



Steps toward Walkability

Delaware County Sidewalk Inventory

Delaware County Sidewalk Inventory

February 2018

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Chapter 1: Introduction

OVERVIEW

The principal objective of the *Delaware County Transportation Plan* is to support the implementation of Complete Streets in Delaware County to sustain vibrant communities. Complete Streets provide safe and comfortable access to destinations to all roadway users – truck drivers, car drivers, transit operators, bicyclists, and pedestrians – regardless of their physical ability or demographic background.

This report is meant as a tool for municipalities and school districts to use when assessing possible sidewalk improvements or new pedestrian connections. Delaware County looks to highlight improvements that can be implemented to make the County’s streets safer and encourage social initiatives that are not feasible without the proper infrastructure (e.g., Safe Routes to School, Walk to School Day, Walk Works, and Walk to Work Week).

This *Sidewalk Inventory Report* identifies both obstacles and favorable conditions for the implementation of Complete Streets in Delaware County as it relates to one particular user: *the pedestrian*. The report presents an analysis of sidewalk conditions, sidewalk connectivity, and walkability in Delaware County, using a variety of locations as examples. It includes design guidelines and information on funding sources for relevant infrastructure improvements.

Connectivity

Connectivity refers to the connectedness of the transportation infrastructure network between an origin and a destination. Traditional street grids in more established neighborhoods and downtown areas typically have a high connectivity score. Regardless of distance, one can quickly and directly reach a destination from any point of origin within the grid. On the other hand, typically new developments with dead end streets or cul-de-sacs generally have a low connectivity score. In these cases, travel time to any destination is longer even for shorter distances.

The same notion can be applied to sidewalks. A continuous sidewalk network facilitates pedestrian travel and reduces travel time, while the absence of sidewalks impedes pedestrian trips and increases travel time.

Walkability

Walkability is a measure of how pedestrian friendly an area is for walking, running, or wheelchair rolling (Tennessee Department of Health). Typically, the more walkable the neighborhood, the more vibrant its community. Sidewalks are the key design component of Complete Streets that result in more walkable areas. They are the infrastructure that provides free access to destinations within a comfortable walking, running, or rolling distance.

Health Benefits

The presence of sidewalks encourages physical activity, thereby improving overall health.

Walking 30 minutes per day can help:

- reduce the risk of coronary heart disease and stroke;
- improve blood pressure, blood sugar levels, and blood lipid profile;
- aid in the maintenance of body weight;
- reduce the risk of osteoporosis;
- reduce the risk of certain types of cancer;
- and reduce the risk of type 2 diabetes.

Source: American Heart Association

Walking 2 to 2.9 miles per hour for 150 minutes per week can help:

- reduce the risk of depression and anxiety;
- reduce the risk of Breast Cancer;
- and reduce the risk of Alzheimer’s Disease.

Source: America Walks

Running and wheelchair rolling are also excellent cardiovascular activities that can help improve physical fitness and strength.

Safety Benefits

In 2015, there were 2 fatal pedestrian crashes and 20 pedestrian crashes that resulted in major injuries in Delaware County (PennDOT 2016). In 2015, 73.9 percent of pedestrian fatalities in Pennsylvania occurred at non-intersections (PennDOT 2015). This fact could point to a lack of convenient or visible pedestrian facilities, including sidewalks and crosswalks. Improving the conditions, design, and placement of pedestrian facilities is one way to discourage unsafe behavior and lower the risk of such tragedies.

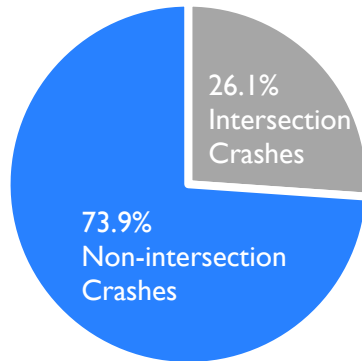


Chart 1-1: Statewide Pedestrian Crashes: Intersection versus Non-intersection. Source: PennDOT.

Environmental Benefits

Transportation is one of the five major sources of emissions (FHWA 2016). On-road mobile sources (cars, trucks, and buses) account for 38% of mono-nitrogen oxides (NOx), 14% of volatile organic compounds (VOCs), and 3% of particulate matter 2.5 micrometers or less in size (PM2.5) (Transportation Conformity Demonstration: Connections 2040 Long-Range Plan and FY 2017 Transportation Improvement Program for Pennsylvania).



Figure 1-1: A sidepath in the heart of Wayne in Radnor Township provides pedestrians with shade and respite from US Route 30.

In December 2016, the Environmental Protection Agency (EPA) issued final determination that Delaware County is in air quality compliance under the Fine Particulate Matter standard. Nevertheless, pollution decreases overall quality of life around the world. High levels of NOx, VOCs, and PM_{2.5} from transportation emissions pose health risks to those exposed. Walking, instead of driving, short distances can help lower emissions from on-road mobile sources.

Economic Benefits

Mobility

Sidewalks can increase mobility by allowing individuals to take trips that they may otherwise have forgone. 122 of 620 Delaware County Transportation Survey respondents stated that they walk to destinations at least 3 times per week. 298 respondents stated that they would walk to destinations more frequently if there were more sidewalks. These results suggest that improved sidewalk connectivity would increase the number of walkers and thereby help reduce vehicle emissions for shorter trips.

Accessibility

Approximately 11 percent of households, or 22,742 households, in Delaware County have no vehicle available. Sidewalks can increase access to destinations and transit options to those who are constrained by the fact that most transportation facilities have been designed in a motor vehicle-centric manner.

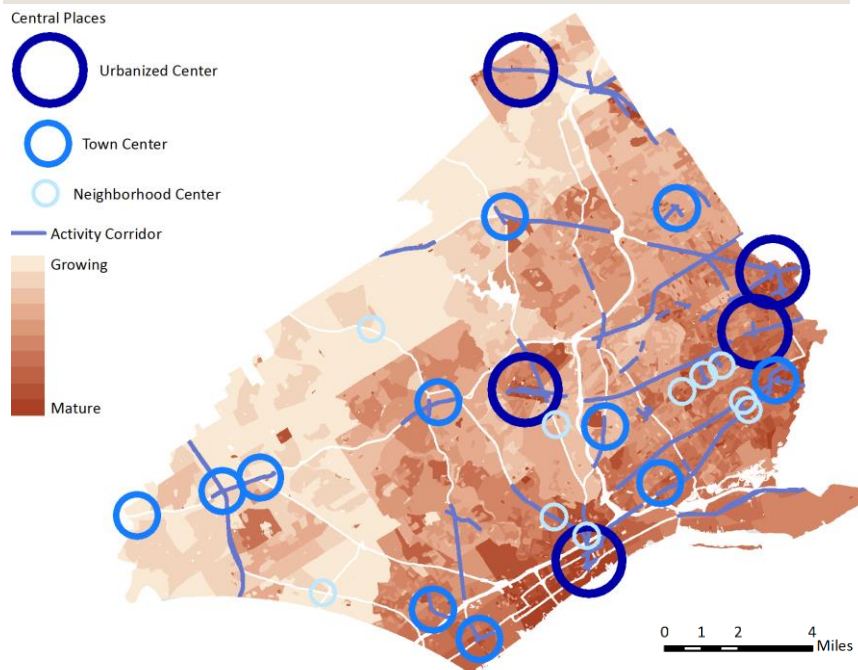
Vibrant Communities

Walkability plays a major role in the enhancement of urban environmental quality and economic vitality. Recent real estate trends show increased market for walkable communities, and the County's Economic Development Plan emphasizes the need for communities to be walkable to attract residents and business.

CONTEXT

Delaware County 2035 establishes two Character Areas to describe residential development in Delaware County: Mature Neighborhoods and Growing Suburbs. Mature Neighborhoods are areas that are established and have realized most of their population, employment growth, and infrastructure build-out. Growing Suburbs are areas that have undeveloped or agricultural land and are experiencing or are forecasted to experience population growth. Mature Neighborhoods are generally found in the eastern and southern parts of the County, while Growing Suburbs characterize the landscape of the northern and western parts of the County.

Map I-1: Delaware County Character Areas and Central Places



Delaware County's Mature Neighborhoods typically have strong sidewalk networks. Yet, many of these older sidewalks do not meet current ADA requirements, are in poor condition, or were not planned properly for today's urban environment.

A small number of major roadways that provide access to public transit in Growing Suburbs have sidewalks. There are few crosswalks at intersections and mid-block crossings, though they are necessary, particularly along U.S. Route 1 and PA Route 3 (West Chester Pike).



Figure I-2: Nether Providence Township was awarded the Department of Community and Economic Development (DCED) 2017 Multimodal Transportation Fund (MTF) award to construct sidewalks on East Rose Valley Road between Providence Road and Osbourne Lane.




Chapter 2: Methodology

Sidewalk Mapping

Sidewalks were mapped by DCPD staff and interns using ArcGIS Online, an online geographic information system (GIS) mapping program. Mappers created a GIS layer that shows the locations of existing sidewalks as well as roadsides that are missing sidewalks in Delaware County. The sidewalk layer was made by digitizing over aerial imagery.

Classification

Features in the sidewalk layer were broken into three categories. The three categories along with their definitions are provided in the table below.

Missing Sidewalk	Sidewalk without Vegetated Buffer	Sidewalk with Vegetated Buffer
		
No sidewalk along roadway.	Sidewalk present but no buffer between sidewalk and roadway.	Sidewalk present with vegetated buffer, such as grass strip, trees, or Green Stormwater Infrastructure.

Entire blocks are classified in one of the three ways, where the majority of sidewalks pertain to one classification. Gaps in sidewalks created by driveways, parking lot entrances, or alleys are mapped as a continuation of an existing sidewalk and are not classified as missing.

Case Study Selection

Sidewalk networks are best described as webs centered around specific destinations; therefore, the case studies presented in this report include the area within a 1/2-mile radius – or a 10-minute walk – of specific destinations. Those destinations fall under the following five categories: schools, transit stops and stations, Central Places/Activity Corridors, residential neighborhoods, and areas of special concern (i.e, isolated shopping centers, industrial and business parks, and elderly care facilities).

The 18 case studies presented in the following chapter are destinations that provide an understanding of sidewalk conditions across Delaware County. The Mature Neighborhoods versus Growing Suburbs dichotomy was considered in the selection to represent the variety of surrounding land use characteristics and travel patterns around similar destinations in distinct parts of the County.

The focus on individual case studies facilitated an in-depth analysis of specific sidewalk networks that can be used to recommend appropriate improvements for other, similar sites in the County. One excellent example of the suitability of the case study approach is the distinction between pedestrian access to schools in Mature Neighborhoods as opposed to Growing Suburbs. Students enrolled at schools in Growing Suburbs are likely to encounter similar pedestrian network conditions, and the same can be said for schools within Mature Neighborhoods across Delaware County. It is important to note that the bicycle networks within the study areas were also analyzed for their potential to provide connections.

Chapter 3: Walking Statistics

WALKABILITY ACROSS DELAWARE COUNTY

Walkability varies greatly between communities in Delaware County. In some communities, walking is a viable mode of transportation because of the pattern of development. This is particularly the case in Mature Neighborhoods in eastern and southern Delaware County.

Nevertheless, even these walkable places could benefit from an improvement in the pedestrian network through the enhancement of pedestrian safety and comfort. One crucial aspect of a strong sidewalk network in Mature Neighborhoods is ADA compliance; sidewalks that were built prior to the implementation of the revised ADA Standards for Accessible Design must be upgraded. As mentioned previously, walkability is a measure of how pedestrian friendly an area is for all users, including those who are mobility impaired.

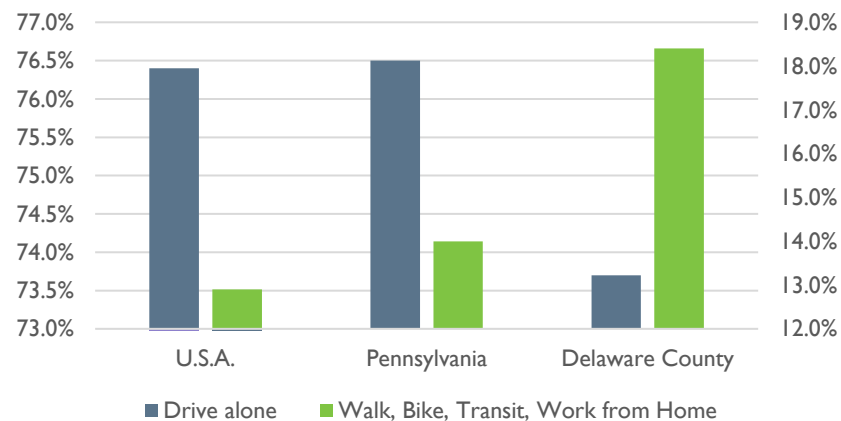
In other communities, there are fewer destinations within walking distance of residential areas so walking is not a viable transportation option for most trips. Strong pedestrian networks and adequate bicycle facilities can extend residents' mobility by granting access to public transit and nearby destinations that would otherwise be unreachable. A strong pedestrian network helps sustain ridership and is important for the safety and mobility of transit riders. 68.6 percent of Delaware Valley transit riders walk to transit in the morning, and 73.9 percent walk to their next destination after leaving a transit vehicle in the afternoon or evening (*Philadelphia Regional On-Board Transit Survey, 2015*).

There are few destinations within walking distance of most residential areas in Growing Suburbs in western Delaware County. Walking, biking, and public transit options are currently limited for most trips.

Nevertheless, sidewalks are important in these communities because they can provide connections to trails and opportunities for physical activity on safe, accessible pedestrian routes. Furthermore, sidewalks in Growing Suburbs provide access to other destinations along arterials and activity corridors, such as parks. Sidewalks can also improve

connectivity between fragmented residential subdivisions and increase social interaction. In the future, more complete sidewalk networks in growing suburbs can improve multimodality and help limit the growth of traffic congestion.

Chart 3-1: National, State, and County Mode Share

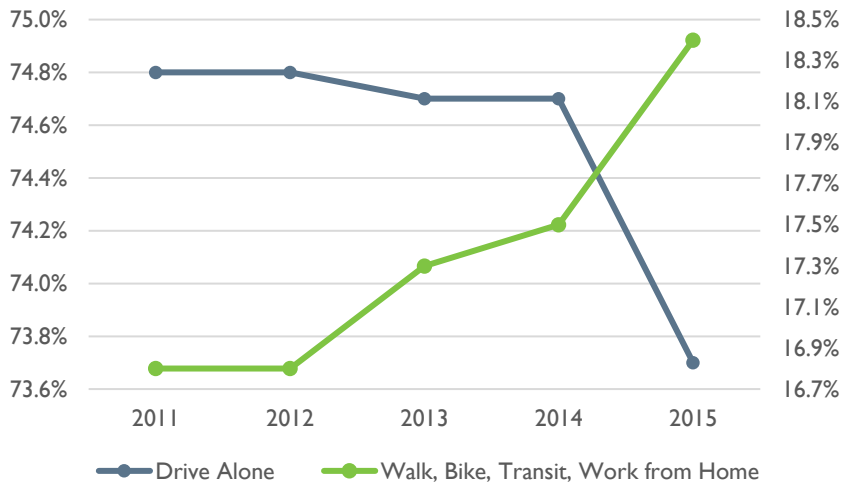


Because Delaware County is an urban area within the Philadelphia Metropolitan Area (the Delaware Valley Region), residents walk, bicycle, and take transit more often than the average resident of Pennsylvania or the United States (see Chart 3-1). Those who work from home also benefit from sidewalks that provide them with an opportunity for physical activity, social interaction, and local trips near their home office.

Not only is the alternative mode share in the County higher than the national and state averages, it also grew steadily between 2011 and 2015. Although most Delaware County workers drive to work alone, the data represented in Chart 3-2 shows that the percentage of residents commuting via alternative modes is increasing as the percentage of single-occupancy vehicle commuters is decreasing. The relatively high and growing alternative mode share in the County

highlights the importance of constructing robust pedestrian and bicycle networks throughout Delaware County.

Chart 3-2: Delaware County Mode Share Shift (2011 – 2015)



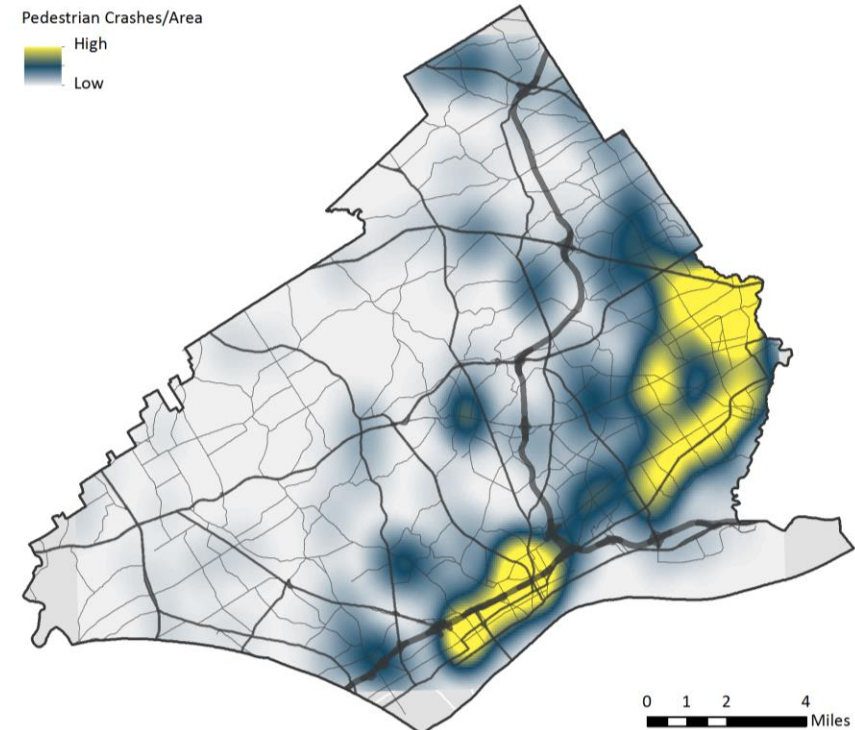
PEDESTRIAN SAFETY

Gaps in the sidewalk network can present a safety risk for pedestrians. In the United States, 5,736 people were killed in pedestrian/motor vehicle crashes in 2015 – the highest number of such deaths in a single year since 1996 (NHTSA Traffic Safety Facts). In addition, pedestrian crash fatalities increased 12.1 percent between 2006 and 2015. The rise in pedestrian crash deaths may be linked to the simultaneous rise in distracted driving and walking. The modal shift to public transit, which results also in an increase in the number of people walking to transit on potentially unsafe routes, may inadvertently create more opportunities for pedestrian crashes.

In Delaware County, the number of pedestrian crash fatalities has increased in recent years, in a trend that mirrors the one seen at the national level. Map 3-1 shows the distribution of pedestrian crashes in the County between 2010 and 2014. It is not surprising that some of

the highest concentrations of pedestrian crashes are in the densely populated Mature Neighborhoods of southern and eastern Delaware County. Improvements to the pedestrian network in these places can reduce pedestrian crashes, and traffic calming measures can help reduce vehicular crashes as well.

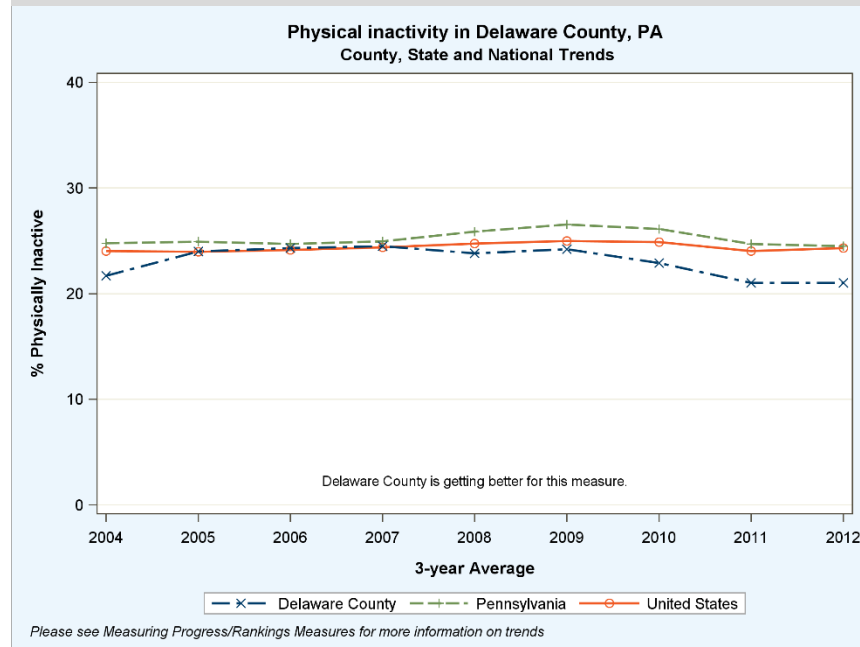
Map 3-1: Pedestrian Crashes (2010 – 2014)



WALKING AND PHYSICAL ACTIVITY

Sidewalks support physically active lifestyles. As stated in Chapter 1, physical activity has been shown to reduce the risk of developing several physical and emotional health conditions, including heart disease, certain types of cancer, type 2 diabetes, depression, and more. In the U.S., more than 1.2 million people died from heart disease, cancers, and diabetes in 2014 (*National Center for Health Statistics, 2015*). Investments in sidewalk construction and maintenance have shown positive results with regard to the health of Delaware County's residents and workforce. Pedestrian infrastructure improvements can build upon the recent (2009 – 2012) decrease in physical inactivity shown in Chart 3-3 below.

Chart 3-3: Physical Inactivity in Delaware County (2004 – 2012)



Source: National Diabetes Surveillance System

WHERE TO WALK FROM HERE

Missing sidewalks account for 1,933 miles of roadside in Delaware County. Filling in all those gaps in the sidewalk network would create more than 623 additional hours, or roughly 26 days, of available walking time in the County. Connecting every gap in the County's pedestrian network would be a tremendous victory. However, it is an enormous undertaking. In order to be successful in improving walkability, initial efforts should focus on increasing pedestrian access to common and crucial destinations, such as those identified in the following chapter of this report. By establishing connections between existing, isolated sidewalk networks, municipalities can increase local walkability and reap the health, safety, environmental, and economic benefits of pedestrian connections to a variety of destinations.

Chapter 4: Case Studies

SCHOOLS

Five schools across Delaware County are included as case studies in this report because sidewalks and their conditions are critical considerations in planning school transportation. Pennsylvania state law mandates that elementary school students be provided bus transportation if they live farther than 1.5 miles from school. The law requires that transportation be provided for middle and high school students that live farther than 2 miles from school.

Those students that are not assigned to a school bus are designated as “walkers.” However, this term is misleading. While it should be possible for students to walk between 1.5 and 2 miles from home to school, there are a number of reasons why they may not. Some parents choose to drive their children, some students choose to drive to school, and some school districts may – either voluntarily or by mandate – provide transportation to students even within the 1.5- or 2- mile radius.

Hazardous Walking Routes are those student walking routes that have been identified as unsafe due to potential incompatibility between vehicles and school students while students are walking between their home and their school or school bus stop (PA Code Chapter 447 Hazardous Walking Routes). Criteria that are used to measure the safety of a route include: pedestrian crash rates, safety of crossings, and – most notably – sidewalks. A route is automatically considered hazardous if it does not have sidewalks.

Though Hazardous Walking Routes exist at multiple Delaware County schools, the completeness of sidewalk networks varies considerably from school to school. That variation can be seen in the school case studies, which represent a cross-section of typical elementary, middle, and high schools within several types of communities, from Mature Neighborhoods in the east to Growing Suburbs in the west. Chart 4-1 shows the total percentage of roadside mileage within school case studies that is missing sidewalks, 46 percent. This clearly points to a

general need for more complete sidewalk networks around schools in Delaware County.

Some of the needs identified in the case studies are near-universal for schools across the County, including the need for more sidewalks and marked crosswalks. Case study analysis also reveals some issues that are specific to schools within particular contexts. For instance, the challenges posed by heavy truck traffic on roads near Marcus Hook Elementary School are likely to be relevant at other schools located near industrial land uses or transportation corridors but not at schools in other settings.

School case studies provide insight into many transportation network characteristics that limit safe, comfortable, and convenient pedestrian and bicycle access. The wide range of existing conditions detailed in the school case studies as well as the recommendations for improvements can help inform school transportation network analysis at many schools throughout Delaware County and aid in school-area transportation planning.

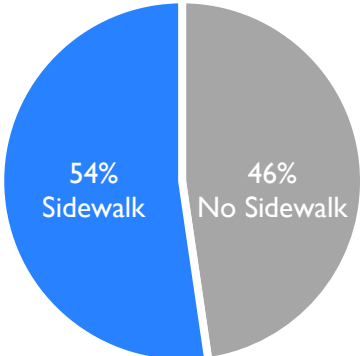


Chart 4-1: Combined Sidewalk Coverage for School Case Studies

Culbertson Elementary School

Overview

Culbertson Elementary School is one of four elementary schools in Marple Newtown School District. It is located in Newtown Township. The Marple Newtown School District Transportation Department has 82 school buses and vans.



Figure 4-1: Culbertson Elementary School, Newtown Township

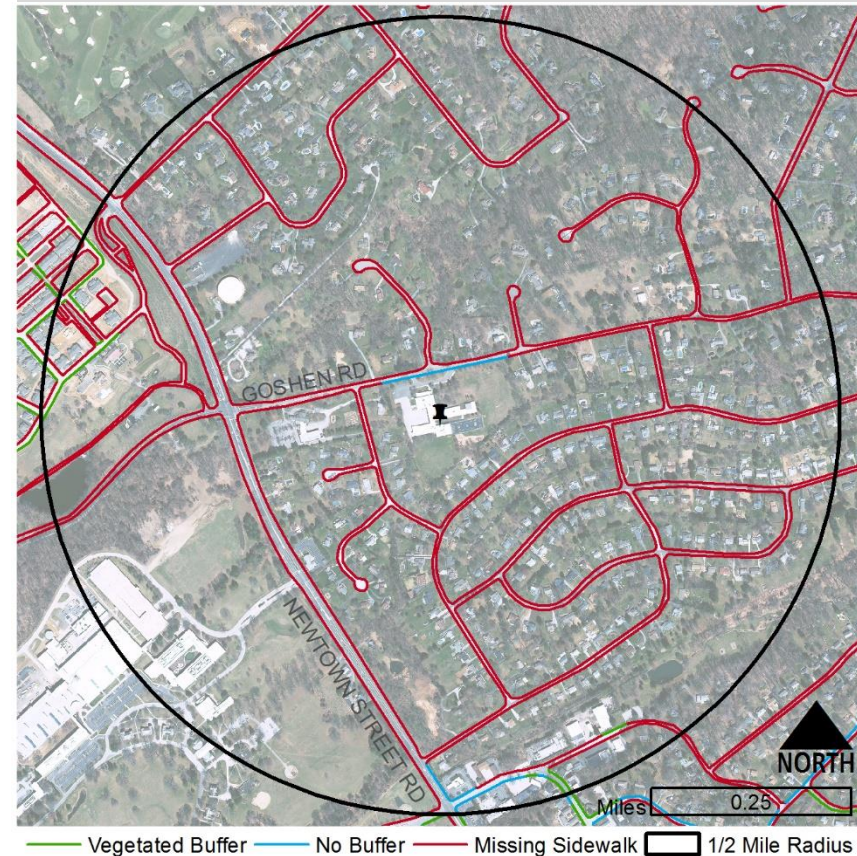
Commuting Patterns

This District's walking policy states that for Grades 1 through 5, students may be required to walk up to $\frac{3}{4}$ of a mile to their school or respective bus stop, well below the 1.5 miles required by state law. Yet, of the 363 children enrolled at Culbertson Elementary School in the 2016/2017 school year, none were walkers. Every student at this school is guaranteed a seat on a school bus because the routes to school have been declared either hazardous by the state or unsafe by the school district.

Despite the fact that school bus transportation is accessible to all Culbertson Elementary School students, according to school

administration estimates, 75 to 90 percent of those who live within a 1.5-mile radius of Culbertson Elementary School are driven to school in a private vehicle. While the school does not keep track of carpools, the administration believes that these instances are rare. Most children that are being escorted to and from school are driven by a parent or guardian.

Map 4-1: Culbertson Elementary School Sidewalk Conditions



Parking

There are approximately 69 parking spaces for elementary school staff and visitors. There are no reported parking issues at this site.

