

THE

REIMAGINED

SPRING GARDEN STREET GREENWAY

June 2013



pennsylvania environmental council



The Pennsylvania Environmental Council (PEC) is one of the state's leading environmental organizations and has been protecting and restoring natural and built environments through innovation, collaboration, education, and advocacy for over 40 years. One of PEC's major initiatives has been developing greenway corridors throughout the Greater Philadelphia area. The Spring Garden Street Greenway is one of the latest projects which PEC has been engaged in to add to Pennsylvania's green infrastructure.

This project was financed in part by a grant from the Community Conservation Partnerships Program, Environmental Stewardship Fund, under the administration of the Pennsylvania Department of Conservation and Natural Resources, Bureau of Recreation and Conservation. Funding from the William Penn Foundation and Delaware Valley Regional Planning Commission's Regional Trails Fund also supported this project.

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pennsylvania
DEPARTMENT OF CONSERVATION
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I. Why Spring Garden Street?

The 2.1-mile Spring Garden Street Greenway (SGSG) will connect two existing and developing riverfront trail systems along the Delaware and Schuylkill rivers. At its western end, SGSG will link to the Schuylkill River Trail via Pennsylvania Avenue while the greenway will join with the developing Delaware River Trail at Columbus Boulevard/Delaware Avenue on the eastern end. The greenway will be central Philadelphia's link in the East Coast Greenway, a bikeway under development running 3,000 miles from Maine to Florida. SGSG will add to the region's growing trail network, known as The Circuit. When complete, The Circuit will include 750 miles of bicycle and pedestrian trails in Greater Philadelphia; over 250 miles are complete, and another 50 miles are currently under development.



Pennsylvania Environmental Council's (PEC) involvement with Spring Garden Street started four years ago with two key questions:

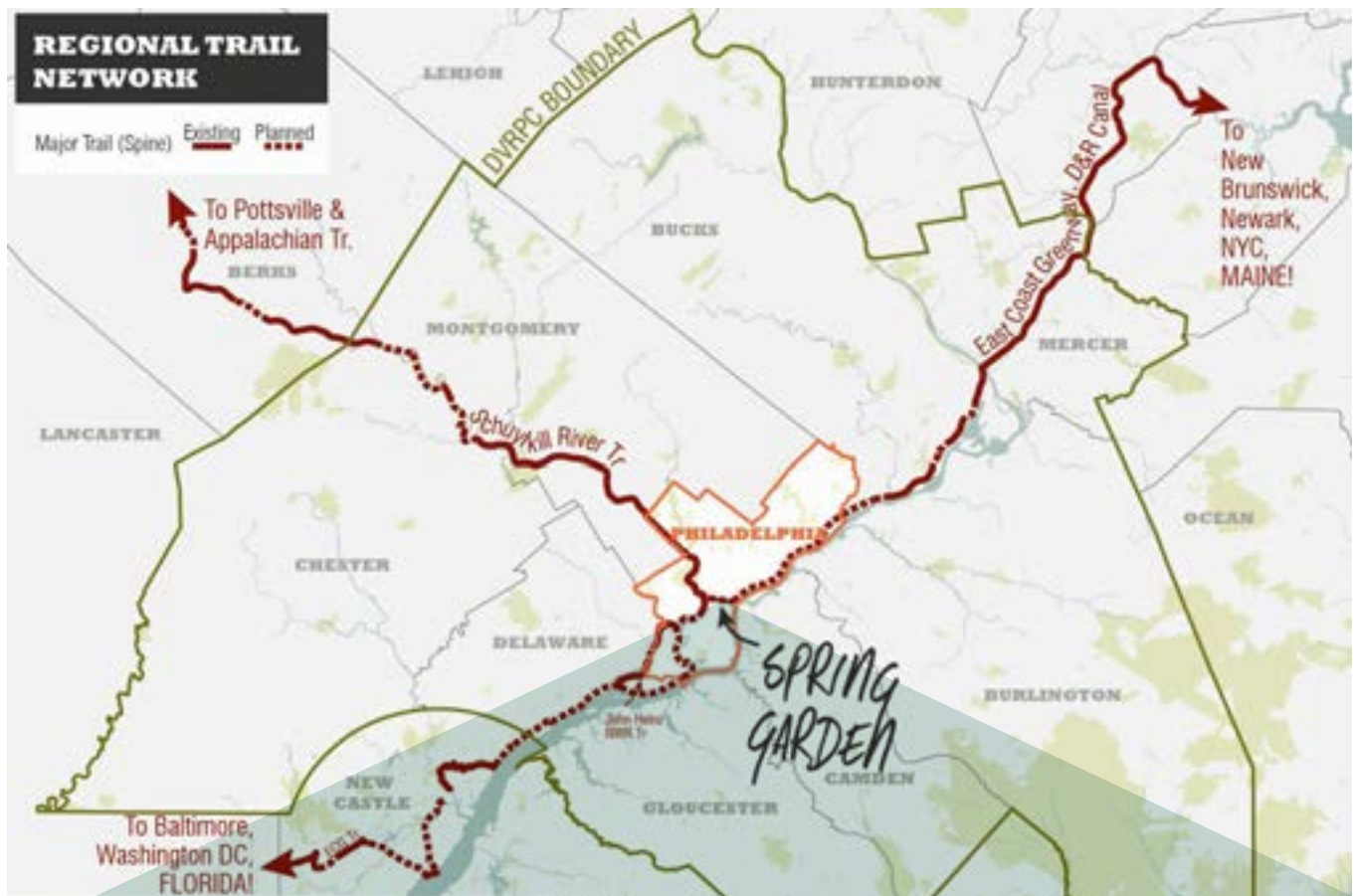
1. How best to connect our region's growing trail network
2. How best to connect Philadelphia's two riverfronts in the densest part of the region

