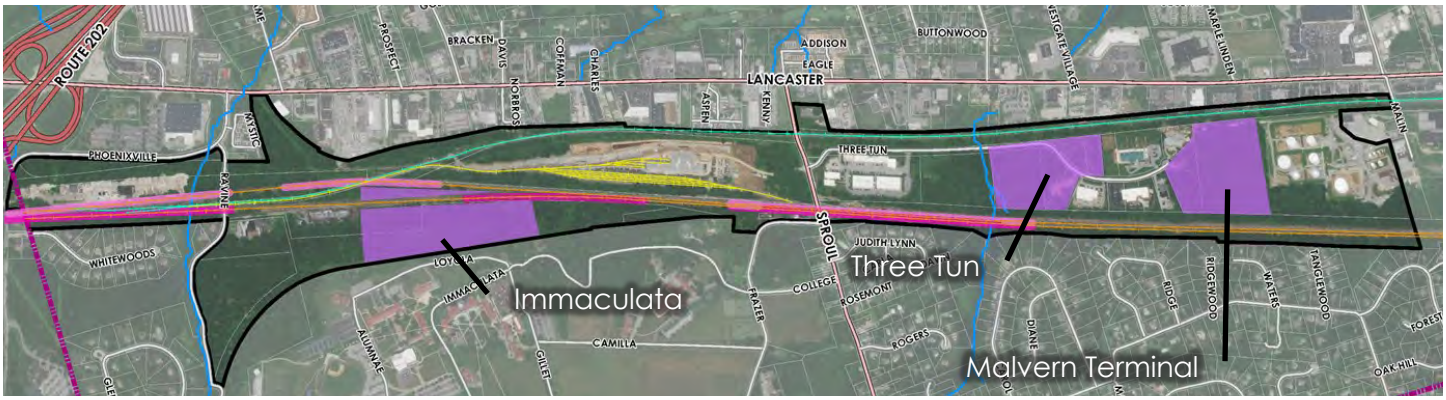
up and drop-off facilities. Additionally, it includes a summary of considerations related to potential SEPTA Bus service to the two preferred station sites.)

- Bicycle and Pedestrian Access

  Stakeholders agreed that providing safe and convenient access for bicyclists and pedestrians is an essential element of the new station. A new station should have good internal and external bicycle and pedestrian access and circulation. In particular, stakeholders expressed the desire to have bicycle and pedestrian access to key destinations within the study area, namely the Route 30 corridor and Immaculata University.

Based on required and desirable station elements, some areas of the study area between Sproul Road (Route 352) and Ravine Road were eliminated from further consideration. The following map of preliminary station sites depicts three general areas that became the focus during the final steps in the evaluation process.

### Preliminary Station Sites




## Field Visit

A field view of the preliminary sites was conducted by the project team on December 11, 2018. The purpose of the field view was to confirm conditions or issues identified on the base maps and further evaluate land available to support the train station facilities, access and circulation for all modes, potential station and platform configurations, and constructability. Observations and photographs were taken from publicly accessible locations and within properties where access was granted. Additionally, drone images and videos provided by SEPTA were used to evaluate other locations not easily accessible. As a result of the field visit, none of the three preliminary station sites were eliminated from consideration. Rather, the field visit observations confirmed that the preliminary station sites were viable and should be evaluated further.

## Service Frequency and Reliability

Another factor considered during site selection is train service frequency and reliability, which depend on the existing infrastructure and demand. Currently, SEPTA provides regional rail service approximately every half hour to the Malvern Station and every hour to the Exton Station. This difference is due to the need for a siding or alternative track for engineers to safely inspect trains at the end of each run without the potential of disrupting service on the mainline. There is a siding available at Frazer Yard, allowing SEPTA to inspect and effectively "turn the train around" to provide inbound service. Given the current conditions and operations, a station located east of Frazer Yard could become the first/last stop for SEPTA service approximately every half hour. Under current conditions, a new station located west of Frazer Yard would likely only have hourly service, since there is currently not a location for the train to easily change the direction of service.

PennDOT and Amtrak are evaluating potential rail infrastructure improvements that will facilitate half hourly service to stations west of Frazer Yard and as far as Exton. The 2015 Pennsylvania State Rail Plan includes a capital improvement project called "New Potts Interlocking." As listed in the plan, this includes a new interlocking west of the Exton Station, along with removing a switch at Glen and retiring the Downs interlocking for an estimated cost of $23.4 million. PennDOT noted that funding is not yet identified, and these potential passenger railroad infrastructure improvements are still being evaluated. However, if these or equivalent improvements are constructed, it will be feasible to provide SEPTA regional rail service every half hour to a station site west of Frazer Yard.

SEPTA representatives also noted that due to the current track configuration, the reliability of service is also reduced west of the Frazer Yard. More specifically, west of Frazer SEPTA and Amtrak share two tracks and they do not have reverse running. Currently, there are no crossovers between the tracks until Thorndale. Therefore, if there is a track problem or other issue west of Frazer Yard, service may be terminated. Whereas, if a track or other issue occurs east of Frazer Yard, limited levels of service may be maintained because there are multiple tracks and more crossovers which allow SEPTA and Amtrak trains to bypass problems.

The two preliminary sites east of Frazer Yard on Three Tun Road are comparable and could support similar levels of service. In assessing the two, the area closer to Sproul Road (Route 352) provides more spacing between Malvern Station and the proposed station, which is preferable

Railroad Terminology

*Reverse Running: The ability to run in the opposite direction than the normal flow. Track signals are often setup to control train movements in one direction only. This limits the ability to run trains in the opposite direction. A bi-directional signal system allows reverse running to be remotely controlled and provides flexibility to adjust operations, if needed.*

for railroad operations. Additionally, this area does not involve property owned by Buckeye Partners for their Malvern Terminal, which includes the storage and transmission of heating oil, gasoline, ethanol, biodiesel. Since there were no distinctive advantages associated with the site involving the Malvern Terminal, it was dismissed from further consideration.

Although the preliminary site west of Frazer Yard may have lower levels of train service, it does offer other advantages, such as direct access to Immaculata University. As a result, this preliminary site was retained for further evaluation.

## Preferred Station Sites

The site selection evaluation process resulted in the identification of two preferred station sites:

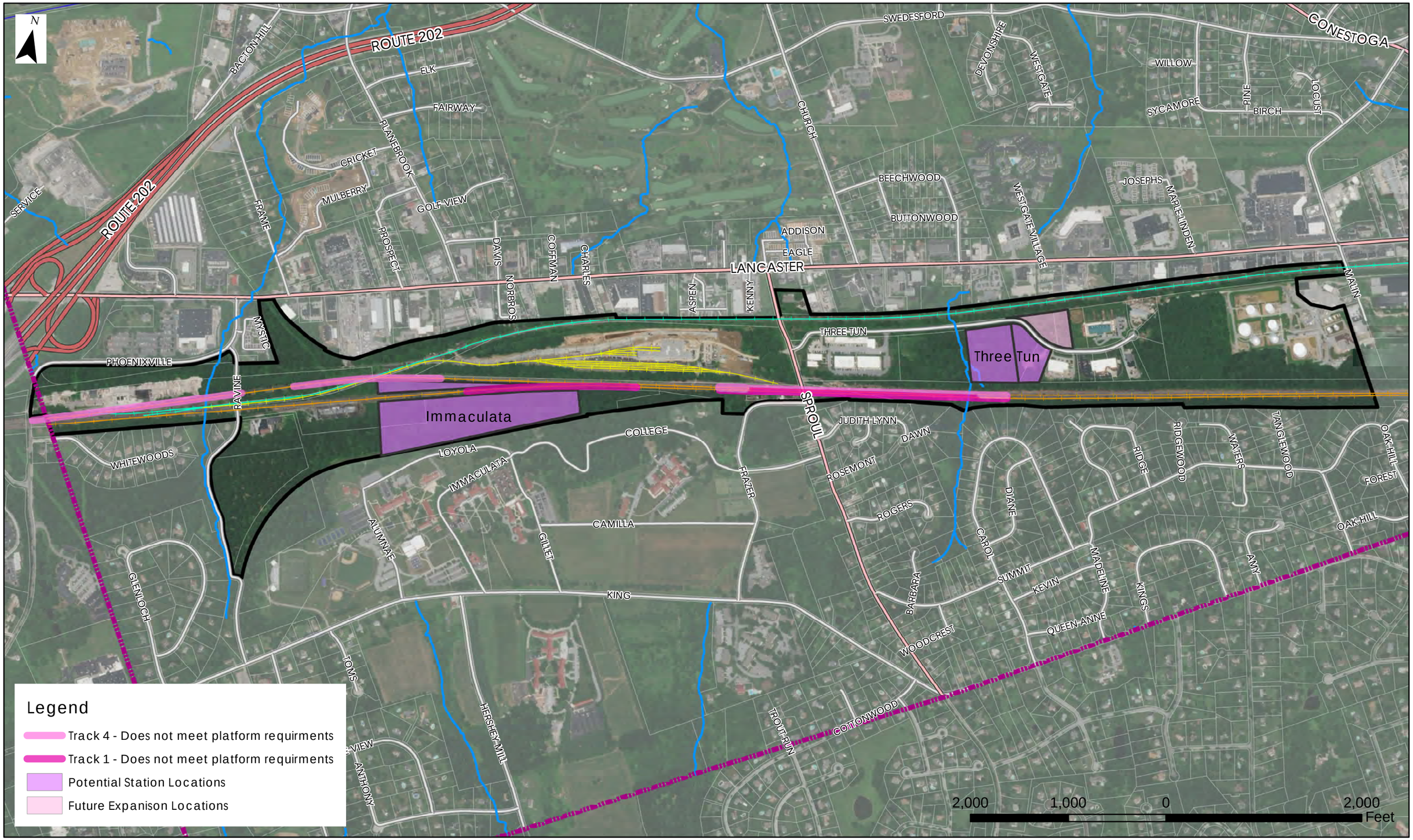
- **Immaculata**—site west of Sproul Road (Route 352)
- **Three Tun**—site east of Sproul Road (Route 352)

These locations are depicted on the Preferred Station Sites Map. More detailed descriptions, maps, and a summary of the advantages and disadvantages of each site are highlighted in the following pages.

Station conceptual design and features, operations and service, and potential future ridership for both of these potential station sites are further detailed in Part 2 and Part 3 of this report.

# EWT Train Station Feasibility Study

## *Preferred Train Station Locations*



# Immaculata Station Site Profile

**Characteristics**

The Sisters, Servants of the Immaculata Heart of Mary (Sisters IHM) own a 27-acre parcel in use by Immaculata University, immediately between the University proper and Amtrak's Keystone line that was formerly occupied by the West Chester Railroad. The parcel stretches from Ravine Road in the west nearly the entire way to Frazer Road in the east. This parcel is heavily wooded, and it is difficult to determine the exact location of the abandoned railroad bed. Steep slopes exist on the south side of the property (adjacent to the University). However, much of the property is relatively flat and developable. This parcel is in proximity to the Norfolk Southern crossover where the freight line joins Amtrak's Keystone Corridor.

**ADVANTAGES**

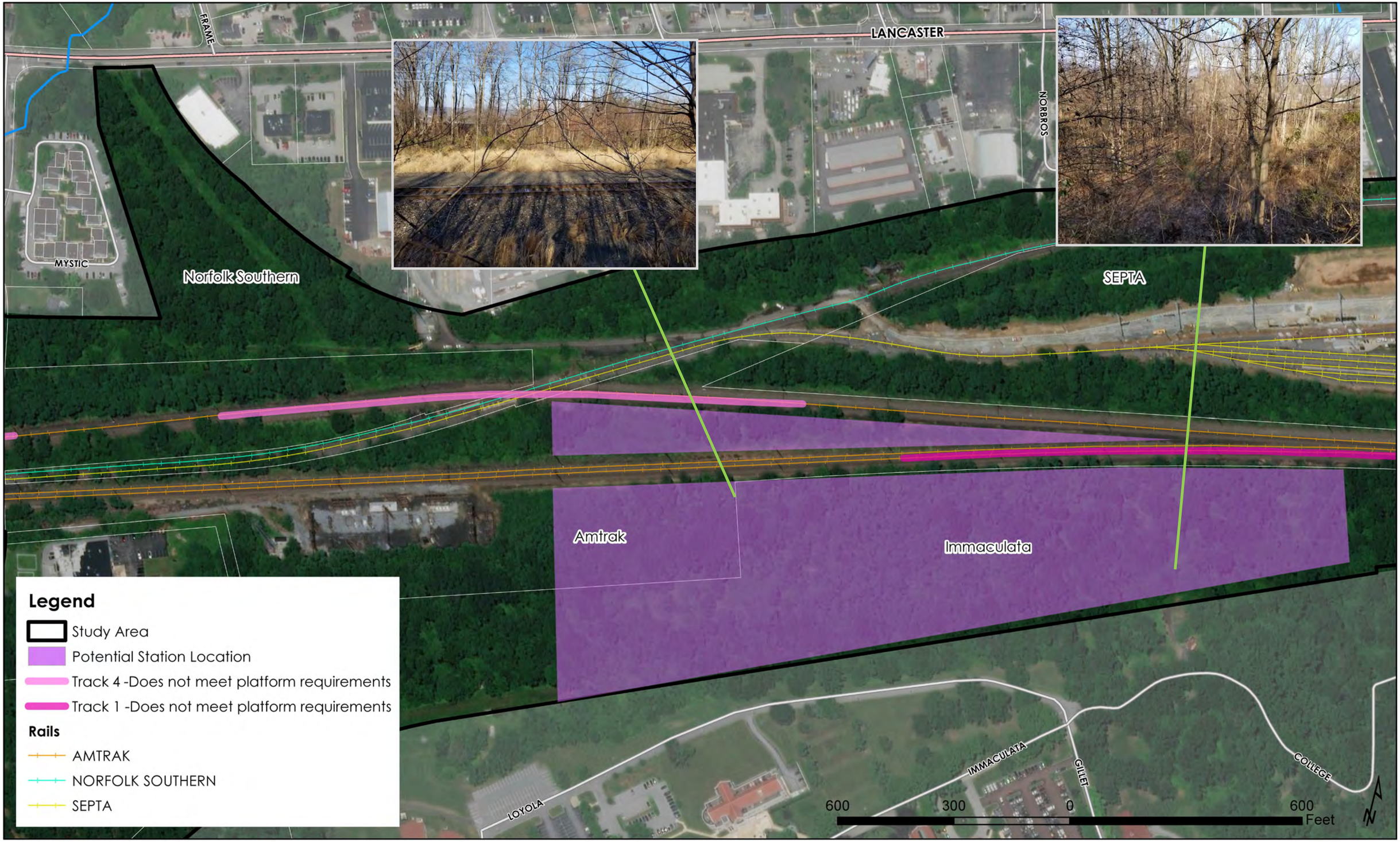
- Located half-way between Malvern and Exton; approximately three miles from each
- Minimal need for track work
- Multiple possible access points
  - ◊ Ravine Road
  - ◊ King Road
  - ◊ Sproul Road (Route 352) to Frazer Road/College Ave/Grotto Drive
  - ◊ Route 30/Phoenixville Pike—requires coordination with Norfolk Southern
- Ample developable land for station facilities and parking with room for expansion
- Center median station area provides room for different platform and track configurations
- Opportunity for direct pedestrian connection to Immaculata University, Camilla Hall, Villa Maria House of Studies, and William Henry Apartments
- Key parcel privately owned by the Servant Sisters of IHM for use by Immaculata University
- Consistent with East Whiteland Township plans for revitalization along Route 30

**DISADVANTAGES**

- Multiple rail lines to cross over for connection and access on the north side of the tracks
- Difficulty constructing pedestrian overpass due to overhead wire (for traction and signals) configuration
- Ravine Road connection to Route 30 limited by four low-clearance tunnels
- Sproul Road (Route 352) connection to Route 30 limited by one low-clearance tunnel and bridge over Norfolk Southern rail lines
- Connection to Route 30 limited—difficult to create "village" around site
- More difficult to provide higher frequency of service since it is west of Frazer Rail Yard without new "Potts" Interlocking
- Some areas with steep slopes (particularly east of the preferred station location); may impact station access

# EWT Train Station Feasibility Study

*Immaculata Station Site*



# Three Tun Station Site Profile

**Characteristics**

There are multiple available lots located along Three Tun Road to the east of Sproul Road (Route 352) that are vacant and available for development. The parcels are bounded to the north by the Norfolk Southern line and to the south by Amtrak. All of the parcels are easily accessed from Sproul Road (Route 352) via Three Tun Road. The adjacent land uses along Three Tun Road are primarily light industrial. Opposite the parcels, south of the Amtrak line, is a residential neighborhood. The parcels are located partially within an interlocking area, and access to the rail line is obstructed by steep slope areas.

**ADVANTAGES**

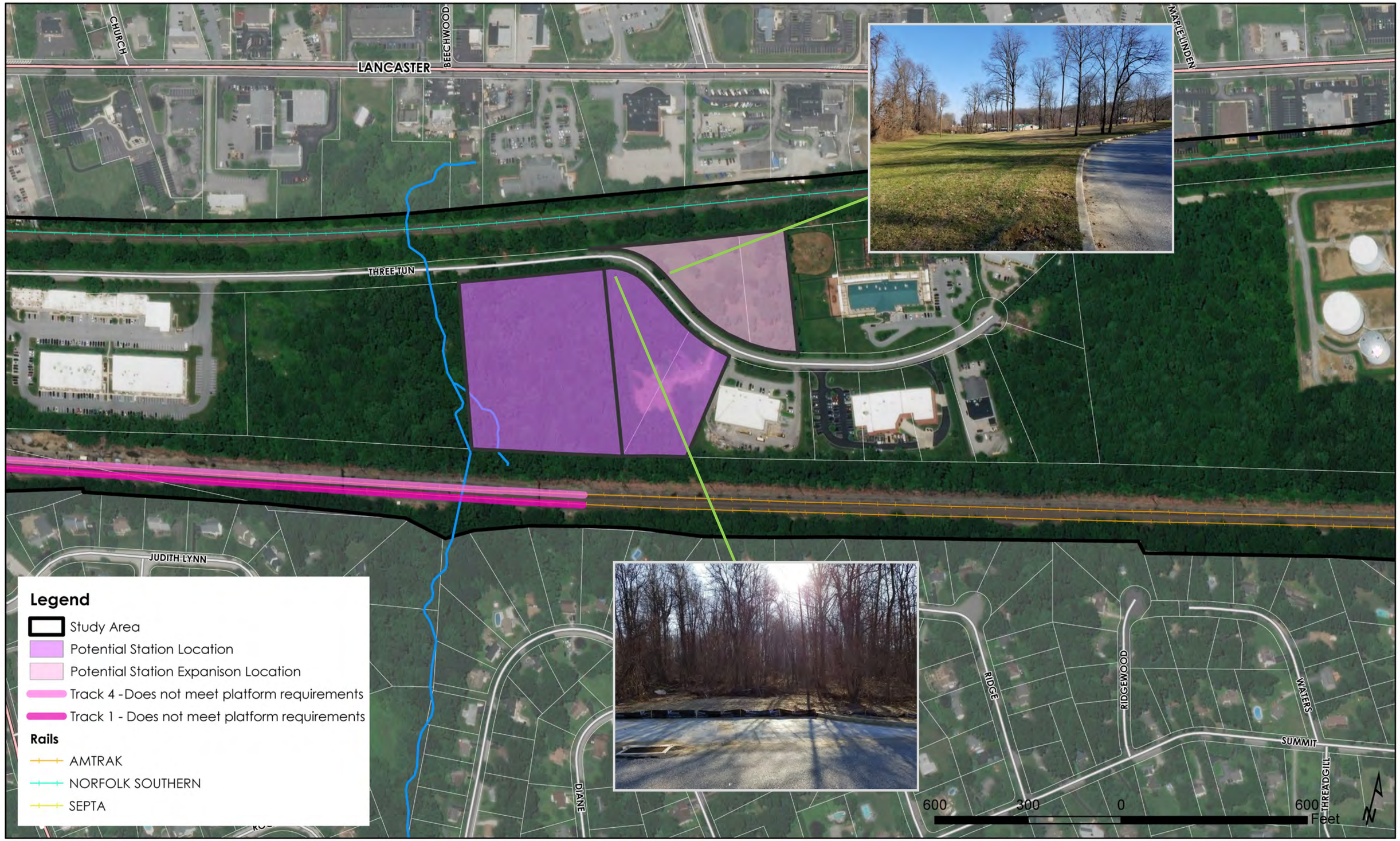
- Three Tun Road easily accessible by automobile from Route 30 via Sproul Road (Route 352)
- Land available and ready for development
- Additional parcels provide opportunity for expansion
- May be possible to retrofit existing bridge carrying Sproul Road (Route 352) over Norfolk Southern with pedestrian infrastructure
- Can accommodate half-hourly service

**DISADVANTAGES**

- Need to assemble multiple privately owned parcels with development potential
- Potential for site development for commercial use in the near term
- Available parcels not directly adjacent to feasible platform location, but still accessible
- Direct connection to Route 30 requires further evaluation
- No pedestrian access for Immaculata University
- Adjacent well established residential area on opposite side of tracks limits vehicular access and residents may have concerns regarding potential impacts
- Some areas with steep slopes, particularly adjacent to the railroad tracks
- Difficulty constructing pedestrian overpass due to overhead wire (for traction and signals) configuration

# EWT Train Station Feasibility Study

## *Three Tun Station Site*



# Part 2 | Findings and Recommendations

## Introduction

Part 1 identifies two viable station sites within East Whiteland Township: Immaculata and Three Tun. Basic design considerations for a station at either of these sites was also identified in Part 1. Those considerations include: a 700' high level station platform, station amenities (i.e. station structures, ADA accommodations), multimodal access considerations, and ample parking to serve the station.

Components of building a new regional rail station are multiple and complex; each impacting the others to create one cohesive station design. Part 2 identifies the conceptual station design of each preferred station location.

This section focused on evaluating the feasibility of constructing train stations on the two preferred locations identified in Part 1. Tasks completed in Part 2 included:

- Identifying the required station elements to be included in the conceptual design of two recommended station locations
- Developing draft concept plans for two recommended station locations
- Identifying potential improvements to railroad infrastructure needed to construct a new train station at either identified location
- Establishing planning level cost estimates for two train station alternatives
- Providing DVRPC with the data required to develop ridership projections for a new station on the Paoli-Thorndale line

## Stakeholder and Public Input

Part 2 included two property owner coordination meetings, meetings with project stakeholders, a technical coordination meeting with SEPTA, and a public meeting. Input received at these meetings informed the project team to refine the recommendations in this report.

**Property Owner Coordination Meetings (January 17, 2019 and February 5, 2019):** Two separate coordination meetings were held with property owners who own land associated with the Three Tun station site. The purpose of the meetings was to make the property owners aware of this train station feasibility study, including the identification of the Three Tun site, and answer their questions.

**Stakeholder Meeting #2—Station Concept Design Workshop (February 12, 2019):** This was the second stakeholder meeting for the project, focusing on the draft station concept plans and evaluation of access and circulation improvement options. Input from stakeholders regarding Amtrak's track requirements for stations led to refinements of the Immaculata station concept plan. Also, individual follow-up meetings with representatives from East Whiteland Township and Immaculata University were held on February 26, 2019 to discuss population and employment forecasts, as well as access and circulation improvement options.

**SEPTA Technical Coordination #2—Workshop (February 21, 2019):** A technical coordination meeting with SEPTA representatives included discussion of train schedules, platform configurations, draft conceptual station design, access and circulation improvements. SEPTA representatives provided input regarding assumptions for the train schedules and cost estimates for the stations.

**Public Workshop (February 27, 2019):** Draft findings and conceptual station designs were presented to the community at an open house prior to an East Whiteland Township Planning Commission meeting. A brief overview presentation was provided during that meeting, followed by a question and answer period. Access and circulation was the key concern expressed by meeting attendees. Generally, there was more support for the Immaculata station site over the Three Tun station site. Factors that contributed to this sentiment included:

- More vehicular and pedestrian access at the Immaculata site.
- Direct connection to Immaculata University at the Immaculata site.
- A better connection to Route 30; which could contribute to establishing a village. (Supported in the East Whiteland Township Comprehensive Plan and Route 30 Corridor Master Plan.)

A strong turnout at the public workshop on February 27, 2019.

## Multimodal Access and Circulation Evaluation

It is essential to provide ample access to any regional rail station. Any regional rail station should be accessible by not only automobiles, but also by people walking, biking, or using other transit services. This section presents a summary of the evaluation of options to provide access to the Immaculata and Three Tun station sites. The evaluation focused particularly on providing access to and from Route 30, which stakeholders identified as a priority.

### Key Constraints

Key constraints that impact access and circulation to the two preferred station sites can be divided into three main categories: railroad bridges, intersection operations, and bicycle/pedestrian access. The key constraints described in this section are illustrated on the Key Constraints map on the following page.

A major barrier that limits circulation throughout East Whiteland Township is the presence of active and inactive railroad corridors. These rail corridors were discussed in detail in Part 1. Within the study area, there are only two roadway corridors that provide north-south connections over the tracks: Ravine Road and Route 352 (Sproul Road). Due to the limited north-south roadway connections, vehicular traffic is funneled to these corridors. Additionally, the locations where the rail lines are carried over roadways have been identified as primary pinch points in East Whiteland Township's road network due to lower overhead (or vertical) and side (or horizontal) clearances. The locations that have the most impact to the two station sites being evaluated in this study are listed below.

- Amtrak (active) over Sproul Road (PA 352)
- Philadelphia and Thorndale Line (inactive) over Ravine Road
- Norfolk Southern (active) over Ravine Road
- Amtrak (active) over Ravine Road
- West Chester Branch (inactive) over Ravine Road

To limit the effects these railroad bridges have on roadway operations, significant effort and funds would need to be allocated to make structural improvements or alternative routes would have to be identified.

A detailed traffic study was not performed as part of this feasibility study. However, past planning efforts, including East Whiteland Township's Act 209 Study, identified various intersections that are

# Access and Circulation

*Key Constraints*


**Legend**

- Constrained Railroad Overpass
- Intersection with Existing Operational Deficiencies*
- Intersection with Future Operational Deficiencies and Proposed Improvements*

* Based on East Whiteland Township Act 209 Study (2017): *Future traffic analysis did not include a new train station*

currently operating below an acceptable level-of-service or are expected to do so in the future. It should be noted that while the Act 209 Study (2017) did consider future growth and development, it did not specifically consider a future train station in East Whiteland Township. It can be assumed that locating a train station in the area of these intersections may exacerbate existing deficiencies. The table below lists the intersections and identifies if there is an existing deficiency or a future deficiency expected based on the Act 209 Study. Additional traffic analysis will be needed to determine the potential impact of a proposed train station and appropriate intersection improvements. Not all existing deficiencies in the study area would be addressed by the train station project.

### Key Intersections with Existing or Future Operational Deficiencies

| Intersection | Deficiency |
|---|---|
| Lancaster Ave (US 30) & Phoenixville Pike | Future |
| Lancaster Ave (US 30) & Planebrook Road | Future |
| Lancaster Ave (US 30) & Sproul Road (PA 352) | Existing |
| Lancaster Ave (US 30) & Church Road | Future |
| Sproul Road (PA 352) & Three Tun Road | Future |
| Sproul Road (PA 352) & College Ave | Future |
| Sproul Road (PA 352) & W King Road | Existing |

Bicycle and pedestrian access to either of the preferred station sites is currently very limited. There are very few sidewalks other than the internal walkways on Immaculata University's campus, no trails exist within the study area, and on-road bicycle infrastructure is not present. This creates an environment that is not very welcoming to individuals with limited access to a vehicle or choose not to drive. Additionally, the study area is bracketed by fixed-route bus service; SEPTA's Route 204 provides service on Lancaster Avenue (US 30) and SEPTA's Route 92 provides service on King Road. This means that potential connecting bus services are nearby, but they are not directly accessible from either the Three Tun or Immaculata station sites. A mix of onsite and offsite infrastructure improvements would be needed to provide access for all users to a new train station in East Whiteland Township.

## Immaculata Station Site Access

No roads provide access to the Immaculata station site today. Therefore, any solution to access and circulation for this site would require new roadway construction. Various options were considered to

achieve the access goals. However, many were dismissed due to cost and constructability considerations. A brief overview of each access consideration has been provided in this section and illustrated on the map on the following page.

**Replacing Railroad Bridges**

As described in the Key Constraints section, the existing railroad bridges on both Ravine Road and Route 352 (Sproul Road) have limited vertical and horizontal clearances. The width restrictions cause vehicles to slow down or wait for oncoming traffic. Additionally, the width restrictions limit the ability to provide dedicated pedestrian or bicycle infrastructure. The height restrictions limit the circulation of trucks, buses, fire trucks, and other heavy vehicles.

Replacing a railroad bridge that supports an active rail line is a very costly and complex improvement. During construction of such structures, rail service must be maintained on the bridge. A new bridge can be designed to provide additional width for travel lanes, as well as bicycle and pedestrian infrastructure. However, a new bridge might not result in a significant increase in vertical clearance because the elevation of the railroad tracks above would not change. While it may be possible to regrade the roadway to provide additional height, roadway regarding introduces additional design issues related to stormwater and access to adjacent properties.

Two access and circulation options that involve replacing existing railroad bridges were identified and evaluated.

- **Ravine Road**

  This option includes replacing the two existing bridges for the active Amtrak and Norfolk Southern rail lines on Ravine Road. It also includes removing the northern and southern existing bridges on Ravine Road, which are no longer necessary and do not support active rail lines. A new access roadway between Ravine Road and the train station would be located south of the Amtrak tracks (and south of the existing private development and Amtrak sub-station). Intersection improvements are identified for Ravine Road at Phoenixville Pike and King Road.

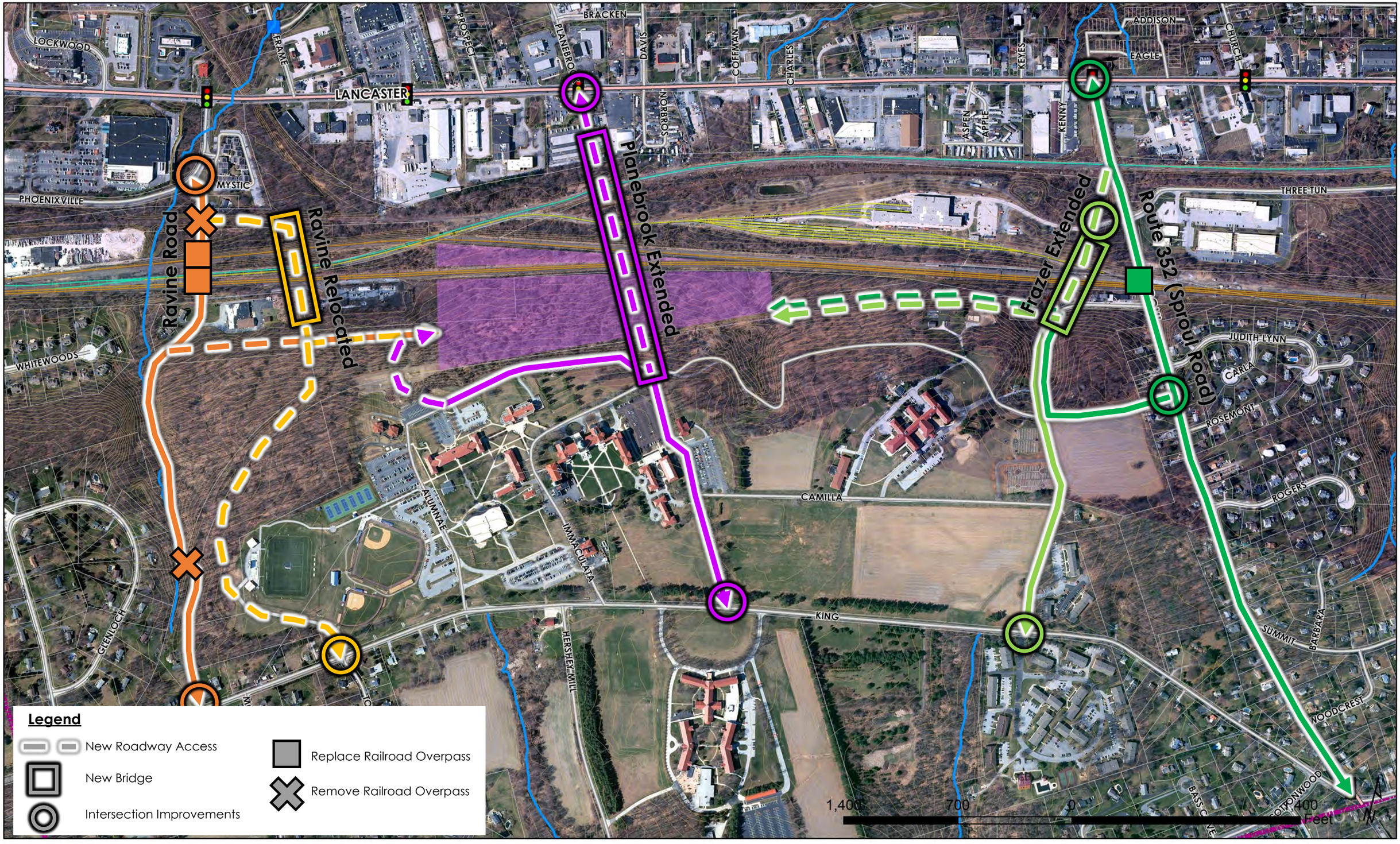
- **Route 352 (Sproul Road)**

  This option involves replacing the existing bridge for the active Amtrak rail lines on Route 352 (Sproul Road). Portions of College Avenue and Frazer Road are improved and a new access roadway would be located between Frazer Road and the train station. Intersections improvements on Route 352 (Sproul Road) are

Intersection Improvements

*These include road widening, auxiliary lanes, road realignment, new and upgrade traffic signals, additional signage, etc.*

*Immaculata Station* *Evaluation of Access and Circulation Options*



identified at Route 30 and College Avenue.

