

# Borough of Swarthmore Pedestrian and Bicycle Accessibility Master Plan



# Borough of Swarthmore

## Pedestrian and Bicycle Accessibility Master Plan

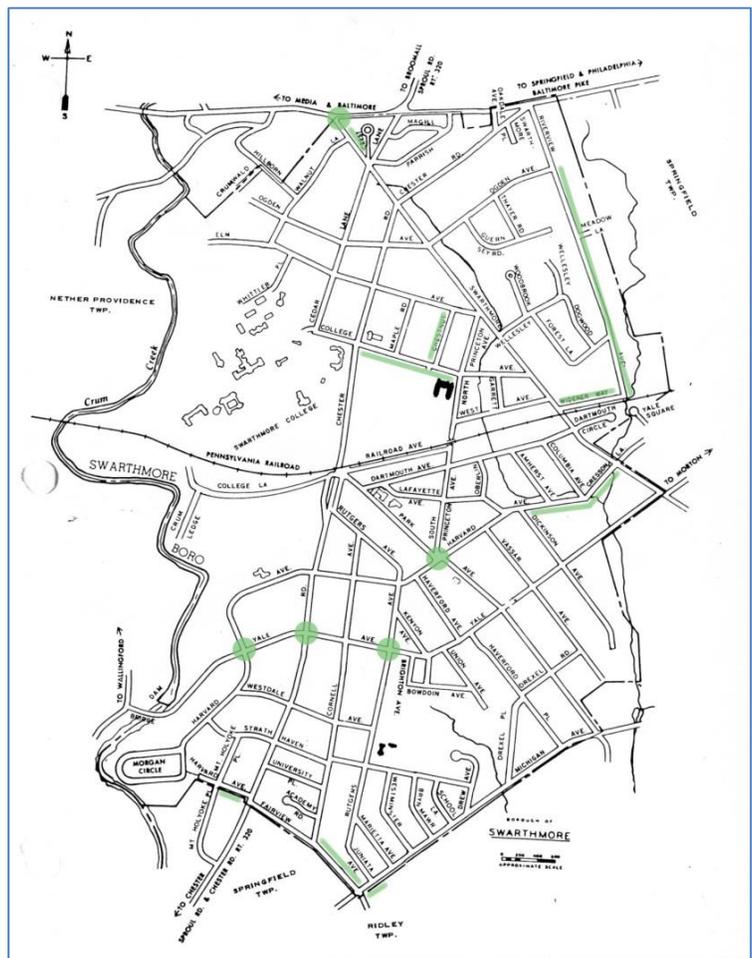
Michael Baker Jr., Inc. was selected to complete the pedestrian and bicycle accessibility master plan for the Borough of Swarthmore. The scope of the plan includes the following tasks:

1. Prioritized plan for installation of sidewalks and improved street crossings
2. Development of a Bicycle Route Network
3. Development of a Public Education Campaign

The following discussion summarizes the results of the study and input of the steering committee.

### Prioritized plan for installation of sidewalks and improved street crossings

Swarthmore Borough is fortunate to have an extensive network of existing sidewalks throughout the Borough. Please refer to Appendix A for a map of the existing sidewalk network provided by the steering committee. The Borough's compact size and development patterns have led to a highly walkable community. This is one of the reasons Swarthmore is so attractive to many residents. There are a few select gaps in this sidewalk network that the Borough is interested in closing and this study will help to accomplish that. This map shows the location of the sidewalk segments and street crossing locations included in this study.



Location map for sidewalk installation and intersection improvements.

The Borough has identified 9 sidewalk segments that they would like to evaluate and prioritize for future construction. The 9 sidewalk segments are as follows:

- College Avenue – Chester Road to North Princeton Avenue
- Swarthmore Avenue – Baltimore Pike to Walnut Lane
- Cresson Lane – Dickenson Avenue to Swarthmore Ave
- Harvard Avenue – Mt. Holyoke Rd to Chester Rd.
- Riverview Avenue – Ogden Avenue to Widener Way
- Widener Way – Swarthmore Ave to Riverview Avenue
- Chestnut Avenue – Elm Avenue to College Ave
- Michigan Avenue – Fairview Avenue to Juniata Avenue
- Fairview Avenue – Cornell Avenue to Michigan Avenue

Baker developed an evaluation system to help prioritize the sidewalk segments. The evaluation system included the following 10 evaluation categories with each category having a maximum value of 10 points.

<b>Adjacent Land Use (10 pts max.)</b>		<b>Block Frontage with Sidewalk (10 pts max)</b>	
Pedestrian-Friendly Commercial (10) – no		Neither side has sidewalk (10)	
Other Commercial – no		1 side has sidewalk (5)	
Residential			
4 or more units/acre – yes			
<4 units/acre			
<b>School Proximity (max. of 2 schools-20 pts max.)</b>			
<i>Elementary School (max 10 pts)</i>			
<1/4 mile (10) –yes			
1/4 to 1/2 mile (5)			
<i>Middle, High School or College (max 10 pts)</i>			
<1/2 mile (10)			
>1/2 mile to 1 mile (5)			
<b>Transit Route Proximity (10 pts max.)</b>			
<1/4 mile (10) –yes			
1/4 to 1/2 mile (5)			
<b>Public Facilities (Park, library, Community Ctr.)</b>			
<1/4 mile			
1/4 to 1/2 mile			
		<b>Environmental Constraints (10 pts max.)</b>	
		Yes (0)/No(10)/Maybe(5)	
		<b>Ease of Construction (10 pts max.)</b>	
		Easy (10) / Medium (5)/ Difficult (0)	
		<b>Other Constraints (Utilities, bridges, buildings, walls) – 10 pts max</b>	
		Yes (0) / No (10) / Maybe (5)	
		<b>Cost/Linear Foot (10 pts max)</b>	
		Low(10) / Med (5) / High (0)	
		<b>Total (Max. 100)</b>	

The evaluation system has a maximum score of 100 points. Each sidewalk segment was evaluated and the individual scoring sheets are included in Appendix A. The following is the ranking of each sidewalk segment with number 1 being the highest priority for soonest construction:

Sidewalk Priority	Score	Comment
1. College Avenue	90	To be done as part of a future College project
2. Chestnut Avenue	90	
3. Swarthmore Avenue	65	
4. Cresson Lane	65	
5. Widener Way	65	Existing painted walkway present
6. Michigan Avenue	60	
7. Harvard Avenue	60	
8. Riverview Avenue	50	
9. Fairview Avenue	50	

As part of the evaluation, a preliminary cost estimate was developed for each segment. The following chart summarizes the estimated costs:

Roadway (from / to)	Approx. Construction Cost	Cost/Linear Foot
College Avenue – Chester Road to North Princeton Avenue	\$ 42,117	\$ 56.16
Swarthmore Avenue – Baltimore Pike to Walnut Lane	\$ 34,595	\$113.43
Cresson Lane – Dickenson Avenue to Swarthmore Ave	\$ 76,697	\$ 63.91
Harvard Avenue – Mt. Holyoke Pl to Chester Rd	\$ 22,979	\$ 60.47
Riverview Avenue – Ogden Avenue to Widener Way	\$ 242,995	\$ 92.57
Riverview Avenue – Widener Way to end of Henderson Field	\$ 25,898	\$ 54.52
Widener Way – Swarthmore Ave to Riverview Avenue	\$ 65,835	\$ 97.53
Chestnut Avenue – Elm Avenue to College Ave	\$ 38,644	\$ 57.68
Michigan Avenue – Fairview Avenue to Ridley Twp. Park	\$ 30,738	\$ 58.00
Michigan Avenue – Fairview Avenue to Juniata Ave	\$ 2,426	\$ 97.03
Fairview Avenue – Cornell Avenue to Michigan Avenue	\$ 50,392	\$ 69.03

Detailed cost estimates for each segment are included in Appendix A.

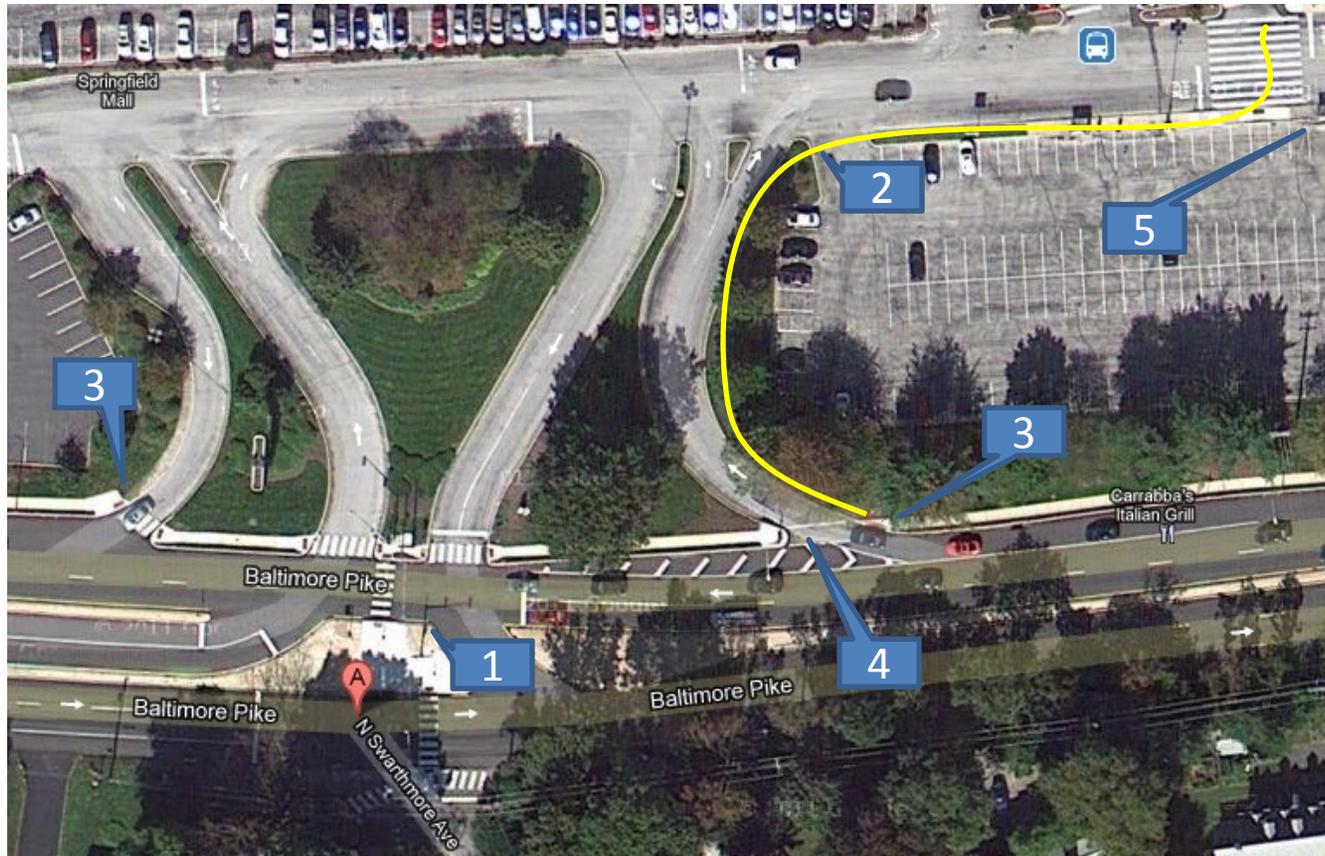
### **Improved Street Crossings**

The Borough identified the following existing intersections to be analyzed for pedestrian crossing improvements:

- Swarthmore Ave and Baltimore Pike
- Park Ave, Harvard Ave and S. Princeton Ave
- Yale Avenue (SR 3016) and Harvard Avenue
- Yale Avenue (SR 3016) and Chester Road (SR 320)
- Harvard Avenue and Chester Road (SR 320)

The following pages outline the existing conditions and recommendations for each location:

# Swarthmore Ave and Baltimore Pike



## Existing Conditions

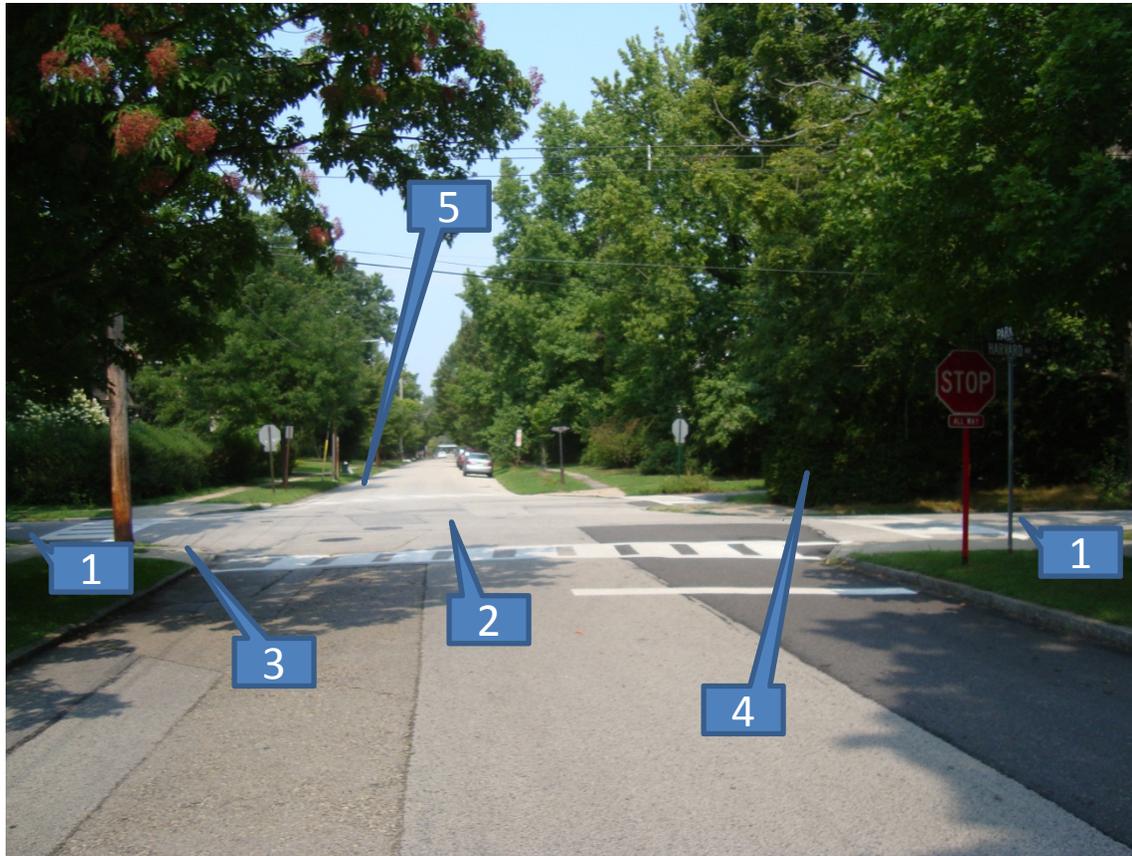
- Signalized int.
- Push Buttons and Continental Crosswalks
- New ADA ramps
- SEPTA Springfield Mall Transportation Center (Bus Routes 107, 109 & 110)

## Recommendations

1. Add hand/man & countdown timers
2. Add sidewalk connection to SEPTA stop and Mall
3. Add "Yield to Peds" signs at right in and right out roadways
4. Add continental crosswalk at right in roadway
5. Bike racks at SEPTA stop and mall



# Park Ave, Harvard Ave and S. Princeton Ave



## Existing Conditions

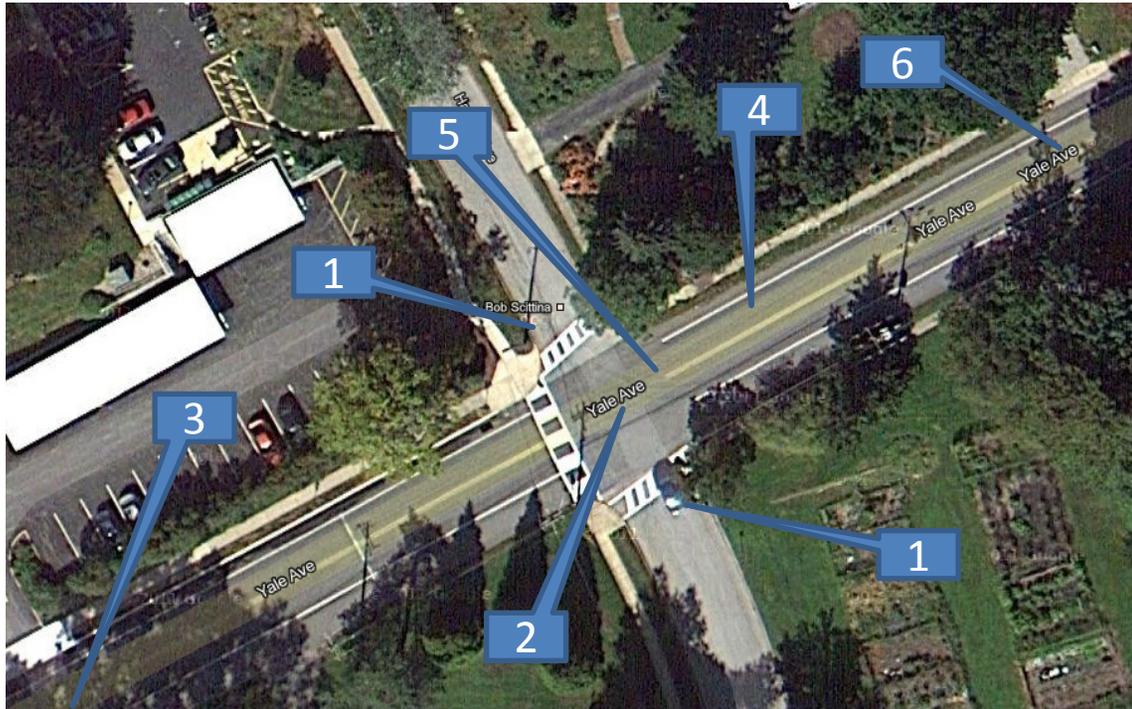
- 5 point, unsignalized int.
- Continental crosswalks all legs
- Stop bars on Park Ave.

## Recommendations

1. Add stop bars on Harvard Ave and S. Princeton Ave
2. Add new ADA ramps all corners
3. Remove extra handicap ramp at Harvard Ave./Park Ave.
4. Trim bushes for visibility
5. Consider adding "PED XING" and / or "STOP" pavement legends on all legs



# Yale Avenue (SR 3016) and Harvard Avenue Intersection



## Existing Conditions

- Unsignalized int.
- 3 ladder/continental crosswalks
- Stop control on Harvard Ave
- Ped Xing, Advance Ped Xing & Yield to Peds signs

## Recommendations

1. Add stop bars on Harvard Ave
2. Add new ADA ramps all corners
3. Add another sign on other side of curve
4. Consider adding "PED XING" and / or "STOP" pavement legends on all legs
5. Consider adding in road "Yield to Peds" placard
6. Consider adding "soft rumble strips" on down hill approach to Harvard



# Yale Avenue (SR 3016) and Chester Road (SR 320)



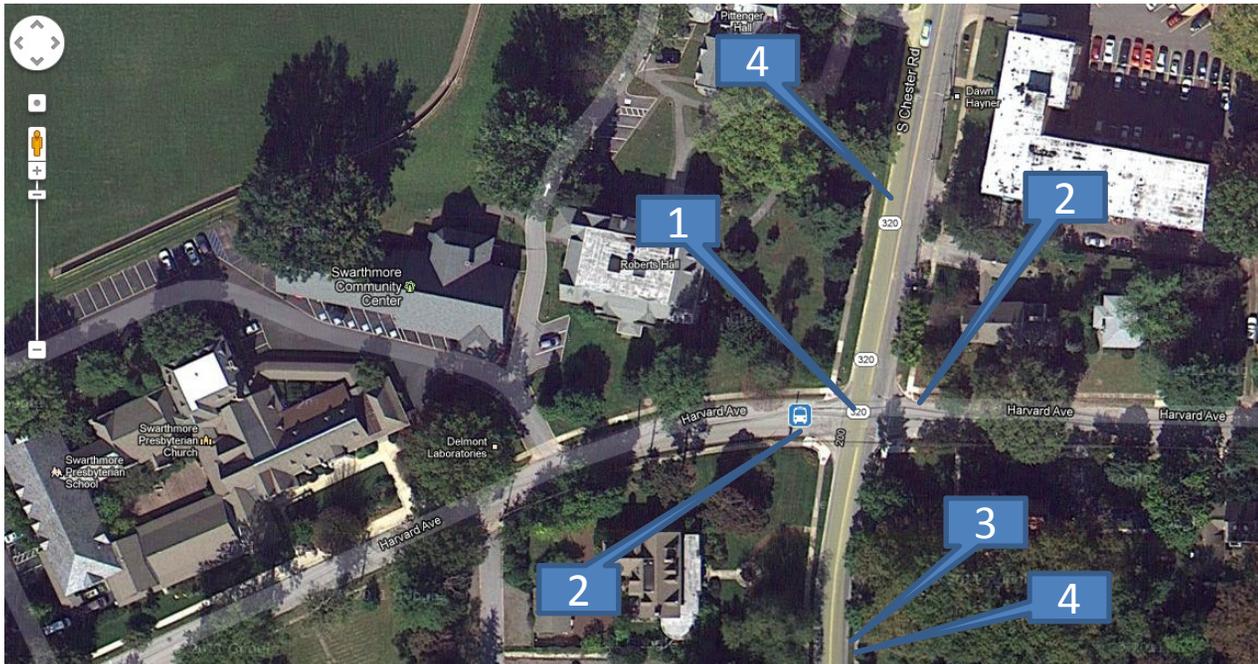
## Existing Conditions

- Signalized Int.
- 4 ladder/continental crosswalks
- Swarthmore Square Office Bldg. – sidewalk conflicts
- Stop Bars set back – good!
- Bike Route signs – good!

## Recommendations

1. Add new ADA ramps all corners
2. Consider push buttons & countdown timers
3. Warning signs &/or pavement marking for sidewalk conflicts at office building

# Harvard Avenue and Chester Road (SR 320)



## Existing Conditions

- Unsignalized Int. (stop control on Harvard)
- No crosswalks
- New ADA ramps
- Community Center, Church and Nursery School nearby on Harvard

## Recommendations

1. Add crosswalks on all legs
2. Add stop bars on Harvard
3. Trim bushes on Chester at curve
4. Add advance “Ped Xing” signs on Chester Ave



One other recommendation that could be considered for each of these locations is the installation of a push button activated rectangular rapid flashing beacon (RRFB). RRFB is a PennDOT approved supplement to warning signs. According to FHWA .gov, RRFBs are defined as user-actuated amber LEDs that supplement warning signs at unsignalized intersections or mid-block crosswalks. They can be activated by pedestrians manually by a push button or passively by a pedestrian detection system. RRFBs use an irregular flash pattern that is similar to emergency flashers on police vehicles. RRFBs may be installed on either two-lane or multi-lane roadways. The Federal Highway Administration website has stated the following regarding RRFBs:

- RRFBs are a lower cost alternative to traffic signals and hybrid signals that are shown to increase driver yielding behavior at crosswalks significantly when supplementing standard pedestrian crossing warning signs and markings.
- An official FHWA-sponsored experimental implementation and evaluation conducted in St. Petersburg, Florida found that RRFBs at pedestrian crosswalks are dramatically more effective at increasing driver yielding rates to pedestrians than traditional overhead beacons.
- The novelty and unique nature of the stutter flash may elicit a greater response from drivers than traditional methods.
- The addition of RRFB may also increase the safety effectiveness of other treatments, such as the use of advance yield markings with YIELD (or STOP) HERE FOR PEDESTRIANS signs. These signs and markings are used to reduce the incidence of multiple-threat crashes at crosswalks on multi-lane roads (i.e., crashes where a vehicle in one lane stops to allow a pedestrian to cross the street while a vehicle in an adjacent lane, traveling in the same direction, strikes the pedestrian), but alone they only have a small effect on overall driver yielding rates.
- Cost is approximately \$10,000 to \$15,000 for purchase and installation of two units (one on either side of a street). This includes solar panels for powering the units, pad lighting, indication units (for both sides of street) with RRFBs in the back and front of each unit, signage on both approaches, all posts, and either passive infrared detection or push buttons with audio instructions.

One additional benefit is that these systems can be installed with solar panels so they do not need a hard wire power source.



Rectangular Rapid Flashing Beacon



Example installation of two RRFBs at a crosswalk.

## Bicycle Route Network

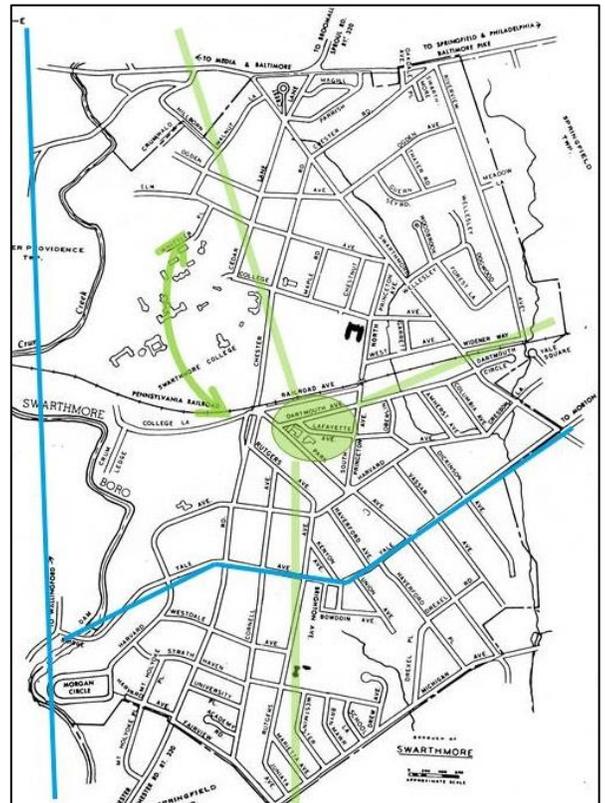


The second main task of this effort was the development of a bicycle route network map for the Borough. The goal of the bicycle route network map is to provide information to bicyclists on the preferred trails, shared roadways and bicycle routes to reach the Borough's many valuable destinations. First, existing bike trails and on-road bike routes such as the Leiper-Smedley Trail and Bicyclists Baltimore Pike were shown on the map. "Bicyclists' Baltimore Pike" is an on road bicycle route that extends from Nether Providence Township to the Philadelphia City line. The route uses Rose Valley Road, Yale Avenue, Franklin Avenue, Providence Road, Baily Road,

and Longacre Boulevard. The route utilizes the paved shoulder of these roadways along with bicycle wayfinding signage to guide bicyclists. PennDOT completed signing and striping of "Bicyclists' Baltimore Pike" in December 2010. The Leiper-Smedley Trail is an approximately 2 mile long paved bicycle trail built along interstate 476 that connects Swarthmore Borough to Delaware County's Smedely Park.