Traffic Flow

Traffic circulation is an issue on Goshen Road during elementary school arrival and dismissal times. As a result of the number of children being dropped off and picked up individually, additional traffic of approximately 40 to 50 vehicles is generated during school drop-off and pick-up times. Traffic congestion and dangerous turn movements from this activity impede traffic flow and make conditions even less safe for potential pedestrians. Shorter trips that should be walkable are generating more vehicular traffic than longer-distance school bus trips.

Walking

Culbertson Elementary School is located on Goshen Road. While Goshen Road experiences relatively low traffic volumes (between 2,500 and 10,000 vehicles per day), it connects to PA Route 252, a higher volume roadway that serves between 10,000 and 20,000 vehicles per day. The school's proximity to PA Route 252 makes improving pedestrian safety in the area important. Without the proper pedestrian infrastructure, it is unsafe for students to walk to school; therefore, very few do. The very few children who do walk to school walk through private properties on the south side of Goshen Road.

Sidewalk Conditions

Culbertson Elementary School has sidewalks along Goshen Road and within the school property that are owned and maintained by the school district. The sidewalks along Goshen Road do not extend beyond the property lines of the elementary school. In fact, this is the only elementary school in Marple Newtown School District that has no sidewalk connection to adjacent residential neighborhoods. The other three elementary schools in the district – Loomis, Russell, and Worrall Elementary Schools – are located at the heart of residential neighborhoods with complete sidewalk networks and other pedestrian safety features, such as marked crosswalks. The existing sidewalks on the property will be reconstructed in 2017, yet the network will not be expanded and no new connections will be made.



Figure 4-2: Goshen Road at school entrance, Newtown Township

Penncrest High School

Overview

Penncrest High School is located in Middletown Township, Delaware County. Penncrest High School is the only high school in Rose Tree Media School District, which serves four municipalities: Edgmont, Middletown, and Upper Providence Townships and Media Borough. This area is approximately 30 square miles. Rose Tree Media School District has 77 buses.



Figure 4-3: Penncrest High School, Middletown Township

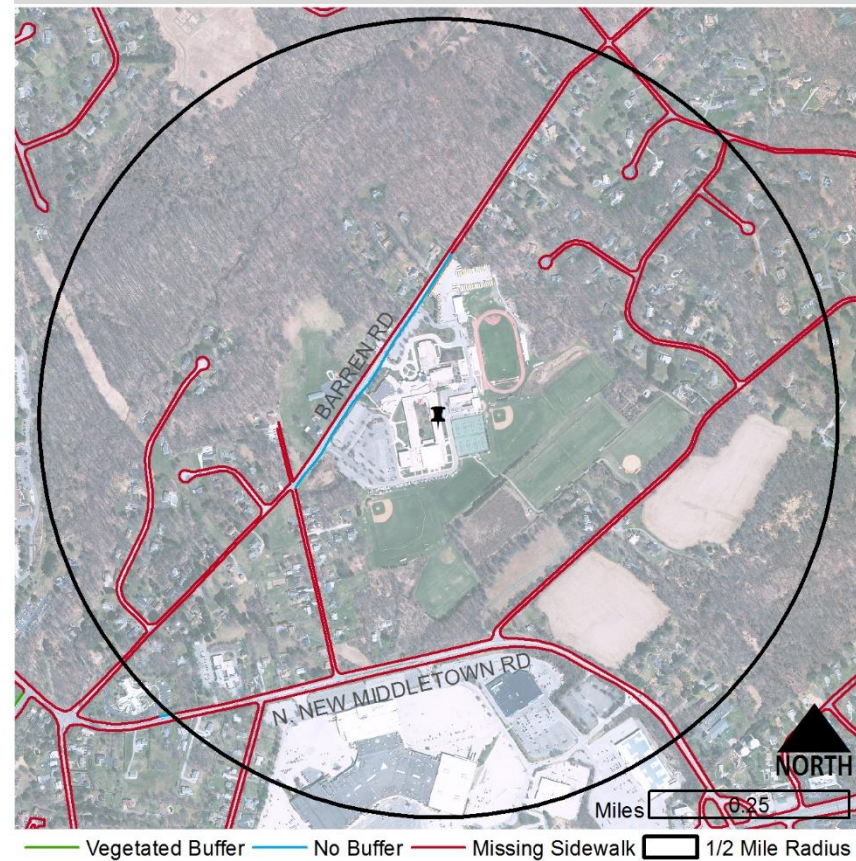
Commuting Patterns

In the 2016/2017 school year, Penncrest High School had approximately 1,250 enrolled students. Of these students, 177 drove themselves to school. Approximately 1,053 students are transported by bus or by a private vehicle driven by a parent or guardian, and fewer than 20 students walk. The school does not keep records on walkers' commuting habits. Therefore, it is impossible to determine exactly how many students are being driven by parents or other students and how many students walk. It is evident, however, that the high school generates a significant amount of motor vehicular traffic during peak hours.

Parking

The high school has one student parking lot with a 200-space capacity; parking is only available to students in twelfth grade. However, students with driver licenses in other grades also drive to school. Because parking is not available, they park at the Granite Run Mall site, and they cross Route 352 (North Middletown Road) to reach school. There is no marked crosswalk on the aforementioned stretch of Route 352.

Map 4-2: Penncrest High School Sidewalk Conditions



Traffic Flow

All buses arrive at Penncrest High School at approximately 7:00 a.m. every morning. Two shuttle connections are provided from Penncrest to Cardinal O’Hara High School in Springfield Township and Archmere Academy in Claymont, Delaware. These buses leave Penncrest High School at 7:15 a.m. for their respective destinations.

All school buses depart from Penncrest at 2:30 p.m. at the end of the day. The high school’s administration reported no traffic congestion or related concerns, despite the extensive bus service and large number of buses flowing in and out of the site at peak hours.

Walking

Students who park at the former Granite Run Mall site, walk to school from the site. Students cross the three lane section of PA Route 352 at the intersection with Van Leer Avenue. Then, they proceed to walk north on Van Leer Avenue, where there are no sidewalks.

The school neither encourages nor wishes to encourage students parking on private, vacant property. However, with the development of the Promenade at Granite Run, one could expect that more students will traverse this path to enjoy the new recreational facilities on the site after school.

Sidewalk Conditions

There are sidewalks on a short segment of Barren Road from Van Leer Avenue to the school entrance. Van Leer Avenue is a residential street; however, the sidewalks end abruptly at the intersection with Barren Road. They do not continue south on Van Leer Avenue to PA Route 352. There are thus no sidewalk connections between the high school and surrounding residential neighborhoods or the Promenade at Granite Run site. Including Van Leer Avenue, two residential streets and numerous single family homes along Barren Road are within a five-minute walking distance – or 0.2 miles – from the entrance to the school property. Yet, no safe access is available from these residences due to the absence of a complete sidewalk network and high-visibility crosswalks.

Bicycle Network

There are currently no on- or off-road bicycle facilities that accommodate access to Penncrest High School. It seems that no students bicycle to school. The Rocky Run Trail, identified in the *Delaware County Open Space and Greenway Plan*, could provide a safe bicyclist and pedestrian connection to Penncrest High School from residences north of Barren Road.



Figure 4-4: Van Leer Avenue, Middletown Township

Marcus Hook Elementary School

Overview

Marcus Hook Elementary School is located in Marcus Hook Borough, Delaware County; the school is one of four elementary schools in Chichester School District. It serves the southern half of Marcus Hook Borough, as well as Trainer Borough to the east. The school is located at the heart of heavy industry and surrounded primarily by industrial land uses.

In the 2016/2017 school year, Marcus Hook Elementary had 325 enrolled students. Marcus Hook Elementary School is a Title I school; 61 percent of students are economically disadvantaged. Marcus Hook Elementary School uses 6 buses.



Figure 4-5: Marcus Hook Elementary School, Marcus Hook Borough

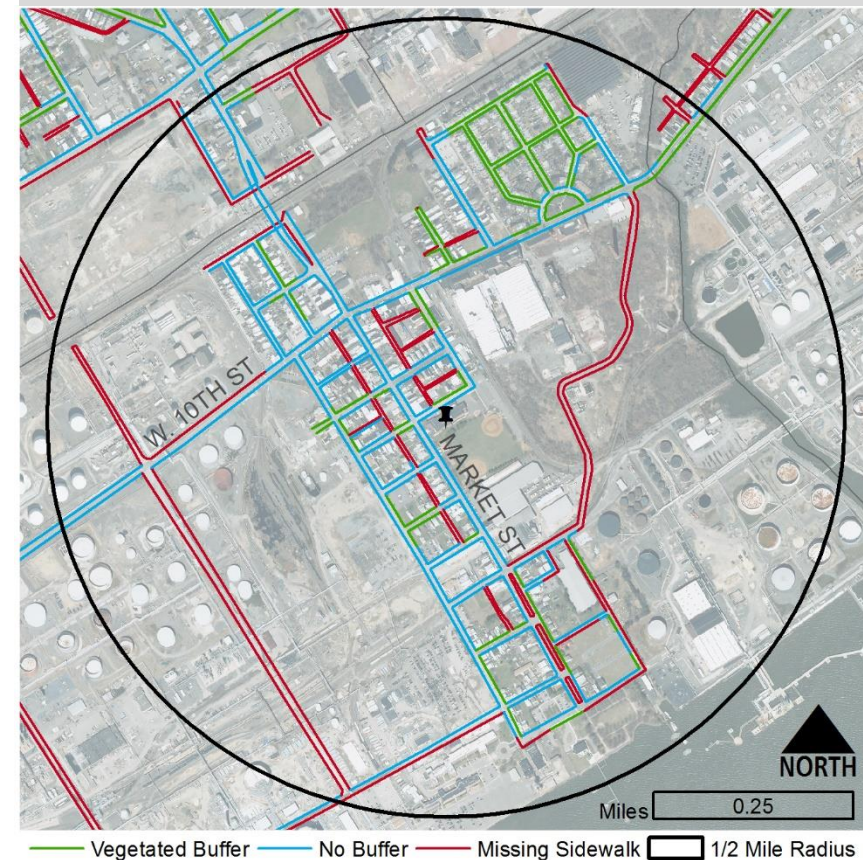
Safe Routes to School 2009/2010

Marcus Hook Elementary School was awarded a \$5,000 Safe Routes to School Grant for the 2009/2010 school year. The program resulted in improved street signage for the direction of traffic and the creation of a one-way bus circle on the north side of the property (West 8th Street), which was previously a two-way street. The implementation of the one-way traffic has improved circulation and safety for children.

Commuting Patterns

Approximately 55 to 60 percent of the student population – between 178 and 195 students – was eligible to be transported by school bus. All those transported by bus lived in Trainer Borough. An estimated 10 percent, or 32 students carpool to and from school. While the school does record which students are allowed to go home with which adults, the actual frequency of carpooling occurrence is not tracked and, therefore, impossible to determine. Only one or two students ride a bike to and from school.

Map 4-3: Marcus Hook Elementary School Sidewalk Conditions



Approximately 113 children could be classified as “walkers” in the 2016/2017 school year, which means that 113 children either walked to school or were driven to and from school. Third and fourth grade children typically walked in groups, without parental supervision. On the other hand, younger children walked alone with one adult or one adult would walk multiple children in a group to and from school. Walking arrangements are arranged privately between parents and guardians; thus, the details and exact numbers of walkers are difficult to track.

Parking

Marcus Hook Elementary has sufficient parking for faculty and visitors in a dedicated lot to the east of the school building, off of West 8th Street. On-street parking is prohibited within the vicinity of the school.

Traffic Flow

Students are dismissed in the recess yard on the north side of the building at West 8th Street, where the bus circle is located.

Walking

Within Marcus Hook Borough, most elementary school students walk from the early 20th century workers housing subdivision known as “Viscose Village.” Viscose Village is about a ½ of a mile – or a 10-minute walk – from Marcus Hook Elementary School.

While the sidewalk network does connect most of Trainer Borough to the elementary school, the industrial uses and resulting truck traffic make routes to school dangerous. All students residing in Trainer are bused, unless parents are willing to walk them, and all students in Marcus Hook either walk (in groups or with parents) or are driven by their parents or guardians.

Sidewalk Conditions

The streets surrounding Marcus Hook Elementary have a strong sidewalk network. Most of the sidewalks leading to the school do not have vegetated buffers, with the exception of Post Road, which connects Trainer Borough to Marcus Hook Borough. Vegetated buffers and safe crossings are crucial in this area due to heavy truck traffic.

Bicycle Network

There are no bicycle facilities on the local streets surrounding Marcus Hook Elementary School. However, part of the on-road portion of the East Coast Greenway (ECG) runs through the heart of Marcus Hook Borough on West 10th Street. The bicycle facilities are marked on this roadway. No students were reported to bicycle to and from the school.



Figure 4-6: West 10th Street (Route 13/ECG), Marcus Hook Borough

Haverford Middle School

Overview

Haverford Middle School is located in Haverford Township, Delaware County. Haverford Middle School is the only middle school in Haverford Township; in the 2016/2017 school year, 1,425 students were enrolled at the school. Only 13 percent of students are economically disadvantaged. Haverford Middle School utilizes 15 school buses to transport students, both in the morning and after school.



Figure 4-7: Haverford Middle School, Haverford Township

Commuting Patterns

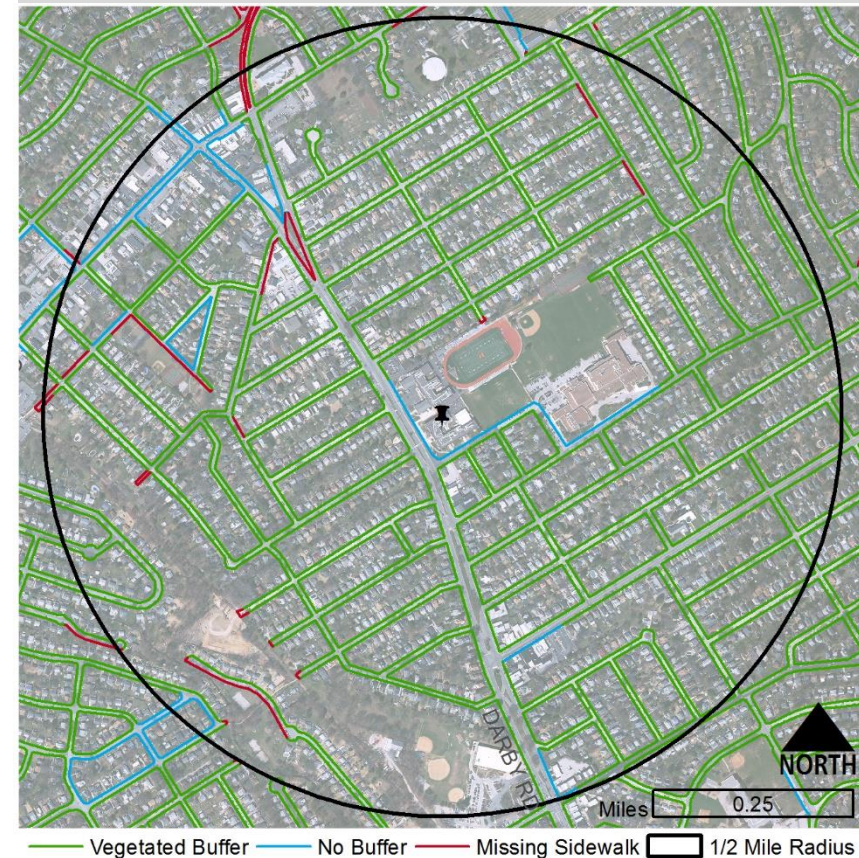
By Pennsylvania state law, middle and high schools are required to provide transportation (school buses) to those students living beyond a 2-mile radius of the school. Haverford Middle School provides school bus service to students living beyond a 1½ -mile radius of the school. Haverford School District provides additional service beyond what is mandated due to PennDOT's identification of several Hazardous Walking Routes in Haverford Township.

Approximately 605 of 1,425 students, or 42 percent, are transported by bus. The remaining 820 students are walkers, carpoolers, or dropped off and picked up individually.

Parking

Haverford Middle School has approximately 117 parking spaces for staff and visitors. Sixty-seven of these parking spots are accessible from Darby Road.

Map 4-4: Haverford Middle School Sidewalk Conditions



Traffic Flow

This section of Darby Road experiences heavy traffic and congestion at peak hours in the morning and evening. Haverford Middle School has a protected bus lane on Darby Road. The drop-off lane is separated from the roadway by a concrete barrier; however, it does inhibit access to the parking lots located on Darby Road.

Mill Road and Brookline Boulevard, both of which are found south of the middle school and are perpendicular to Darby Road, experience extreme delays due to school bus traffic from both the middle and high schools.

Walking

Many students walk and ride their bicycles from nearby residential neighborhoods to the north and south of the middle school. Though the two crossings immediately in front of the school are controlled by crossing guards before and after school, there are few other safe places for children to cross and other intersections they may traverse on their route.

Of all the schools in this report, Haverford Middle School is the only school with a group of students who consistently commute to and from school by bicycle. In the 2016/2017 school year, approximately 10 children bicycled to and from school. While reportedly the number of student bicyclists has steadily increased in recent years, this was the largest number to date.

Sidewalk Conditions

Haverford Township has a complete sidewalk network. There are two marked crosswalks on Darby Road to access the school: one at Fairfield Road and one at Braeburn Road. They are solid red crosswalks with white borders. With the exception of the sidewalks directly in front of the middle school, most sidewalks in the area have vegetated buffers.

Bicycle Network

Haverford Middle School is located on Darby Road; this roadway is popularly traversed by bicyclists. While there are no bicycle facilities on Darby Road, bicyclists of all ages use the travel lanes. Darby Road has a low speed limit of 35 miles per hour, on-street parking on the southbound side, a landscaped median in the portion of the roadway studied, and a designated school zone in front of Haverford Middle School. These features may act as traffic calming measures that either directly (by slowing motor vehicular traffic speeds) or indirectly (by increasing perceived safety) promote the use of the roadway – as

opposed to sidewalks – for bicycling. At the same time, Darby Road experiences high traffic volumes, and bicycle facilities would make this roadway safer for cyclists.



Figure 4-8: Darby Road and Bellemead Avenue Intersection, Haverford Township

Haverford High School

Overview

Haverford High School is located in Haverford Township, Delaware County in the vicinity of Haverford Middle School. Haverford High School is the only high school in Haverford Township. In the 2016/2017 school year, 1,710 students were enrolled at the school. Only 14 percent of students are economically disadvantaged.



Figure 4-9: Haverford High School, Haverford Township

Commuting Patterns

As mentioned previously, Haverford School District provides additional service beyond what is mandated because there are several Hazardous Walking Routes in Haverford Township. Though the neighborhood surrounding Haverford High School has a complete sidewalk network, intersections are particularly dangerous due to heavy vehicular traffic and inadequate pedestrian crossings.

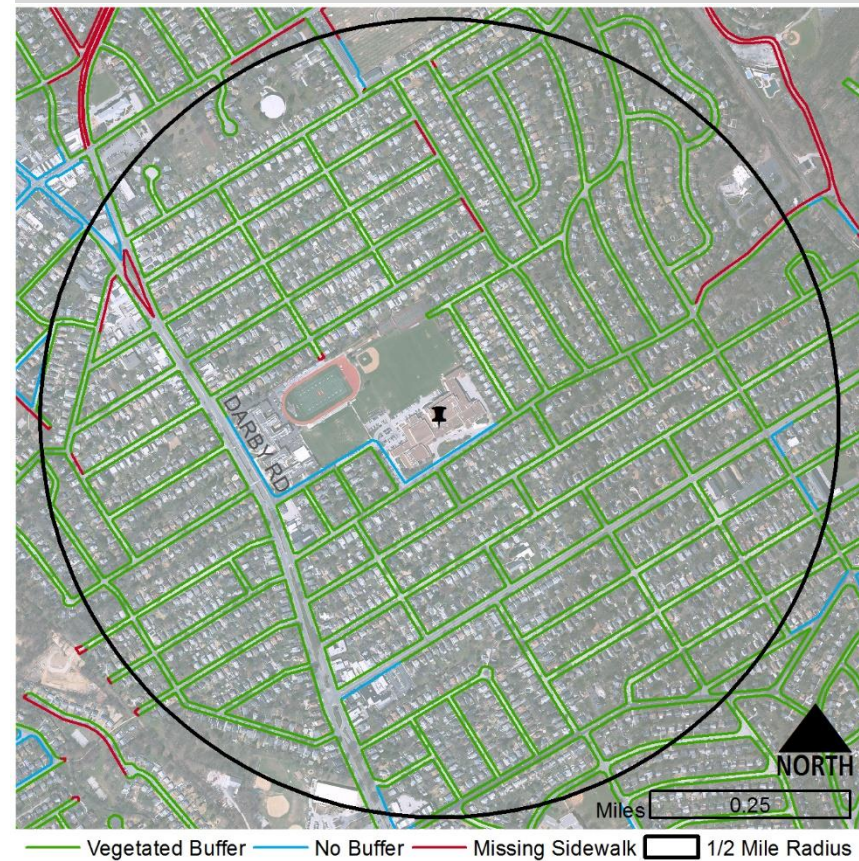
Approximately 763 of 1,710 students, or 46 percent, are transported by bus. The remaining 947 students are walkers, drivers, carpoolers, or dropped off and picked up individually.

Parking

There are fewer than 50 of approximately 184 parking spaces available to students for parking. As a result, students park in public parking spaces along the residential streets in the neighborhood.

Even though school starts at 7:30 AM, student drivers begin circling the area for parking at 6:40 AM, creating additional traffic.

Map 4-5: Haverford High School Sidewalk Conditions



School Buses

Haverford High School utilizes 19 school buses to transport students in the morning and 12 school buses to transport students after school.

Traffic Flow

From the west, Golf Road is the only direct access point to the school grounds, and Mill Road is the only direct access point to the school on the southern side. The bus circle and front entrance front Mill Road.

Given that Mill Road is the only access route to and from Haverford High School for school buses, extreme delays occur at the intersection of Mill Road and Darby Road after drop-off in the morning and after pick-up in the afternoon. It takes about 20 minutes for school buses to clear the area after drop-off and pick-up times.

Parents or guardians must drop their children off on side streets because the parking lots are closed to this type of traffic in the morning and afternoon.

Walking

Some students walk from nearby residential neighborhoods. However, school administration has noted that many students drive only one or two blocks simply to park slightly closer to school, despite the existence of sidewalks. Very few, if any, high school students ride bicycles to school.

Sidewalk Conditions

The area's sidewalk network is complete, and most sidewalks have a vegetated buffer. Nevertheless, there is only one marked crosswalk to access the front of the school building on Mill Road at Allston Road. High-visibility crosswalks are crucial to pedestrian safety in this area, and they could encourage more students to walk to school.

Bicycle Network

As mentioned previously, there are no bicycle facilities on Darby Road, despite the fact that bicyclists of all ages use the travel lanes. During peak school traffic hours, high school students can be observed bicycling westward on Golf Road to turn onto – or cross – Darby Road. Though not many high school students bicycle to school, an increasing number of middle school students do. This trend points to the rising significance of this mode of transportation in this vicinity. As a result, there is a

need to provide more bicycle-friendly access to these two destinations that serve a vulnerable, predominantly non-driver population: children.

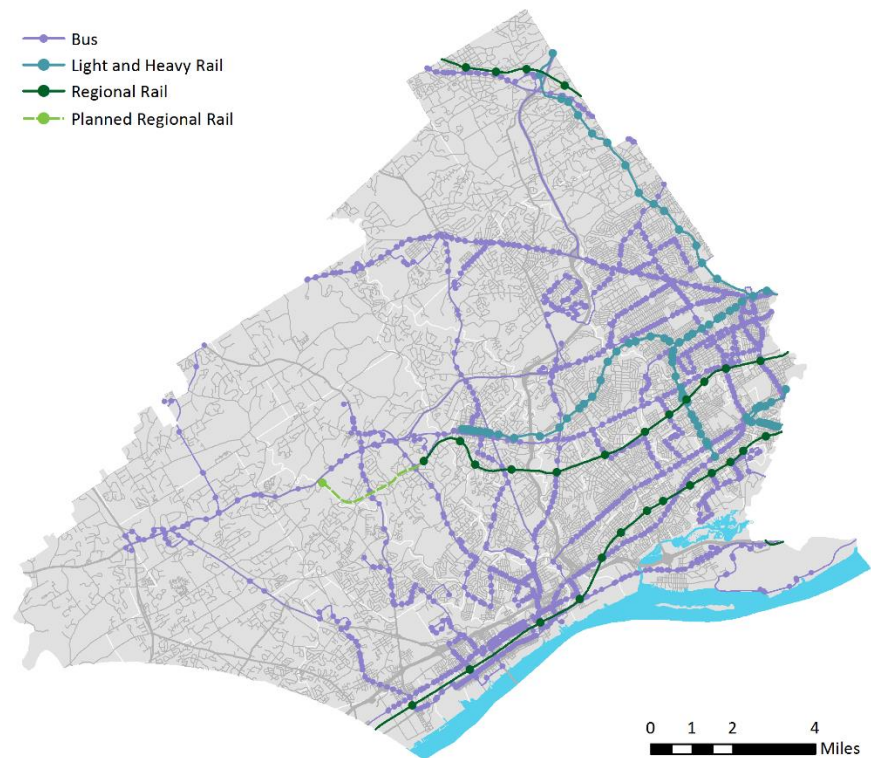


Figure 4-10: Darby Road and Golf Road Intersection, Haverford Township

TRANSIT

Delaware County has an extensive public transit network (see Map 4-6), which features regional rail, light and heavy rail (trolley and high speed/elevated lines), and bus service. Every transit rider on any one of the County’s 36 public transit lines is a pedestrian at some point during their trip; for this reason, transit stations need strong pedestrian networks and are included as case studies in this report.

Map 4-6: Delaware County Public Transit Network



Transit station case studies review existing conditions to identify opportunities for pedestrian and bicycle access improvement. In order to provide context-specific analysis, stations of varying types – which are defined in detail in the Delaware County 2035 Transportation Plan – are represented in the case studies. The station areas of one typical

Regional Rail *Commuter Station* (Moylan-Rose Valley) and one *Central Station* (Eddystone) are analyzed, as are the networks of one typical Light/High Speed Rail *Central Stop* (Drexelbrook) and one *Residential Stop* (Garrett Hill).

Fortunately, sidewalk coverage surrounding transit stations is generally strong in Delaware County, especially surrounding rail stations. Sidewalk mileage exceeds missing sidewalk mileage for transit station case studies (see Chart 4-2). While a fairly complete sidewalk network is a positive attribute for a station area to possess, there are many more transportation network characteristics that contribute to the quality of its pedestrian and non-motorized access, such as bicycle facilities, crosswalks, and surrounding speed limits. These characteristics and more are examined in the case studies.

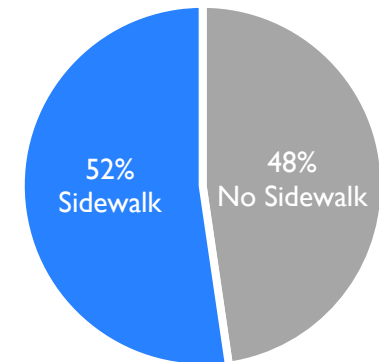


Chart 4-2: Combined Sidewalk Coverage for Transit Case Studies

Some needs identified in the case studies are consistent across transit lines and are relevant to improving pedestrian access to nearly any transit station. Other needs are more specific to one typology or another, such as the poor ADA access and low station visibility at Garrett Hill Station, which are common at Light/High Speed Rail Residential Stops.

Regional Rail

Moylan-Rose Valley

Context

Moylan-Rose Valley Station in Nether Providence Township is part of the SEPTA Media/Elwyn Regional Rail Line. The station experiences a weekday average of 319 boards and 291 alights. There are no connecting transit lines for transfer at the station. Moylan-Rose Valley Station is a commuter station, and it is accessed primarily by automobile. The station's 149-space parking lot is regularly filled. The Pennsylvania Institute of Technology (PIT), a junior college and technical school with roughly 800 active students and 150 faculty members, is located less than a ¼ of a mile north of the station. Nevertheless, single-family detached homes are the predominant land use in the area.



