



West Whiteland

TOWNSHIP

PA Route 100 Congestion Mitigation Study

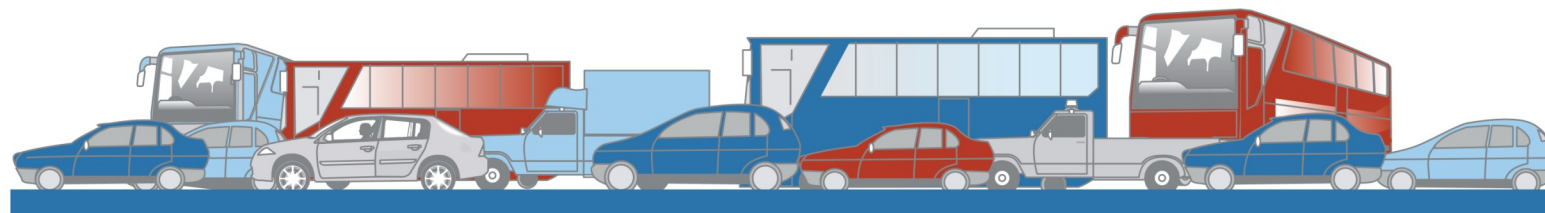


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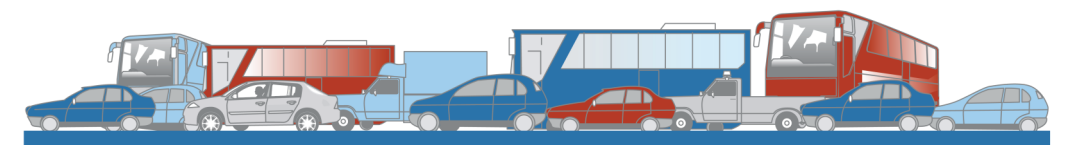
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Chapter 1

Background

PA Route 100 Congestion Mitigation Study





1 | Background

A | Introduction

The PA Route 100 Corridor Congestion Mitigation Study was completed by McMahon Associates, Inc. on behalf of West Whiteland Township. Funding for the study was provided by the Delaware Valley Regional Planning Commission (DVRPC) through the Transportation and Community Development Initiative (TCDI) program with a 20 percent match provided by West Whiteland Township.

This study is a comprehensive evaluation of the PA Route 100 Corridor between approximately Boot Road and Commerce Drive (approximately 1.3 miles) in West Whiteland Township, Chester County, Pennsylvania. The overall objective of this study is to identify means by which congestion may be alleviated and mobility thereby improved along this critical and very busy stretch of PA Route 100. The most recent traffic counts show that nearly 60,000 vehicles travel this segment every day resulting in chronic congestion during the peak hours and on weekends. Typically, peak congestion on PA Route 100 occurs in the northbound lanes during the weekday afternoon commuter peak period. A map of the study corridor is provided in **Figure 1.1**.

There are several obvious factors that contribute to the corridor congestion and include:

- four lanes of northbound traffic merging into just two lanes at the point where PA Route 100 is joined by Pottstown Pike just north of the Boot Rd. intersection;
- traffic generated by the Exton Train Station, which is served by both

SEPTA and Amtrak and for which access from PA Route 100 is awkward;

- the volume of traffic entering and exiting the US Route 30 expressway in both the eastbound and westbound directions; and
- traffic generated by adjoining and proximate land uses, including six major residential communities with a total of over 2,000 dwelling units and four shopping centers, including Exton Square Mall (currently being expanded) and the Main Street at Exton lifestyle center, which will become a true mixed-use community with the imminent construction of over 400 apartment units.

In addition, PA Route 100 is the only major north-south route connecting northern and central Chester County. Locally, the corridor connects Exton to the West Chester area in the south and the PA Turnpike Downingtown Interchange and Pottstown in the north, establishing the corridor's importance as a primary commuter route. Regionally, PA Route 100 also serves as a prime connection between Allentown, PA and Wilmington, DE (via a connection with US Route 202), which ensures its role in the movement of goods in the region.

B | Goals & Objectives

The goal of this study is to identify a comprehensive approach to alleviating motor vehicle congestion, providing safe accommodations for pedestrians and bicyclists, and improving access to the Exton Train Station. To achieve this goal, the study evaluates capacity adding and operational alternatives that promote multimodal connections, preserve or enhance the quality of life for nearby residents, and improve access to businesses in Exton.

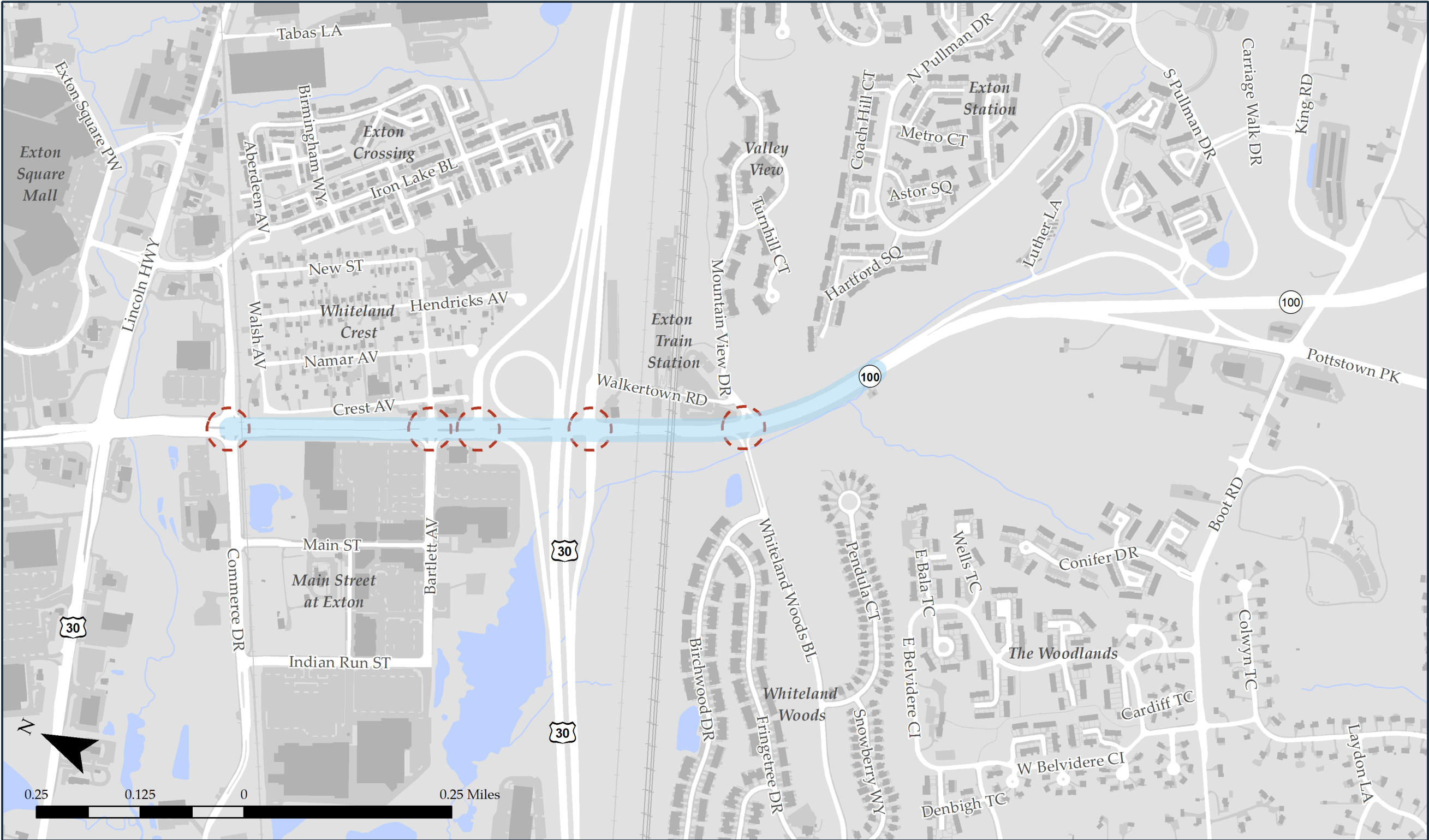
As part of the comprehensive project approach, the following five elements were considered during the assessment of existing conditions and development / evaluation of improvement alternatives:

- 1 Evaluate the feasibility of constructing additional travel lanes along PA Route 100 without impacts to the U.S. Route 30 Expressway.**
- 2 Identify and evaluate other structural solutions, including but not limited to intersection improvements and pedestrian bridges.**
- 3 Evaluate the efficacy of non-structural solutions (e.g. signal timing, video monitoring, variable speed limits, etc.) to mitigate congestion, both with and without structural solutions.**
- 4 Identify options for safely accommodating pedestrians and bicyclists, including but not limited to a connection between the Chester Valley Trail and the Exton Train Station, as well as PA Route 100 crossings.**
- 5 Identify options to enhance the visibility and accessibility of the Exton Train Station (for vehicular, pedestrian, and bicycle traffic as well as mass transit).**

ROUTE 100 CORRIDOR CONGESTION MITIGATION STUDY

FIGURE 1.1: STUDY AREA

DRAFT



Legend

- Focus Area
- Study Intersections

Sources:
Roads - Chester County GIS
Impervious Surface - DVRPC



C | Planning Context

The area immediately surrounding the study area for this project has been the focus of various recent and concurrent studies and capital improvements.

- In 2016, West Whiteland Township received a DCED Multimodal Fund Grant to provide a multimodal connection between the Exton Train Station and the Chester Valley Trail.
- The Chester County Planning Commission completed a feasibility study that identified the former Philadelphia Thorndale Rail Line as the preferred alignment to extend the Chester Valley Trail from Exton, west toward Downingtown.
- The Central Chester County Bicycle and Pedestrian Circulation Plan identified various improvements for this area including a bicycle route to West Chester.
- The Southeastern Pennsylvania Transit Authority (SEPTA) has committed capital investments to the Exton Train Station, including high level platforms for Americans with Disabilities Act compliance.

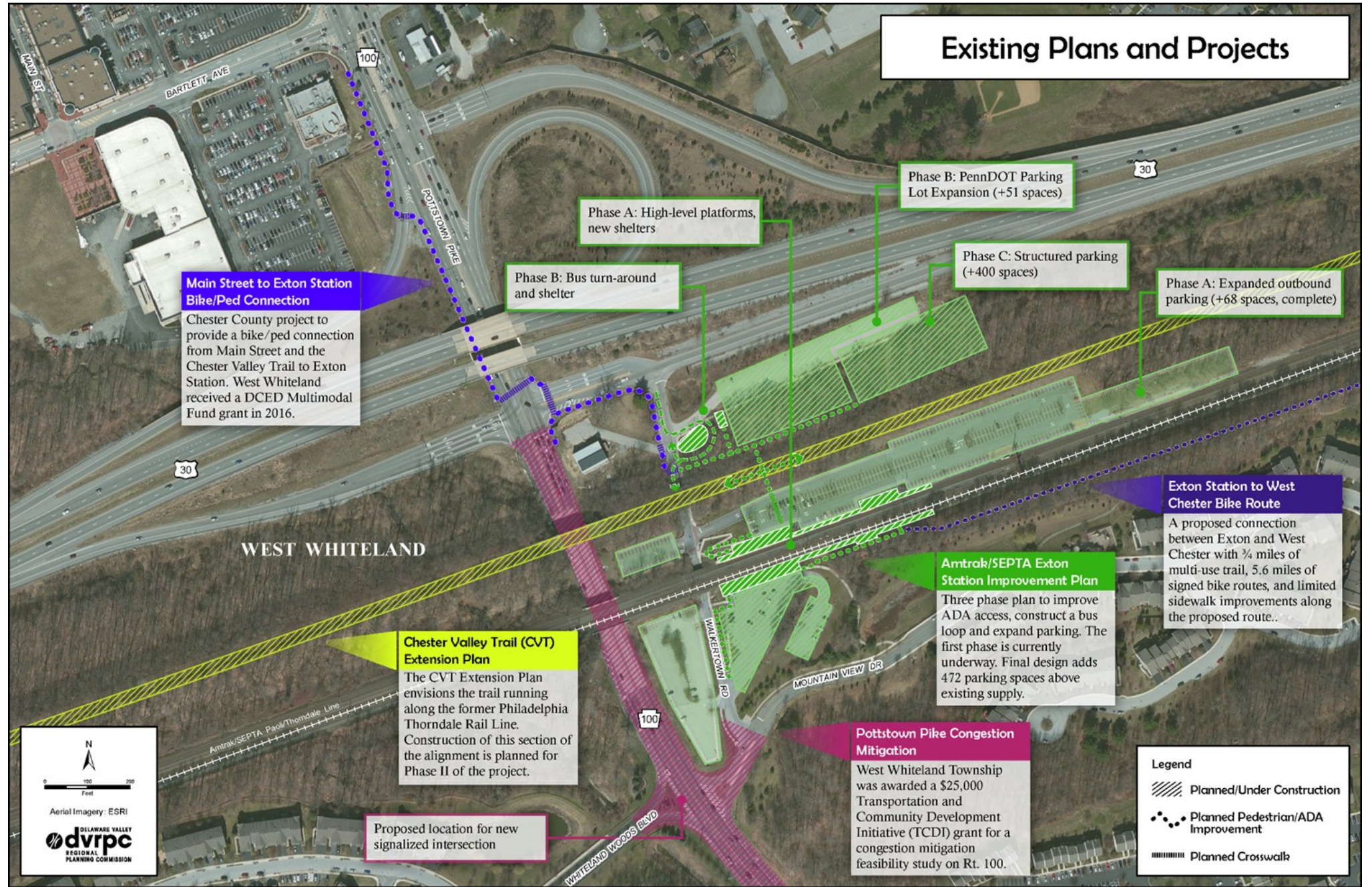
All of these initiatives were summarized in a study completed by DVRPC (see **Figure 1.2** on this page). The DVRPC study focused specifically on addressing various issues facing the Exton Train Station. Those issues include: station parking and vehicular access; future bus loop and parking configuration; potential for future TOD development; and a comprehensive bicycle and pedestrian access to the train station.

Additionally, the study area is included in the DVRPC Congestion Mitigation Process (CMP) subcorridor 8C. The CMP analyzes the regional transportation network to identify strategies that minimize congestion on major corridors. Strategies identified for subcorridor 8C include: planning for nonmotorized transportation; signal improvements; and major reconstruction with minor capacity additions. Recommendations in this study support advanced appropriate strategies identified by the CMP for this corridor.

The need for improvements in this area of PA Route 100 has also been documented in Chester County’s Transportation Improvements Inventory:

RW 46—PA 100 Near Exton Rail Station—Reconfigure for 3 NB Thru Lanes.

Figure 1.2: DVRPC Inventory of Existing Plans and Projects



Any improvement to the PA Route 100 corridor would be supported by transportation policies established in Landscapes2, Chester County’s Comprehensive Policy Plan. The roadway design alternatives presented in this study are generally consistent with those suggested for Suburban Growth Areas in the Multimodal Circulation Handbook for Chester County.



D | Public & Agency Involvement

A Study Advisory Committee (SAC) comprised of elected officials, township staff, subject matter experts, and community members was appointed by West Whiteland Township. The SAC's role was to collaborate with the project consultants on assessing issues and evaluating solutions for the PA Route 100 corridor. Throughout the course of the study, the SAC was convened for four meetings to complete the following tasks:

SAC Meeting # 1—A kick-off meeting was held to refine the project goals and objectives, review existing conditions, as well as to solicit input about relevant issues along the corridor.

SAC Meeting # 2—Preliminary improvement alternatives were reviewed with the SAC and a preferred roadway improvement scenario was identified for further evaluation by the consultant team.

SAC Meeting # 3—A conceptual improvement plan for the PA Route 100 was developed and reviewed for the critical section between Whiteland Woods Boulevard/Mountain View Drive and the U.S. Route 30 Eastbound On-/Off-Ramp intersection.

SAC Meeting # 4—The study advisory committee reviewed the draft study and provided feedback on recommendations.

The Study Advisory Committee was made up of the following individuals:

- Mimi Gleason; Township Manager
- John Weller; Township Director of Planning and Zoning
- Ted Otteni; Township Public Works Director
- Justin Smiley; Township Planner
- George Turner; Former Township Supervisor
- Rob Hall; Township Resident (Courts at Valley View)
- Jeff Glisson; Township Resident (Whiteland Woods)
- Cheryl Jones; Township Resident (Exton Station)
- John Fiore; Wolfson Group, Inc.

- Mark Cassel; Manager of Suburban Service Planning & Schedules, SEPTA
- Tom Stead; Transportation Planner, DVRPC
- Brian Styche; Transportation Director, Chester County Planning Commission

As noted, staff from both DVRPC and the SEPTA participated in the study advisory committee. SEPTA staff was able to provide valuable input on capital improvements at the Exton Train Station as well as service limitations of suburban bus service and potential bus circulation and bus stop changes in the study area. DVRPC shared traffic data and findings from the study of Exton Train Station that they were advancing concurrently. Input from both agencies was considered while developing and evaluating proposed PA Route 100 corridor improvement alternatives within the study area.

Likewise, a cursory technical review meeting with PennDOT District 6 staff was held on September 18, 2017 to review the preferred improvement alternative. Proposed roadway cross-sections through the critical project segment under the Amtrak-SEPTA bridge were presented at this meeting. More information on the preferred improvement alternatives is presented later in this report. Recommendations were revised to reflect the feedback received at this initial meeting. Continued input from PennDOT will be needed to advance the proposed improvements through detailed engineering, safety, operations, and other reviews regardless of the implementation approach that is selected.

