



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

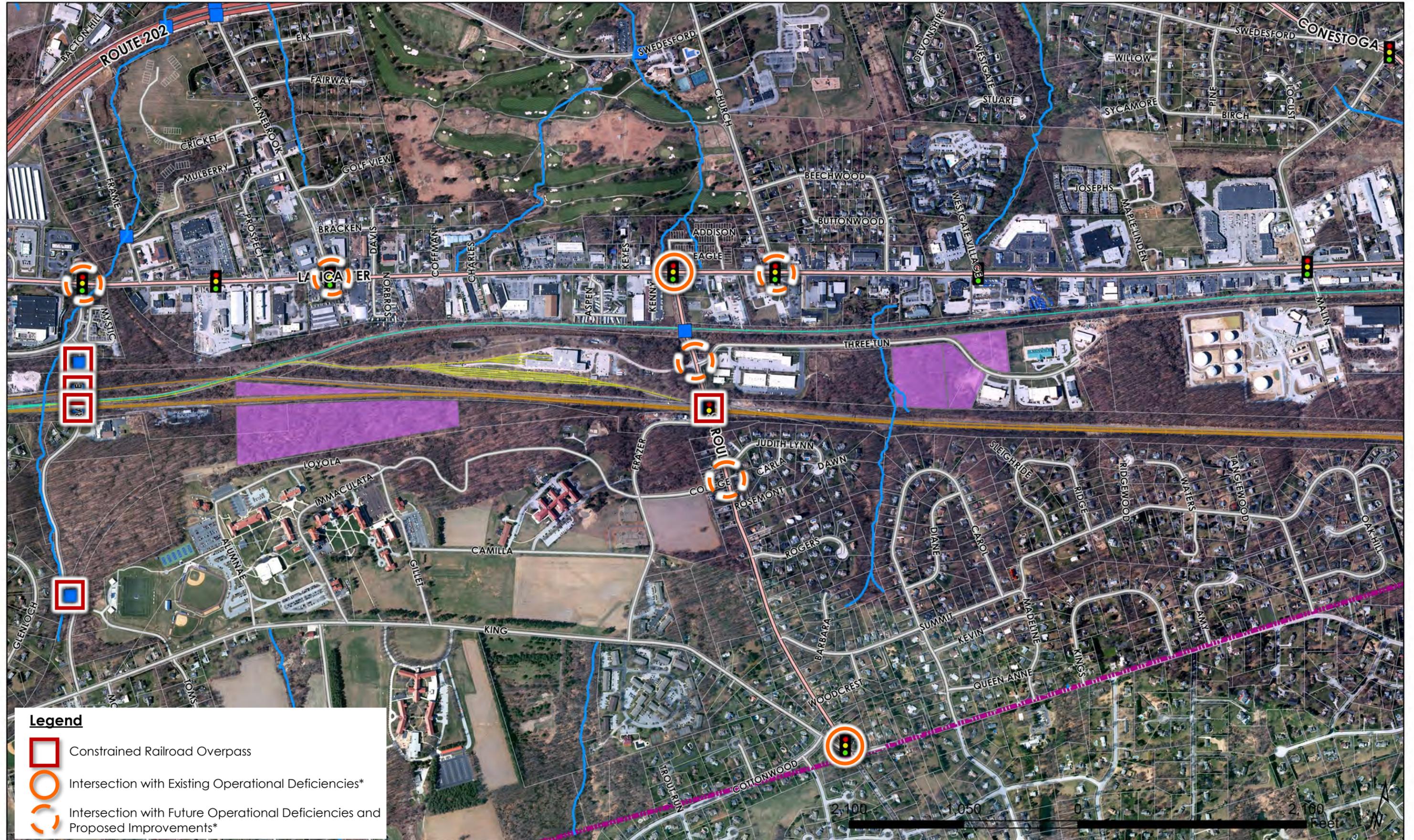
Key constraints that impact access and circulation to the two preferred station sites can be divided into three main categories: railroad bridges, intersection operations, and bicycle/pedestrian access. The key constraints described in this section are illustrated on the Key Constraints map on the following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