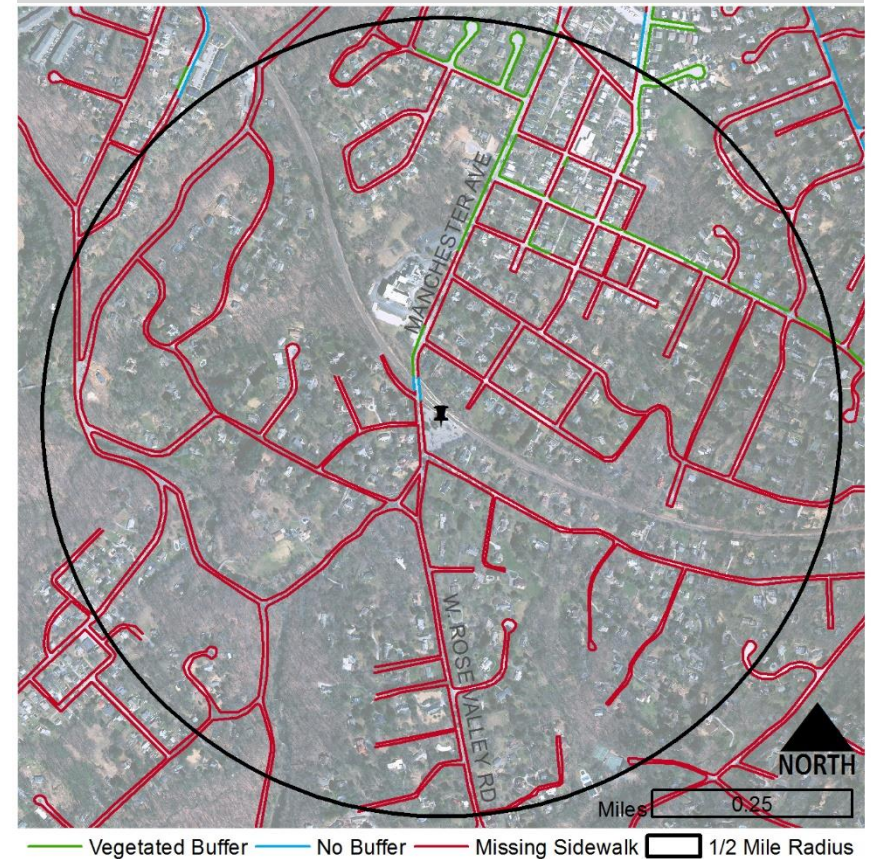
Figure 4-11: Moylan-Rose Valley Station

Pedestrian Network

Pedestrian access is critical at commuter stations such as Moylan-Rose Valley Station because the station parking lots are routinely utilized at capacity, and there are limited opportunities for parking expansion.

Considering that ridership has been increasing on all four of the SEPTA regional rail lines in Delaware County, pedestrian access to Moylan-Rose Valley must be improved to accommodate ridership.

Map 4-7: Moylan-Rose Valley Regional Rail Sidewalk Conditions



Mobility-impaired passengers could access the station's inbound platform from the parking lot. However, it is not a fully ADA accessible station. The outbound platform is most accessible from the parking lot via an inter-track crossing, but the inter-track crossing does not have audio or visual signals for transit users of all physical abilities. There is

also a paved walkway leading to the outbound platform from Manchester Avenue, but the walkway is steep and does not feature handrails. High level platforms with tactile warning strips would also improve ADA access.

PIT is the only nearby destination connected to Moylan-Rose Valley Station by a sidewalk. The sidewalk is on the southbound side of Manchester Avenue, and there is no marked crosswalk on the roadway on the north side of the bridge over the railroad tracks. Manchester Avenue is a busy collector street with an Annual Average Daily Traffic (AADT) count of 9,500 vehicles near the station. Furthermore, visibility is poor on this segment of Manchester Road due to the varied topography and resulting curvature of the roadway. Just north of the station, the residential neighborhoods have intermittent segments of sidewalk with a vegetated buffer. However, there is a significant gap between those sidewalks and the sidewalk at PIT.

The residential neighborhoods immediately east and west of Moylan-Rose Valley Station do not have sidewalks, but the local streets are low volume and low speed, and some have traffic calming features. Pedestrians may feel comfortable walking on these local streets without sidewalks during the daytime, but a lack of lighting makes them dangerous to navigate at night. Once these pedestrians reach the vicinity of the station, access is obstructed by an absence of appropriate facilities.

Residents who live south of the station have poor pedestrian access. Rose Valley Road, which must be used for a portion of most trips from the south, is a moderately high volume collector street with no sidewalks, no marked crosswalks, and narrow shoulders. Additionally, Rose Valley Road intersects Ridley Creek Road, Manchester Road, and Woodward Road within 500 feet of the station. These three intersections allow multiple turn movements, which are a danger to pedestrians.

Bicycle Network

Moylan-Rose Valley Station is not connected to any on-road bicycle facilities or paved bicycle trails, but there is bicycle parking on site. Cyclists may use roadways beyond the station's walkshed, such as Manchester Avenue, Rose Valley Road, and Knowlton Road to access regional rail. These collector streets are not ideal for bicyclists because they are characterized by heavy traffic and high speeds, and they have narrow or no shoulders. The local streets that cyclists would use to access collector streets, however, are well suited to bicycle travel with low traffic volumes and posted speed limits.



Figure 4-12: Moylan Avenue and Orchard Road intersection, Nether Providence Township

Eddystone

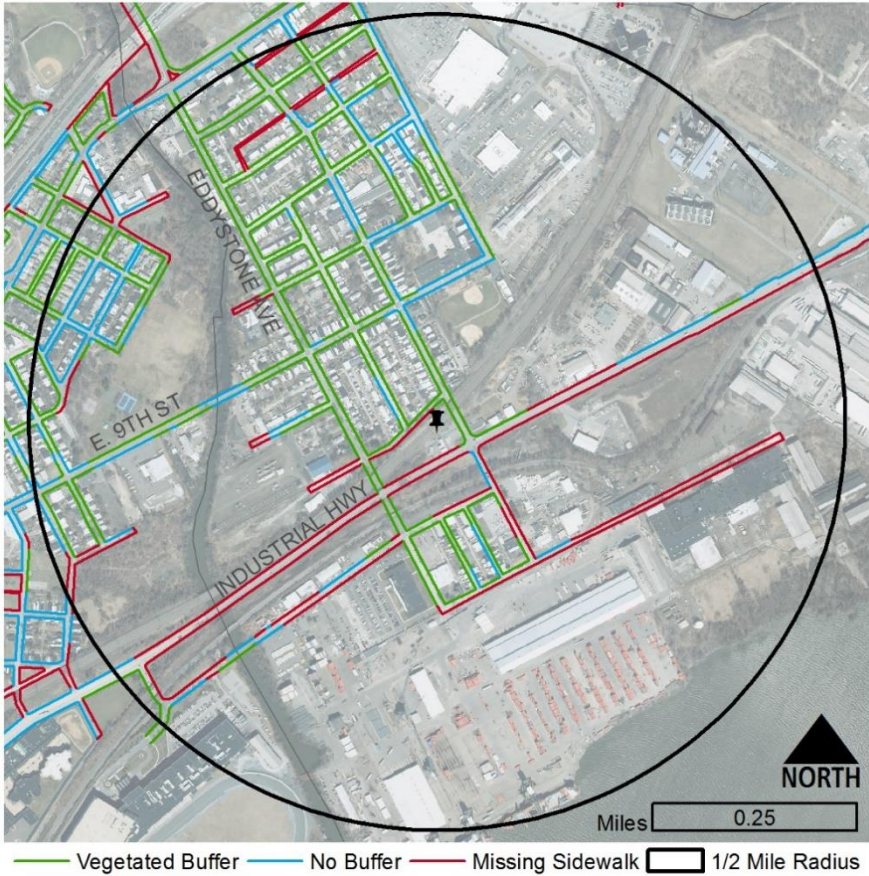
Context

Eddystone Station is located in Eddystone Borough on SEPTA’s Wilmington/Newark Regional Rail Line. Average weekday ridership for the station consists of 64 boards and 63 alights. The 37 Bus provides transit service to and from this regional rail station. Because Eddystone Station is located in a heavily developed area, there is limited space for parking. There are only 12 commuter parking spaces. The dense neighborhood north of the station is mixed use and includes commercial destinations, Eddystone Elementary School, and attached and semi-detached residential units. Slightly farther north and just outside the ½-mile radius of the station, Eddystone Crossings Shopping Center on Chester Pike is served by the 114 Bus. Eddystone Industrial Complex and a cluster of row houses are located on East 4th Street south of the station and Industrial Highway (PA Route 291).



Figure 4-13: Stairway entrance to Eddystone Station outbound platform, Eddystone Borough

Map 4-8: Eddystone Regional Rail Sidewalk Conditions



Pedestrian Network

The Wilmington/Newark Line and bus service generate numerous pedestrian trips in Eddystone Borough. A quality pedestrian network is essential to support the use of Eddystone Station because there are few parking spaces and little room for parking expansion. Due to Eddystone Borough’s high density, many destinations are within walking distance for residents. While the pedestrian network surrounding Eddystone Station is well developed, enhancements and upgrades are recommendable.

Eddystone Station is not ADA accessible. Both platforms must be accessed from metal staircases, so people with significant mobility limitations are unable to reach them. Elevators, ramps, and high level platforms with tactile warning strips would improve Eddystone's ADA accessibility. ADA access to bus stops in the area varies considerably, but in general needs improvement.

The pedestrian network north of Eddystone Station is nearly complete; it has sidewalks with vegetated buffers and few challenging intersections. There is one access road and marked truck route to the Eddystone Crossings Shopping Center that is missing a sidewalk. Bus riders have been observed walking in the road from the shopping center to the eastbound 114 Bus stop on Chester Pike via this route.

The pedestrian network south of Eddystone Station poses more challenges. The most direct pedestrian route from the station to the residential and industrial neighborhood south of Route 291 is Saville Avenue. Saville Avenue has a sidewalk on only one side of the road, and it is in poor condition. Pedestrians crossing Route 291 on Saville Avenue need to traverse four busy travel lanes; 18,000 vehicles travel on Route 291 through Eddystone, many of which are trucks. There is one low visibility, standard crosswalk on Route 291 at the intersection but no pedestrian traffic signal.

The poor pedestrian network south of Route 291 affects riders of the SEPTA's 37 Bus. The eastbound 37 Bus stop located at the intersection of Saville Avenue and Route 291 is the only one accessible to Eddystone residents. It does not have a paved waiting or loading area, and wait times can be long due to infrequent service. Furthermore, there is no shelter or seating, and the Saville Avenue sidewalk does not extend to the bus stop. The eastbound 37 Bus service connects Eddystone residents to important employment centers, such as the Philadelphia International Airport and South Philadelphia.

Bicycle Network

Eddystone Station currently lacks bicycle parking, and it is not connected to on-road bicycle facilities or paved trails. Nevertheless, the

September 11th Memorial Trail and East Coast Greenway use Route 291, and an off-road multi-use path may be constructed in the future. The area from which Eddystone Station is likely to draw bicycle trips is relatively small and coincides with the neighborhoods from which it may draw pedestrian trips. Bicyclists traveling to the station from communities north and south of the station can find mostly low volume, low speed routes. Cyclists who wish to travel a more significant distance to the station from the east or west will find that Route 291 is the most direct route. At the moment, this roadway's lack of bicycle facilities, high traffic volume, heavy use by trucks, narrow shoulders, and relatively high speed limit of 35 miles per hour make it a high stress route for bicyclists. Bullens Lane provides the most direct route farther north to expand the station's bicycle trip catchment area, but without bicycle facilities along the corridor, most bicyclists would not consider it a viable option.



Figure 4-14: PA Route 291 and Saville Avenue, Eddystone Borough

Light Rail

Drexelbrook

Context

Drexelbrook Station is a stop on the I01 Trolley Line in Upper Darby Township. On average, there are 99 weekday boards and 103 alights at Drexelbrook Station. On-street parking is available near the station. North of the station, land use is mostly medium-density residential, and the I11 Bus runs along State Road. South of the station is the privately owned Drexelbrook neighborhood, which consists of fairly high-density residential land use, some commercial properties, and a special event center. The Drexeline Shopping Center is less than ½ of a mile west of the station, and the Aronimink Neighborhood Center sits about ½ of a mile to the east; each of these destinations has its own I01 Trolley stop.

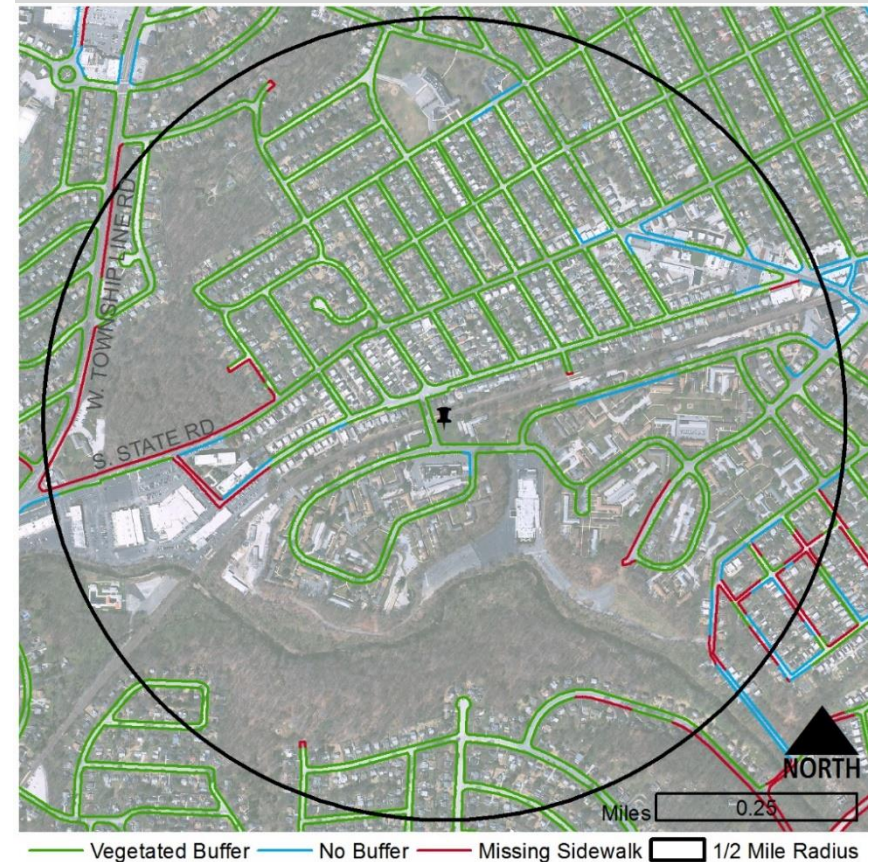


Figure 4-15: Drexelbrook Station, Upper Darby Township

Pedestrian Network

A strong pedestrian network is essential for Drexelbrook Station because neighboring I01 Trolley stations are located very close to it. Without a well-developed sidewalk network, transit users within the

Map 4-9: Drexelbrook Light Rail Sidewalk Conditions



Drexelbrook Station walkshed might opt to patronize other nearby stations with better pedestrian access. Generally, though, the pedestrian network surrounding the station is well-developed. Most roads in the area have sidewalks and many of the sidewalks even have vegetated buffers. Access to the station is adequate for people with disabilities, too, thanks to street level platforms connected to sidewalks on all sides. ADA access could be improved through the installation of tactile warning strips that help visually impaired passengers locate the platforms' edges, and the pedestrian network could be improved in a few key places to bolster accessibility for the general population.

The most significant lengths of missing sidewalk surrounding Drexelbrook Station are near the Drexline Shopping Center. Drexline Shopping Center is a popular destination for residents living in the Drexelbrook area, and gaps in the sidewalk network may inhibit pedestrian travel to the shopping center.

The State Road pedestrian crossing poses another challenge for pedestrians. The segment of State Road that is within the study area experiences a high traffic volume of 18,000 vehicles a day, and speeds on the roadway can be higher than the posted 30 mile-per-hour limit. Visibility is limited due to the hilly topography and curvature of the roadway. Trolley riders living north of State Road and people who work at Drexelbrook need to cross State Road regularly, as do bus riders accessing the III Bus which runs on this segment of State Road. There is one marked crosswalk on State Road at the intersection with Claredon Road near Drexelbrook Station. It is a standard crosswalk, making it difficult to notice. Many Drexelbrook Station trolley riders may find the crosswalk to be impractical because it is located on the western edge of the station's catchment area, away from the heart of the residential neighborhood north of State Road. Traffic calming features and additional high-visibility crosswalks on State Road could improve walking trips for pedestrians in the area.

Sidewalk coverage could be improved in the southeastern corner of the station's walkable buffer, as well. Residents here are more likely to use Aronimink Station than Drexelbrook, but completing the pedestrian network would make the streets navigable for all users, regardless of destination.

Bicycle Network

Drexelbrook Station currently has no bicycle parking, and no bicycle facilities are connected to it. Few cyclists are likely to access the station from the east or west because there are other stations ½ of a mile away in each of those directions that offer equal or higher levels of service and access, so access from the north and south are critical.

Most bicycle trips to the station from the south probably come from within the Drexelbrook neighborhood, which is already well suited for biking, with low speeds, low traffic volumes, and speed humps. The area to the north of the station which is likely to draw cyclists is generally bound by Township Line Road to the west and Burmont Road to the east. Most of the roads within this area are also local streets which many bicyclists would consider to be comfortable to navigate under current conditions. The most difficult part of a ride to the station from the north is crossing State Road. State Road has high traffic volumes, misaligned intersections, and poor visibility in some places. Cyclists crossing State Road from the north must enter traffic on State Road and turn across a traffic lane to access roads south of State Road. Many roads south of State Road are one-way, so cyclists have limited options as they turn south off State Road toward Drexelbrook, extending the amount of time they need to spend in traffic on the busy road.



Figure 4-16: Revere Road in Drexelbrook, Upper Darby Township

Garrett Hill

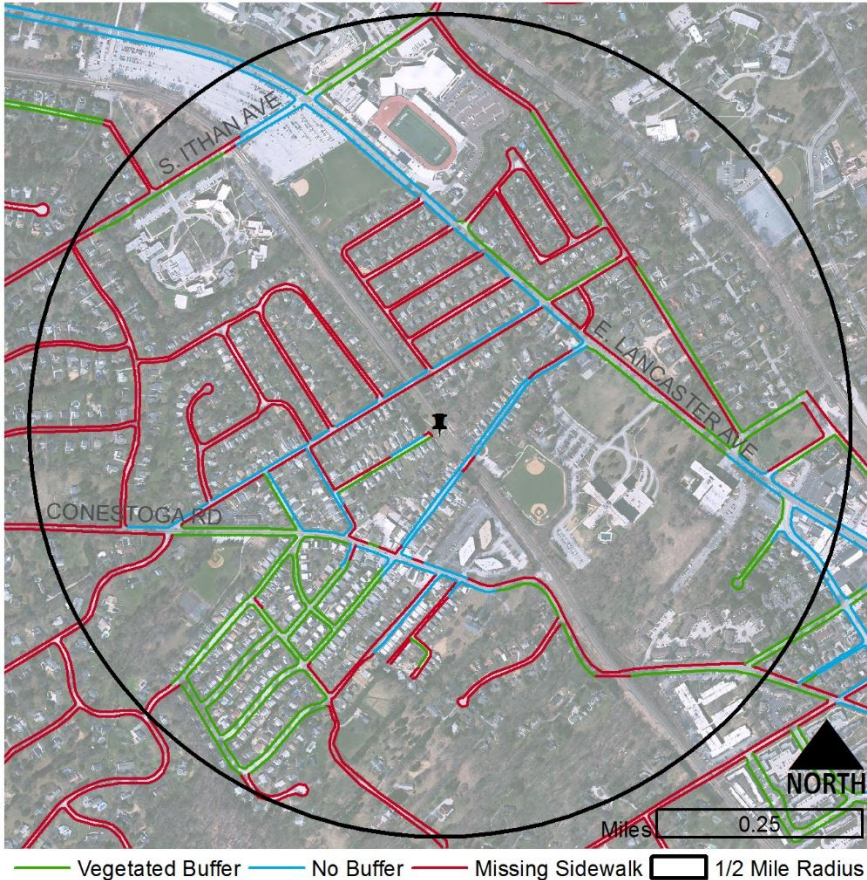
Context

Garrett Hill Station is located in Radnor Township on the Norristown High Speed Line (NHSL). Garrett Hill Station experiences a weekday average of 123 boards and 129 alights. The SEPTA 105 Bus operates near Garrett Hill Station, offering a transfer opportunity. There is on-street parking near the station. West of Garrett Hill, land use is mostly medium-density residential, with commercial properties and medical facilities located along Conestoga Road. East of the station, there is a mix of open space and high- and medium-density residential land uses leading up to Lancaster Avenue (U.S. Route 30), which is a commercial corridor that hosts commercial, mixed-use, and institutional properties. Villanova University is about 1/2 of a mile north of Garrett Hill, but most Villanova trips are likely captured by the Stadium and Villanova NHSL Stations as well as the Villanova Regional Rail Station.



Figure 4-17: Garrett Hill Station's inbound platform, Radnor Township

Map 4-10: Garrett Hill Light Rail Sidewalk Conditions



Pedestrian Network

To increase transit use at Garrett Hill Station, strong pedestrian access is essential because there are few parking spaces available in the area. The sidewalk network is well-developed in the small residential neighborhood located southwest of the station, as is evident in Map 4-9. However, the area within a 1/2-mile radius is characterized by several gaps in the sidewalk network. Access to the station for people with impaired mobility is particularly difficult. To access either platform, pedestrians need to traverse stairways and narrow, paved walkways

without handrails. The platforms also lack tactile warning strips for visually impaired passengers.

The medium-density residential neighborhood south of Conestoga road provides the best pedestrian access to Garrett Hill Station. Roads in the neighborhood have sidewalks with vegetated buffers on both sides of the road, with few exceptions. The most difficult part of walking trips from this community is crossing Conestoga Road, a collector street with high traffic volumes, but several intersections along the roadway have marked crosswalks, and “Yield to Pedestrian” signs. There are gaps in the sidewalk network on Conestoga Road, which limits mobility and access to the station. However, every road north of Conestoga Road that connects to the station has a sidewalk on at least one side, and traffic volumes and speeds are low.

Pedestrians travelling from the area north of Lowry’s Lane have a more challenging commute. The residential neighborhoods there have almost no sidewalks, and there is only one marked crosswalk on Lowry’s Lane at its intersection with Lancaster Avenue. At the same time, Lowry’s Lane does not experience particularly high traffic volumes, and it has speed humps that help calm traffic.

Pedestrian trips from Lancaster Avenue and the area east of Lancaster Avenue are also constrained by an incomplete sidewalk network. Lancaster Avenue is a commercial corridor with bus service. Villanova University’s main campus is also located on Lancaster Avenue. This corridor connects the mixed-use neighborhoods of Rosemont and Bryn Mawr, east of Garrett Hill Station. There are lengths of missing sidewalk near Garrett Hill on Lancaster Avenue, and there are several gaps in the sidewalk network in the residential neighborhoods on the westbound side of Lancaster Avenue. Considering the high volume of pedestrian and vehicular (AADT of 21,000 vehicles a day) traffic on this segment of Lancaster Avenue, safety is paramount. A pedestrian bridge is currently under construction across Lancaster Avenue at the Ithan Avenue intersection.

Bicycle Network

Garrett Hill Station has no bicycle parking, and it is not connected to any bicycle facilities. Most bicycle trips to Garrett Hill Station would likely come from the residential communities east and west of the NHSL railway. Communities to the north and south of Garrett Hill Station are served by other NHSL stations that offer a comparable level of service. Bicyclists travelling to Garrett Hill from both the east and the west can utilize local streets that have relatively low traffic volumes and low speeds. Lowry’s Lane and Garrett Avenue, collector streets with low traffic volumes, low speeds, and traffic calming features, provide the most direct access for cyclists (see Figure 4-17). Cyclists travelling to Garrett Hill Station from the west need to cross Conestoga Road, which could be challenging because it is a high volume roadway with misaligned intersections.



Figure 4-18: Garrett Avenue, Radnor Township

CENTRAL PLACES

Delaware County is home to a diverse range of Central Places, defined in Delaware County 2035 as community focal points that help to establish a unique sense of place. Central Places case studies provide an overview of existing conditions at four distinct Central Place typologies: Urbanized Centers (69th Street Transportation Center), Town Centers (Boothwyn), Neighborhood Centers (Morton Borough), and Activity Corridors (West Chester Pike). Central Places differ from one another in terms of scale, land use, and transportation network characteristics, but adequate pedestrian amenities are essential for all.



Figure 4-19: 69th Street, Upper Darby Township

Several of Delaware County’s Central Places benefit from exceptionally well-developed sidewalk networks. Chart 4-3 shows that sidewalks comprise nearly two-thirds (64 percent) of roadside mileage at Central Places case studies, the greatest share of roadside mileage for any case study type. Nonetheless, there are many opportunities for pedestrian and bicycle facility improvement at Central Places.

Case studies reveal a range of issues that currently limit mobility at Central Places and provide insight into opportunities to enhance transportation networks. Some of the existing conditions identified in the case studies are consistent across Central Place typologies, such as the need for more and higher visibility crosswalks.

Meanwhile, some issues are more specific to one typology than others, such as the pedestrian safety risk created by particularly high speed limits along segments of the West Chester Pike Activity Corridor. The case study analysis in this chapter can guide readers who are interested in improving these Central Places and others as they develop plans to improve walking and bicycling access to their communities of interest.

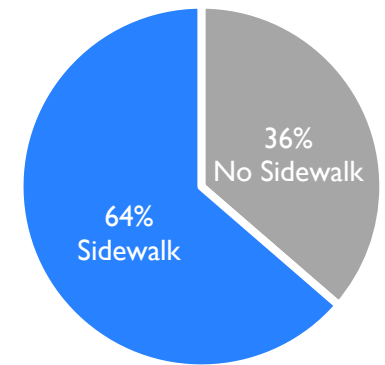


Chart 4-3: Combined Sidewalk Coverage for Central Place Case Studies

Urbanized Centers

69th Street Transportation Center

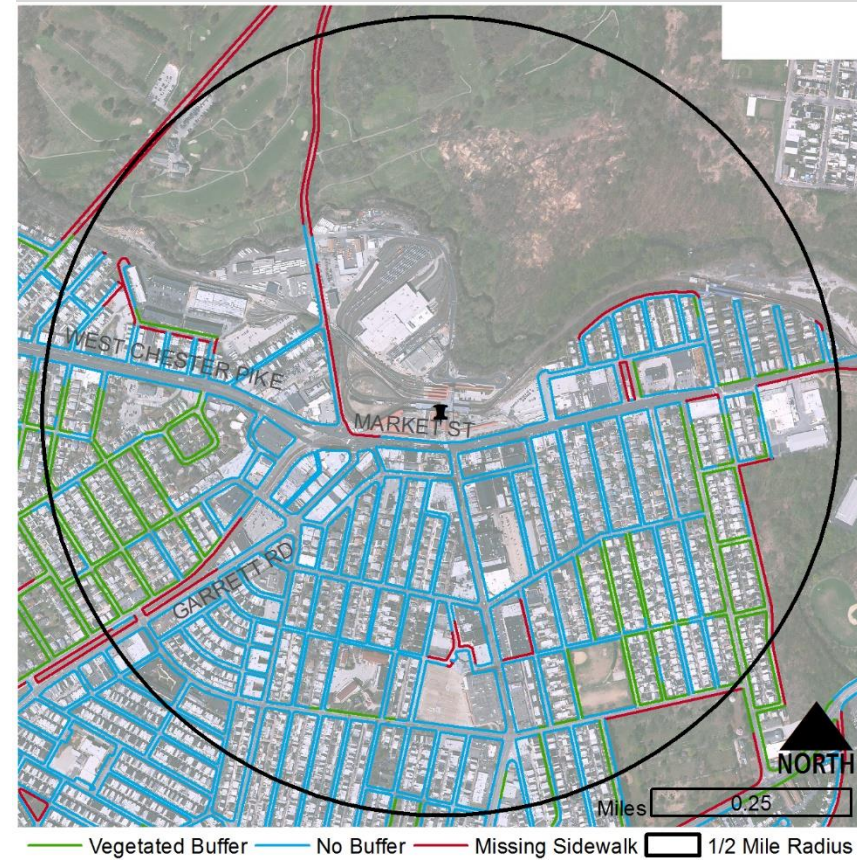
Context

69th Street Transportation Center is an Urbanized Center located on Delaware County's border with Philadelphia in Upper Darby Township. It serves as a major transit hub for the SEPTA system and Delaware County. On an average weekday, 15,394 people pass through the turnstiles of 69th Street's Market-Frankford Line station, while thousands more board buses, trolleys, and the NHSL, accessing the transit hub's 22 connected transit lines. People are also drawn to the area surrounding the transportation center, which has high residential density, for work and entertainment. On-street parking and some surface parking lots exist nearby in addition to SEPTA's parking lot, which has 182 parking spaces. The area surrounding the transportation center experiences high rates of pedestrian use because of the intense concentration of commercial activity, residences, and public transportation facilities.