E | Project Process and Schedule

The project team observed the following workflow while developing the Route 100 Corridor Congestion Mitigation Study:

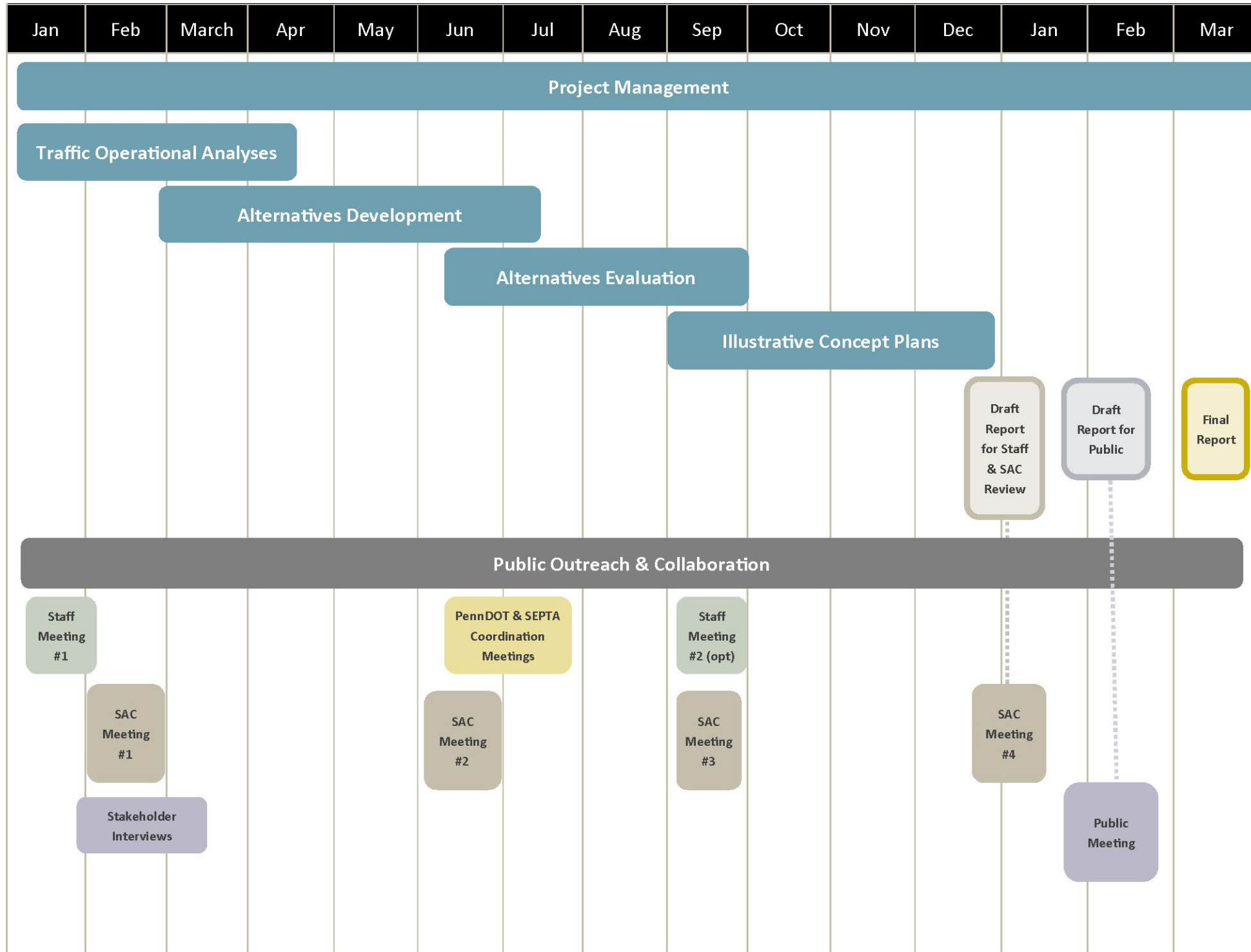
- 1) Existing Conditions Inventory—The project team documented existing infrastructure and traffic operating conditions through field views and by obtaining available plans.
- 2) Traffic Operational Analysis—Capacity and queuing analyses were completed for the weekday morning and afternoon commuter peak hours for the intersections in the study area with input from the Study Advisory Committee.

- 3) Alternatives Development—Various geometric and technological solutions to improve the functionality of the corridor were investigated. The alternatives were presented to the Study Advisory Committee for discussion and prioritization.
- 4) Alternatives Evaluation—Performance, benefits, costs, and other implications of the alternatives were compared to identify preferred solutions.
- 5) Illustrative Concept Plans—Planning-level conceptual layout plans were prepared to illustrate a preferred geometric alternative for primary study intersection on the PA Route 100 corridor in West Whiteland Township.

The project schedule anticipated at the outset of this project is shown in **Figure 1.3**.



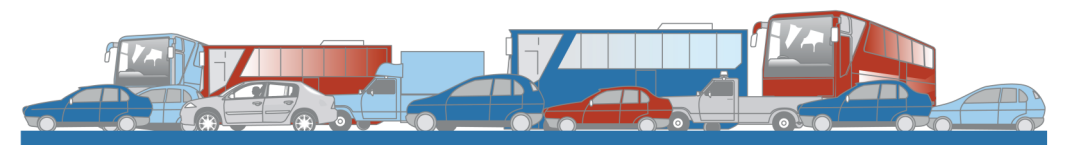
Figure 1.3: Anticipated Project Schedule



Chapter 2

Existing Conditions

PA Route 100 Congestion Mitigation Study





2 | Existing Conditions & Issue Identification

A | Transportation Setting

PA Route 100, locally referred to as Pottstown Pike, is a major arterial and the primary north-south route through West Whiteland Township. It provides a critical commuter and freight connection between northern and central Chester County. Within the study area, PA Route 100 is dominated by an interchange connection with the US Route 30 Exton Bypass. This connection, while greatly increasing mobility throughout the region, contributes to the traffic congestion that afflicts this corridor. Additionally, 5 key intersections with PA Route 100 were considered in this study as follows (starting in the south and working north):

- 1) Whiteland Woods Blvd/ Mountain View Dr
- 2) Exton Bypass Eastbound Off-ramp/ Eastbound On-ramp
- 3) Exton Bypass Westbound Off-ramp
- 4) Bartlett Ave
- 5) Commerce Dr

A listing of all roadways within the study area and their corresponding functional classification and speed limit is depicted in **Table 2.1**.

Surrounding Land Use Context

Within the study area, retail/commercial and residential land use types predominate. However, there are a few institutional uses, such as the West

Whiteland Township Administration Building, West Whiteland Fire Company, Exton Elementary School, and the Exton Train Station.

Major residential developments within the study corridor area include Valley View, Whiteland Woods, Exton Station, and Whiteland Crest. These account for nearly 1,500 total housing units. Additionally, Main Street at Exton has

Table 2.1: Roadway Characteristics

Roadway	Chester County Functional Classification	Smart Transportation Classification	Speed Limit
PA 100 (Pottstown Pike)	Major Arterial	Regional Arterial	45
US 30 Exton Bypass	Expressway	Expressway	55
Whiteland Woods Blvd	Local	Local	25
Mountain View Dr	Local	Local	20
Walkertown Rd	Local	Local	25
Howard Rd	Local	Local	n/a
(US 30 EB on-ramp)			
Bartlett Ave	Local	Local	25
Commerce Dr	Minor Collector	Neighborhood Collector	35

been approved to add more than 400 apartment units. Exton is also home to a large concentration of retail and commercial space. Large shopping centers such as Main Street at Exton, Whiteland Towne Center, Exton Square Mall, and Fairfield Place (as well as retail and commercial uses along Business US 30) contribute to over 6,000,000 total square feet of commercial space in West Whiteland Township.

All of these residential and commercial developments rely on a relatively short section of PA Route 100 to provide access to the north and south, which is a major cause of traffic congestion in the study area.

PennDOT Land Use Context

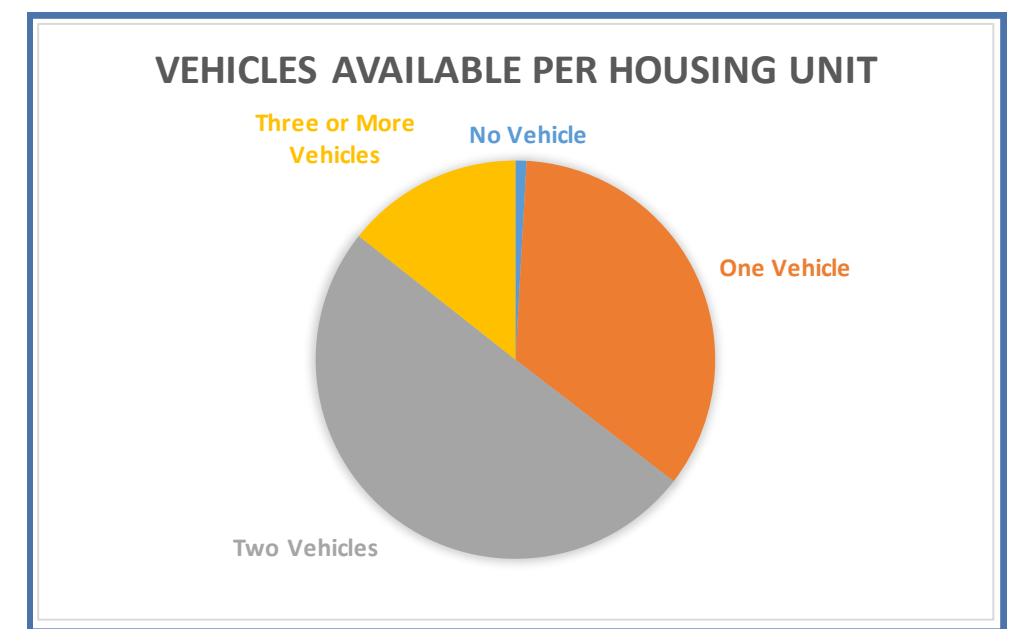
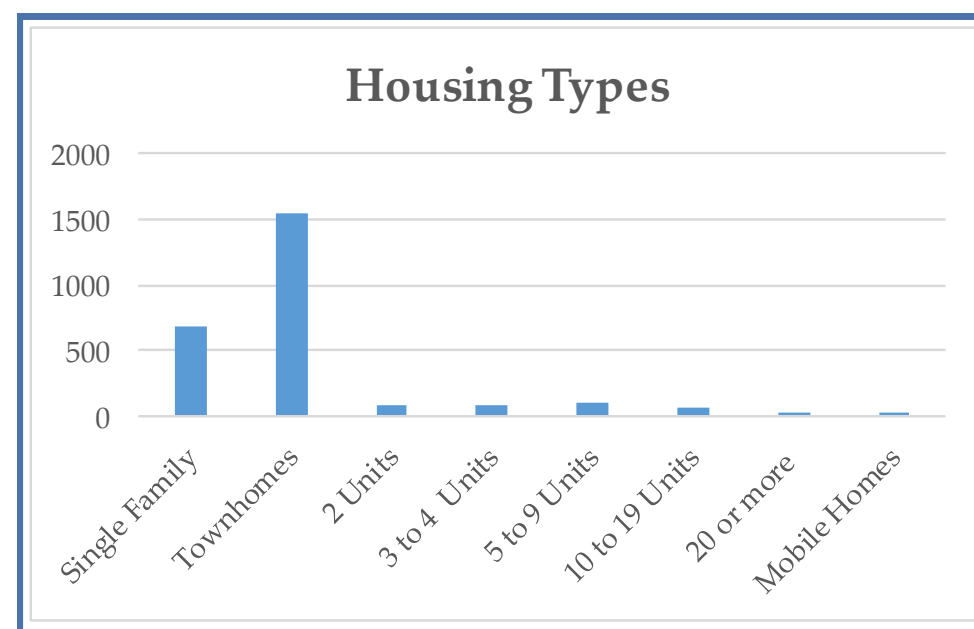
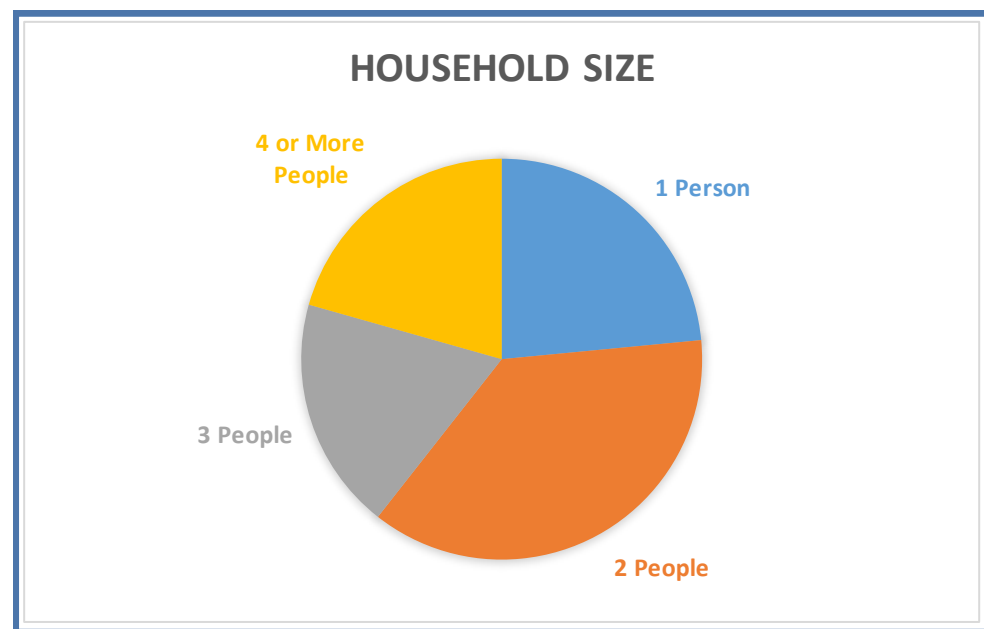
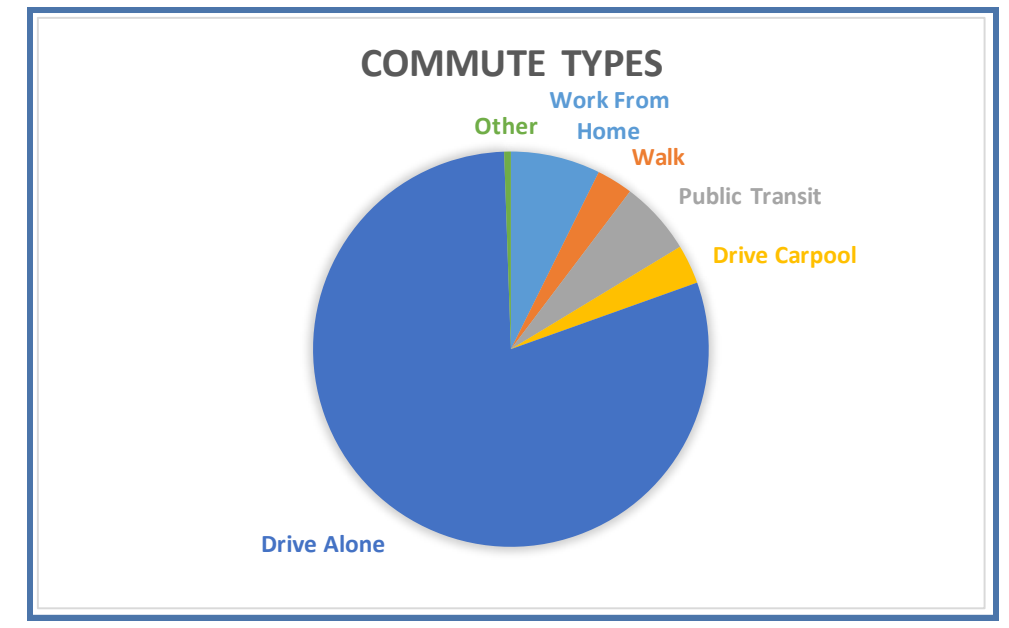
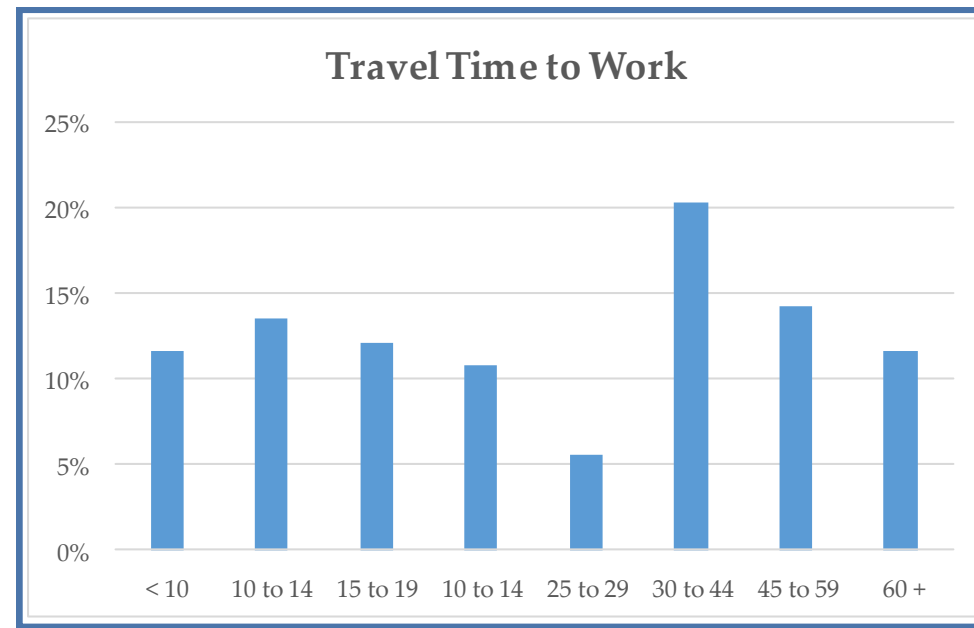
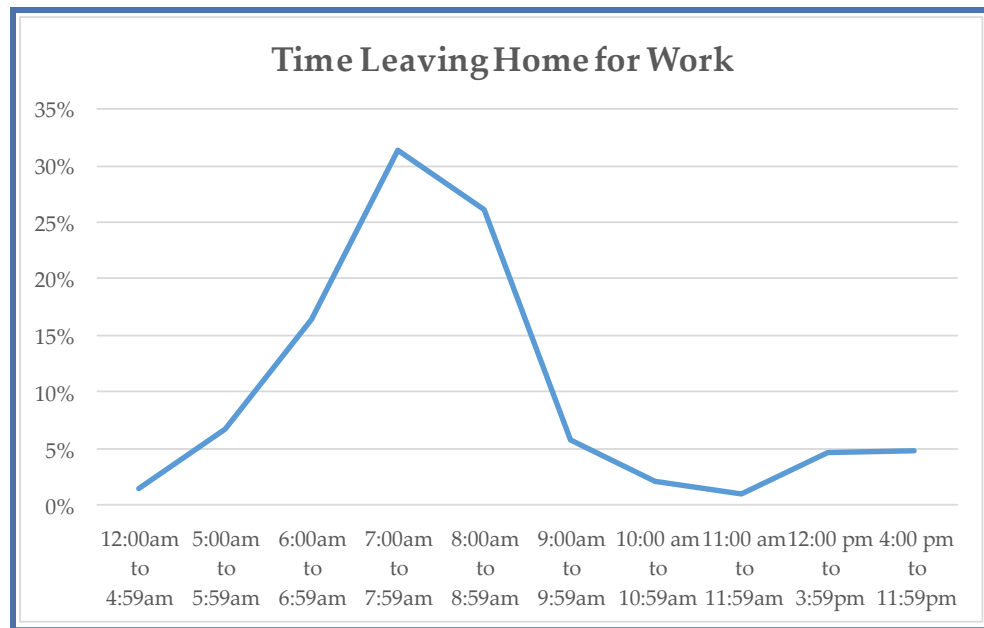
In the Smart Transportation Guidebook developed jointly by PennDOT and NJ DOT, Exton would be characterized as a Suburban Center. Suburban centers are described as cohesive, often mixed-use, collections of land uses where commercial uses serve surrounding neighborhoods. The area is designed to be accessible by car with large parking areas. Pedestrians are typically not as well accommodated as in town centers, and opportunities to cross the primary roadway (PA Route 100 in this case) are limited.