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

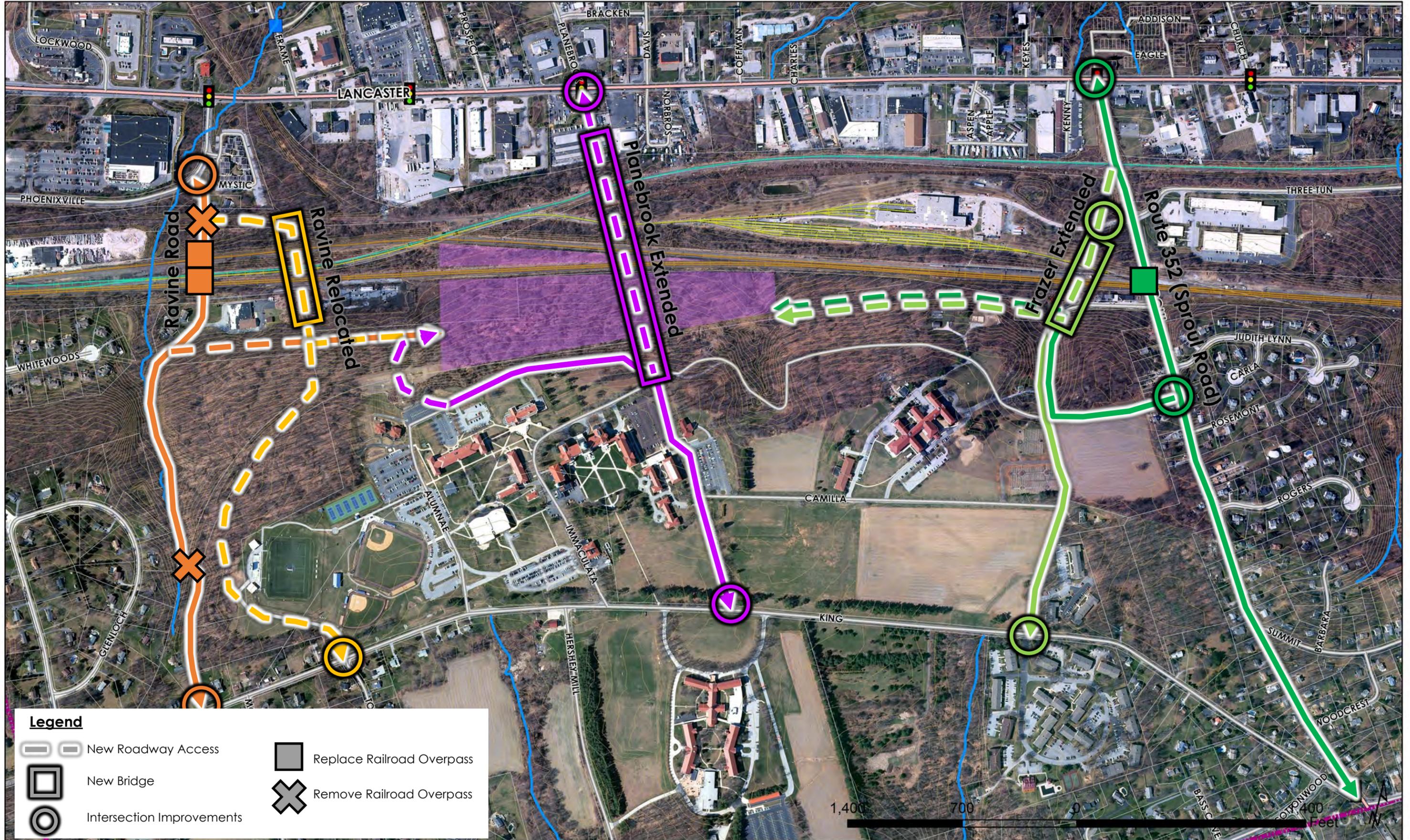
This option includes replacing the two existing bridges for the active Amtrak and Norfolk Southern rail lines on Ravine Road. It also includes removing the northern and southern existing bridges on Ravine Road, which are no longer necessary and do not support active rail lines. A new access roadway between 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.



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 Phoenixville 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.

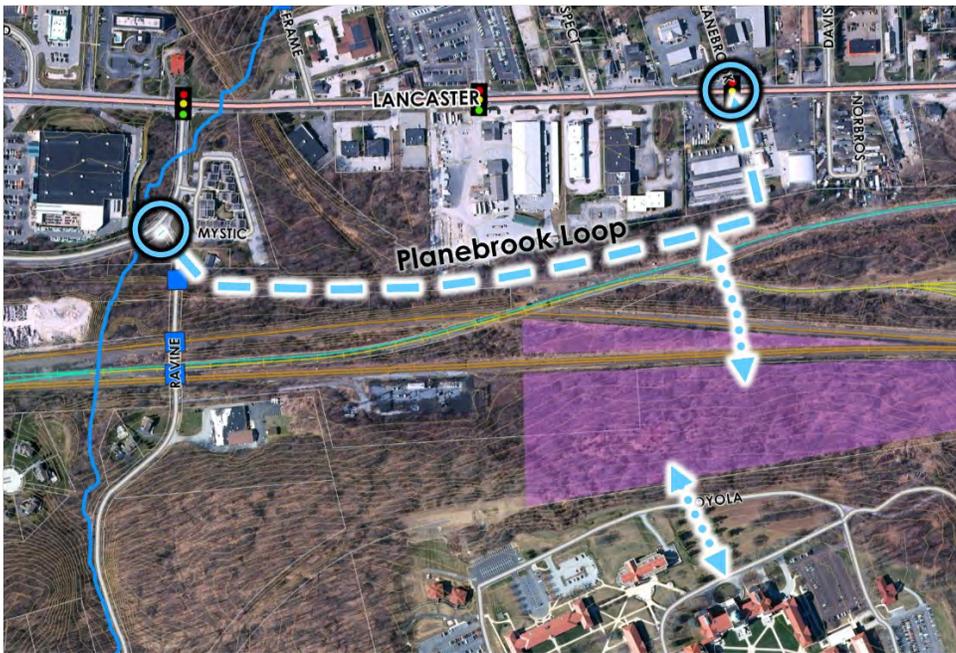
Of the options identified involving a new bridge, Ravine Relocated is the most feasible due to the relatively short distance between the tracks, available properties on the north and south sides, and the existing topography. In addition to providing access to the Immaculata station site, this option 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