Options for replacing the two railroad bridges on Ravine Road or the one railroad bridge on Route 352 (Sproul Road) were considered and dismissed because of the significant cost for design and construction, and the limited benefit of having height restrictions that would prohibit access to the proposed Immaculata Station site for buses and other larger vehicles from the Route 30 corridor and areas north of the site. As a result, options for new bridges were identified and evaluated.

**New Bridges**

New bridges over railroad tracks are generally less costly and complicated to construct than railroad bridges.

Three primary access and circulation options that involve new bridges over the railroad tracks were identified and evaluated.

- **Planebrook Extended**

  The concept of extending Planebrook Road to the south and providing a new roadway connection between Route 30 and King Road was identified in the Route 30 Corridor Master Plan developed by East Whiteland Township. This option includes a new bridge over the Norfolk Southern, SEPTA, and Amtrak tracks and new roadway to connections on either end of the bridge. Additionally, this option includes improvements to Gillet Drive and Loyola Drive and a new roadway from Loyola Drive to the train station site. Intersection improvements would be provided at Route 30/Planebrook Road and Gillet Drive/King Road. All new roadways and the bridge include sidewalks or other facilities for bicycle and pedestrian access, such as bike lanes, paths, or trails.

  The Planebrook Extended option involves crossing four active rail lines and the associated catenary and transmission lines. At this location the distance between the various tracks is relatively wide, approximately 500 feet, and there are steep slopes south of the tracks near Loyola Drive. As a result, this option involves a significant and costly bridge structure. On the north side of the bridge, the connection to Route 30 at Planebrook likely requires retaining walls in order to provide the minimum 23 feet vertical clearance over the Norfolk Southern tracks. On the south side of the bridge near Loyola Drive and Gillet Drive, grading or retaining walls may also be required to transition and meet the existing grade. This option brings additional traffic to the heart of Immaculata University's campus, which could potentially

introduce conflicts between vehicular traffic and pedestrians. Additionally, the new bridge structure would bifurcate the train station site, likely requiring piers within the proposed parking lot and impacting circulation within the parking lot. Also, access to the station would not be direct, due to the topography between the tracks and Immaculata University's campus, and would require utilizing a segment of Loyola Drive. Given the significant costs, potential impacts, and indirect access to the train station site, the Planebrook Extended option was considered and dismissed.

- **Frazer Extended**

The Frazer Extended option includes a new bridge over the active SEPTA and Amtrak tracks to provide a new roadway connection between Route 352 (Sproul Road) and Frazer Road. This requires improvements and potential realignment of the Route 352 (Sproul Road) and Three Tun Road intersection. In addition, it includes intersection improvements at Route 30/Route 352 (Sproul Road) and King Road/Frazer Road. A new roadway just south of the Amtrak tracks provides access to the station site from Frazer Road. All new roadways and the bridge include sidewalks or other facilities for bicycle and pedestrian access.

The Amtrak and SEPTA tracks are located approximately 100 feet apart in the area of Frazer Extended, which requires a less significant and costly bridge structure for the crossing (in comparison to the Planebrook Extended option). However, the grades on the south side of the tracks make a connection to Frazer Road impractical. Additionally, a bridge and roadway connection in this area would impact the private property and business located on the west side of Route 352 (Sproul Road) between Frazer Road and the railroad tracks. North of the tracks, improvements at the intersection of Route 352 (Sproul Road)/Three Tun Road and SEPTA's Frazer Yard driveway are also challenging due to topography and utilities. There is also a chance that the existing Route 352 (Sproul Road) bridge over Norfolk Southern would need to be replaced in order to accommodate the new bridge and roadway connections. As a result, this option was dismissed.

- **Ravine Relocated**

The Ravine Relocated option includes a new roadway located east of the existing Ravine Road. The new roadway connects the existing intersection of Phoenixville Pike/Ravine Road to the north with the intersection of King Road/Tom Circle to the south, with intersection improvements identified for both locations. At the

northern end, the connection to Phoenxville Pike/Ravine Road generally follows an existing Norfolk Southern access roadway and likely requires removal of the existing Ravine Road railroad bridge for the former Philadelphia and Thorndale Line. This option includes a new bridge over the active Amtrak and Norfolk southern tracks. At this location, the tracks are less than 200 feet apart. The bridge structure would likely require retaining walls on both the north and south sides of the track. On the south side of the tracks, retaining walls would help to minimize impacts to the existing private commercial property and Amtrak sub-station. South of the new bridge, the new roadway alignment generally follows portions of the former West Chester Branch and an existing emergency access driveway for athletic fields on Immaculata University's campus. In addition to upgrading the access driveway, this option would likely involve providing a new traffic signal at the intersection of King Road/Tom Circle. A new access roadway to the station site would be provided on the south side of the tracks. All new roadways and the bridge include sidewalks or other facilities for bicycle and pedestrian access.

There are a number of alternative configurations associated with this option, including different new roadway alignments for connecting to Route 30 or King Road. Additionally, with this option, there is the potential to vacate portions of the existing Ravine Road while maintaining access to properties that front on the roadway, or Ravine Road could remain.

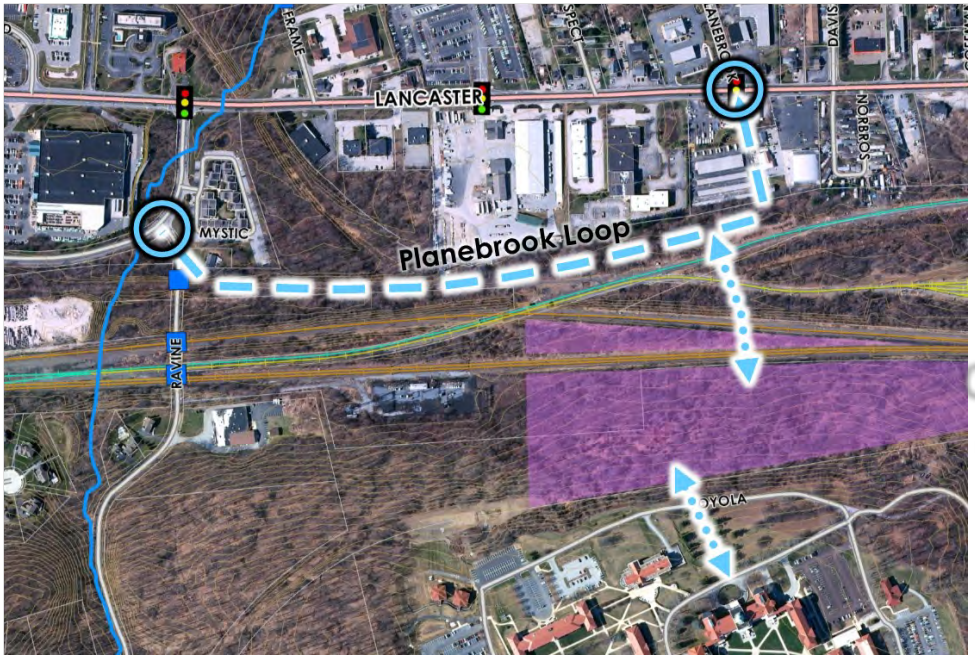
Of the options identified involving a new bridge, Ravine Relocated is the most feasible due to the relatively short distance between the tracks, available properties on the north and south sides, and the existing topography. In addition to providing access to the Immaculata station site, this option could help to address overall community and circulation constraints by providing a less restricted north-south connection over the various railroad tracks. Additionally, it could enhance access to Immaculata University's campus without introducing significant traffic and potential conflicts in the heart of the campus. While the Ravine Relocated option is feasible and provides numerous benefits, it requires a significant investment due to the scope of the new roadway connections and bridge.

**Bicycle, Pedestrian and Bus Access**

While addressing the existing constrained railroad bridges or providing a new bridge over the railroad tracks is highly desirable and beneficial, these options are both costly and complex. With a focus on

providing non-vehicular access between Route 30 and the Immaculata station site, the concept of the Planebrook Loop was identified. As illustrated in the Planebrook Loop Concept, this option includes building a new roadway connection between the intersections of Phoenixville Pike/Ravine Road and Route 30/Planebrook Road. The new roadway primarily uses land owned by Norfolk Southern that is not used for active tracks. The new roadway would include a bus and drop-off/pick-up area, as well as sidewalks for pedestrian access to Route 30. This option includes a pedestrian overpass to connect the bus and pick-up/drop-off area on the Planebrook Loop with the station platforms and other station facilities. This concept provides a more direct pedestrian connection to the planned mixed use area on Route 30 at Planebrook Road.

### Planebrook Loop Concept




**Legend**

- New Roadway Access
- New Bicycle/ Pedestrian Access
- Intersection Improvements

The Planebrook Loop Concept, in conjunction with providing a direct pedestrian access to Immaculata's campus on the south side of the tracks, offers numerous benefits for providing dedicated bicycle, pedestrian, and bus access to the Immaculata station site. As a result, the Planebrook Loop became a key component of the station conceptual design plan.

**Preferred Access and Circulation Improvements**

Based on the evaluation of various improvement options and input from stakeholders and the public, preferred access and circulation improvements were selected for the Immaculata station site. Vehicular access to the parking area is provided via College Avenue/Frazer Road

and a new roadway along the south side of the railroad tracks. This access includes signalization and intersection improvements at College Avenue and Route 352 (Sproul Road), as well as upgrades to both College Avenue and Frazer Road. Intersection improvements, including additional turn lanes, are also included at the intersection of Route 30/Route 352 (Sproul Road). Primary access for bicyclists, pedestrians, bus/shuttle riders, and other passengers who are picked-up/dropped-off is provided via the Planebrook Loop, including intersection improvements at Route 30/Planebrook and Ravine Road/ Phoenixville Pike. The Planebrook Loop likely requires removing the existing northern railroad bridge on Ravine Road. A direct pedestrian pathway or stairs to Immaculata's campus should be provided north of Villa Maria Hall, which reinstates the access route to the former Immaculata Train Station on the West Chester Branch. These improvements represent Phase 1, which are critical to the establishment of the Immaculata Train Station.

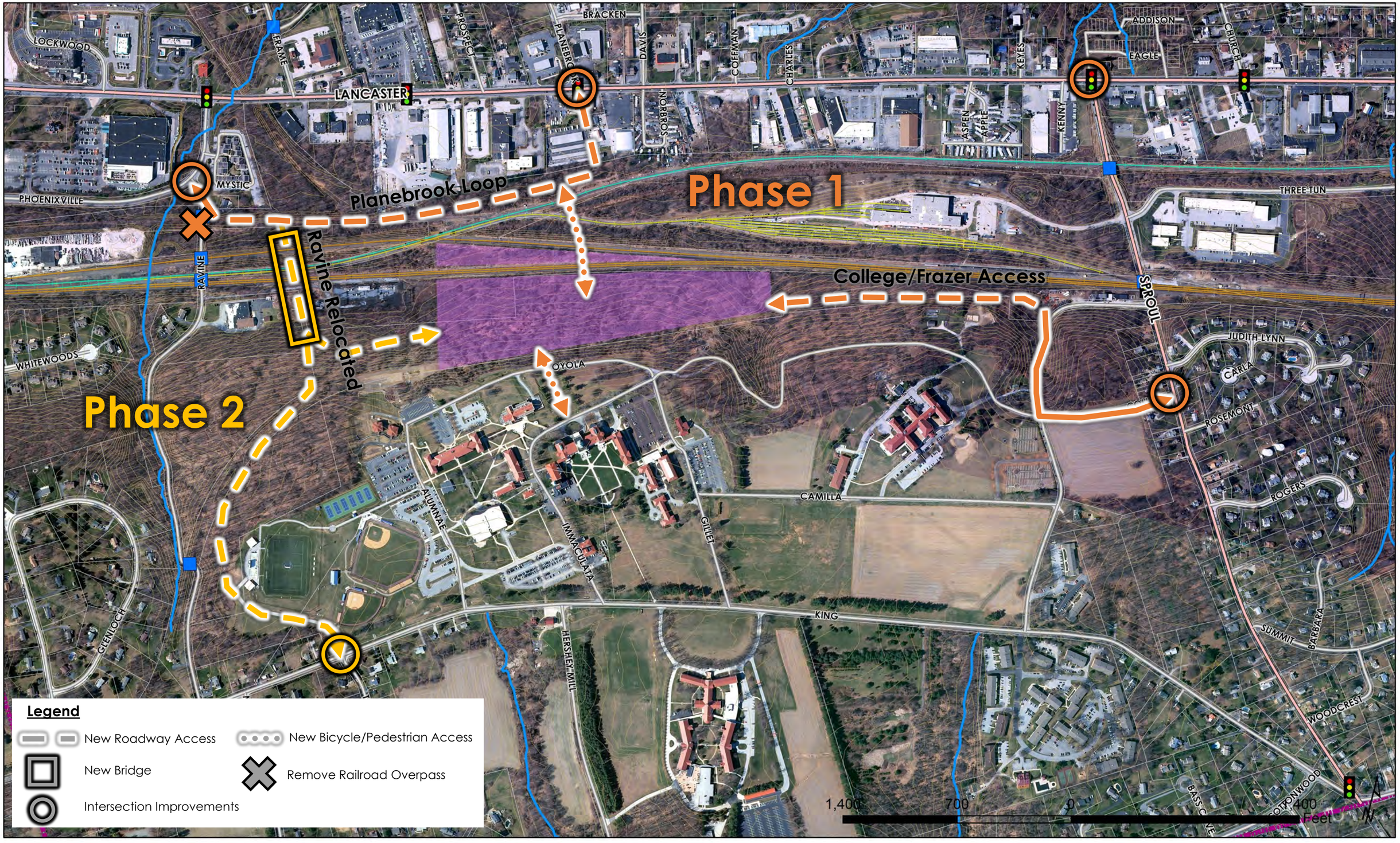
The option of Ravine Relocated, as previously described, is identified as Phase 2 of improvements. While it is not necessary to provide train station access, the Ravine Relocated concept does address overall circulation issues in the area and would enhance access to the train station, as well as Immaculata's campus. Phase 2 improvements could be completed independently of the train station project. Additionally, the Ravine Relocated concept would require further evaluation, including traffic analysis and conceptual engineering.

### Access and Circulation Options Studied—Immaculata Site

| | |
|---|---|
| **Replacing Railroad Bridges** | |
| Ravine Road | Dismissed |
| Route 352 (Sproul Road) | Dismissed |
| **New Bridges** | |
| Planebrook Extended | Dismissed |
| Frazer Extended | Dismissed |
| Ravine Relocated | Preferred Phase 2 |
| **New Roadways** | |
| College/Frazer Access | Preferred Phase 1 |
| **Multimodal Access** | |
| Planebrook Loop | Preferred Phase 1 |

*Immaculata Station*

*Access and Circulation Improvements*



## Three Tun Station Site Access

Access to the Three Tun station site is more straight forward than the Immaculata site, because Three Tun Road currently provides access to the proposed station site. However, various additional access options were considered and are detailed below and on the map on the following page. Although Three Tun Road provides vehicular access to the site, access for people walking and biking is very challenging due to the lack of dedicated bicycle or pedestrian infrastructure.

- **Route 352 (Sproul Road)**

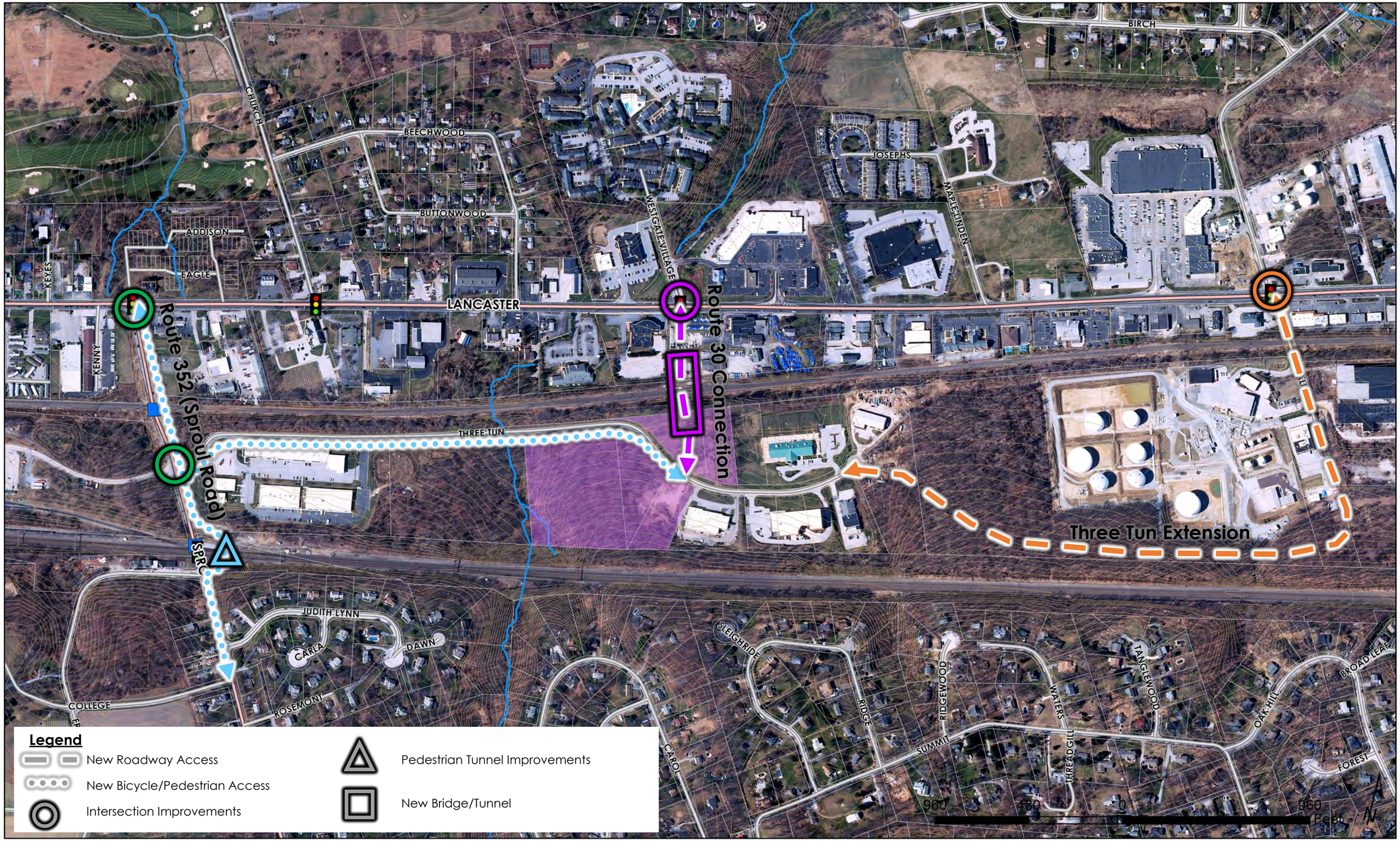
  Route 352 (Sproul Road) is critical for access to Three Tun Road and the station location. One of the key constraints on Route 352 (Sproul Road) is the existing railroad bridge for the active Amtrak tracks, which limits north-south movement on Route 352. The current railroad bridge has a 10 foot vertical clearance, which restricts some trucks and larger vehicles. The width of the bridge is also limited and there are no dedicated bicycle or pedestrian facilities. Pedestrian access is provided with a traffic signal that stops traffic to allow a pedestrian to walk, posing both safety and operational concerns. As described in the Access and Circulation section for the Immaculata station site, the option of replacing this bridge was considered and dismissed.

  For the Three Tun station site, pedestrian or bicycle access to and from areas south of Amtrak's tracks (including Immaculata University's campus) is critical. There is an existing pedestrian tunnel just east of Route 352 (Sproul Road) that provided cross track circulation for former Frazer Train Station. The pedestrian tunnel is still intact, but is now sealed. This tunnel could be opened and upgraded with connecting paths on either side to provide pedestrian and bicycle access to the Three Tun station site.

  Given existing and future traffic conditions, intersection improvements are needed for Route 352 (Sproul Road) at Route 30 and Three Tun Road. The intersection improvements include additional turning lanes at Route 30 and signalization at Three Tun Road. These improvements were identified in East Whiteland Township's Act 209 Study and would help to provide access to the train station.

- **Route 30 Connection**

  Options for providing a more direct connection between Route 30 and the Three Tun station site were evaluated, including providing a new bridge or tunnel to cross the active Norfolk Southern tracks.




**Legend**

- New Roadway Access
- New Bicycle/Pedestrian Access
- Intersection Improvements
- Pedestrian Tunnel Improvements
- New Bridge/Tunnel

Options for providing a vehicular connection or a pedestrian only connection were considered. Due to the required clearance, existing grades, and close proximity of Route 30 to the Norfolk Southern tracks, a new bridge or tunnel was deemed infeasible.

- **Three Tun Extension**

  Extending Three Tun Road to Malin Road was evaluated as part of the Malin Road Extension Feasibility Study (2010), which was completed by Malvern Borough in partnership with East Whiteland Township. Based on this previous study, the new roadway connection is feasible, but costly. The estimated cost for the new roadway and other associated improvements was $8.8 to $11 million dollars (2010 dollars). This option, while potentially beneficial to overall access and circulation in the area, is not critical for providing access to the train station and can continue to be considered as an independent project.

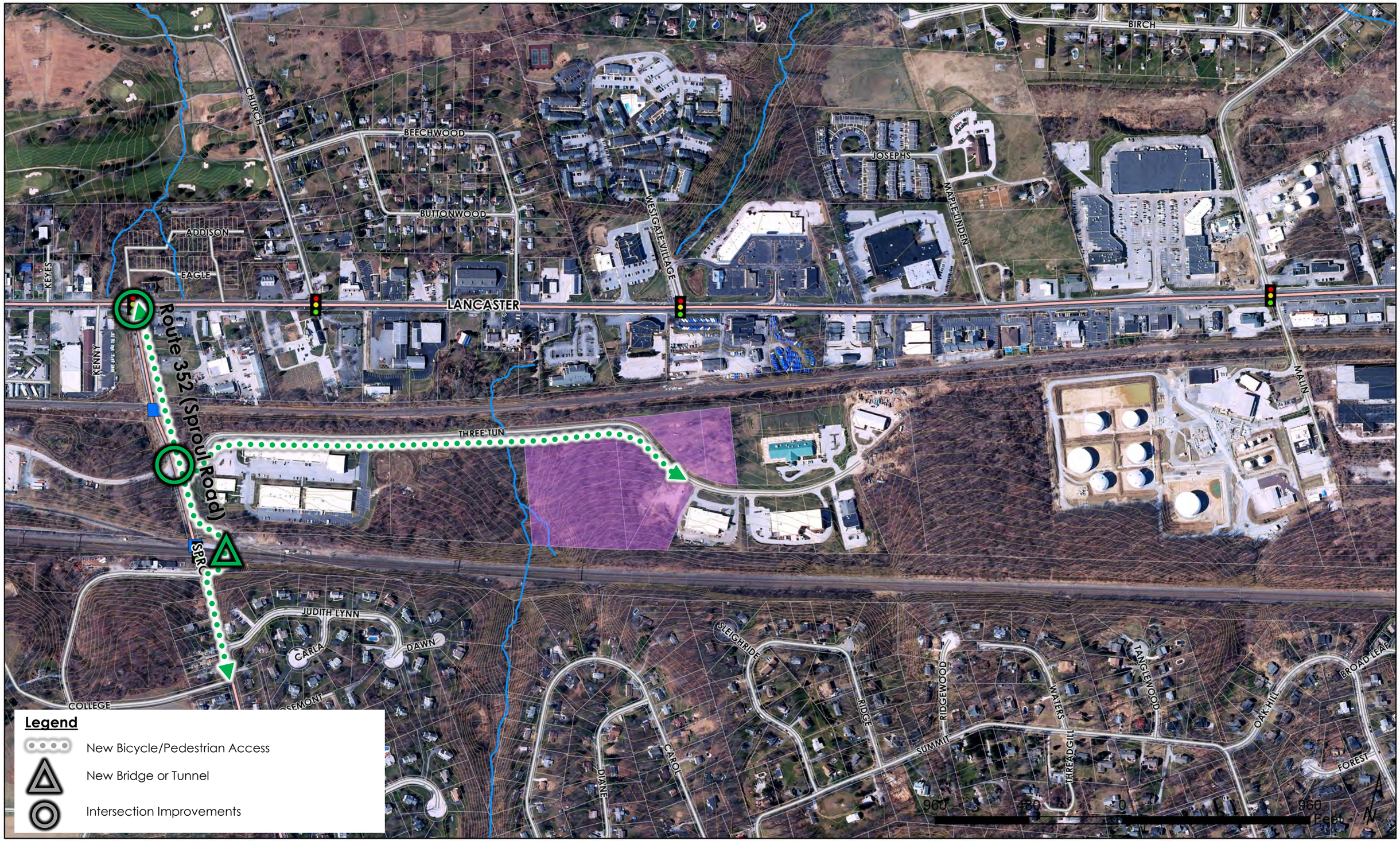
**Preferred Access and Circulation Improvements**

The preferred access and circulation improvements for the Three Tun station site are focused on the Route 352 (Sproul Road) corridor. The intersection improvements include additional turn lanes at Route 352 (Sproul Road)/Route 30 and signalization at Route 352 (Sproul Road)/ Three Tun Road. Pedestrian access improvements include upgrading the existing pedestrian tunnel just east of Route 352 (Sproul Road) and providing connecting paths to the north and south. To the north, the preferred improvements include a sidewalk connection to Route 30 and a sidewalk on the south side of Three Tun Road between Route 352 (Sproul Road) and the station site.

Access and Circulation Options Studied—Three Tun Site

| | |
|---|---|
| **New Bridges** | |
| Route 30 Connection | Dismissed |
| **New Roadways** | |
| Three Tun Extension | Dismissed |
| **Intersection Improvements** | |
| Route 352 (Sproul Road)/ Route 30<br>Route 352 (Sproul Road)/Three Tun Road | Preferred |
| **Multimodal Improvements** | |
| Pedestrian Tunnel at Sproul Road | Preferred |

# *Three Tun Station* — *Access and Circulation Improvements*



## Track and Platform Configuration

One of the key factors in the location and design of a train station is the configuration of the track and platforms. It is desirable to locate the platforms in an area where track runs in a straight line. This is done to meet Amtrak requirements, and is a key factor in determining feasible station locations and high level platform design. High level platforms are not permitted to be located in an area where the track has more than 1.67 degrees of curvature or more than one inch of super elevation. This, along with other factors as described in this section, were considered when selecting the preferred platform configuration for each station site.

In reviewing the existing railroad infrastructure in these areas, there are several platform configurations that can be envisioned, each with different impacts to this infrastructure. Appendix 2.1 provides descriptions and sketches of the various configurations considered.

The track numbering system to the right is referenced in the various platform configuration options that were considered for each station site. In particular, there are two options for providing a new third track in the future and they are identified as either New Track 2 or New Track 3.

### Track Numbering System

***Track 1**: existing inbound track at the south side of the Amtrak right of way*

***New Track 2**: a new outbound track, to the north and parallel to Track 1*

***New Track 3**: a new outbound track, to the south and parallel to Track 4*

***Track 4**: existing outbound track to the north side of the Amtrak right of way*

**Factors for Evaluating Platform Configurations**

There are several key factors for evaluating each of the platform configurations as outlined below.

A. **Track, Signal, and Catenary Changes**—Some configurations require extensive changes and additions to the track, signal, and catenary infrastructure. Where new tracks are installed, extensive reconfigurations to track, signals, and catenary would be required, particularly at the Glen, Frazer, and Paoli interlockings. The most significant impact would be a major increase in the cost of the project. Extensive interlocking work has a large impact to railroad operations during construction, which always needs to remain in service. At either location, using side platforms north of Track 4 – outbound and south of Track 1 – inbound presents the least impact to existing railroad infrastructure, with changes to track, signals, and catenary due only to operational considerations which may become evident once operational modeling is performed.

B. **Future Operational Considerations**—Scenarios where the future installation of both New Tracks 2 and 3 would be obstructed are not ideal, as this prohibits future capacity

expansion and segregation of Amtrak and Norfolk Southern operations from SEPTA's operation. Obstructing one of these new tracks, while more palatable, also limits future capacity expansion. While there is no concern for additional capacity at this time, not reserving future expansion may be short sighted. As a result, options requiring new track construction have been eliminated.

Amtrak and PennDOT are planning and coordinating on a variety of potential track improvements along the Keystone Corridor. The list of the Proposed Passenger Rail Projects in the 2015 Pennsylvania State Rail Plan includes providing a New "Potts" Interlocking in conjunction with Glen 103 Switch Removal and retiring the Downs Interlocking for an estimated cost of $23.4 million (2015 dollars). These improvements were originally identified in conjunction with the relocation of the Downingtown Station. The new Potts Interlocking will be configured to allow SEPTA trains to start all service at Exton Station, thus making it possible to provide the Immaculata site with half-hour service equal to the Three Tun location. Glen Interlocking will also be reconfigured and upgraded as part of this project. Frazer Yard operations will change significantly, as Frazer Interlocking will see substantially less use, and Glen Interlocking will be the primary exit of the trains. There is not a specific schedule for these improvements, as they are still in the design phase.

Amtrak also shared future plans to modify the track within the Three Tun site as shown in Appendix 2.2. These modifications involve extending and moving the existing portion of Track 3 within Frazer Interlocking to the east and extending the Yard Lead Track parallel to Track 4 and moving the switch eastward. These change are intended to improve operational efficiencies of Amtrak's Keystone Corridor trains and SEPTA's trains leaving Frazer Yard. The existing portion of Track 3 is used to allow trains from Frazer Yard to queue until they are permitted to enter Track 1. Presently the configuration of Frazer Interlocking requires trains to reduce their speed on Track 4, but the modifications would allow movements that are at a higher speed, thus improving schedule times. Amtrak did not provide a specific timeframe for the proposed track changes.

C. **Power and Signal Cable Relocations**—All scenarios require the overhead power distribution cables to be raised to allow pedestrian bridge installation. Typically, these lines are kept

very high due to their high voltage. It is also suspected that there are buried signal and communication cables along the tracks. These will impact the construction of foundations and would be required to be relocated. Since these considerations are common to each configuration, it does not affect selection.

D. **Norfolk-Southern Participation**—Any scenario which impacts Norfolk Southern operations creates the need for additional coordination and expands the approval process which only complicates and delays design and construction. This impact will occur with any platform configurations that require new track to be installed, as modifications to the Glen Interlocking will be required. While Amtrak maintains ownership of Glen Interlocking, it is Norfolk Southern's access point to their heavily traveled freight line to Trenton and beyond.

E. **Constructability** — Both sites have limited access to one side because of constraints of land use (such as residential neighborhoods) and steep terrain. This creates a larger challenge for construction along an existing railroad operation. In some scenarios, more than one existing track will need to be crossed for construction to occur, which would increase operational impacts.