In 2009, PEC conducted the Center City Greenway Feasibility Study to answer these questions. The study concluded that a greenway along Spring Garden Street was the best option. Spring Garden Street is an existing east-west bicycle route with standard bike lanes and – unique in the Center City area – has space within the right-of-way for a greenway. The connection to both riverfronts is clear and direct and is well known by local bicyclists. SGSG will improve the driving experience for motorists, maintain parking, and—with reconstruction of the median—the route will provide a fully separated greenway experience for a variety of users. The feasibility study identified Spring Garden Street as the preferred location for a greenway and began the process of realizing Spring Garden Street's potential to be a more complete street that better serves those traveling via foot, bicycle, car, bus, or train.



Spring Garden Street Greenway, a link in the East Coast Greenway, will be the main Circuit connection across Center City Philadelphia linking the Schuylkill River Trail and the developing Delaware River Trail.

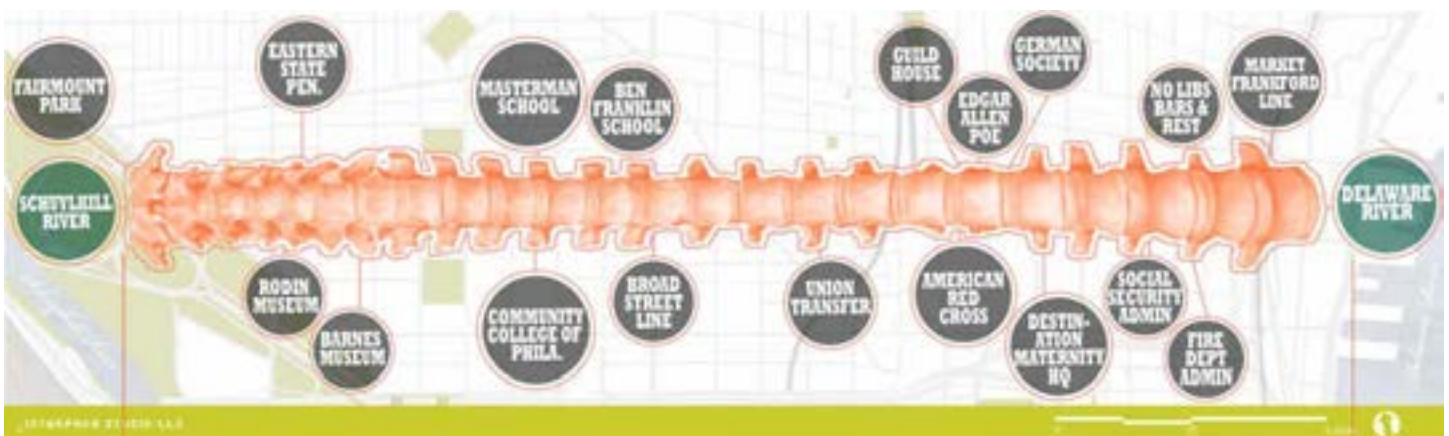
SGSG will transform Spring Garden Street into one of the most vibrant streets and commercial corridors in Philadelphia, while also making it a calmer and safer street to drive, bike, and walk. Spring Garden Street will act as a linear park and urban trail within central Philadelphia with a new bikeway separated from vehicular traffic. SGSG will offer additional recreation and commuting space for walkers, joggers, and cyclists. It will sustainably manage stormwater runoff, connect neighborhoods, and catalyze economic investment.



THE VISION

By making thoughtful physical changes to Spring Garden Street, we can create a place where more people can safely travel, work, live, shop, and recreate.