The recommended lane widths for regional arterials in suburban centers is 11 to 12 feet. While shoulders are not generally recommended, they can be applicable in some situations. Accommodation for people who bike, walk, or use public transportation should be provided in the suburban center context.

Travel Characteristics

The travel characteristics within the study area are fairly typical for a suburb in the Delaware Valley. Approximately 80% of residents commute via single occupancy vehicles, most people are leaving home between 7:00 am and 9:00 am to go to work, and most individuals have access to a vehicle. Despite access to transit (Exton Train Station, SEPTA 92) and West Whiteland Township’s commitment to providing pedestrian connections, very few township residents actually commute by public transportation.

This heavy reliance on single occupancy vehicles leads to more cars on the roads and increased congestion on the roadway system. Inevitably, being the major north-south route and connection to the Exton Bypass, PA Route 100 bears the brunt of this traffic (not to mention all of the traffic passing through). The following sections of this chapter delve into more detail about these and related topics.



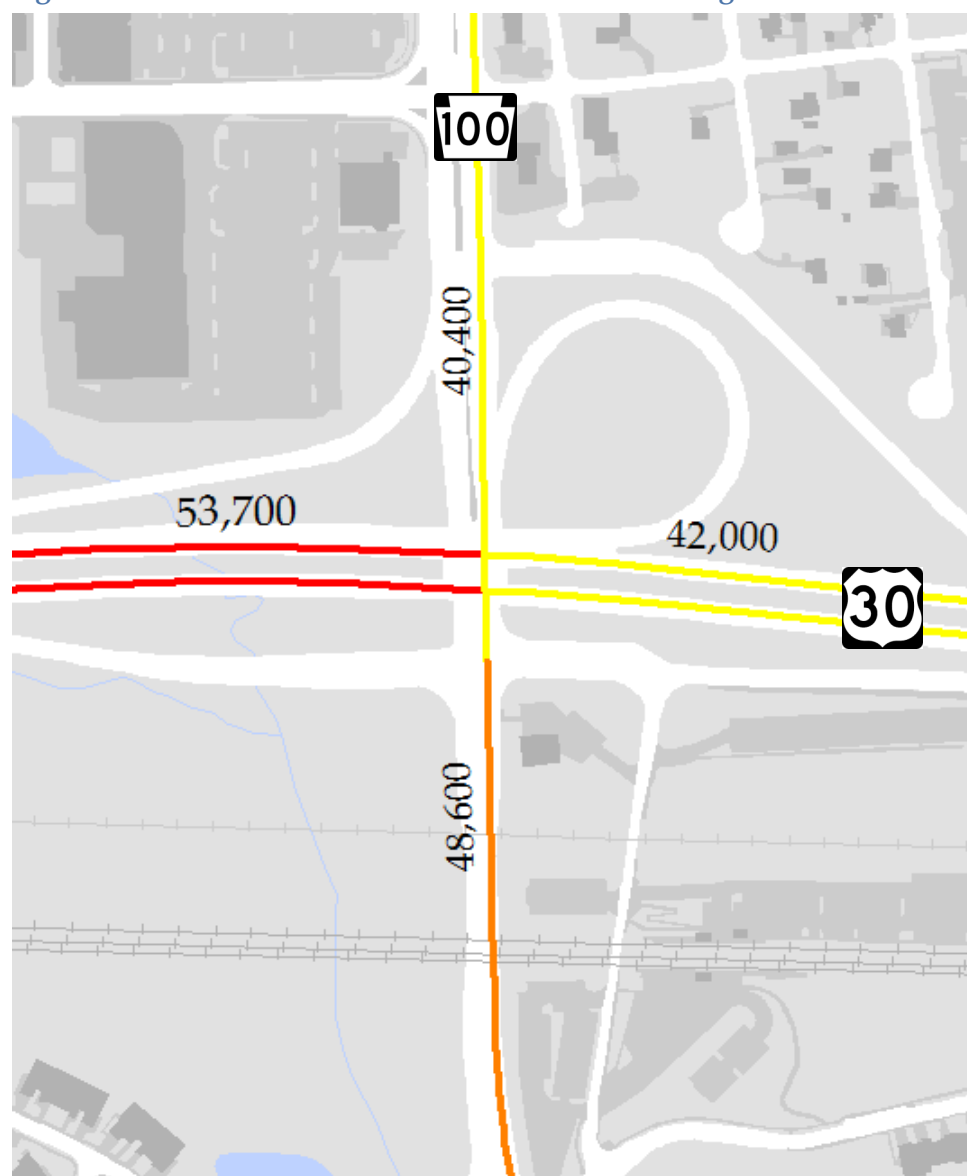
Data source for all charts on this page: US Census 2012-2016 ACS



B | Traffic Operations

Traffic volumes in the study area are primarily concentrated in the PA Route 100 and US Route 30 Exton Bypass interchange area. As **Figure 2.1** illustrates, traffic is comparable on both routes; roughly 40,000-55,000 vehicles on average per day. However, there is a higher number of vehicles utilizing the southern and western legs of the interchange. This likely indicates that more people are traveling to and from the west and the south (such as US Route 202). Traffic volumes are much lower on side streets such as Bartlett Avenue, Howard Road, Mountain View Drive, and Whiteland Woods Blvd. However, because of their utilization as access to the SEPTA/

Figure 2.1: Traffic Volumes at PA 100 / US 30 Interchange

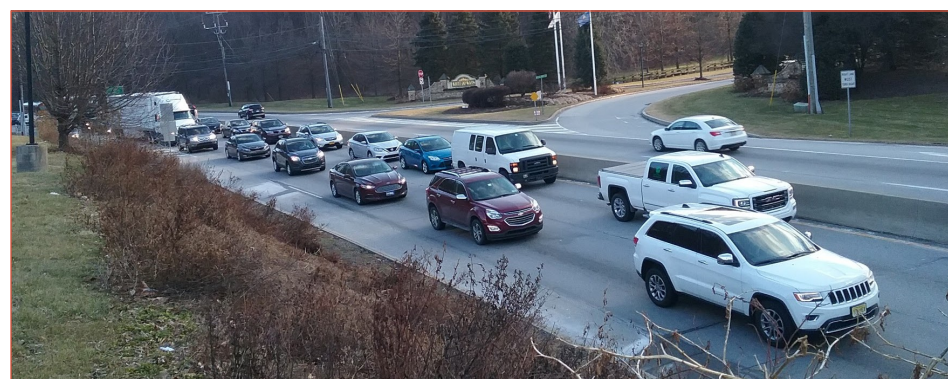


Amtrak train station, Howard Road and Mountain View Drive experience higher volumes of traffic than other side streets during the peak hours.

High traffic volumes contribute to poor traffic operations at multiple intersections along PA Route 100. Generally, intersections nearer the US Route 30 Exton Bypass interchange perform at lower levels of service. **Figure 2.2** illustrates the PM peak hour delay and overall level of service at key intersections in the corridor.

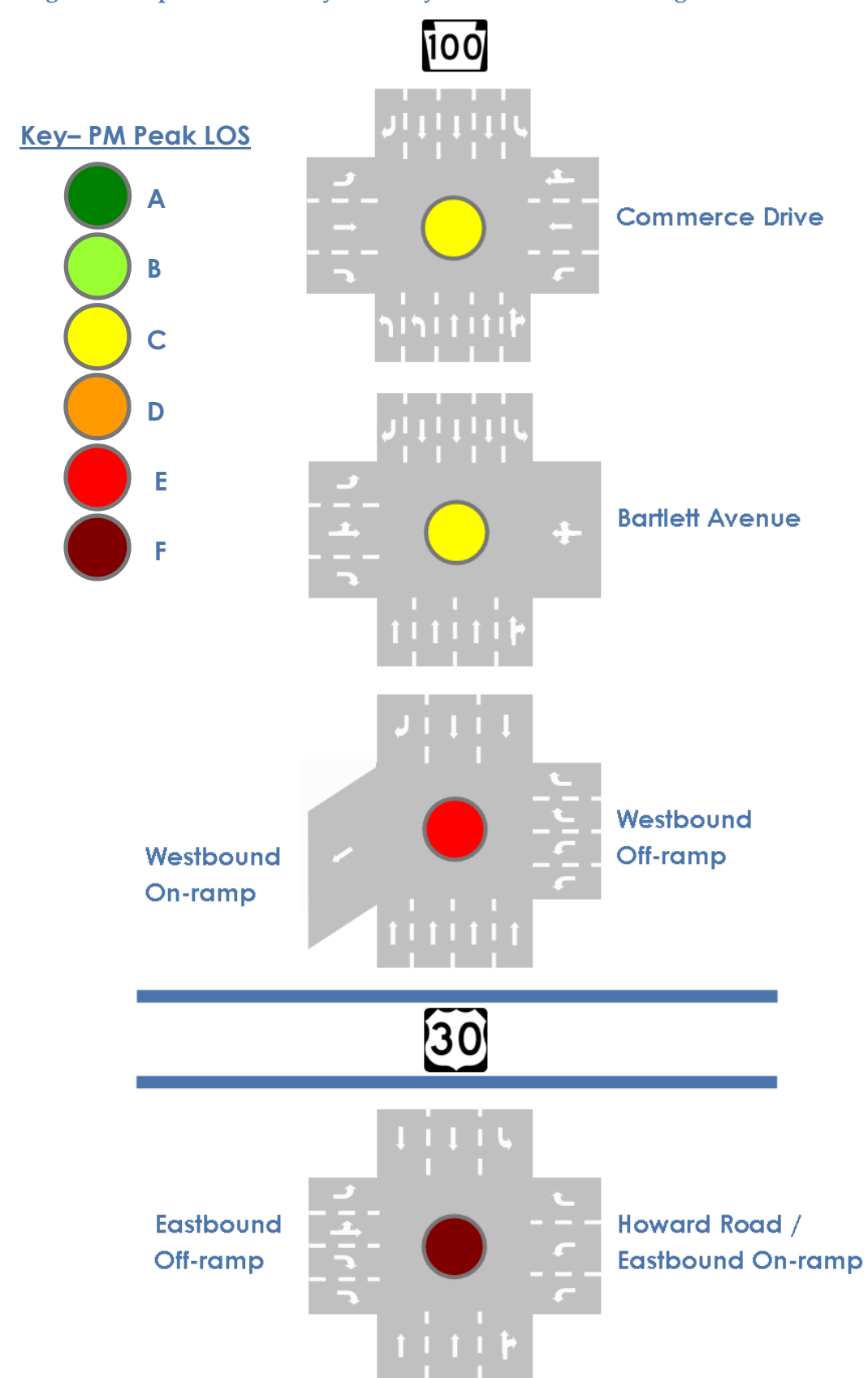
Both the Commerce Drive and Bartlett Avenue intersections with PA Route 100 perform at a level of service C (a measure of intersection performance with A being best and F being worst). This indicates that there are some delays, but the delay is generally acceptable. The intersection with the Westbound Off-ramp from the US Route 30 Exton Bypass performs at a level of service E; meaning the delay at this intersection is intolerable. Even worse, the intersection with the Eastbound On and Off ramps performs at a level of service F.

Long queue lengths exist at nearly every intersection in the study corridor. This can mostly be attributed to high traffic volumes, heavy turning movements, and close spacing of intersections. Queue lengths are the worst at the intersection of PA Route 100 and the US Route 30 Exton Bypass Eastbound Ramps/ Howard Rd in the northbound direction. Also, a high volume of traffic is merging from Pottstown Pike onto PA Route 100 just south of this intersection, further exacerbating the long queues. Due to the constraints of the two railroad bridges, the through / right-turn lane onto Eastbound US Route 30 is not long enough to accommodate current traffic volumes, and the potential capacity of this additional lane is not realized. Additionally, there are spikes in traffic volumes attributed to the arrival of Amtrak and SEPTA trains at the Exton Train Station.



Traffic queuing on PA Route 100 from the US Route 30 ramps.

Figure 2.2: Operational Analysis at Key Intersections – Existing Conditions



A detailed analysis of operations for the corridor can be found in the appendix.

C | Corridor Crash History

For the period between 2012 and 2016, the most commonly reported crashes on PA Route 100 in the study area are rear-end crashes, as shown in **Figure 2.3** on page 6. This type of crash is commonly associated with high traffic volumes and congestion. Rear-end crashes are particularly concentrated in the area between the eastbound and westbound ramps to the US Route 30 Exton Bypass, the two worst performing intersections in the study area. Major delays and stop-start conditions are contributing factors to the high concentration of rear-end crashes. Even with no pedestrian accommodations and plenty of anecdotal and physical evidence of pedestrians, there were no crashes involving pedestrians recorded in the study area during the period analyzed.

D | Pedestrian and Bicycle Circulation

Through various capital improvements and the land development approval process, West Whiteland Township has been able to establish a fairly comprehensive sidewalk and trail network in the township. This is particularly true in the Exton area. However, one connection that has eluded the township in the past is linking the Exton Train Station to the rest of Exton, despite the strong interest in this connection, as evidenced by “desire paths” on both the east and west side of PA Route 100, people are making this hazardous journey today.



A “desire path” along PA Route 100, under the US Route 30 Exton Bypass bridges.

To remedy this condition, in 2016 the township received a DCED Multimodal Fund Grant to construct a multi-use trail connecting the Chester Valley Trail to the Exton Train Station. The new path will begin at the intersection of Commerce Dr. and PA Route 100, continue on the western side of PA Route 100, under the US 30 Exton Bypass, add safe and accessible pedestrian crossings at the Eastbound On and Off Ramps, and connect into the Exton Train Station property. Pending approval from PennDOT, construction is anticipated to begin in the summer of 2018. Matching funds for the DCED grant were provided by The Wolfson Group (owner of Main Street at Exton) and West Whiteland Township. Detailed drawings, provided by West Whiteland Township’s consultant, can be found in the appendix of this document.

Currently, PA Route 100 is not intended or recommended for on-road bicycling. This is primarily due to three factors: (i) high volume of traffic, (ii) intolerable congestion, and (iii) roadway design characteristics. These factors mean that PA Route 100 is a hazardous road for even the most experienced bicycle riders. In 2017, DVRPC documented this fact in their Bicycle Level of Traffic Stress (LTS) analysis. That analysis categorized PA Route 100 as LTS 4; the highest level of stress, and thus, the least suitable for on-road cycling. Opportunities for providing dedicated space for bicycles is likely very limited. Therefore, West Whiteland Township and Chester County have placed more emphasis and effort into providing multi-use trail connections in the study area.

E | Public Transportation

Another factor that contributes to the traffic congestion on PA Route 100 is the location and popularity of the Exton Train Station. The station serves both SEPTA Regional Rail and Amtrak Intercity Rail. SEPTA’s Paoli/Thorndale Line serves Exton with half hour weekday service to and from Center City Philadelphia. While Amtrak’s Keystone Service makes hourly stops at Exton. The total ridership at the Exton Train Station is roughly 900 SEPTA and Amtrak riders daily, making it the second busiest train station in Chester County, behind only Paoli.

The Exton Train Station is located at the confluence of two major highway corridors (PA Route 100 and US Route 30 Exton Bypass), ensuring that it is easily accessible to automobiles, and making it the defacto train station for communities both north and south of Exton including West Chester,

Uwchlan, and Upper Uwchlan. However, this high level of accessibility also causes traffic surges associated with the train station. These surges correspond to the SEPTA and Amtrak train schedules. Generally, a higher number of vehicles are traveling to the station in the morning, and in the afternoon a higher number of vehicles are departing the station. Opportunities for people to walk or bike to the train station are limited. There is an existing sidewalk along Mountain View Dr. that connects the Valley View neighborhood to the train station property. The only other pedestrian connections are informal paths along PA Route 100 to Main Street at Exton. However, there is a desire for people to be able to access the station on foot from the western side of PA Route 100, particularly from the Whiteland Woods neighborhood.