Figure 4-20: 69th Street Transportation Center, Upper Darby Township

Map 4-11: 69th Street Transportation Center Sidewalk Conditions



Pedestrian Network

Free pedestrian movement surrounding 69th Street Transportation Center is vital to the economy of the adjacent community, and ample pedestrian access to the transportation center is key to its success as a multimodal transit hub for Delaware County and the greater SEPTA system. Generally, the pedestrian network surrounding 69th Street Transportation Center is well developed with few consequential gaps. ADA access is strong, too. The recently renovated trolley and bus loops at the transportation center are ADA accessible, as are the 69th Street stations on the Market-Frankford Line and NHSL.

Although the pedestrian network is well developed, enhancement opportunities exist. For example, most sidewalks surrounding 69th Street Transportation Center do not have vegetated buffers. Where space permits, installing vegetated buffers can improve pedestrian comfort and perceived safety. Improving pedestrian safety remains an important issue for 69th Street. According to PennDOT, in the five-year period between 2010 and 2014, 78 pedestrians were hit by a vehicle in the study area: six of those pedestrians sustained major injuries. More visible crosswalks, better pedestrian crossing signals, and pedestrian refuge islands could be installed in some locations to improve safety. Traffic patterns and speeds could be altered – especially on Market Street, where the speed limit is 35 miles per hour, despite heavy pedestrian traffic – to reduce crash risks as well as the severity of crash-induced injuries.

Bicycle Network

Several bicycle racks, capable of holding about 22 bicycles, exist at the transportation center's 69th and Market Streets entrance. No on-road bicycle facilities or paved trails connect directly to the transportation center, but there are bike facilities nearby. Just outside of the ½-mile radius, the Cobbs Creek Trail runs south alongside 63rd Street and the Cobbs Creek Parkway all the way to 70th Street near Darby Borough, and on-road bike lanes along Spruce, Walnut, and Market Streets in Philadelphia reach 63rd Street and the Cobbs Creek Trail just outside of the study area. Many of the roadways around the transportation center are congested, and cyclists may not feel comfortable riding on them without designated bicycle facilities. Considering 69th Street's function as a major transit hub, the high population density of the surrounding area, and the existence of nearby bicycle facilities offering access to and from Philadelphia, it is likely that bicycle facilities connecting directly to the station would be well used.



Figure 4-21: 69th Street, Upper Darby Township



Figure 4-22: Market Street and West Chester Pike, Upper Darby Township

Town Centers

Boothwyn

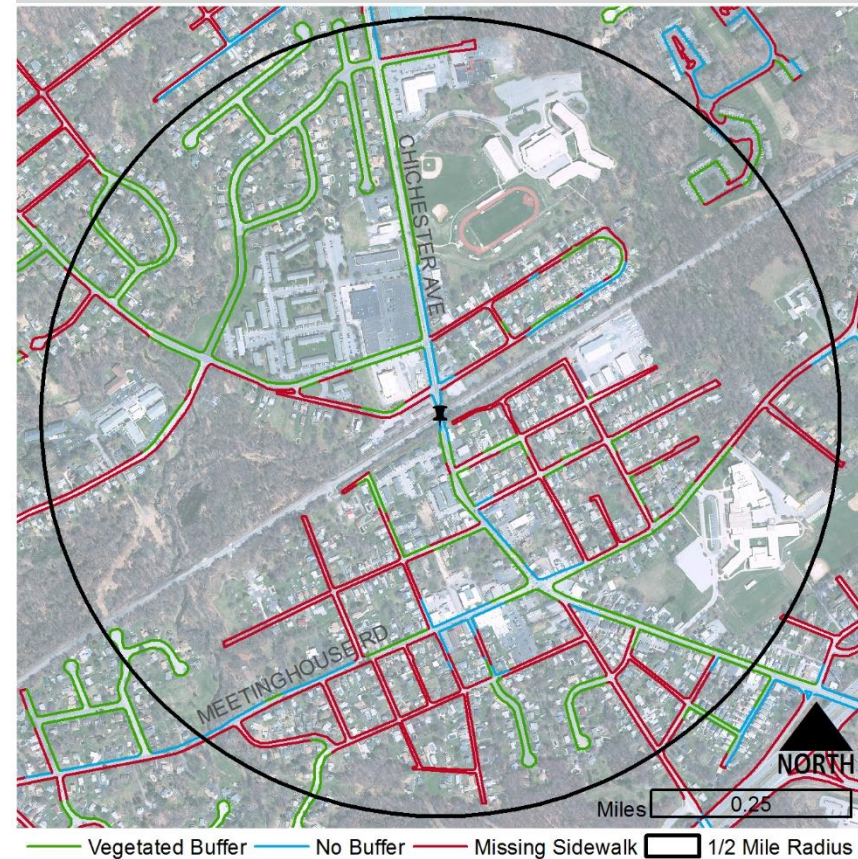
Context

Boothwyn is a Town Center in Upper Chichester Township, centered around Chichester Avenue and Meetinghouse Road. The 119 Bus travels through Boothwyn along Chichester Avenue. The bus carries an average of 710 riders a day, but only a fraction of those trips begin or end in Boothwyn. Many destinations along Chichester Avenue and Meetinghouse Road feature surface parking lots, and most homes in the area have their own driveways, so there is no shortage of parking. Land use at the center of Boothwyn along Chichester Avenue and Meetinghouse Road is mostly comprised of commercial properties and offices, while adjacent communities primarily consist of single-family detached homes, with a few apartment buildings located west of Chichester Avenue and north of CSX train tracks that bisect the study area diagonally. Two public schools are located east of Chichester Avenue within the ½-mile radius, and one is located just south of the radius off Blueball Avenue.



Figure 4-23: Chichester Avenue and Meetinghouse Road, Upper Chichester Township

Map 4-12: Boothwyn Town Center Sidewalk Conditions



Pedestrian Network

As a Town Center, Boothwyn is a small-scale, locally significant center of commercial and cultural activity for the surrounding community. It also hosts bus service and multiple schools. These factors create a need for a fully functional pedestrian network that effectively serves a wide variety of users. Under current conditions, sidewalk coverage in Boothwyn varies considerably, with the strongest coverage along Chichester Avenue and the weakest coverage in the residential communities east and west of Chichester Avenue.

Pedestrians are accommodated well along Chichester Avenue. Sidewalks exist along nearly the entire length of the road in Boothwyn. Other pedestrian amenities include several high-visibility crosswalks and five bus shelters with seating in the area north of the bridge over the CSX tracks. The pedestrian network on Chichester Avenue could be improved by including a pedestrian signal at the Bethel/Thornton Road intersection and by upgrading the pedestrian signal at the Meetinghouse Road intersection to include a countdown for pedestrian crossings.

Boothwyn's secondary corridor, Meetinghouse Road, is less pedestrian-friendly. Missing sidewalks along the southern roadside of Meetinghouse Road west of its intersection with Chichester Avenue hinder pedestrian travel from nearby residences to destinations at Boothwyn's center. Missing sidewalks along the northern side of Meetinghouse Road east of its intersection with Chichester Avenue not only hinder pedestrian access to the Town Center but also limit access to Chichester Middle School for students travelling to the school from the north. There are two standard crosswalks along Meetinghouse Road in front of the school, but the northernmost entrance has no marked crosswalk. Repairing and extending a paved path from Vernon Avenue to the school's existing paved paths would improve access for students south of the school.

The pedestrian network surrounding Chichester High School is more complete. There are sidewalks with vegetated buffers along the school's Chichester Avenue frontage, and there are continental crosswalks at the nearest intersections. There is no marked crosswalk at the mid-block crossing on Chichester Avenue to the main entrance of the school. Students travelling to school from the Willowbrook Apartments, located across Chichester Avenue from the main entrance, may be tempted to cross at the unmarked mid-block crossing, a potentially dangerous proposition considering the high traffic volume and considerable width of the roadway. Because the high school draws students from many parts of Boothwyn, missing sidewalks in adjacent streets limit access to the school.

Bicycle Network

There are no bicycle facilities on the roadways in Boothwyn and the shoulders are narrow, but bicyclists do cycle in this area. Traffic volumes along Chichester Avenue in Boothwyn are high; one segment has an AADT of 20,000 vehicles per day. Meetinghouse Road has lower traffic volumes and wider shoulders than Chichester Avenue. Travel to either of these roadways from the surrounding residential neighborhoods is relatively low stress.

There are three schools within a mile of Boothwyn Town Center. Most students would need to travel on Chichester Avenue to bicycle to school. As mentioned previously, however, there are no bicycle facilities on this roadway.



Figure 4-24: Chichester Ave and Boothwyn and Kingsman Roads, Upper Chichester Township

Neighborhood Centers

Morton Borough

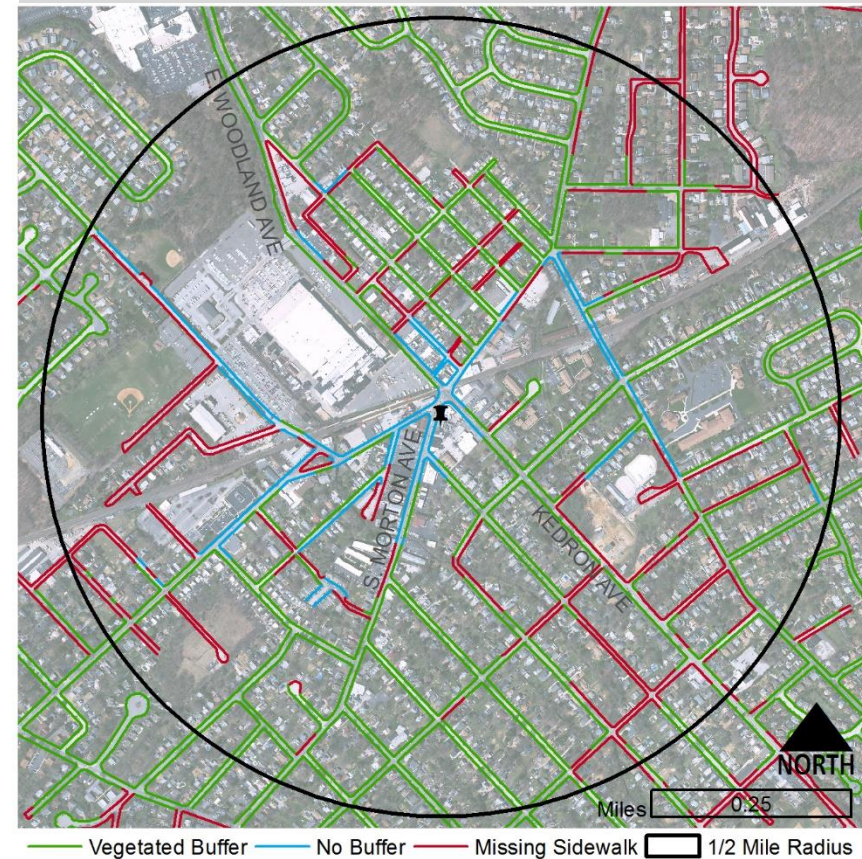
Context

Morton Borough functions as a Neighborhood Center positioned around the intersection of PA Route 420 and Morton Avenue. It has regional rail service from the Media/Elwyn Line at Morton Station and bus service from the 107 Bus along Route 420. Morton Station averages 515 boards and 606 alights a day. The 107 Bus carries 1,092 passengers daily, although only a fraction of 107 Bus passengers board or alight in Morton Borough. SEPTA reports 342 commuter parking spaces near Morton Station in addition to on-street parking. A shopping center surrounded by a large surface parking lot is located along Route 420 north of Morton Station. At the center of Morton Borough, there is a core of attached mixed-use and commercial buildings, which are surrounded by medium-density residential developments and some apartment and condominium buildings.



Figure 4-25: Morton Avenue and Yale Avenue, Morton Borough

Map 4-13: Morton Borough Sidewalk Conditions



Pedestrian Network

Morton has high potential in terms of walkability because of its strong transit access, pedestrian-oriented central business district, and relatively dense residential communities. Morton's sidewalk network is already reasonably well developed, but improving the overall pedestrian network can help it realize its full potential.

One impactful deficiency in the pedestrian network is the Church Road unmarked mid-block crossing. Many commuters park at the Church Road parking lot and walk south along Church Road on their way to

Morton Station. Just north of the train tracks, pedestrians cross Church Road to access a paved walking path that leads to the station, but there is no marked crosswalk to provide safe pedestrian access to the walking path.

Pedestrian crossings at Morton's main intersections of Morton Avenue and Route 420 are also difficult. The four-leg intersection culminates at the at-grade crossing with the Media/Elwyn Line rail tracks. Of all the roads that converge on this intersection, only the segment of Morton Avenue north of Route 420 does not have a marked crosswalk. However, all crosswalks near the intersection are low-visibility, standard crosswalks, and this intersection does not have pedestrian signals. Considering the high traffic volumes of 14,000 and 8,800 vehicles a day on these segments of Route 420 and Morton Avenue respectively, improved pedestrian amenities are needed at this intersection.

Just west of the intersection of Route 420 and Morton Avenue, Yale Avenue merges into Morton Avenue, creating an awkward intersection with many turning movements. There is no marked crosswalk at the convergence of Yale and Morton Avenues, and the stop sign on Yale Avenue is a temporary sign held in place by parking chocks. The stop sign's post is shorter than a permanent sign and the sign's face is smaller, making it less visible than a traditional stop sign. Furthermore, a lack of pavement markings makes merging confusing for drivers. Improving pedestrian amenities at the intersection would improve the safety and attractiveness of pedestrian trips to Morton Station and Morton's central business district.

Bicycle Network

Morton Station has four bicycle racks capable of accommodating eight bicycles. Bicyclists' Baltimore Pike provides a bicycle route to the station for cyclists travelling from the east and west. Because of the grid pattern of local streets south of the station, many cyclists coming from that direction can find relatively comfortable routes to the station that do not rely on heavily trafficked, solely auto-oriented roadways for significant distances.

Bicycle access from the north is more challenging because the street pattern there is less continuous. Few local streets and low volume roadways provide direct access to the station. Cyclists traveling from the north need to utilize higher volume collector streets with inconsistent, sometimes narrow shoulders to access Morton. Without bicycle facilities, many bicyclists may not be comfortable riding to Morton from the north.



Figure 4-26: PA Route 420 and Morton Avenue, Morton Borough

Activity Corridors

West Chester Pike

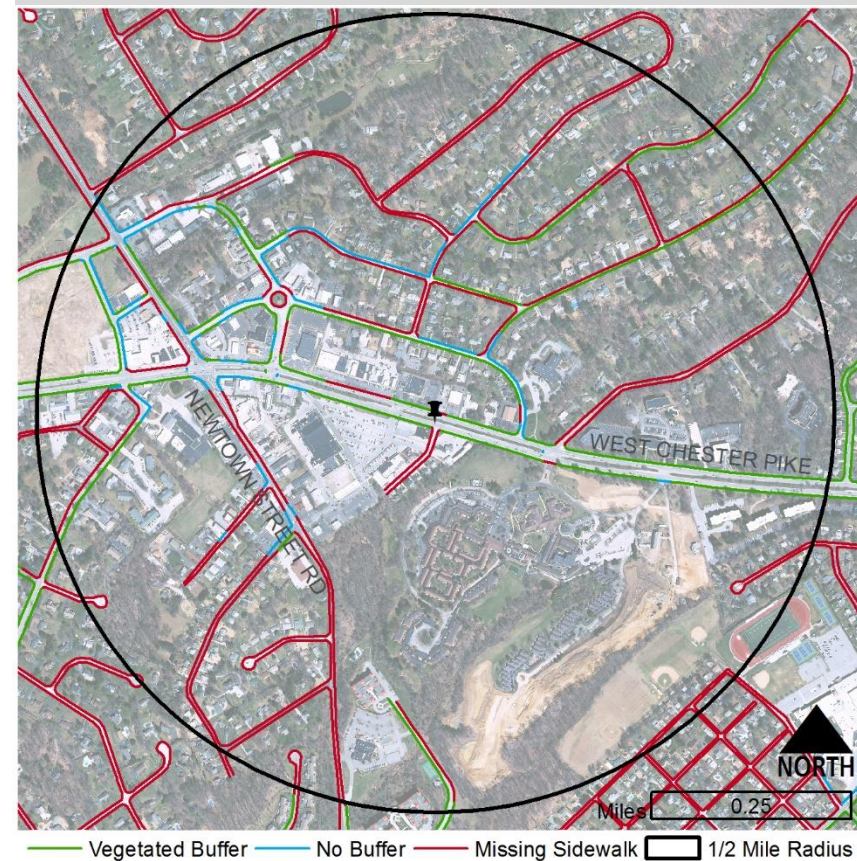
Context

West Chester Pike (PA Route 3) functions as an Activity Corridor in Delaware County, where it extends from from 69th Street Transportation Center in Upper Darby through Haverford, Marple, Newtown, and Edgmont Townships. Buses 104, 112, 115, 120, 123, and 126 operate along the corridor with a combined daily ridership of 7,876 passengers, making it an important public transit corridor. Despite the variety of transit options available on West Chester Pike, there is significant congestion there. Much of West Chester Pike is surrounded by a mix of retail, social, and employment opportunities as well as residential neighborhoods. The intensity and diversity of activity varies geographically, but it is generally higher in the east than in the west. Most businesses along Route 3 have surface parking lots.



Figure 4-27: West Chester Pike and Newtown Street Road Intersection, Newtown Township

Map 4-14: PA Route 3 Sidewalk Conditions in Newtown Square



Pedestrian Network

A fully developed pedestrian network along the West Chester Pike Activity Corridor could greatly improve walkability for surrounding communities, many of which are already geographically close to destinations on the corridor but may lack the infrastructure to access them on foot or in a wheelchair. Improving pedestrian access to transit stops, specifically, can make transit a more attractive transportation option for people who currently travel through the corridor in a personal vehicle. Additionally, stronger pedestrian access to transit stops on West Chester Pike would be a step toward creating the

conditions necessary for enhanced bus service to thrive there, something which DVRPC has explored with the *Enhanced Bus Service on West Chester Pike* study and which is currently being pursued by a diverse group of stakeholders known as the West Chester Pike Coalition.

Currently, sidewalk conditions vary along West Chester Pike. In the east, sidewalks on West Chester Pike and in surrounding neighborhoods are well developed. Sidewalk coverage generally decreases moving west, and in the farthest western edge of the County, sidewalks are missing on most of West Chester Pike itself, as well as in surrounding low-density residential communities.

High volume intersections along West Chester Pike have marked crosswalks and pedestrian traffic signals, but some less commonly used intersections lack such features. Unmarked and unsignalized crosswalks along the corridor can be difficult for pedestrians to navigate, in part, because of the width of the four-lane arterial roadway. Some segments of West Chester Pike are as wide as 100 feet. Long crossings are more comfortable for pedestrians to navigate in eastern segments of West Chester Pike where wide vegetated medians exist at many intersections and serve as pedestrian refuge islands. Medians become slimmer and more scarce as one travels west along the corridor.

High traffic volumes and speeds also make crossing West Chester Pike difficult in some places. The westernmost segment in Delaware County from Boot Road in Newtown Township to the County boundary in Edgmont Township, has a speed limit of 55 miles per hour and carries nearly 30,000 vehicles per day. Bus stops exist on these segments of the roadway, which have no paved waiting or loading area and are not connected to sidewalks or marked crosswalks to facilitate pedestrian movement. East of Boot Road, the speed limit drops to 40 miles per hour for the largest section of the road within the County, but some of these segments are the most heavily used in the County with traffic volumes as high as 39,000 vehicles a day near I-476. East of Township Line Road in Upper Darby, the speed limit drops to 35 miles per hour

where population density is higher, but pedestrian safety is still an issue, and the road has a high pedestrian crash rate. Targeted improvements to sidewalks, marked crosswalks, pedestrian signals, refuge islands, and transit stops can improve pedestrian mobility along West Chester Pike and increase the attractiveness of transit service, potentially significantly alleviating traffic congestion.

Bicycle Network

There are no bicycle facilities on West Chester Pike. Residents east of I-476 and south of West Chester Pike can utilize the Darby Creek Trail to access the corridor but cannot travel safely by bicycle on West Chester Pike. It is possible to access the highway from surrounding, low stress residential streets, particularly in central and eastern communities. In the west, collector streets with little or no shoulder and relatively high speeds are often the only option for bicyclists; without bicycle facilities, a smaller number of bicyclists are comfortable using these roads.



Figure 4-28: West Chester Pike, Edgmont Township

RESIDENTIAL NEIGHBORHOODS

Residential neighborhoods in Delaware County range from Mature Neighborhoods – well-established places with mostly built-out infrastructure and strong transit access – to Growing Suburbs – places that are experiencing or are forecast to experience growth and feature more auto-oriented transportation networks. In any community, strong pedestrian networks can connect residents with one another as well as employers, schools, recreational facilities, and more.



Figure 4-29: Mature residential neighborhood, Lawrence Road and Rittenhouse Circle intersection, Haverford Township

The pedestrian networks of Mature Neighborhoods and Growing Suburbs are typically quite different from one another. Although Chart 4-4 shows that the sidewalk networks of the two residential neighborhood case studies combine to provide relatively strong sidewalk coverage (61 percent), analysis of the individual case studies reveals significant differences in the sidewalk networks of the two neighborhoods. The Mature Neighborhood (Lawrence Road/Eagle Road in Haverford Township) features a nearly complete sidewalk network,

while the Growing Suburb (Nicole Drive and Wendy Way in Bethel Township) is dominated by missing sidewalks.

Sidewalk coverage is effective in providing a general sense of the walkability of a neighborhood, but many other factors contribute to the quality of its transportation network. Residential neighborhood case studies examine a number of those factors to provide a more nuanced analysis of transportation network conditions.

Case study analysis reveals some issues that affect both case study neighborhoods. In both communities, there are gaps in the sidewalk network that isolate sections of neighborhoods from their surroundings. The case studies also highlight issues that are specific to either Mature Neighborhoods or Growing Suburbs. For example, the emphasis on the potential of pedestrian and bicycle facilities to not only connect residents with recreational facilities, but also to serve as recreational facilities themselves, is unique to Growing Suburbs. Residents of neighborhoods across the County can use the analysis in the case studies to improve walkability where they live.

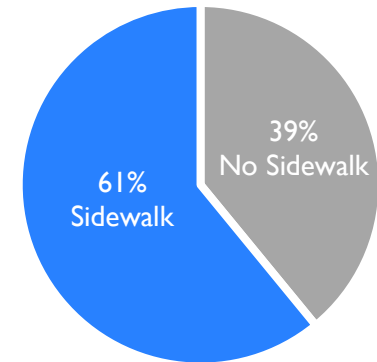


Chart 4-4: Combined Sidewalk Coverage for Residential Neighborhood Case Studies

Mature Neighborhood

Lawrence Road/Eagle Road

Context

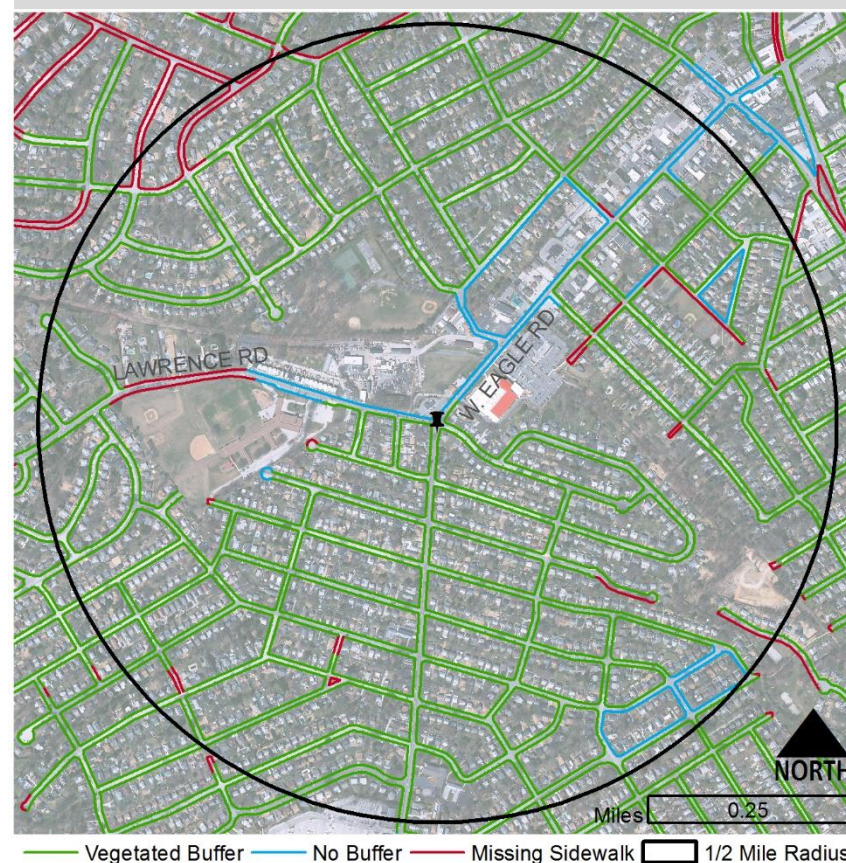
The intersection of Lawrence Road and Eagle Road is a central junction in Haverford Township. Lawrence and Eagle Roads provide fundamental connections between PA Route 3 – which provides access to I-476, residential neighborhoods, and downtown Havertown. In addition, the Haverford Area YMCA is a major community destination located just north of this intersection; it is accessible via bicycle or on foot. The Penny Trail begins at the rear of the YMCA parking lot, and it connects this junction to residential neighborhoods just east.



Figure 4-30: Eagle Road south of Lawrence Road intersection, Haverford Township

Lawrence Road serves as a collector street, connecting numerous residential developments and residences from the intersection with Eagle Road (east) to the intersection with PA Route 3 (west). Lawrence Road has a sharp curvature and steep incline. Therefore, driver visibility is low in both directions. The design of the roadway is not conducive to speeding, but the 35-mile-per-hour speed limit may be exceeded. Eagle Road also connects numerous residential developments to PA Route 3,

Map 4-15: Lawrence Road and Eagle Road Sidewalk Conditions



but the land uses that front it are predominantly commercial. The speed limit on Eagle Road is also 35 miles per hour. The roadway is narrow, and peak hour congestion is common at the intersection with Lawrence Road. Eagle Road is a relatively straight road, but it has numerous curb cuts. Each business has its own access, resulting in numerous turn movements that can endanger pedestrians.

Pedestrian Network

Lawrence Road and Eagle Road both provide sidewalk connections to destinations, but conditions for pedestrians differ greatly between the

two. Mobility is especially important in this predominantly residential area because of the presence of the YMCA, a large community facility with limited parking.

Lawrence Road has two marked crosswalks: one standard crosswalk at the intersection with Eagle Road and one continental crosswalk in front of Lynnwood Elementary School. The segment of Lawrence Road in front of this school is also a designated school zone. There are sidewalks on both sides of the road from the Eagle Road intersection to just before the end of the school zone. As shown in Map 4-14, there are no sidewalks along Lynnwood Park. The lack of pedestrian facilities discourages access from Lawrence Road to this public park.

There are two signed, unmarked pedestrian crossings between the elementary school and PA Route 3. One is located at Mount Pleasant Road, where the westbound sidewalk begins on both sides of the road, and it connects residential neighborhoods on either side of Lawrence Road. Farther west, there are only sidewalks on the north side of the road from the Tyson Road intersection, and there are no sidewalks on either side of the road from Ellis Road to PA Route 3. The residential developments that connect to Lawrence Road have excellent sidewalk networks. They also all have vegetated buffer. (see Map 4-14). At the same time, the developments are not well connected to one another, resulting in “sidewalks to nowhere.” Residents would benefit greatly from being able to safely walk to friends’ houses along Lawrence Road or commercial destinations on Eagle Road. The gaps in the sidewalk network along Lawrence Road currently prevent this.

Eagle Road has sidewalks on either side of the roadway and marked crosswalks at each intersection. Furthermore, many of the sidewalks have ADA-compliant ramps.

Bicycle Network

Children and adults bicycle on Lawrence and Eagle Roads for leisure and to reach destinations on Eagle Road. Younger bicyclists tend to use the sidewalks, where they exist. All bicyclists can be seen using the roadway where there are no sidewalks.

There is a shoulder on each side of Eagle Road north from the Brierwood Road intersection to the intersection with Lawrence Road. This segment of Eagle Road could be ideal for the addition of a bicycle lane. North of Lawrence Road and south of Brierwood Road, there is limited right-of-way.

Lawrence Road has a shoulder on either side from the PA Route 3 intersection to the Eagle Road intersection. A bicycle lane could be added to one – or both – sides of Lawrence Road. Given the design of this roadway, a wider bicycle lane on the south side, providing direct access to Lynnwood Elementary School, could provide a safer route for those who already use Lawrence Road to reach their destinations.