As Swarthmore Borough has a very centralized and densely developed Town Center, it is logical that bicyclists will want to access the town center on a regular basis. In addition, Baker worked with the steering committee to develop a list of the major recreational, educational, commercial and other destinations in the Borough. It is anticipated that bicyclists will want to access these destinations as well. A "hub and spoke" model seemed appropriate for existing configurations of destinations in the Borough. Just like the wheel on a bicycle, the model has a strong center hub and spokes radiate out from the hub connecting to the edges of the wheel. The Town Center and train station serve as the hub of the network and the bicycle friendly streets and

bicycle boulevards are the spokes. The many existing walkways and paths through Swarthmore College will serve as the spokes of the network on the west side of the Borough. The Leiper-Smedley Trail and Bicyclists Baltimore Pike serve as good portions of the outside edges of the network.



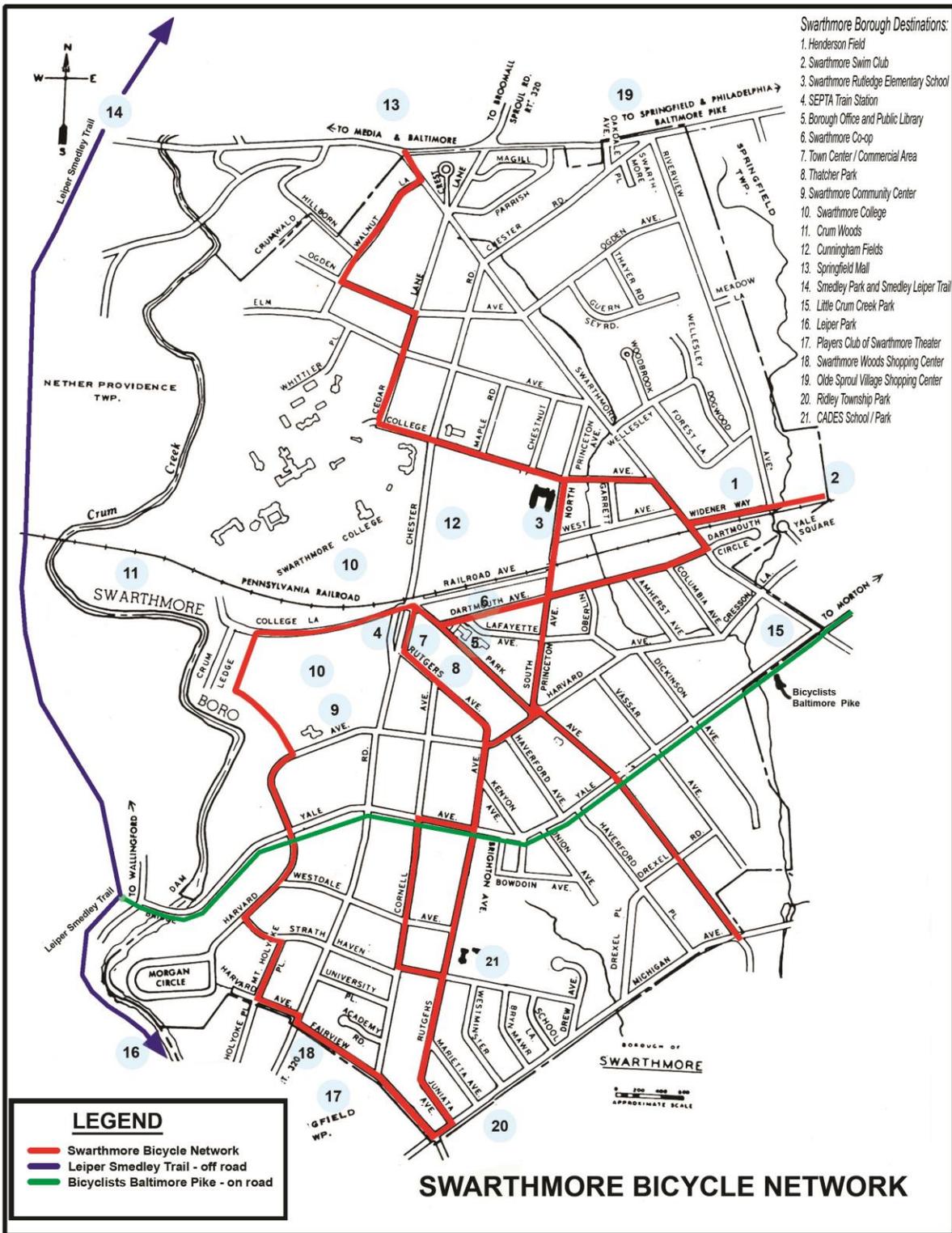
Spoke and hub layout on Borough map.

Several members of the steering committee and their families conducted a bicycle ride throughout the Borough to get a first-hand perspective of potential roadways to be used as part of the bicycle network.



Steering committee members and family during our bicycle evaluation of the Borough roadways.

Based on the observations developed during the bicycle ride and the input of the steering committee, the following bicycle network map was developed. See Appendix A for a full size pdf.



swarthmore\_map 2 markups 130125.pdf

Proposed bicycle network map for Swarthmore Borough.

## **Bicycle Boulevards:**

One of the major recommendations to the Borough is to identify a number of roadways for conversion into bicycle boulevards to connect neighborhoods to the Town Center. A Bicycle Boulevard is a road or street that is ideal for bicyclist transport through specialized road treatment such as traffic calming and speed reduction, signage and pavement markings, and intersection crossing treatments.



**Example of shared lane markings along a bicycle boulevard.**

The following identifies some of the specific treatments that can be used to create bicycle boulevards:

### **Signage**

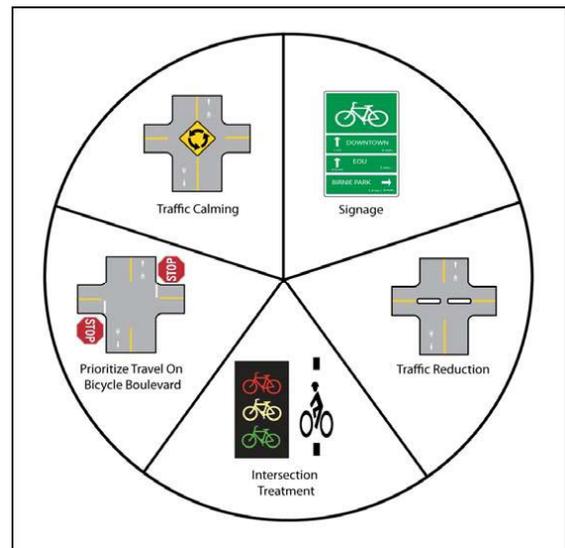
- Identification Signs
- Bicycle scale destination / way-finding Signs
- Warning Signs

### **Prioritize Bicycle Travel on Bicycle Boulevard**

- Pavement Markings
- Stop/Yield Signs

### **Intersection Treatment**

- Bicycle Boxes/Advanced Stop Bar
- Bicycle Activated Signals
- High Visibility Raised Crossing Islands



**Potential parts of a bicycle boulevard system.**

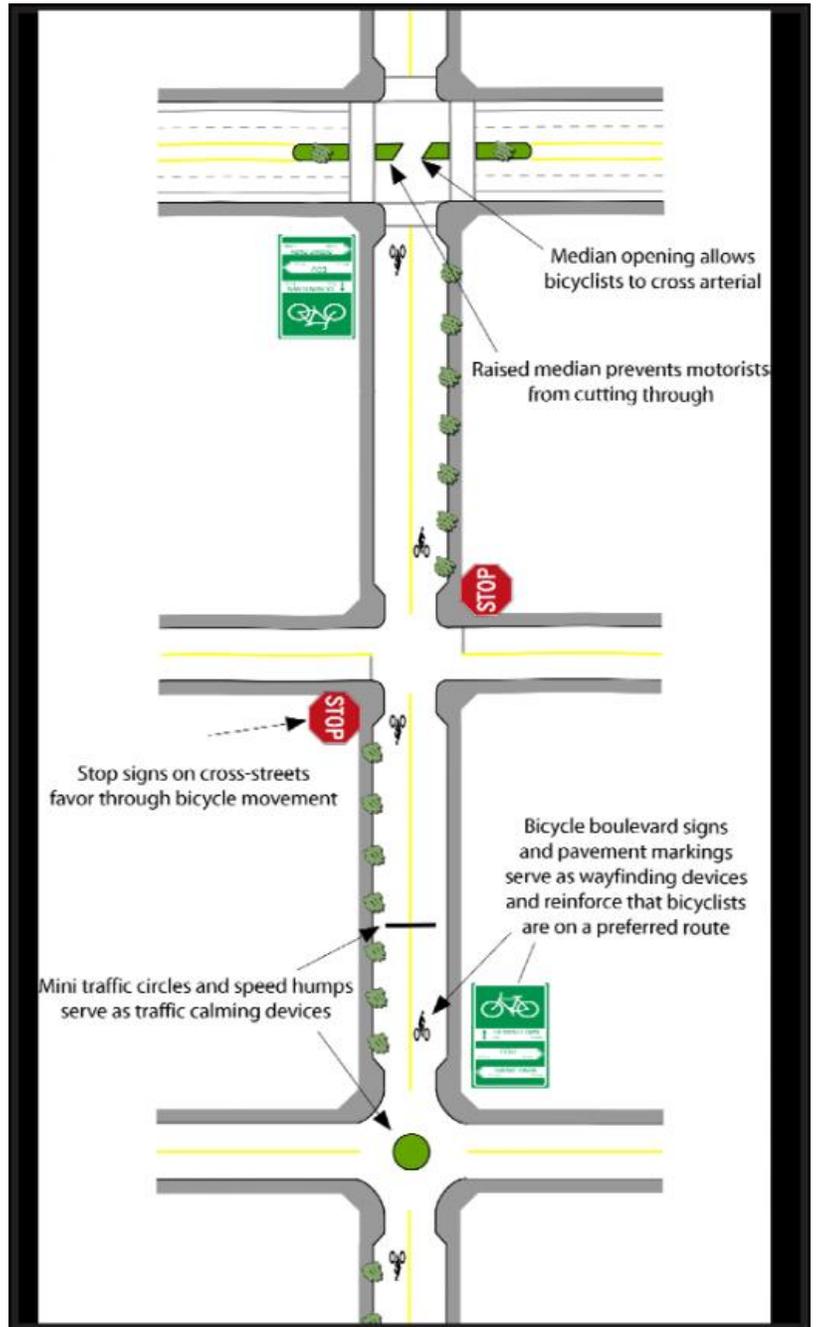
### Traffic Calming

- Traffic Circles
- Speed Tables
- Painted and Patterned Surfaces
- Chicanes
- Curb Extensions
- Residential Speed Limit
- Advisory Bicycle Lane
- Contraflow Bicycle Lane

### Traffic Reduction

- Non-Motorized Only Crossings
- Partial Non-Motorized Only Crossings

A combination of the above treatments is often utilized to enhance the use of specific roadways as bicycle boulevards. The above treatments are typically used on a regular interval along a number of blocks of a roadway corridor to as shown in the figure to the right.



Example showing various treatments used to create a bicycle boulevard.

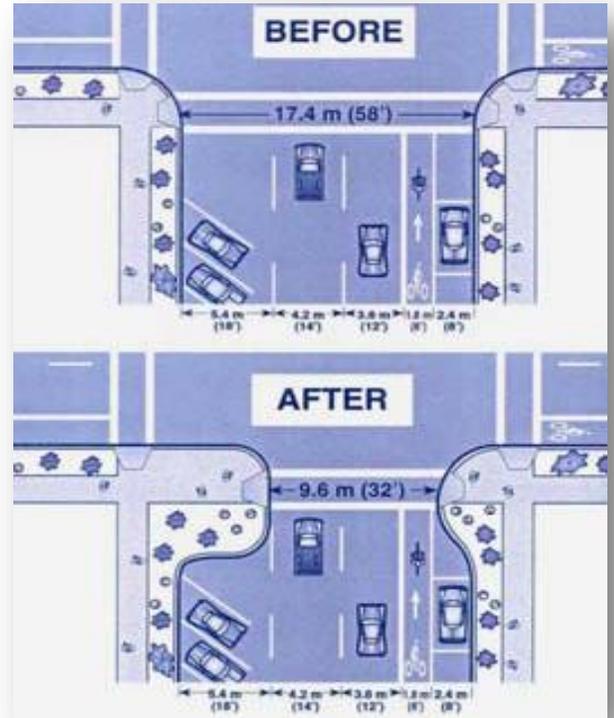
## Traffic Calming

Traffic calming consists of physical infrastructure and other measures put in place on roads to slow down, reduce motor vehicle traffic and to improve safety for pedestrians and cyclists. Examples of traffic calming measures include:

- Slower speed limits
- Narrow lanes
- Speed humps and speed tables
- Curb extensions and chicanes (see photo)
- Roundabouts and specified bike lanes



Example photo of chicane.



Before and after graphics showing curb extensions.