Two fixed route buses travel through the study area; SEPTA 92 and Krapf’s Coaches “A” Bus. The SEPTA 92 connects Exton with West Chester, Malvern, Paoli, and King of Prussia. It provides multiple connecting services at the Exton Transit Center (Exton Square Mall), West Chester Transit Center, and King of Prussia Mall, and it connects with SEPTA Regional Rail at Malvern and Paoli. Krapf’s Coaches “A” Bus provides transit access to West Chester, Downingtown and Coatesville from Exton while making key stops at both the Exton Transit Center (Exton Square Mall) and West Chester Transit Center. Both of these routes utilize PA Route 100 through the study area; passing directly in front of the Exton Train Station. However, neither of the buses make stops at the train station due to vehicle and infrastructure limitations on the train station property. Despite the existence of a bus shelter with SEPTA 92 signage at the corner of PA Route 100 and Howard Road, the bus does not stop there. With virtually no pedestrian facilities between Commerce Drive and the Exton Train Station (particularly on the east side of PA Route 100), utilizing SEPTA or Krapf’s services in the study area can be difficult.

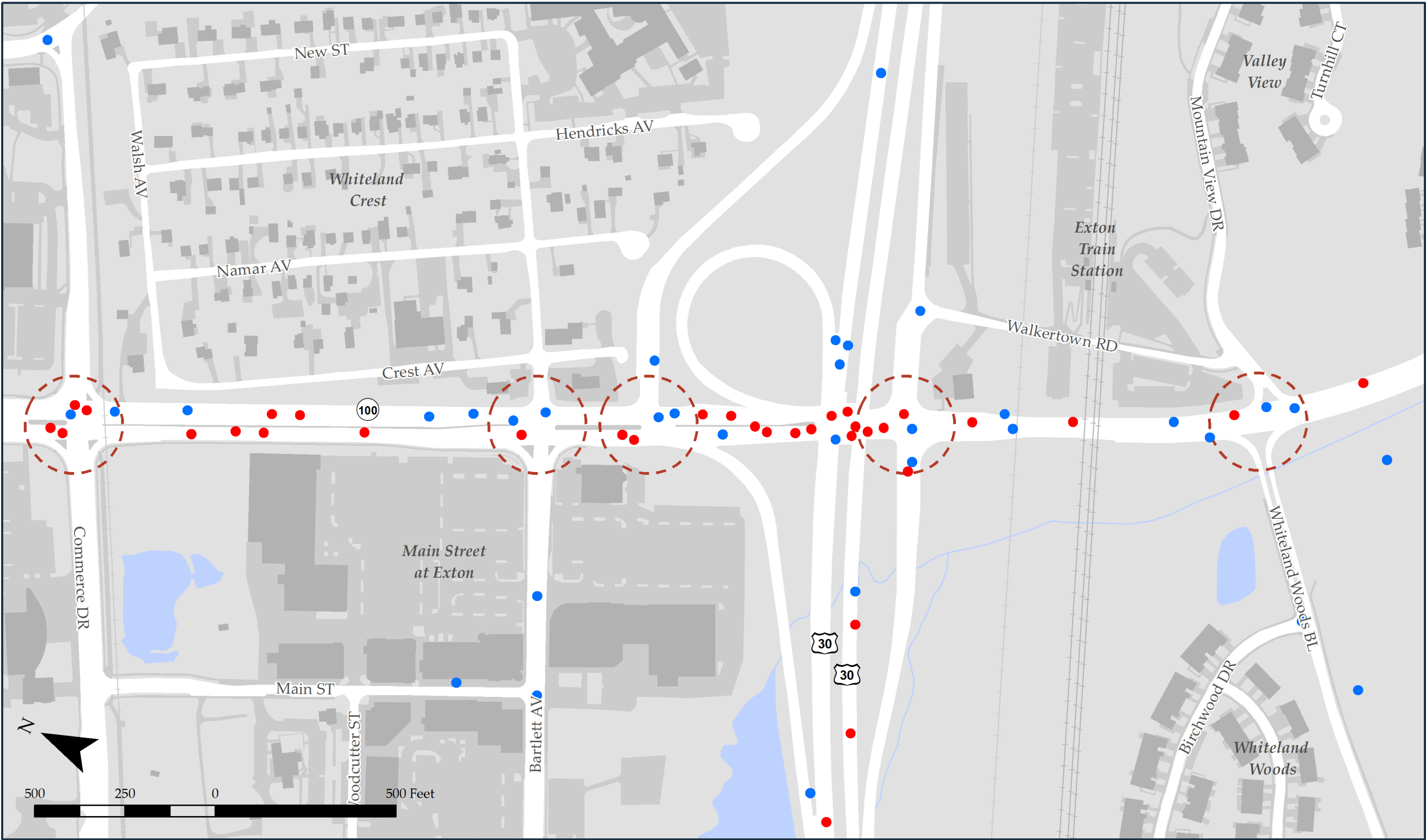
Various private commuter shuttles also provide service to and from the Exton Train Station; however, those shuttles are provided by employers and are not available for public use. Current services include a shuttle available to West Chester University students, staff, and faculty. These shuttles do enter the train station property.




ROUTE 100 CORRIDOR CONGESTION MITIGATION STUDY

FIGURE 2.3: REPORTABLE CRASHES (2012 - 2016)

DRAFT



Legend

 Study Intersections

Collision Type

 All Other

 Rear-end

Sources:
Reportable Crashes (2012-2016)
- PennDOT
Roads - Chester County GIS
Impervious Surface - DVRPC



F | Corridor Constraints

Exton is located at the crossroads of multiple regional transportation corridors, which leads to unique constraints that impact the ability to expand PA Route 100 to handle the congestion issues through traditional capacity solutions. Said constraints include structural obstacles (i.e. bridges), expressway interchanges, planned bicycle/ pedestrian facilities, and land development patterns. The bottom line is there are limited opportunities to feasibly widen the right of way on PA Route 100.

Traveling north on PA Route 100, it is hard to miss three of the biggest constraints on the corridor. First there is the active railroad bridge that carries Amtrak and SEPTA over PA Route 100. At approximately 66 feet wide, this is the narrowest section of the corridor to contend with. Immediately following the Amtrak bridge is the inactive Norfolk Southern bridge, which provides only slightly more space at approximately 67 feet. The last major structure is the bridge carrying the US 30 Exton Bypass over PA Route 100. While this bridge is much wider than the other two at approximately 85 feet, it also has two additional lanes of traffic that take up this additional width. The two railroad bridges account for possibly the biggest issue on the corridor. They create a pinch-point where PA Route 100 and Pottstown Pike must merge from two northbound lanes each (four lanes total) to just two northbound lanes combined.

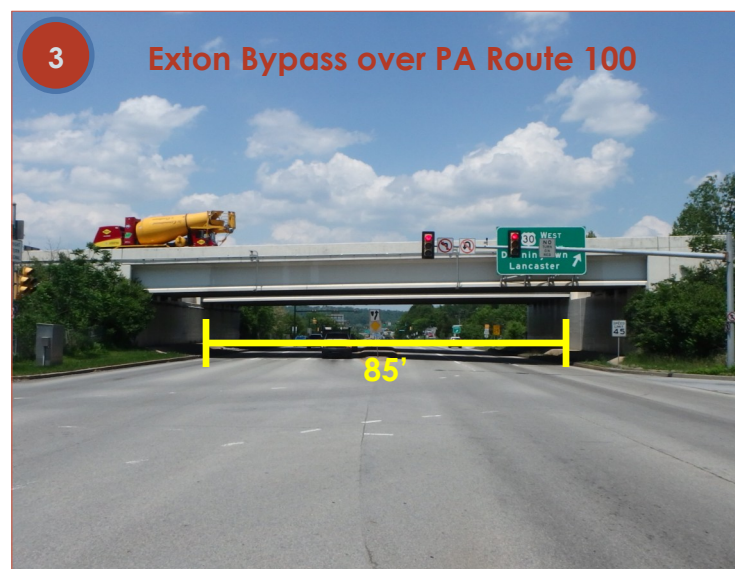
Another major obstacle is the complicated US 30 Bypass Interchange. This interchange is comprised of a 4-way signalized intersection at the Eastbound Off-Ramp and Howard Road / Eastbound On-Ramp. It is an unusual situation for the Eastbound On-Ramp to be utilized for two-way traffic, but it is necessitated by the need for southbound access to and from the Exton Train Station. A quarter of a cloverleaf is utilized to facilitate access from northbound PA Route 100 to westbound US 30 Exton Bypass. This free flow ramp can cause some weaving movements from motorists, because the far right lane is a continuation of the turning lane from the previous intersection. This situation is not evident to motorists who are unfamiliar with the area until after they traverse the Howard Road intersection. A quarter diamond is used for westbound US 30 Exton Bypass access from southbound PA Route 100, and this performs well for automobile traffic. However, both this ramp and the previously mentioned ramp can be hazardous for pedestrians to traverse. Both the low height (10' 8") and the narrow width (approximately 17') of the bridge carrying the railroad over Walkertown Road limit the use of Walkertown Road as an alternative route to PA Route 100. Structural constraints in the study area are shown in **Figure 2.4**.

The planned multi-use trail connection that was covered earlier in this chapter could potentially impact any future capacity adding that may be needed on PA Route 100. However, providing a safe and accessible connection between the Chester Valley Trail and the Exton Train Station is a higher priority for the community than allowing for an additional lane of traffic in this area.

West Whiteland Township has done a good job of regulating setbacks so that future highway expansion would not be hindered. However, some of the structures in the study area predate the US 30 Exton Bypass. Homes in the Whiteland Crest neighborhood and the commercial structure at the corner of PA Route 100 and Howard Road limit the available options for a future redesign of PA Route 100/ US 30 Exton Bypass interchange.

Figure 2.4: Structural Constraints in Study Area

	Structure	Type	Available Width (under bridge)	Existing Lanes
1	Amtrak over PA Route 100	Railroad (Active)	66'	4
2	Former Philadelphia and Thorndale Line over PA Route 100	Railroad (Inactive)	67'	4
3	Exton Bypass over PA Route 100	Expressway	85'	6
4	Amtrak over Walkertown Road	Railroad (Active)	17'	2



G | Key Findings

While studying the existing conditions on PA Route 100 in the study area, various dominating aspects that add to traffic congestion in the Exton area were identified. These aspects can be distilled down to the key findings that are listed below and illustrated in **Figure 2.5**:

- The PA Route 100 / US Route 30 Exton Bypass is one of the busiest junctions in Chester County, experiencing nearly 100,000 vehicles per day on average.
- Due to limited other north-south options, this corridor sees a heavy mix of regional pass-through traffic, local traffic, and traffic accessing the Exton Train Station.
- Amtrak and SEPTA train arrivals and departures cause surges in traffic that have a significant impact on traffic operations during the AM and PM peak hours.
- The absence of a direct connection between the western leg of the US Route 30 Exton Bypass and the southern leg of PA Route 100 forces all traffic that is going to or coming from US Route 202 to funnel through the constrained intersection of PA Route 100 and US Route 30 Exton Bypass Eastbound Ramps / Howard Road.
- PA Route 100 is highly constrained south of the US Route 30 Exton Bypass due to bridges, topography, rail, and other structures.

It became evident that the most critical intersection along the study corridor was the intersection of PA Route 100 and US Route 30 Exton Bypass Eastbound Ramps / Howard Road. The short northbound outside travel lane (approximately 150 ft) reduces operational capacity, and very heavy through and turning movements add to traffic congestion. For this reason, most improvement alternatives focus on improving the operations and capacity of this critical intersection.

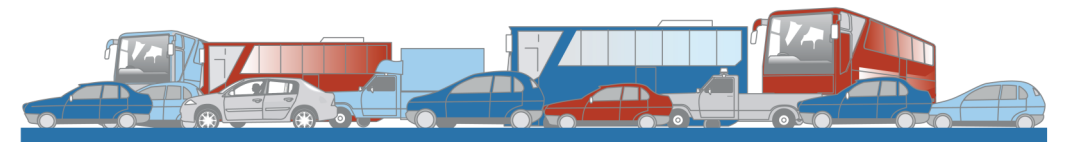
Figure 2.5: Key Existing Conditions Findings



Chapter 3

Alternatives Development

PA Route 100 Congestion Mitigation Study





3 | Alternatives Development

This chapter summarizes the various alternatives that were considered to address West Whiteland Township’s three main goals for PA Route 100:

- 1) Identify a comprehensive approach to alleviating motor vehicle congestion
- 2) Provide safe accommodation for pedestrians and bicyclists
- 3) Improve access to the Exton Train Station

Many of the identified solutions focused on addressing existing and future congestion at the US Route 30 Exton Bypass eastbound interchange first. Through preliminary analysis, this intersection was identified as the key intersection along the study corridor, and the primary source of traffic congestion on this stretch of PA Route 100. Future traffic operations were then considered at each of the remaining study intersections.

A | Non-structural Capacity Solutions

Solutions that would provide added capacity along PA Route 100 without requiring structural changes to existing infrastructure were considered before alternatives that would require major changes to the US Route 30 Exton Bypass, interchange ramps, railroad bridges, or other major infrastructure. These preliminary, non-structural capacity improvements were considered individually and in combination with other approaches. They included:

Adding travel lanes along PA Route 100 – North of the US Route 30

Exton Bypass interchange, PA Route 100 carries three through travel lanes in each direction. Preferably, those six through lanes would be continued south through the interchange area; however, there is not enough available width due to the corridor constraints in this area. This solution would install a third travel lane in the northbound direction on PA Route 100 only. The additional northbound lane would extend from roughly the merging Pottstown Pike ramp, under the two railroad bridges, and meet with the existing through / right-turn lane at the Howard Road / Eastbound US 30 ramp.

Adding lanes along side street and ramp approaches – Providing additional through and turning lanes at various study intersections was considered. In doing so, the side street demands can be more efficiently served; moving more cars in less time. The saved time could then be reallocated to PA Route 100 thus improving traffic flow and reducing congestion on the primary roadway.

Restricting or relocating certain turning movements – Shifting movements from busy intersections and accommodating those movements at other locations can improve the operations at key intersections. Left-turn advance traffic signal phasing often decreases the efficiency of an intersection. Therefore, most scenarios included restriction of left-turn movements at key intersections.

B | Structural Capacity Solutions

After reviewing non-structural improvement scenarios, solutions that involved structural modifications to the US Route 30 Exton Bypass, interchange ramps, railroad bridges, or other major infrastructure were considered. These improvements would result in some temporary interruption of service along PA Route 100. Additionally, each improvement would potentially require approval from the Federal Highway Administration and other agencies beyond those that would be required for a less transformative roadway improvement project. In most cases, the structural solutions would require a larger financial commitment than the non-structural solutions. Like the non-structural solutions, these preliminary, structural capacity improvements were considered individually and in combination with other approaches. They included:

Providing flyover ramp – This approach is to create a new ramp to relocate certain heavy ramp movements at existing, congested, signalized interchange ramps. The new ramp would join the roadway at a location with available capacity. Potentially, the new ramp movements could be accommodated as a yield-controlled approach or a dedicated receiving lane could be provided along the main roadway.

Providing an alternative intersection treatment – There are available alternative intersection concepts that have been developed to address capacity and safety issues by limiting the amount of turning movement conflicts. Those intersection types include Single-Point Urban Interchanges (SPUI), Diverging Diamond Interchanges (DDI), and Displaced Left-Turn Interchanges (DLTI). These intersection designs can often provide added capacity to a busy interchange with less travel lanes compared to traditional intersections/interchanges; an attractive concept considering the corridor constraints on PA Route 100.

Adding travel lanes along PA Route 100 – The most straight-forward approach to adding capacity would be to add lanes to PA Route 100. In order to implement this approach, modifications to existing structures, most notably the Amtrak railroad bridge and the Norfolk Southern railroad bridge would be required.

Channelizing interchange ramp lanes – Channelizing specific turning movements at the US Route 30 Exton Bypass interchange ramps would simplify the traffic signal operations at key intersections in the study area. Additional efficiencies can be achieved by converting these movements to yield-controlled or providing additional receiving lanes along PA Route 100.

C | Additional Non-structural Solutions

Additional improvements to the corridor system were considered that included utilization of existing traffic signal technologies and intelligent transportation solutions. In most cases, these solutions cannot be readily modeled by standard traffic analysis software. The required detailed modeling was beyond the scope of this project, so only a high level overview of available solutions is provided in this study. However, available advanced signal technologies and corridor management solutions that could be considered for the PA Route 100 corridor include:

Traffic Signal Optimization—Traffic signal optimization involves retiming the traffic signals to best manage peak flows with current traffic signal equipment and intersection geometries. Automated traffic systems can provide continuous performance measures to

engineers in order to develop highly optimized traffic timings that improve traffic flow and reduce overall delays.

Adaptive Traffic Control— With adaptive traffic control, signal timings can be optimized in real-time by the signal controller to handle fluctuations in traffic demands on a corridor or at single intersections. US Department of Transportation research shows that travel times can often be reduced by more than 10 percent while also reducing stops, collisions, and operating costs.

Ramp Management—There are two different forms of ramp management: ramp metering and junction control. Ramp metering involves installation of signals on highway on-ramps to control the frequency of which vehicles enter the flow of traffic on an expressway. This reduces overall congestion by managing the amount of traffic entering an expressway and by breaking up platoons that make it difficult to merge. Junction control can dynamically assign lanes at on-ramps to better manage flow.

Monitoring & Variable Message System Guidance—Traffic monitoring systems can be employed to continuously monitor traffic conditions to relay information back to motorists. In some cases, motorists can be directed to other routes or given travel time information. Queue monitoring systems can warn motorists of downstream congestion in advance.

D | Exton Station Visibility and Access

To improve visibility and access to the Exton Train Station, the concept of providing a signalized intersection at Mountain View Drive / Whiteland Woods Boulevard was considered. Currently, this intersection provides only for right-in/ right-out movements on both of the side street approaches to PA Route 100, which limits accessibility to the Exton Train Station. Various scenarios discussed in this chapter were considered in conjunction with this intersection improvement.

A left turn bay would not be feasible on PA Route 100 at a new signalized intersection due to the proximity and lateral constraint of the Amtrak / SEPTA bridge, and therefore, a jug-handle would be necessary to facilitate access to the train station from southbound PA Route 100. While improving this intersection, the internal traffic circulation at the Exton station would

remain the same as it is today; however, the Exton Train Station would be directly accessible to residents of the Whiteland Woods neighborhood. Reconfiguring Walkertown Road as the through route to make Mountain View Drive the side street could also be considered as part of the overall improvement.