Figure 4-31: Lawrence Road west of Eagle Road intersection, Haverford Township

Growing Suburb

Nicole Drive and Wendy Way

Context

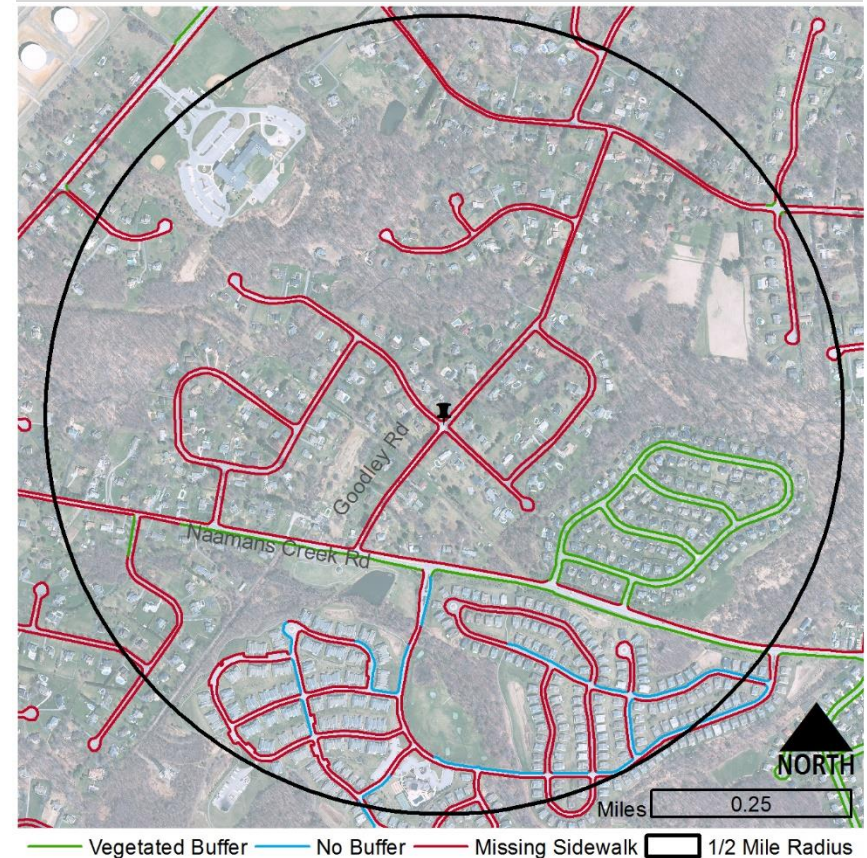
Unlike in Mature Neighborhoods such as Haverford Township, arterial and collector streets in Growing Suburbs such as Bethel Township do not have a variety of surrounding land uses. Most uses are residential. To capture the uniqueness of this suburban environment, Nicole Drive and Wendy Way, two local residential streets, are described herein.

Nicole Drive and Wendy Way are located off of Goodley Road. The two streets are connected and comprise the backbone of a residential development. They provide access to 19 single-family homes. As a result, they experience very low traffic volumes. Goodley Road has a speed limit of 25 miles per hour and also experiences low traffic volumes, and Naaman’s Creek Road (PA Route 491) has an average annual daily traffic (AADT) count of 6,273 vehicles per day. Goodley Road provides access to PA Route 491 for residents living in that area. John T. Adkinson Park is located less than 1/5 of a mile from Nicole Drive, which is theoretically a less-than-five-minute walk.



Figure 4-32: PA Route 491 and Goodley Road intersection, Bethel Township

Map 4-16: Nicole Drive and Wendy Way Sidewalk Conditions



Pedestrian Network

There are many similar residential streets in Delaware County’s Growing Suburbs that are well-connected when considering motor vehicle travel but isolated when considering non-motorized means. One needs a private vehicle in order to access destinations and be mobile in Growing Suburbs. This characteristic is certainly a disadvantage to vulnerable and protected populations who may not have a driver’s license such as children, the elderly, the disabled, those convicted of certain crimes, and the economically disadvantaged. Unfortunately,

vulnerable and protected populations may not live in areas that provide safe and complete pedestrian, bicyclist, and transit networks.

Map 4-15 shows the conditions of the sidewalk network within a ½-mile radius of the Nicole Drive and Wendy Way neighborhood. One nearby neighborhood just south of Nicole Drive and Wendy Way has a complete sidewalk network. However, the sidewalks end at the development's entrances on Naaman's Creek Road. There are sidewalks on the other side of Naaman's Creek Road which lead to north to the park and south to other residential neighborhoods. The important fact to highlight here is the tremendous potential of this Growing Suburb in terms of local connections. Some developments along Naaman's Creek Road have complete sidewalk networks with vegetated buffers, and these developments are even connected to one another by the sidewalk on the south side of Naaman's Creek Road. Nevertheless, other neighborhoods remain isolated.

Access to local destinations are important. Completing the sidewalk connections in this and similar areas in Delaware County would increase mobility in otherwise car-dependant areas and even provide walking routes for recreation. In the case of Nicole Drive and Wendy Way, there are no pedestrian facilities leading to the nearby park or elementary school, Bethel Springs Elementary School, from the surrounding residential neighborhoods. Though the speed limit is 25 miles per hour on PA Route 491 and there are sidewalks directly in front of the park, there are no connecting sidewalks or marked pedestrian crossings on PA Route 491. Most developments in the area have ADA-compliant ramps, but there are no marked crosswalks at the entrance of any developments or across Naaman's Creek Road.

Bethel Springs Elementary School is located just north of the case study neighborhood. Improving sidewalk connections in this area would improve connections to the school and would allow schoolchildren to walk within ½ of a mile of the school. In this way, the school district would not need to provide additional transportation service to those

living within walking distance, having a beneficial impact on traffic congestion, air quality, and safety in the future.

Bicycle Network

There are no marked shoulders on Naaman's Creek Road or Goodley Road, but these two roadways have low speed limits and few travel lanes (two). At the same time, visibility is low and these roads are narrow. In order to make these roadways more comfortable for cyclists, bicycle facilities such as marked shoulders, signage, or sharrows would be appropriate. Foulk Road (PA Route 261), on which Bethel Springs Elementary School is located, has marked shoulders on either side of the roadway that could be used for cycling.

Residential streets in the area such as Nicole Drive and Wendy Way are comfortable cycling roads, but they are not typically connected by a grid street pattern. Therefore, cyclists of all levels cannot comfortably venture beyond the limits of their own residential pocket without traversing a higher volume roadway.



Figure 4-33: Goodley Road, Bethel Township

AREAS OF SPECIAL CONCERN

Individual areas of special concern differ from one another significantly. Area of special concern case studies include an industrial park (Lawrence Industrial Park), a commercial destination (Media Shopping Center), and an elderly care facility (Plush Mills Senior Living). Despite their differences, the three locations share some transportation network characteristics. Pedestrian access is a necessity at all areas of special concern, as they serve as origins or destinations for many trips.



Figure 4-34: Area of Special Concern, Media Shopping Center, Media Borough and Nether Providence Township

More than 61 percent of roadside mileage within areas of special concern case studies consists of missing sidewalks (see Chart 4-5), giving areas of special concern the poorest sidewalk coverage of any case study type. Due to the diverse nature of areas of special concern, it is likely that sidewalk coverage varies considerably from one area of special concern to another. Nevertheless, the low sidewalk coverage revealed at case studies suggests that there may be ample room for improvement at many areas of special concern throughout Delaware County. Individual case studies provide more in-depth analysis of

existing conditions to expose context-specific opportunities for improvement.

Some pedestrian and bicycle network limitations are present at all three area of special concern case study locations. Among the shared issues are particularly impactful gaps in the sidewalk network, insufficient bicycle facilities, and inadequate crosswalks. The case studies also reveal some problems that are particular to individual types of areas of special concern. The challenge to pedestrian mobility posed by the expansive parking lot and poor sidewalk connectivity at Media Shopping Center is one that can be found at many commercial destinations in Delaware County. The variety of areas of special concern covered in these case studies yields analysis and opportunities for improvement that are relevant to several different areas of special concern across Delaware County.

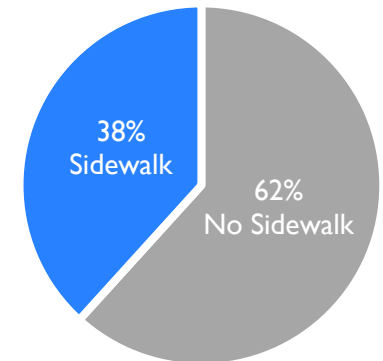


Chart 4-5: Combined Sidewalk Coverage for Area of Special Concern Case Studies

Industrial Parks

Lawrence Industrial Park

Context

Lawrence Industrial Park is located in Marple Township, Delaware County; it is part of the larger Lawrence Park development. Planned by Upper Darby native Ralph Bodek, Lawrence Park was built in the late 1950s. Because approximately 200 acres were zoned for light industrial uses, Lawrence Park became a prototypical mixed use development during suburbanization (2016 Dixon). The plans for the development incorporated common open spaces, such as Lawrence Park, and sites for schools, such as Loomis Elementary School (2015 Lane). As is evident in Map 4-16, a curvilinear street design was implemented, and the residential development included sidewalks (though there was no transit service to the area at the time of its inception).

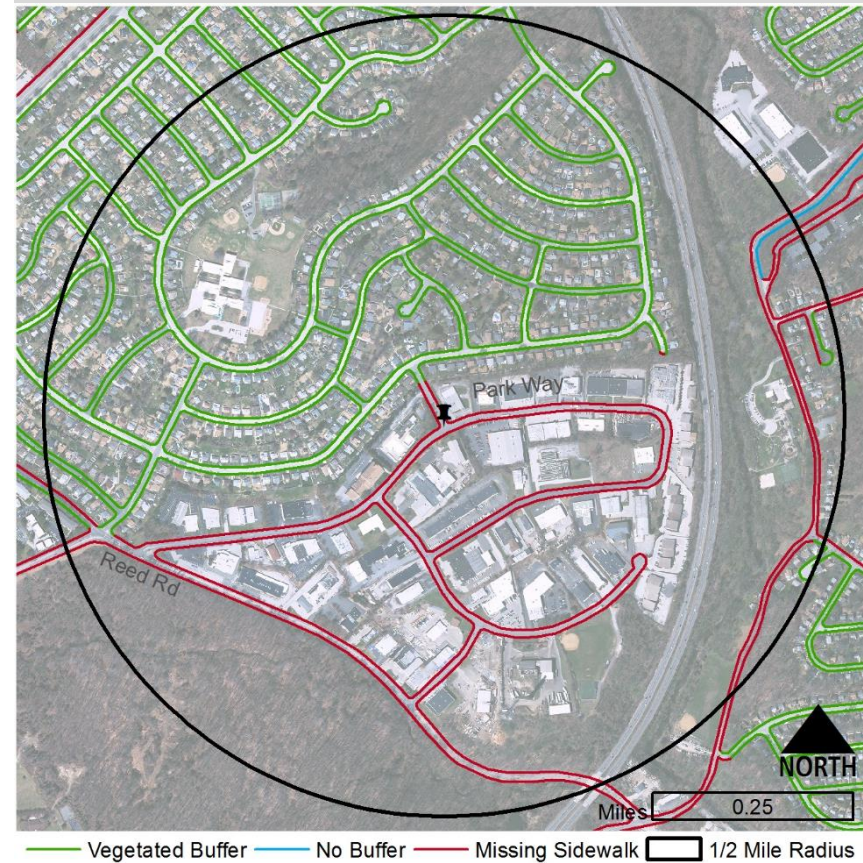


Figure 4-35: Sussex Boulevard in Lawrence Industrial Park, Marple Township

Today, the Lawrence Park area, which includes the residential neighborhood, commercial district, and industrial park is served by the 107 and 126 Buses. The sidewalk network remains intact. However, to

this day, there is no sidewalk connection between the residential neighborhood and the industrial park, and there are some gaps in the sidewalk network leading from the residential neighborhood to Lawrence Park Shopping Center.

Map 4-17: Lawrence Industrial Park Sidewalk Conditions



Pedestrian Network

For some residents – and certainly for workers that commute via transit to the site – stops within the industrial park are closer to their final destination. Yet, as mentioned previously, there are no sidewalks leading into or within the industrial park. There are many commercial,

industrial, and institutional uses within the industrial park, resulting in consistent motorized traffic through the area. Pedestrians moving within the industrial park or walking to and from the transit stops are forced to walk in the roadway or on private property.

Bicycle Network

There are neither on-road nor off-road bicycle facilities in this study area. However, the residential streets are low stress, and bicycle facilities are not necessary on these roadways in order to make them bicycle-friendly. Due to the heavier, commercial-related traffic in the commercial portion of the development, bicycle facilities could improve access to transit stops and travel within the industrial park. The roadways are approximately 40 feet wide here, and they can easily accommodate bicycle lanes on both sides.



Figure 4-36: Abbott Drive, Marple Township



Figure 4-37: Bus Stop at Abbot Drive and Sussex Boulevard, Marple Township

Commercial Destinations

Media Shopping Center

Context

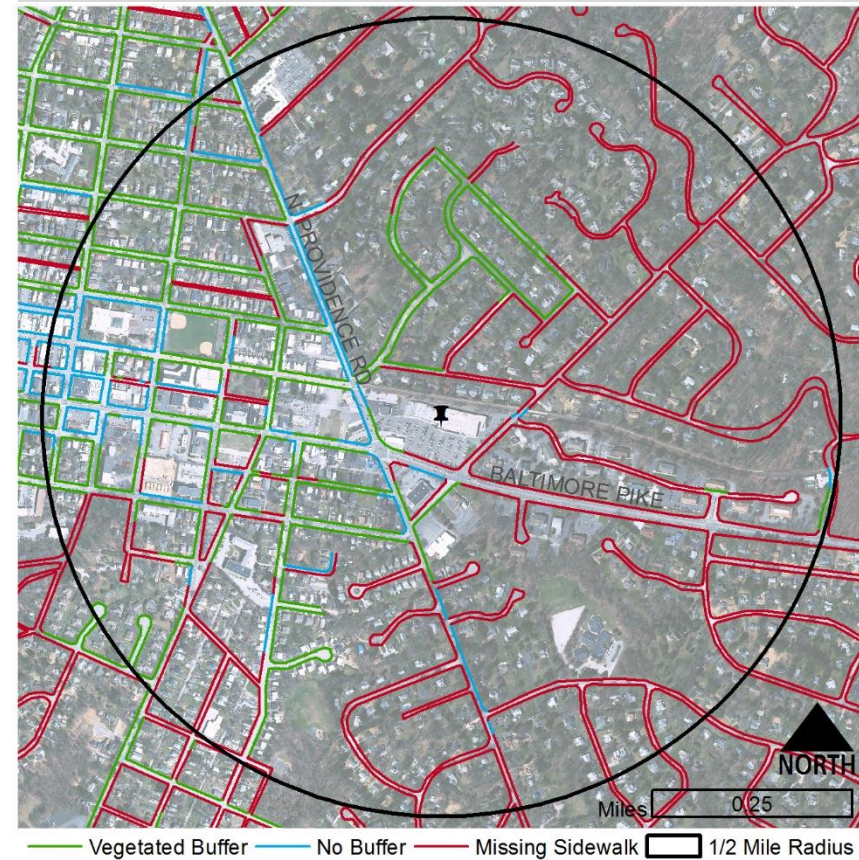
Media Shopping Center is located in Media Borough and Nether Providence Township, Delaware County. It is located just east of Media's Urbanized Center. While the sidewalk network in downtown Media is excellent, sidewalk connections disappear traveling east on Baltimore Avenue/Pike, as evident in Map 4-17.

Media Shopping Center is comprised of two parcels owned by the same property owner. Therefore, the construction and maintenance of a sidewalk around the entire site would require the initiative of only one entity. The shopping center has six motor vehicular access points: two on Baltimore Avenue, two on Providence Road (PA Route 252), and two on Beatty Road.



Figure 4-38: Media Shopping Center, Nether Providence Township

Map 4-18: Media Shopping Center Sidewalk Conditions



Pedestrian Network

Media Shopping Center does not have sidewalks along the front property line on Baltimore Avenue or east property line on Beatty Road. There is a supermarket in the shopping center, but it is not connected to the residential neighborhoods to the east, south, and north. On the other hand, the intersection of Baltimore Avenue and Providence Road (PA Route 252) on the west end of the shopping center has 4 continental crosswalks. These crosswalks connect the existing sidewalk network west of PA Route 252 to Media Shopping Center. Pedestrians regularly carry shopping bags from the

supermarket, through the parking lot, and across the dangerous, unmarked intersection at Baltimore Avenue and Beatty Road (and mid-block across Baltimore Avenue). Short distance shopping trips for small items cannot be made easily and safely.

Bicycle Network

There are no bicycle facilities in this area. However, Media Borough generates significant bicycle traffic, and there is public bicycle parking throughout the borough. Furthermore, the Borough of Media has a bicycle plan, which was adopted in early 2017. The plan proposes the conversion of the four-foot shoulders on North Providence Road into four-foot bike lanes. The plan does not propose facilities on Baltimore Avenue; however, it does suggest working with the County Planning Department to extend Bicyclists' Baltimore Pike through Media Borough. At the same time, the results from the survey included in the plan and conducted in 2015 show that 101-112 respondents desired bicycle facilities on Baltimore Ave in Media (which extends into Nether Providence). Nether Providence currently does not have a bicycle plan, but bicycle connections between the two municipalities could increase the use of alternative transportation and alleviate some of the traffic congestion on Baltimore Pike.



Figure 4-39: Baltimore Pike shopping center access, Nether Providence Township



Figure 4-40: Baltimore Pike in front of shopping center, Nether Providence Township

Elderly Care Facilities

Plush Mills Senior Living

Context

Plush Mills is a senior living facility in Nether Providence Township, Delaware County. It is located on the south side of Baltimore Pike by the I-476 interchange. The site is not directly served by public transit, and the entrance is located on Plush Mills Road. There are no sidewalks leading directly to the facility or the adjacent Victoria Mills complex to the north, and there are no direct pedestrian routes to and from the nearest transit stop.



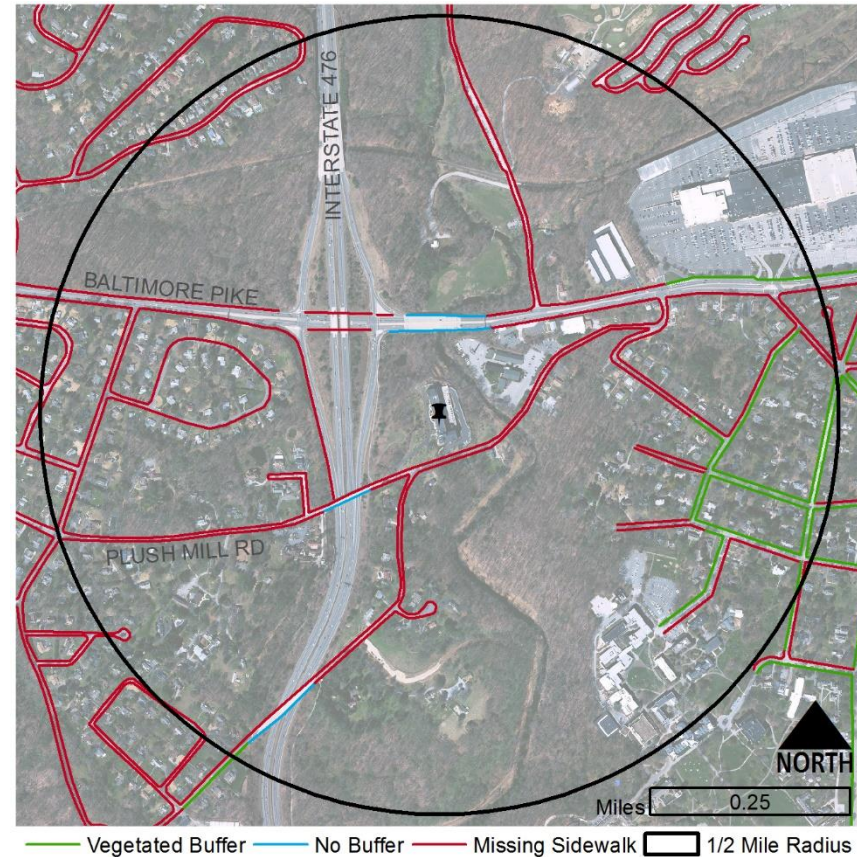
Figure 4-41: Plush Mills Senior Living, Nether Providence Township

Pedestrian Network

There is a westbound I 10 Bus stop at Baltimore Pike and Wallingford Road on the north side of Baltimore Pike. The most direct route to Plush Mills and the Victoria Mills complex from this transit stop requires pedestrians to cross Baltimore Pike and walk along Wallingford Road/Plush Mills Road to the facility's entrance. In this scenario, visitors

or employees must cross the busy highway at an extremely dangerous intersection and then walk 0.4 miles on a narrow, low-visibility roadway with no pedestrian facilities.

Map 4-19: Plush Mills Senior Living Sidewalk Conditions



A second – and similarly dangerous – option to reach Plush Mills on foot is to walk westbound along the north side of Baltimore Pike to the I-476 interchange and cross Baltimore Pike at the Leiper-Smedley Trail. One would need to continue on the trail until reaching Plush Mills Road, then travel north toward the entrance. The first section of Baltimore Pike that must be traversed has no sidewalk. A third option is to walk

along the north side of Baltimore Avenue, enter Smedley park, and cross Baltimore Pike through the earthen trail tunnel that connects to the Swarthmore Trails. This section of the earthen path ends just south of the Wallingford Road bridge. One would then walk another 350 feet to the final destination. Once a pedestrian reaches the entrance to the Plush Mills property, he or she must walk up a steep incline with no pedestrian facilities to the building (see Figure 4-37).

Pedestrians can be seen walking westward along the north side of Baltimore Pike from the Baltimore Pike and Wallingford Road bus stop toward Media Shopping Center. In order to do so, they must traverse the interchange, and missing sidewalks at the interchange make these trips extremely dangerous. Despite the fact that there are no sidewalks through the interchange, pedestrian signals and standard crosswalks at the I-476 off-ramp encourage pedestrian travel through this area. These crosswalks connect the Leiper Smedley Trail on the north and south sides of Baltimore Pike; however, they do not connect to east-west sidewalks. There are shoulders on part of the north side of Baltimore Pike west of I-476, but these are not suitable for pedestrian travel. There is a one-mile gap between the Baltimore Pike and Wallingford Road bus stop and the next, westbound stop at Baltimore Pike and Grandview Road.

Bicycle Network

There is only one paved bicycle facility in this area. The Leiper-Smedley Trail connects Smedley Park on the north side of Baltimore Pike to the Plush Mills property on the south side of Baltimore Pike. The Leiper-Smedley trail connection is above-ground. There is also an earthen trail along Crum Creek – part of the Swarthmore Trails – that provides a north-south tunnel connection across Baltimore Pike for bicyclists and pedestrians. This dirt path is not ADA-accessible. Further developing trail connections could be one way to improve the area’s walkability. However, this would not eliminate the need for sidewalks and high-visibility crosswalks that provide more direct connections to various destinations in the vicinity.



Figure 4-42: Baltimore Pike and Wallingford Road I 10 Bus stop, Springfield Township



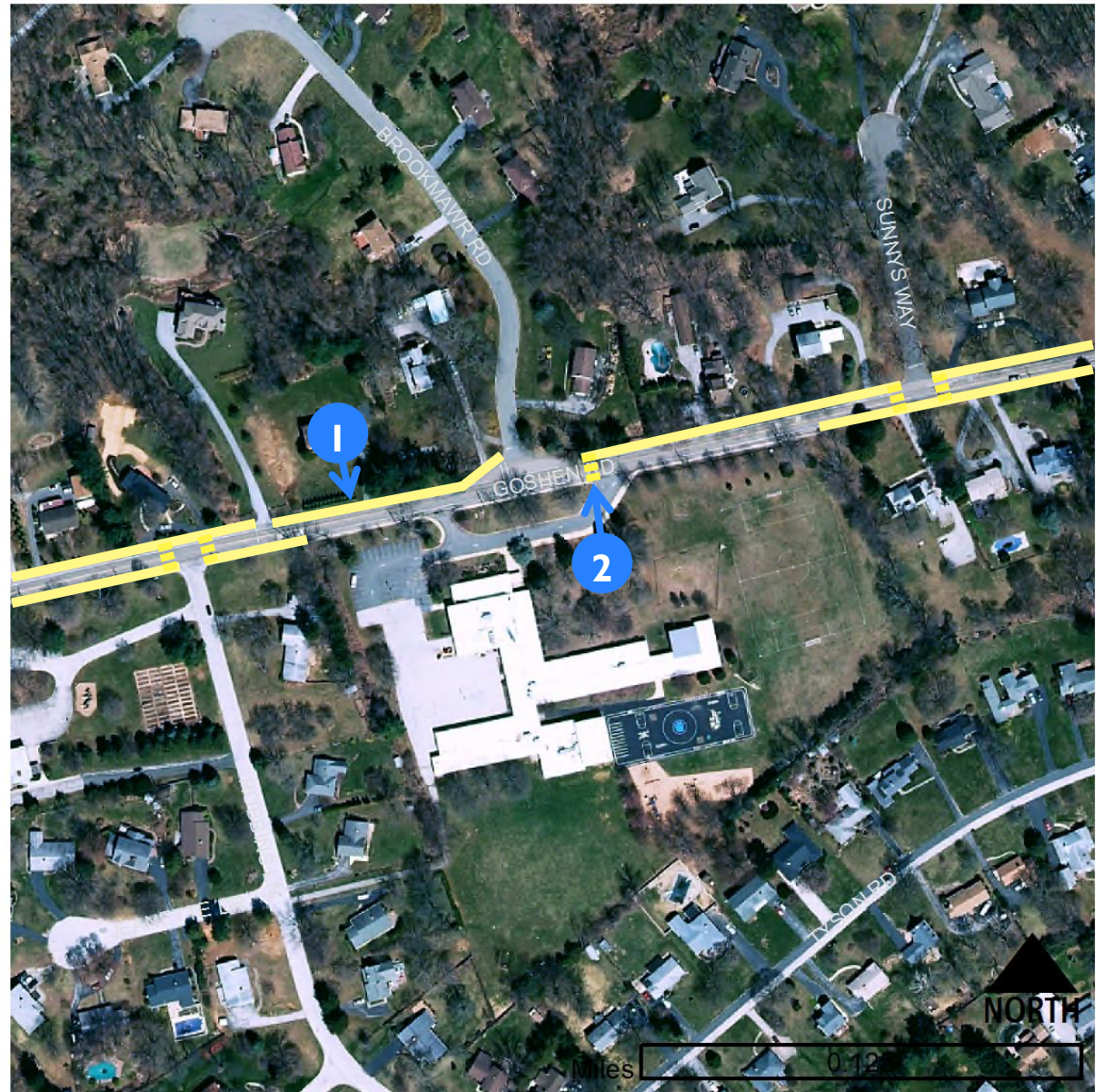
Figure 4-43: Plush Mill Road bridge, Nether Providence Township

Chapter 5: Implementation

CASE STUDY DESIGN RECOMMENDATIONS

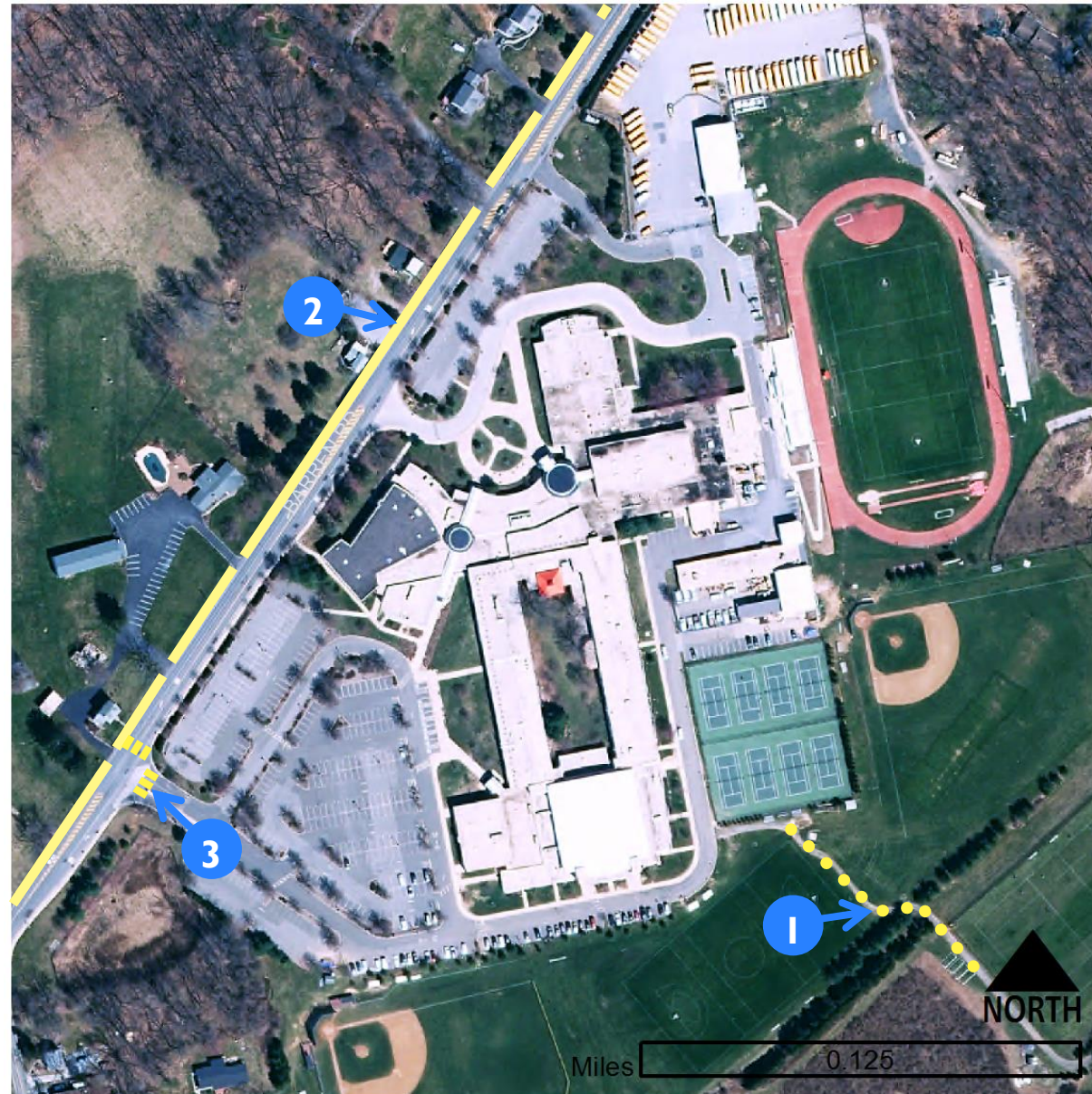
Culbertson Elementary School

- 1 Build new sidewalks.
- 2 Install safe, marked crosswalks.
- 3 Implement walking school buses. This area would benefit greatly from such an activity to help solidify the identity of the community. Children also greatly benefit from pre-school interaction and exercise.