## Intersection Treatments:

Bicycle boulevards often incorporate intersection treatments to highlight the bicycle movements on that particular roadway and to enhance the continuity of the bicycle route. Examples of the treatments include:

- Clearly labeled crosswalks
- Continue sharrows/bike lanes
- Greenbacked Sharrows and colored bike lanes
- Bike boxes
- Dashed lines and chevron markings



Colored bike lane markings through an intersection to highlight bike crossing.



Chevron markings to connect bike lanes.



Colorized bike box in front of stop bar.

**Signage and Markings:**

Signs and pavement markings are often used to identify a roadway as a bicycle boulevard. The following are examples of these types of signs and markings:

- Custom Street Signs identifying street as a bike boulevard
- Standard bike route signs
- Colored bike lanes
- Standard warning signs (Share the Road)
- Shared Lane Markings (i.e. sharrows)



**Proposed Bicycle Boulevards within the Borough:**

As part of this plan we are recommending that several roadways in the Borough be specifically identified as bicycle boulevards and that improvements be made to emphasize these as preferred for bicycle and pedestrian use. We recommend the following to accomplish this designation:

- Identify them as bicycle boulevards in the Borough’s comprehensive plan, official maps and/or ordinance
- Emphasize bicycle and pedestrian improvements with any public or private development project that occurs along these roadways in the future
- Add “share the road”, bicycle route and shared lane markings along these roadways
- Consider custom street signs identifying these roadways as bicycle boulevard
- Pursue grant funding to incorporate additional bicycle/pedestrian improvements on these routes
- Consider allocating future Borough funding to incorporate additional bicycle/pedestrian improvements on these routes
- Develop educational information / web page to educate the Borough residents and the general public about the bicycle boulevards

The following section outlines the roadways that are recommended for designation as bicycle boulevards:

### **Juniata Avenue/Rutgers Avenue/Cornell Avenues**

A series of one way paired bike lanes and shared roadways is recommended to create bicycle boulevards along Juniata Avenue, Rutgers Avenue and Cornell Avenue. These roadways connect the southern edge of the Borough to the Town Center and several Borough destinations. Rutgers Avenue is a one way street from Strathaven Ave. to Yale Ave and has a posted 15 mph speed limit. There is an existing plastic roadway barrier present at the intersection Yale Avenue. Permanent measures could be installed at this location to enhance the bike boulevard concept. Rutgers Avenue currently has a roadway width of 25'. This could be reconfigured to fit a 7' parking lane, a 12' travel lane and a 6' wide one way bike lane into town. The following additional improvements should be considered:

- Shared lane/bike lane markings, share the road signs
- Bike Crossing signs and intersection markings on Juniata, Cornell and Yale Avenues
- Consider 4 way stop signs at Yale Ave/Rutgers Avenue



Plastic roadway barrier on Rutgers Avenue near Yale Avenue.

## Dartmouth Avenue & Widener Way



Existing condition on Widener Way.

These two roadways provide a good connection from the eastern edge of the Borough to/from the Town Center. They also connect to the Swarthmore Co-op food market, Henderson athletic fields and the popular Swarthmore Swim club. However, a short, busy

section of Swarthmore Ave and the SEPTA railroad crossing is included in this route. This area should be examined closely in the future for additional safety considerations. Shared Lanes are envisioned along Dartmouth Avenue to provide enhanced bicycle access to the Town Center. The existing sidewalks along Dartmouth provide good pedestrian access.

Widener Way is a one way street with an existing striped 5'-6' wide walking/biking area within the pavement area (see photo). Several options could be considered to enhance the safety and functionality of this area including:

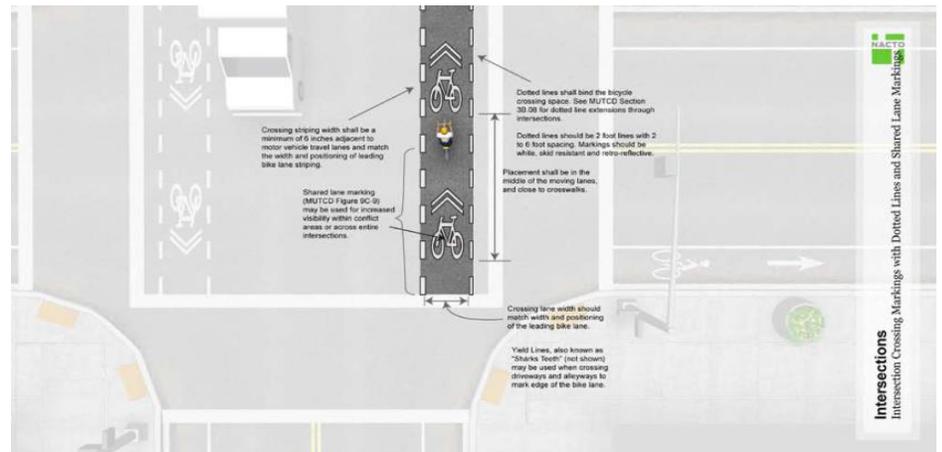
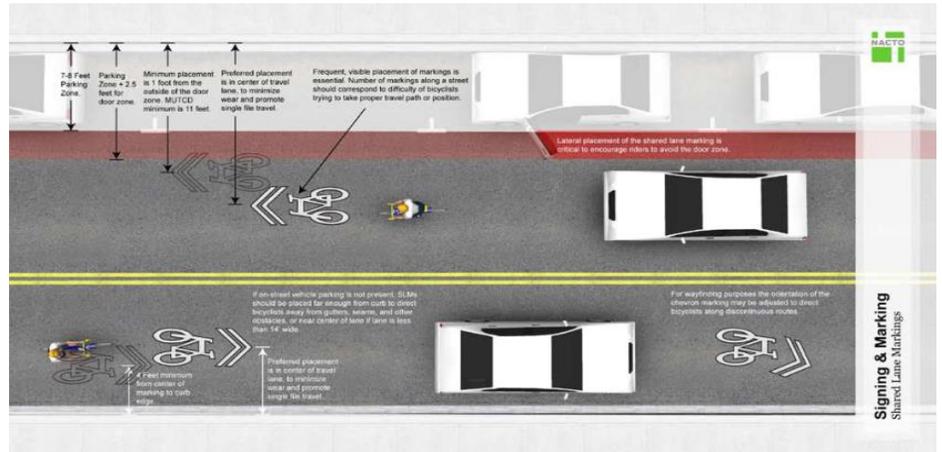
- Flexible delineators with centerline and flow arrows (top photo)
- Option 1 plus a painted buffer (2<sup>nd</sup> photo)
- Curbed island (3<sup>rd</sup> photo)
- Raised curb and sidewalk with sharrows (bottom photo)



Renderings of potential walking and bicycling concepts along Widener Way.

**Swarthmore Ave, Walnut Lane, Ogden Avenue, Cedar Lane, College Ave, North Princeton**

The Springfield Mall is a major commercial destination in the area and is located at the northern edge of the Borough. Residents and Swarthmore College students are frequent customers to the many stores in the mall. A route that connects the Town Center to the College and to the mall was identified. Using lower volume side streets along North Princeton Avenue, College Avenue, Cedar Lane, Ogden Lane, Walnut Lane and Swarthmore Avenue to reach the signalized intersection at Baltimore Pike was recommended by the steering committee. The existing signalized intersection at Baltimore Pike has pedestrian push buttons and other accommodations to allow for safe crossings of this busy arterial. The improvements such as sharrow markings, share the road signs and intersection crossing treatments as shown in these NACTO Urban Bicycle Guide figures are suggested along this route:



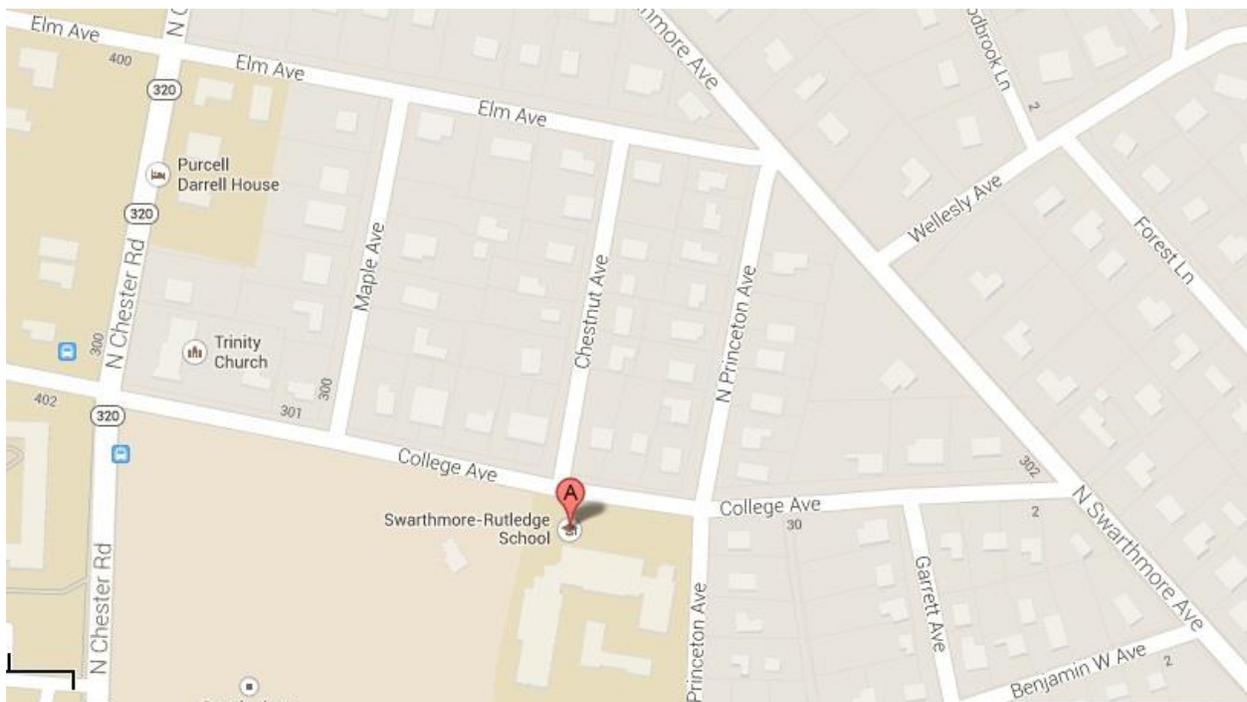
Top figure: plan view of shared lane markings. Bottom figure: Shared lane markings through an intersection.

## **Public Education Campaign**

As part of this study, the Borough requested the development of a two part public education campaign. The first part is entitled “Let’s get moving.” The second part of the campaign is entitled “Safe Streets Swarthmore.” The following outlines our recommendations for these two efforts.

### **“Let’s get moving”**

The focus of the “Let’s get moving” campaign is encouraging school age students to walk to school on a more regular basis. Specifically, the Borough is focusing efforts on improving walking rates to the Swarthmore Rutledge Elementary school (SRS) located on College Avenue in the Borough. The school is located relatively near the Town Center and is surrounded by a large, walkable area with numerous sidewalks. Although the SEPTA regional rail line is located to the south, an existing pedestrian tunnel provides safe access under the tracks for students. The tunnel is currently under construction and being upgraded to replace stairways with ADA accessible and bicycle accessible ramps.



**Map showing the location of the Swarthmore Rutledge Elementary School.**

Pennsylvania holds an annual “Walk or Roll to School” day during early October of every year (see <http://www.saferoutespa.org/walk-to-school-day>). SRS actively participates in that event every year with considerable participation. In consultation with the Borough, the SRS Home and School association is actively developing a regular walk to school day and/or walking school bus program. The national center for safe routes to school defines a walking bus as:

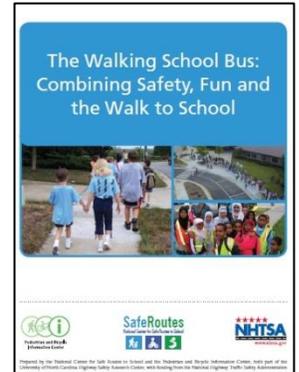


“A walking school bus is a group of children walking to school with one or more adults. If that sounds simple, it is, and that’s part of the beauty of the walking school bus. It can be as informal as two families taking turns walking their children to school to as structured as a route with meeting points, a timetable and a regularly rotated schedule of trained volunteers.”

A bicycle version of the walking school bus is often called a “bicycle train.” In support of that effort, the following recommendations are provided to assist with that planning:

### **Walk to School / Walking School Bus Program**

- Form a “Walk to School “ committee
- Provide a Letter and survey to parents to gauge interest/issues with a walk to school day program
  - Announce “walk to school” program and provide hard copy of survey
  - Use online survey as well
- Plan a Parent work shop ((working meeting with home and school reps.)
  - Small group exercise - Using the aerial maps & worksheets, each group will identify:
    - Preferred routes for walking or bicycling to/from school
    - Barriers or areas with safety concerns related to walking or bicycling to/from school
    - Potential improvements to address each issue/concern
- Create a map of the area within ½ mi and ¾ mile of SRS
  - ½ mi = 10 minute walk
  - ¾ mi= bikers (5-10 minutes)
- Identify potential gathering locations for walk to school groups / walking school bus
- Sign up volunteers and coordinate schedules for parents to accompany the walking school bus.



A critical element is to have a system in place for the situation when adults are ill or have conflicts that prevent them from supervising the walking school bus. There is significant amount of resources available to assist with developing a walking school bus program

(<http://www.walkingschoolbus.org/resources.html>). The annual walk to school day event is often a logical kickoff point for a walking school bus or regular walk to school day program.