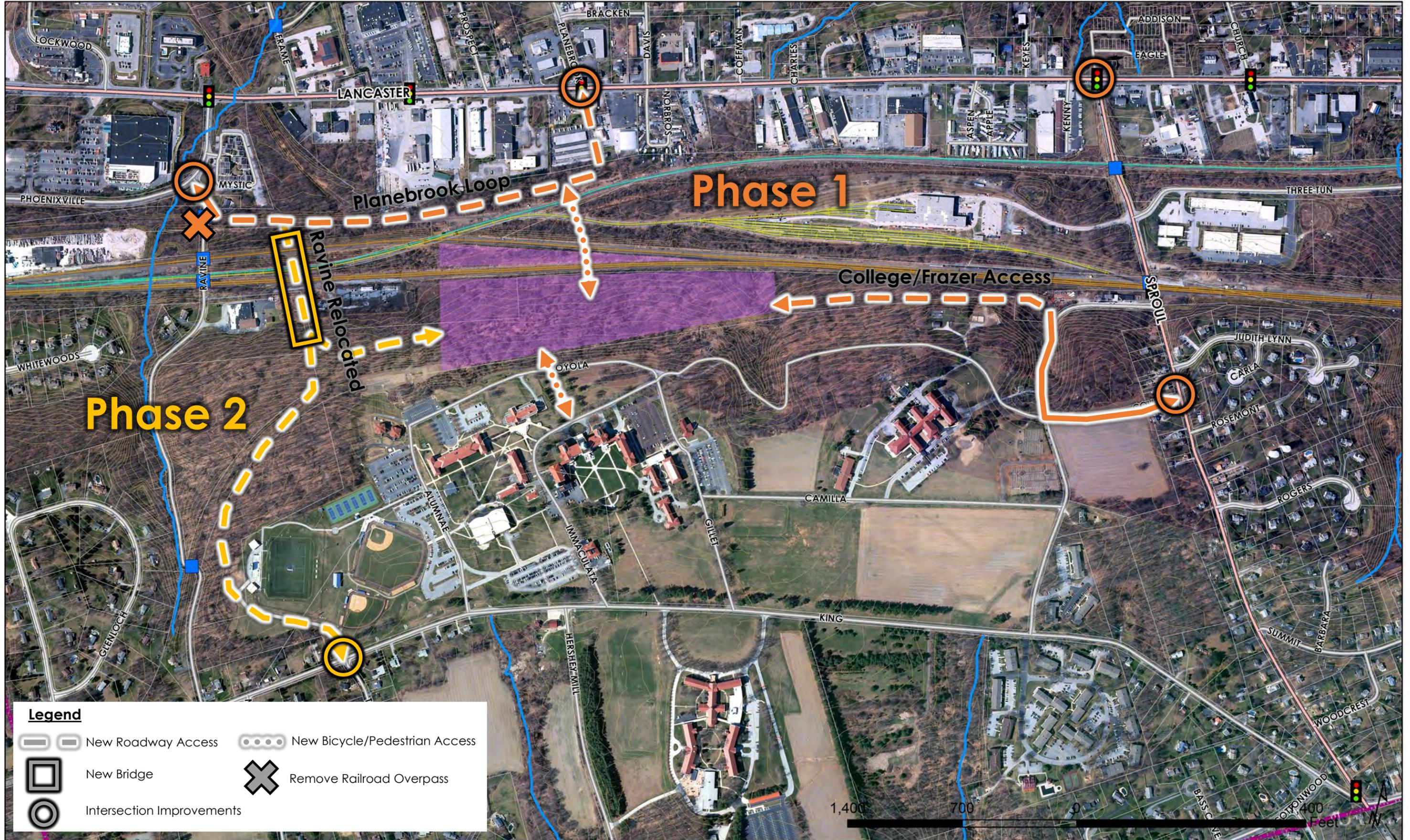
Based on the evaluation of various improvement options and input from stakeholders and the public, preferred access and circulation improvements were selected for the Immaculata station site. Vehicular access to the parking area is provided via College Avenue/Frazer Road

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



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)