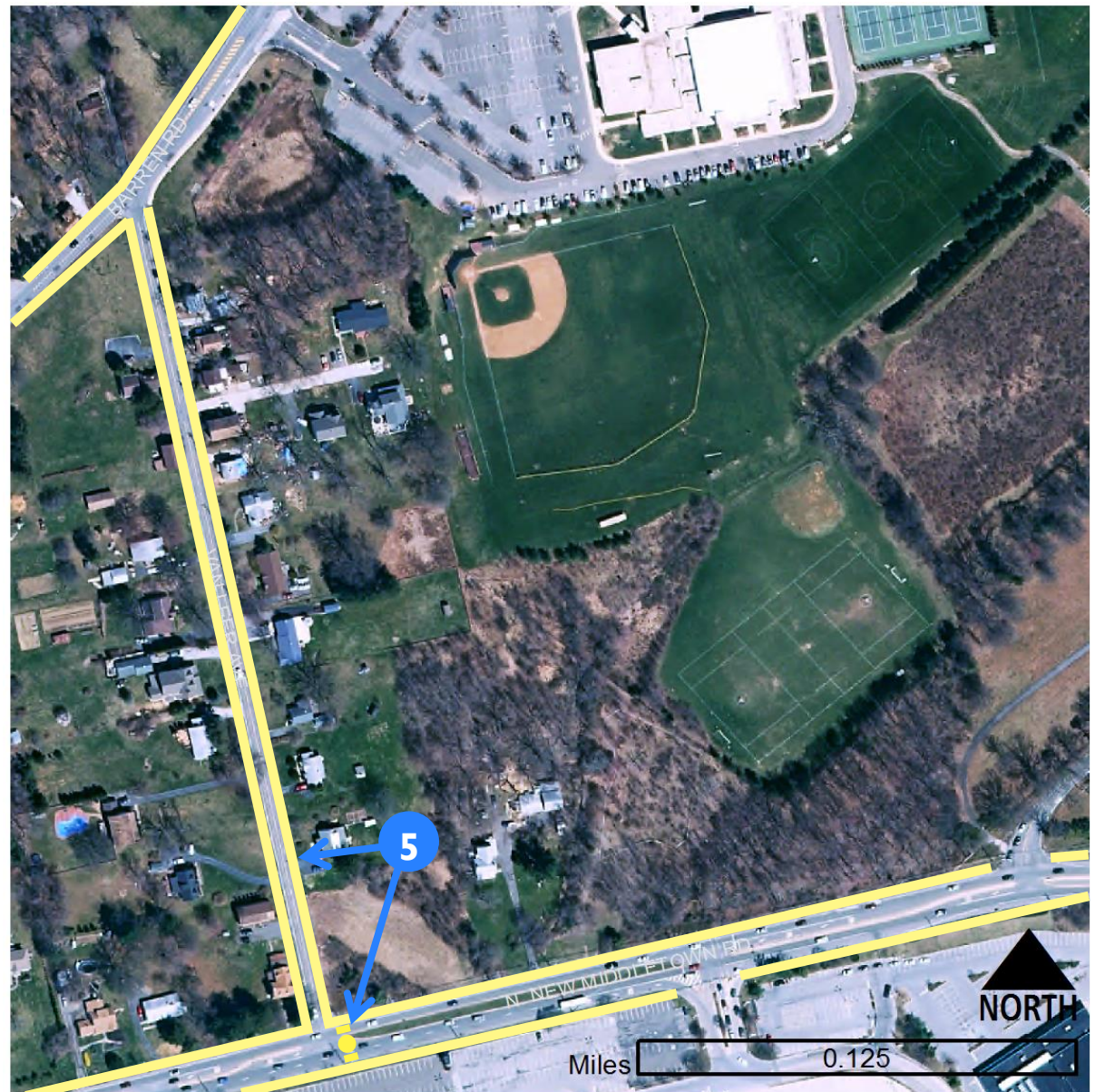


Penncrest High School

- 1 Encourage the use of informal paths and increase mobility in the area by providing safe connections from the collector street to destinations.
- 2 Build new sidewalks.
- 3 Install safe, marked crosswalks.
- 4 Improve pedestrian circulation within the campus so that students can access the building safely and the pedestrian experience is more pleasant for visitors as well. Pavement markings can be used to create a clear pedestrian path to different locations on campus to and from the sidewalk on Barren Road, acting to raise driver awareness and provide wayfinding for pedestrians.



- 5 Better facilities along Van Leer and connections to Promenade at Granite Run would improve pedestrian mobility. A crosswalk from the Promenade development to Van Leer with a pedestrian refuge island on Route 352 would make crossing the highway much safer. This section of Route 352 is 2 to 4 lanes, experiences an AADT of 22,000 vehicles, and has a speed limit of 35 miles per hour.



Marcus Hook Elementary School

- 1** Add pavement markings or signage on Maiden Lane and McClure Lane, where the construction of sidewalks is not feasible, to remind drivers that there is a school nearby and to be aware of children walking or bicycling.
- 2** Install 4-way marked crosswalks where appropriate. Flashing signage to accompany existing crosswalks on Market Street may be appropriate due to heavy truck traffic.
- 3** Install mid-block crossing on 8th Street, where bus pick-up and drop-off is located. Parents and children cross here between buses. This habit is unlikely to change so installing a crosswalk with signage would make it safer.
- 4** Educate parents and students about safe pedestrian and bicyclist habits.
- 5** Implement walking school buses. In this area, students do not need to travel far, and the sidewalk network is strong. More than half of the students at Marcus Hook Elementary come from economically disadvantaged households. Providing a safe, collective transportation service such as this could alleviate pressure from some families.



Haverford Middle and High Schools

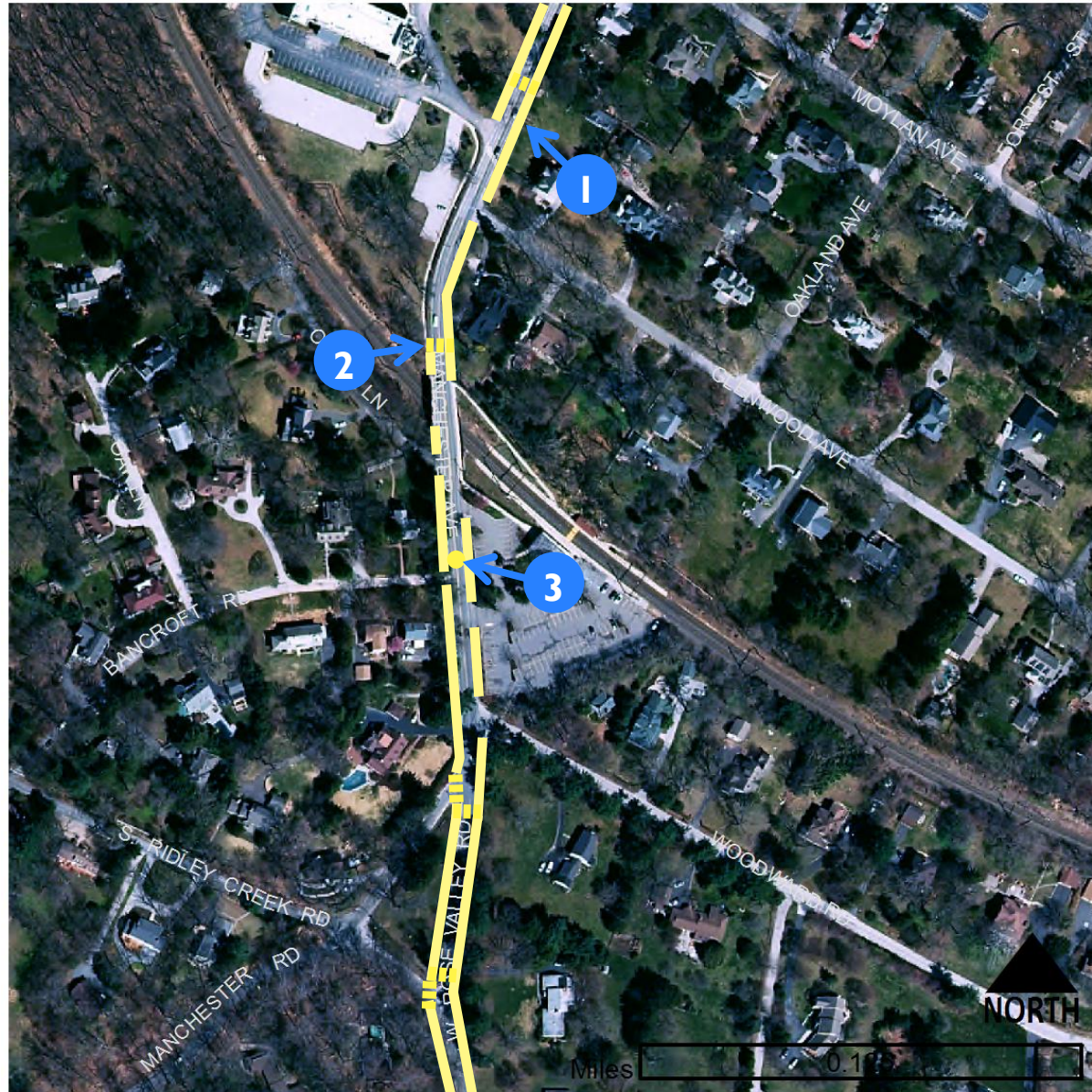
This aerial photo shows the area within a 1/8-mile radius of Haverford Middle School. Though only a portion of Haverford High School is shown, the focus of the image – Darby Road – is the crucial artery and traffic issue for both schools. Therefore, these recommendations provide traffic solutions that would benefit both schools.

- 1 Traffic calming is needed in this area, despite the fact that existing on-street parking and landscaped medians act as traffic calming measures. Raised intersections at East Marthart Avenue and Darby Road and Mill Road and Darby Road would make these intersections safer for pedestrians.
- 2 Install bicycle facilities on Darby Road. Many children and adults alike use Darby Road to commute during peak hours.
- 3 Implement walking school buses. Many high school and middle school students commute to school here. Crossing Darby Road is dangerous, however, and may deter parents from letting their children walk. Walking school buses could encourage parents and students to ditch their cars for trips to school, thereby alleviating traffic in the area.



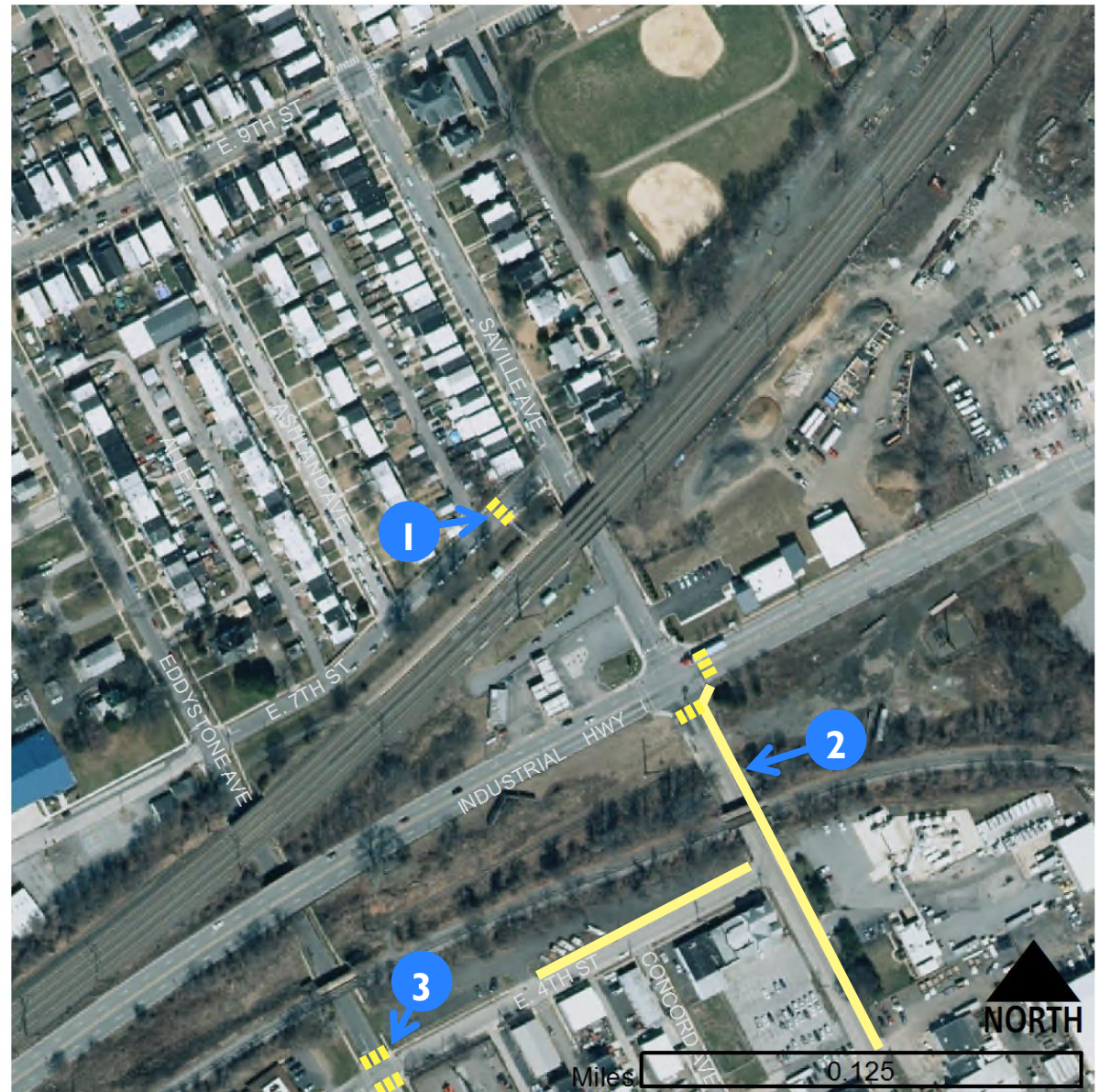
Moylan-Rose Valley Regional Rail Station

- 1 Install sidewalks along Manchester Avenue and Rose Valley Road.
- 2 Install a marked crosswalk on the north side of the bridge, where the side path ends. Also install crosswalks at misaligned (not at a 90-degree angle) three-way intersections on Rose Valley Road, where low visibility makes crossing dangerous for pedestrians.
- 3 Install a pedestrian refuge island by the access to the train station.



Eddystone Regional Rail Station

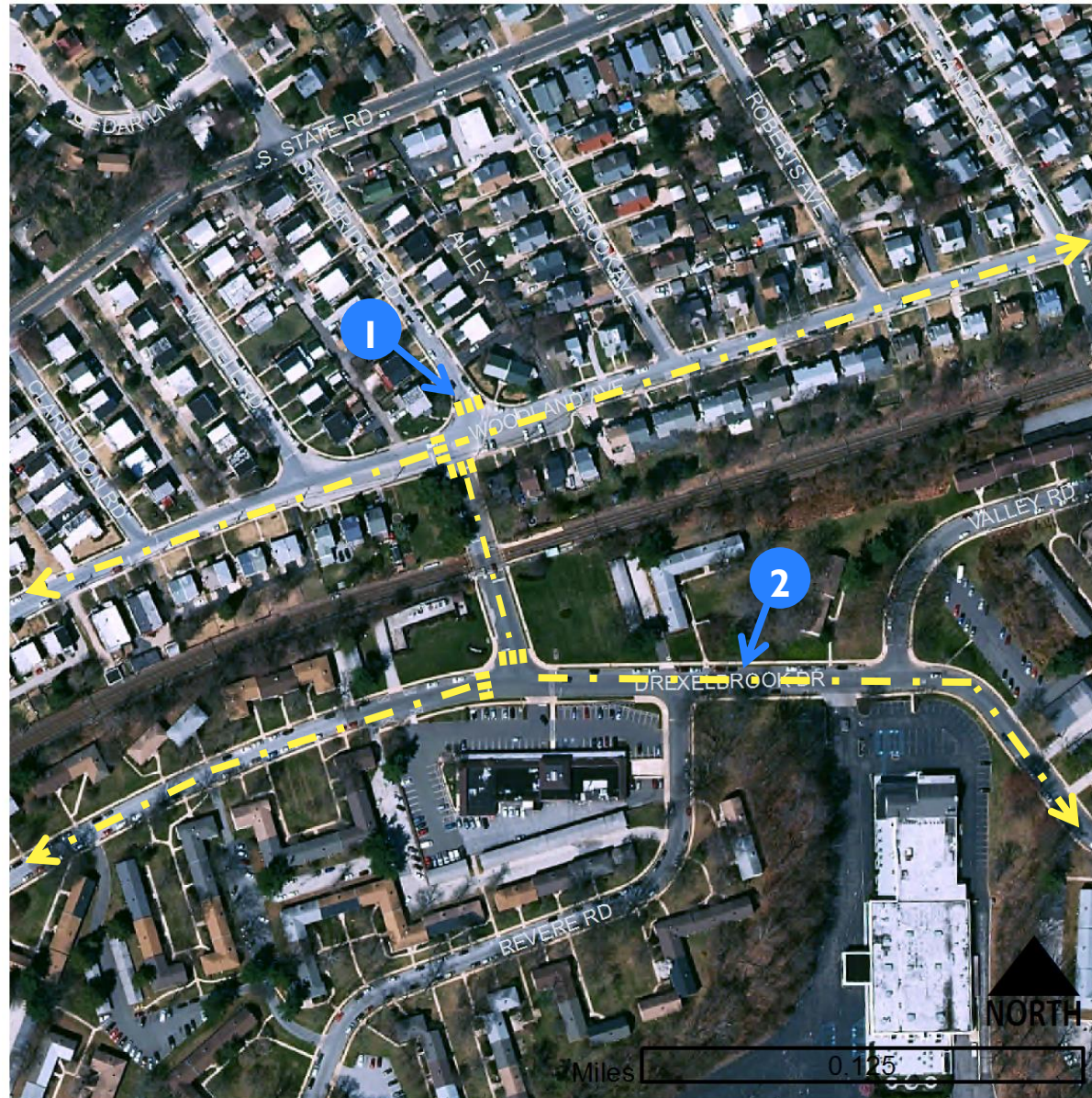
- 1 Add marked crosswalks at Eddystone Avenue and East 4th Street and the east and south side of the Saville Avenue and Industrial Highway (Route 291) intersection. The latter should be highly visible due to the location of two bus stops at this intersection. Add a crosswalk in front of the Eddystone Station stairs on East 7th Street.
- 2 Add sidewalks. Gaps in the existing sidewalk network along East 4th Street from Saville Avenue to Harrah's Boulevard should be completed. This would provide a direct connection for visitors to the casino as well as those who work in offices or warehouses along East 4th Street. Sidewalks should also be added on Saville Avenue and East 2nd Street, which leads into Penn Terminals to provide a safe place for workers to walk when there is truck traffic.
- 3 Upgrade existing sidewalks. Where necessary, existing sidewalks should be upgraded so that they are ADA accessible. For example, ramps should be added to access the sidewalks on the corner of Eddystone Avenue and East 4th Street.
- 4 Education: Employers should encourage employees to take transit to work. Harrah's casino should encourage visitors to take transit.



Drexelbrook Light Rail Station

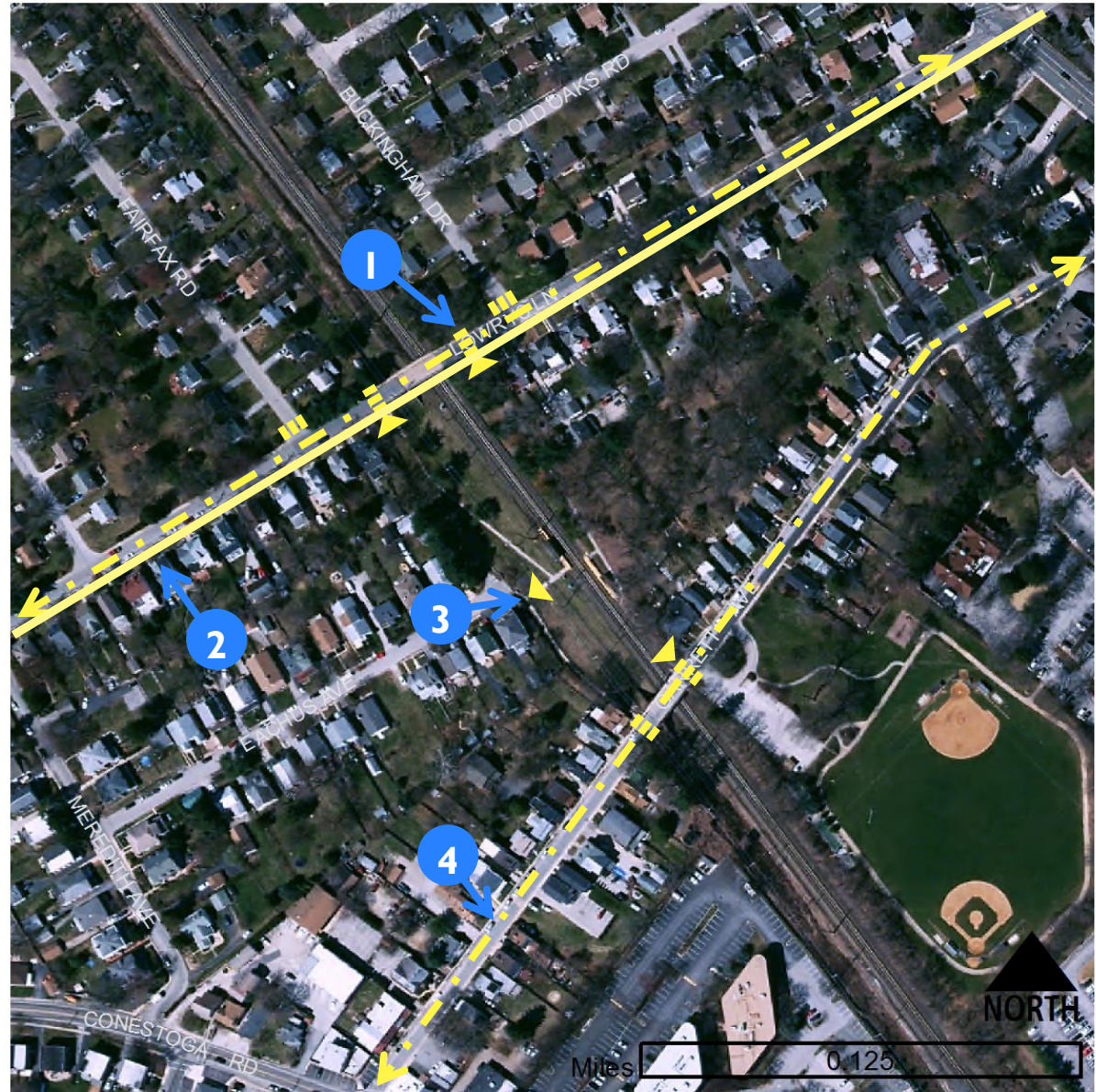
- 1 Install marked crosswalks. While the sidewalk network in the area is complete and provides a safe walking space for pedestrians, there are few marked crosswalks on Woodland Avenue and Drexelbrook Drive, which run parallel to the trolley tracks.
- 2 Bicycle facilities would be a tremendous asset to the area. Bicycle commutes to the station from surrounding neighborhoods could be made safer by adding sharrows or even bicycle lanes on Woodland Avenue, Drexelbrook Drive, and Wildell Road.

Wildell Road intersects the 101 Trolley tracks. The cartway is 40 feet wide, and there are only two travel lanes. With a lane width of 12 feet, there would still be 8 extra feet in each direction to include bicycle facilities to connect the residential neighborhoods north and south of the station.



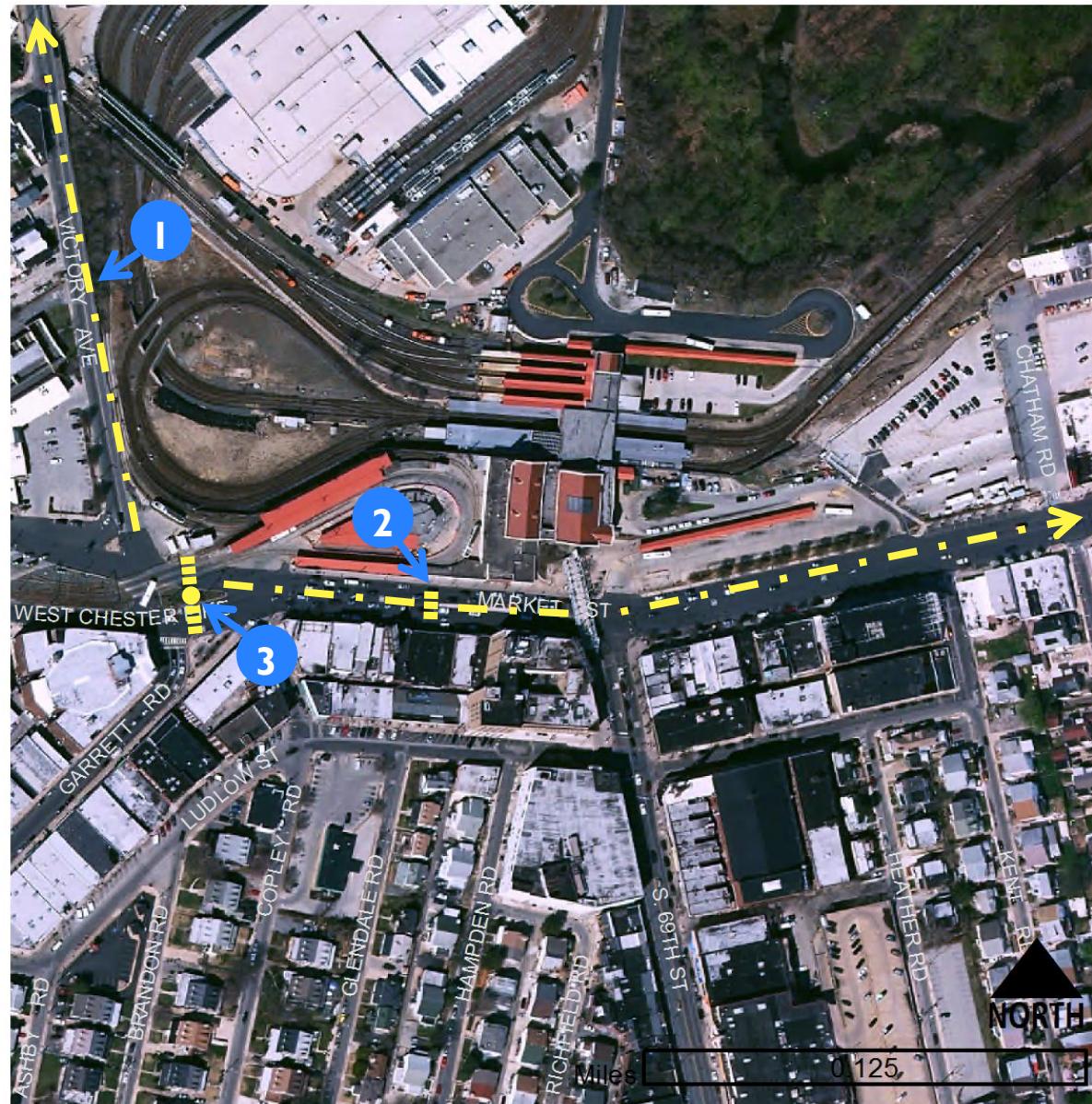
Garrett Hill High Speed Line Station

- 1 Install high-visibility crosswalks at the station access points on either side of the bridges on Lowrys Lane and Garrett Avenue as well as at Fairfax Road and Buckingham Drive. Curb ramps for ADA access must be included.
- 2 Fill in gaps in the sidewalk network along Lowrys Lane.
- 3 Replace the stairs leading down to the station from the roadway with a ramp to make this station ADA-accessible.
- 4 Implement sharrows on Lowrys Lane and Garrett Avenue. The surrounding residential neighborhoods provide low stress roads for bicycling. Because motor vehicular access to the station is limited, bicycling should be encouraged and made safer.
- 5 Install wayfinding signage. It is very difficult to see this station and its access points from the roadway. Wayfinding signage could help increase ridership by pointing out the station to new residents who may not know it exists.