F. **Steep Slopes**—In many areas, there are steep slopes adjacent to the tracks in locations where platforms would be constructed. While this can be mitigated somewhat, it will be a concern for constructability.

A detailed comparison of these factors is provided in Appendix 2.1.

**Platform Configuration**

Ultimately, for the purpose of site comparison, the platform configurations selected were determined by matching the platform configurations at existing adjacent stations. Other alternatives may be preferred in the future, however other feasible configurations would be very similar in cost. The preferred platform configuration for each site are as follows:

Immaculata—Side Platforms, North of Track 4 and South of Track 1

Three Tun—Side Platforms, North of Track 4 and South of Track 1

## Station Concept Plans

Station concept plans have been developed for the two sites: Immaculata and Three Tun. The preliminary programming analysis based on input from stakeholders and SEPTA representatives, as well as features of other similar SEPTA regional rail stations, was documented in Part 1 of this study and formed the basis for the conceptual design plans developed for Part 2. The Americans with Disabilities Act requires all transit facilities to provide equal opportunity and access for persons with disabilities.

**Immaculata**

The Immaculata site is located between Route 30 and Immaculata University on the south side of the inbound track. The station concept includes high level side platforms 700' in length with canopies and heated shelters that are offset from one another due to existing track constraints. The inbound platform includes a heated waiting room with restrooms and a utility room. The main parking lot, which includes drop-off/ pick-up layby's, is located adjacent to the inbound platform and tiered to accommodate the existing grading of the site.

Terminology

*Layby: An area along the side of a driveway or roadway where vehicles may pull off to stop or wait for a short time.*

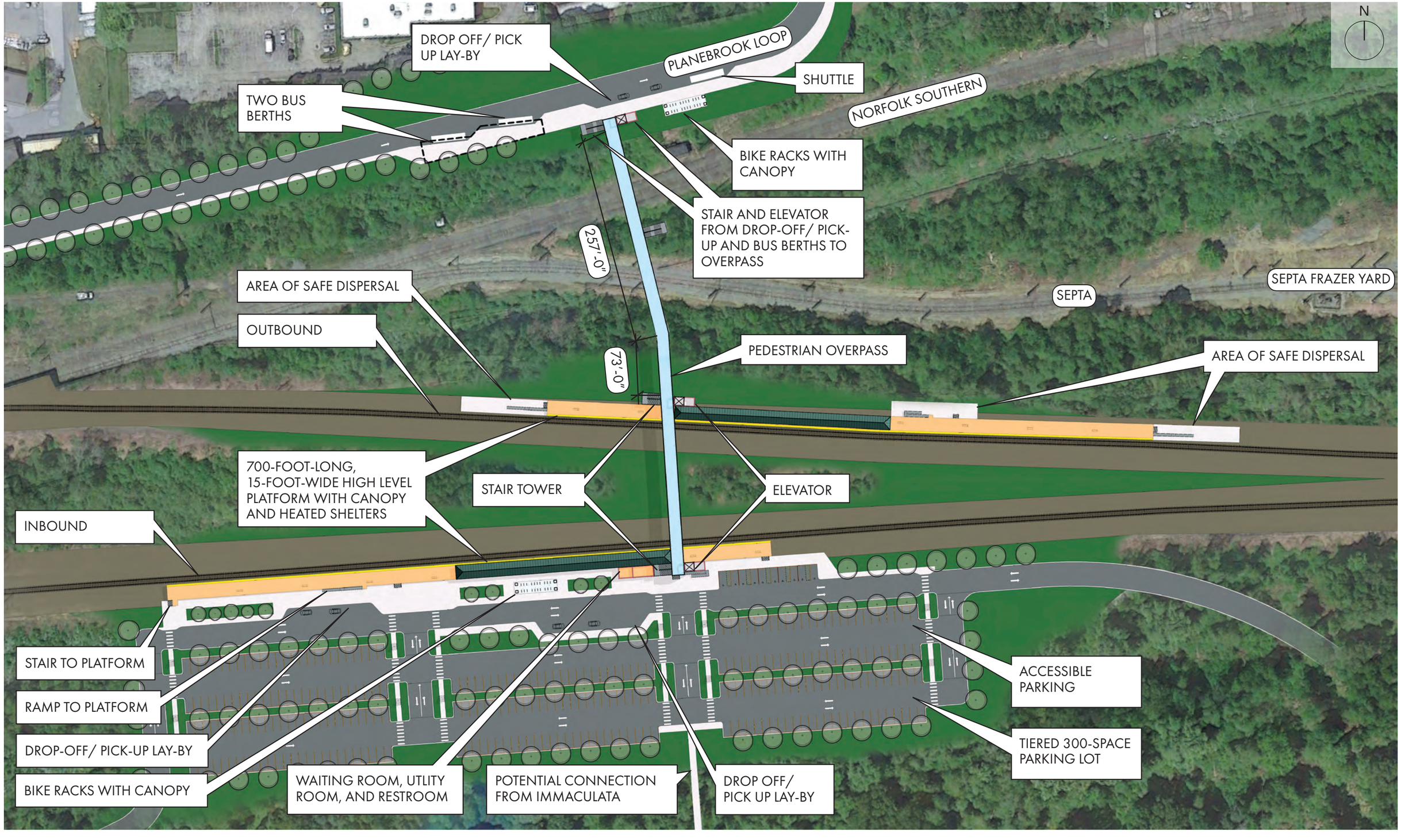
A pedestrian overpass with elevators and stair towers provides cross track circulation for an ADA accessible route between platforms. It should be noted that, when feasible, SEPTA has expressed a preference for ramps instead of elevators to provide ADA accessibility to high level platforms. However, based on the findings from Part 1 of this study, the existing site constraints, and the potential for connecting to Route 30, a pedestrian overpass with stairs and elevators is proposed for this site.

The outbound platform is land locked between multiple rail lines with no direct access to the outbound platform other than from the pedestrian overpass stair and elevator. Due to this constraint, the outbound platform includes areas of safe dispersal for passengers to seek refuge in the event of an emergency.

An opportunity for a direct connection to Immaculata University is possible from the south end of the site. Due to the existing site constraints this connection would need to be further evaluated to determine the best means of realizing this connection. However, it is envisioned to provide a connection to Villa Maria Hall in the heart of Immaculata's campus. A drop-off/pick-up layby and two bus berths, known as the Planebrook Loop, is proposed directly off Route 30. Access to the Planebrook Loop is provided by extending the pedestrian overpass from the outbound platform over the Norfolk Southern line to a stair and elevator located at the Planebrook Loop entrance.

# EWT Train Station Feasibility Study

## *Immaculata Station Site*



# EWT Train Station Feasibility Study

## *Immaculata Station Aerial*

**Three Tun**

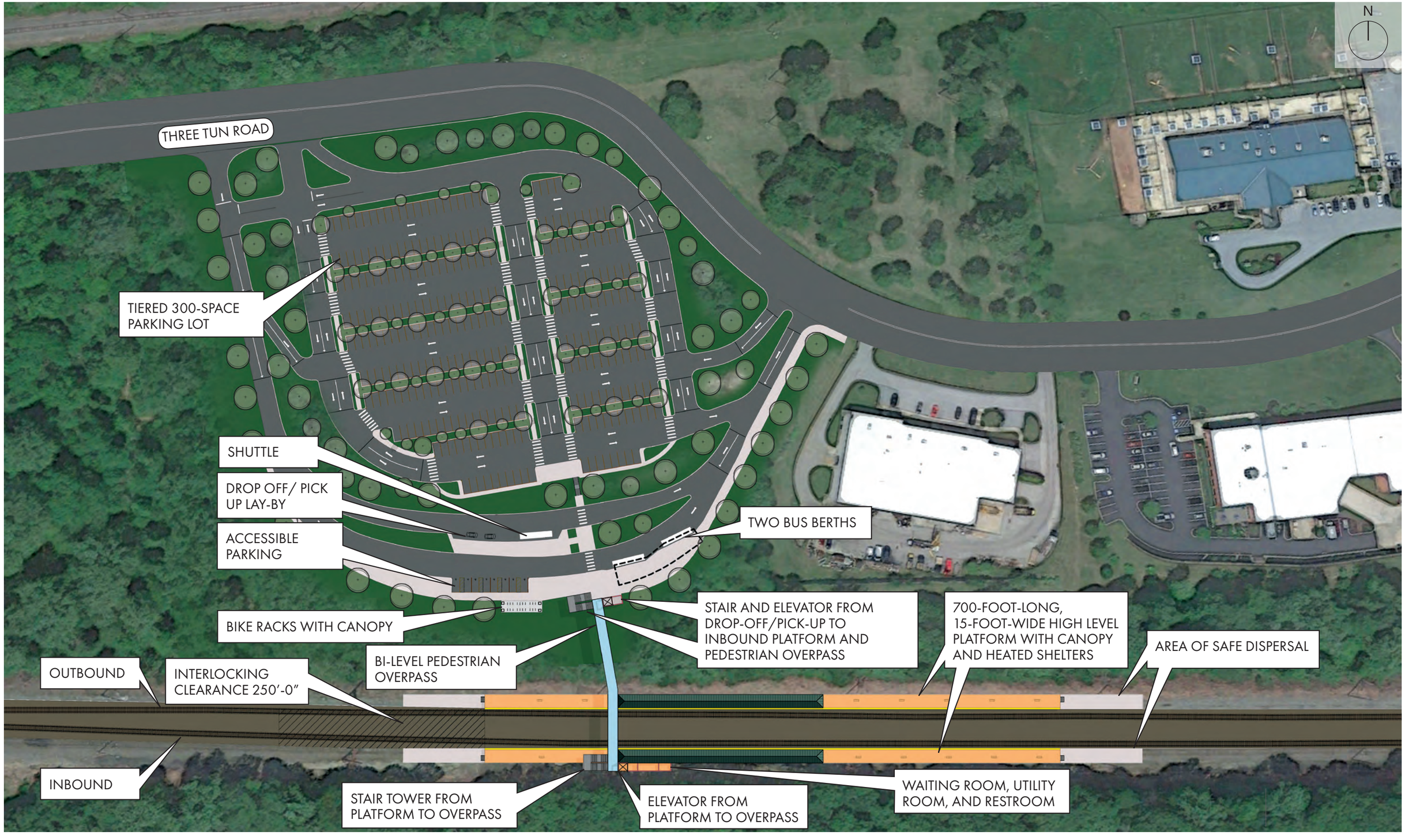
The Three Tun site is located on the north side of the existing outbound (most northern) track. The site is located on a hillside that slopes up from Three Tun Road to top of Amtrak rail. The site is located adjacent to the Frazer Yard Interlock clearance area which sets the western edge of the station platforms. The station concept includes high level side platforms 700' in length with canopies and heated shelters. The inbound platform includes a heated waiting room with restrooms and a utility room. Both the inbound and outbound platforms have areas of safe dispersal for passengers to seek refuge in the event of an emergency.

A designated drop-off/pick-up circulation drive with two bus berths provides direct access to the station entrance and reduces congestion in the parking lot which is located within the circulation loop. The parking lot is sized initially for 300 parking spaces and tiered to accommodate the existing grades.

Stairs and elevators provide cross track circulation for ADA accessible routes from the station entrance at the drop-off/ pick-up area to the outbound and inbound platforms via a bi-level pedestrian overpass. It should be noted that when feasible SEPTA has expressed a preference for ramps instead of elevators to provide ADA accessibility to high level platforms. However, similar to the Immaculata site, based on the findings from Part 1 of this study and the existing site constraints, that approach is infeasible.

# EWT Train Station Feasibility Study

## *Three Tun Station Site*



# *Three Tun Station Aerial*

## Conceptual Service Plan

SEPTA developed conceptual service plans (train schedules) for each station site as an input for ridership forecast models. They are not intended to serve as proposed service schedules. As such, for the purposes of this study, **the conceptual schedules do not resolve scheduling conflicts with Amtrak service on the Keystone Line or impacts to SEPTA's continued through service on other regional rail lines**. Amtrak would require a Rail Traffic Controller (RTC) Simulation to support any proposed schedule changes in the future. Additionally, any future proposed track or infrastructure improvements that would allow for increased service frequency are not accounted for in the conceptual service plan for either of the sites.

With the current infrastructure, the two train station locations identified in this study support very different levels of service. The conceptual service plans are based on the SEPTA schedule for the Paoli -Thorndale regional rail line dated December 2018. Part 1 summarizes the factors that impact service to the two preferred station locations identified in this study. Conceptual service plans for each station site are described below. Adding a new station in East Whiteland Township at either location would increase travel times at Thorndale, Downingtown, Whitford, and Exton stations by two minutes in each direction.

**Conceptual Service to Three Tun Site**

Service to the Three Tun station site would be similar to the service currently provided at SEPTA's Malvern Station. This includes the frequent express services that bypass stations closer to Philadelphia and the Great Valley Flyer service, which provides service west of Paoli only. The Three Tun station would also serve as the beginning or end of service for multiple trains throughout the day. Below are brief descriptions of projected Weekday Inbound, Weekday Outbound, Saturday, and Sunday/Holiday services.

- Weekday Inbound Service: Half hourly service to Philadelphia would have trains leaving the Three Tun station site approximately two minutes prior to the times that trains are currently serving the Malvern Station. In most cases trains would depart the Three Tun station approximately every half hour.
- Weekday Outbound Service: Half hourly service from Philadelphia would have trains arriving at the Three Tun site approximately two minutes after they currently do at Malvern Station. In most cases the trains would arrive at the Three Tun station approximately every half hour.

- Saturday Service: Trains to Philadelphia would depart approximately two minutes before they currently do at SEPTA's Malvern Station. Trains from Philadelphia would arrive approximately two minutes after they currently do at SEPTA's Malvern Station. The Three Tun station site would be served approximately every half hour or every hour in each direction depending on the time of day.
- Sunday and Major Holiday Service: Trains to Philadelphia would depart approximately two minutes before they currently do at SEPTA's Malvern Station. Trains from Philadelphia would arrive approximately two minutes after they currently do at SEPTA's Malvern Station. Trains would serve this station every hour in each direction, and the Three Tun station would be the beginning/ terminus of service on the Paoli/Thorndale Line.

**Conceptual Service to Immaculata Site**

Hourly service to the Immaculata station site would be similar to the service that SEPTA currently provides to Exton Station. This would include the Great Valley Flyer service. Below are brief descriptions of projected Weekday Inbound, Weekday Outbound, Saturday, and Sunday/Holiday services.

- Weekday Inbound Service: Hourly service to Philadelphia would have trains leaving a station at the Immaculata site approximately six minutes after to the times that trains are currently serving the Exton Station. In most cases trains would depart the Immaculata station approximately every one hour.
- Weekday Outbound Service: Hourly service from Philadelphia would have trains arriving at the Immaculata station site approximately six minutes before they currently do at Exton Station. In most cases the trains would arrive at the Immaculata station approximately every one hour.
- Saturday Service: Trains to Philadelphia would depart approximately six minutes after they currently do at SEPTA's Exton Station. Trains from Philadelphia would arrive approximately six minutes before they currently do at Exton Station. The Immaculata station site would be served approximately every one hour or every two hours in each direction depending on the time of day.
- Sunday and Major Holiday Service: In this scenario, there would be no Sunday or holiday service to the Immaculata station. SEPTA does not currently provide this service to Exton Station.

Half hour service levels and frequency to the Immaculata Site would be similar to those identified for the *Conceptual Service to Three Tun Site*. This includes the frequent express services that bypass stations closer to Philadelphia and the Great Valley Flyer service, which provides service west of Paoli only. The Immaculata station would also serve as the beginning or end of service for multiple trains throughout the day.

Additionally, there is potential that SEPTA's current fixed route bus services would be able to provide service to a new train station in East Whiteland Township. The two bus routes that currently operate within the area are SEPTA 92 along King Road and SEPTA 204 along Route 30. Based on the conceptual station designs for the two sites and current infrastructure limitations, both sites could potentially be served by SEPTA 204 by diverting from Route 30. Low bridges on Sproul Road (PA 352) and Ravine Road prohibit access to the sites for SEPTA 92 vehicles. Pedestrian access between the Immaculata site and SEPTA 92 could be provided through Immaculata University's campus. Additionally, SEPTA 92 could provide more direct access to the Immaculata site with additional access improvements identified as Phase 2 or Ravine Road relocated.

## Capital Cost Estimates

Constructing and providing service to a new train station in East Whiteland Township will require a significant investment in both capital improvements and operations. Rough order of magnitude cost estimates were developed for the capital improvements required to construct a train station at either the Immaculata or Three Tun sites. The cost estimates account for:

- Train station structures and features;
- Railroad infrastructure required to facilitate service to the new station; and
- Access and circulation improvements.

The cost estimates are appropriate to use for planning and budgeting purposes only. More detailed construction cost estimates would be developed during a future design phase.

The estimates provided in this report do not include costs for providing train service to the station, which would include costs of operations and possibly costs for purchasing and maintaining additional rail cars. Moreover, the costs do not include other railroad infrastructure improvements that may be planned by Amtrak or SEPTA, which could impact one or both station sites.

**Construction and Contingency**

- The station and railroad infrastructure estimates were developed based on the station concept plans and actual or estimated costs from similar station projects. The estimates include the following key elements.
    - Train Station Elements: Platforms and foundations, canopies, waiting rooms, restrooms, utility room, elevators, stair towers, pedestrian overpasses, equipment and furnishings, bicycle racks, services (electric, fire suppression, water, and sewer), site grading and earthwork, paving and pavement markings for parking areas, curbs and sidewalks, stormwater management, and landscaping.
    - Railroad Infrastructure: Relocating overhead wires and underground ductbanks, signals, and flagging during construction by Amtrak, Norfolk Southern, and/or SEPTA.
- The access and circulation improvement estimates were based on limited field reconnaissance, estimated quantities, and unit costs from recently bid projects. Additionally, the estimates include lump sum approximations for maintenance and protection of traffic, erosion and sediment control, mobilization, and utility relocation and demolition.
- The cost estimates include a contingency of 25% given the conceptual nature of design work, scope of the improvements, unknown future conditions, and overall complexity of project. This contingency percentage is consistent with guidance included in PennDOT's Estimating Manual (Publication 352) for major, complex projects in the planning phase. The costs do not include any environmental remediation (including but not limited to removal and replacement of contaminated soils) or environmental impact mitigation.

**Engineering and Construction Management/Inspection**

- Estimates for engineering and permitting reflect 12—15% of the construction costs.
- Estimates for construction management/inspection reflect 5—8% of the construction costs.

**Right-of-Way**

- Estimates of the existing and required right-of-way were developed based on GIS data obtained from Chester County, aerial photography, and limited field reconnaissance. Legal right-of-way

lines or property lines have not been independently verified through field survey or title/deed research.

- Estimates of the value of right-of-way were developed based on readily available information regarding current real estate listings and recent real estate sales for comparable properties. The estimates generally reflect current market conditions and general trends. The right-of-way estimates were not prepared or reviewed by a certified real estate appraiser.
- Estimates do not include land owned by Amtrak or SEPTA due to the current Station Lease Agreement, which would need to be amended to include the proposed East Whiteland Train Station.
- For the Immaculata Station site, the estimates do not include the purchase of land owned by the Sisters of IHM due to current conversations regarding a potential public-private partnership involving the Sisters of IHM providing the land for the train station as contribution to the project.
- Estimates do not include cost of temporary construction easements that may be needed to facilitate construction
- Existing legal rights-of-way and existing property lines, as well as the size and location of any required rights-of-way (temporary or permanent) will need to be determined during preliminary engineering for proposed improvements.

Rough Order of Magnitude Cost Estimates for Immaculata Site

| | Train Station Elements (including pedestrian circulation) & Railroad Infrastructure | Multimodal Access & Circulation *Phase 1* | TOTAL |
|---|---|---|---|
| Construction Sub-Total | $ 66,678,000 | $ 14,385,000 | |
| Contingency (25%) | $ 16,670,000 | $ 3,597,000 | |
| **Construction Total** | **$ 83,384,000** | **$ 17,982,000** | |
| | | | |
| Design (12—15%) | $ 10,002,000 | $ 2,698,000 | |
| Construction Inspection/ Management (5—8%) | $ 4,168,000 | $ 1,439,000 | |
| Right-of-Way | | $ 1,930,000 | |
| | | | |
| **TOTAL (2019)** | **$ 97,518,000** | **$ 24,049,000** | **$ 121,567,000** |

*Note: All estimates rounded up to the nearest thousand.*

### Rough Order of Magnitude Cost Estimates for Immaculata Site—Access & Circulation *Phase 2*

| | Multimodal Access & Circulation *Phase 2* |
|---|---|
| Construction Sub-Total | $ 17,405,000 |
| Contingency (25%) | $ 4,352,000 |
| **Construction Total** | **$ 21,757,000** |
| | |
| Design (15%) | $ 3,264,000 |
| Construction Inspection/ Management (8%) | $ 1,741,000 |
| Right-of-Way | $ 216,000 |
| | |
| **TOTAL (2019)** | **$ 26,978,000** |

*Note: All estimates rounded up to the nearest thousand.*

The cost estimates for the Immaculata Site do not include the costs for railroad infrastructure improvements necessary to provide half hourly service. The 2015 Pennsylvania State Rail Plan includes a cost estimate of $23.4 million for the New Potts Interlocking project, which includes retiring the Downs Interlocking and Glen Switch Removal.

### Rough Order of Magnitude Cost Estimates for Three Tun Site

| | Train Station Elements (including pedestrian circulation) & Railroad Infrastructure | Multimodal Access & Circulation | TOTAL |
|---|---|---|---|
| Construction Sub-Total | $ 53,053,000 | $ 8,350,000 | |
| Contingency (25%) | $ 13,264,000 | $ 2,088,000 | |
| **Construction Total** | **$ 66,317,000** | **$ 10,438,000** | |
| | | | |
| Design (12—15%) | $ 7,959,000 | $ 1,566,000 | |
| Construction Inspection/ Management (5—8%) | $ 3,316,000 | $ 836,000 | |
| Right-of-Way | $ 1,920,000 | $ 500,000 | |
| | | | |
| **TOTAL (2019)** | **$ 79,512,000** | **$ 13,340,000** | **$ 92,852,000** |

*Note: All estimates rounded up to the nearest thousand.*

**Cost Estimates Comparison and Conclusions**

The Immaculata Station is estimated to cost more to design and construct than the Three Tun Station. The key differences in the costs between the two sites is related to the access and circulation improvements, including the pedestrian overpass and connection to the Planebroook Loop that are part of the Immaculata Station conceptual plan. These distinctive improvements provide a better connection between the station site and Route 30, which is consistent with local plans and was a priority identified by stakeholders. For planning and budgeting purposes, a key conclusion is that a new train station in East Whiteland Township is estimated to cost roughly $100 million.

## Population and Employment Forecasts

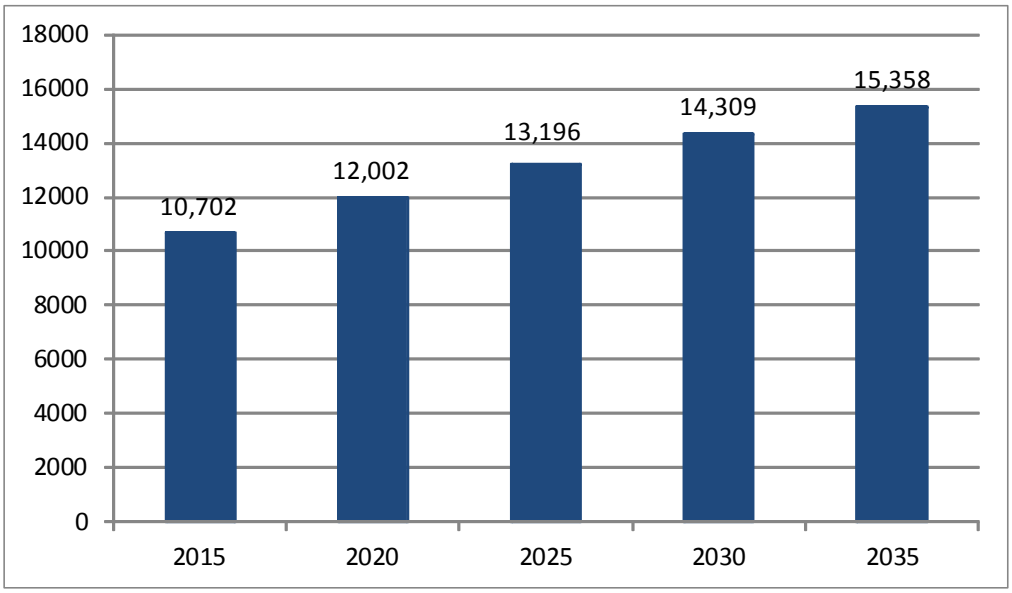
East Whiteland Township is a growing suburb approximately 25 miles northeast of Center City Philadelphia. Recent residential, commercial, and office development proposals in the township indicate that it is an attractive location with potential for more growth. According to US Census 2013-2017 American Community Survey data, East Whiteland is home to approximately 11,072 people. There are approximately 22,681 jobs in East Whiteland Township as of 2015. (LODES Version 7.3)

As part of this Study, DVRPC has requested an assessment of how the current population and employment projections for East Whiteland and its neighboring municipalities would be impacted by a potential new train station. These updated projections will assist DVRPC in calibrating ridership forecasts, an important factor to consider in the new station's viability.

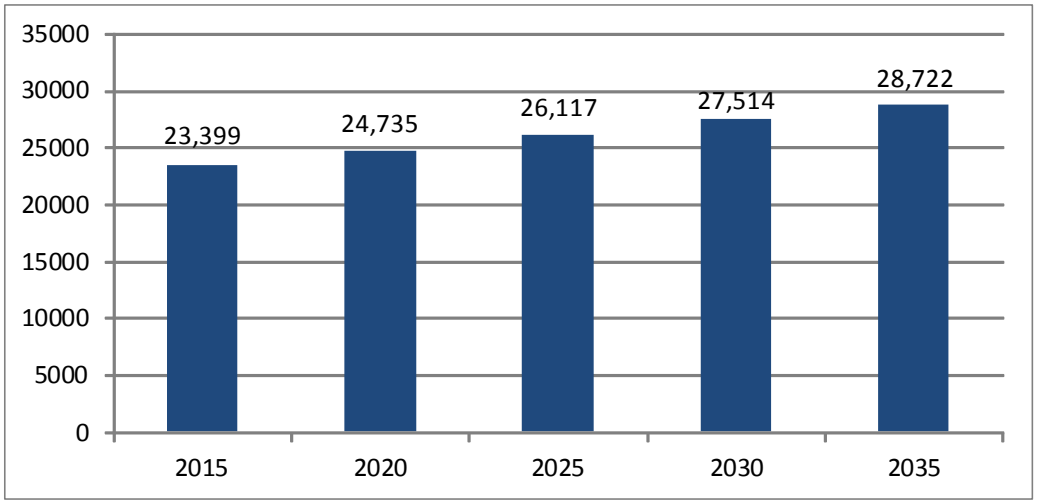
**Existing Population and Employment Projections**

DVRPC produces projections for its nine-county metropolitan area once every five years. The most recent projections for East Whiteland Township are shown in the charts on the following page. It is anticipated that population in the Township will increase by 4,700 between 2015 and 2035, a 44% increase, to a total of 15,358. Employment within the Township is projected to increase by 23%, or 5,300 jobs during that same period, for a total of 28,722 in 2035.

DVRPC Population Projections for East Whiteland Township




DVRPC Employment Projections for East Whiteland Township




**Reviewing the Existing Population and Employment Projections**

In recent years, East Whiteland Township has experienced rapid changes. With large developments such as Uptown Worthington, Atwater Village, and the potential revitalization of the Great Valley Corporate Center, a significant amount of development has occurred and much remains in the pipeline. These approved developments can provide a "reality check" on the current projections for 2035, and thus help to clarify the baseline before considering future train station impacts on population and employment.

In 2017, East Whiteland completed a Land Use Assumptions Report to lay the groundwork for an Act 209 Study for assessment of a transportation impact fee. This study inventoried and analyzed the available lands in order to estimate the total development that could occur under current zoning. This "build out" analysis:

- Inventoried all approved and pending development;
- Inventoried vacant land and calculated the capacity of these parcels for future development by netting out floodplains, steep slopes, restrictive easements, and other conditions that would decrease the amount of development that could take place; and
- Estimated potential locations for redevelopment, with focus on parcels that were underutilized or functionally obsolete, those located along Route 30, and those within the Great Valley Corporate Center.

The tables below and on the following page depict the approved development at the time of this report.

### Approved Residential Development and Projected Population (2017)

| Project[1] | Single-family Detached | Two-family | Single-family Attached | Apartment Units |
|---|---|---|---|---|
| Atwater Village | 68 | 80 | 401 | |
| 99 Church Road | 43 | | | |
| Celia Tract | | | 59 | |
| Cockerham Tract | | | 51 | |
| Haven at Atwater | | | | 326 |
| Linden Hall | | | 60 | |
| Swedesford Square | | | | 244 |
| Uptown Worthington | | | | 753 |
| **Total Units** | **111** | **80** | **571** | **1,323** |
| Persons/HH (type.)[2] | 3.51 | 2.22 | 2.22 | 1.67 |
| Projected Population by Unit Type | 389 | 178 | 1,267 | 2,209 |
| **Total Projected Population** | **4,043** | | | |

*Source: 1. East Whiteland Township; 2. Montgomery County Planning Commission, Characteristics of the Population in New and Existing Housing Units, January 2012*

Approved Non-residential Development (2017)

| Project[1] | Approved Square Footage |
|---|---|
| Atwater Village Commercial | 24,250+13,200 SF Charter School |
| Exeter 8 Lee | 121,575 |
| Immaculata University | 14,540 |
| People's Light & Theater | 2,152 |
| Tom Ward | 5,800 |
| 20 Moores | 198,000 |
| Uptown Worthington | 422,500 |
| Lincoln Court | 16,000 |
| 6 GV PW | 57,000 |
| **Total SF** | **845,125** |
| Estimated Employment | 3,126 jobs |
| *Source: 1. East Whiteland Township* | |

When comparing the projected population and employment from the developments approved in 2017 to the 2035 Population and Employment Projections, the following is clear:

- With the build-out of all residential units approved in 2017, the Township would meet 86% of the 2035 population; and
- With the build-out of all nonresidential square footage approved in (and before) 2017, the Township would meet 59% of its 2035 employment projections.

The fact that over half of the population and employment projected for the next 20 years is already approved and in the pipeline in 2017, may be an indicator that the projections are underestimated. However, in the two years since the Land Use Assumption Report, it is also clear that even approved development and subsequent absorption by the market does not happen as fast as may be anticipated.

**Land Use Assumptions Report: Total Build-out and Baseline Projections**

While the purpose of the Land Use Assumptions Report was to estimate development for a ten-year period (2017-2027), the analysis laid the groundwork for ultimate build out in the Township and then calibrated these estimates down, assuming that the build-out would occur over a much longer period than the next ten years.

The Land Use Assumptions report estimated that under existing Township zoning regulations, the total build-out, including redevelopment, would be:

- 5,000,000 square feet of nonresidential space; and
- 1,255 residential units of a diversity of types, but primarily attached and multifamily (based on previous approvals).

Using this build-out as the baseline for the 2035 population and employment projections, it is assumed that all approved units and square footage will be built out by 2025 and that an additional 25-50% of the residential build-out will be approved and built by 2035.

### 2035 Projected Population (Before Train Station)

| | | |
|---|---|---|
| A | **Existing Population (2015)[1]** | **10,702** |
| B | **Additional Population from Approved Units[2]** | 4,043 |
| C | **Additional 25-50% of total build-out approved and built by 2035[3]** | 300-600 units |
| D | **Population equivalent[4]** | 660-1,320 persons |
| E | **Projected Population by 2035[5]** | **15,400 – 16,070** |

*Notes:*

1. *Source: US Census*
2. *See "Approved Residential Development and Projected Population (2017)", page 2-33*
3. *According to the LUAR (2017) Total Build-out under existing zoning was estimated to be 1,255 residential units.*
4. *Units in Row C multiplied by 2.2 (Residential multiplier based upon Montgomery County Planning Commission, Characteristics of the Population in New and Existing Housing Units, January 2012)*
5. *Total of Rows A + B + D*

Similarly, these projections assume that all approved nonresidential square footage will be built out by 2025. However, in terms of additional nonresidential development, we assume that the rate of employment growth will be nearly half as fast as the rate of residential development (similar to the current ratio of population to employment projections put forth by DVRPC). Therefore, the additional amount of the total nonresidential build-out is estimated to be 10% to 20%.