### **Promotional Activities for the Annual Walk to School Event**

The annual walk to school day event is an ideal time to show students and their families how easy and fun it can be to walk to school. The hope is that this will not just be something that happens once a year but, something happens on a regular basis throughout the school year. The following are some recommendations to develop additional exposure and increased participation for the annual walk to school day event:

- Provide an announcement letter/flyer in late Sept. for walk to school day (see sample in Appendix B)
  - Hard copies and/or email through school or Home and School group
- Hold a poster contest for walk/roll to school day in mid- September
- Make a presentation at a home and school meeting to promote the event
- Coordinate with the police dept., school staff, crossing guards, fire dept./fire police, bike clubs, to assist with the event activities
- Consult Borough staff for advice on routes and request police assistance along the route during the event
- Contact Local businesses (i.e. Sporting goods, bike shops, etc.) for donations
  - Hang posters in their windows
- Provide articles/advertisements in local newspapers, websites, borough newsletter promoting walk to school day
- Proclamation for Walk or roll to School Day from Borough Council
- Press release, media reporter from SRS
- Post info on borough and school websites

To cap off the event, plan a festive destination at SRS. Tents, banners, balloons, giveaways, music, high school marching band, cheerleaders, balloon arches, etc. are just some of the fun things that could be waiting for the students when they arrive at school that day!

#### Promotional Materials for Bicycling and Walking:

Education materials should be provided for bicyclists, pedestrians and motorists alike to ensure each mode knows its rules and responsibilities. The following flyer, created by the Bicycle Coalition of Greater Philadelphia, is provided to assist with educational efforts for bicyclists on roadways as well as trails. We recommend that this flyer be placed on the Borough and School District websites as well as distributed throughout the community. A full size version of this flyer is included in the Appendix B of this report.

# Trail Etiquette

## Cyclists

1. Be courteous—trails are for all users
2. Keep right (except to pass)
3. Ring a bell or politely call out “on your left” when passing
4. Give ample room when passing
5. Keep your speed down and enjoy the view
6. Stay single file during busy times
7. Yield right-of-way to other trail users

## All Users

1. Keep right, walk no more than two abreast
2. Stay alert, faster trail users need to pass
3. When stopped, step off the trail
4. Keep dogs on a leash and clean up after your dog
5. Share the trail; be considerate of all users

### OUT AND ABOUT - URBAN RIDING BASICS

**The Basics**

- A bike is a legal vehicle with the same rights and duties as a motor vehicle.
- Obey all traffic signs, signals and rights-of-way.
- Always wear your helmet.
- Wear bright colored clothing.
- Keep pant legs and shoelaces out of moving parts.
- Use a white front light and rear red light from dawn to dusk.

**Ride with Traffic**

- Make Physics Work for You: Two objects moving towards each other have a faster closing speed than two objects moving in the same direction.

### Hand Signals

Left

Stop/Slow

Right

**Riding skills**

- Practice looking over your shoulder, this helps you keep an eye on traffic while keeping a straight line.
- Keep a look out for potholes, glass, puddles and opening doors.
- Leave plenty of space between you and the vehicle in front of you.

**Lane positioning**

- Ride in the right wheel line of a lane if there is no bike lane or wide shoulder.
- Stay out of the door zone, ride 4 feet away from parked cars.
- Keep a straight line; don't swerve in an out of parked cars.

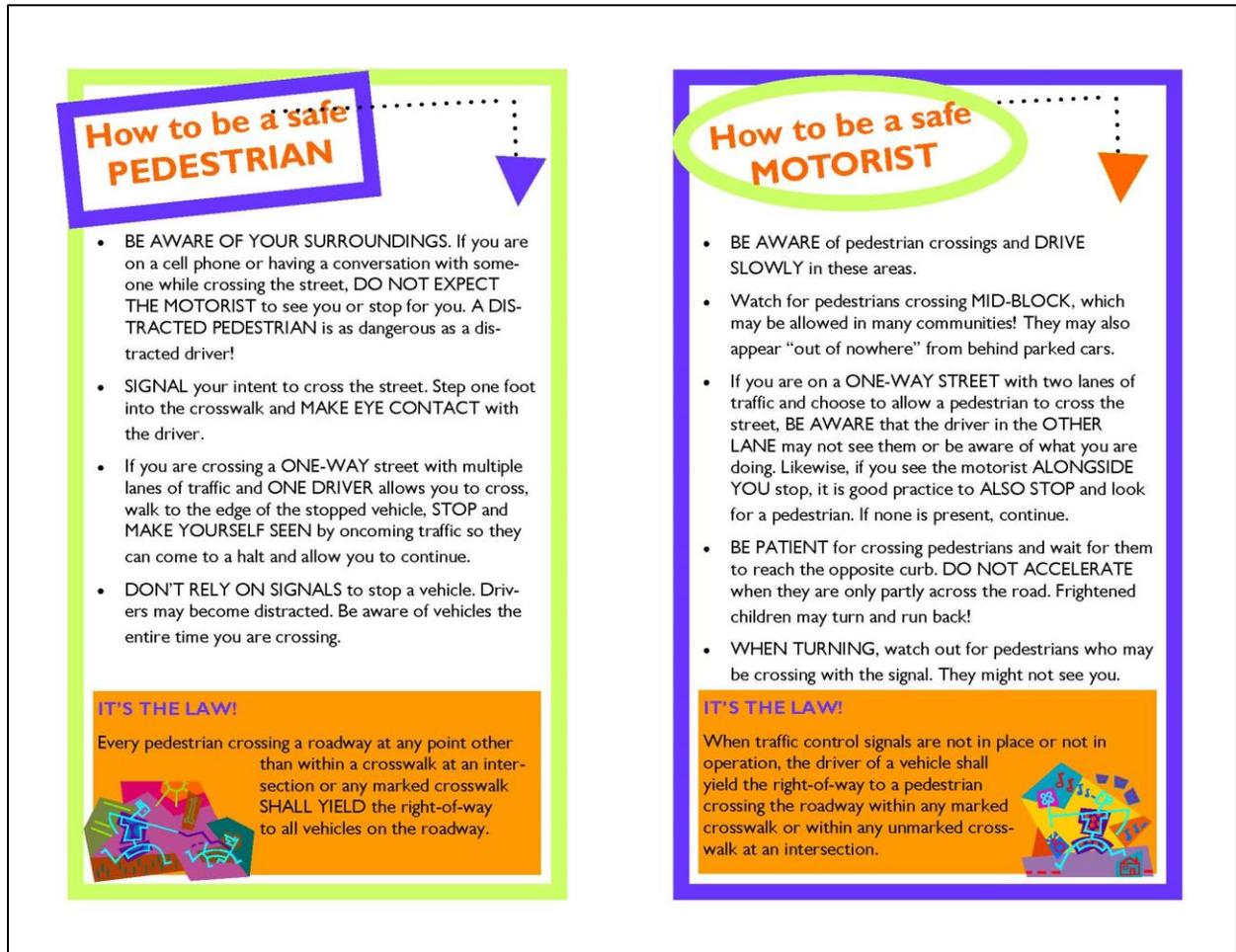
**Sidewalks**

- Walk your bike on the sidewalk. It's the law and riding puts you and other users in danger. Cyclists double their chances of a crash by riding on sidewalks; pedestrians and cars don't expect to see you there.



Bicycle educational flyer for trail riding and on road riding.

The following is a flyer for pedestrian and motorist safety. We recommend that both flyers be placed on the Borough and School District websites as well as distributed throughout the community. A full size version is included in Appendix B.



Education flyer for pedestrian and motorists regarding pedestrian crossings.

### Safe Streets Swarthmore

The second program the Borough is interested in is an effort to raise the awareness of motorists that Swarthmore is a place where we share the roadway with bicyclists and pedestrians. By PA Law – Vehicle Code Chapter 35, bicyclists and pedestrians have the right to safely use the roadway as follows:

“§ 3542. Right-of-way of pedestrians in crosswalks.

- (a) General rule.--When traffic-control signals are not in place or not in operation, the driver of a vehicle shall yield the right-of-way to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk at an intersection.

§ 3501. Applicability of traffic laws to pedalcycles.

(a) General rule.--Every person riding a pedalcycle upon a roadway shall be granted all of the rights and shall be subject to all of the duties applicable to the driver of a vehicle by this title."

We recommend that the program include the following efforts to improve safety on Swarthmore streets for all users:

- Infrastructure improvements to physically show that the Borough is committed to safe streets and these policies
- Education efforts
- Enforcement of state laws and policies to reinforce educational and infrastructure measures

Infrastructure Improvements:

The Borough has been very proactive and has already started installing "share the road", bicycle route and shared lane markings at various locations throughout the Borough. This political support and investment in physical infrastructure shows the motorists that Swarthmore is a bicycle and pedestrian friendly community. Another major infrastructure investment is the Princeton Avenue Pedestrian Tunnel project. That project will improve pedestrian and bicycle mobility in the Borough as well as improve access to the nearby elementary school.

Other infrastructure measures that could be considered include:

- Additional "Yield to Pedestrians in Crosswalk" in road placards
- Custom "share the road" similar to the photo to the right

Education:

Again the Borough has been proactive and started the effort to educate the community about sharing the road. The Borough wrote the following article about the installation of the sharrow markings. Regular articles in the local newspapers and on the Borough and



Sharrow article written by the Borough staff is an excellent example of educational methods.



New signage and sharrow markings installed in Swarthmore.



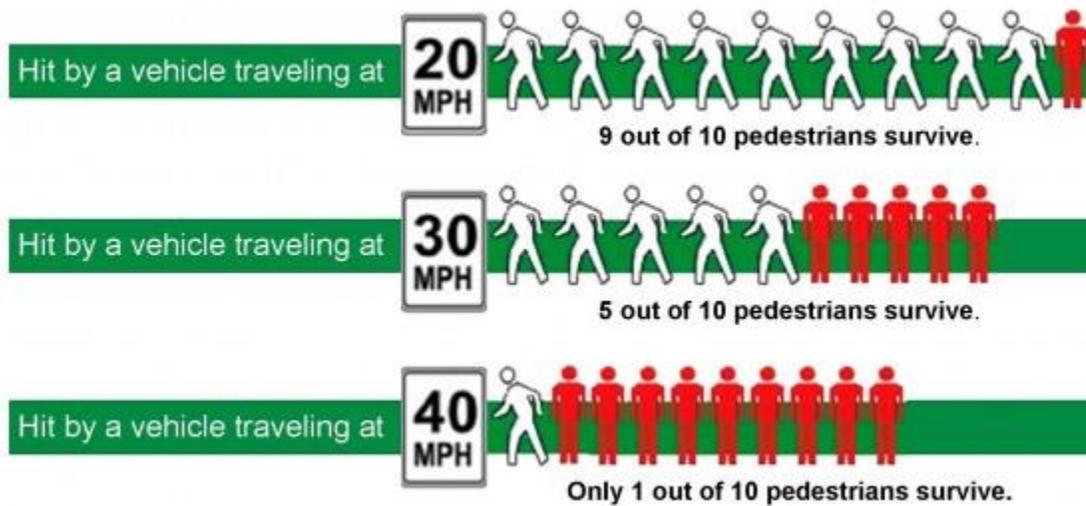
Example educational sign for entrance points to the Borough.

School District website related to walking and bicycling safety, motorist rules of the road related to crosswalks and passing bicyclists, trail riding/walking etiquette etc. should be part of this effort. Presentations on these topics at the local schools are also recommended to educate students, teachers and other members of the community. Distribution of the safety flyers is also recommended to students/parents on a regular basis.

Enforcement:

Continued support from the Borough Police Department will have a beneficial impact on the awareness of motorists that Swarthmore is a place that is safer for bicyclists and pedestrians. Firm and consistent enforcement of the laws outlined above in the PA Vehicle code will ensure safer streets for users in the Borough. The Borough has also requested recommended locations for electronic “Your speed is” monitoring devices.

According to Radarsign incorporated, studies have proven that slowing traffic down will greatly reduce the chances of a fatal accident involving pedestrians and automobiles. A small change in speeds has a dramatic effect on whether those involved live or die as shown in the graphic below.



Based on observed speed issues, traffic volumes and locations in the relation to the existing and proposed bicycle network, the following locations are recommended for these sign locations:

- Chester Road between College Avenue and Harvard Avenue (both directions)
- Yale Avenue between Kenyon Avenue and Chester Road (both directions)

The police department would also be an excellent resource to consult for known speeding locations.