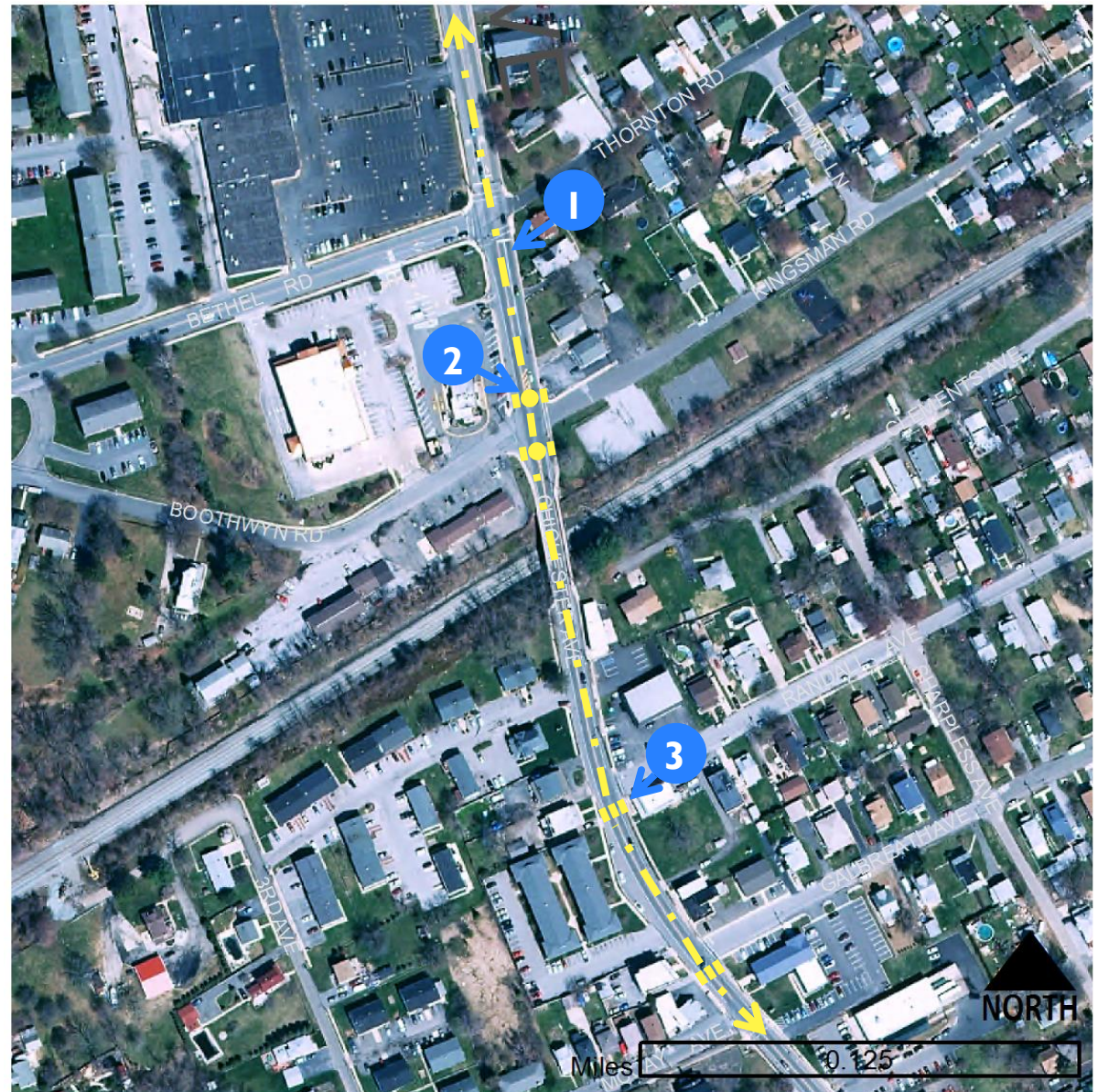
69th Street Transportation Center

- 1** Improve bicycle access to Philadelphia along West Chester Pike/Market Street through Millbourne Borough and Victory Avenue, which becomes Cardington Road in Philadelphia. Cardington Road has bicycle lanes and Share the Road signage. There is not enough right-of-way on Victory Avenue for bicycle lanes; however, sharrows could help make this commute to and from Philadelphia safer.
- 2** Install safe mid-block crossings. Though not ideal, pedestrians cross at the 5-point intersection mentioned above as well as mid-block on Market Street. Marked crosswalks would shorten crossing distances and make it safer to cross.
- 3** Currently there is a grass median at this intersection. This could be transformed into a pedestrian refuge island if marked crosswalks were to be added here.
- 4** Lower the speed limit on Market Street from 35 to 25 miles per hour. There is a lot of pedestrian traffic in the area.



Boothwyn Town Center

- 1 Install bicycle lanes on Chichester Avenue. Chichester Avenue is a congested roadway and encouraging bicycling could help ease congestion. A road diet is not appropriate, but bicycle lanes can be installed where there are shoulders. Sharrows could be installed where there are no shoulders (over and just north of the bridge).
- 2 Pedestrian refuge islands at the intersection of Chichester Avenue and Boothwyn Road could help shorten crossing distances between bus stops and the shopping centers on the southbound side of the roadway.
- 3 Marked crosswalks should be installed at intersections with bus stops to provide safer access to transit along this corridor.

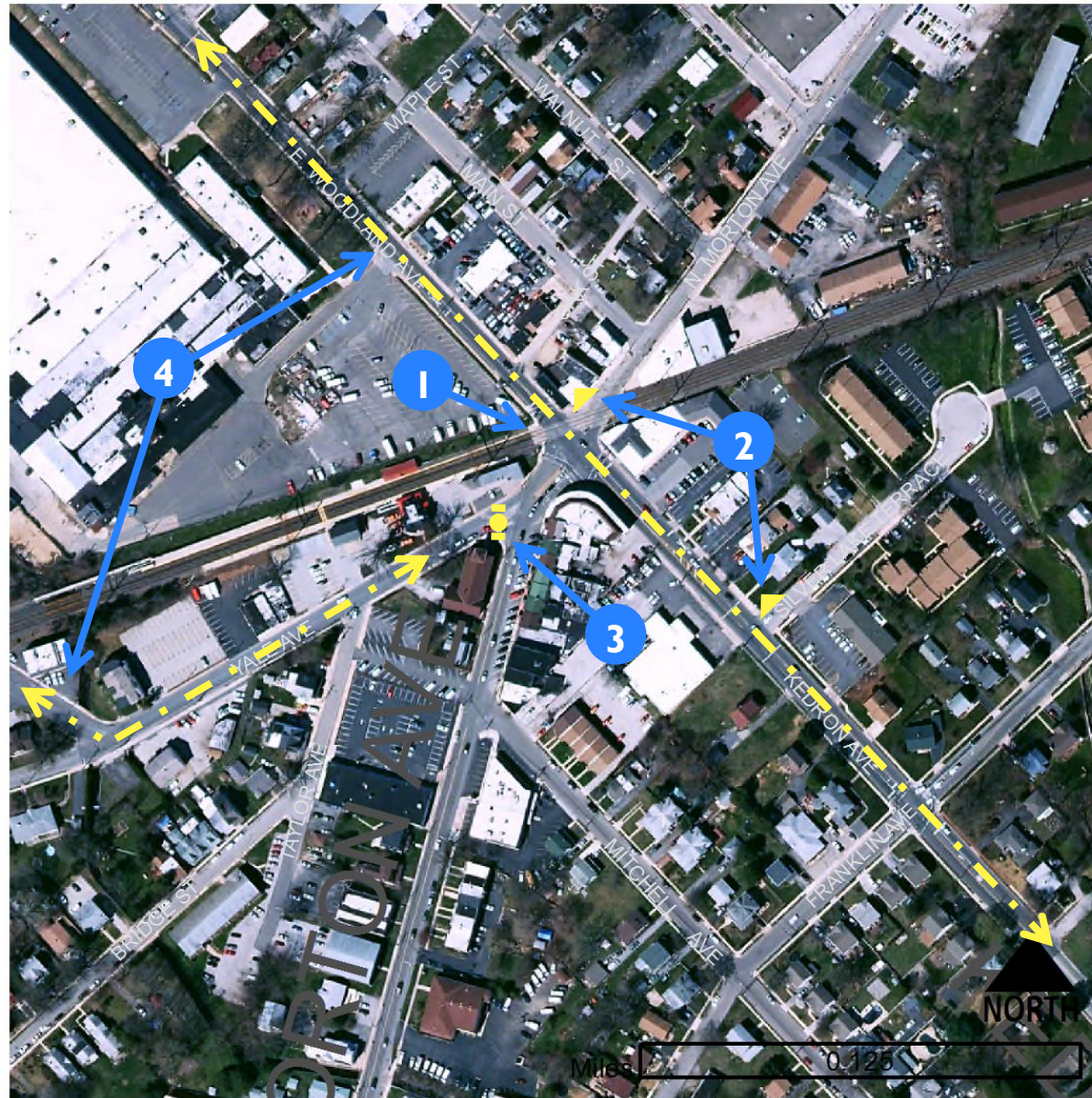


Morton Neighborhood Center

- 1** Streetscape enhancements are needed at the intersection and regional rail grade crossing located at the heart of Morton Borough's business district.
- 2** Sidewalks in the vicinity that are not ADA compliant should be upgraded to include ADA-access ramps.
- 3** A solid or continental crosswalk should be installed where Yale Avenue merges with Morton Avenue south of the major intersection. A pedestrian refuge island with landscaping elements in place of the current, makeshift island where the stop sign stands would enhance the appearance of the downtown.

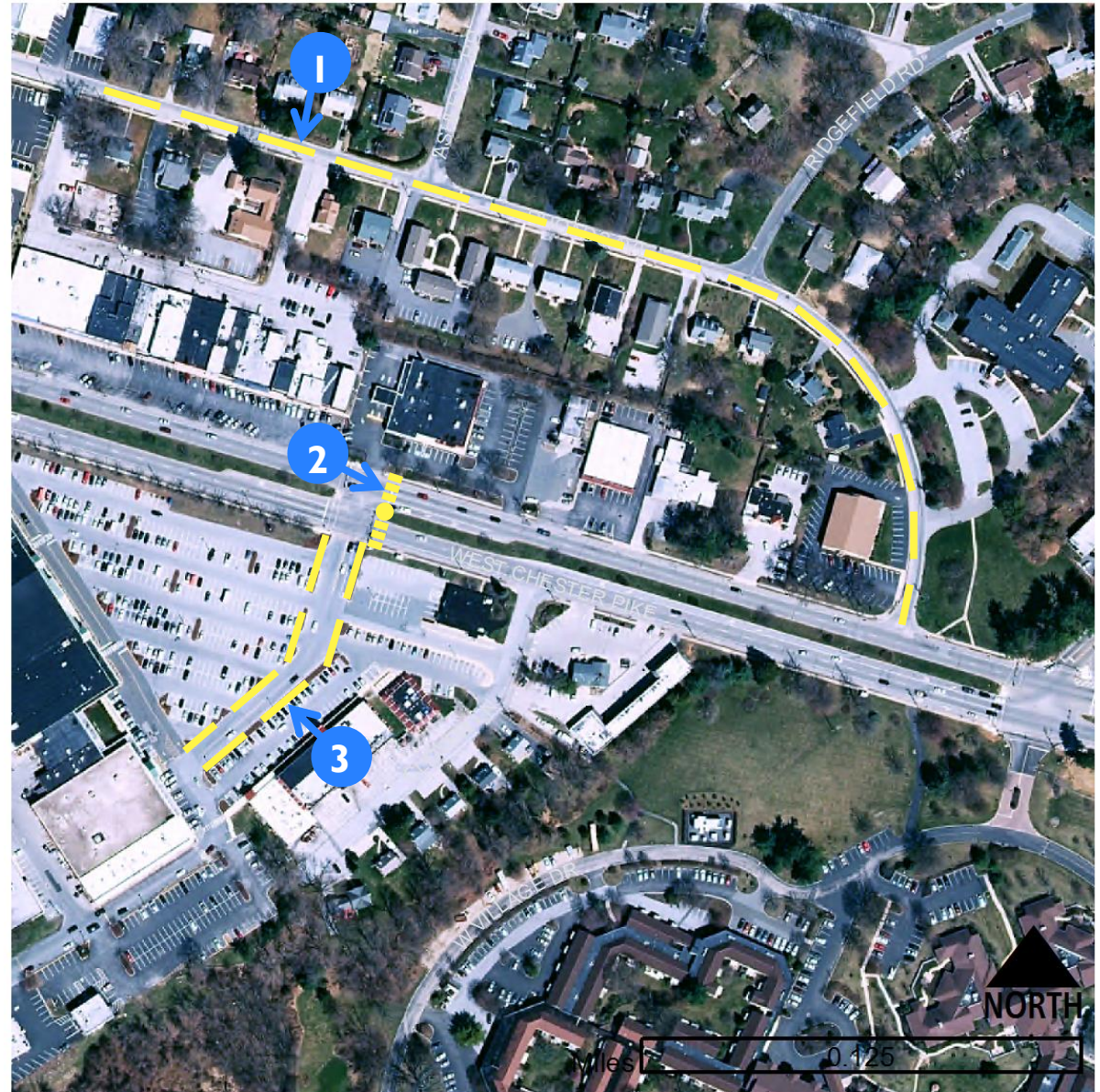
Pavement markings indicating the direction of traffic and upcoming merge would help guide vehicular traffic.

The stop sign should be moved to the right-hand side of the cartway and should meet design requirements.
- 4** Improve bicycle access to the area from the north. Installing sharrow markings could make cyclists more comfortable on Church Road and East Woodland Avenue (Route 420), after engineering improvements are made to the central, 4-point intersection and grade crossing.



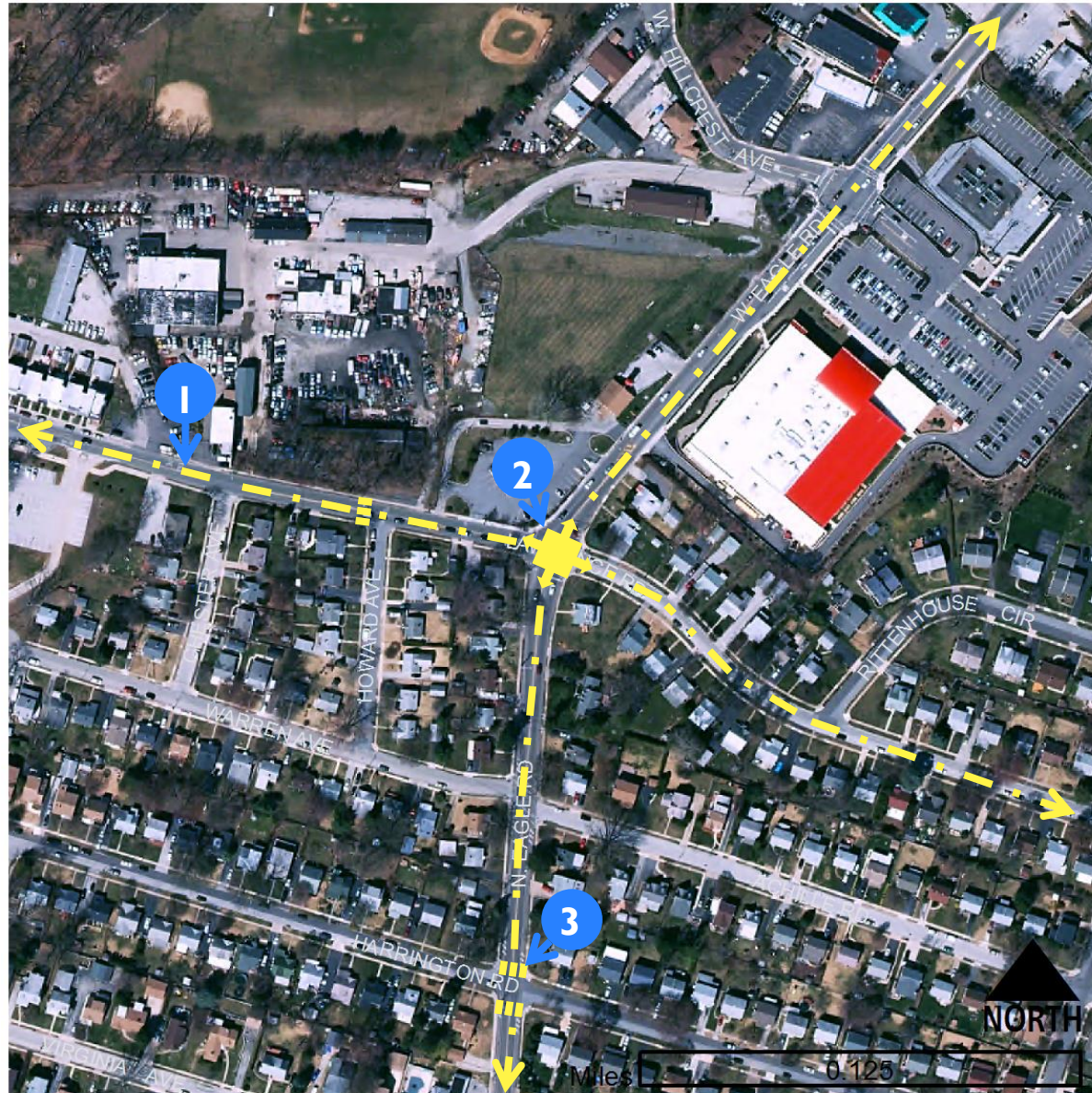
West Chester Pike: Newtown Square

- 1 Create a painted, four-foot pedestrian and bicycle lane on the northbound side of Rhoads Avenue from where the sidewalk ends just east of St. Albans Circle to the intersection with West Chester Pike. This path could be accompanied by Share the Road signage. The cartway is approximately 25 feet wide and could accommodate two 10 to 11 foot motor vehicular lanes and a four-foot pedestrian and bicycle lane.
- 2 Move the marked crosswalks across West Chester Pike on the west side of the Newtown Square Shopping Center entrance to the east side of the entrance. Include a pedestrian refuge island in the median. Bus riders regularly cross the highway here, instead of at the existing pedestrian crossing, because the bus stops for service in both directions are located on this side. This redesign would need to be coordinated with SEPTA.
- 3 Mark a clear and safe path for pedestrians into the shopping center using wayfinding signage and/or pavement markings that would help make drivers more aware of pedestrian activity.



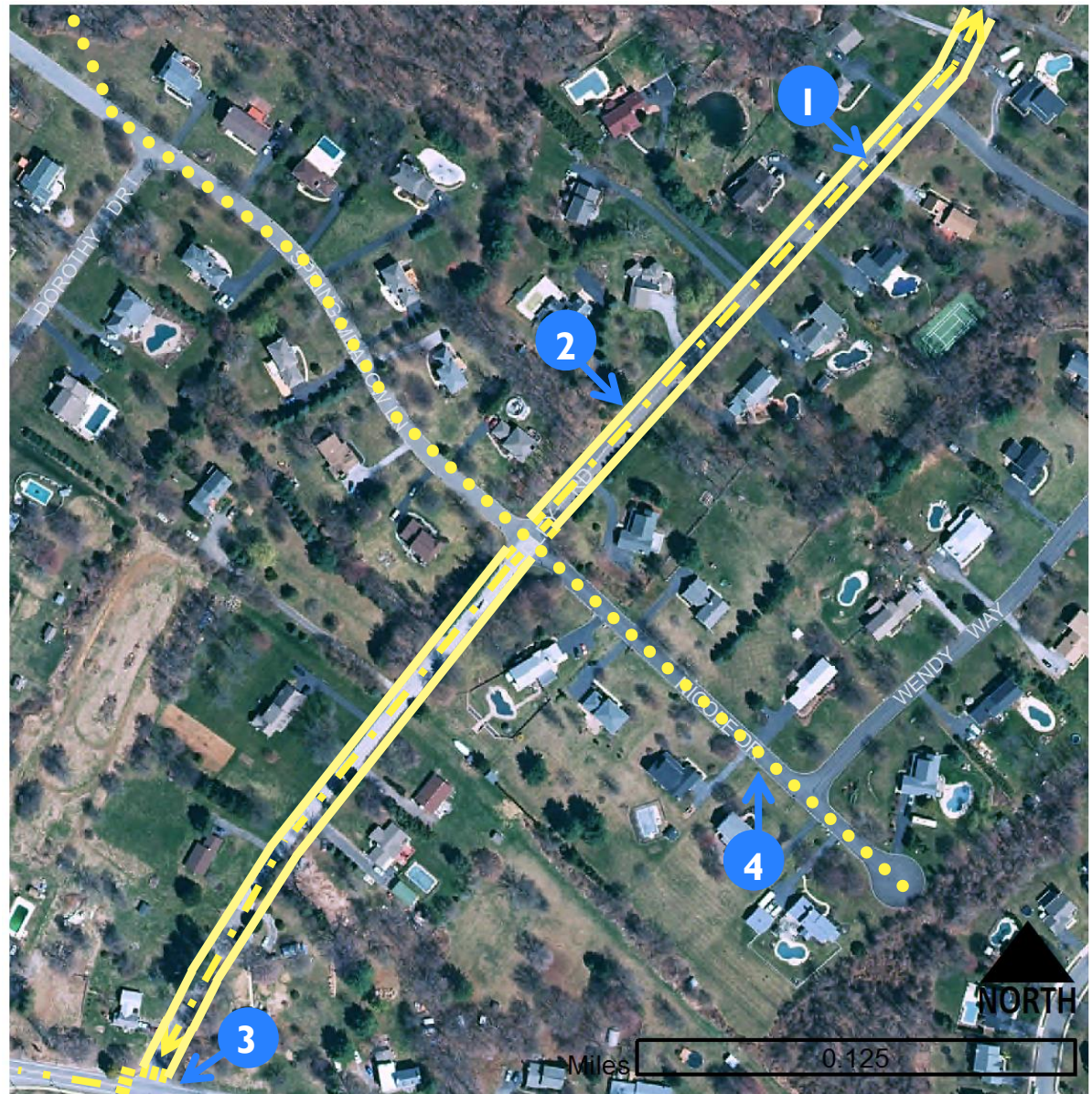
Lawrence Road and Eagle Road

- 1 Bicycle facilities are imperative on Lawrence Road and Eagle Road. Adults and children cycle on both roadways. Bicycle lanes could be installed on Lawrence Road from PA Route 3 to Eagle Road and on Eagle Road from Brierwood Road to Lawrence Road.
- 2 A raised intersection could help lower speeds and make drivers more aware of bicyclists and pedestrian traffic in this predominantly residential area.
- 3 An additional marked crosswalk on Lawrence Road at Howard Avenue could help improve mobility in the area. Furthermore, installing more marked crosswalks on Eagle Road (south of the Lawrence Road intersection) would improve mobility.
- 4 Implement walking school buses. Lynewood Elementary School is located on Lawrence Road. Walking school buses could help ease congestion along this corridor during peak hour traffic.



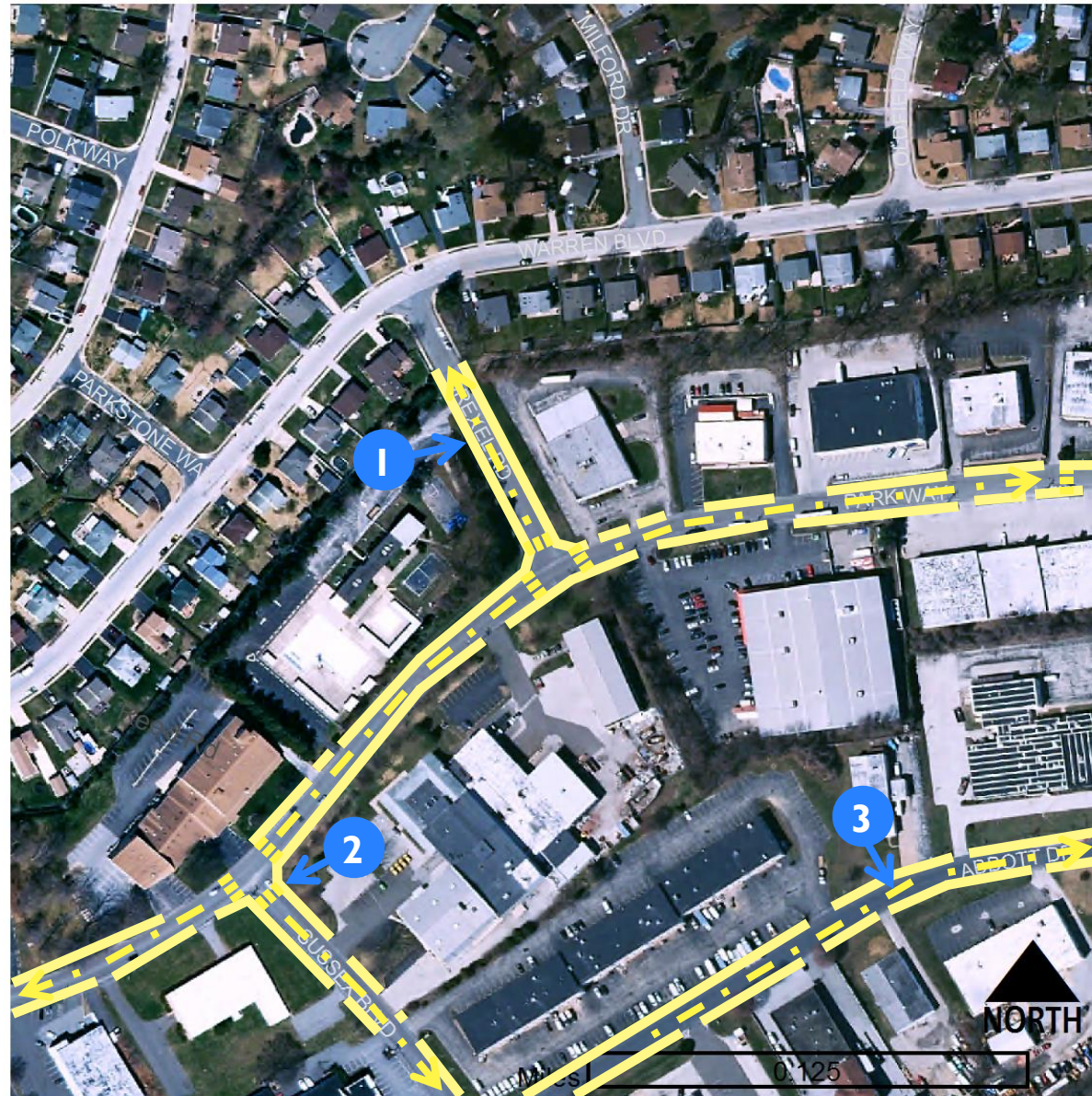
Nicole Drive and Wendy Way

- 1 Bicycle facilities would not only provide efficient connections to parks and between neighborhoods, but they would also be scenic recreational routes. Naaman's Creek Road (Route 491) has shoulders on both sides of the roadway, which could be transformed into bike lanes. Goodley Road could accommodate sharrows.
- 2 A sidewalk on both sides of Goodley Road would be appropriate because it is a collector roadway. This sidewalk would connect with a crosswalk across Naaman's Creek Road.
- 3 Marked crosswalks and Share the Road signage should be installed where Goodley Road intersections residential developments. High-visibility crosswalks are needed at the intersection of Naaman's Creek Road and Goodley Road to provide pedestrian access to the entrance of John T. Adkinson Park.
- 4 A sidewalk/trail connection through the residential developments to Bethel Springs Elementary School (located $\frac{1}{4}$ of a mile northwest of the area shown on the right) would benefit the community and support the potential for walking school buses in the future.