E | Multimodal Accommodations

Identifying safe pedestrian and bicycle access to the Exton Train Station was a key component of this study. With the connection from the Exton Train Station to the Main Street at Exton and the Chester Valley Trail being planned by West Whiteland Township, the focus for this study turned to providing access across PA Route 100. The township's project will provide Americans with Disabilities Act (ADA) compliant crosswalks, complete with curb ramps and pedestrian signals, at the intersection of PA Route 100 and the US Route 30 Exton Bypass eastbound off-ramp. This crossing will not be accessible from the Whiteland Woods neighborhood, because other proposed improvements eliminate the pedestrian walkway under the two railroad bridges. However, the proposed improvements at the Whiteland Woods Boulevard / Mountain View Drive intersection with PA Route 100 would provide an opportunity to create a safe pedestrian crossing. Through the laterally constrained section of PA Route 100 where it crosses under the two railroad bridges, Walkertown Road can serve as the pedestrian accessible north-south route parallel to PA Route 100.

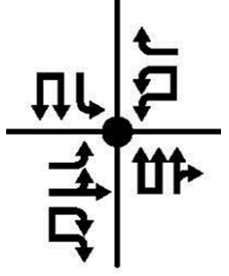
Additionally, the Chester County Planning Commission recommended utilizing the Norfolk Southern inactive rail line through the study area as the preferred alternative to extend the Chester Valley Trail from Exton to Downingtown. Design of the future trail may present additional opportunities for improving Exton Train Station access, internal circulation, and parking. With this trail, the Norfolk Southern bridge would be converted to a pedestrian bridge over PA Route 100. As this project advances, convenient access to the trail crossing should be considered.



F | Preliminary Improvement Scenarios

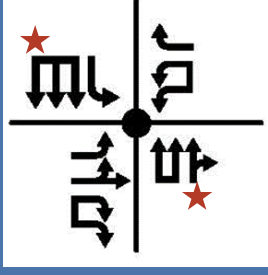
Various combinations of the previously described improvements were considered to improve traffic operations and reduce congestion on the PA Route 100 corridor in West Whiteland Township. These multiple scenarios were then consolidated. In total, sixteen different improvement scenarios were developed for this project. Some are minor alterations to current geometry, while others require major infrastructure investment. The following is a listing of each of the scenarios that were analyzed. All of the scenarios, in some way, alter the intersection of PA Route 100 and the US 30 Exton Bypass eastbound ramps. The graphics associated with each scenario depict the improvements at this intersection. In some cases, improvements to the Mountain View Drive and Whiteland Woods Boulevard intersection are required. In the scenarios presented, improvements are denoted by a red star.

Existing Condition




The existing configuration at the intersection of PA Route 100 and the US 30 Bypass Eastbound Ramps / Howard Road consists of: two through lanes and a left-turn lane in the southbound direction; two through lanes and a through / right-turn lane in the northbound direction; a double left-turn lane and a right-turn lane in the westbound direction; and a double right-turn lane, a through / left-turn lane, and a left-turn lane in the eastbound direction. The Exton Train Station can only be accessed southbound via the US 30 Eastbound On-Ramp / Howard Road.

Scenario 1—Third Travel Lane



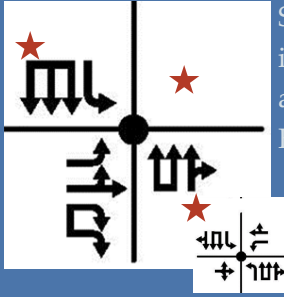
This scenario provides an additional (third) travel lane along PA Route 100 in both directions. It includes extending the existing (outside) northbound through / right-turn lane. Scenario 1 would improve access to the Exton Train Station, Whiteland Woods, and Valley View. However, the Exton Bypass bridge and both rail road bridges present structural constraints and would require reconstruction.

Scenario 2—Third Travel Lane + Station Access



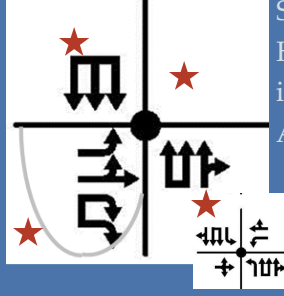
Like Scenario 1, Scenario 2 would provide a third travel lane in each direction on PA Route 100. However, it also includes a new, signalized intersection at the Whiteland Woods Boulevard and Mountain View Drive intersection (see inset). This scenario would improve access to the Exton Train Station, Whiteland Woods, and Valley View. It is also constrained by the Exton Bypass bridge and both railroad bridges.

Scenario 3—Third Travel Lane + Station Access + Walkertown Road Closure



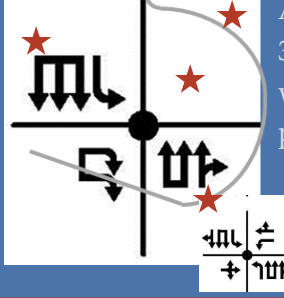
Scenario 3 is largely the same as Scenario 2, except that access to Exton Train Station is provided only at the new signalized intersection at Whiteland Woods Boulevard and Mountain View Drive intersection while closing access to Walkertown Road via Howard Road. Access to Whiteland Woods and Valley View would be improved, and traffic would be removed from the critical intersection of PA Route 100 and US 30 Exton Bypass eastbound ramps. Like the previous two scenarios, this is also constrained by existing structures in the corridor.

Scenario 4—Jug-Handle



Same as Scenarios 1-3, Scenario 4 provides a third travel lane in both directions. However, southbound left-turns on PA Route 100 are relocated to a new jug-handle in the southwest quadrant of the US Route 30 Exton Bypass Eastbound off-ramp. Access to the Exton Train Station would only be provided at a newly signalized intersection with Whiteland Woods Boulevard and Mountain View Drive. Train station traffic would be removed from the critical intersection. However, existing structures in the corridor would require reconstruction.

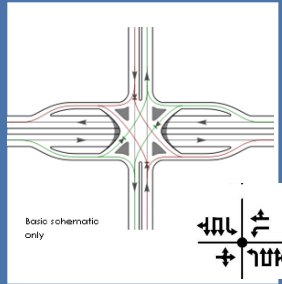
Scenario 5—Flyover Ramp



A third travel lane in each direction would be provided. Traffic exiting the US Route 30 Exton Bypass eastbound wishing to continue onto PA Route 100 northbound would use a new flyover ramp. Access to the Exton Train Station would only be provided at a newly signalized intersection with Whiteland Woods Boulevard and Mountain View Drive. Train station traffic would be removed from the critical intersection. However, existing structures in the corridor would require reconstruction.



Scenario 6—Single-Point Urban Interchange (SPUI)



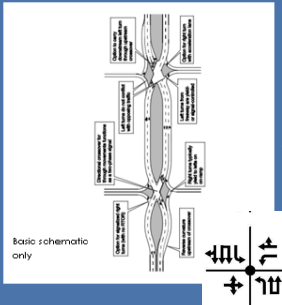
This scenario provides a third travel lane in each direction on PA Route 100. The entire interchange would be reconstructed so all movements would meet at one, signalized intersection. Access to the Exton Train Station would only be provided at a newly signalized intersection with Whiteland Woods Blvd. and Mountain View Dr. Train station traffic would be removed from the critical intersection. However, existing structures in the corridor would require reconstruction.

Scenario 9—Traffic Signal Optimization



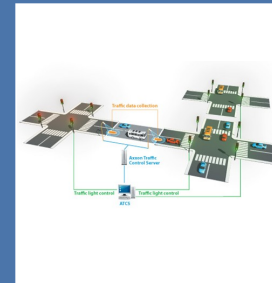
A traffic signal inventory was completed as part of this project. The signals in place on PA Route 100 are operating properly, and they have been optimized as much as possible. Traffic signal timings should be reviewed periodically.

Scenario 7—Diverging Diamond Interchange (DDI)



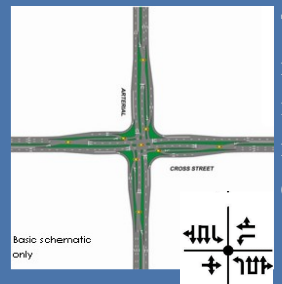
PA Route 100 would be reconstructed into a diverging diamond interchange (DDI) design. DDI's eliminate left turn conflicts. Some Exton Train Station traffic would be removed from the critical intersection by providing at a newly signalized intersection with Whiteland Woods Blvd. and Mountain View Dr. However, existing structures in the corridor would require reconstruction.

Scenario 10—Adaptive Traffic Control



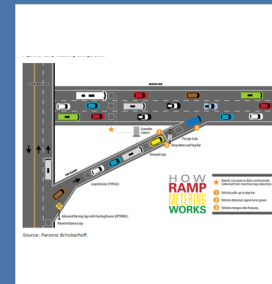
Adaptive signals are utilized on PA Route 100 in Upper Uwchlan Township and elsewhere in the region. This option may be less effective on intersections with high side street demand.

Scenario 8—Displaced Left-Turn Interchange (DLTI)



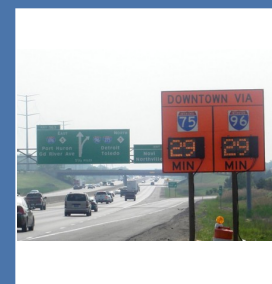
This scenario provides a third travel lane in each direction and reconstructs the interchange to relocate left turns. Some Exton Train Station traffic would be removed from the critical intersection by providing at a newly signalized intersection with Whiteland Woods Blvd. and Mountain View Dr. However, existing structures in the corridor would require reconstruction.

Scenario 11—Ramp Management



Ramp metering reduces mainline congestion and overall delay, while increasing mobility throughput. Travel times, even when considering time in queue on the ramp, are generally reduced when ramp metering is implemented. Travel time reliability has become an important measure of ramp metering effectiveness. Many regions have experienced increased travel time reliability (reduced variations in day-to-day travel times) due to ramp metering.

Scenario 12—Monitoring & Variable Message System Guidance

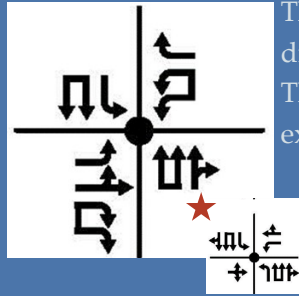


Traffic monitoring can provide real-time data to traffic professionals to help understand how the corridor is operating. Variable Message Systems (VMS) can be used to warn drivers of potential travel time impacts.

Scenarios 10 –12 were considered, but not analyzed due to software and project scope limitations.

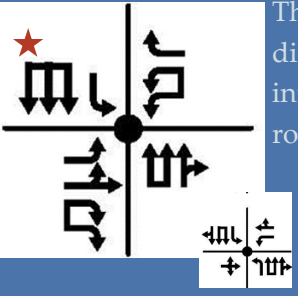


Scenario 13—Third Northbound Travel Lane



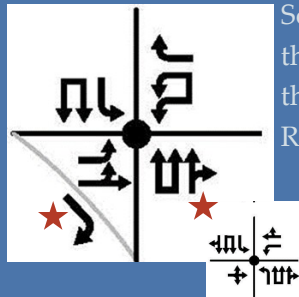
This scenario provides third travel lane on PA Route 100 in the northbound direction only to address the worst congestion and queuing condition in the corridor. The existing (outside) northbound through / right lane would be extended under the existing rail road bridges. New train station access would be provided at a signalized intersection at Whiteland Woods Boulevard and Mountain View Drive. Existing rail road bridge structures would not be impacted in this scenario.

Scenario 15—Third Southbound Travel Lane



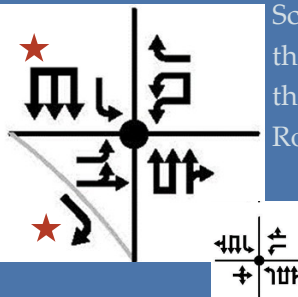
This scenario provides third travel lane on PA Route 100 in the southbound direction only. New train station access would be provided at a signalized intersection at Whiteland Woods Boulevard and Mountain View Drive. Existing rail road bridge structures would potentially be impacted in this scenario due to the geometric need to transition lanes beneath the two bridge structures.

Scenario 14—Third Northbound Travel Lane & Channelization



Scenario 14 is largely the same as Scenario 13. However, right-turn movements from the US Route 30 Exton Bypass eastbound off ramp would be channelized. Removing that turning movement from the signal phasing at the key intersection with PA Route 100. New train station access would be provided at a signalized intersection at Whiteland Woods Boulevard and Mountain View Drive. Existing rail road bridge structures may be impacted depending on the merge area length.

Scenario 16—Third Southbound Travel Lane & Channelization

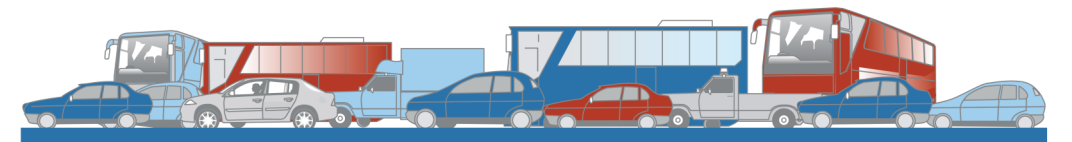


Scenario 16 is largely the same as Scenario 15. However, right-turn movements from the US Route 30 Exton Bypass eastbound off ramp would be channelized. Removing that turning movement from the signal phasing at the key intersection with PA Route 100.



Chapter 4: Alternatives Evaluation

PA Route 100 Congestion Mitigation Study





4 | Alternatives Evaluation

A | Evaluation Process

An initial screening of each alternative scenario was conducted to determine the feasibility and effectiveness of reducing traffic congestion on PA Route 100 in West Whiteland Township. The findings were presented to the Study Advisory Committee and PennDOT District 6 for review and comment. The alternative scenarios were revised based on these comments. Subsequently, the Study Advisory Committee agreed upon a short-term preferred alternative. More detailed analysis and a conceptual layout exhibit were developed for this preferred alternative for closer evaluation.

The effectiveness of each scenario was evaluated by estimating overall intersection delay reduction and intersection level of service that each alternative could produce at the key PA Route 100 / US Route 30 Exton Bypass Eastbound Ramp intersection. Both measures are determined by modeling each scenario in traffic simulation software. The Highway Capacity Manual describes level of service at signalized intersections this way:

“Signalized intersection level of service (LOS) is defined in terms of a weighted average control delay for the entire intersection. Control delay quantifies the increase in travel time that a vehicle experiences due to the traffic signal control as well as provides a surrogate measure for driver discomfort and fuel consumption. Signalized intersection LOS is stated in terms of average control delay per vehicle (in seconds) during a specified time period (e.g., weekday PM peak hour).” (HCM, 2010)

Each alternative scenario achieved varying levels of delay reduction. **The initial feasibility of the alternative scenarios was determined by evaluating their potential physical and operational impacts.** The single biggest

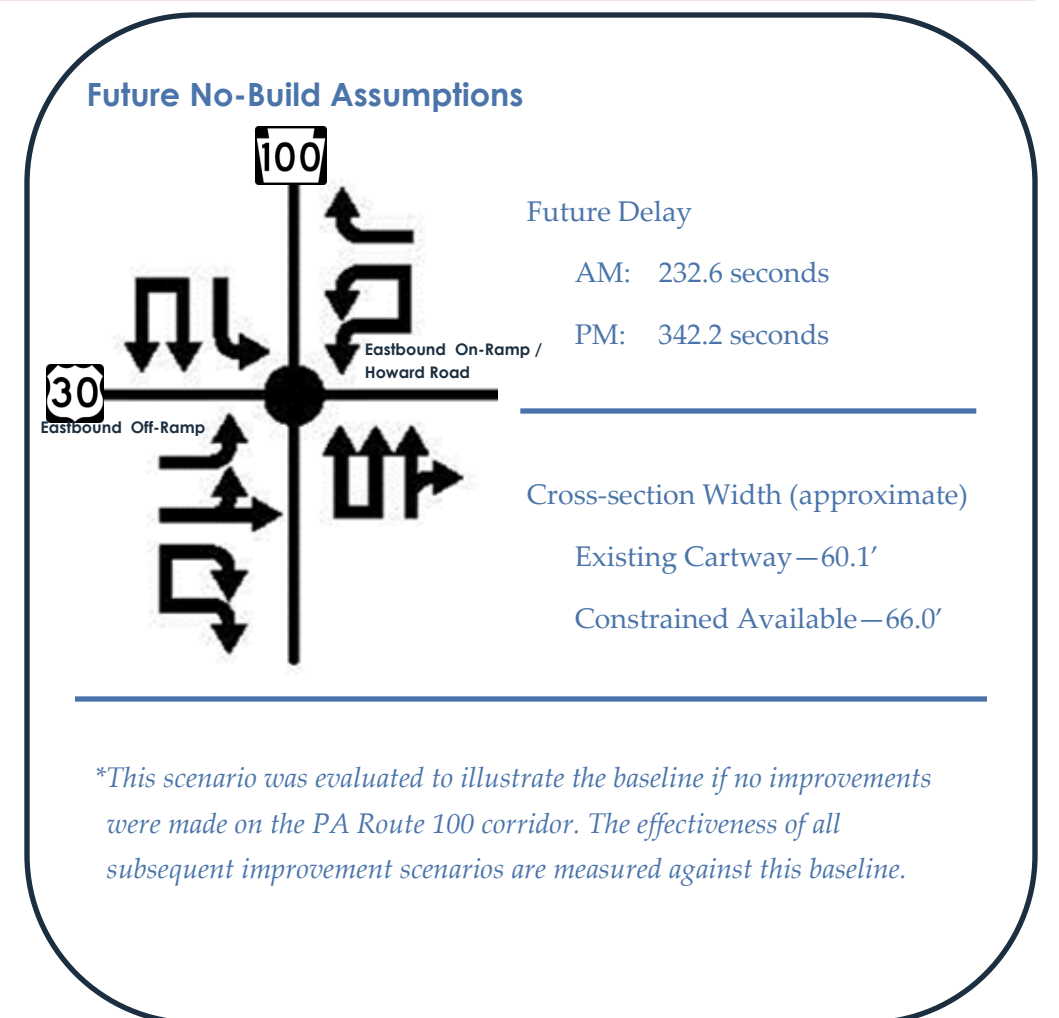
constraint in this corridor is the limited cartway width as a result of the Amtrak and Philadelphia and Thorndale Line bridge structures, as previously described. The total width needed to implement each proposed improvement was compared to the existing available width under each bridge. The width needed to accommodate the improvement alternative exceeded the available width in many cases, and major structural changes would be required to advance those alternatives. Only alternatives that could be implemented without altering existing structures were considered feasible as a short-term improvement. Additional factors affecting feasibility that were considered included impacts to existing turning movements, access to the Exton Train Station, and bicycle and pedestrian circulation.