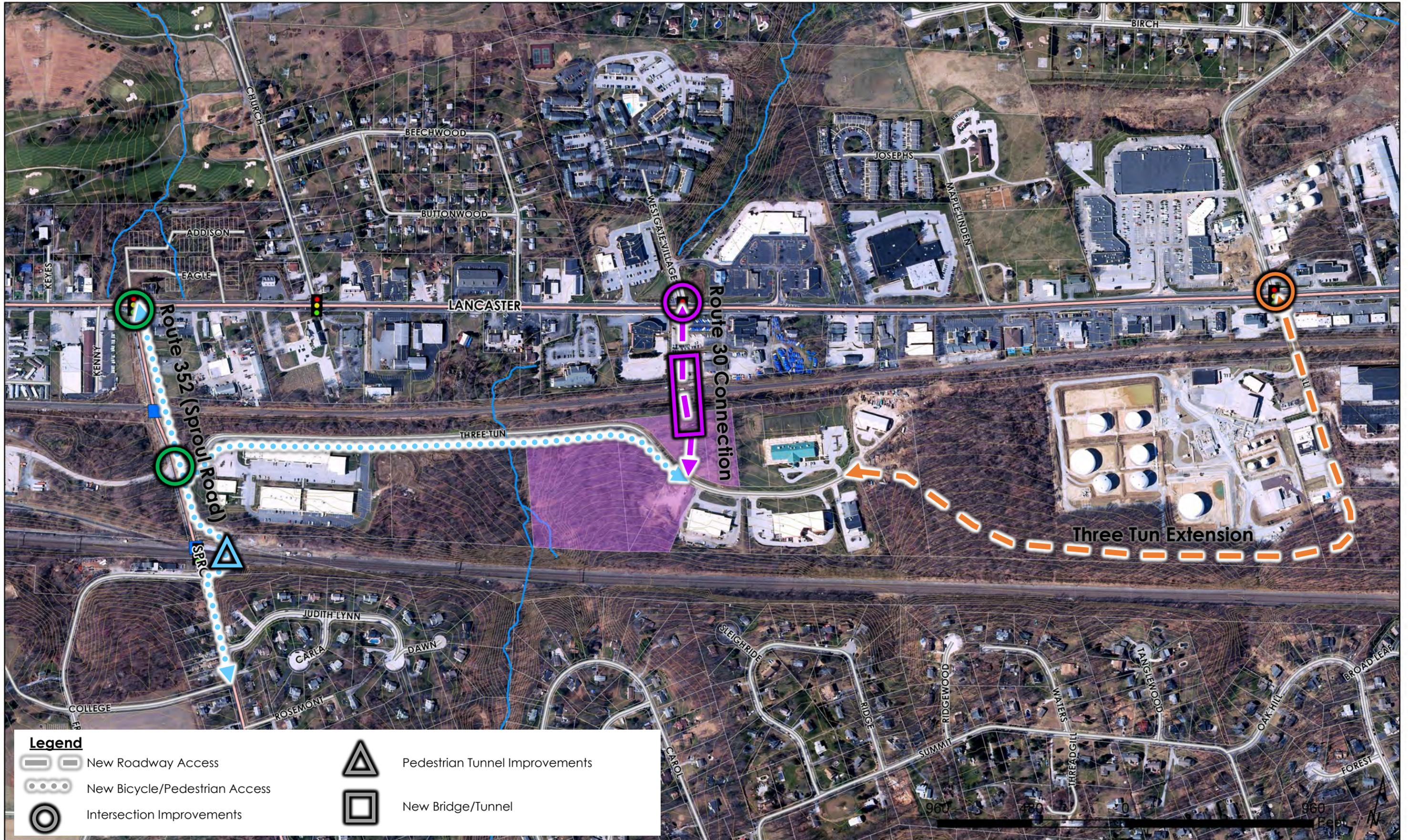
Route 352 (Sproul Road) is critical for access to Three Tun Road and the station location. One of the key constraints on Route 352 (Sproul Road) is the existing railroad bridge for the active Amtrak tracks, which limits north-south movement on Route 352. The current railroad bridge has a 10 foot vertical 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.



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**

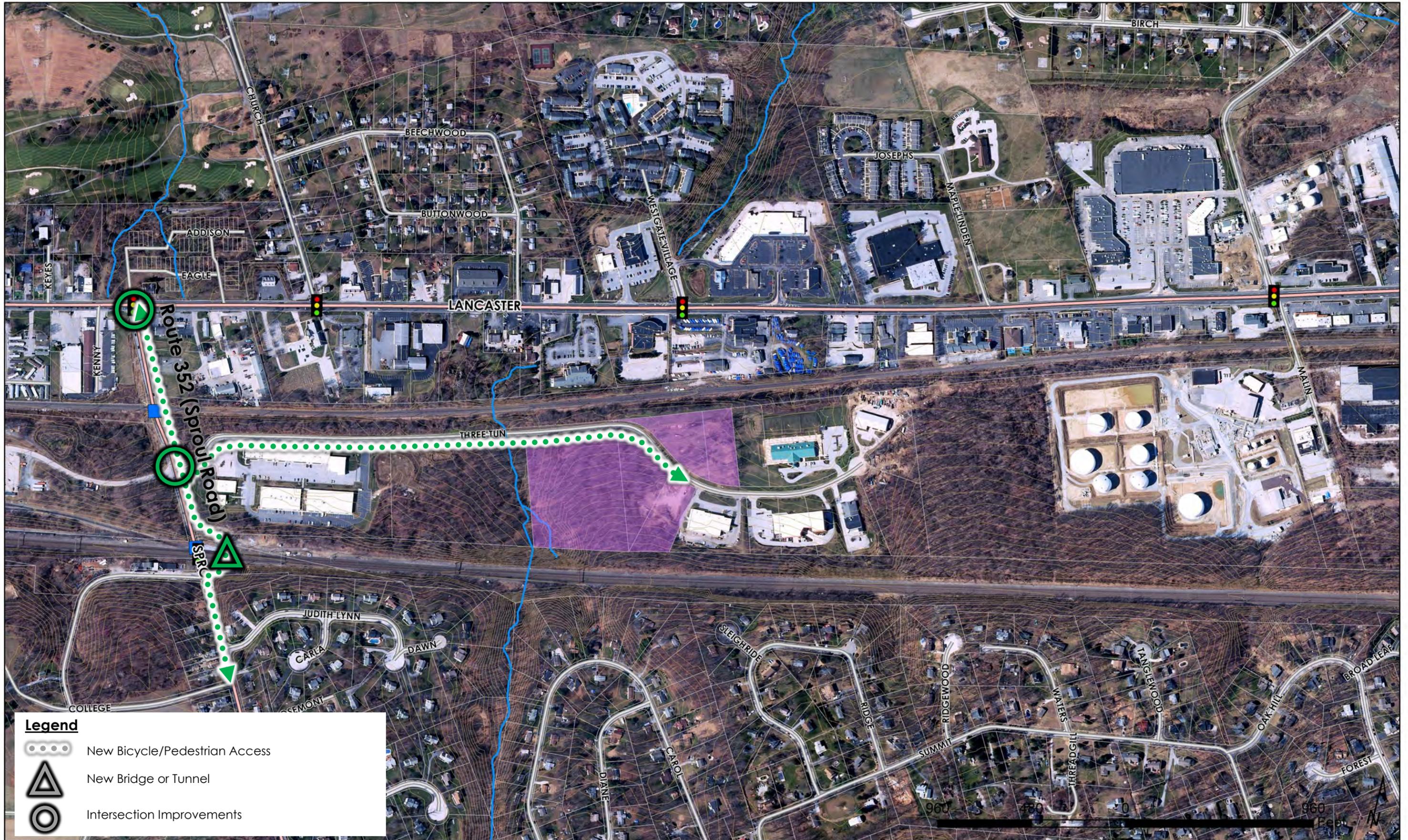
Extending Three Tun Road to Malin Road was evaluated as part of the Malin Road Extension Feasibility Study (2010), which was completed by Malvern Borough in partnership with East Whiteland Township. Based on this previous study, the new roadway connection is feasible, but costly. The estimated cost for 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	Preferred
Route 352 (Sproul Road)/Three Tun Road	
Multimodal Improvements	
Pedestrian Tunnel at Sproul Road	Preferred