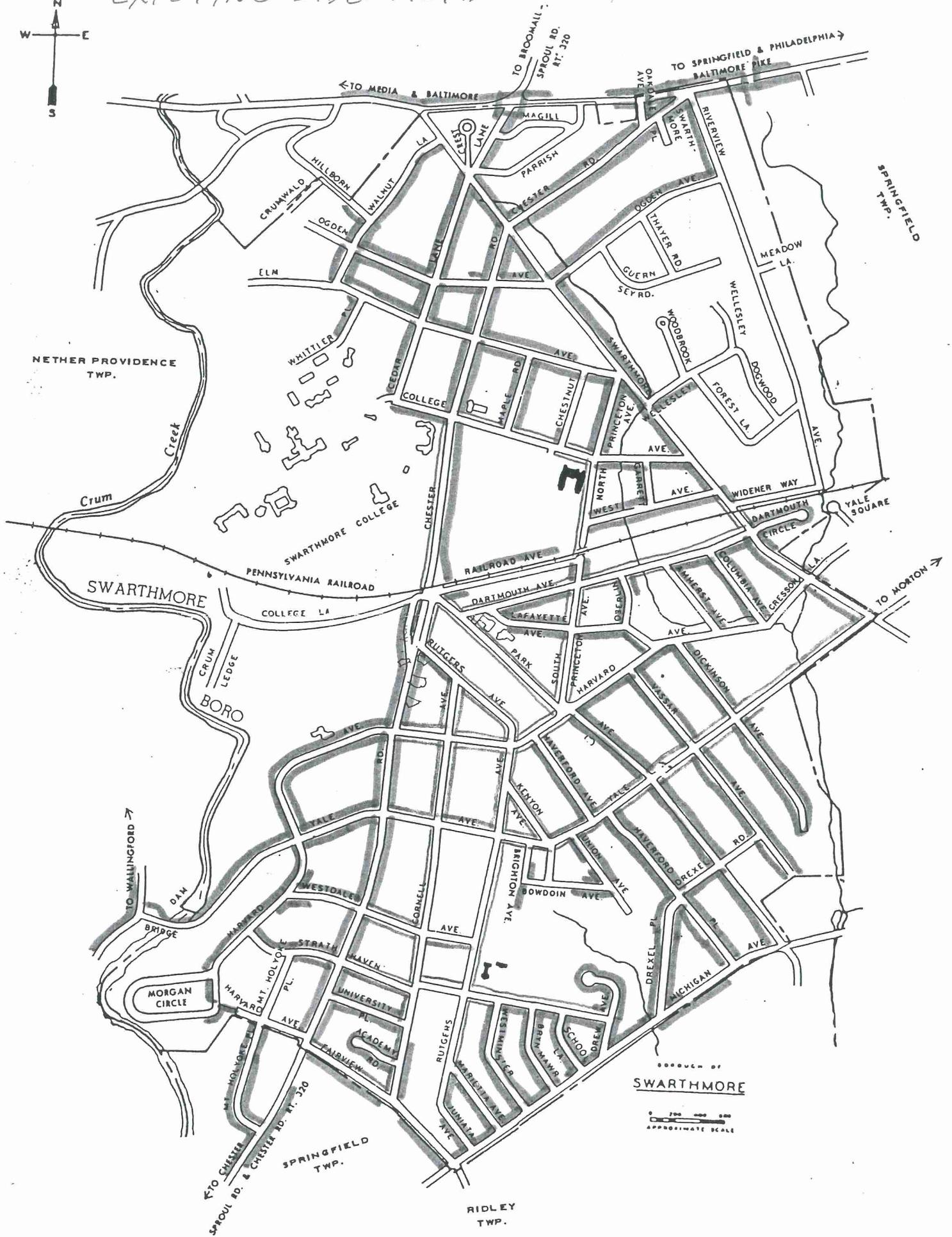
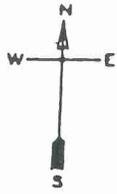
One advantage of these signs is that they can be relocated as needed to other locations.

In conclusion, Swarthmore Borough is already a pedestrian and bicycle friendly community. The addition of the sidewalk, intersection, bicycle network and other physical improvements discussed in this plan will just enhance an already excellent community. In addition, the public information and educational efforts will improve the safety for all modes of transportation in the Borough.



# Appendix A

# EXISTING SIDEWALKS



## Sidewalk Evaluations

### College Avenue – Chester Road to North Princeton Avenue

<b>Adjacent Land Use</b>		<b>Block Frontage with Sidewalk</b>	
Pedestrian-Friendly Commercial (10) - no		Neither side has sidewalk (10)	
Other Commercial – no Residential		1 side has sidewalk (5)	5
4 or more units/acre - yes	10		
<4 units/acre			
<b>School Proximity (max. of 2 schools)</b>			
<i>Elementary School</i>			
<1/4 mile (10) -yes	10		
1/4 to 1/2 mile (5)			
<i>Middle, High School or College</i>			
<1/2 mile (10)	10		
>1/2 mile to 1 mile (5)			
<b>Transit Route Proximity</b>			
<1/4 mile (10) –yes	10		
1/4 to 1/2 mile (5)			
<b>Public Facilities (Park, library, Community Ctr.)</b>			
<1/4 mile	10		
1/4 to 1/2 mile			
		<b>Environmental Constraints</b>	
		Yes (0)/No(10)/Maybe(5)	10
		<b>Ease of Construction</b>	
		Easy (10) / Medium (5)/ Difficult (0)	5
		<b>Other Constraints (Utilities, bridges, buildings, walls)</b>	
		Yes (0) / No (10) / Maybe (5)	10
		<b>Cost/Linear foot</b>	
		Low(10) / Med (5) / High (0)	10
		<b>Total (Max. 100)</b>	90

Field Notes:

- Worn foot path present
- Tennis Courts, benches and water fountain present
- Existing sidewalk at Swarthmore Rutledge elementary school

**Swarthmore Avenue – Baltimore Pike to Walnut Lane**

<b>Adjacent Land Use</b>		<b>Block Frontage with Sidewalk</b>	
Pedestrian-Friendly Commercial		Neither side has sidewalk (10)	10
Other Commercial – yes (mall)	10	1 side has sidewalk (5)	
Residential			
4 or more units/acre – yes		<b>Cost/Linear foot</b>	
<4 units/acre		- Low(10) / Med (5) / High (0)	0
<b>School Proximity (max. of 2 schools)</b>			
<i>Elementary School</i>			
<1/4 mile –yes			
1/4 to 1/2 mile – yes	5	<b>Environmental Constraints</b>	
<i>Middle, High School or College</i>		Yes (0)/No(10)/Maybe(5)	10
<1/2 mile	5	<b>Ease of Construction</b>	
>1/2 mile to 1 mile		Easy (10) / Medium (5)/ Difficult (0)	5
<b>Transit Route Proximity</b>		<b>Other Constraints (Utilities, bridges, buildings, walls)</b>	
<1/4 mile (10) –yes	10	Yes (0) / No (10) / Maybe (5)	5
1/4 to 1/2 mile (5)		- Utility poles	
<b>Public Facilities</b>		- Minor grade differences	
<1/4 mile			
1/4 to 1/2 mile	5	<b>Total (Max. 100)</b>	65

Field Notes:

- “Do not enter” sign at Crest Lane
- 1 way up to first driveway
- Sidewalk present on SR 320
- Roadway width is approx. 22’
- Two way portion of Swarthmore Ave serves 3 driveways
- Utility poles to avoid
- Slight grade differences

**Cresson Lane – Dickenson Avenue to Swarthmore Ave**

<b>Adjacent Land Use</b>		<b>Block Frontage with Sidewalk</b>	
Pedestrian-Friendly Commercial –no		Neither side has sidewalk (10)	10
Other Commercial – no		1 side has sidewalk (5)	
Residential			
4 or more units/acre – yes	10		
<4 units/acre		<b>Cost/Linear foot</b>	
<b>School Proximity (max. of 2 schools)</b>		Low(10) / Med (5) / High (0)	10
<i>Elementary School</i>			
<1/4 mile			
1/4 to 1/2 mile – yes	5	<b>Environmental Constraints</b>	
<i>Middle, High School or College</i>		Yes (0)/No(10)/Maybe(5)	5
<1/2 mile		<b>Ease of Construction</b>	
>1/2 mile to 1 mile		Easy (10) / Medium (5)/ Difficult (0)	10
<b>Transit Route Proximity</b>		<b>Other Constraints (Utilities, bridges, buildings, walls)</b>	
<1/4 mile (10)		Yes (0) / No (10) / Maybe (5)	0
1/4 to 1/2 mile (5) –yes	5	- Move utility pole at bridge	
<b>Public Facilities</b>		- Extend bridge wing wall	
<1/4 mile	10		
1/4 to 1/2 mile		<b>Total (Max. 100)</b>	65

Field Notes:

- Sidewalk present on Amherst Ave.
- Leads to Little Crum Creek park
- Bridge with 5’ sidewalk
- Utility pole in center of sidewalk area immediately adjacent to bridge - PECO to Move
- Drop off behind curb – wing wall extension needed to eliminate
- Existing bituminous path in Park
- Sidewalk on both sides on Columbia. ADA ramps and crosswalks needed.
- Recommend Bit. Path in park set back from roadway and connection to the fireplace area

**Harvard Avenue – Mt. Holyoke Rd to Chester Rd.**

<b>Adjacent Land Use</b>		<b>Block Frontage with Sidewalk</b>	
<i>Pedestrian-Friendly Commercial –yes, across Chester Rd.</i>	5	Neither side has sidewalk (10)	10
<i>Other Commercial – no</i>		1 side has sidewalk (5)	
<i>Residential</i>			
4 or more units/acre – yes	5	<b>Cost/Linear foot</b>	
<4 units/acre		Low(10) / Med (5) / High (0)	10
<b>School Proximity (max. of 2 schools)</b>			
<i>Elementary School</i>			
<1/4 mile -			
1/4 to 1/2 milec-no	0	<b>Environmental Constraints</b>	
<i>Middle, High School or College</i>		Yes (0)/No(10)/Maybe(5)	10
<1/2 mile		<b>Ease of Construction</b>	
>1/2 mile to 1 mile –no	0	Easy (10) / Medium (5)/ Difficult (0)	5
<b>Transit Route Proximity</b>		<b>Other Constraints (Utilities, bridges, buildings, walls)</b>	
<1/4 mile (10) -		Yes (0) / No (10) / Maybe (5)	10
1/4 to 1/2 mile (5) –yes	5	- Large trees/landscaping	
<b>Public Facilities</b>			
<1/4 mile	0		
1/4 to 1/2 mile –no		<b>Total (Max. 100)</b>	60

Field Notes:

- Harvard Ave is a one way street from Chester Rd.
- Sidewalks on both sides of Mt. Holyoke Rd.
- No parking on Harvard Ave.
- Roadway width is approx. 16'
- Traffic signal at Harvard Ave and Chester. Crosswalks present.

**Riverview Avenue – Ogden Avenue to Widener Way**

<b>Adjacent Land Use</b>		<b>Block Frontage with Sidewalk</b>	
<i>Pedestrian-Friendly Commercial –no</i>		Neither side has sidewalk (10)	10
<i>Other Commercial – no</i>		1 side has sidewalk (5)	
<i>Residential</i>			
4 or more units/acre – yes	10	<b>Cost/Linear foot</b>	
<4 units/acre		Low(10) / Med (5) / High (0)	0
<b>School Proximity (max. of 2 schools)</b>			
<i>Elementary School</i>			
<1/4 mile			
1/4 to 1/2 mile – yes	5	<b>Environmental Constraints</b>	
<i>Middle, High School or College</i>		Yes (0)/No(10)/Maybe(5)	10
<1/2 mile		<b>Ease of Construction</b>	
>1/2 mile to 1 mile		Easy (10) / Medium (5)/ Difficult (0)	0
<b>Transit Route Proximity</b>		<b>Other Constraints (Utilities, bridges, buildings, walls)</b>	
<1/4 mile (10)		Yes (0) / No (10) / Maybe (5)	0
1/4 to 1/2 mile (5) –yes	5	- Grade differences and need for retaining walls	
<b>Public Facilities</b>		- Large trees and utility poles	
<1/4 mile	10		
1/4 to 1/2 mile		<b>Total (Max. 100)</b>	50

**Field Notes**

- 24' wide road (2 travel lanes and parking lane)
- 5 bikes and 3 pedestrians observed during field view
- No parking on Henderson Field side
- Striped area ends at north edge of Henderson Field
- No sidewalks on Forest Lane
- 25 mph posted speed limit
- Significant grade differences north of Forest Lane. Walls would be required for west side.
- Large trees and utility poles present
- Recommend bike racks at Henderson Field
- Potentially use “sharrows” for bike traffic
- Consider sidewalk along Henderson Field – Forest Lane to Widener Way

**Widener Way – Swarthmore Ave to Riverview Avenue**

<b>Adjacent Land Use</b>		<b>Block Frontage with Sidewalk</b>	
<i>Pedestrian-Friendly Commercial –no</i>		Neither side has sidewalk (10)	10
<i>Other Commercial – no</i>		1 side has sidewalk (5)	
<i>Residential</i>			
4 or more units/acre – yes	10	<b>Cost/Linear foot</b>	
<4 units/acre		Low(10) / Med (5) / High (0)	0
<b>School Proximity (max. of 2 schools)</b>			
<i>Elementary School</i>			
<1/4 mile			
1/4 to 1/2 mile – yes	5	<b>Environmental Constraints</b>	
<i>Middle, High School or College</i>		Yes (0)/No(10)/Maybe(5)	10
<1/2 mile		<b>Ease of Construction</b>	
>1/2 mile to 1 mile		Easy (10) / Medium (5)/ Difficult (0)	10
<b>Transit Route Proximity</b>		<b>Other Constraints (Utilities, bridges, buildings, walls)</b>	
<1/4 mile (10)		Yes (0) / No (10) / Maybe (5)	10
1/4 to 1/2 mile (5) –yes	0		
<b>Public Facilities</b>			
<1/4 mile	10		
1/4 to 1/2 mile		<b>Total (Max. 100)</b>	65

Field Notes:

- Widener Way is one way street toward Swim Club from Swarthmore Ave.
- 6'-7' Striped "walkway/bikeway" along north side of Widener Way
- Recommend improved crossing to/from Swim Club entrance
- 4 large toaster style bike racks at Swim Club. Several bikes present.
- Playground present at Swim Club
- Pedestrian bridge and walkway to Swim Club present
- Ideas for striped walkway – flexible delineators, curb or curb stops, bike rumble strip, painted buffer