B | Future Traffic Projections

A future design year of 2028 was initially evaluated to test the efficacy of any potential improvements. Accordingly, existing traffic volumes were projected based on both anticipated local traffic growth and regional traffic growth. Local traffic growth accounted for new traffic associated with two planned developments along the corridor that included:

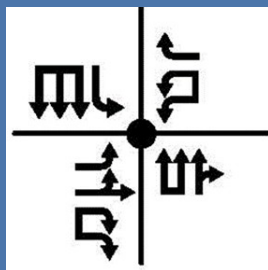
- Main Street at Exton Residential—410 multi-family residential units
- Exton Train Station Project—578 additional parking spaces

Regional traffic growth projections were based on the PennDOT recommended regional growth rate for similar roadways in Chester County. The annual growth rate (available at the time this analysis was conducted) was 1.71% per year for the initial alternatives screening. This growth rate was later revised by PennDOT to 0.65% per year based on new traffic data.



C | Preliminary Findings

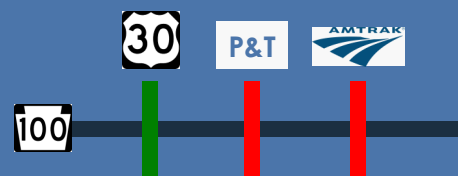
Alternative 1—Third Travel Lane



Future Delay Reduction

AM: -67.5 seconds (-29%)
 PM: -98.9 seconds (-29%)

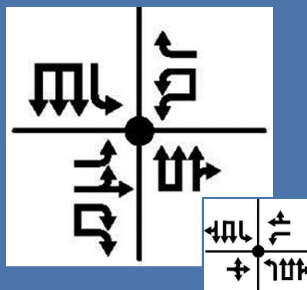
Structural Constraints



Pros: Minor reductions in delay at critical intersection

Cons: Constrained by existing structures; intersection will still function at overall LOS F during both periods

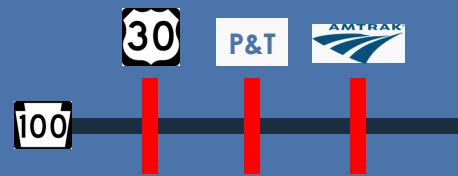
Alternative 2—Third Travel Lane + New Station Access



Future Delay Reduction

AM: -119.3 seconds (-51%)
 PM: -173.9 seconds (-51%)

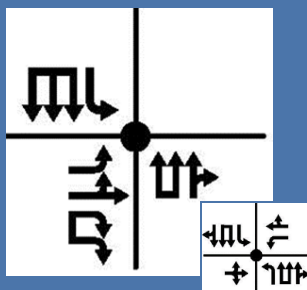
Structural Constraints



Pros: Reductions in delay at critical intersection

Cons: Constrained by existing structures; intersection will still function at overall LOS F during both periods

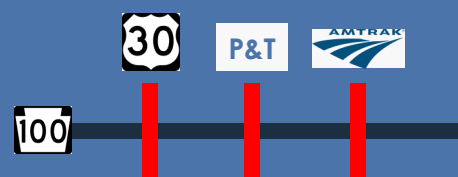
Alternative 3—Third Travel Lane + New Station Access + Walkertown Road Closure



Future Delay Reduction

AM: -147.2 seconds (-70%)
 PM: -219.6 seconds (-64%)

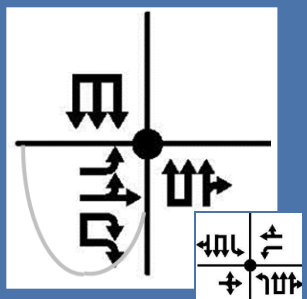
Structural Constraints



Pros: Train station traffic removed from critical intersection; reductions in delay at critical intersection

Cons: Constrained by existing structures; intersection will still function at overall LOS F during both periods; potential bus circulation impacts in train station area

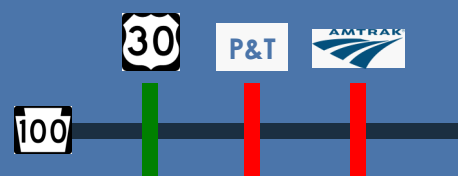
Alternative 4—Jug-Handle + New Station Access



Future Delay Reduction

AM: -162.0 seconds (-70%)
 PM: -216.4 seconds (-63%)

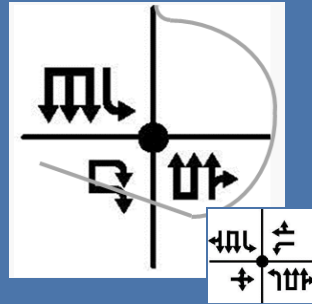
Structural Constraints



Pros: Reductions in delay at critical intersection; train station traffic removed from critical intersection; intersection will function at a LOS E during both peak periods

Cons: Constrained by existing structures; potential bus service impacts in train station area

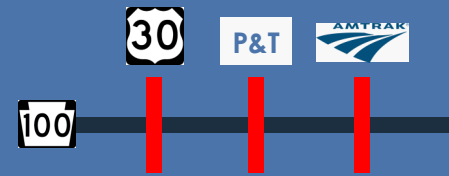
Alternative 5—Flyover Ramp + New Station Access



Future Delay Reduction

AM: -156.1 seconds (-67%)
 PM: -248.5 seconds (-73%)

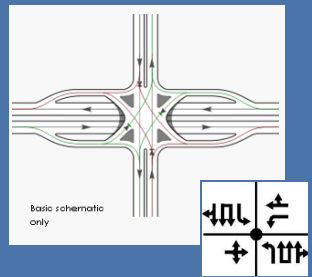
Structural Constraints



Pros: Train station traffic removed from critical intersection; reductions in delay at critical intersection (LOS E in AM)

Cons: Constrained by existing structures; intersection will still function at overall LOS F during pm peak period; potential bus circulation impacts in train station area

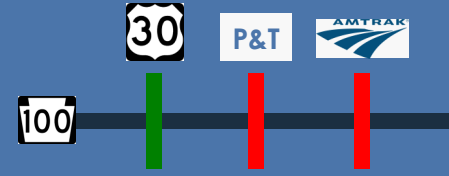
Alternative 6—Single-Point Urban Interchange (SPUI) + New Station Access



Future Delay Reduction

AM: -98.8 seconds (-42%)
 PM: -101.8 seconds (-30%)

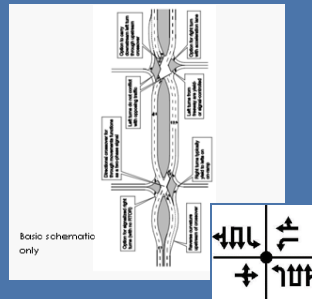
Structural Constraints



Pros: Train station traffic removed from critical intersection; reductions in delay at critical intersection.

Cons: Constrained by existing structures; intersection will still function at overall LOS F during both periods

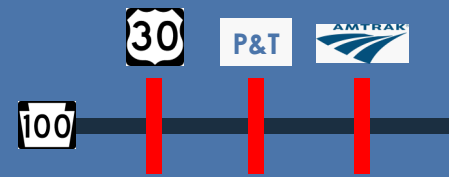
Alternative 7—Diverging Diamond Interchange (DDI) + New Station Access



Future Delay Reduction

AM: -196.8 seconds (-85%)
 PM: -121.5 seconds (-36%)

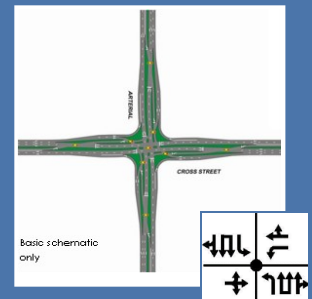
Structural Constraints



Pros: Some train station traffic removed from critical intersection; reductions in delay at critical intersection (LOS E or better in AM)

Cons: Constrained by existing structures including US Route 30 Exton Bypass; intersection will still function at overall LOS F during pm peak; potential bus service impacts

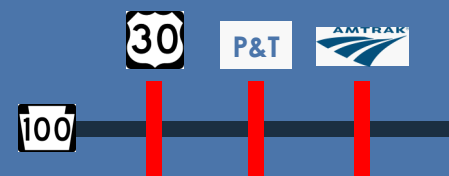
Alternative 8—Displaced Left Turn Interchange (DLTI) + New Station Access



Future Delay Reduction

PM: -230.9 seconds (-67%)

Structural Constraints



Pros: Some train station traffic removed from critical intersection; reductions in delay at critical intersection (LOS E+ WB ramps)

Cons: Constrained by existing structures including US Route 30 Exton Bypass; intersection will still function at overall LOS F (though improved); potential bus service impacts

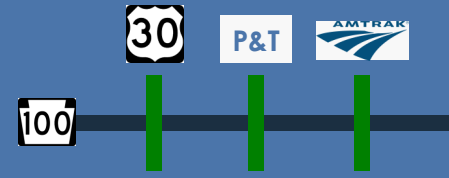
Scenarios 9–12 were considered, but not analyzed due to software and project scope limitations.

Alternative 9—Traffic Signal Optimization



Future Delay Reduction
Minimal

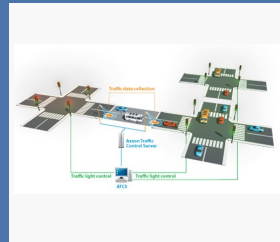
Structural Constraints



Pros: Minor reductions in delay at critical intersection.

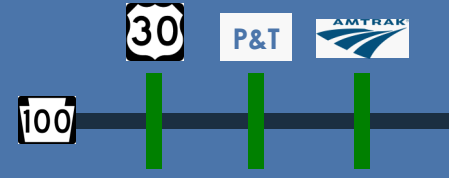
Cons: Analysis revealed traffic signal programs were generally optimized, so no major benefits are expected at this time. Traffic volumes and signal timings should be monitored over time if other advanced traffic control systems are not provided.

Alternative 10—Adaptive Traffic Control



Future Delay Reduction
Moderate delays can be seen in some cases.

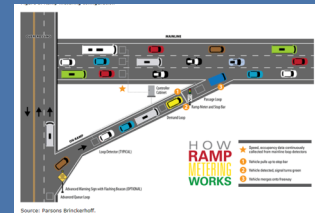
Structural Constraints



Pros: Minor reductions in delay at critical intersection; other sections of PA Route 100 utilize adaptive traffic control; studies have shown that travel times can be reduced by more than 10% while also reducing stops, collisions, and operating costs

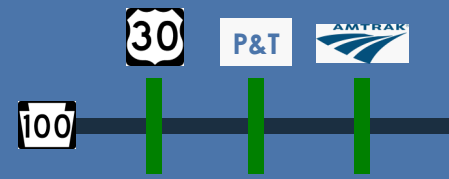
Cons: May be less effective on intersections with high side street demand

Alternative 11—Ramp Management



Future Delay Reduction
Unknown at this time.

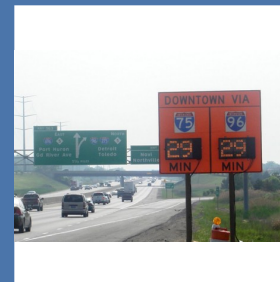
Structural Constraints



Pros: Studies have shown that travel time can be reduced anywhere from 5% to 170%; high benefit to cost ratio

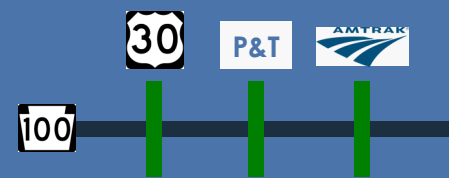
Cons: none

Alternative 12—Monitoring & VMS Guidance



Future Delay Reduction
Unknown at this time

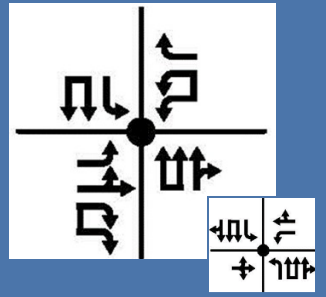
Structural Constraints



Pros: Traffic conditions downstream can be relayed back to motorists, giving them an opportunity to choose an alternate route; high benefit to cost ratio

Cons: none

Alternative 13—Third Northbound Travel Lane + New Station Access

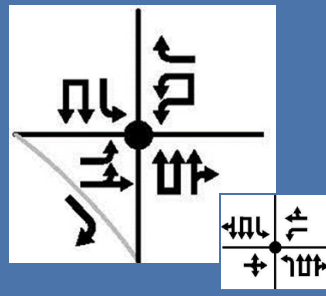


Future Delay Reduction
 AM: -66.2 seconds (-28%)
 PM: -82.3 seconds (-24%)

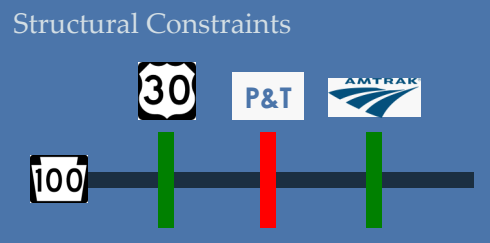


- Pros: Provides additional through capacity on PA Route 100 in one direction given constraints
- Cons: Intersection will still function at overall LOS F during both peak periods (but with reduced delays and queues)

Scenario 14—Third Northbound Travel Lane & Channelization + New Station Access

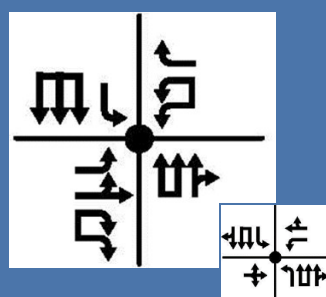


Future Delay Reduction
 AM: -170.6 seconds (-73%)
 PM: -128.1 seconds (-37%)

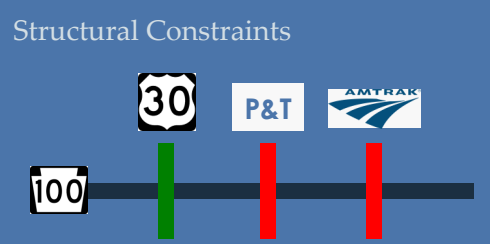


- Pros: Provides additional through capacity in one direction given constraints; key intersection will function at LOS E in AM peak
- Cons: Intersection will still function at overall LOS F during PM peak; transitioning channelized right turn lanes impact Philadelphia and Thorndale Line bridge

Scenario 15—Third Southbound Travel Lane + New Station Access

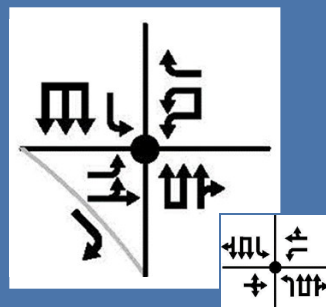


Future Delay Reduction
 AM: -102.5 seconds (-44%)
 PM: -128.1 seconds (-37%)

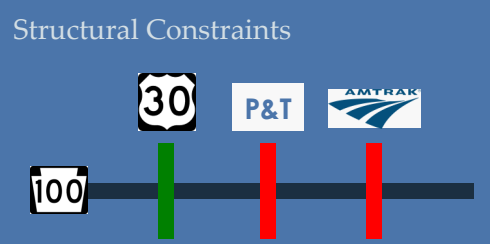


- Pros: Provides additional through capacity on PA Route 100 in one direction given constraints
- Cons: Intersection will still function at overall LOS F during both peak periods

Alternative 16—Third Southbound Travel Lane & Channelization + New Station Access



Future Delay Reduction
 AM: -158.8 seconds (-68%)
 PM: -161.6 seconds (-47%)



- Pros: Provides additional through capacity in one direction given constraints; key intersection will function at LOS E in AM peak
- Cons: Intersection will still function at overall LOS F during PM peak; transitioning channelized right turn lanes impact Philadelphia and Thorndale Line bridge

D | Preferred “Short-term” Alternative

Given existing constraints on the PA Route 100 corridor, feasible short-term alternatives for improving traffic congestion are limited. The alternatives that would provide the best improvements to traffic flow in the study area would also require major capital investment to significantly increase the available width in the corridor. Those improvements may be feasible with a major reconstruction project to reconfigure the bridges, interchanges, and other structures along PA Route 100. However, at the time of this study, no major reconstruction projects are planned. Therefore, only alternatives that would not necessitate the need for altering structural constraints were considered. The preferred “short-term” alternative, depicted in **Figure 4.1**, was chosen by the study advisory committee is to provide a third travel lane on PA Route 100 and to improve the Whiteland Woods Boulevard / Mountain View Drive intersection (Alternative 13).

In this alternative, a third northbound travel lane on PA Route 100 would extend from the on-ramp from Pottstown Pike in the south, under the railroad bridges, and meet with the existing shared through / right-turn lane at the US Route 30 Exton Bypass eastbound on-ramp. The new lane would fit the existing available width under the Amtrak and

Philadelphia and Thorndale Line railroad bridge structures. The new cross section (**Figure 4.2**) would consist of two southbound 11’ through lanes and three northbound 11’ through lanes with 2’ offset widths on either side, and the median would be offset toward the southbound lanes. Design exceptions would be needed to reduce the median width to 4’ wide and reduce the clear zone width to the bridge abutments on both sides to only 1.5’. This cross-section, as well as two alternative cross section scenarios, were presented to PennDOT for their preliminary feedback. Initially, PennDOT is supportive of the concept of providing the third northbound through lane as depicted in **Figure 4.2**.