Legend

-  New Bicycle/Pedestrian Access
-  New Bridge or Tunnel
-  Intersection 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.

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

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

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.

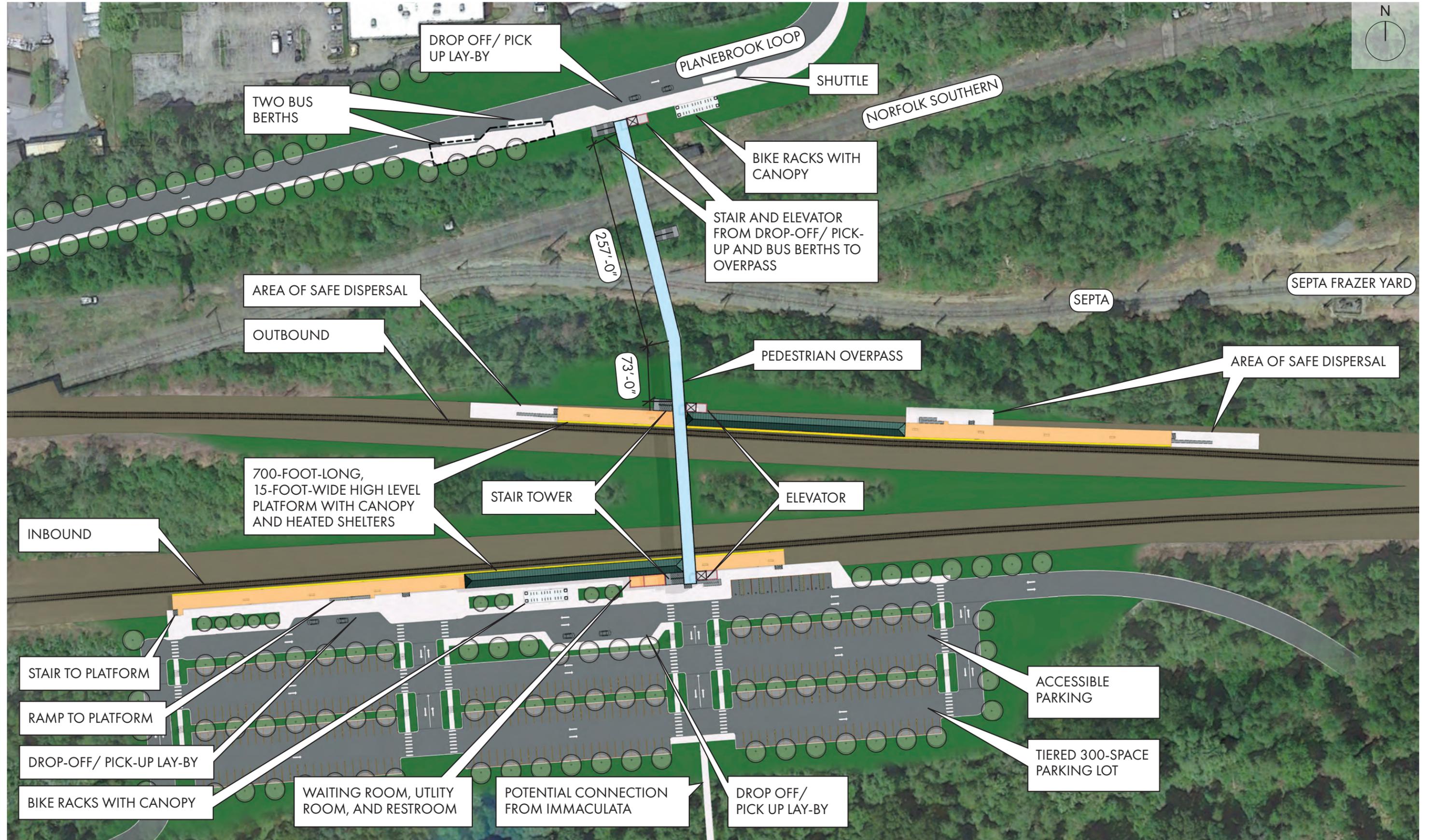
A pedestrian overpass with elevators and stair towers provides cross track circulation for an ADA accessible route between platforms. It should be noted that, when feasible, SEPTA has expressed a preference for ramps instead of elevators to provide ADA accessibility to high level platforms. However, 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.