### 2035 Projected Employment (Before Train Station)

| | | |
|---|---|---|
| A | **Existing Employment (2015)[1]** | **23,399** |
| B | **Additional employment gained from 2017 Approved SF by 2025[2]** | 3,126 |
| C | **Additional 10-20% of build-out SF, approved and built by 2035[3]** | 500,000 – 1,000,000 |
| D | **Employment equivalent[4]** | **1,305 – 2,610** |
| E | **Projected Employment by 2035[5]** | **27,830 – 29,140** |

*Notes:*

1. Source: DVRPC
2. See "Approved Non-Residential Development (2017)", page 2-33
3. According to the LUAR (2017) Total Build-out under existing zoning was estimated to be 5,000,000 square feet of non-residential space.
4. Based on Conversion Factors for Employment, Maryland National Capital Park and planning Commission, assuming 55% shopping center/ restaurant; 20% office/R&D; and 25% 'other'
5. Total of Rows A + B + D

Based upon previously approved units and a proportion of estimated build-out, the above population projections for 2035 represent a slight increase over the current projections adopted in 2016. The employment projections fall right in line with DVRPC's existing adopted projections.

**The Impact of a Train Station on Population and Employment**

The concept of a new train station has been well received by the East Whiteland community up to this point (the concept was first introduced in the Township's 2015 Comprehensive Plan and was further advanced in the Route 30 Corridor Master Plan, adopted in 2018.) This excitement is caused by several factors that include helping to build a new, more positive, identity for East Whiteland as a whole and Route 30 in particular by reviving the Village of Frazer, and increased convenience for residents and employers.

However, in discussions with the Township, there is little reason to believe it would significantly alter the population or employment projections of the surrounding municipalities, particularly since both West Whiteland and Malvern have their own stations.

Within East Whiteland, the planning team and Township agreed that a train station would have the following impacts:

- A train station would accelerate redevelopment along the Route 30 Corridor;
- A train station may, depending on the location and configuration of access roads, open up additional lands in the immediate vicinity for development;
- A train station would make zoning changes more likely in the future, particularly along Route 30. Such changes would most likely increase the amount of residential uses along the corridor, turning it into a true mixed use, multimodal corridor (per the vision of the Route 30 Corridor Master Plan); and
- A train station would increase the appeal of Immaculata University to new students, for both on-campus residence and commuting.

Based on these assumptions and with the Land Use Assumptions Report conclusions in mind, we believe that the population projections for East Whiteland would increase by a factor of 5% to 10%, and the employment projections would increase by a factor of 3% to 5%. The results are reflected in the tables on the following page.

### 2035 Projected Population (With Train Station)

| | | With Train Station |
|---|---|---|
| A | **Base Population[1]** | **15,400-16,070** |
| B | **Additional % of total build-out triggered by train station[2]** | **5-10%** |
| C | **Anticipated units by 2035** | **63-126 units** |
| D | **Anticipated population by 2035[3]** | **138-278 persons** |
| E | **Projected Population by 2035[4]** | **15,540-16,350** |

*Notes:*

1. *See "2035 Projected Population (Before Train Station)", page 2-34*
2. *According to the LUAR (2017) Total Build-out under existing zoning was estimated to be 1,255 residential units.*
3. *Units multiplied by 2.2 (average persons per household and rounded up to nearest 10*
4. *Total of rows A + D*

### 2035 Projected Employment (With Train Station)

| | | With Train Station |
|---|---|---|
| A | **Baseline Projection[1]** | **27,830-29,140** |
| B | **Additional % of total build-out triggered by train station[2]** | **3%-5%** |
| C | **Square footage equivalent** | **150,000-250,000** |
| D | **Employment equivalent[3]** | **380-630** |
| E | **Projected Employment by 2035[4]** | **28,210-29,770** |

*Notes:*

1. *See "Approved Non-residential Development(2017)", page 2-33*
2. *According to the LUAR (2017) Total Build-out under existing zoning was estimated to be 5,000,000 square feet.*
3. *Units multiplied by conversion factors sourced from Maryland-National Capital Park and Planning Commission, assuming the additional bump is approximately 65% retail/restaurant, 10% office, and 25% "other"; rounded to nearest 10*
4. *Total of Rows A + D*

**Summary of Population and Employment Projections**

Based on East Whiteland's previous Land Use Assumptions Report, approved and pending development, and a comparison with DVRPC's current population and employment projections, this report assesses the potential impacts of a future train station, and estimates the following ranges of population and employment for 2035:

- Population: 15,540 – 16,350
- Employment: 28,210 – 29,770

**Additional Considerations**

Immaculata University has the potential to greatly impact ridership at a new station in East Whiteland Township. Students and faculty would be key constituencies that would potentially utilize a new station here. Immaculata University provided enrollment and employment

projections to Fall 2035. The student enrollment projections are based on a number of factors, including high school graduation rates, anticipated population growth in the area, planned expansion of on-campus housing, and changes underway with University programs and curriculum. The possibility of a train station near campus was not considered in the development of the forecasts. With a new train station nearby, there are opportunities for additional growth in enrollment.

Enrollment at Immaculata is expected to nearly double by 2035. As of the Fall 2018 semester, on-campus enrollment was at 2,605. The university is planning for on-campus enrollment to be approximately 5,063 for the Fall 2035 semester. These numbers include all students enrolled in undergraduate studies, graduate studies, continuing education programs, and elderly programs. It does not include online programming, because those students, since not on-campus, would not factor in the potential train station ridership.

A better indicator of potential student train ridership than total enrollment numbers is the number of students commuting to campus. The university currently is planning to maintain student housing for approximately 50% of its undergraduate population. Currently 380 (48%) undergraduate students are housed on-campus. Thanks to planned, on-campus student housing, the University will be able to house approximately 812 (45% of projected undergraduate enrollment)

### IU Growth Rates Applied

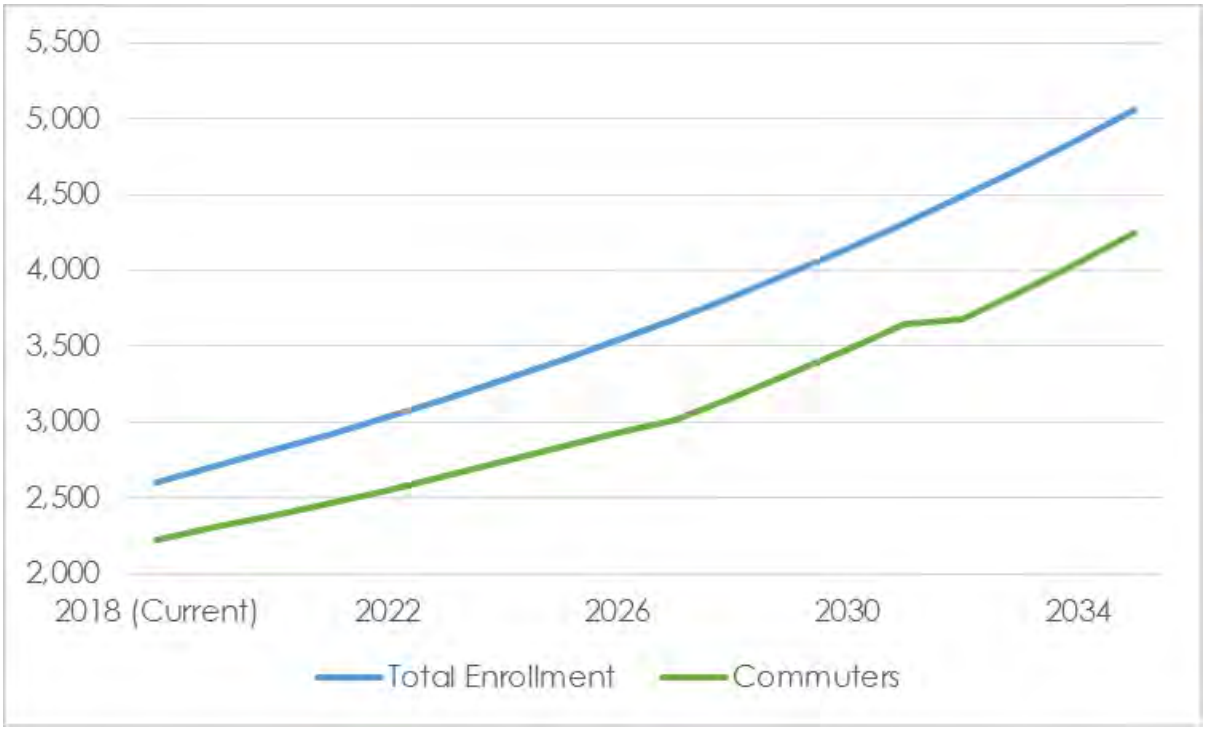
***Undergraduate**: 5% per year*

***Graduate**: 4% per year*

***Continuing Ed.**: 5% per year*

***Elderly**: 1% per year*

### Projected Absolute Change in Immaculata University Enrollment



students on-campus. Comparing on-campus, student housing to total on-campus enrollment means that 2,225 (85%) currently commute to campus and 4,251 (83%) are expected to commute to campus in 2035. The graphic above illustrates total enrollment and commuter increases projected to 2035.

Student enrollment is not the only potential train station ridership generated by Immaculata University, though. Immaculata University currently employs 356 workers. This includes full-time, part-time, and contractor positions on campus. By 2035, that number is expected to increase to approximately 619, people assuming consistent student to faculty ratios. Additionally, Camilla Hall employs 265 people today, and that employment level is expected to remain steady through 2035. All of these employees in close proximity to a potential future station in East Whiteland Township constitute a large potential ridership base. Additional population or employment at other nearby locations, such as the William Henry Apartments and Villa Maria Academy, are captured in the overall township population and employment forecasts.

### Camilla Hall

Camilla Hall is the Covent Home *and* Healthcare Center of the Sisters, Servants of the Immaculate Heart of Mary.


Image: Chester County Planning Commission

# Part 3 | Ridership Forecasts

## Introduction

The Delaware Valley Regional Planning Commission (DVRPC) developed ridership forecasts for both the Immaculata and Three Tun Station sites using the most recent travel demand model, called TIM2.3.1 (Transportation Improvement Model version 2.3.1). The TIM2.3.1 model includes representations of the highway and public transit systems in DVRPC's nine member counties, plus an extended area of 16 counties in Pennsylvania, New Jersey, Delaware, and Maryland, immediately surrounding the DVRPC region (where a less detailed transportation network is modeled). The transit network represents operational characteristics of the regional transit system including route alignment, stop locations, service schedules, and fare information. See Appendix 3.1 for more information about DVRPC's travel forecasting process and the modeling results. Stakeholders reviewed and provided input regarding the ridership forecasts at Stakeholder Meeting #3 held on May 21, 2019.

## Future Year Alternatives

Four initial future year alternatives were modeled for the purposes of this study:

- 2035 No Build (no new train station)
- 2035 with the Immaculata Station and hourly train service
- 2035 with the Immaculata Station and half hourly train service
- 2035 with the Three Tun Station and half hourly train service

These alternatives are meant to represent feasible scenarios based on known existing and assumed future conditions as presented in Part 1 and Part 2.

Each scenario includes all of the transportation projects in DVRPC's Transportation Improvement Program (TIP) and Long Range

Transportation Plan (LRTP) that are scheduled to be complete by the analysis year (2035). There are a number of regionally significant projects that will influence the ridership forecasts on SEPTA's Paoli/ Thorndale line and therefore forecasts for the proposed station in East Whiteland. In particular, parking capacity expansion projects are in the planning or design phases for the nearby Paoli, Exton and Downingtown Amtrak and SEPTA stations. All three projects are assumed to be complete by 2035 in the TIM2.3.1 model. These projects will double the number of parking spaces that are available at these three stations, which may impact the demand for parking at the proposed East Whiteland station.

### Existing and Proposed Parking at other Stations

| | Existing Parking | Future Parking | Increase |
|---|---|---|---|
| Paoli Station | 486 | 1,086 | 600 |
| Exton Station | 610 | 1,043 | 433 |
| Downingtown Station | 360 | 900 | 540 |
| **TOTAL** | **1,456** | **3,029** | **1,573** |

## Key Model Inputs and Assumptions

### Proposed Stations and Associated Improvements

**Station Concept Plans and Access and Circulation Improvements:** For the 2035 build alternatives analyzed, elements of the station concept plans and preferred access and circulation improvements identified in Part 2 were key inputs to the TIM2.3.1 model, as follows:

- **Immaculata Station**—Includes the new College Avenue/Frazer Road access roadway, the Planebrook Loop, and the pedestrian overpass to connect the Planebrook Loop with the platforms.
- **Three Tun Station**—Includes the intersection improvements at Route 352/Route 30 and Route 352/Three Tun Road, as well as sidewalks along Route 352 and Three Tun Road.

**Number of Parking Spaces:** The concept plans for the Immaculata and Three Tun station sites presented in Part 2 each include 300 parking spaces. The size of the parking lots was based on current conditions at similar and nearby stations and do not necessarily reflect potential demand for parking. Both sites have area available for

additional parking and could feasibly support 100 to 150 additional surface spaces.

The four existing adjacent SEPTA regional rail stations (Paoli, Malvern, Exton, and Whitford) have 100% parking utilization according to data from 2018 provided by SEPTA. The average number of parking spaces currently provided by SEPTA at these four stations is 410. For the purposes of the ridership forecasts, 400 parking spaces were assumed at each of the two station sites. This amount of parking is feasible given the site constraints, and it was used so that ridership forecasts are not skewed or distorted by an over or under supply of parking at each site.

**Bus/Private Shuttle Service:** For the purpose of the ridership forecasts, existing bus routes and schedules were not revised to directly serve either the Immaculata or Three Tun Station sites. At this point in the planning process, the potential routes and schedules for SEPTA or private shuttle services are unknown. Additionally, SEPTA is not able to commit to bus service plans for the model horizon year of 2035. It is reasonable to assume that ridership forecasts would be modestly higher for both sites with the addition of direct and timed transfers to bus or private shuttle services.

**Train Service:** The TIM2.3.1 model assumes the following levels of regional rail service for the three future build alternatives. These are consistent with the train service described in Part 2.

- **Immaculata Station**
  - Hourly Service: 21 inbound trains per day with service approximately every hour, similar to existing train service to the Exton Station
  - Half Hourly Service: 36 inbound trains per day with service approximately every half-hour, similar to the existing train service to the Malvern Station. It was to be the assumed westernmost stop with half-hour service
- **Three Tun Station**
  - Half Hourly Service: 36 inbound trains per day with service approximately every half-hour, similar to the existing train service to the Malvern Station. It was to be the assumed westernmost stop with half-hour service

### Population and Employment Forecasts

DVRPC has developed and adopted regional population and employment forecasts in five-year increments between 2015 and 2045

for each municipality in the nine county region. These socioeconomic projections are part of the foundation of DVPRC's travel demand model. As described in Part 2, DVRPC's adopted population and employment forecasts for East Whiteland Township were reviewed and revised based on recent and anticipated growth in the township. Additionally, revised population and employment forecasts were developed to account for the potential growth that may occur in the area surrounding a new station to a future year of 2035. Due to the proximity of the two proposed sites, the same forecasts were used for both the Immaculata and Three Tun Station.

In order to more accurately capture potential population and employment within the vicinity of the proposed stations, enrollment forecasts for students and staff at Immaculata University were applied to the travel demand model's zonal data. Immaculata University is expecting strong growth with a 6% annual increase in undergraduate enrollment, and 1%-5% annual growth in other student programs. They also expect 4% annual growth in employment at the University. The University is a major potential origin/destination for trips within the study area. Therefore, the anticipated growth in students and staff has a significant influence on the number of potential riders for a new train station, particularly at the Immaculata site. Additionally, the possibility of a train station near campus was not considered in the development of the enrollment and employment forecasts for the University. With a new train station, particularly on the Immaculata Site, the University would expect additional growth in the number of students, faculty, and staff.

## Ridership Forecasting Results

The ridership forecasts are presented in the table below.

2035 Ridership Forecasts from DVRPC's TIM2.3.1 Model

| | First Train (Inbound) | Last Train (Inbound) | # of trains (Inbound) | Total Daily Boardings (including Park-n-Ride vehicles) | Park-n-Ride vehicles |
|---|---|---|---|---|---|
| **Immaculata Hourly Service** | 05:14 | 23:25 | 21 | 385 | 90 |
| **Immaculata Half Hourly Service** | 04:21 | 23:25 | 36 | 530 | 175 |
| **Three Tun Half Hourly Service** | 04:21 | 23:25 | 36 | 360 | 240 |

The overall ridership levels and the total daily boardings are comparable between the one hour Immaculata and half hour Three Tun forecasts. However, the half hour Immaculata forecast is much higher than the other two build alternatives.

- The Immaculata Station site offers more convenient access and short walking times to/from Route 30, Immaculata University, and the other nearby institutional and commercial uses. This results in higher projected ridership from non-drivers. It also reflects the anticipated growth in student enrollment at Immaculata University, which could be served by the Immaculata Station.
- The Three Tun Station site has more direct access to the regional highway network via Sproul Road (SR 0352), which makes it more attractive for riders driving to the station. Long walking times to/ from Route 30, Immaculata University, and nearby residential neighborhoods results in lower projected ridership from non-drivers.

### Forecasted Regional Rail Ridership Growth

Comparing the future build alternatives to the 2035 No Build alternative provides an indication of how many "new" riders would potentially use the regional rail services versus how many riders would shift from another station to use the new station in East Whiteland. For modeling purposes, ridership was evaluated for a study area that

included the Paoli, Malvern, Exton, or Whitford stations on SEPTA's Paoli/Thorndale Regional Rail line.

For the Three Tun Station alternative, the model forecasted virtually no change in the overall number of riders using regional rail within the study area. For the Immaculata Station alternatives, the model forecasted approximately 130 "new" riders to the regional rail system for hourly service and 230 "new" riders for half hourly service. The new riders are likely utilizing regional rail due to the direct connections to Immaculata University's campus and the Route 30 corridor. Additionally, the "new" riders for the Immaculata Station are likely influenced by the forecasted growth in student enrollment and staff at Immaculata University.

## Potential Changes to Key Inputs and Results

Travel forecasting models provide an estimation of future travel patterns and transit ridership based on the model inputs. They are highly influenced by the future transportation network and projected future land use, population, and employment. When these projections are met, travel model outputs generally fall within 15 percent of the actual, future values. However, future ridership at a new station in East Whiteland Township could be impacted by several other factors, as follows:

### Bus/Shuttle Service to Stations

It is feasible and probable that a new station will be served by bus and shuttle services. Additional direct transit connections would likely increase ridership for either station site.

### Railroad Infrastructure and Train Service

Improvements to the rail infrastructure along the Keystone Corridor/ SEPTA Paoli/Thorndale Rail Line could impact the frequency of train service and resultant ridership. For example, providing half hourly train service to the Immaculata Station becomes feasible with completion of the proposed Potts Interlocking or a similar improvement that would enable SEPTA trains to change directions and tracks west of Frazer Yard (and west of the proposed Immaculata Station). Additionally, the frequency of rail service is dependent upon the availability of rail cars, availability of crews, and train scheduling.

### Parking Expansion Projects at Other Stations

DVRPC's travel demand model for 2035 includes significant increases in parking capacity due to capital projects in the planning and design phases at the Paoli, Exton and Downingtown Stations. However, if one or more of those projects does not move forward as anticipated, it would likely increase the ridership forecasts for either the Immaculata Station or the Three Tun Station.

### Growth and Development

East Whiteland Township could update their land use ordinances to allow for more mixed-use and walkable development around the train station site. These land use policy updates could support increased potential ridership and also provide opportunities for the formation of a public-private partnership. For example, market forces could support new transit oriented development at the station site and result in higher ridership.

### Future (Long Term) Considerations

In addition to the project specific factors, there are a number of future considerations that may influence ridership forecasts. Unforeseen changes in the national and regional economies and other market forces can have a significant effect on future land use and travel patterns. The travel model assumes that household income, transit fares, parking charges, tolls, and other auto operating costs will all increase at approximately the same rate through 2035. Finally, technological advances, including autonomous vehicles, have the potential to dramatically change the ways people travel and could result in either increased or decreased demand for transit.


Image: Chester County Planning Commission

# Part 4 | Conclusions

## Overall Station Site Evaluation

This study determined that there are two feasible locations for a train station in East Whiteland Township, Chester County: Immaculata and Three Tun. Each of two potential sites hold distinct advantages and disadvantages. However, it would be possible to construct, allow access to, and provide service at either location.

Many factors went into the determination that these two sites could support a train station, as detailed in Parts 1-3 of this study. The key factors that should be considered for implementation include:

- Consistency with Local and Regional Plans
- Train Service Frequency
- Relationship to Other Planned Railroad Improvements
- Site Constraints
- Property Ownership
- Competing Uses for the Site
- Access & Circulation
- Ridership
- Capital Cost
- Constructability
- Local Support

These considerations are detailed on the table on the following page. The table highlights factors where one of the station sites offers a distinguishable advantage in comparison to the other site.

## Stakeholder and Public Input

Stakeholders reviewed and provided input regarding the overall station site evaluation and potential next steps. Additionally, draft findings were presented to the public.

## Overall Site Evaluation Table

*Shaded boxes represent distinct advantage for the particular site.*

| | Immaculata Station Site | Three Tun Station Site |
|---|---|---|
| **Consistency with Local and Regional Plans** | – Strongly supports East Whiteland Township's plans to revitalize Route 30 due to a more direct connection and walking access to/from Route 30 | – Generally supports East Whiteland Township's plans to revitalize Route 30 |
| **Train Service Frequency** | – ~60 minute headways for weekday service with current track infrastructure<br>– Potential for ~30 minute headways for weekday service with planned track improvements | – ~30 minute headways for weekday service with current track infrastructure |
| **Relationship to Other Planned Railroad Improvements** | – May require coordination related to improvements to Glen Interlocking<br>– See note above regarding Train Service Frequency | – Need for close coordination with Amtrak's planned improvements for Frazer Interlocking and Frazer Yard Access |
| **Site Constraints** | – Topography requires regrading | – Steep topography requires significant regrading |
| **Property Ownership** | – Potential public-private partnership for use of property owned by the Sisters of IHM<br>– Requires property from Norfolk Southern and 2—3 private property owners for access and circulation improvements | – Requires property from two private property owners for station facilities<br>– Requires additional private property for access and circulation improvements |
| **Competing Uses for the Site** | – Site is not likely to be developed in the near term due to property ownership and existing access limitations | – Significant potential for the site to be developed with a commercial use in the near term given the existing zoning and recent development activity along Three Tun Road |
| **Access & Circulation** | – $24,049,000 Estimated Cost for Access and Circulation improvements<br>– Requires new access roadway<br>– Opportunities for multiple points of access | – $13,340,000 Estimated Cost for Access and Circulation improvements<br>– Existing roadway access |
| Route 30 | – Direct multimodal access to Route 30 with proposed Planebrook Loop | – Less direct access to Route 30, particularly for bicyclists, pedestrians, and bus/shuttle |
| Immaculata University | – Direct multimodal access to campus and other related destinations | – No direct access to campus |
| Regional Highways | | – More direct vehicular (park-n-ride) access to/from Route 30 and regional highway network |
| Bus/Shuttle | – More direct access to/from Route 30 for existing bus routes and potential shuttle operations with proposed Planebrook Loop | – Requires longer diversion from existing bus routes on Route 30 |
| Bike/Ped | – Convenient access and shorter walking times to/from Route 30 and Immaculata University | – Longer walking times to/from Route 30, Immaculata University, and nearby residential neighborhoods |
| **Ridership** | – 530 weekday boardings  forecasted in 2035 with half hourly service<br>– 385 weekday boardings forecasted in 2035 with hourly service<br>– Higher ridership from non-drivers and higher number "new" riders to the regional rail system (approximately 230 for half hourly service and 130 for hourly service)<br>– Greater potential for growth in ridership beyond 2035 | – 360 weekday boardings forecasted in 2035 with half hourly service<br>– Higher ridership from drive-trips<br>– Lack of "new" riders to the SEPTA system compared to ridership forecast for the "no-build" alternative |
| **Capital Cost** | – $121,567,000 Estimated Total Station Project Cost (2019) | – $92,852,000 Estimated Total Station Project Cost (2019) |
| **Constructability** | – Potential site access constraints due to Frazer Yard<br>– Requires new access roadway to station site for construction<br>– Requires coordination, approvals, and right-of-way from Norfolk Southern | – Limited site access due to steep slopes and residential neighborhood on south side of the tracks<br>– Existing roadway access<br>– Requires limited coordination with Norfolk Southern<br>– Platform/track configuration and railroad infrastructure may be impacted by planned improvements for Frazer Interlocking and Frazer Yard Access |
| **Local Support** | – General preference expressed for station site at public meeting, particularly given relationship to Route 30 and Immaculata University, as well as opportunities for multiple points of access<br>– Strong support from Sisters, Servants of IHM and Immaculata University | |

**Stakeholder Meeting #3 (May 21, 2019):** The focus of the third and final stakeholder meeting was reviewing the ridership forecasts, cost estimates, and potential next steps. Stakeholders identified the need for an additional ridership forecasting model run (half hourly service to the Immaculata Site) and provided input on additional potential next steps that would lead to implementation. The stakeholders also expressed their support for the Immaculata site being selected as the preferred station site.

**Final Public Presentation (June 12, 2019):** The draft findings and recommendations from the report were presented to the public at a regularly scheduled East Whiteland Township Board of Supervisors meeting. Comments and questions received from the public included: how this project is consistent with East Whiteland Township's goals for creating a walkable village in Frazer; what is included in the cost estimates and how the project would be funded; concern about how the station would be accessible to people of all abilities; the possibility of shuttle buses to Immaculata University and other destinations; and support for half-hourly service to the Immaculata Station.

## Factors for Success—Preferred Station Site

While a variety of factors need to fall in line in order for a new station in East Whiteland to become a reality, one of the key factors for success is local and regional support. Project support and leadership is critical for identifying, advocating, and securing funding for continued planning, design and construction of the train station.

During the study process, all of the local stakeholder organizations and institutions expressed their strong support and preference for the Immaculata Station site. More specifically, the Immaculata Train Station is supported by East Whiteland Township, Immaculata University, Sister Servants of the IHM, and the Transportation Management Association of Chester County. Support from Immaculata University and Sister Servants of the IHM and TMACC is documented in Appendix 4.1. These stakeholders noted the following key factors for why the Immaculata Station site is their preferred site for the new station.

- **Consistency with community vision and goals** —East Whiteland Township envisions Frazer as a walkable, inviting downtown. This is documented in the township's Comprehensive Plan and the Route 30 Corridor Master Plan. The Immaculata site, with the Planebrook Loop and pedestrian overpass, is closer and better connected to one of the potential western mixed-use centers

identified in the Route 30 Corridor Master Plan. The Immaculata site presents opportunities for the train station to support mixed-use and walkable development along Route 30. Additionally, the train station is consistent with Immaculata University's plans to attract and expand opportunities for students and staff.

- **Access to Route 30**—The Immaculata site, with the proposed Planebrook Loop, has the potential to provide a better connection to Route 30 for all user types than the Three Tun Site. This is supportive of the township's goal to create a village setting in Frazer with a mix of land uses that are accessible to pedestrians, bicycles, transit users, and motorists. Additionally, development of the Immaculata Station provides a pedestrian connection between Immaculata's campus (and the related institutions) and Route 30.

- **Competing uses for the site and future development potential**—A portion of the property needed for the Immaculata Station site is owned by the Sisters, Servants of IHM. At this point, the Sisters, Servants of IHM support use of their property for a train station and do not have any other immediate plans to develop the site for other purposes. Whereas, the property needed for the Three Tun Station site is privately owned and one lot is for sale. Given recent development activity along Three Tun Road, there is a strong potential for the Three Tun Station site properties to be sold or developed in the near term. Development of the Three Tun Station site properties would make construction of the train station at that location more challenging and more costly. Additionally, the size of the available property and proximity to Immaculata University provides the potential for future transit oriented development surrounding the Immaculata Station. If the Sisters of IHM (or a subsequent property owner) would elect to develop this area, there are several considerations and constraints that influence the development potential and those are highlighted in Appendix 4.2.

- **Ridership**—Based on DVRPC's ridership forecasts, the Immaculata Station supports higher ridership, particularly with half hourly service. The Immaculata Station also supports a higher number of non-drivers and a higher number of "new" riders to the regional rail system. Additionally, the site has greater potential for future growth in ridership beyond 2035 given the proximity to Immaculata University and the connection to Route 30.

With strong local support for the Immaculata Station site and lack of clear and distinct advantages for the Three Tun Station site, continued planning efforts should focus on advancing the Immaculata Station site.

## Next Steps

A new train station in East Whiteland Township is a long term capital project that will require significant investment of time and resources. Notably, local and regional support needs to be built, a funding strategy needs to be developed, and key supportive infrastructure projects need to be advanced. These key next steps are outlined below and will help to advance implementation of a new train station in East Whiteland Township.

**Form a Train Station Coalition**

High levels of local and regional support are required for a project of this scale and magnitude to succeed. One or more committed champions must be prepared to see this project through a long-term process that could take many years and likely decades before the first passenger service is provided in Frazer. One key individual or organization to carry the torch and provide continuity and persistence needs to be identified. Local and regional support may strengthen or fade over time, so a consistent message will be vital to this projects success.

Currently, the Immaculata Train Station is supported strongly by East Whiteland Township, Immaculata University, Sister Servants of the IHM, and TMACC. This small group can be the foundation of a coalition of supporters and build upon the momentum from this study to gain additional support for the project. This group should set realistic and achievable short and medium-term goals to work towards the ultimate goal of providing passenger rail service in East Whiteland Township. Some of the short-term goals are listed below.

1. Identify the core stakeholders to make up a coalition group to meet regularly and monitor the progress of the train station.
2. Engage legislators, planning partners (i.e. SEPTA, Amtrak, PennDOT, Chester County, etc.), and other stakeholders by inviting them to coalition meetings and voicing a clear mission to decision makers.
3. Build local community support from residents and businesses that would benefit from the train station in Frazer, and keep the community engaged with regular updates.

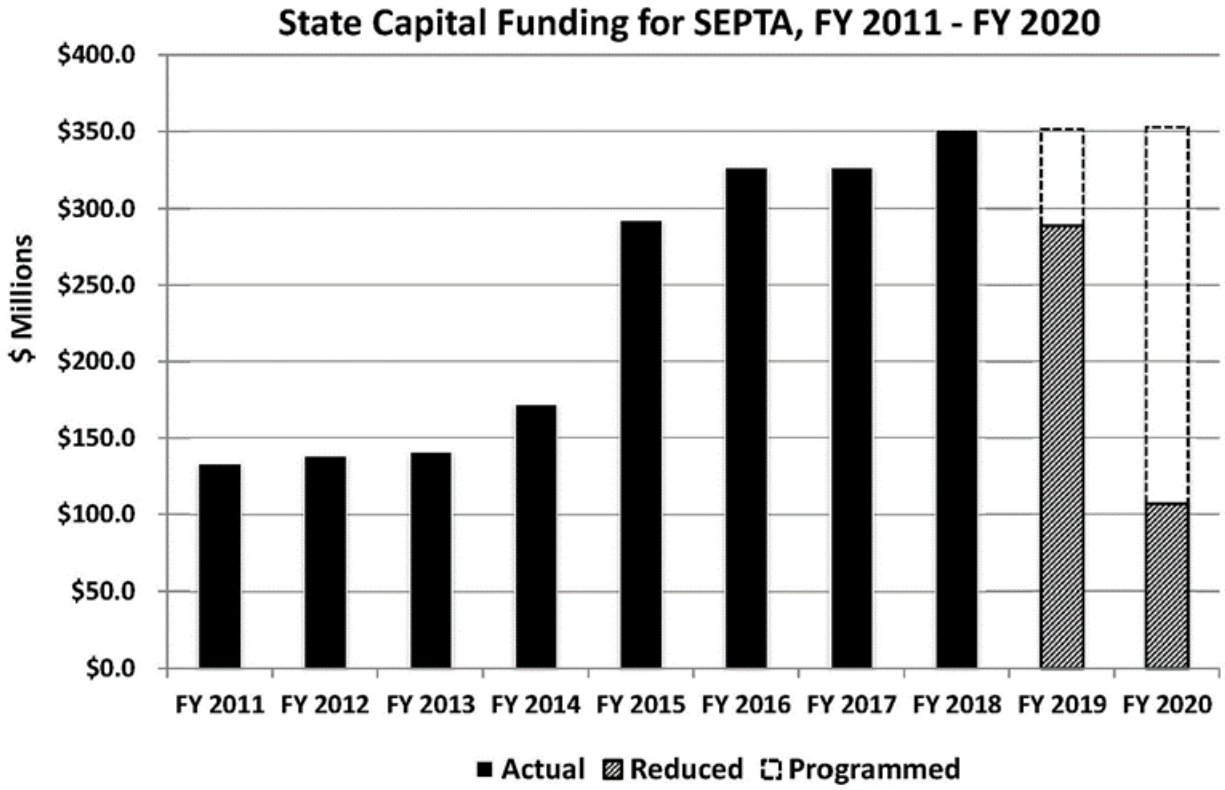
The primary short-term goal for the coalition should be to advocate for the train station project to be included in Chester County's Transportation Priority Projects. This list is updated every two years, and it serves as the basis of projects considered for inclusion in DVRPC's Long Range Plan. It is also submitted for consideration to the

State Transportation Commission. This is a first step towards advocating for the project to be included on DVRPC's Long Range Transportation Plan, DVRPC's Transportation Improvement Program (TIP), and SEPTA's Capital Budget. The coalition can also take a leadership role in advancing the other next steps outlined below.