A new traffic signal would be installed at the intersection of Whiteland Woods Boulevard / Mountain View Drive and PA Route 100. The new traffic signal would facilitate all directional movements at the intersection. Though, due to corridor constraints, southbound left turn movements from PA Route 100 to Mountain View Drive would need to be accommodated by a far-side jug-handle as shown in **Figure 4.3**. Additionally, an ADA accessible pedestrian crossing would be provided at the intersection allowing for safe pedestrian access across PA Route 100 for residents of the Whiteland Woods neighborhood.

Figure 4.1: Preferred “Short-term” Alternative

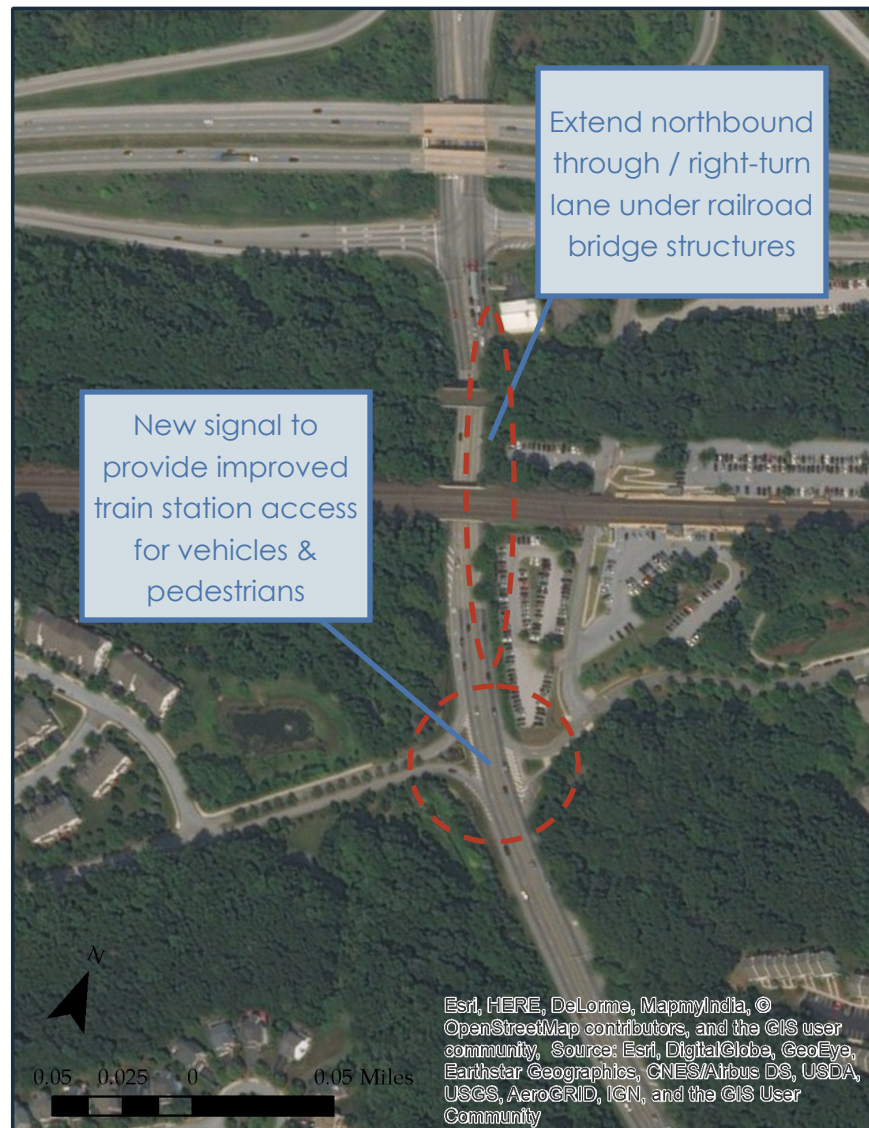


Figure 4.2: Preferred Alternative Cross Section

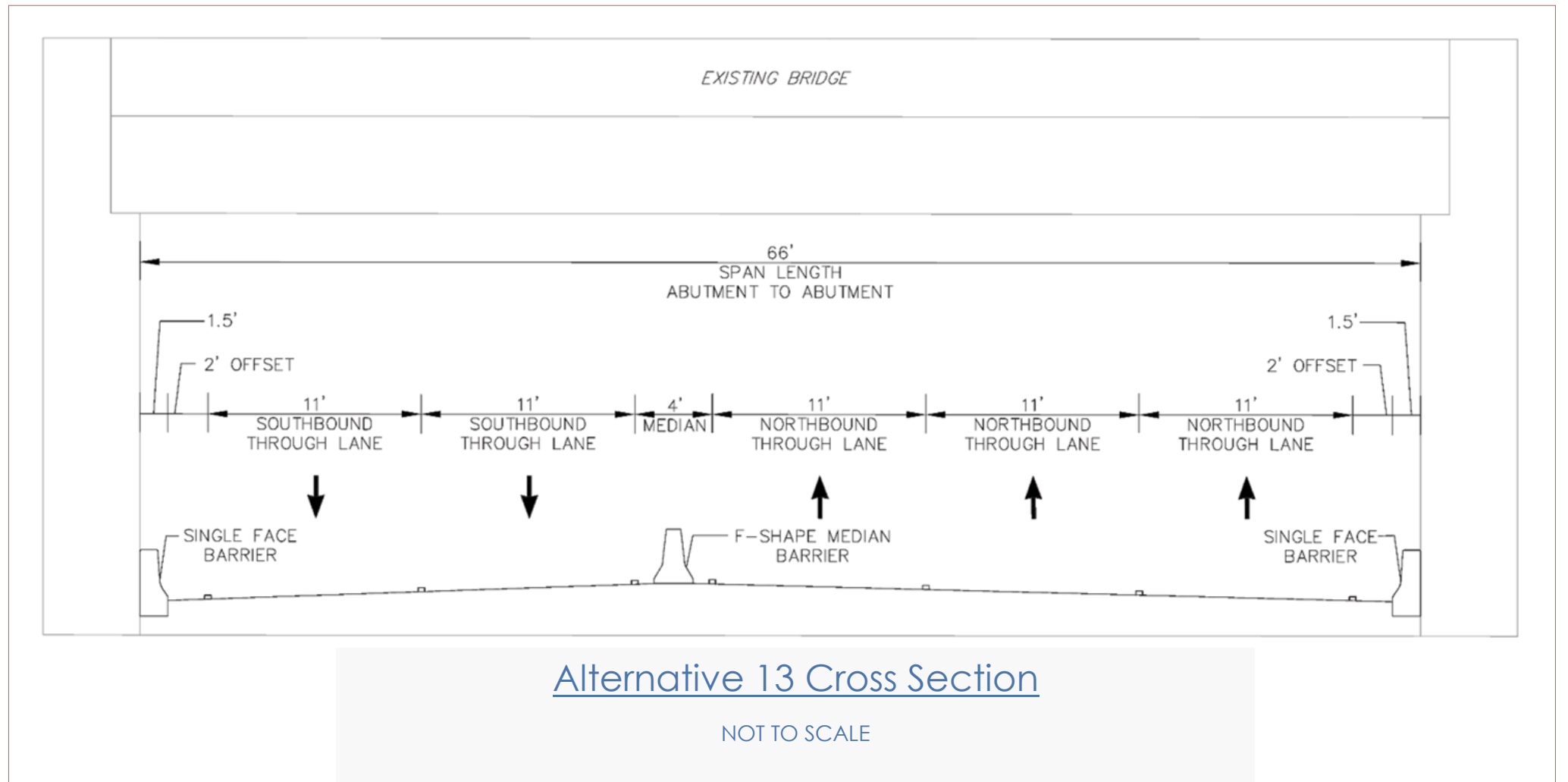
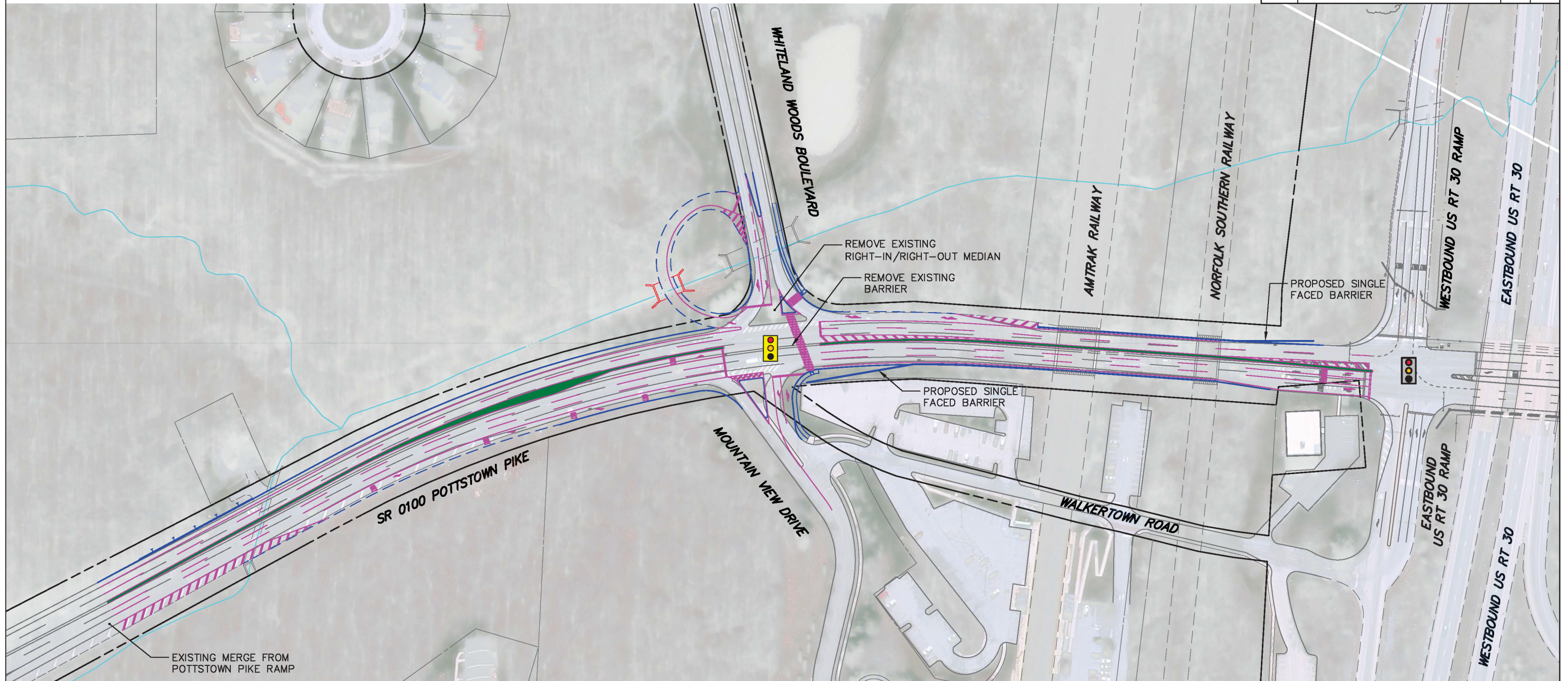


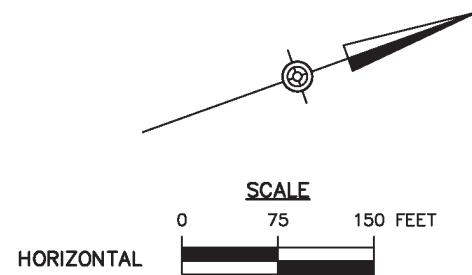
Figure 4.3: Preferred Alternative (Alternative 13) Plan View

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
6-0	CHESTER	0100	-	1 OF 1
WEST WHITELAND TOWNSHIP				
REVISION NUMBER	REVISIONS	DATE	BY	



LEGEND

- | | | | |
|--|---|--|-----------------------------------|
| | PROPOSED CURB | | EXISTING CURB |
| | PROPOSED PAVEMENT MARKINGS | | EXISTING EDGE OF PAVEMENT |
| | PROPOSED EDGE OF PAVEMENT | | EXISTING PAVEMENT MARKINGS |
| | PROPOSED CONCRETE BARRIER | | EXISTING RIGHT-OF-WAY LINE |
| | PROPOSED TRAFFIC SIGNAL | | UNNAMED TRIBUTARY TO VALLEY CREEK |
| | MODIFIED TRAFFIC SIGNAL | | PROPERTY LINE |
| | PROPOSED CULVERT (OR EXTENSION OF EXISTING CULVERT) | | |



NOTES:

- EXISTING CONDITIONS DEPICTED ON THE CONCEPTUAL DESIGN EXHIBIT ARE BASED ON GIS DATA, AERIAL PHOTOGRAPHY AND LIMIT FIELD MEASUREMENTS ONLY.
- LEGAL RIGHT-OF-WAY LINES AND PROPERTY LINES ARE ESTIMATED BASED ON GIS DATA AND PLANS PROVIDED BY PENNDOT AND CHESTER COUNTY. LEGAL RIGHT-OF-WAY LINES OR PROPERTY LINES HAVE NOT BEEN INDEPENDENTLY VERIFIED THROUGH FIELD SURVEY OR TITLE/DEED RESEARCH
- THIS EXHIBIT DOES NOT DEPICT REQUIRED RIGHT-OF-WAY LINES (TEMPORARY OR PERMANENT) WHICH WILL LIKELY BE REQUIRED FOR THE CONSTRUCTION OF THE PROJECT. THE SIZE AND LOCATION OF ALL EASEMENTS WILL NEED TO BE DETERMINED DURING THE PRELIMINARY ENGINEERING OF THE PROJECT.

Preferred Alternative (Alternative 13) Cost Estimates

As part of this project, cost estimates were developed for the purposes of budgeting for future capital improvements. They are in no way intended to be the final costs for the project. Opinions of cost are subject to change based on plan / design revisions, fluctuations in unit costs, field conditions, and differences in locale. Final costs are contingent only on actual bids from contractors. These cost estimates were developed under the assumption that the project would be implemented utilizing federal funding. A detailed Engineer’s Conceptual Opinion of Cost can be found in the Appendix of this document.

Total Roadway Construction	\$7,186,000
Construction Inspection	\$719,000
Right-of-Way and Easements	\$1,500,000
Above Ground Utility Relocations	\$500,000
Inflation	\$3,407,000
Engineering and Permitting	\$1,750,000

Total Project Cost **\$15,062,000**

E | Conceptual Variations

The Study Advisory Committee was in favor of the conceptual layout for the Preferred Alternative (Alternative 13). The design and features of the concept were presented and discussed with the committee. Several potential modifications were discussed and subsequently evaluated further. Those include:

Near-side Jug-Handle

It was discussed to replace the conceptual far-side jug-handle with a near-side jug-handle to possibly better accommodate a bus stop. Based on a preliminary evaluation, there is limited space to accommodate the southbound left turn lane at the Exton Train Station with a near-side jug-handle in addition to several other constraints. The positioning of any bus stops should be further evaluated during design.

Additional Side Street Capacity

In order to reduce side street green signal time, and allocate more time to move traffic on PA Route 100, it was discussed to add an additional through lane along Whiteland Woods Boulevard in order to improve traffic flow along PA Route 100. Based on our review, there is limited space to receive the two incoming lanes on the east side of the intersection. This scenario would likely require designated one travel lane for Walkertown Road (train station access) and one travel lane for Mountain View Drive, and as such, one lane may be more heavily used than the other thereby negating the potential green time reductions. This scenario can be further investigated as this project is advanced.

Barrier Treatments along Bridge Abutments

The barrier treatments along PA Route 100 will be addressed during a future phase of the project when a detailed design is advanced. Current approved design criteria will be used.

F | Additional Recommendations

The preferred short-term alternative (Alternative 13) would improve traffic flow and reduce congestion on PA Route 100 within the study area. However, additional strategies could be employed along with the preferred alternative to continually reduce congestion on the corridor.

Signal Optimization

As part of this study, analysis showed that the existing signals are currently optimized as much as possible for existing condition. Traffic volumes can be routinely monitored with new data collection and traffic signal timings can be re-evaluated. Additionally, with the implementation of the preferred alternative, the signal timings should be reviewed and optimized to allow for the best traffic flow on PA Route 100.

Adaptive Traffic Controls

The preferred alternative would not preclude implementation of adaptive traffic controls on PA Route 100. West Whiteland Township should consider installation of an adaptive traffic signal system, which is in place along other sections of PA Route 100. Adaptive signal technology should not be limited to the intersections included in this study. This technology could be implemented on all of the signals on PA Route 100 in the township and even coordinated with signals in neighboring municipalities.

Real-time Traffic Monitoring

Traffic monitoring and VMS Guidance could be implemented on both the PA Route 100 and US Route 30 Exton Bypass corridors. Variable message boards could be employed to warn motorists of congestion and other issues ahead of arriving at this pinch point, thus giving them an opportunity to select an alternate route to avoid this congested area.

Major Corridor Reconstruction & Planning

At some point in the future, the US 30 Exton Bypass will be due for a major reconstruction/rehabilitation. West Whiteland Township should be continually involved in the planning and design for such a project. Some of the alternatives presented in this study, while not feasible in the short term, could be implementable through a larger capital improvement project. The Single-point Urban Interchange (SPUI), Diverging Diamond Interchange (DDI), and Displaced Left-turn Interchange (DLTI) alternatives all have significant potential delay reduction, especially when paired with additional through lanes on PA Route 100. PennDOT should consider these alternatives when the time comes for reconstructing the interchange and bridges that carry the US Route 30 Exton Bypass over PA Route 100.

In addition, the need to provide an additional convenient, and preferably, direct connection between US Route 202 (to the south) and US Route 30 Exton Bypass (to the west) should be evaluated. Such a connection could greatly improve traffic operations along PA Route 100 in the study area and potentially reduce the scope of the needed infrastructure improvements to address existing and future demands.