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.



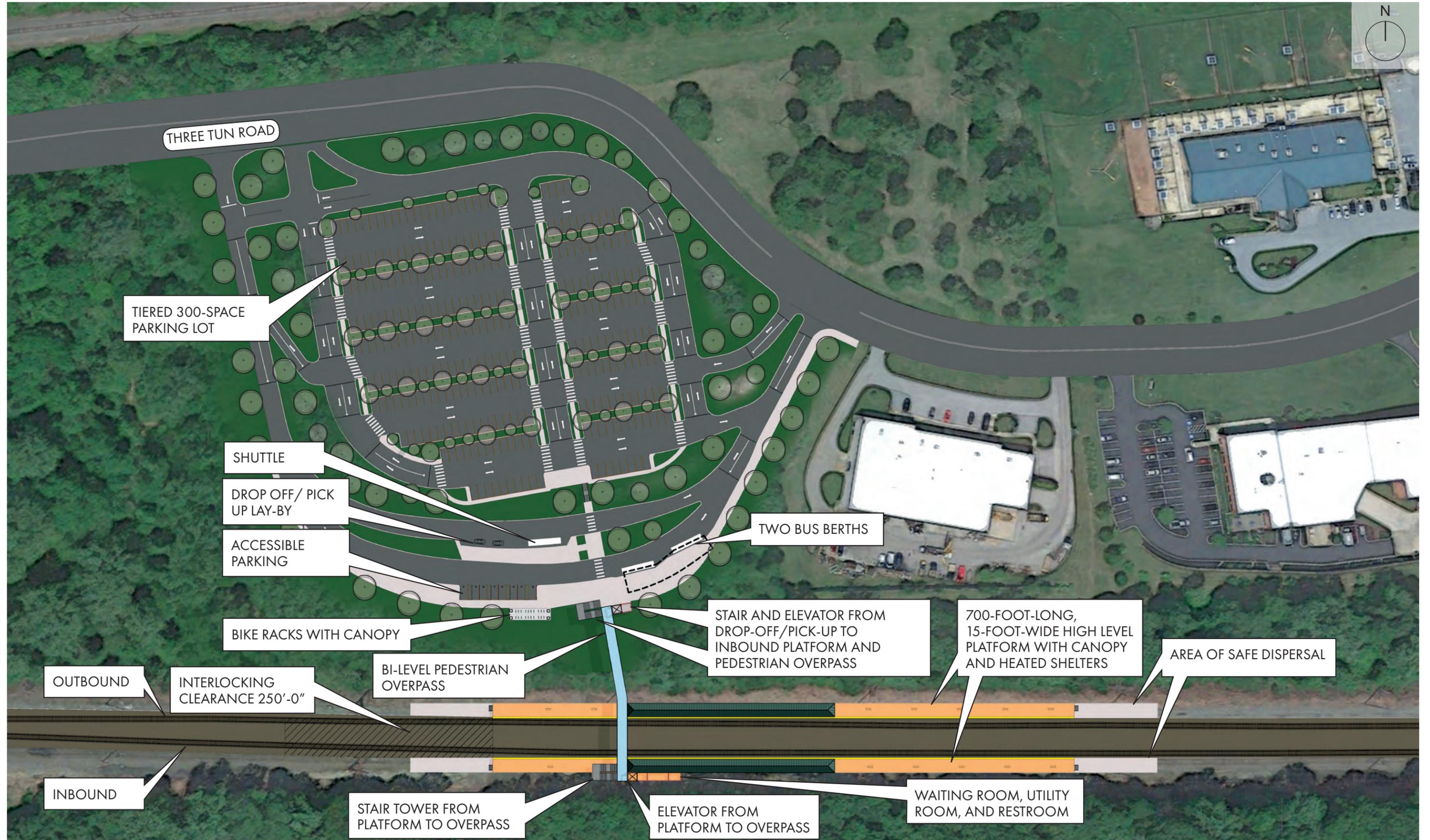


Three Tun

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.