**Chestnut Avenue – Elm Avenue to College Ave**

<b>Adjacent Land Use</b>		<b>Block Frontage with Sidewalk</b>	
<i>Pedestrian-Friendly Commercial –no</i>		Neither side has sidewalk (10)	10
<i>Other Commercial – no</i>		1 side has sidewalk (5)	
<i>Residential</i>			
4 or more units/acre – yes	10	<b>Cost/Linear foot</b>	
<4 units/acre		Low(10) / Med (5) / High (0)	10
<b>School Proximity (max. of 2 schools)</b>			
<i>Elementary School</i>			
<1/4 mile			
1/4 to 1/2 mile – yes	10	<b>Environmental Constraints</b>	
<i>Middle, High School or College</i>		Yes (0)/No(10)/Maybe(5)	10
<1/2 mile	5	<b>Ease of Construction</b>	
>1/2 mile to 1 mile		Easy (10) / Medium (5)/ Difficult (0)	10
<b>Transit Route Proximity</b>		<b>Other Constraints (Utilities, bridges, buildings, walls)</b>	
<1/4 mile (10)	5	Yes (0) / No (10) / Maybe (5)	10
1/4 to 1/2 mile (5) –yes			
<b>Public Facilities</b>			
<1/4 mile	10		
1/4 to 1/2 mile		<b>Total (Max. 100)</b>	90

Field Notes:

- No parking on west side
- Sidewalk present on 1 side of Elm Ave plus one small area on both sides
- No parking 2am – 6 am on east side
- At the crosswalk to SRS, no ADA ramp present on the north side

**Michigan Avenue – Fairview Avenue to Juniata Avenue**

<b>Adjacent Land Use</b>		<b>Block Frontage with Sidewalk</b>	
<i>Pedestrian-Friendly Commercial –no</i>		Neither side has sidewalk (10)	
<i>Other Commercial – no</i>		1 side has sidewalk (5)	5
<i>Residential</i>			
4 or more units/acre – yes	10	<b>Cost/Linear foot</b>	
<4 units/acre		Low(10) / Med (5) / High (0)	0
<b>School Proximity (max. of 2 schools)</b>			
<i>Elementary School</i>			
<1/4 mile	10		
1/4 to 1/2 mile – yes		<b>Environmental Constraints</b>	
<i>Middle, High School or College</i>		Yes (0)/No(10)/Maybe(5)	10
<1/2 mile		<b>Ease of Construction</b>	
>1/2 mile to 1 mile		Easy (10) / Medium (5)/ Difficult (0)	10
<b>Transit Route Proximity</b>		<b>Other Constraints (Utilities, bridges, buildings, walls)</b>	
<1/4 mile (10)		Yes (0) / No (10) / Maybe (5)	10
1/4 to 1/2 mile (5) –yes	0	-	
<b>Public Facilities</b>		-	
<1/4 mile	5		
1/4 to 1/2 mile		<b>Total (Max. 100)</b>	60

Field Notes:

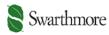
- Notre Dame Church and School? present
- Recommend extending to Ridley Township Park
- Small gap in sidewalk on north side near Fairview

**Fairview Avenue – Cornell Avenue to Michigan Avenue**

<b>Adjacent Land Use</b>		<b>Block Frontage with Sidewalk</b>	
<i>Pedestrian-Friendly Commercial –no</i>		Neither side has sidewalk (10)	
<i>Other Commercial – no</i>		1 side has sidewalk (5)	5
<i>Residential</i>			
4 or more units/acre – yes	10	<b>Cost/Linear foot</b>	
<4 units/acre		Low(10) / Med (5) / High (0)	5
<b>School Proximity (max. of 2 schools)</b>			
<i>Elementary School</i>			
<1/4 mile			
1/4 to 1/2 mile – yes	0	<b>Environmental Constraints</b>	
<i>Middle, High School or College</i>		Yes (0)/No(10)/Maybe(5)	10
<1/2 mile		<b>Ease of Construction</b>	
>1/2 mile to 1 mile		Easy (10) / Medium (5)/ Difficult (0)	5
<b>Transit Route Proximity</b>		<b>Other Constraints (Utilities, bridges, buildings, walls)</b>	
<1/4 mile (10)		Yes (0) / No (10) / Maybe (5)	5
1/4 to 1/2 mile (5) –yes	5	-	
<b>Public Facilities</b>		-	
<1/4 mile	5		
1/4 to 1/2 mile		<b>Total (Max. 100)</b>	50

Field Notes:

- Grade issues on east side
- Many large trees to remove on east side
- Retaining wall(s) narrows existing sidewalk areas on west side
- Ped push buttons at intersection - good



Swarthmore Borough  
 Sidewalk Evaluations  
 Preliminary Construction Cost Estimates



Roadway (from / to)	Approx. Construction Cost	Cost/Linear Foot	Relative cost/LF	Comments
College Avenue – Chester Road to North Princeton Avenue	\$ 42,117	\$ 56.16	Low	To be completed by the College
Swarthmore Avenue – Baltimore Pike to Walnut Lane	\$ 34,595	\$ 113.43	High	
Cresson Lane – Dickenson Avenue to Swarthmore Ave	\$ 76,697	\$ 63.91	Low	
Harvard Avenue – Mt. Holyoke Pl to Chester Rd	\$ 22,979	\$ 60.47	Low	
Riverview Avenue – Ogden Avenue to Widener Way	\$ 242,995	\$ 92.57	High	
Riverview Avenue – Widener Way to end of Henderson Field	\$ 25,898	\$ 54.52	Low	
Widener Way – Swarthmore Ave to Riverview Avenue	\$ 64,505	\$ 95.56	High	
Chestnut Avenue – Elm Avenue to College Ave	\$ 38,644	\$ 57.68	Low	
Michigan Avenue – Fairview Avenue to Ridley Twp. Park	\$ 30,738	\$ 58.00	Low	
Michigan Avenue – Fairview Avenue to Juniata Ave	\$ 2,426	\$ 97.03	High	
Fairview Avenue – Cornell Avenue to Michigan Avenue	\$ 50,392	\$ 69.03	Medium	

Low=50-70  
 Med=70-90  
 High=90-120

**College Avenue – Chester Road to North Princeton Avenue**  
**Preliminary Construction Cost Estimate**



Trail Feature	Description	Length (ft)	Width (ft)	Quantity	Unit	Cost/Unit	Total Cost	Comments
Concrete Sidewalk		750	5	417	SY	\$70	\$ 29,167	Includes excavation
Concrete Curb				0	LF	\$30.00	\$ -	
ADA Ramps				2	EACH	\$1,000.00	\$ 2,000	
Tree Trimming				1	LS	\$500	\$ 500	
						Subtotal	\$ 31,667	
Contingency (15%)				1	LS		\$ 4,750	
Mobilization (5%)				1	LS		\$ 1,583	
E&S/Site Restoration (3%)							\$ 950	
Design/Permits (10%)							\$ 3,167	
						Total	\$ 42,117	

cost/lf      \$    56.16

**Swarthmore Avenue – Baltimore Pike to Walnut Lane**  
**Preliminary Construction Cost Estimate**



Trail Feature	Description	Length (mi)	Length (ft)	Width (ft)	Quantity	Unit	Cost/Unit	Total Cost	Comments
Concrete Sidewalk			305	5	169	SY	\$70	\$ 11,861	Includes excavation
Concrete Curb			305		305	LF	\$30.00	\$ 9,150	
ADA Ramps					2	EACH	\$1,000.00	\$ 2,000	
Grading					1	LS	\$1,000	\$ 1,000	
Clearing					1	LS	\$2,000	\$ 2,000	
							Subtotal	\$ 26,011	
Contingency (15%)					1	LS		\$ 3,902	
Mobilization (5%)					1	LS		\$ 1,301	
E&S/Site Restoration (3%)								\$ 780	
Design/Permits (10%)								\$ 2,601	
							Total	\$ 34,595	

cost/lf      \$ 113.43

**Cresson Lane – Dickenson Avenue to Swarthmore Ave  
Preliminary Construction Cost Estimate**



Trail Feature	Description	Length (mi)	Length (ft)	Width (ft)	Quantity	Unit	Cost/Unit	Total Cost	Comments
Concrete Sidewalk			1200	5	667	SY	\$70	\$ 46,667	Includes excavation
Concrete Curb					0	LF	\$30.00	\$ -	
ADA Ramps					6	EACH	\$1,000.00	\$ 6,000	
Wingwall Repairs					1	LS	\$3,000	\$ 3,000	
Clearing & Tree Trimming					1	LS	\$1,000	\$ 1,000	
Crosswalks to Columbia Ave					1	LS	\$1,000	\$ 1,000	
							Subtotal	\$ 57,667	
Contingency (15%)					1	LS		\$ 8,650	
Mobilization (5%)					1	LS		\$ 2,883	
E&S/Site Restoration (3%)								\$ 1,730	
Design/Permits (10%)								\$ 5,767	
							Total	\$ 76,697	
PECO Pole Relocation							\$0		PECO to Move pole at no cost to Borough

cost/lf      \$ 63.91

**Harvard Avenue – Mt. Holyoke Pl to Chester Rd**  
**Preliminary Construction Cost Estimate**



Trail Feature	Description	Length (mi)	Length (ft)	Width (ft)	Quantity	Unit	Cost/Unit	Total Cost	Comments
Concrete Sidewalk			380	5	211	SY	\$70	\$ 14,778	Includes excavation
Concrete Curb					0	LF	\$30.00	\$ -	
ADA Ramps					2	EACH	\$1,000.00	\$ 2,000	
Tree Trimming					1	LS	\$500	\$ 500	
							Subtotal	\$ 17,278	
Contingency (15%)					1	LS		\$ 2,592	
Mobilization (5%)					1	LS		\$ 864	
E&S/Site Restoration (3%)								\$ 518	
Design/Permits (10%)								\$ 1,728	
							Total	\$ 22,979	

cost/ft      \$    60.47

**Riverview Avenue – Ogden Avenue to Widener Way  
Preliminary Construction Cost Estimate**



Trail Feature	Description	Length (mi)	Length (ft)	Width (ft)	Quantity	Unit	Cost/Unit	Total Cost	Comments
Concrete Sidewalk			2625	5	1458	SY	\$70	\$ 102,083	Includes excavation
Concrete Curb					0	LF	\$30.00	\$ -	
ADA Ramps					4	EACH	\$1,000.00	\$ 4,000	
Retaining Walls					1	LS	\$50,000	\$ 50,000	
Clearing					1	LS	\$10,000	\$ 10,000	
Grading					1	LS	\$10,000	\$ 10,000	
							Subtotal	\$ 176,083	
Contingency (15%)					1	LS		\$ 26,413	
Mobilization (5%)					1	LS		\$ 8,804	
E&S/Site Restoration (3%)								\$ 5,283	
Design/Permits (15%)								\$ 26,413	
							Total	\$ 242,995	

cost/lf \$ 92.57

**Riverview Avenue – Widener Way to end of Henderson Field  
Preliminary Construction Cost Estimate**

Trail Feature	Description	Length (mi)	Length (ft)	Width (ft)	Quantity	Unit	Cost/Unit	Total Cost	Comments
Concrete Sidewalk			475	5	264	SY	\$70	\$ 18,472	Includes excavation
Concrete Curb					0	LF	\$30.00	\$ -	
ADA Ramps					1	EACH	\$1,000.00	\$ 1,000	
							Subtotal	\$ 19,472	
Contingency (15%)					1	LS		\$ 2,921	
Mobilization (5%)					1	LS		\$ 974	
E&S/Site Restoration (3%)								\$ 584	
Design/Permits (10%)								\$ 1,947	
							Total	\$ 25,898	

cost/lf \$ 54.52

**Widener Way – Swarthmore Ave to Riverview Avenue**  
**Preliminary Construction Cost Estimate**



Trail Feature	Description	Length (mi)	Length (ft)	Width (ft)	Quantity	Unit	Cost/Unit	Total Cost	Comments
Concrete Sidewalk			675	5	375	SY	\$70	\$ 26,250	Includes excavation
Concrete Curb			675		675	LF	\$30.00	\$ 20,250	
ADA Ramps					2	EACH	\$1,000.00	\$ 2,000	
Clearing & Tree Trimming					0	LS	\$1,000	\$ -	
							Subtotal	\$ 48,500	
Contingency (15%)					1	LS		\$ 7,275	
Mobilization (5%)					1	LS		\$ 2,425	
E&S/Site Restoration (3%)								\$ 1,455	
Design/Permits (10%)								\$ 4,850	
							Total	\$ 64,505	

cost/lf      \$ 95.56

**Chestnut Avenue – Elm Avenue to College Ave  
Preliminary Construction Cost Estimate**



Trail Feature	Description	Length (mi)	Length (ft)	Width (ft)	Quantity	Unit	Cost/Unit	Total Cost	Comments
Concrete Sidewalk			670	5	372	SY	\$70	\$ 26,056	Includes excavation
Concrete Curb					0	LF	\$30.00	\$ -	
ADA Ramps					2	EACH	\$1,000.00	\$ 2,000	
Clearing & Tree Trimming					1	LS	\$1,000	\$ 1,000	
							Subtotal	\$ 29,056	
Contingency (15%)					1	LS		\$ 4,358	
Mobilization (5%)					1	LS		\$ 1,453	
E&S/Site Restoration (3%)								\$ 872	
Design/Permits (10%)								\$ 2,906	
							Total	\$ 38,644	

cost/lf      \$ 57.68

**Michigan Avenue – Fairview Avenue to Ridley Twp. Park  
Preliminary Construction Cost Estimate**



Trail Feature	Description	Length (mi)	Length (ft)	Width (ft)	Quantity	Unit	Cost/Unit	Total Cost	Comments
Concrete Sidewalk			530	5	294	SY	\$70	\$ 20,611	Includes excavation
Concrete Curb					0	LF	\$30.00	\$ -	
ADA Ramps					2	EACH	\$1,000.00	\$ 2,000	
Tree Trimming					1	LS	\$500	\$ 500	
							Subtotal	\$ 23,111	
Contingency (15%)					1	LS		\$ 3,467	
Mobilization (5%)					1	LS		\$ 1,156	
E&S/Site Restoration (3%)								\$ 693	
Design/Permits (10%)								\$ 2,311	
							Total	\$ 30,738	

cost/lf      \$ 58.00

**Michigan Avenue – Fairview Avenue to Juniata Ave  
Preliminary Construction Cost Estimate**

Trail Feature	Description	Length (mi)	Length (ft)	Width (ft)	Quantity	Unit	Cost/Unit	Total Cost	Comments
Concrete Sidewalk			25	5	14	SY	\$70	\$ 972	Includes excavation
Concrete Curb					0	LF	\$30.00	\$ -	
ADA Ramps					1	EACH	\$1,000.00	\$ 1,000	
Tree Trimming					0	LS	\$500	\$ -	
							Subtotal	\$ 1,972	
Contingency (15%)					1	LS		\$ 296	
Mobilization (5%)					1	LS		\$ 99	
E&S/Site Restoration (3%)								\$ 59	
Design/Permits (10%)								\$ -	
							Total	\$ 2,426	