**Evaluate Funding Options**

Currently, there is uncertainty related to federal and state funding, particularly for public transportation capital improvements. At the state level, Act 44 (2007) and amended by Act 89 (2013) require the Pennsylvania Turnpike Commission to provide PennDOT with $450 million annually through June 2022 for transit capital improvements across the state. Starting in Fiscal Year 2022, the payments are reduced to $50 million. This is illustrated by the graph below from SEPTA's FY 2020 Capital Budget Proposal showing historic and expected state capital funding for SEPTA.

Without a new dedicated funding source for transit capital improvements statewide, projects that are currently in the planning or design phases may be delayed or suspended. This increases the backlog of transit capital projects and will impact SEPTA's ability to advance future transit expansion projects, such as designing and constructing a new train station.



The possible funding mechanisms for a project of this scale are somewhat limited. The traditional method of funding the project through SEPTA's Capital Budget and the regional Transportation Improvement Program (TIP) can take many years due to financial constraints, focus on a state of good repair for transportation investments, and competition for limited funds. However, there are other funding options that may have the potential to accelerate project delivery. The list below outlines some of these funding mechanisms.

- **SEPTA Capital Budget / Regional TIP**—As outlined above, funding stability is a big question, and there are many other transit capital projects and even other station improvement projects projects ahead of this one in the queue.
- **Grant Funding**—There are various grants available for public transportation enhancements. However, due to the relatively localized impact, it is unlikely that this project would receive a grant large enough to cover the total cost of building a new train station. However, smaller federal and state grants could be applied to fund components of the project that have some independent utility.
- **Tax Increment Financing**—This is a public financing method that is used to subsidize infrastructure projects. Taxing bodies, including the County, School District, and Municipality, must approve utilization of all or a portion of taxes derived from future development to pay for certain improvements related to the development project.
- **Transit Revitalization Investment District (TRID) and Transportation Partnership Districts** — State legislation enables the formation of special districts that allow municipalities to cooperate with one another, transit agencies, and private sector partners to provide funding for transportation improvement projects that support economic growth and development.
- **Public / Private Partnership**— This is a cooperative arrangement between governmental entities and private corporations. They exist in many different forms, but generally are intended to provide innovative project delivery and financing models. For the Immaculata Station, the Sister Servants of the IHM have expressed an interest in partnering to advance the project by providing land specifically for the train station. (See Appendix 4.1.)

It is likely that, in order to get the required funding for a project of this scale, a combination of the funding strategies above will have to be employed. The coalition that is established to advance the train station

project will need to perform additional research into each of these strategies to determine what is appropriate and feasible in East Whiteland Township.

**Complete Additional Plans and Studies**

While this Feasibility Study provides a comprehensive planning foundation for the project, there are additional plans and studies that can be undertaken to advance implementation. Future plans and studies might be related to evaluating potential project benefits and funding options. Potential topics for studies include:

- Analysis of the potential economic development impact of the proposed station;
- Evaluation of potential transit oriented development or other private partnership opportunities; and
- Development of ridership forecasts for other build alternatives that reflect different train service/schedules.

**Advance Design and Construction of Early Action—Access and Circulation Improvements**

Several of the access and circulation improvements will address existing transportation deficiencies and will also benefit a future train station. Many of these improvements were identified in previous local plans, including East Whiteland Township's Act 209 Study and the Route 30 Corridor Master Plan. Advancing design and construction of these improvements will provide benefits to the community in the near term and decrease the cost for access and circulation improvements associated with the train station in the future. Listed below (in priority order) are access and circulation improvements that can be implemented in the near term given the relative cost.

1. Route 30 and Sproul Road (Route 352) Intersection Improvements

   This intersection improvement was identified in East Whiteland Township's Act 209 Study and the Route 30 Corridor Master Plan. The potential scope of improvements includes providing the following additional turn lanes:

   - Eastbound Route 30 Right Turn Lane
   - Northbound Sproul Road (Route 352) Left Turn Lane

   The total estimated project cost is $4.5 to $5 million.

2. Removal of Bridges for Abandoned Rail Lines on Ravine Road

   There are two existing railroad bridges for abandoned rail lines on

Ravine Road. The northernmost bridge is for the inactive Philadelphia and Thorndale Line and the southernmost bridge is for the inactive West Chester Branch. The bridges have lower vertical and horizontal clearances that limit traffic flow and create safety concerns. The northernmost bridge is located close to the intersection of Phoenixville Pike and Ravine Road and near the proposed alignment for the Planebrook Loop, which is part of the Immaculata Station concept plan. Removing this bridge would reduce the cost and complexity of implementing the Planebrook Loop. The southernmost bridge is located at a S-curve in Ravine Road and has stop signs for both directions of travel due to the limited width and sight distance. Removing this bridge would improve safety and traffic flow along Ravine Road. Developing cost estimates for the removal of these structures would require additional engineering evaluation.

3. Pedestrian Connections Along Sproul Road (Route 352)

   Pedestrian access between the Route 30 corridor and Immaculata University and residential neighborhoods to the south is limited due to the lack of sidewalks and the constrained railroad bridge for Amtrak's Keystone Corridor rail line. Adding sidewalk connections and reopening the pedestrian tunnel under the railroad tracks to the east of Sproul Road (Route 352) would enhance pedestrian access to destinations on Route 30, Immaculata University and related institutions, and the proposed train station. The total estimated project cost is $4 to $5 million.

4. Sproul Road (Route 352) and College Avenue Intersection Improvements

   Installing a traffic signal at Sproul Road (Route 352) and College Avenue was identified in East Whiteland Township's Act 209 Study. With College Avenue serving as a key access point for the proposed Immaculata Train Stations, turning lanes and additional improvements may be needed. The total estimated cost for the traffic signal and related improvements is $1.5 to $2 million.

The coalition can advocate for federal and state transportation funding for these projects through DVPRC's Transportation Improvement Program. Additionally, there are a number of competitive grant funding sources that can be considered and pursued for these early action access and circulation improvements, including:

- PennDOT Multimodal Transportation Fund
- Commonwealth Financing Authority (CFA) Multimodal

Transportation Fund

- DVRPC Congestion Mitigation and Air Quality (CMAQ) Program
- PennDOT and DVRPC Transportation Alternatives Set-Aside Program

**Support Track and Infrastructure Improvements along the Keystone Corridor/Paoli –Thorndale line**

PennDOT's Bureau of Public Transportation, Amtrak, and SEPTA are actively planning and designing a number of railroad infrastructure improvements along the Keystone Corridor/Paoli-Thorndale Rail line. As plans and designs are advanced, the coalition should advocate for the future East Whiteland Train Station to be considered and not precluded in the design processes. For example, implementation of the new Potts Interlocking would benefit the future East Whiteland Train Station. The coalition can advocate for design and construction of the Potts Interlocking in the near term, which will likely expand train service options for the new station in the future.

# Appendix

CONTENTS

East Whiteland Township Train Station Feasibility Study

*Stakeholder Meeting*

*December 4, 2018 at 2pm*

*Immaculata University - 1145 King Rd, Immaculata, PA 19345*

*Villa Maria Hall - Blue Room (2nd Floor)*

## Agenda

- Introductions

- Background

- Overview
  - Scope
  - Schedule
  - Role of the Stakeholder Committee

- Train Station Vision and Program Elements

- Preliminary Evaluation of Potential Station Site(s)
  - Site Selection Evaluation Criteria
  - Base Maps

- Next Steps
  - Evaluation of Potential Site(s) & Field Visits
  - SEPTA Technical Coordination Workshop: December 18, 2018
  - Technical Memo #1 to Stakeholders for Review and Comment: January 7, 2019
  - Technical Memo #1 Comments Due: January 18, 2019

- Future Stakeholder Meetings
  - Meeting #2 – Station Concept Design Workshop:
    - Availability week of February 11th or 18th
  - Meeting #3 – Ridership Forecasts and Draft Report:
    - Availability week of May 20th

# East Whiteland Township Train Station Feasibility Study

*Stakeholder Meeting*

*February 12, 2019 at 2pm*

*Immaculata University - 1145 King Rd, Immaculata, PA 19345*

*Villa Maria Hall - Board Room (1st Floor)*

## Agenda

- Introductions
- Tech Memo #1
- Draft Station Concept Plans
- Access and Circulation Evaluation
- Other Assumptions for Ridership Forecasts
- Public Meeting

  February 27, 2019
  Open House: 6pm – 7pm
  Presentation: During East Whiteland Township Planning Commission Meeting beginning at 7pm

  - Materials
  - Promotion

- Next Steps
  - SEPTA Technical Coordination Meeting #2: February 21st
  - Public Open House & Presentation: February 27th
  - Technical Memo #2 to Stakeholders for Review and Comment: March 8th
  - Technical Memo #2 Comments Due: March 22nd
  - Assumptions for Ridership Forecasts to DVRPC: March 29th
  - Stakeholder Meeting #3 – Ridership Forecasts and Draft Report: May 21st

East Whiteland Township Train Station Feasibility Study

*Stakeholder Meeting*

*May 21, 2019 at 2pm*

*Immaculata University - 1145 King Rd, Immaculata, PA 19345*

*Villa Maria Hall - Blue Room (2nd Floor)*

## Agenda

- Introductions
- Recap of Recent Coordination Activities
  - Future track improvements along the Keystone Corridor
  - Cost Estimates
  - Station Concept Plans
- DVRPC Ridership Forecasts
- Summary Evaluation of Station Sites
- Potential Project Phasing and Next Steps
- Draft Report
  - Draft to Stakeholders: Week of June 3rd
  - Overview Public Presentation
    June 12, 2019
    During East Whiteland Township Board of Supervisors Meeting beginning at 7pm
- Next Steps
  - TMACC Board Presentation: May 31st
  - Draft Report to Stakeholders for Review and Comment: Week of June 3rd
  - Presentation at EWT Board of Supervisors Meeting: June 12th
  - Technical Memo #2 Comments Due: Week of June 17th
  - Final Report: June 28th

**East Whiteland Township Train Station Feasibility Study**

*SEPTA Technical Coordination Meeting*

*December 14, 2018 at 1pm*

## Agenda

- Introductions
- Project Background & Overview
- Evaluation of Potential Station Site(s)
- Preliminary Preferred Station Site(s)
- Immaculata Station Site:
    - Advantages and Disadvantages
    - Potential Station Program Elements & Configuration
- Three Tun Station Site:
    - Advantages and Disadvantages
    - Potential Station Program Elements & Configuration
- Technical Memo #1: Input for Preferred Station Site(s)
- Next Steps
    - Technical Memo #1 to Stakeholders for Review and Comment: January 7, 2019
    - Technical Memo #1 Comments Due: January 18, 2019
    - Stakeholder Meeting #2: February 12, 2019 at 2pm
    - Public Presentation #1: February 13, 2019 (*Tentative)*
    - SEPTA Technical Coordination #2 – Conference Call: Week of February 18, 2019

# Potential Station Programming Elements

## Waiting and Boarding

- ☐ **Platforms – High Level**
  - Length: 528′ (six car consist), with potential to expand to 700′ (eight car consist)
  - Type: Side (12′) OR Center Island (24′)
  - Canopy:
    - Inbound: One-third of platform
    - Outbound: Cover stairs and ramps with short extension onto platform
  - Heated Shelters: One each (Inbound and Outbound)
  - Clearance to interlocking: 250′, with potential to request a waiver to 200′
- ☐ **Cross Track Circulation**
  - Type: Tunnel OR Overpass (Enclosed or Open)
  - Assumed to be 12′ wide clear
- ☐ **Elevators: One with potential for second at each point?**
- ☐ **Station Building**
  - SEPTA Preference?
    - Code Variance could be required if no station building because of toilet room requirement
  - If a station is provided: Standard SEPTA
- ☐ **Ticketing Kiosk(s)**
- ☐ **TOD Potential**
  - Customer driven: Food or amenities
  - Shared parking use (off-hour)
  - Local market / opportunities

## Access and Circulation

- ☐ **Parking**
  - Minimum: 250 - 300 spaces ?
  - Capacity for expansion (target): 350 – 400 spaces ?
  - Assumed to be unstructured
- ☐ **Bus**
  - Number/type
  - Schedule overlap
  - Waiting facilities
- ☐ **Private Shuttle**
  - Number/type
  - Staging area
- ☐ **Vehicle Pick-up/Drop-off**
- ☐ **Bike Parking**
  - Covered OR uncovered
- ☐ **Bike/Ped Access**

# Comparison of Preferred Station Sites

| | Immaculata | Three Tun |
|---|---|---|
| **Advantages** | – Located approximately half way between Malvern and Exton<br>– Minimal need for track work<br>– Multiple possible access points<br>  o Ravine Road<br>  o King Road<br>  o Route 352 (Sproul Road) to Frazer Road / College Ave/ Grotto Drive<br>  o Route 30/Phoenixville Pike – would need coordination with Norfolk Southern<br>– Ample developable land for station facilities and parking with room for expansion.<br>– Center median station area provides room for different platform and track configurations<br>– Opportunity for direct pedestrian connection to Immaculata University<br>– 1 parcel privately owned by Immaculata University / Sisters of Immaculate Heart of Mary | – Three Tun Road easily accessible by automobile via Route 352 (Sproul Road)<br>– Land available and ready for development<br>– Additional parcels provide opportunity for expansion<br>– May be possible to retrofit existing bridge carrying Sproul Road over Norfolk Southern with pedestrian infrastructure |
| **Disadvantages** | – Multiple rail lines to cross over for connection and access on the north side of the tracks<br>– Difficulty constructing overpass due to overhead wire configuration<br>– Ravine Road connection to Route 30 limited by 4 low-clearance tunnels<br>– Route 352 (Sproul Road) connection to Route 30 limited by 1 low-clearance tunnel<br>– Connection to Route 30 limited<br>– More difficult to provide higher frequency of service since it is west of Frazer Rail Yard<br>– Some areas with steep slopes (particularly east of the station location) | – Located approximately 2 miles from Malvern Station (4 miles from Exton)<br>– Need to assemble multiple privately owned parcels with development potential<br>– Available parcels not directly adjacent to feasible platform location<br>– Direct connection to Route 30 requires further evaluation<br>– No walk-up access for Immaculata University<br>– Adjacent well established residential area on the south side of the tracks limits access and residents may have concerns regarding potential impacts<br>– Potential hazardous materials, particularly Buckeye Terminals property<br>– Some areas with steep slopes |

East Whiteland Township Train Station Feasibility Study

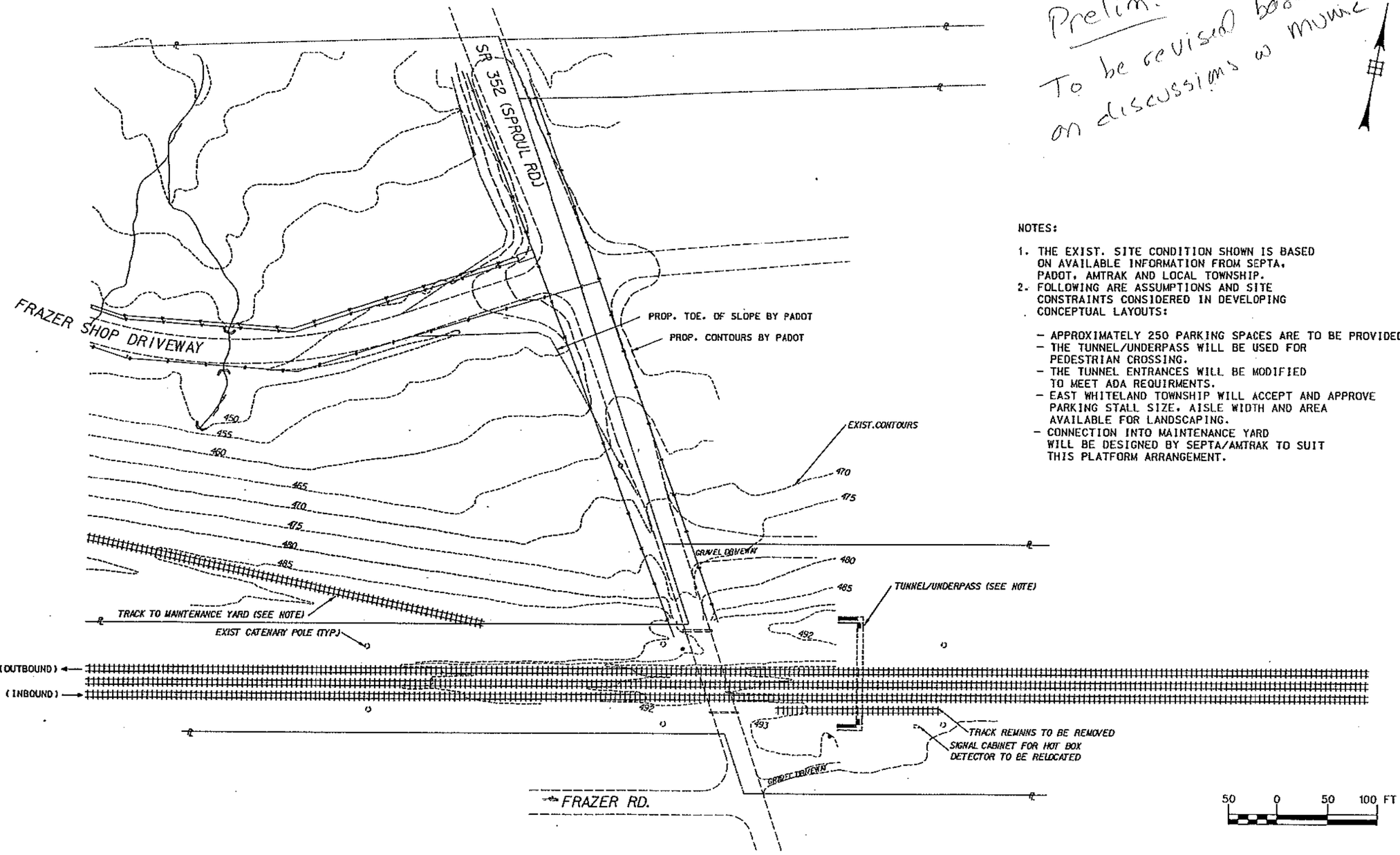
*SEPTA Technical Coordination Meeting #2*

*February 21, 2018 at 1pm*

## Agenda

- Introductions
- Tech Memo #1
- Train Schedules: Three Tun Site and Immaculata Site
- Track/Platform Configuration
- Draft Station Concept Plans
- Access and Circulation Evaluation
- Cost Estimates and Assumptions
- Other Assumptions for Ridership Forecasts
- Public Meeting
  February 27, 2019
  Open House: 6pm – 7pm
  Presentation: During East Whiteland Township Planning Commission Meeting beginning at 7pm
- Next Steps
  - Public Open House & Presentation: February 27th
  - Technical Memo #2 to Stakeholders for Review and Comment: March 8th
  - Technical Memo #2 Comments Due: March 22nd
  - Assumptions for Ridership Forecasts to DVRPC: March 29th
  - Stakeholder Meeting #3 – Ridership Forecasts and Draft Report: May 21st

Prelim. —
To be revised based on discussions w MVMC




NOTES:

1. THE EXIST. SITE CONDITION SHOWN IS BASED ON AVAILABLE INFORMATION FROM SEPTA, PADOT, AMTRAK AND LOCAL TOWNSHIP.
2. FOLLOWING ARE ASSUMPTIONS AND SITE CONSTRAINTS CONSIDERED IN DEVELOPING CONCEPTUAL LAYOUTS:

   - APPROXIMATELY 250 PARKING SPACES ARE TO BE PROVIDED.
   - THE TUNNEL/UNDERPASS WILL BE USED FOR PEDESTRIAN CROSSING.
   - THE TUNNEL ENTRANCES WILL BE MODIFIED TO MEET ADA REQUIRMENTS.
   - EAST WHITELAND TOWNSHIP WILL ACCEPT AND APPROVE PARKING STALL SIZE, AISLE WIDTH AND AREA AVAILABLE FOR LANDSCAPING.
   - CONNECTION INTO MAINTENANCE YARD WILL BE DESIGNED BY SEPTA/AMTRAK TO SUIT THIS PLATFORM ARRANGEMENT.

| REV. | DATE | DESCRIPTION | BY | CKD | APD |
|---|---|---|---|---|---|
| 0 | | FOR CONSTRUCTION | | | |

EDWARDS AND KELCEY, INC.
484 South Old Middletown Road, Media, PA 19063-4833

SEPTA APPROVALS

Manager Rail Facilities

Chief Engineer

SCALE 1"=50'
DRAWN BY EMH
DATE 6/18/92
CHECKED BY

Southeastern Pennsylvania Transportation Authority
ENGINEERING & CONSTRUCTION DIVISION
RAIL FACILITIES DEPARTMENT
714 Market Street Philadelphia, PA 19106-2385

SEPTA - PARKING AND STATION EXPANSION PROGRAM-PACKAGE "E"

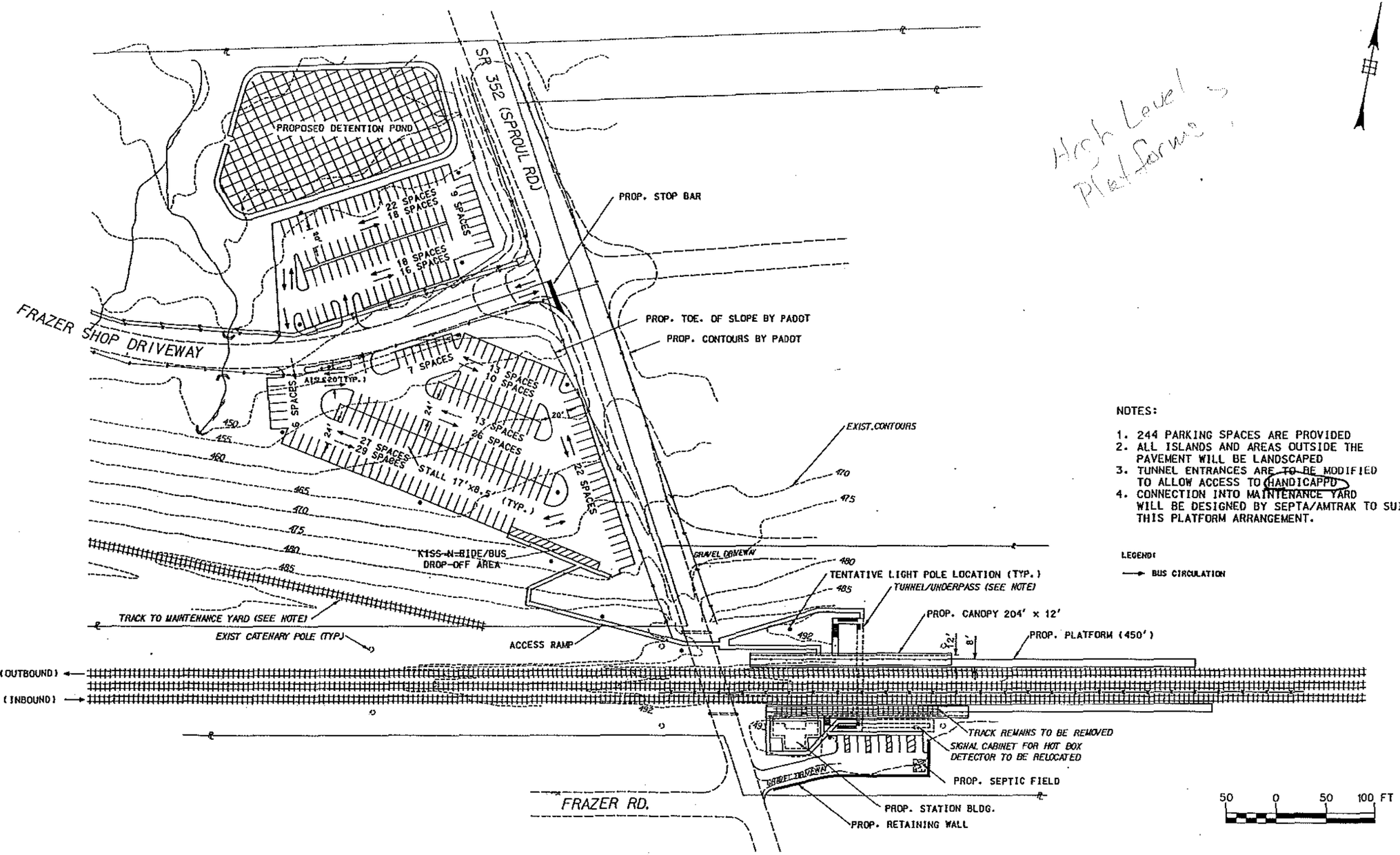
TITLE
FRAZER STATION
EXISTING SITE

SUBMITTAL LEVEL 30 %

DRAWING NUMBER

SHEET NUMBER 6

SEPTA DRAWING NUMBER




Track Level Platforms ?

NOTES:

1. 244 PARKING SPACES ARE PROVIDED
2. ALL ISLANDS AND AREAS OUTSIDE THE PAVEMENT WILL BE LANDSCAPED
3. TUNNEL ENTRANCES ARE TO BE MODIFIED TO ALLOW ACCESS TO HANDICAPPD
4. CONNECTION INTO MAINTENANCE YARD WILL BE DESIGNED BY SEPTA/AMTRAK TO SUIT THIS PLATFORM ARRANGEMENT.

LEGEND:

→ BUS CIRCULATION

SUBMITTAL LEVEL 30 %

| REV. | DATE | DESCRIPTION | BY | CKD | APD |
|---|---|---|---|---|---|
| 0 | | FOR CONSTRUCTION | | | |

EDWARDS AND KELCEY, INC.
484 South Old Middletown Road, Media, PA 19063-4833

SEPTA APPROVALS

Manager Rail Facilities

Chief Engineer

SCALE 1"=50'

DRAWN BY EMH

DATE 6/18/92

CHECKED BY

Southeastern Pennsylvania Transportation Authority

ENGINEERING & CONSTRUCTION DIVISION
RAIL FACILITIES DEPARTMENT
714 Market Street Philadelphia, PA 19106-2385

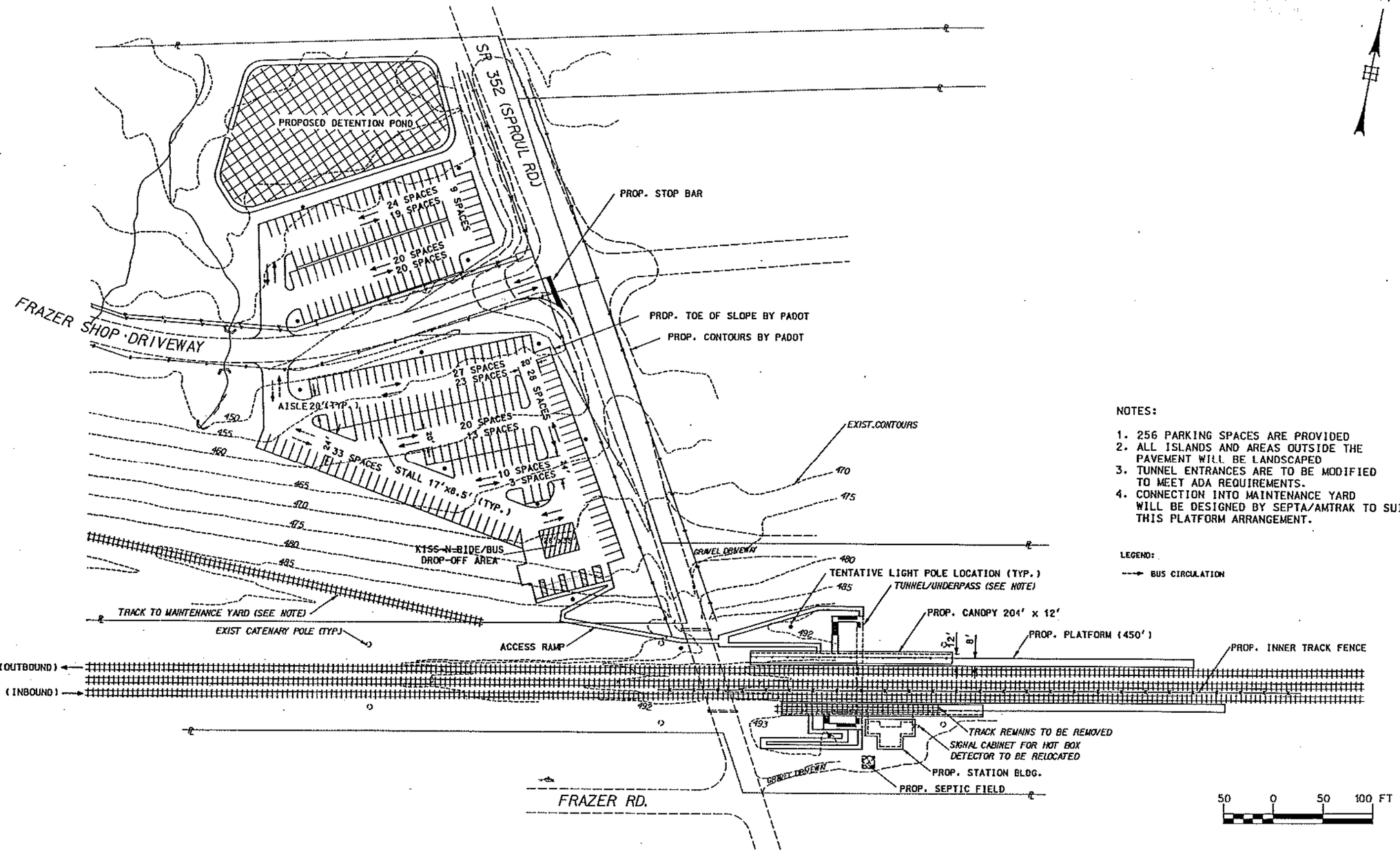
SEPTA - PARKING AND STATION EXPANSION PROGRAM-PACKAGE "E"

TITLE
FRAZER STATION
(CONCEPTUAL LAYOUT ALT #1)

DRAWING NUMBER

SHEET NUMBER 7

SEPTA DRAWING NUMBER




NOTES:

1. 256 PARKING SPACES ARE PROVIDED
2. ALL ISLANDS AND AREAS OUTSIDE THE PAVEMENT WILL BE LANDSCAPED
3. TUNNEL ENTRANCES ARE TO BE MODIFIED TO MEET ADA REQUIREMENTS.
4. CONNECTION INTO MAINTENANCE YARD WILL BE DESIGNED BY SEPTA/AMTRAK TO SUIT THIS PLATFORM ARRANGEMENT.