Conceptual Service Plan

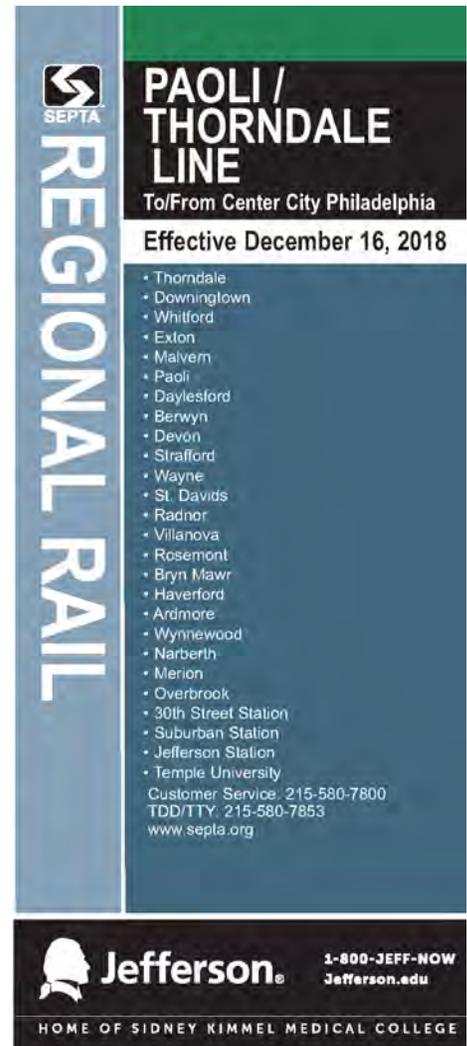
SEPTA developed conceptual service plans (train schedules) for each station site as an input for ridership forecast models. They are not intended to serve as proposed service schedules. As such, for the purposes of this study, **the conceptual schedules do not resolve scheduling conflicts with Amtrak 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.



SEPTA
REGIONAL RAIL

PAOLI / THORNDALE LINE
To/From Center City Philadelphia
Effective December 16, 2018

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- Downingtown
- Whitford
- Exton
- Malvern
- Paoli
- Daylesford
- Berwyn
- Devon
- Strafford
- Wayne
- St. Davids
- Radnor
- Villanova
- Rosemont
- Bryn Mawr
- Haverford
- Ardmore
- Wynnewood
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- 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

Part 2 | Findings and Recommendations

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.

Part 2 | Findings and Recommendations

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 Planebrook 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

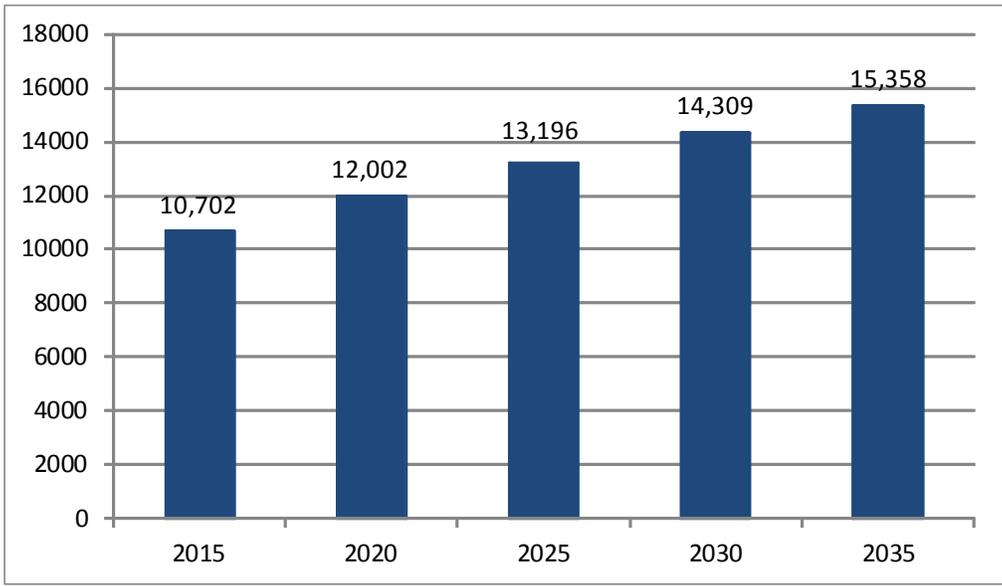
East Whiteland Township is a growing suburb approximately 25 miles northeast of Center City Philadelphia. Recent residential, commercial, and office development proposals in the township indicate that it is an attractive location with potential for more growth. According to US Census 2013-2017 American 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.