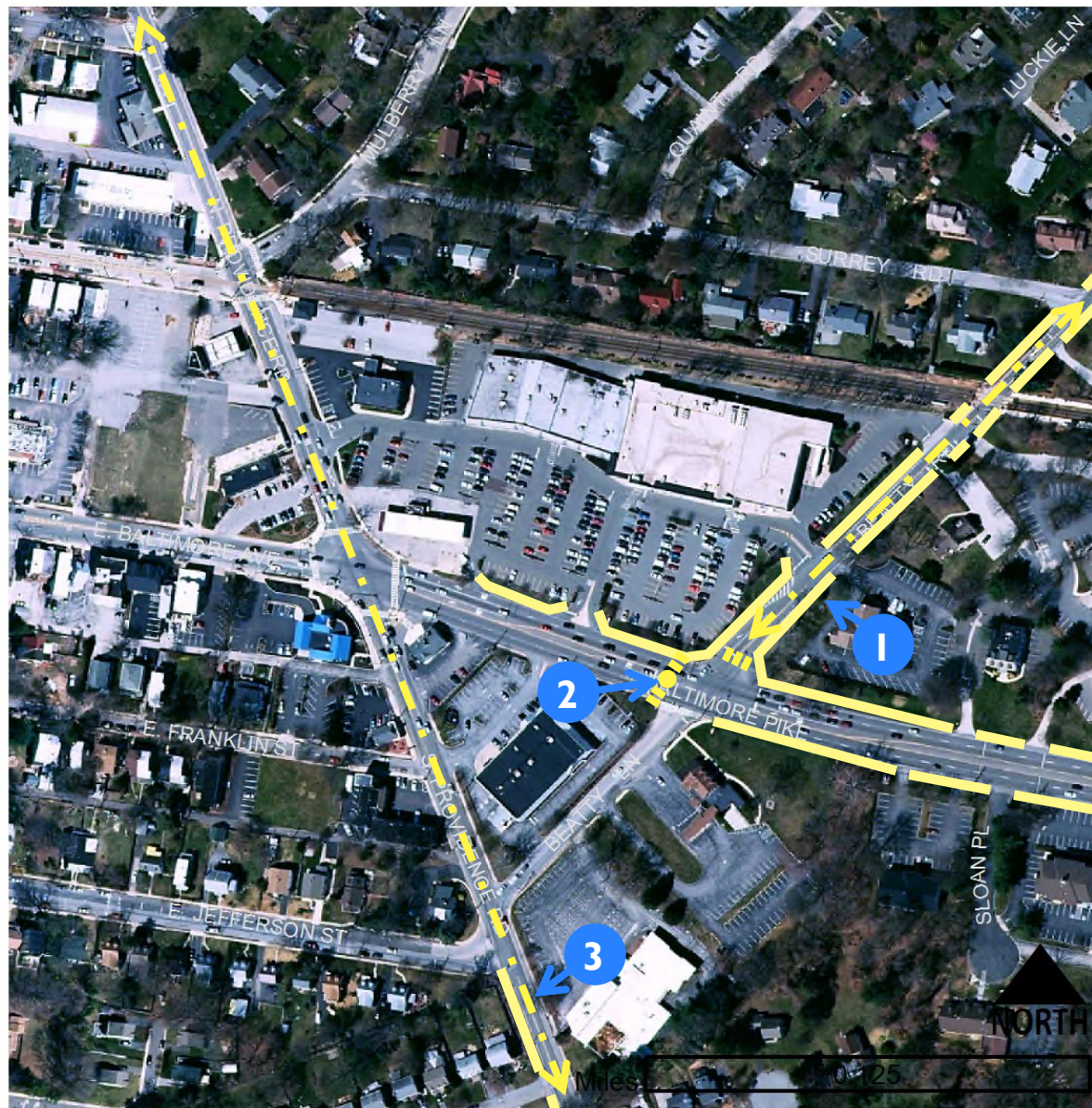
Lawrence Industrial Park

- 1 Add sidewalks. Install sidewalks in the industrial/commercial land use portion of the development to provide access to /from offices and bus stops to/from the residential development.
- 2 Add marked crosswalks at bus stop locations so that riders can cross safely.
- 3 Install bike lanes on the wide roadways within the industrial park to allow for active transportation to and through the area.



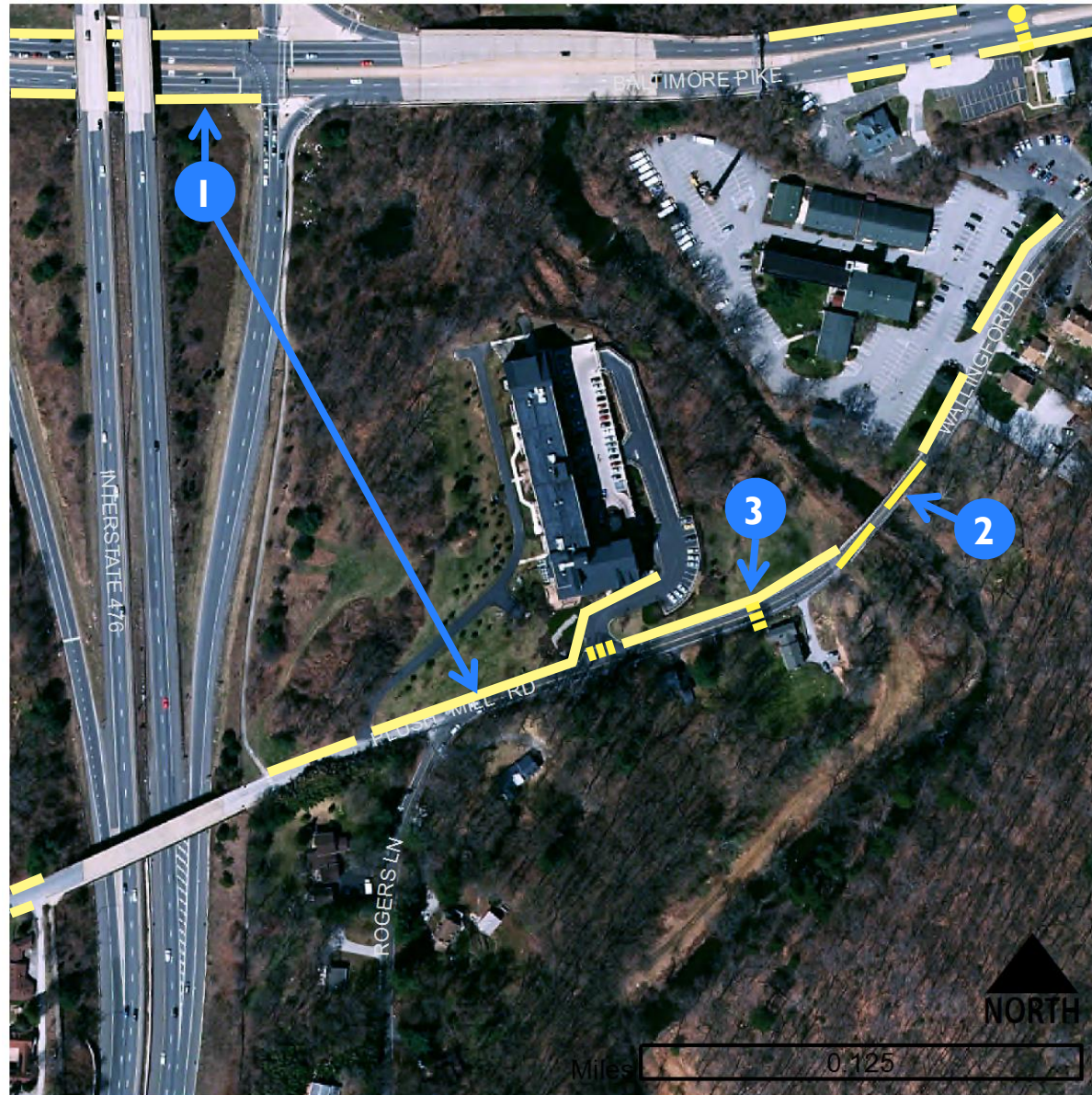
Media Shopping Center

- 1 Add sidewalks. Install sidewalks along Baltimore Avenue east of Media Shopping Center as well as on Beatty Road to/from the Beatty Road 101 Trolley stop and residential areas to the east and north of the shopping center.
- 2 Install marked crosswalks at bus stop locations along Baltimore Pike. A pedestrian refuge island may be appropriate to shorten crossing distances in certain locations, such as the intersection of Baltimore Pike and Beatty Road.
- 3 Bicycle facilities along Beatty Road and Providence Road (Route 252) would allow residents to make short bicycle trips to local stores.



Plush Mills Senior Living

- 1** Add sidewalks. Install sidewalks along Baltimore Pike, including at the interchange, where the crosswalks currently only connect to the north-south Leiper-Smedley trail. Sidewalks should also be installed along Wallingford Road from Baltimore Pike to Victoria Mills complex and Plush Mills Senior Living.
- 2** Install signage or pavement markings to indicate that the bridge is shared by pedestrians, bicyclists, and motor vehicles. The bridge is not wide enough in its current state to provide facilities for other users.
- 3** Add marked crosswalks at bus stop locations along Baltimore Pike with a pedestrian refuge island where feasible to shorten crossing distances. A marked crosswalk is needed across Plush Mill Road to connect the Swarthmore Trails south of the bridge. A crosswalk at the entrance of Plush Mills Senior Living would provide access to a sidewalk within the property to the entrance.
- 4** Education: inform Plush Mills Senior Living staff about alternative commuting options and walking paths to reach the facility.



BEST PRACTICES



- 1 Louella Avenue, Radnor Township**

Louella Avenue has excellent pedestrian facilities. These include brick crosswalks and signage that make pedestrian crossings highly visible. The area surrounding Radnor Middle School has a complete sidewalk network, and ADA ramps have been implemented at intersections.
- 2 North Chester Road, Swarthmore Borough**

The roundabout completed in 2016 on North Chester Road in Swarthmore Borough not only calms traffic but also provides safe access for individuals of all abilities to cross at the four legs of the intersection.
- 3 East 14th Street, City of Chester**

The East 14th Street streetscape in the City of Chester includes a landmark pedestrian refuge island and highly visible sidewalks and crosswalks, which are accented with brick pavers.
- 4 US Route 1, Concord Township**

New developments along US Route 1 in Concord Township have included the installation of sidewalks with vegetated buffers and ADA access to bus stops.

Creekside Village, Bethel Township
Creekside Village is a Growing Suburb residential neighborhood in Bethel Township. It has a strong sidewalk network that makes pedestrian circulation within the neighborhood safer, and the sidewalks provide pedestrian access to Naaman's Creek Road, an important arterial in Bethel.

- 6 East Hinckley Avenue and East Sellers Avenue, Ridley Park Borough**

Bumpouts at the intersection of East Hinckley Avenue and East Sellers Avenue in Ridley Park Borough shorten

pedestrian crossing distances, provide a place for pedestrians to rest, and help increase motorist awareness of active transportation in the area.

- 7 69th Street, Upper Darby Township**

The pedestrian bridge across Market Street at 69th Street Transportation Center provides safe access for pedestrians across the busy roadway. Crowds of transit users can enter and exit the transit hub safely.
- 8 East Coast Greenway, Tinicum Township**

Though usually not classified as on-road facilities, multi-use trails provide a shared pedestrian and bicyclist facility that improves mobility, circulation, and – in some cases – access to major destinations.

COUNTY SERVICES

Pedestrian and Bicycle Plans

The Delaware County Planning Department can assist municipalities, school districts, and schools in the creation of pedestrian and bicycle plans. The department can provide technical assistance as well as help coordinate stakeholder meetings and community outreach efforts.

Municipal Comprehensive Plans and Zoning Codes

The Delaware County Planning Department can prepare updates to a municipal comprehensive plan to include language about facilities for active transportation. The planning department can also assist municipalities in revising specific sections of their zoning code to reflect more bicycle- and pedestrian-friendly policies that are in line with communities' objectives for land use and development.

Targeted Walkability Studies

If a public entity is interested in pursuing bicycle and pedestrian improvements in a specific area, the planning department can conduct targeted analyses to provide preliminary investigative insight. The department can prepare a report for any public entity with information about traffic congestion, traffic volume, existing conditions of pedestrian and bicycle facilities, public opinion, and potential improvements.

Grant Application Assistance

Finally, the Delaware County Planning Department is always available to assist public entities with federal, state, and local grant opportunities. Planning department staff is well-versed in the grant application process and can help the applicant with a wide range of activities – from providing general information to preparing the application, depending on the applicant's needs.

Contact Information

Delaware County Planning Department

Court House/Government Center

201 West Front Street

Media, PA 19063

Telephone: (610) 891-5200

Email: Planning_Department@co.delaware.pa.us

FUNDING SOURCES

Statewide Competitive Programs

Act 89 Multi-Modal Transportation Fund (MTF)

Provides grants to encourage economic development and ensure that a safe and reliable system of transportation is available to the residents of the commonwealth. Eligible projects include: intercity bus and rail service improvement, bus stops, transportation centers, park-and-ride facilities, rail freight sidings, land acquisition for eligible airport development, land interests required for air approach, and clear zone purposes, sidewalk-crosswalk safety improvements, bicycle lanes, route designation, in-fill development by assisting with traffic impact mitigation, local highways development, highway noise and sound barriers, bridges, which will benefit state system and local economic development, and greenways. Projects (to be announced) may be awarded between \$100,000 and \$3,000,000.

- **Department of Community and Economic Development's (DCED) MTF**, on behalf of the Commonwealth Financing Authority (CFA), accepts applications every year between March 1 and July 31. See Guidance and Application Materials on DCED website: www.dced.pa.gov/programs/multimodal-transportation-fund/

Key words: development or rehabilitation of transportation assets, streetscape, lighting, sidewalk enhancement, pedestrian safety, connectivity of transportation assets, transit-oriented development

Timing: Accepts applications every year between March 1 and July 31.

- **PennDOT MTF** See Guidance and Application Materials on PennDOT's Multimodal Transportation website: www.penndot.gov/ProjectAndPrograms/MultimodalProgram/

Key words: bus and rail service improvement, bus stops, sidewalk-crosswalk safety improvements, bicycle lanes, route designation

Timing: Usually fall.

Green Light Go

Act 89 of 2013 created a new grant funding program for designated corridors to reduce congestion and improve efficiency of traffic signals on state highways. Green Light-Go Pennsylvania's Municipal Signal Partnership Program will provide up to \$40 million state funds during State Fiscal Year (SFY) 2016-2017, and after, for the operation and maintenance of traffic signals along critical and designated state highways with a required 20% municipal or private cash match. For more information, see www.dot.state.pa.us/signals.

Key words: traffic signal efficiency, state highways

Timing: Usually summer/fall.

Automated Red-Light Enforcement (ARLE)

The ARLE program is a statewide program that targets high crash intersections within the Commonwealth of Pennsylvania with the implementation of an automated system that records violations by drivers who run red lights and are fined for their violation. Thus far, the program has been implemented within the City of Philadelphia and Abington Township. The Pennsylvania Department of Transportation distributes the funds collected from fines via a grant program specifically designated for transportation safety improvements. Municipalities may apply, directly to PennDOT, for these grant moneys to pay for eligible roadway enhancement, safety, and congestion projects. As of July 2016, the DVRPC region has been awarded a total of \$33,069,000 out of a statewide distribution of \$45,427,000, or 73 percent of the statewide distribution. For more information, see [www.dot.state.pa.us/Portal%20Information/Traffic%20Signal%20Portal/FUNDA RLE.html](http://www.dot.state.pa.us/Portal%20Information/Traffic%20Signal%20Portal/FUNDA%20RLE.html)

Key words: driver violations, red light running, roadway enhancement, safety, congestion

Timing: Usually summer.

DCED Municipal Assistance Program (MAP)

Provides funding to assist local governments to plan for and efficiently implement a variety of services and improvements and soundly manage development with an emphasis on intergovernmental approaches. Community planning: comprehensive plans, land use ordinances, Transit Revitalization Investment District (TRID) planning studies, and entrepreneurial/innovative

plans that support community and economic development improvements with an emphasis on multi-municipal plans. Grants of up to 50 percent of eligible costs.

Key words: TRID

Timing: Ongoing.

Pennsylvania Infrastructure Bank (PIB)

A PennDOT program that provides low-interest loans to help fund various transportation projects within the Commonwealth. Borrowers include cities, townships, boroughs, counties, transportation authorities, economic development agencies, not-for-profit organizations, and private corporations. The PIB provides a low-cost means to fund projects, in whole or in part. For more information: www.penndot.gov/ProjectAndPrograms/Planning

Key words: low-interest loans, transit, highway/bridge

Timing: Ongoing.

Statewide Transportation Alternatives Program (TAP)

Transportation alternatives projects build pedestrian and bicycle facilities, improve access to public transportation, create safe routes to school, preserve historic transportation structures, provide environmental mitigation, and create trail projects that serve a transportation purpose, while promoting safety and mobility. \$17,962,000 TAP funds, in FY17 and \$18,309,000 in FY18, and thereafter, are made available per the FAST Act directly to Pennsylvania for use in selecting projects on a competitive basis. A recent competitive round totaling \$26,000,000 of statewide TAP funding occurred in the spring of 2016, with final project selections recently announced. For more information: <https://www.penndot.gov/ProjectAndPrograms/Planning/Pages/Transportation%20Alternatives%20Set-Aside%20-%20Surface%20Trans.%20Block%20Grant%20Program.aspx>

Key words: pedestrian and bicycle facilities, access to public transportation, safe routes to school, historic preservation, environmental mitigation, trails

Timing: Periodic, to be announced.

Regional Competitive Programs

Competitive Congestion Mitigation and Air Quality (CMAQ) Program

The DVRPC Competitive CMAQ Program seeks transportation-related projects that can help the region reduce emissions from mobile sources and meet the National Clean Air Act Standards. CMAQ-eligible projects will demonstrably reduce air pollution emissions and, in many cases, reduce traffic congestion. Projects may be submitted by a public agency or a public-private partnership. A Subcommittee of the DVRPC Regional Technical Committee (RTC) evaluates the projects and makes recommendations to the DVRPC Board for final selection. In July 2016, the DVRPC Board approved the most recent round of the DVRPC Competitive CMAQ Program by selecting 17 projects for funding in the DVRPC Pennsylvania counties, for a total CMAQ award of \$21,900,000. For more information, see www.dvrpc.org/CMAQ/

Key words: emissions from mobile sources, air pollution

Timing: Periodic, date to be announced.

Transportation Alternatives Set-Aside Program

Transportation alternatives projects build pedestrian and bicycle facilities, improve access to public transportation, create safe routes to school, preserve historic transportation structures, provide environmental mitigation, and create trail projects that serve a transportation purpose, while promoting safety and mobility. The FAST Act apportions \$3,857,000 TAP funds in FY17 and \$3,932,000 TAP funds annually, after FY2017, directly to the DVRPC southeastern Pennsylvania region for use in selecting projects on a competitive basis. For more information, see www.dvrpc.org/TAP/PA/

Key words: pedestrian and bicycle facilities, access to public transportation, safe routes to school, historic preservation, environmental mitigation, trails

Timing: Usually summer/fall.

Safe Routes to Transit

This is a technical assistance program aimed at providing selected project sponsors (municipalities or the counties in the DVRPC region) with the information and concepts needed to complete competitive applications for funding programs. Municipalities or counties are invited to identify critical gaps

in the transportation network that limit pedestrian and bicycle accessibility to transit stations by submitting an online application. DVRPC project staff selects projects for analysis, and once projects are selected, DVRPC will work with project sponsors to define access issues and develop conceptual improvements with specific funding opportunities in mind. Projects may include: existing conditions analysis, developing conceptual pedestrian and bicycle recommendations, stakeholder coordination, estimating project costs, identifying construction (and maybe design) funding sources, and advising on grant applications for potential funding sources.

Key words: gaps in the transportation network, access to transit, pedestrian and bicycle facilities

Timing: Unknown.

Transportation and Community Development Initiative (TCDI)

Grant program of the DVRPC that supports local development and redevelopment efforts in qualifying municipalities of the Delaware Valley. TCDI provides a mechanism for municipalities to undertake locally directed actions to improve their communities, which in turn implement their local and county comprehensive plans and support the goals and vision of the long-range land use and transportation plan. It seeks to support and leverage state and county programs by providing funding in selected areas to undertake planning, analysis, or design initiatives for projects or programs that enhance development or redevelopment and enhance or improve the efficiency of the regional transportation system. Funding for TCDI program comes from a combination of state transportation dollars and federal STP funds. Through fiscal years 2002 to 2017, DVRPC has distributed over \$10,116,095 to the DVRPC Pennsylvania region for TCDI planning grants. For more information, see www.dvrpc.org/TCDI/

Key words: development, redevelopment, efficiency of regional transportation system

Timing: Usually winter.

Local and Micro Grants

Community Development Block Grant (CDBG) Program

The CDBG Program, operated by the U.S. Department of Housing and Urban Development (HUD), provides an annual grant to Delaware County's Office of Housing and Community Development (OHCD) as well as Chester City, Haverford Township, and Upper Darby Township. Seventy percent of HUD grants must be used for activities that benefit low- and moderate-income persons. Communities can apply to receive CDBG grants from HUD grant administrators for a wide variety of projects. Many projects funded with CDBG grants are not solely pedestrian-focused, but rather, incorporate pedestrian improvements within a larger scope of work. Between 2013 and 2017, more than \$4.8 million in CDBG funds were awarded to Delaware County projects that incorporated pedestrian improvements.

Key words: low/moderate income, community development, streetscapes, building restoration/demolition, historic preservation, parks and recreational facilities, planning, administration

Timing: Applications are usually due in January.

Transportation Enhancement Grant

As part of the Transportation Enhancement Grant program, the DCTMA awards three grants of \$1,000, \$2,000, and \$5,000 to qualified DCTMA members for transportation enhancements. Projects must be compatible with the DCTMA mission of mitigating congestion and reducing emissions. The proposed project must promote alternative transportation such as walking, bicycling, public transit, telecommuting, carpooling, vanpooling, a compressed work week, and similar modes. For more information, see <https://www.dctma.org/>

Only DCTMA members are eligible for funding through this program.

Key words: safe bus shelters, secure bike parking, accessible crosswalks, timed lights, signage, and other projects that promote alternative transportation

Timing: Usually summer.

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Appendices

APPENDIX A: DELAWARE COUNTY SIDEWALK IMPROVEMENT PROJECTS/ENGINEERING DESIGNS/STUDIES

Project	Location	Grant	Complete	Pedestrian Improvements	
Sidewalk Construction					
1	Route 352 in front of new Brookhaven shopping center	Brookhaven Borough	Developer funds	2016	New Sidewalk
2	Baltimore Pike: Main Line Health and CHOP	Concord Township	Twp. Requirement	2015	New Sidewalk
3	Wegman's (loop road)	Concord Township	Twp. Requirement; PennDOT MTF 2014	2015	New Sidewalk
4	Fellowship Drive between Route 322 and Covenant Fellowship Church	Concord Township	Twp. Requirement	2016	New Sidewalk
5	Route 322 Improvement Project	Concord, Bethel, and Upper Chichester Townships	TIP PennDOT project funds	2023	New Sidewalk (Upper Chichester)/Pedestrian Connections to Transit
6	Darby Road Streetscape Improvements	Haverford Township	DCED MTF 2016	Unknown	Streetscape
7	Wallingford Avenue between Manchester Avenue and Providence Road	Nether Providence Township	TAP 2012 & 2014	2016	New Sidewalk
8	Copples Lane between Strath Haven Middle School and Callender Lane	Nether Providence Township	TAP 2014	2017	New Sidewalk
9	Moore Road between Brookhaven Road and Media parkway	Nether Providence Township	TAP 2016	2020-2022	New Sidewalk
10	Possum Hollow Road between Providence Road and Wallingford train Station	Nether Providence Township	CMAQ	2020-2022	New Sidewalk

11	Rose Valley Road between Providence Road and Osbourne Lane. (Bikeable/Walkable Wallingford)	Nether Providence Township	DCED MTF 2017	2020-2022	New Sidewalk/Bike Lane
12	Cabrini University Connectivity and Pedestrianization Project	Radnor Township	DCED MTF 2016	2030	Pedestrian Circulation
13	N. Wayne Avenue/West Avenue/Poplar Avenue Pedestrian Improvements	Radnor Township	DCED MTF 2016	Unknown	New Sidewalk
14	Lancaster Avenue Pedestrian Bridge	Radnor Township (Villanova University)	DCED MTF 2016	2018	Pedestrian Bridge
15	Pedestrian Promenade	Radnor Township (Villanova University)	DCED MTF 2016	2019	Promenade
16	Hillside Road between Crum Lynne Road and Glenloch Road	Ridley Park Borough	TAP 2014	2018	New Sidewalk
17	Sproul Road between sidewalk north of Media trolley bridge and sidewalk on bridge	Springfield Township	TAP 2016	2019	New Sidewalk
18	Saxer Avenue and Brookside Road Improvements	Springfield Township	DCED MTF 2016	Unknown	Rebuilding Existing Sidewalk

19	Chestnut Avenue, south side of College Avenue between Chester Road and Swarthmore Rutledge Elementary School, Harvard Avenue/Cresson Lane between Dickinson Avenue and Little Crum Creek Park	Swarthmore Borough	TAP 2014	2018	New Sidewalk
20	Township Line Road between Bella Vista Road and Bella Vista Road loop (back to Township Line)	Upper Darby Township	Safe Routes to School	2015	New Sidewalk
Related Projects					
21	Traffic Signal Pedestrian Accommodations	Aston Township	Green Light-Go	Unknown	Pedestrian Signals
22	Aston Township Streetscape Improvements	Aston Township	DCED Multimodal Transportation Fund 2015 & 2017	2016	Streetscape
23	Secane Station Construction	Upper Darby Township	SEPTA Federal Transit Administration & PA Act 89	Fall 2017	Pedestrian tunnel under platform, new station building with canopy, full ADA compliance for entire station, mid-block pedestrian crossing on Providence Road.
24	Traffic Signal Pedestrian Accommodations	Concord Township	Green Light-Go	Unknown	Pedestrian Signals
25	Gateway Slope Park	Lansdowne Borough	DCNR 2016 & DCED Multimodal Transportation Fund 2017	Unknown	Project includes construction of a pedestrian walkway.
26	SR420 Bridge Replacement	Prospect Park Borough and Tincum Township	PennDOT Bridge Replacement	Unknown	Bridge replacement to include improved pedestrian facilities, trail connection to John Heinz National Wildlife Refuge.
27	Villanova Station Improvements	Radnor Township	SEPTA Federal Transit Administration & PA Act 89	Phase I Winter 2018	New, wider pedestrian tunnel with access ramps and stairs and new lighting.
28	Trail across playing field and new pedestrian bridge to connect with Ridley Middle School	Ridley Park Borough	TAP 2014	2018	Trail/Pedestrian Bridge

29	Audible Pedestrian Signals at Baltimore Pike & Saxer Avenue	Springfield Township	Green Light-Go	Unknown	Pedestrian Signal
30	69th St. TC West Terminal Improvements	Upper Darby Township	FTA Bus and Bus Facilities Program Livability Initiative Grant	2016	Raised customer waiting area, ADA enhancements.
Studies/Engineering					
31	Walkable Chadds Ford	Chadds Ford Township	Brandywine Conservancy/Chadds Ford Township	2017	Engineering study/design proposal
32	Morton Connects	Morton Borough	TCDI	2018	Project analyzes possible transportation solutions such as traffic calming and streetscape enhancements to stimulate economic development.
33	Multi-Modal Modernization of the Garrett Road Corridor	Upper Darby Township	TCDI	2018	Includes traffic study to identify vehicular and pedestrian circulation through the Garrett Road and Byword Avenue area.

APPENDIX B: COUNTYWIDE MAP OF SIDEWALK CONDITIONS AS OF 01/11/18