LEGEND:

⟶ BUS CIRCULATION

| REV. | DATE | DESCRIPTION | BY | CKD | APD |
|---|---|---|---|---|---|
| 0 | | FOR CONSTRUCTION | | | |

EDWARDS AND KELCEY, INC.
484 South Old Middletown Road, Media, PA 19063-4833

SEPTA APPROVALS

Manager Rail Facilities

Chief Engineer

SCALE 1"=50'
DRAWN BY EMH
DATE 6/18/92
CHECKED BY

Southeastern Pennsylvania Transportation Authority
ENGINEERING & CONSTRUCTION DIVISION
RAIL FACILITIES DEPARTMENT
714 Market Street Philadelphia, PA 19106-2385

SEPTA - PARKING AND STATION EXPANSION PROGRAM-PACKAGE "E"

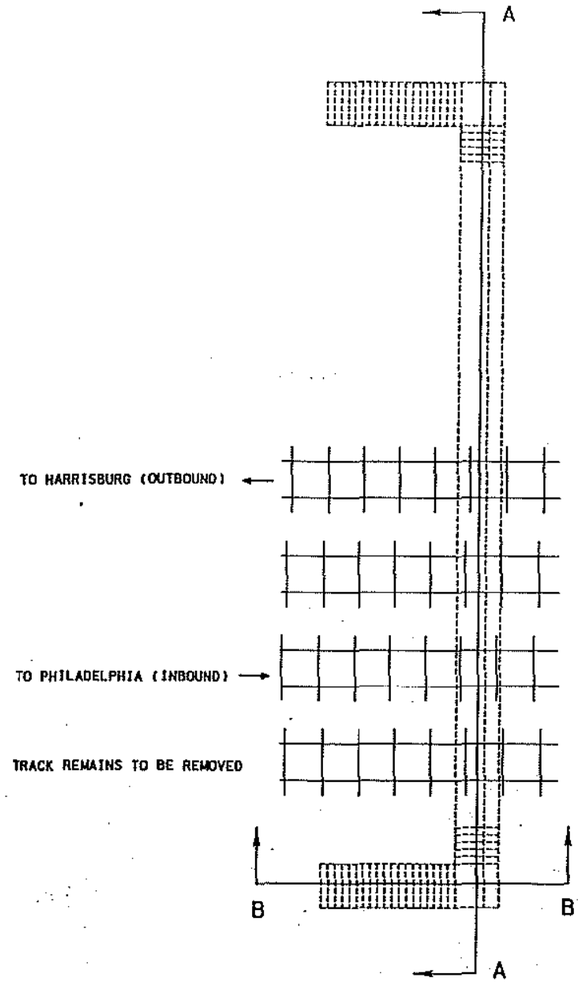
TITLE
FRAZER STATION
(CONCEPTUAL LAYOUT ALT #2)

SUBMITTAL LEVEL 30 %

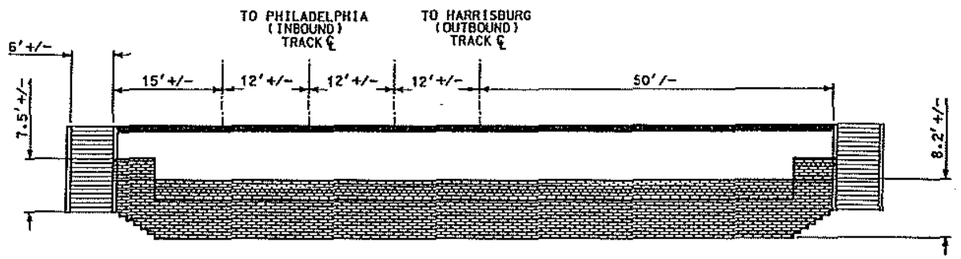
DRAWING NUMBER

SHEET NUMBER 8

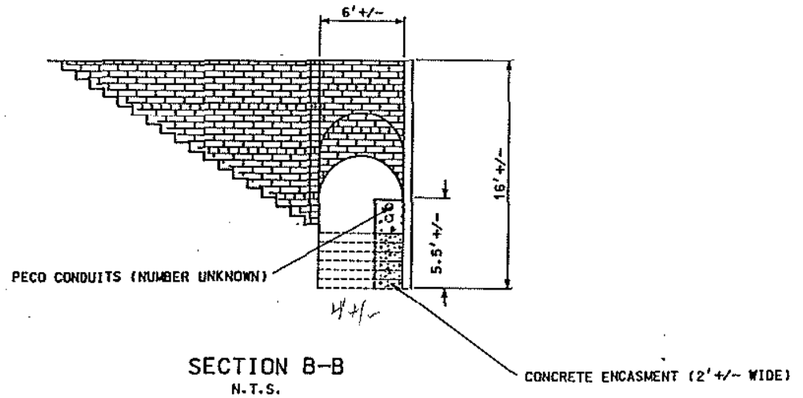
SEPTA DRAWING NUMBER




PLAN VIEW
N.T.S.




SECTION A-A
N.T.S.




SECTION B-B
N.T.S.

| REV. | DATE | DESCRIPTION | BY | CKD | APD |
|---|---|---|---|---|---|
| 0 | | FOR CONSTRUCTION | | | |

EDWARDS AND KELCEY, INC.
464 South Old Middletown Road, Media, PA 19063-1833

SEPTA APPROVALS

Manager Rail Facilities

Chief Engineer

SCALE N.T.S.
DRAWN BY EMH
DATE 6/23/92
CHECKED BY

Southeastern Pennsylvania Transportation Authority
ENGINEERING & CONSTRUCTION DIVISION
RAIL FACILITIES DEPARTMENT
714 Market Street Philadelphia, PA 19106-2385

SEPTA -- PARKING AND STATION EXPANSION PROGRAM-PACKAGE "E"

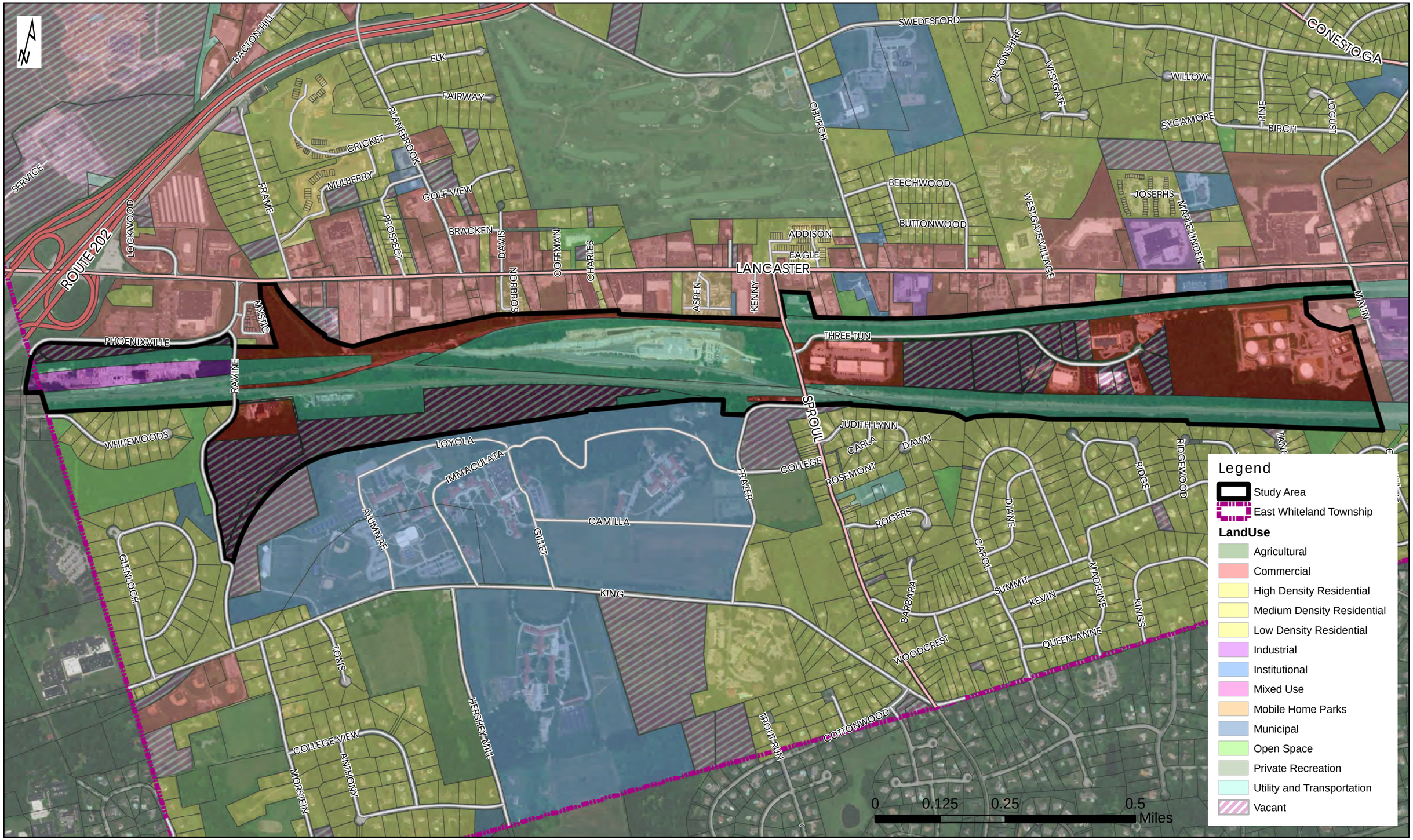
TITLE
FRAZER STATION
EXISTING TUNNEL

SUBMITTAL LEVEL 30 %

DRAWING NUMBER
SHEET NUMBER 9
SEPTA DRAWING NUMBER

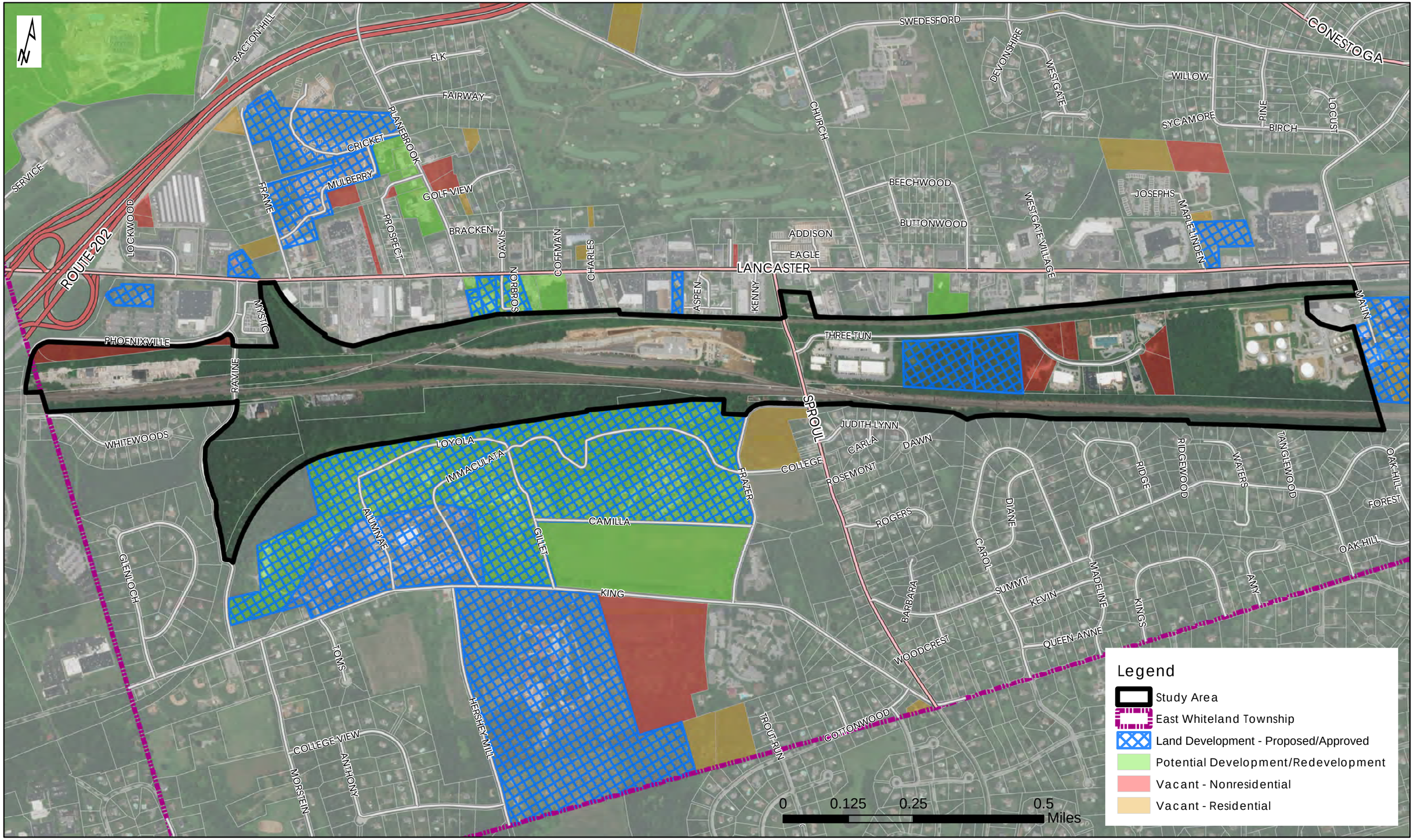
# EWT Train Station Feasibility Study

## *Existing Land Use*



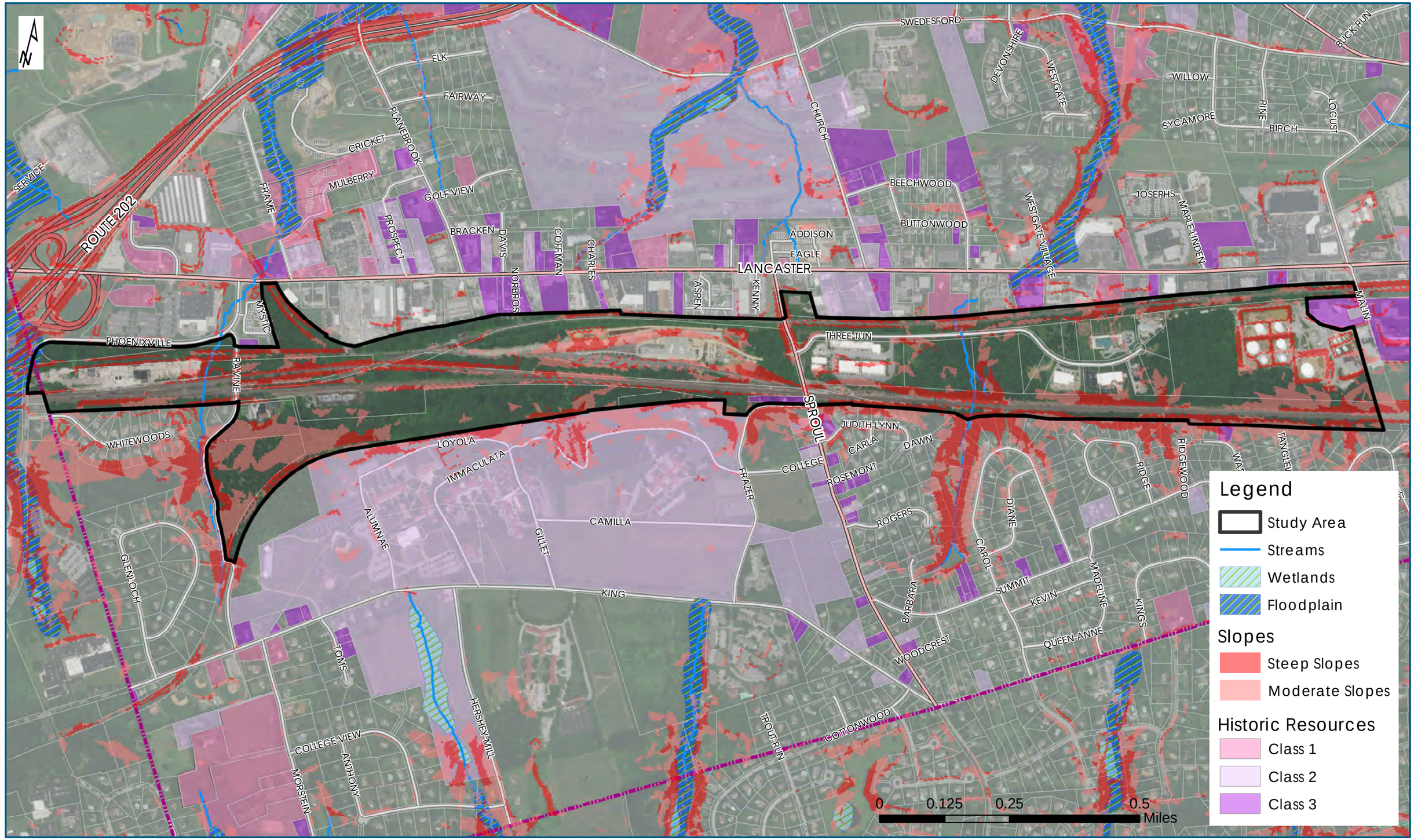
# EWT Train Station Feasibility Study

## Potential Land Development



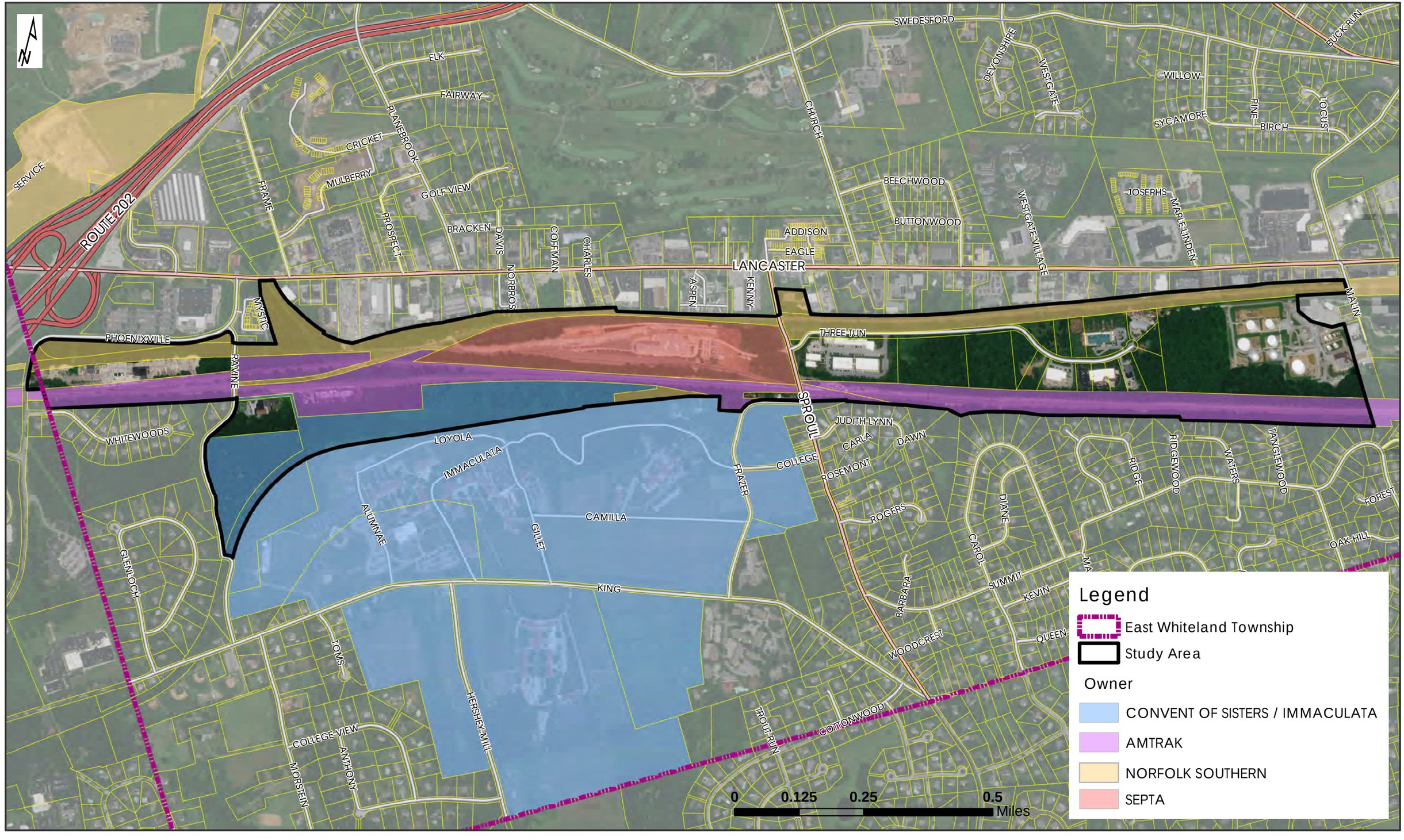
# EWT Train Station Feasibility Study

*Environmental Features*



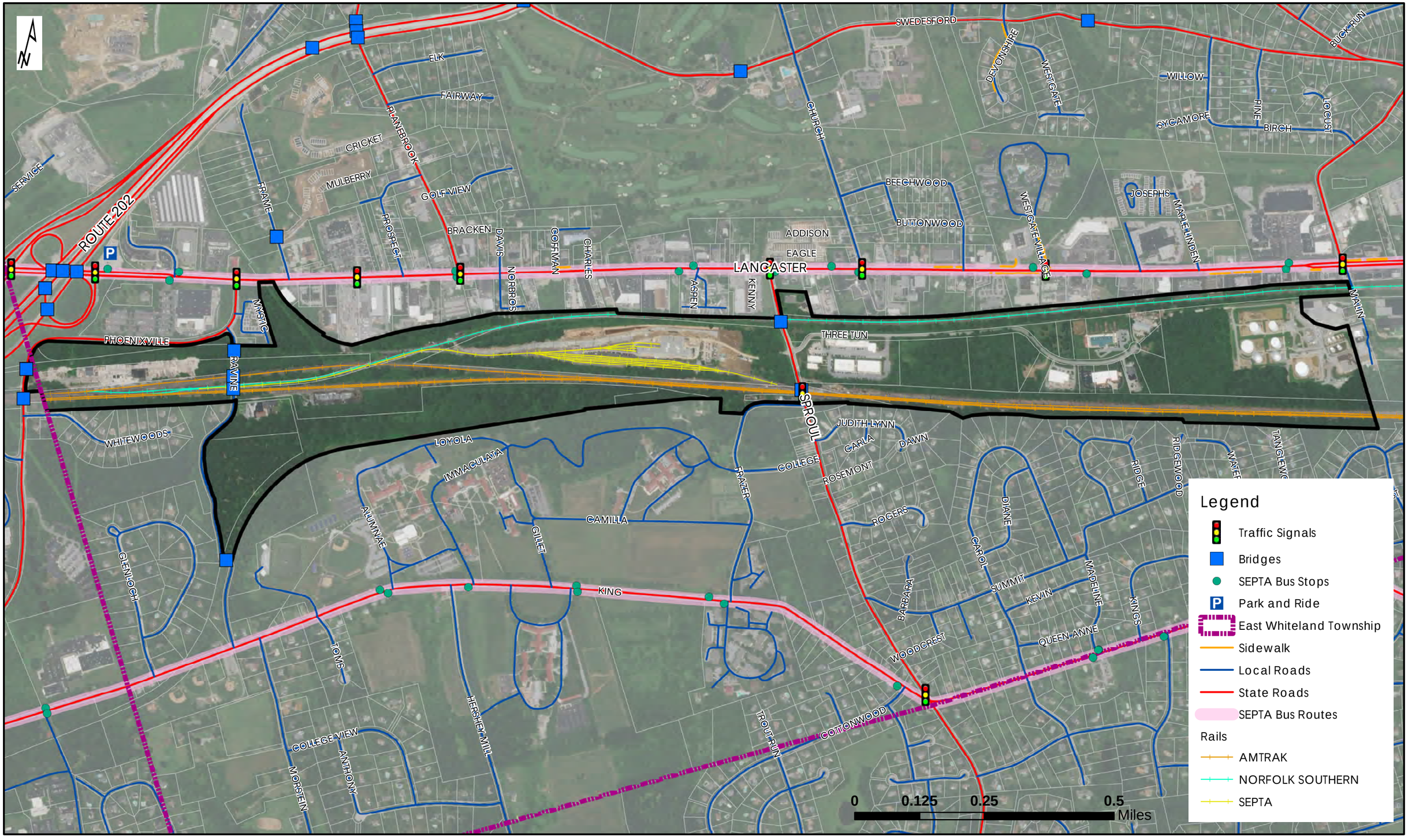
# EWT Train Station Feasibility Study

# Property Ownership



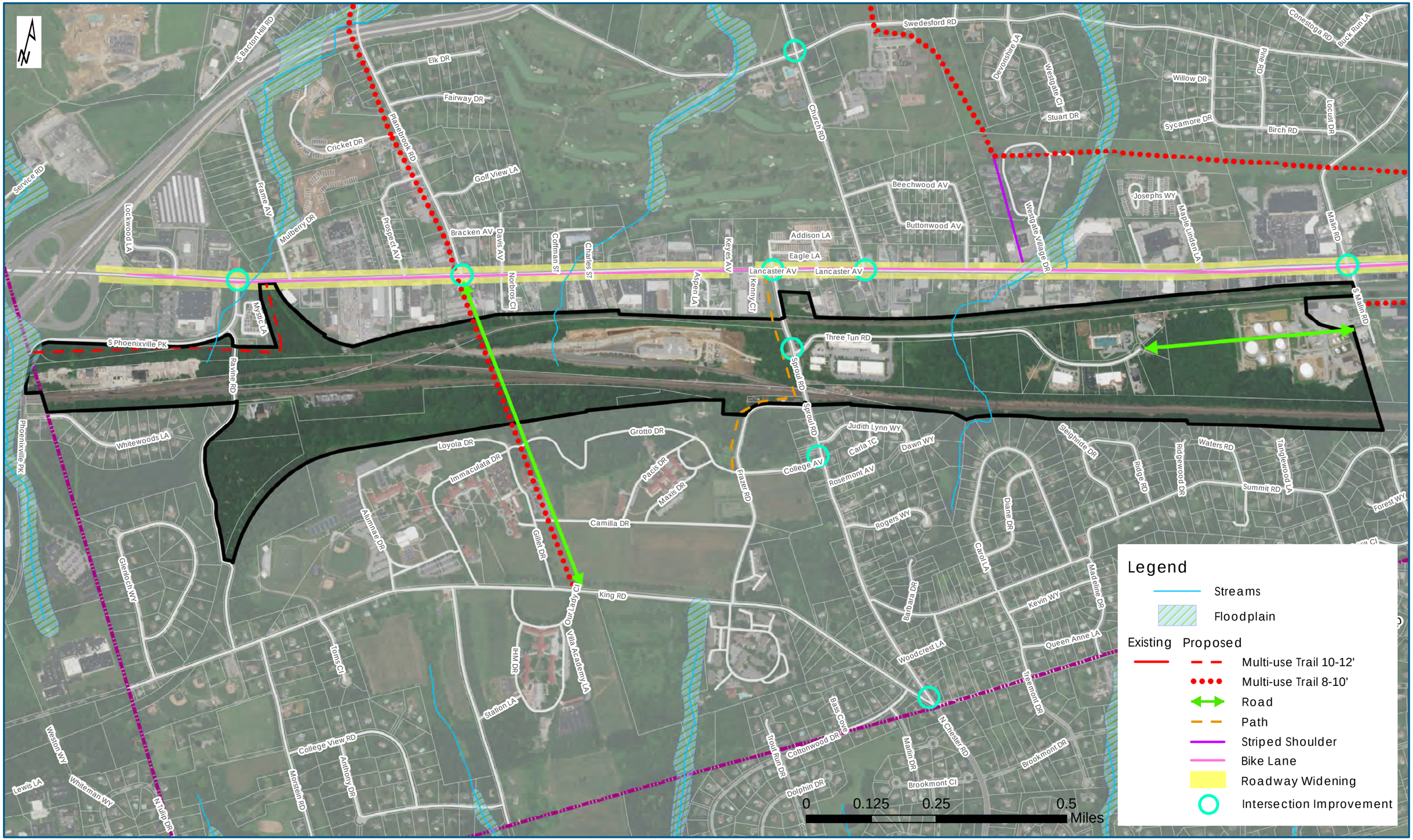
# EWT Train Station Feasibility Study

## *Existing Transportation Features*



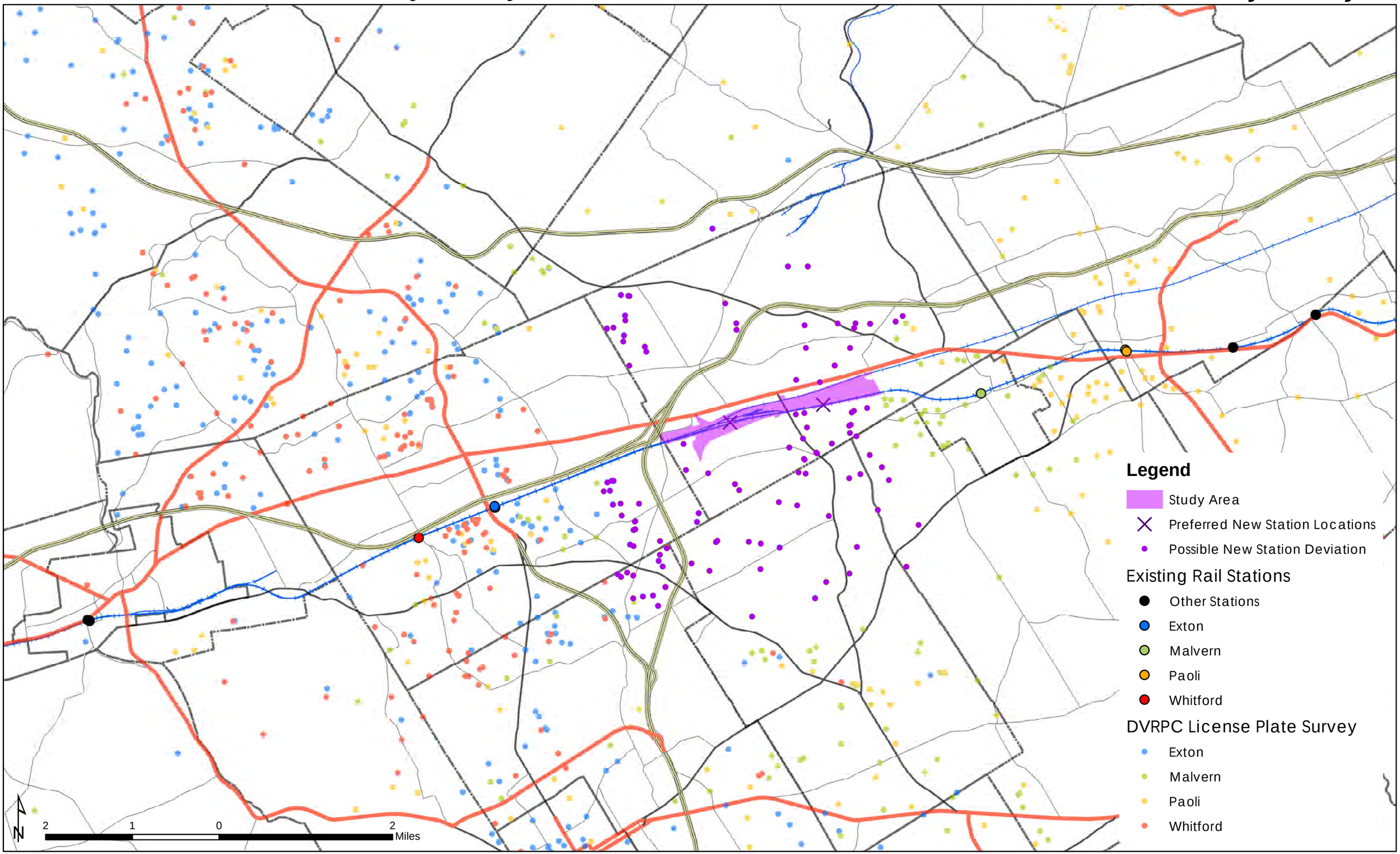
# EWT Train Station Feasibility Study

## Proposed Transportation Features



# EWT Train Station Feasibility Study

*License Plate Survey Analysis*



# Appendix 2.1

# Platform Configurations

During the initial review of the sites a number of possible configurations of platforms were envisioned. This appendix lists possible configurations, provides sketches for clarity, and contains the analysis of the configurations, and ultimately the reasoning used to conclude which configuration is preferred.

For reference, tracks are numbered sequentially with Track #1 as the southernmost to Track #4 as the northernmost. Presently, Tracks #2 and #3 do not exist, but they once did and could be constructed if necessary.