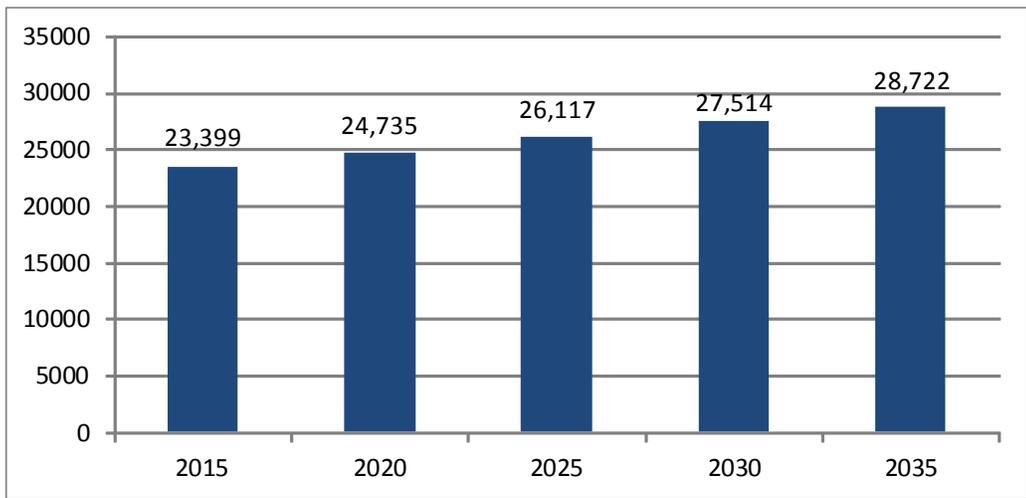
Existing Population and Employment Projections

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.

Part 2 | Findings and Recommendations

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.

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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 Units²	4,043
C	Additional 25-50% of total build-out approved and built by 2035³	300-600 units
D	Population equivalent⁴	660-1,320 persons
E	Projected Population by 2035⁵	15,400 – 16,070
Notes: <ol style="list-style-type: none"> 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 2025²	3,126
C	Additional 10-20% of build-out SF, approved and built by 2035³	500,000 – 1,000,000
D	Employment equivalent⁴	1,305 – 2,610
E	Projected Employment by 2035⁵	27,830 – 29,140
Notes: <ol style="list-style-type: none"> 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 Population¹	15,400-16,070
B	Additional % of total build-out triggered by train station²	5-10%
C	Anticipated units by 2035	63-126 units
D	Anticipated population by 2035³	138-278 persons
E	Projected Population by 2035⁴	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 Projection¹	27,830-29,140
B	Additional % of total build-out triggered by train station²	3%-5%
C	Square footage equivalent	150,000-250,000
D	Employment equivalent³	380-630
E	Projected Employment by 2035⁴	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

Part 2 | Findings and Recommendations

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.

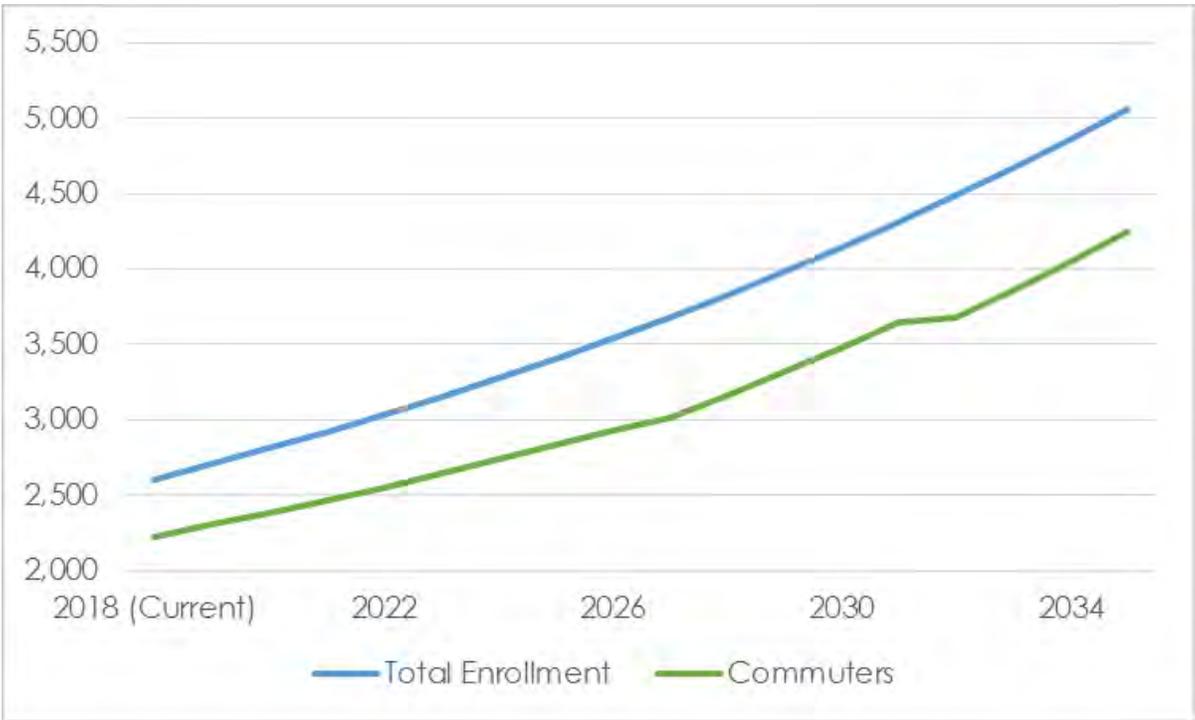
Enrollment at Immaculata is expected to nearly double by 2035. As of the Fall 2018 semester, on-campus enrollment was at 2,605. The university is planning for on-campus enrollment to be approximately 5,063 for the Fall 2035 semester. These numbers include all students enrolled in undergraduate studies, 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.