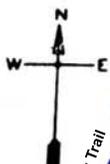
cost/lf      \$ 97.03

**Fairview Avenue – Cornell Avenue to Michigan Avenue  
Preliminary Construction Cost Estimate**



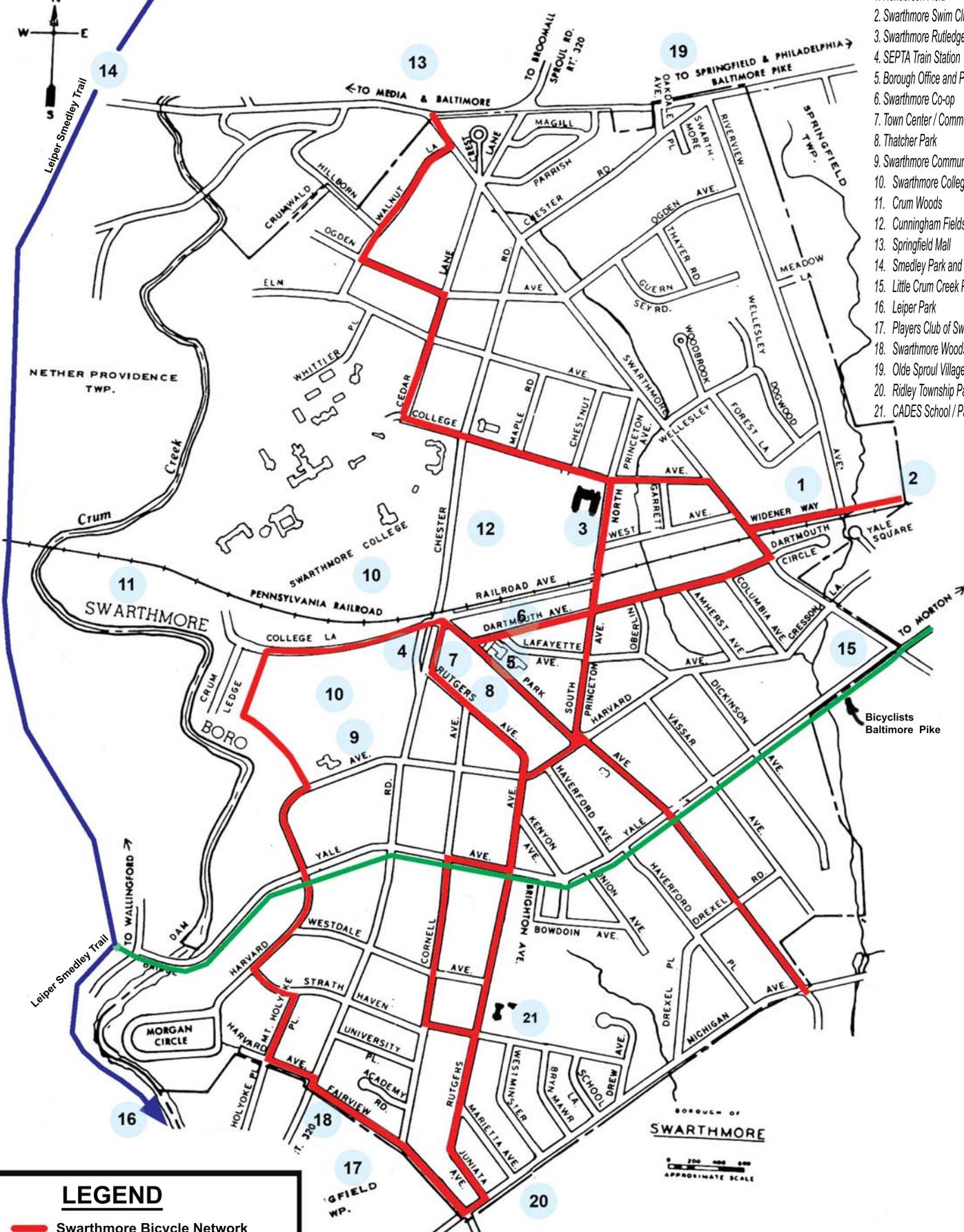
Trail Feature	Description	Length (mi)	Length (ft)	Width (ft)	Quantity	Unit	Cost/Unit	Total Cost	Comments
Concrete Sidewalk			730	5	406	SY	\$70	\$ 28,389	Includes excavation
Concrete Curb					0	LF	\$30.00	\$ -	
ADA Ramps					2	EACH	\$1,000.00	\$ 2,000	
Tree Trimming					1	LS	\$7,500	\$ 7,500	
							Subtotal	\$ 37,889	
Contingency (15%)					1	LS		\$ 5,683	
Mobilization (5%)					1	LS		\$ 1,894	
E&S/Site Restoration (3%)								\$ 1,137	
Design/Permits (10%)								\$ 3,789	
							Total	\$ 50,392	

cost/lf      \$ 69.03



**Swarthmore Borough Destinations:**

1. Henderson Field
2. Swarthmore Swim Club
3. Swarthmore Rutledge Elementary School
4. SEPTA Train Station
5. Borough Office and Public Library
6. Swarthmore Co-op
7. Town Center / Commercial Area
8. Thatcher Park
9. Swarthmore Community Center
10. Swarthmore College
11. Crum Woods
12. Cunningham Fields
13. Springfield Mall
14. Smedley Park and Smedley Leiper Trail
15. Little Crum Creek Park
16. Leiper Park
17. Players Club of Swarthmore Theater
18. Swarthmore Woods Shopping Center
19. Olde Sproul Village Shopping Center
20. Ridley Township Park
21. CADES School / Park



**LEGEND**

- Swarthmore Bicycle Network
- Leiper Smedley Trail - off road
- Bicyclists Baltimore Pike - on road

0 200 400 600  
APPROXIMATE SCALE

**SWARTHMORE BICYCLE NETWORK**

# Appendix B

Mark your calendar and plan to  
walk or bike to school with your kids



Join our school as it participates in  
***Walk or Roll to School Day***  
Wednesday, October 9

**Parents, start a walking  
school bus or bike train**

Accompany your children to school as a group and make regular "stops" along the route to pick up additional children and parents to walk or bike.

*More information can be found at  
[www.saferoutesinfo.org/program-tools/there-guide-walking-school-bus-programs](http://www.saferoutesinfo.org/program-tools/there-guide-walking-school-bus-programs).*

**To get started, contact your  
school coordinator**

OR

**visit [www.saferoutespa.org](http://www.saferoutespa.org)**



This internationally recognized day (held the first Wednesday in October) celebrates the benefits of walking by encouraging schoolchildren across the nation and the world to walk and bicycle to school.

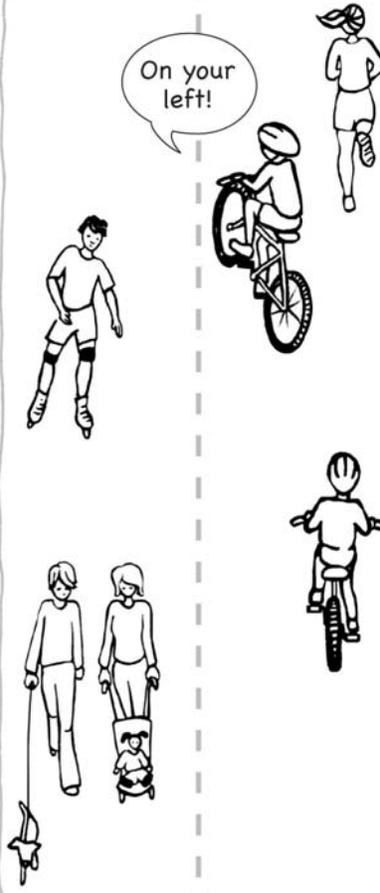
**Why Walk?**

- Promote physical activity and health
- Teach safe walking and cycling skills to children
- Reduce traffic congestion, pollution, and speed near schools
- Draw attention to how walkable a community is and where improvements can be made
- Show concern for the environment
- Take back neighborhoods for people on foot or bicycle
- Share time with children, other parents, and community leaders

# Trail Etiquette

## Cyclists

1. Be courteous—trails are for all users
2. Keep right (except to pass)
3. Ring a bell or politely call out “on your left” when passing
4. Give ample room when passing
5. Keep your speed down and enjoy the view
6. Stay single file during busy times
7. Yield right-of-way to other trail users



## All Users

1. Keep right, walk no more than two abreast
2. Stay alert, faster trail users need to pass
3. When stopped, step off the trail
4. Keep dogs on a leash and clean up after your dog
5. Share the trail; be considerate of all users

## OUT AND ABOUT – URBAN RIDING BASICS

### The Basics

- A bike is a legal vehicle with the same rights and duties as a motor vehicle.
- Obey all traffic signs, signals and rights-of-way.
- Always wear your helmet.
- Wear bright colored clothing.
- Keep pant legs and shoelaces out of moving parts.
- Use a white front light and rear red light from dawn to dusk.

### Hand Signals



### Riding skills

- Practice looking over your shoulder, this helps you keep an eye on traffic while keeping a straight line.
- Keep a look out for potholes, glass, puddles and opening doors.
- Leave plenty of space between you and the vehicle in front of you.

### Lane positioning

- Ride in the right wheel line of a lane if there is no bike lane or wide shoulder.
- Stay out of the door zone, ride 4 feet away from parked cars.
- Keep a straight line; don't swerve in an out of parked cars.

### Ride with Traffic

- Make Physics Work for You: Two objects moving towards each other have a faster closing speed than two objects moving in the same direction.

### Sidewalks

- Walk your bike on the sidewalk. It's the law and riding puts you and other users in danger. Cyclists double their chances of a crash by riding on sidewalks; pedestrians and cars don't expect to see you there.



## How to be a safe PEDESTRIAN

- **BE AWARE OF YOUR SURROUNDINGS.** If you are on a cell phone or having a conversation with someone while crossing the street, **DO NOT EXPECT THE MOTORIST** to see you or stop for you. A **DISTRACTED PEDESTRIAN** is as dangerous as a distracted driver!
- **SIGNAL** your intent to cross the street. Step one foot into the crosswalk and **MAKE EYE CONTACT** with the driver.
- If you are crossing a **ONE-WAY** street with multiple lanes of traffic and **ONE DRIVER** allows you to cross, walk to the edge of the stopped vehicle, **STOP** and **MAKE YOURSELF SEEN** by oncoming traffic so they can come to a halt and allow you to continue.
- **DON'T RELY ON SIGNALS** to stop a vehicle. Drivers may become distracted. Be aware of vehicles the entire time you are crossing.

### IT'S THE LAW!

Every pedestrian crossing a roadway at any point other than within a crosswalk at an intersection or any marked crosswalk **SHALL YIELD** the right-of-way to all vehicles on the roadway.



## How to be a safe MOTORIST

- **BE AWARE** of pedestrian crossings and **DRIVE SLOWLY** in these areas.
- Watch for pedestrians crossing **MID-BLOCK**, which may be allowed in many communities! They may also appear “out of nowhere” from behind parked cars.
- If you are on a **ONE-WAY STREET** with two lanes of traffic and choose to allow a pedestrian to cross the street, **BE AWARE** that the driver in the **OTHER LANE** may not see them or be aware of what you are doing. Likewise, if you see the motorist **ALONGSIDE YOU** stop, it is good practice to **ALSO STOP** and look for a pedestrian. If none is present, continue.
- **BE PATIENT** for crossing pedestrians and wait for them to reach the opposite curb. **DO NOT ACCELERATE** when they are only partly across the road. Frightened children may turn and run back!
- **WHEN TURNING**, watch out for pedestrians who may be crossing with the signal. They might not see you.

### IT'S THE LAW!

When traffic control signals are not in place or not in operation, the driver of a vehicle shall yield the right-of-way to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk at an intersection.