Autonomous / Connected Vehicles

The township should continue to monitor this emerging technology, along with major stakeholders such as PennDOT, SEPTA, and Chester County. This new technology could potentially reduce traffic significantly, but it may require the implementation of new supportive technologies and infrastructure.

Above-Grade Pedestrian Crossing

The new signalized PA Route 100/Whiteland Woods Boulevard/Mountain

PA Route 100 Congestion Mitigation Study



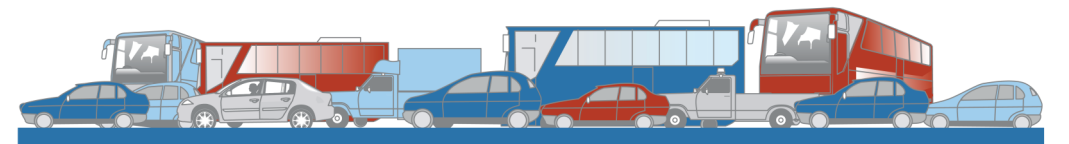
View Drive intersection will provide an at-grade pedestrian crossing of the heavily travelled study corridor. The high traffic volumes, vehicle speeds, and long crossing distance may make this crossing uncomfortable for pedestrians. As the plans for the Chester Valley Trail Plan extension plans to utilize the former Philadelphia-Thorndale (Norfolk Southern) bridge, opportunities to provide convenient pedestrian connections to the extension between the train station and the Whiteland Woods Community. This planned trail extension offers the most practical opportunity for the above-grade pedestrian crossing of PA Route 100 in the area.



Chapter 5

Implementation Strategies

PA Route 100 Congestion Mitigation Study





5 | Implementation Strategies

There are a variety of options for funding transportation projects in Pennsylvania. The traditional mechanism is the Transportation Improvement Program (TIP) is likely the most feasible for implementing the preferred alternative; outlined in **Figure 5.1** below. This can often be a long and expensive process, but is necessary to access federal transportation funds. Alternative implementation methods include competitive grant programs and the highway occupancy permitting process. This chapter outlines the feasible strategies to implement the preferred alternative for alleviating traffic congestion on PA Route 100 in West Whiteland Township.

Figure 5.1: Transportation Project Implementation Process



Source: Chester County Planning Commission

A | Federal Funding Process

The Transportation Improvement Program (TIP) is a region-wide document that is required by federal law to list all projects that will be utilizing federal funds, as well as other regionally significant capital improvement projects. In this region, the list is agreed-upon by the five member Pennsylvania counties of the Delaware Valley Regional Planning Commission (DVRPC); Bucks, Chester, Delaware, Montgomery, and Philadelphia. DVRPC also maintains the TIP and ensures that the projects listed conform to federal requirements.

For a project to receive TIP funding it relies heavily on the buy-in and expertise of the county. In Chester County, all potential transportation capital improvement projects are listed on the Transportation Improvement Inventory (TII). The TII is updated every two years with input from municipalities across Chester County. Congestion reduction improvements on PA Route 100 in West Whiteland Township are listed on the 2017 TII. This is the first step in initiating a transportation project for the TIP process.

Traditionally, the next step to TIP funding for a project in Chester County is to be listed on Chester County's Transportation Priority Projects (TPP). The TPP is a list of the highest priority capital transportation improvements in Chester County. Support letters for these priorities are provided by the Chester County Commissioners, the Chester County Senate Delegation, and the Chester County House Delegation. Many of the projects listed on the TPP are already receiving implementation funding. Those that have not received funding (or need additional funding) are candidates to be included in the region-wide long range plan. The preferred alternative in this study is not

currently listed on Chester County's Transportation Priority Projects.

Connections 2045 Long-Range Plan for Greater Philadelphia is the current long range plan for the DVRPC region. For projects to be eligible to be listed on the TIP, they must first be listed on the region's long range plan. Connections 2045 lists all capital improvement projects that the region hopes to receive federal funding to implement in the next 25 years and is updated every 5 years. The current long range plan was adopted by the DVRPC Board on October 26, 2017. Congestion improvements on PA Route 100 were not included in Connections 2045.

Finally, to receive federal funding, projects must be listed on the TIP. Once projects receive funding through the TIP process they can begin engineering, utility, and right of way work before moving on to construction. The preferred alternative has a start to this process by being listed on Chester County's Transportation Improvement Inventory. However, with diligence on the part of West Whiteland Township and community / political support, this project would be a prime candidate to complete this process.

It should be noted that this process involves the highest level of review and oversight by PennDOT, the Federal Highway Administration, and additional regulatory agencies. The review process takes a considerable amount of time and significantly adds to the overall project cost.

B | Competitive Grant Programs

Competitive grant programs are an opportunity to fast-track funding and construction of capital improvement projects. Grant funded projects may or may not be required to be listed on the TIP. However, grant funded projects do not need to be included in the long range plan. Grant programs typically require the project sponsor to provide matching funds, and there are costs associated with administering a grant funded project. This section highlights

various grant programs that are currently available and that the preferred alternative for PA Route 100 and West Whiteland Township would be eligible. Many of these grant programs utilize federal funds, so funding the preferred alternative in this way will involve some of the same project delivery costs as going through the TIP process. Additionally, the required funds to complete the project in whole may not be made available by a competitive grant award. Additional funding may be required to fully cover the costs of all phases of the preferred alternative. West

Most Appropriate

Least Appropriate

Multimodal Transportation Fund—Pennsylvania Department of Community and Economic Development

“The Multimodal Transportation Fund provides grants to encourage economic development and ensure that a safe and reliable system of transportation is available to the residents of the commonwealth.”

Uses: 1) projects which coordinate local land use with transportation assets to enhance existing communities; 2) projects related to streetscapes, lighting, sidewalk enhancement and pedestrian safety; 3) projects improving connectivity or utilization of existing transportation assets; and 4) projects related to transit-oriented development

Request amount constraints: \$100,000—\$3,000,000

Local match requirement: 30% minimum

Congestion Mitigation and Air Quality (CMAQ) Program—Delaware Valley Regional Planning Commission

“DVRPC’s Competitive Congestion Mitigation and Air Quality Improvement Program (CMAQ) seeks to fund transportation projects that will improve air quality and reduce traffic congestion in the DVRPC Region.”

Uses: projects include pedestrian and bicycle projects, transit improvement programs, congestion reduction and traffic flow improvements, diesel retrofit projects, and funding of transportation demand management programs, among others

Request amount constraints: \$250,000 minimum

Local match requirement: 20% minimum

Better Utilizing Investments to Leverage Development (BUILD) Grants—United States Department of Transportation

“BUILD Transportation grants are for investments in surface transportation infrastructure and are to be awarded on a competitive basis for projects that will have a significant local or regional impact. BUILD funding can support roads, bridges, transit, rail, ports or intermodal transportation.”

Uses: road and bridge projects eligible under title 23, United States Code

Request amount constraints: \$5,000,000 minimum

Local match requirement: 20% minimum

**This program replaced the Transportation Investment Generating Economic Recovery (TIGER) grant program.*

Multimodal Transportation Fund—Pennsylvania Department of Transportation

“The Multimodal Transportation Fund provides grants to ensure that a safe and reliable system of transportation is available to the residents of this commonwealth.”

Uses: 1) projects which coordinate local land use with transportation assets to enhance existing communities; 2) projects related to streetscapes, lighting, sidewalk enhancement and pedestrian safety; 3) projects improving connectivity or utilization of existing transportation assets; and 4) projects related to transit-oriented development

Request amount constraints: \$100,000—\$3,000,000

Local match requirement: 30% minimum

Automated Red Light Enforcement (ARLE) Grant

“The intent of this program is to fund worthwhile, relatively low-cost projects that improve the safety and mobility of the traveling public.”

Uses: improvements to traffic signals, roadway improvements at signalized intersections, school zones, guiderail, roadside safety

Request amount constraints: projects must be cost effective; must be listed on the TIP if over \$100,000

Local match requirement: none required, but cost sharing is encouraged

**This funding source would be a good option for implementing adaptive traffic controls on the PA Route 100 corridor.*

Infrastructure for Rebuilding America (INFRA) Grants—United States Department of Transportation

“The INFRA program provides dedicated, discretionary funding for projects that address critical issues facing our nation’s highways and bridges.”

Uses: a highway or bridge project carried out on the National Highway System (NHS) including projects that add capacity on the Interstate System to improve mobility or projects in a national scenic area

Request amount constraints: \$5,000,000 minimum

Local match requirement: none

Whiteland Township may wish to consider combining multiple competitive grant awards. Most of the programs would require the applicant to provide matching funds. However, there are limitations to matching requirements for each of these programs. It is not uncommon for federal funds to be prohibited from being used as the match for other federal funds. For instance, if the project received TIGER funds, TIP funding could likely not be used to fulfill the match requirement.

West Whiteland Township staff should research each and fully understand the requirements of these funding opportunities individually before submitting an application.

C | Township-funded Capital Improvements

The quickest and easiest way to implement the preferred alternative would be for West Whiteland Township to fully fund the project through the township general fund budget. Maintaining control of the funding would afford the township minor flexibility in design. However, PA Route 100 is a state-owned road and part of the National Highway System. Therefore, minimum design criteria from PennDOT and FHWA would need to be met.

The time and cost savings of funding a project in this manner is gained by reducing the amount of review and approvals needed from PennDOT and FHWA. The township would be required to obtain a Highway Occupancy Permit (HOP) to construct the improvements on the corridor.

West Whiteland Township has enacted a Transportation Impact Fee for all land developments that occur within the township. Transportation impact fees are a way for municipalities to fund offsite improvements to address deficiencies in the transportation system. All possible improvements must be included in a Capital Improvement Plan to be eligible to use the funds collected by the Transportation Impact Fee. Improvements on PA Route 100 are not included in West Whiteland Township’s Capital Improvement Plan, so the township could consider updating the Transportation Capital Improvement Plan and Traffic Impact Fee accordingly.

PennDOT offers financing assistance to municipalities for transportation capital improvements. The PA Infrastructure Bank is a program that provides low interest loans for transportation projects. The program is intended for construction project, but other phases such as design, right-of-way acquisition, and transportation equipment purchases are considered on a case by case basis. Eligible projects include road construction and resurfacing, traffic signals and signal upgrades, drainage structures, and stormwater management.

Township staff should evaluate the feasibility of funding the preferred alternative using township funds.

D | Train Station Site Development

Improvements to the Exton Train Station are currently being planned by SEPTA, Amtrak, and PennDOT. With the addition of high-level and longer platforms that are currently under construction, there will be an increased need for getting people to the Exton Train Station. In the future, a bus loop and additional parking are planned for the station. These improvements have the potential for a regional benefit by reducing the amount of traffic traveling into Philadelphia.

As plans for improvements to the Exton Train Station progress, there is an opportunity for some or all of the improvements in the Preferred Alternative to be advanced during the construction at the Exton Train Station. West Whiteland Township should continually engage with the following project partners to express the community concerns in regards to traffic on PA Route 100 and advance project recommendations or interim solutions:

- Chester County Planning Commission
- SEPTA
- PennDOT
- Amtrak

E | Optional Project Phasing

Cost estimates presented in this study were prepared with the assumption that all improvements included in the preferred alternative would be implemented simultaneously. However, it would be possible to split the project into two distinct phases. Either of the two phases could be advanced individually, but advancing them together would provide the most traffic congestion and access benefits to the corridor. The two phases are presented in Table 5.1.

The benefit of phasing the projects is that the overall costs could be spread over a longer period of time. Essentially allowing individual expenditures to be reduced. However, phasing the project has two main drawbacks. First, the full benefit of the improvements cannot be realized by either of the phases independently. Second, the total project cost would significantly increase, because some of the tasks associated with implementing a transportation improvement would have to be duplicated for each project. The township should evaluate the costs / benefits of phasing the project.

Table 5.1: Optional Project Phasing

Additional Northbound Lane On PA Route 100 (five lane cross-section)	New Traffic Signal at Mountain View Drive / Whiteland Woods Boulevard
Description	
<ul style="list-style-type: none"> Extend the existing northbound through / right-turn lane on PA Route 100 from Howard Road to the Pottstown Pike on-ramp Shift lanes under the Amtrak and Norfolk Southern bridge structures to accommodate five lane cross-section 	<ul style="list-style-type: none"> A new traffic signal to accommodate all turning and pedestrian / bicycle movements at the intersection
Independent Utility	
<ul style="list-style-type: none"> Could potentially improve northbound traffic throughput on PA Route 100 Improve safety of motorists traveling on PA Route 100 	<ul style="list-style-type: none"> Improved access to Exton Train Station from Whiteland Woods neighborhood A pedestrian crossing can be accommodated at the intersection
Issues	
<ul style="list-style-type: none"> Does not achieve the goal of improving Exton Train Station access and visibility Does not achieve the goal of improving pedestrian mobility 	<ul style="list-style-type: none"> Does not achieve the goal of improving traffic congestion on PA Route 100 (without third northbound lane)



F | Recommended Actions / Next Steps

It is clear that the most feasible implementation approach is to advance this project through the Transportation Improvement Program. West Whiteland Township will continue to have a role as the champion for this initiative.

There could be opportunities for the township to be more or less involved

in the development of project alternatives. A basic blueprint for implementing the preferred alternative is presented in **Table 5.2** below. The tasks are divided into three different stages and assigned to different agencies.

Work can begin immediately on Stage 1 tasks. These are mostly tasks for West Whiteland Township staff. Stage 2 tasks depend in some way on the

completion of stage 1 tasks. The final group, Stage 3, are tasks that rely on the implementation funding source to have been identified in one of the previous stages. It should also be noted that some of these tasks should run concurrent with each other.

Additional details about building community support and intermediate improvements are found on the following page.

Table 5.2: Implementation Action Items

Implementation Steps:	Build Community and Political Support for Preferred Alternative	Evaluate Feasibility of Funding Options	Research Grant Opportunities	Determine Township Funding Commitment	Apply for Competitive Grant Programs	Lobby for Inclusion on LRP	Lobby for TIP funding	Advertise for Engineering Services	Complete Pre-construction Phases (Including Permitting)	Advertise for Construction	Complete Construction
Federal Funding Process	1	1	n/a	2 ^b	n/a	2	2	3 ^b / 3	3	3	3
Competitive Grant Programs	1	1	1	2	2	n/a	n/a	3	3	3	3
Township-funded Capital Improvements	1	1	n/a	2	n/a	n/a	n/a	3	3	3	3
Phased Implementation ^a	1	1	1	2 ^c	2 ^c	2 ^d	2 ^d	3 ^c / 3 ^d	3	3 ^c / 3 ^d	3

Stage 1
Stage 2
Stage 3

	Township Responsibility		PennDOT Responsibility
	Chester County Responsibility		Consultant / Contractor Responsibility

- a This approach could be applied in conjunction with any of the other approaches.*
- b West Whiteland Township may choose to advance the design phase.*
- c Only necessary if West Whiteland Township is advancing implementation.*
- d Only necessary if PennDOT is advancing implementation.*



Building Community and Political Support for the Preferred Alternative

The Transportation Improvement Program (TIP) funding process can take a long time to advance a project to the construction phase. Building a strong foundation of local support is the first step in the process and can start immediately. To facilitate this, West Whiteland Township can employ a few strategies.

- Develop a flyer or brochure highlighting the need and benefit of implementing the preferred alternative improvement; to be distributed to West Whiteland Township elected officials, residents, and key stakeholders via newsletters, mailings, community meetings, and posting on the township’s website.
- Devote a prominent page on the township’s website to track the progress and provide updates on the advancement of the project.
- Pass a municipal resolution identifying the preferred alternative as a top priority for the community.
- Give presentations to the various homeowners associations in the vicinity of the improvements.
- Demonstrate the regional benefit to and request letters of support from neighboring municipalities.
- Attend appropriate DVRPC meetings to advocate for the project with key elected and appointed officials in the region.
- Remain engaged with SEPTA in regards to the planned improvements to the Exton Train Station to ensure the community needs are addressed and to identify opportunities to partner on capital improvements.
- Remain engaged with PennDOT in regards to future maintenance and reconstruction of PA Route 100 and the US Route 30 Exton Bypass.
- Provide input to the Chester County Planning Commission on their biennial updates to the county’s Transportation Improvements Inventory and Transportation Priority Projects documents.
- Provide information about the needs and benefits of the preferred alternative to the Chester County Board of Commissioners, PA General Assembly members, and United States Congress members to request support for advancing the project.

Important Project Stakeholders

Various stakeholders will need to be engaged to advance the preferred alternative. The following list highlights some of the key project stakeholders, but it is not intended to be an exhaustive list. Additional important stakeholders may be identified as West Whiteland Township builds community and political support for the project.

Organizations

- West Whiteland Township Board of Supervisors
- Whiteland Woods Homeowners Association
- Valley View Homeowners Association
- Exton Station Homeowners Association
- Southeastern Pennsylvania Transportation Authority (SEPTA)
- Pennsylvania Department of Transportation (PennDOT), Engineering District 6
- Delaware Valley Regional Planning Commission (DVRPC)
- Chester County Planning Commission
- Chester County Board of Commissioners
- Uwchlan Township
- West Goshen Township

Pennsylvania General Assembly

- Representative Duane D. Milne
- Senator Andrew E. Dinniman

United States Congress

- Senator Robert Casey Jr.
- Senator Patrick Toomey
- PA 6th District Representative Ryan Costello

Intermediate Improvements

As the township takes steps to advance the preferred alternative improvement plan, it should also consider potentially more immediate steps to incrementally reduce traffic congestion along the corridor. Traffic signal improvements along the PA Route 100 corridor, including installation of adaptive traffic control, would provide some limited peak hour relief and improve off-peak operating conditions. This traffic signal upgrade could be funded with a variety of grant programs.

Also, the township should consider working with PennDOT to further evaluate the benefits of real-time traffic monitoring that could provide best route information to drivers in the area, thus allowing some drivers to avoid the congested study area.