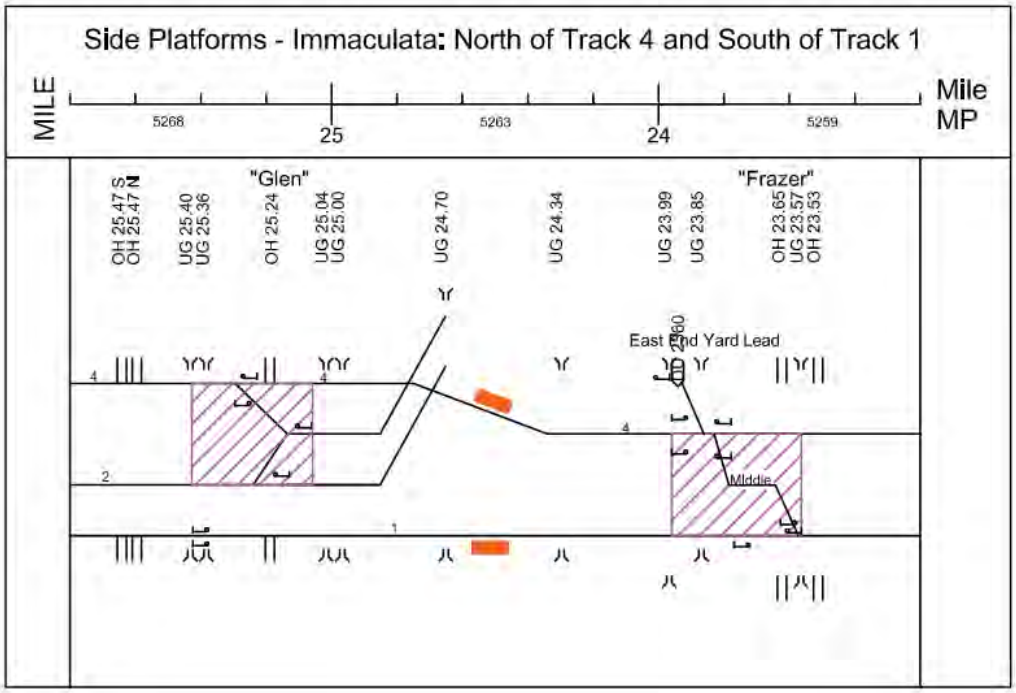
**Platform Configurations Considered for Immaculata**

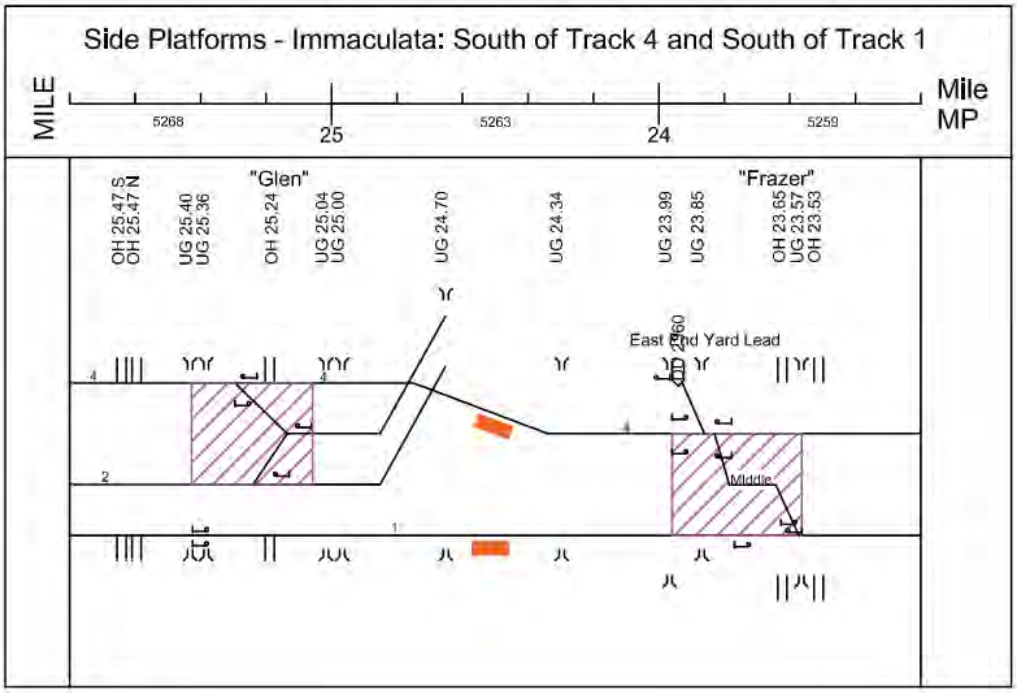
Listed in the table below are the different configurations considered.

| Immaculata Site | | |
|---|---|---|
| 1. | Side Platforms | North of Track 4 and South of Track 1 |
| 2. | Side Platforms | South of Track 4 and South of Track 1 |
| 3. | Side Platforms | South of New Track 3 and South of Track 1 |
| 4. | Side Platforms | North of New Track 2 and South of Track 1 |
| 5. | Center Platform | Between Track 1 and Track 4 |
| 6. | Center Platform | Between New Track 2 and Track 4 |
| 7. | Center Platform | Between New Track 2 and New Track 3 |
| 8. | Center Platform | Between Track 1 and New Track 3 |

# Appendix 2.1

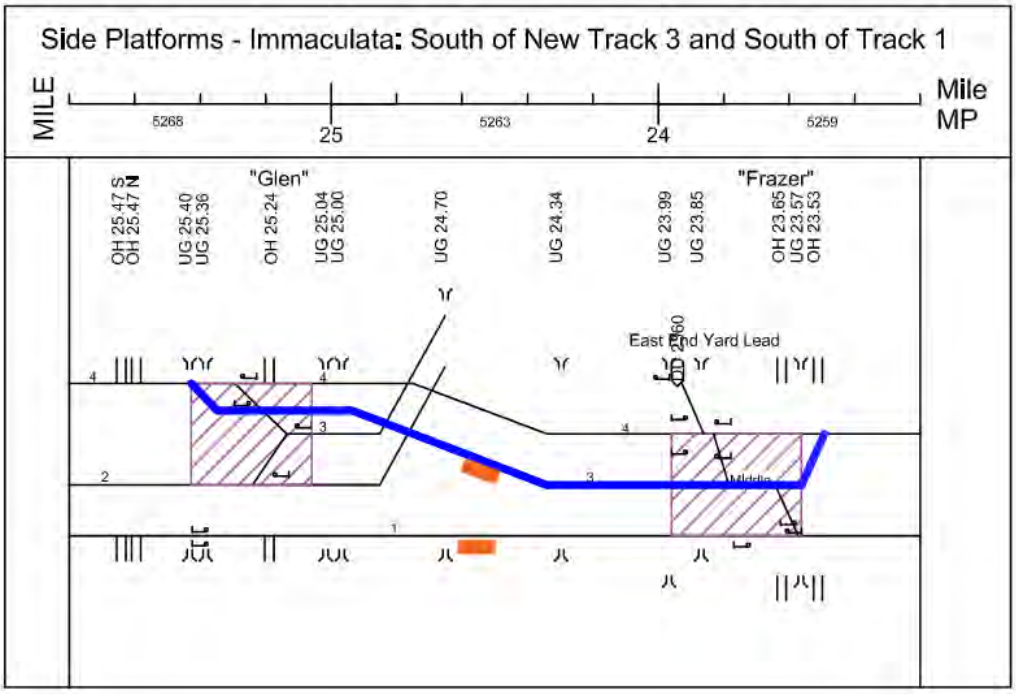
## Platform Configurations

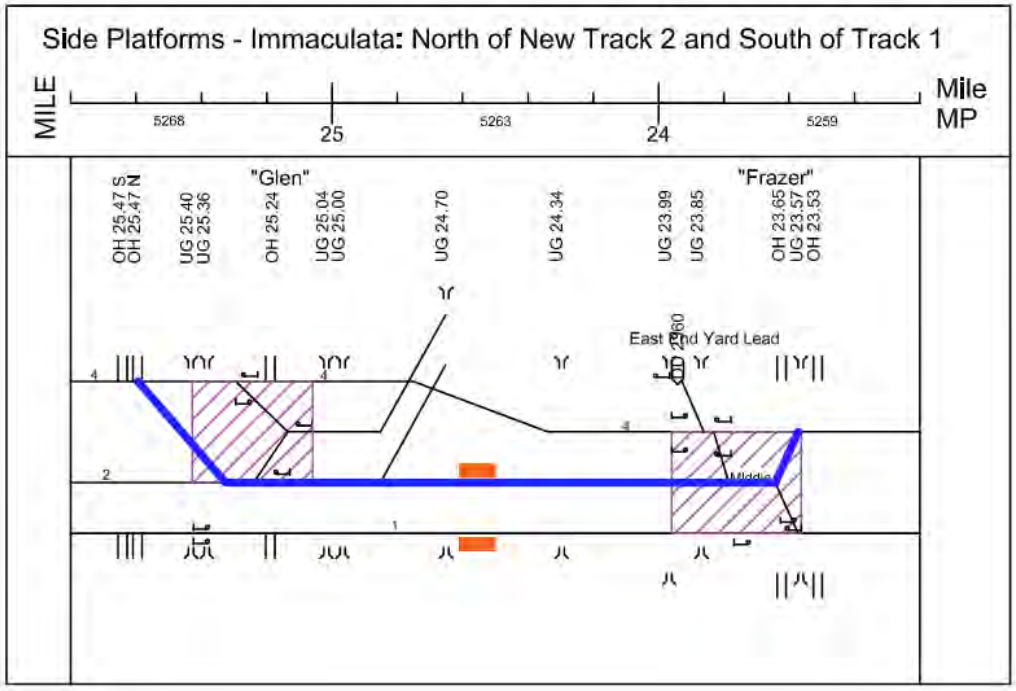


# Appendix 2.1

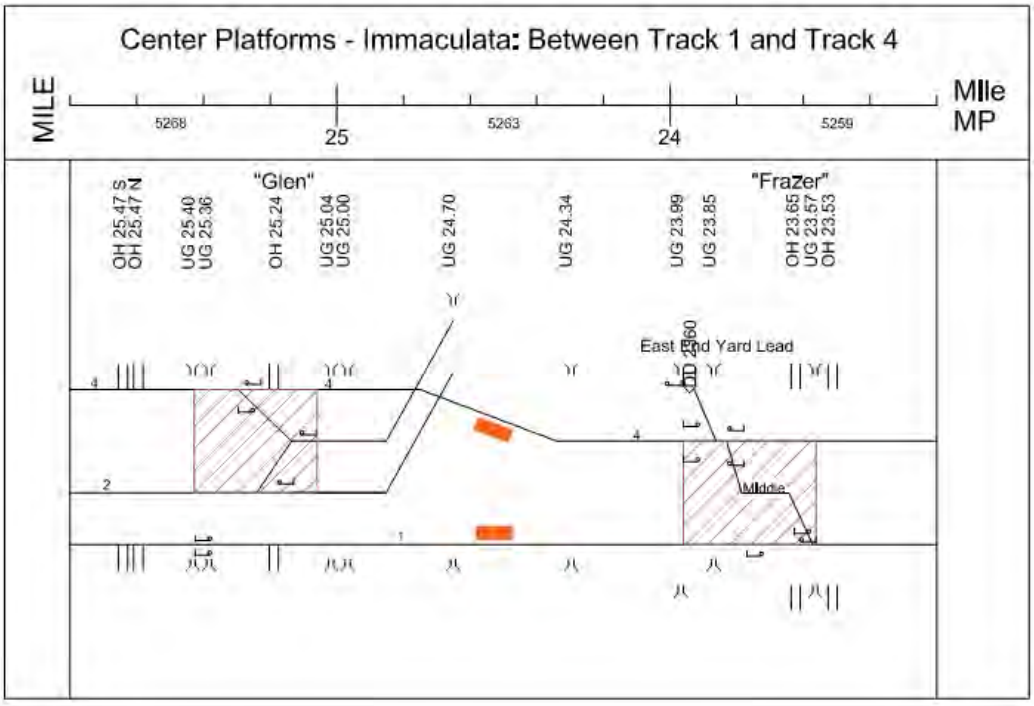
## Platform Configurations

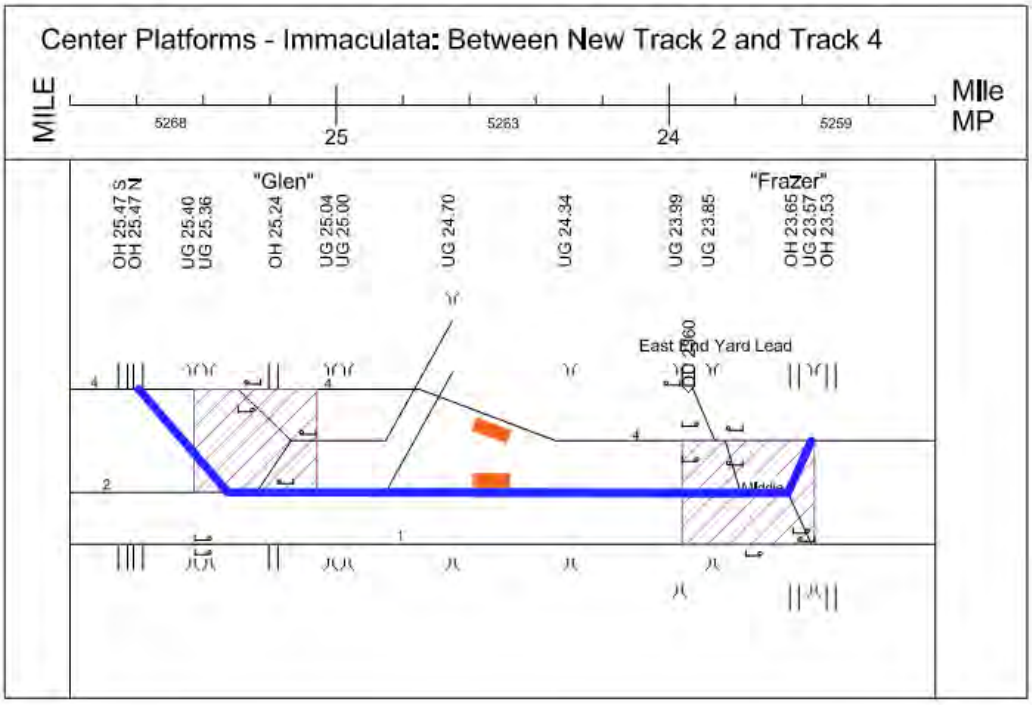


# Appendix 2.1

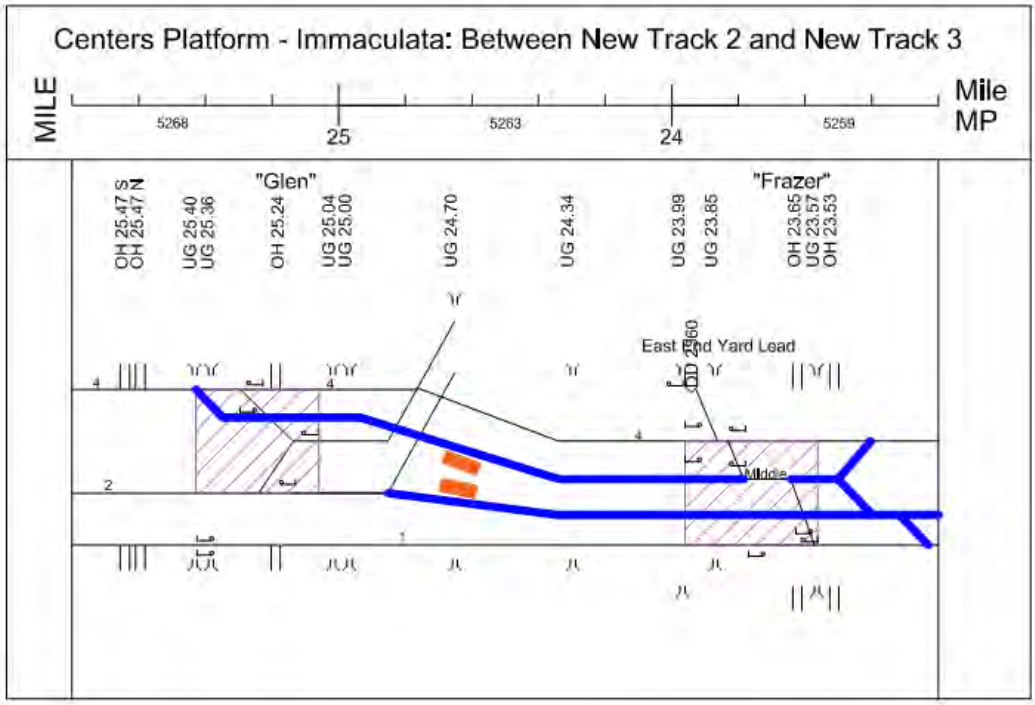
## Platform Configurations

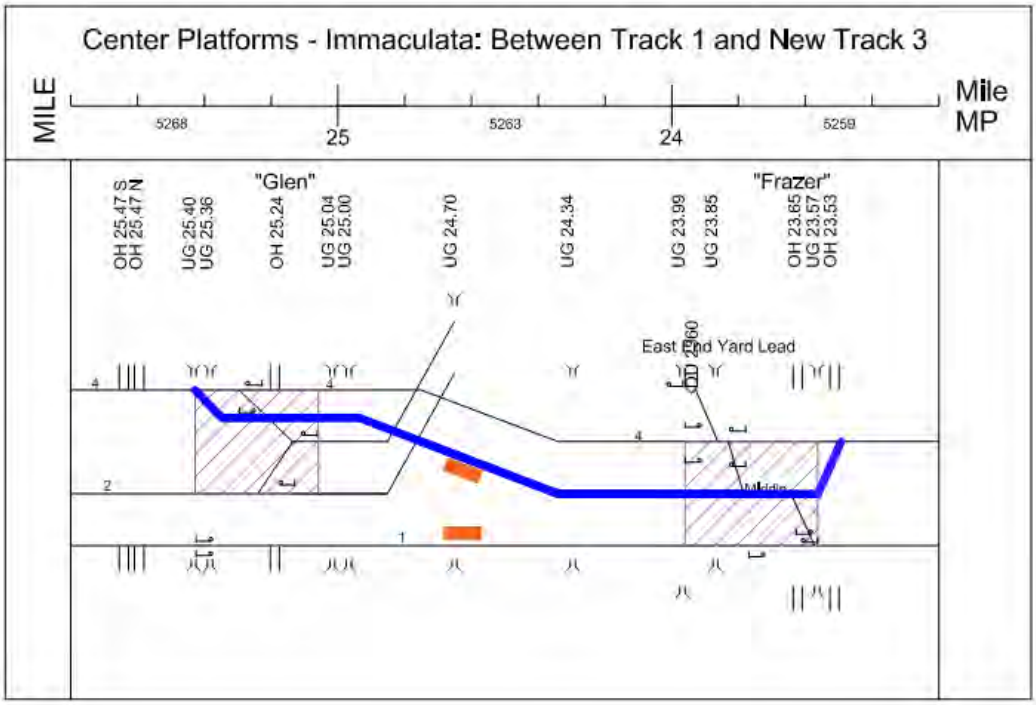


# Appendix 2.1

## Platform Configurations



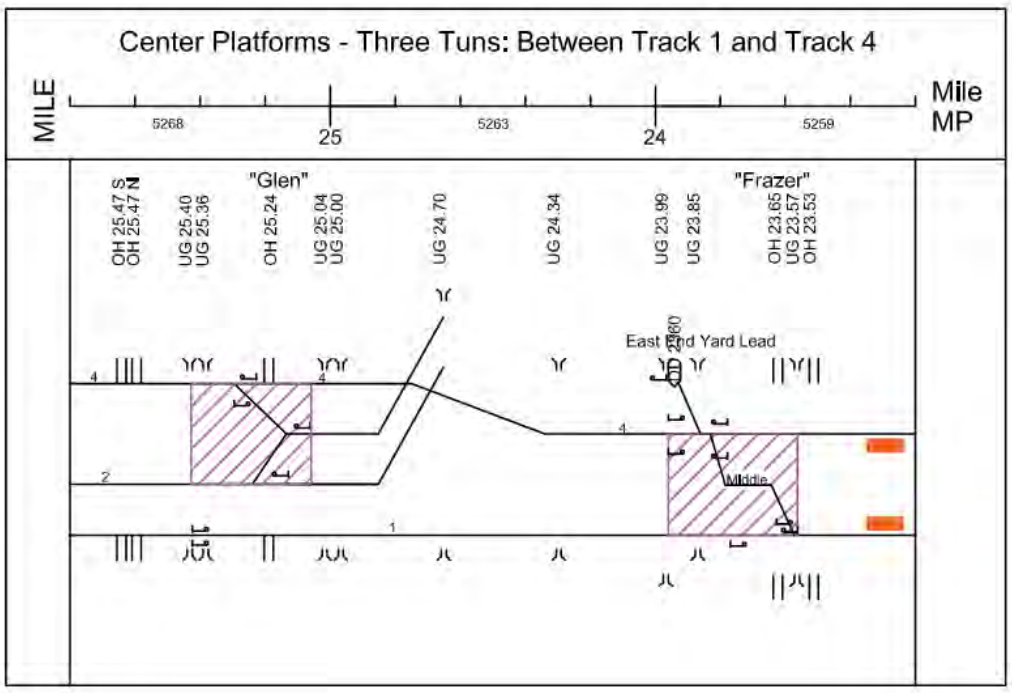



# Appendix 2.1

# Platform Configurations

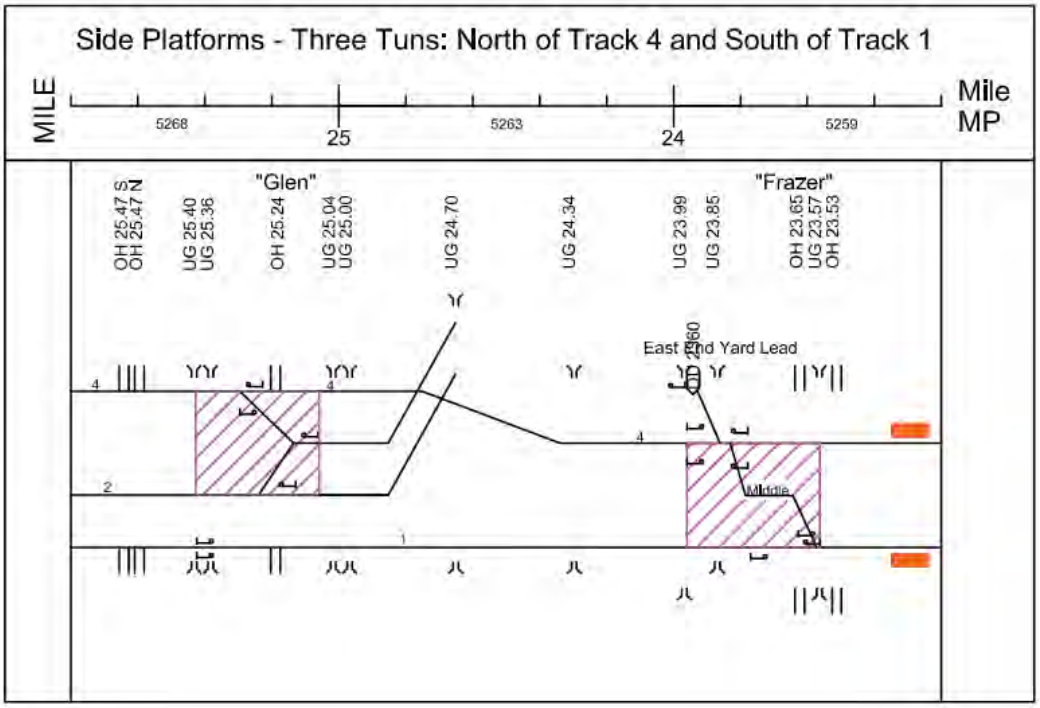
## Platform Configurations Considered for Three Tun Site

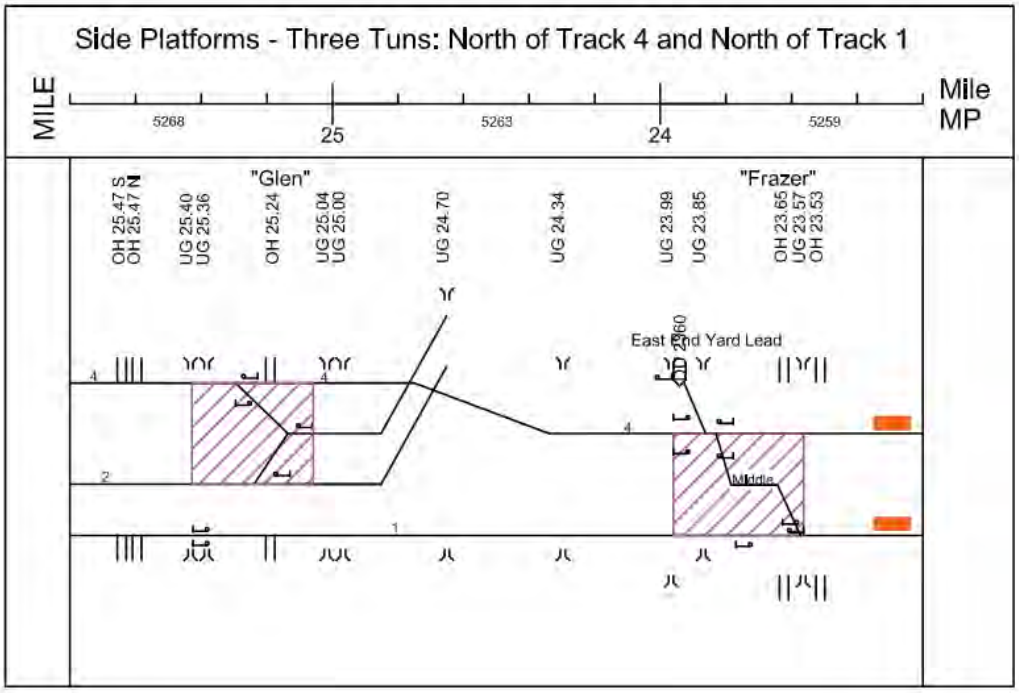
| Three Tun | | |
|---|---|---|
| 1. | Center Platform | Between Track 1 and Track 4 |
| 2. | Side Platforms | North of Track 4 and South of Track 1 |
| 3. | Side Platforms | North of Track 4 and North of Track 1 |
| 4. | Side Platforms | South of Track 4 and South of Track 1 |



# Appendix 2.1

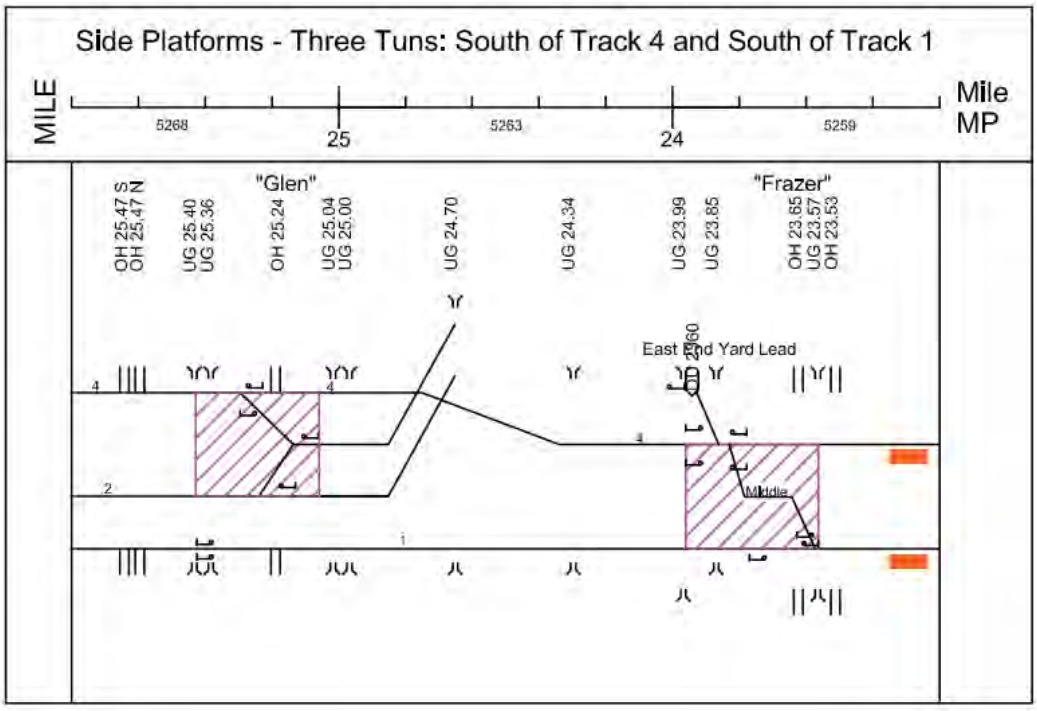
## Platform Configurations



# Appendix 2.1

# Platform Configurations




**Platform Configuration Ratings**

The tables below compare the platform configuration ratings of the various options considered for each station site.

Red highlighted items indicate that there are high costs or large operational impacts related to the configuration.

Yellow indicates that as being a limiting factor but would not preclude it from consideration.

Green indicates that the factor would not impact feasibility.

A configuration was dismissed from consideration if it prohibited construction of additional tracks.

The preferred platform configuration for either site is highlighted in blue.

# Appendix 2.1

## Platform Configurations

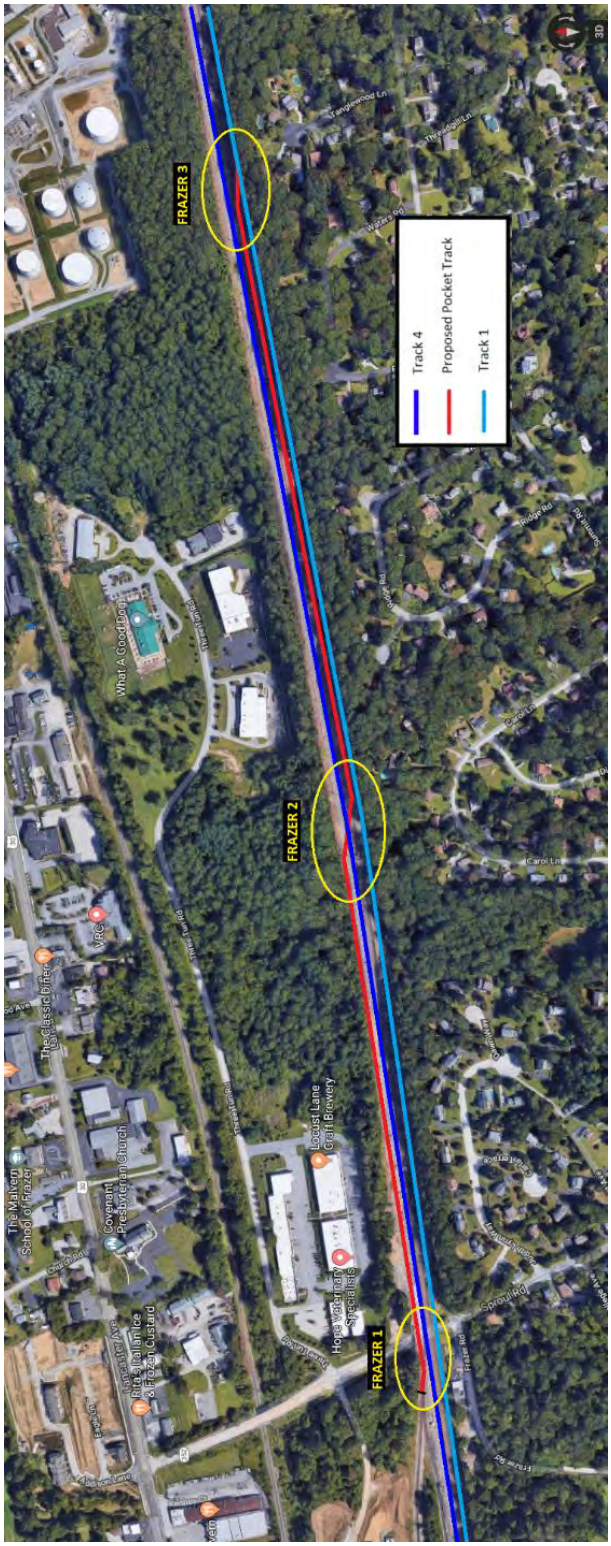
| Immaculata | | | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|
| 1. | Side Platforms | North of Track 4 and South of Track 1 | | | | | | |
| 2. | Side Platforms | South of Track 4 and South of Track 1 | | | | | | |
| 3. | Side Platforms | South of New Track 3 and South of Track 1 | | | | | | |
| 4. | Side Platforms | North of New Track 2 and South of Track 1 | | | | | | |
| 5. | Center Platform | Between Track 1 and Track 4 | | | | | | |
| 6. | Center Platform | Between New Track 2 and Track 4 | | | | | | |
| 7. | Center Platform | Between New Track 2 and New Track 3 | | | | | | |
| 8. | Center Platform | Between Track 1 and New Track 3 | | | | | | |

| Three Tun | | | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|
| 1. | Center Platform | Between Track 1 and Track 4 | | | | | | |
| 2. | Side Platforms | North of Track 4 and South of Track 1 | | | | | | |
| 3. | Side Platforms | North of Track 4 and North of Track 1 | | | | | | |
| 4. | Side Platforms | South of Track 4 and South of Track 1 | | | | | | |

**A.** Track, Signal, and Catenary Changes – Adding new track increases cost substantially.
**B.** Future Operational Considerations – Obstructs future capacity and/or future plans
**C.** Power and Signal Cable Relocations – Required at all locations.
**D.** Norfolk-Southern Participation – Increases costs and coordination.
**E.** Constructability – Crossing two tracks makes it harder to construct.
**F.** Steep Slopes – Can be mitigated. Steep Slopes are encountered at all combinations.

# Appendix 2.2

## Frazer Interlocking Future Plans




This figure shows future changes to Frazer Interlocking envisioned by Amtrak. The Yard Lead (Frazer 1 to Frazer 2) and the Pocket Track (Frazer 2 to Frazer 3) will be extended to be approximately 2216-feet long with #20 Turnouts. This will allow track movements to be 45 mph and improve efficiency for both yard movements and mainline movements in this area.

June 2019

DVRPC

PROCESS MEMO

# East Whiteland Station Transit Forecasts



DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION


**The Delaware Valley Regional Planning Commission** is the federally designated Metropolitan Planning Organization for a diverse nine-county region in two states: Bucks, Chester, Delaware, Montgomery, and Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer in New Jersey.

DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION

**DVRPC's vision** for the Greater Philadelphia Region is a prosperous, innovative, equitable, resilient, and sustainable region that increases mobility choices by investing in a safe and modern transportation system; that protects and preserves our natural resources while creating healthy communities; and that fosters greater opportunities for all.

**DVRPC's mission** is to achieve this vision by convening the widest array of partners to inform and facilitate data-driven decision-making. We are engaged across the region, and strive to be leaders and innovators, exploring new ideas and creating best practices.

***TITLE VI COMPLIANCE*** | *DVRPC fully complies with Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, Executive Order 12898 on Environmental Justice, and related nondiscrimination statutes and regulations in all programs and activities. DVRPC's website, www.dvrpc.org, may be translated into multiple languages. Publications and other public documents can be made available in alternative languages and formats, if requested. DVRPC public meetings are always held in ADA-accessible facilities, and in transit-accessible locations when possible. Auxiliary services can be provided to individuals who submit a request at least seven days prior to a public meeting. Requests will be accommodated to the greatest extent possible. Any person who believes they have been aggrieved by an unlawful discriminatory practice by DVRPC under Title VI has a right to file a formal complaint. Any such complaint may be in writing and filed with DVRPC's Title VI Compliance Manager and/or the appropriate state or federal agency within 180 days of the alleged discriminatory occurrence. For more information on DVRPC's Title VI program or to obtain a Title VI Complaint Form, please visit: www.dvrpc.org/GetInvolved/TitleVI, call (215) 592-1800, or email public_affairs@dvrpc.org.*

*DVRPC is funded through a variety of funding sources including federal grants from the U.S. Department of Transportation's Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), the Pennsylvania and New Jersey departments of transportation, as well as by DVRPC's state and local member governments. The authors, however, are solely responsible for the findings and conclusions herein, which may not represent the official views or policies of the funding agencies.*

# INTRODUCTION

East Whiteland Station is a proposed Regional Rail station on the SEPTA Paoli/Thorndale Line between Exton and Malvern stations; filling a gap of roughly six rail-miles. The portion of the Paoli/Thorndale Line under study is the four adjacent stations on either side of the proposed site, that is: Whitford, Exton, Malvern and Paoli stations. The major motivation for this study is to investigate the potential ridership of a new Regional Rail station in East Whiteland Township, Chester County, PA.

There are two proposed sites for the station, "Immaculata" and "Three Tun". The Immaculata Site (Figure 1) is located just north of the Immaculata University campus. This site includes pedestrian access to Immaculata University campus; an extension of Planebrook Road (proposed "Planebrook Loop"), past U.S. 30, connecting to Ravine Road; a pedestrian overpass connecting the Planebrook Loop to the station; and a 400 space parking lot accessible from Frazer Road via a new driveway. The Three Tun Site (Figure 2) is located on Three Tun Road, and includes a 400 space parking lot south of Three Tun Road. With the Three Tun Site, a higher service frequency (hourly) is assumed, while at the Immaculata Site both high (hourly) and lower (half-hour) service are assumed separately.

The DVRPC travel demand model was used to estimate future ridership for stations at both build sites and the adjacent stations.

**Figure 1:** Immaculata Site

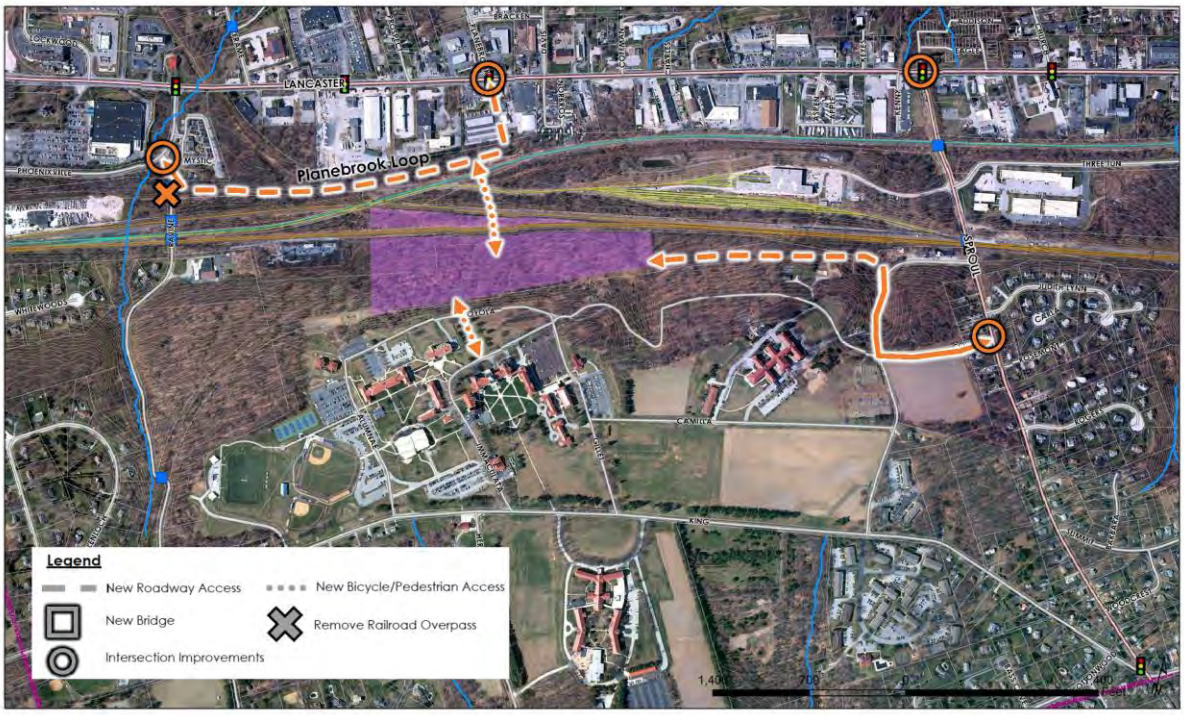
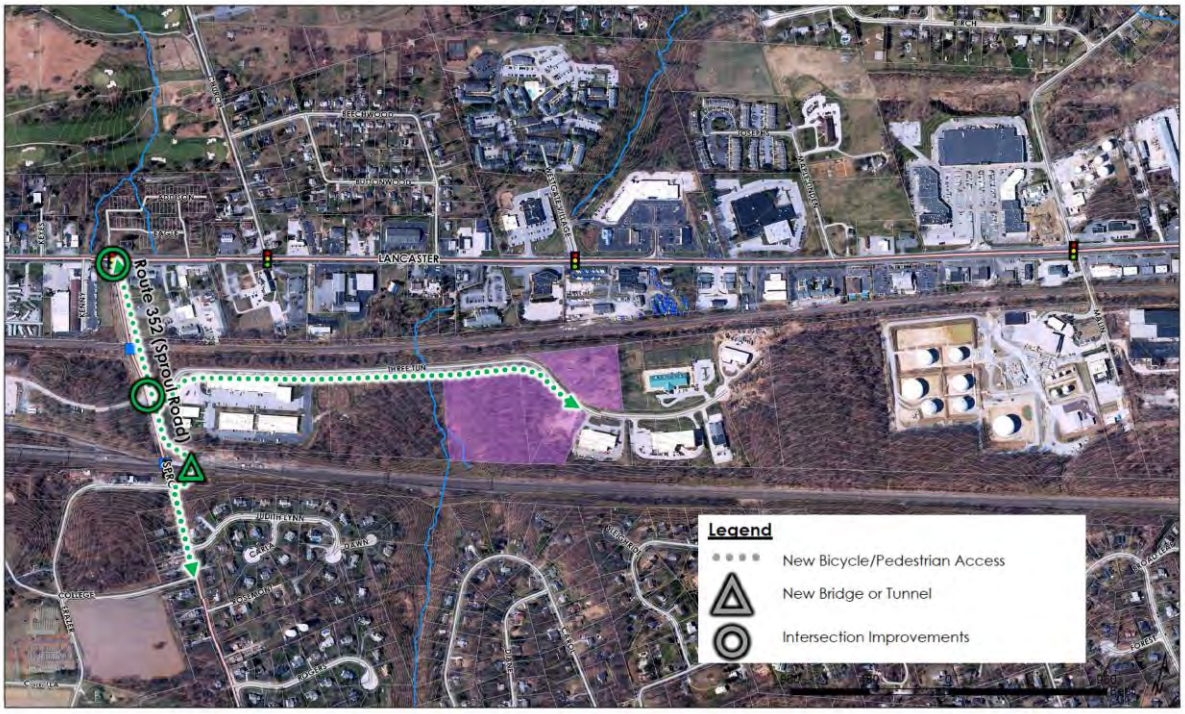


**Figure 2.** Three Tun Site



# DVRPC TRAVEL FORECASTING PROCESS

Travel forecasts for this study were conducted using DVPRC's most recent travel demand model TIM2.3.1 (Transportation Improvement Model version 2.3.1). TIM2.3.1 is a traditional four-step, trip-based model built on PTV's VISUM 15.0 software platform. The model includes representations of the highway and public transit systems in DVRPC's nine member counties plus an extended area of 16 counties (where a less detailed transportation network is modeled) in Pennsylvania, New Jersey, Delaware, and Maryland, immediately surrounding the DVRPC region. The transit network represents operational characteristics of the regional transit system including route alignment, stop locations, service schedules, and fare information.

TIM2.3.1 follows the traditional steps of trip generation, trip distribution, modal split, and traffic assignment. However, an iterative feedback loop is employed from traffic assignment to the trip distribution step. The feedback loop ensures that the congestion levels used by the models when determining trip origins and destinations are equivalent to those that result from the traffic assignment step. Additionally, the iterative model structure allows trip making patterns to change in response to changes in traffic patterns, congestion levels, and changes to the transportation system.

TIM2.3.1 is disaggregated into four time periods:  AM peak (6 AM to 10 AM), midday (10 AM to 3 PM), PM peak (3 PM to 7 PM), and evening (7 PM to 6 AM). This disaggregation begins in trip generation, where factors are used to separate daily trips into the individual time periods. TIM2.3.1 then utilizes completely separate model chains for AM peak, midday, PM peak, and evening travel simulation runs. Time-of-day sensitive inputs to the models, such as highway capacities and transit service levels, are disaggregated to be reflective of time-period-specific conditions.

## Trip Generation

The trip generation module uses both socio-economic and location attributes to estimate the magnitude of travel demand for any given geographic area. Base year estimates and future year forecasts of population, households by income, employment by industry, land use, retail density, and many other variables are used to determine the number of trips produced by and attracted to small areas known as transportation analysis zones or TAZs. These trips are calculated for several trip purposes on the basis of trip rates applied to the zonal estimates of demographic and employment data. Trip purposes include work, shopping, school/university, and other non-work trips, light and heavy truck trips, and taxi trips.

## Trip Distribution

Trip distribution is the process by which the zonal trip ends established in the trip generation analysis are linked together to form origin-destination patterns in a trip table format. AM peak, midday, PM peak, and evening trip ends are distributed separately based on a set of impedance calculations that consider the time and cost of travel. Separate distribution models are applied at the zonal level for each trip purpose.

## Modal Split

The modal split model is also run separately for each time period. The modal split module calculates the fraction of each TAZ-to-TAZ cell in the trip table that should be allocated to transit, and then assigns the

residual to the highway side. The choice between highway and transit usage is made on the basis of comparative cost, travel time, and frequency of service, with other aspects of modal choice being used to modify this basic relationship. In general, the better the transit service, the higher the fraction assigned to transit, although trip purpose and auto ownership also affect the allocation. The model further divides highway trips into auto drivers and passengers.

## Highway Assignment

For highway trips, the final step in the simulation process is the assignment of vehicle trips to the highway network representative of the alternative being modeled. For AM, midday, PM, and evening travel, the assignment model produces the future traffic volumes for individual highway links that are required for the evaluation of each alternative. The regional nature of the highway network and trip table underlying the assignment process allows the diversion of travel into and through the study area to various points of entry and exit in response to the changes made to the transportation system.

Highway trips are assigned to the network representative of a given alternative by determining the best (minimum time) route through the highway network for each origin-destination pair, and then allocating highway travel to the facilities along that route. This assignment model is "capacity restrained," which means that congestion levels are considered when determining the best route. An iterative equilibrium assignment method is used to implement the capacity constraint. When the assignment and associated trip table reach equilibrium, no path significantly faster than the one actually assigned for each trip can be found through the network, given the capacity restrained travel times on each link.

## Transit Assignment

After equilibrium is achieved, the transit trip tables are assigned to the transit network to produce link and route passenger volumes. The transit person trips produced by the modal split model are "linked," which means that they do not include any transfers that occur either between transit trips or between auto approaches and transit lines. The transit assignment procedure accomplishes two major tasks. First, the transit trips are "unlinked" to include transfers, and second, the unlinked transit trips are associated with specific transit facilities to produce link, line, and station volumes. These tasks are accomplished simultaneously within the transit assignment model, which assigns the transit trip matrix to minimum impedance paths built through the transit network. There is no capacity-restraining procedure in the transit assignment model.

## Transit Assignment Validation

Before a travel model can be used to predict changes in transit ridership due to the various new station alternatives, its ability to replicate existing conditions is tested. The simulated transit assignments are compared to current transit counts taken at stations serving the study area. The travel model is executed with current conditions and the results are compared with recent transit counts. Based on this analysis, the East Whiteland travel model produced accurate traffic ridership. The validated model was then executed for each of the build alternatives.

The following tabulations summarize the errors in the assigned ridership. Four stations in the study area with available daily ridership counts were used for model validation: Whitford, Exton, Malvern, and Paoli

stations. The total number of boardings at all facilities, 3,175, is within two percent of the total counted volume of 3,233 boardings.

**Table 1. Average Travel Model Calibration Error for the East Whiteland study area**

| Location | Counted Boardings | Assigned Boardings | Difference | Percent Difference |
|---|---|---|---|---|
| **Whitford** | 399 | 318 | -81 | -20.3 % |
| **Exton** | 797 | 801 | 4 | 0.5 % |
| **Malvern** | 850 | 734 | -116 | -13.6% |
| **Paoli** | 1,187 | 1,322 | 135 | 11.4 % |
| **All** | **3,233** | **3,175** | **-58** | **-1.8 %** |

# TRANSIT FORECASTS

For each of the 2035 future year scenarios, the inputs to the TIM2.3.1 model were modified to reflect the relevant zonal demographic and employment estimates as well as the necessary changes to the highway and transit networks. The model was then executed with those inputs and the changes in highway volume and transit ridership from a 2015 base year were tabulated and analyzed. All of the results presented in this section are for an average annual weekday.

## Future Year Alternatives

Four future year alternatives were modeled: 2035 No-Build, 2035 Build (Immaculata Site, hourly service), 2035 Build (Immaculata Site, half-hour service) and 2035 Build (Three Tun Site). The coded transportation networks for all alternatives includes all of the transportation projects in DVRPC's Transportation Improvement Program (TIP) and Long Range Plan that are scheduled to be open by the analysis year.

There are a number of regionally significant projects that may impact ridership on the Paoli/Thorndale Line that are scheduled to be open in 2035. This includes expanding parking at three stations: at Exton from 610 to 1,043 paces; at Paoli from 486 to 1,086 spaces; and at Downingtown from 360 to 900 spaces. Also included is an extension of the Media/Elwyn Line from Elwyn, PA to Wawa, PA which would provide 600 more spaces to the area and extend the catchment area of the Media/Elwyn Line.

## Socioeconomic Projections

DVRPC's long-range population and employment forecasts are revised periodically to reflect changing market trends, development patterns, local and national economic conditions, and available data. The completed forecasts reflect all reasonably known current information and the best professional judgment of predicted future conditions. The revised forecasts, in five-year increments between 2015 and 2045, were adopted by the DVRPC Board in 2016. They support the Region's 2045 Long Range Plan and serve as the basis for DVRPC's planning and modeling activities during the life of the Plan.

DVRPC uses a multi-step, multi-source methodology to produce its forecasts at the county level. County forecasts serve as control totals for municipal forecasts, which are disaggregated from county totals. Municipal forecasts are based on an analysis of historical data trends adjusted to account for infrastructure availability, environmental constraints to development, local zoning policy, and development proposals. Municipal population forecasts are constrained using density ceilings and floors. County and, where necessary, municipal input is used throughout the process to derive the most likely population forecasts for all geographic levels.

### Population Forecasting

Population forecasting at the regional level involves review and analysis of six major components: births, deaths, domestic in-migration, domestic out-migration, international immigration, and changes in group quarters populations (e.g., dormitories, military barracks, prisons, and nursing homes). DVRPC uses both the cohort survival concept to age individuals from one age group to the next, and a modified Markov transition probability model based on the most recent US Census and the US Census' recent Current Population Survey (CPS) research to determine the flow of individuals between the Delaware

Valley and areas outside the region. For movement within the region, Census and IRS migration data, coupled with CPS data, are used to determine migration rates between counties. DVRPC relies on county planning offices to provide information on any known, expected, or forecasted changes in group quarters populations. These major population components are then aggregated and the resulting population forecasts are reviewed by member governments for final adjustments based on local knowledge.

### Employment Forecasting

Employment is influenced by local, national, and global political and socioeconomic factors. The National Establishment Time Series (NETS) database serves as DVRPC's primary data source for employment forecasting. Employment sectors include mining, agriculture, construction, manufacturing, transportation, wholesale, retail, finance/insurance, service, government, and military. Other supplemental sources of data include the US Census Bureau, Bureau of Economic Analysis, the Bureau of Labor Statistics, Occupational Privilege tax data, and other public and private sector forecasts. As in the population forecasts, county-level total employment is used as a control total for sector distribution and municipal level forecasts. Forecasts are then reviewed by member counties for final adjustments based on local knowledge.

### Study Area Population and Employment Forecasts

As part of the East Whiteland Station Study, the consultant team reviewed its most recent population and employment estimates, its long-range population and employment forecasts, and all proposed land use developments in the study area. Employment and enrollment forecasts at Immaculata University and affiliated Camilla Hall Nursing Home were provided by Immaculata University to improve demographic estimates for their respective zone. Immaculata University is expecting strong growth at 6% annual increase in undergraduate enrollment and 1%-5% annual growth in other student programs. They expect 4% annual growth in employment and no growth at Camilla Hall Nursing Home. These estimates were applied to the model's zonal data. A summary can be found in Table 2.

**Table 2.** Immaculata University and Camilla Hall enrollment, residency and employment forecasts

| | | | 2015 – 2035 Change | |
|---|---|---|---|---|
| **Immaculata University** | **2015** | **2035** | **Abs.** | **Pct.** |
| Student Enrollment | 2,709 | 5,063 | 2,354 | 87% |
| Student Residents | 434 | 812 | 378 | 87% |
| Immaculata University Workers | No data | 619 | | |
| Camilla Nursing Home Employees | No data | 265 | | |
| All workers | - | 884 | | |

Between 2015 and 2035, the total population in the study area is projected to increase by 10,902 residents to 73,061. This represents an increase of just under 18 percent from the 2015 value of 62,141. All study area municipalities except Malvern are expected to add more than 2,000 new residents between 2015 and 2035. East Whiteland Township has the greatest relative and absolute increase in

population at 4,656 new residents, a 43 percent increase. The study area's population is growing at a slower rate than Chester County as a whole. Table 3 summarizes the study area's population forecasts.

The study area will also add over 17,000 new jobs between 2015 and 2035, an increase of 16.3 percent. This is lower than the employment growth rate of Chester County. The highest relative growth occurs in Malvern, with 26.4% more jobs, but the other study area municipalities have higher absolute growth rates. Table 4 summarizes the study area's employment forecasts.

**Table 3.** Study Area Population Forecasts

| | Population | | 2015 – 2035 Change | |
|---|---|---|---|---|
| **Location** | **2015** | **2035** | **Abs.** | **Pct.** |
| Chester County | 515,939 | 624,832 | 108,893 | 21.1% |
| West Whiteland Twp | 18,450 | 21,614 | 3,164 | 17.1% |
| East Whiteland Twp | 10,702 | 15,358 | 4,656 | 43.5% |
| Malvern Boro | 3,430 | 3,924 | 494 | 14.4% |
| Tredyffrin Twp | 29,559 | 32,165 | 2,606 | 8.8% |
| **Study Area Municipalities** | **62,141** | **73,061** | **10,902** | **17.6%** |

**Table 4.** Study Area Employment Forecasts

| | Employment | | 2015 – 2035 Change | |
|---|---|---|---|---|
| **Location** | **2015** | **2035** | **Abs.** | **Pct.** |
| Chester County | 309,605 | 374,967 | 65,362 | 21.1% |
| West Whiteland Twp | 23,476 | 28,175 | 4,699 | 20.0% |
| East Whiteland Twp | 23,399 | 29,374 | 5,975 | 25.5% |
| Malvern Boro | 2,359 | 2,981 | 622 | 26.4% |
| Tredyffrin Twp | 55,459 | 61,270 | 5,811 | 10.5% |
| **Study Area Municipalities** | **104,693** | **121,800** | **17,107** | **16.3%** |

# RESULTS

Travel forecasting models are designed to provide the most likely future travel patterns, traffic volumes, and transit ridership indicative of the model inputs. Travel forecasts are highly influenced by the future transportation network and projected future land use, population, and employment. When these projections are met, travel model outputs generally fall within 15 percent of the actual, future values. Unforeseen changes in the national and regional economies and other market forces can have a profound effect on future land use and therefore travel patterns. The TIM2.3.1 travel model assumes that household income, transit fares, parking charges, tolls, and other auto operating costs will all increase at approximately the same rate thru 2035. Unanticipated policy changes that heavily influence one or more of these variables can cause the margin of error in the transit forecasts to increase.

## Average Daily Transit Ridership Forecasts

**Table 5:** Transit Forecasts at East Whiteland Station

| Site | # of trains (Inbound) | Boardings (including Park & Ride) | Park & Ride vehicles | Boardings (Full Study Area) |
|---|---|---|---|---|
| **Immaculata Hourly Service** | 21 | 385 | 90 | 3,990 |
| **Immaculata Half Hourly Service** | 36 | 530 | 175 | 4,084 |
| **Three Tun Half Hourly Service** | 36 | 360 | 240 | 3,858 |
| **No-Build** | - | - | - | 3,853 |
| **Base (2015 counts)** | - | - | - | 3,233 |

Transit forecasts for the 2035 build and no-build scenarios are provided in Table 5. For the Immaculata Site, with 21 inbound daily trains (hourly service), the forecasted ridership is 385 daily boardings including 90 park and ride vehicles and 3,990 boardings for the full five-station study area (Whitford, Exton, East Whiteland, Malvern and Paoli). For the Immaculata Site with 36 inbound trains (half-hour service), the forecasted ridership is 530 daily boardings with 175 park and ride vehicles and 4,084 study-area boardings. For the Three Tun Site, with a service frequency of 36 inbound trains daily, the forecasted ridership is 360 daily boardings which include 240 park-and-ride vehicles, and 3,858 study-area boardings. For the No-Build, there were 3,853 study area boardings.

# ABSTRACT

**Title:** East Whiteland Station Transit Forecast

**Publication Number:**

**Date Published:**

**Geographic Area Covered:**
Chester County, East Whiteland Township, West Whiteland Township, Malvern Borough, Tredyffrin Township

**Key Words:**

**Abstract:**
East Whiteland Station is a proposed Regional Rail station on the SEPTA Paoli/Thorndale Line between Exton and Malvern stations; filling a gap of roughly six rail-miles. Ridership projections are provided for two site alternatives of the station for an anticipated opening year of 2035.

**Staff Contacts:**
Benjamin Loeb
Transportation Engineer
Phone: 215.238.2944
Email: bloeb@dvrpc.org

DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION

190 N Independence Mall West
8th Floor
Philadelphia, PA 19106-1520
215.592.1800 | fax: 215.592.9125
www.dvrpc.org

190 N Independence Mall West
8th Floor
Philadelphia, PA 19106-1520
215.592.1800 | fax: 215.592.9125
www.dvrpc.org

DELAWARE VALLEY
dvrpc
REGIONAL
PLANNING COMMISSION

*Sisters, Servants of the Immaculate Heart of Mary*
*1 Our Lady Circle*
*Malvern, Pennsylvania 19355*
TELEPHONE: 610-647-2160
FAX: 610-889-4874

June 6, 2019

Mrs. Natasha G. Manbeck
McMahon Transportation Engineers, Project Manager
840 Springdale Drive
Exton, Pennsylvania 19341

Dear Mrs. Manbeck,

The Sister Servants of the Immaculate Heart of Mary (Sisters) and Immaculata University fully support the location of a new train station on the property owned by the Sisters and sited at Immaculata University.

The train station will satisfy the longstanding unmet transportation needs of both current and potential students, faculty, staff and employees of Immaculata University, Camilla Hall, the Villa Maria House of Studies and the Villa Maria Lower School.

Current conversation regarding a 3P and the solicitation of funding have included the potential of the Sisters providing the land as a contribution for 3P membership or grant match.

Sincerely,

Sister Mary Ellen Tennity IHM

Sr. Mary Ellen Tennity, IHM
General Superior

Barbara Lettiere
President, Immaculata University

TMACC
Transportation Management Association of Chester County

June 2019

Dear Stakeholders:

On behalf of the Board of Directors for the Transportation Management Association of Chester County (TMACC), we were appreciative to be included as a stakeholder, of the process and of the outcome of the East Whiteland Train Station Study. Knowing that a Frazer station located on the Keystone Corridor is feasible, enables the East Whiteland Township, Chester County Planning Commission, Immaculata University and TMACC to advocate for the future station.

We do recognize that the study determined that there are two feasible locations for a train station in East Whiteland Township, Chester County: Immaculata and Three Tun. Each of these two potential sites does hold distinct advantages and disadvantages but **agree that the Immaculata site is the desired location**.

The future of an Immaculata Station in East Whiteland is consistent with the Township's community vision and goals and will help better envision Frazer as a walkable, inviting community. Additionally, the train station is also consistent with Immaculata University's plans to attract and expand opportunities for students and staff. Even though locating a future station on Immaculata's property does have increased cost due to property constraints, the site offers more visibility, eliminates the competing us of a commercial property and improves access and circulation of the road infrastructure network.

While a variety of factors need to fall in line in order for a new station in East Whiteland to become a reality, the project support and leadership is critical for identifying, advocating, and securing funding for continued planning, design and construction of the train station. In conclusion, TMACC, agrees with the committee's findings and recommendations that the Immaculata site represents a better long-term infrastructure project for East Whiteland and Chester County's residents and businesses.

Sincerely,

P. Timothy Phelps
Executive Director

*7 Great Valley Parkway, Suite 144 • Great Valley Corporate Center •Malvern, Pennsylvania 19355*
*Phone 610.993.0911 Fax 610.993.0922 e-mail info@tmacc.org Web www.tmacc.org*

# Immaculata Station Site Development Potential

The Sisters, Servants of the Immaculata Heart of Mary (Sisters of IHM) own three vacant parcels generally located north and west of Immaculata University's campus and south of Amtrak's Keystone Corridor. The attached map identifies the parcels as A, B, and C and depicts some existing conditions in the area. If the Sisters of IHM (or a subsequent property owner) would elect to develop this area, there are several considerations and constraints that influence the development potential.

The area has steep slopes (15—25%) and very steep slopes (25%+) which are restricted from development in East Whiteland Township's ordinance. Additionally approximately five acres of parcel C are proposed for the train station parking and access roadway. Accounting for the areas of steep slopes and the station area, there are approximately 32 acres available for potential development within these three parcels.

## Developable Acreage on Immaculata Site

| | Pin | Gross Acres | Woodland[1] | 15-25% slope[1] | 25%+ slope[1] | Proposed Station and Access | Developable acres[2] |
|---|---|---|---|---|---|---|---|
| A | 42-6-28 | 12.7 | 8.76 | 0 | 0 | | 12.7 |
| B | 42-6-27 | 12.7 | 12.7 | 6.07 | 0.17 | | 6.46 |
| C | 42-6-25 | 27.2 | 26.8 | 5.74 | 2.80 | 5.0 | 13.66 |
| Total | | | | | | | 32.82 |

In East Whiteland Township, the amount of development that can be built on a property is governed by the maximum floor-area ratio (FAR). Floor area ratio is calculated by multiplying the developable area (in square feet) by the FAR. The table below provides a range of gross square feet of potential development given the developable acres. If a train station is developed in this location, the Township may implement a new zoning overlay district specific to the vision for this area. The FAR of the overlay may be within or higher than the range of 0.4 to 0.7, thus changing the development potential within this area.

## Potential Gross Square Footage on Immaculata Site

| | Pin | Developable acres[3] | Potential FAR range[4,5] | Potential Gross Square Feet Range[6] |
|---|---|---|---|---|
| A | 42-6-28 | 12.7 | 0.4 to 0.7 | 221,200 to 387,200 |
| B | 42-6-27 | 6.46 | 0.4 to 0.7 | 112,500 to 196,800 |
| C | 42-6-25 | 13.66 | 0.4 to 0.7 | 237,800 to 416,500 |
| Total | | 32.82 | | 571,500 to1,000,500 |

*Notes:*

1. *Sources: Consultant measurement of Chester County GIS data.*
2. *Total acreage minus steep slopes (15%-25%) or very steep slopes (25% +) and proposed station and access. Woodlands are not protected by the East Whiteland Township Zoning Ordinance.*
3. *See Developable Acreage table.*
4. *The FAR per existing Institutional District regulations is 0.4 and 0.7 is the same FAR as the village mixed use district along Route 30.*
5. *If a train station is developed in this location, the Township may implement a new zoning district with a different FAR.*
6. *Rounded down to the nearest hundred.*

## Immaculata Station Site Development Potential

In addition to FAR, there are several other factors that influence and determine what can be built. Development must meet all other regulations, such as setbacks, building height, and impervious coverage, as well as parking, etc. The configuration of steep slopes on parcel B will pose a challenge to situating any buildings since structures are not permitted in steep slope areas. Furthermore, the developable portions of the parcels could be reduced depending on the right-of-way needs for additional access or circulation to the site. However, if there is interest and support, the Immaculata Station site has land available adjacent to the station with development potential.

# East Whiteland Township

Chester County
Pennsylvania

## Legend

- Potential Immaculata Train Station
- Building Footprints 2015
- 100 Year Floodplain
- Wetlands
- Woodlands
- Railroads

**Slopes**

- 0 - 15%
- 15 - 25%
- Greater than 25%

A

B

C

Immaculata University

N

500 250 0 500
Feet

Data Sources: All Base Data, 100 Year Floodplain, Wetlands, Woodlands, Steep Slopes, Building Footprints - Cheter County GIS, 2015

June 27, 2019