SGSG will not only connect communities to each other and the rest of the city, but it will benefit users by providing a safe and enjoyable connection to large natural resources such as Fairmount Park, Boathouse Row, and Kelly Drive on the west end, and the Delaware River, Penn's Landing, and the new Race Street Pier to the east. SGSG will also connect many of the city's signature cultural attractions and destinations, such as the Philadelphia Museum of Art, the Philadelphia Zoo, the Fairmount Waterworks, the new Barnes Foundation Museum, the Edgar Allan Poe House, the German Society, the Festival Pier, Chinatown, the Independence Seaport Museum, and the Convention Center District. The greenway's proximity to high density neighborhoods and its link between two major trails creates the potential for SGSG to become one of Pennsylvania's most heavily used trails.



today, **SPRING GARDEN STREET** is a **'SPINE'** connecting many **LOCAL ASSETS**

FROM THE ART MUSEUM TO FESTIVAL PIER

Project Goals

RECREATION & HEALTHY LIFESTYLES

Make it easier for people to get outside and exercise near where they live and work by providing a green destination for walking, strolling, skateboarding, rollerblading, and biking between the Schuylkill and Delaware River Trails.

TRANSPORTATION

Increase safety and accessibility for drivers, walkers, bicyclists, and transit riders.

ECONOMIC INVESTMENT

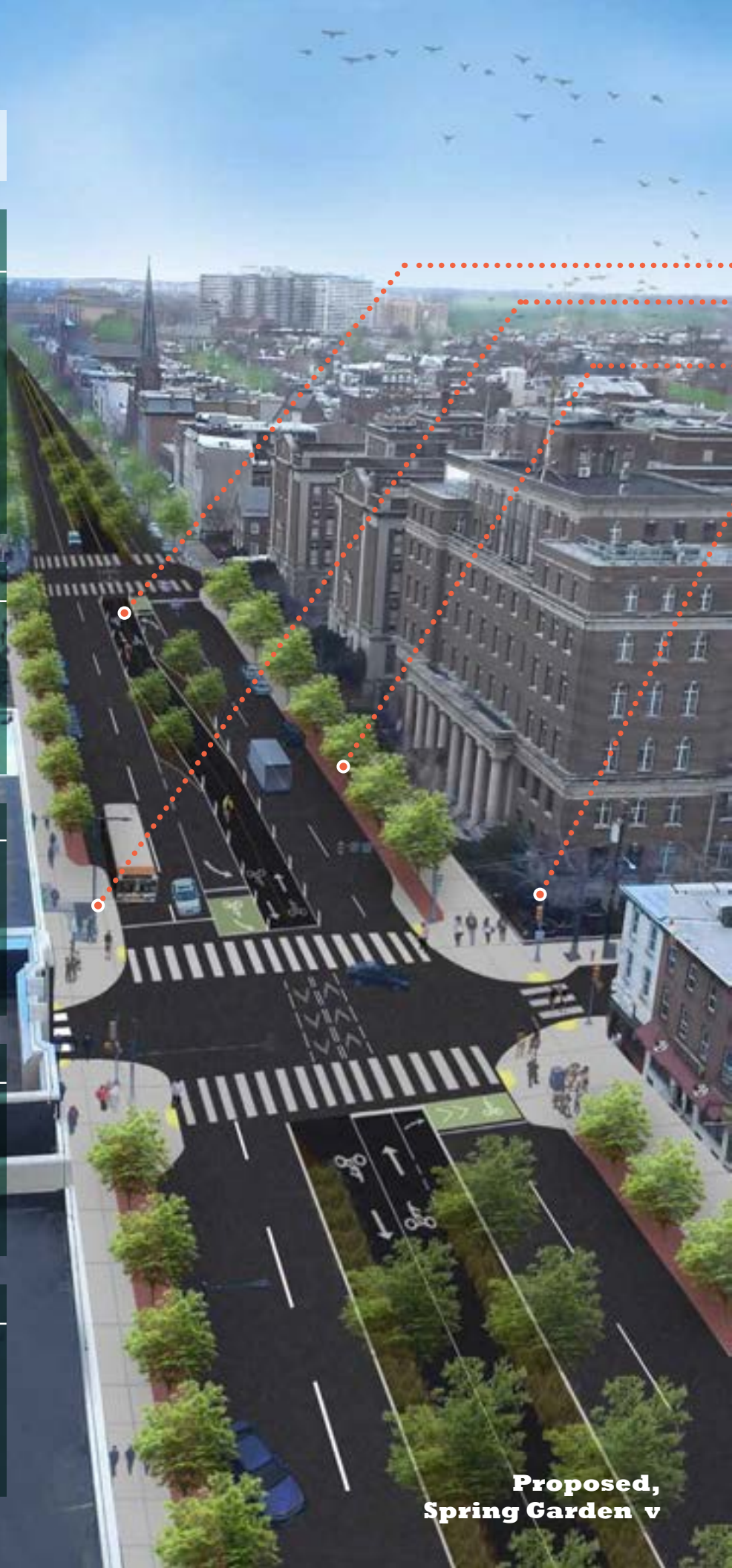
Encourage reinvestment and support existing businesses by bringing customers to the corridor.

COMMUNITY DEVELOPMENT

Become the front door to diverse communities.

BEAUTIFICATION

Beautify the street through new landscaping and trees to provide shade and help meet the City's stormwater management goals.



**Proposed,
Spring Garden v**

TRANSFORMED SPRING GARDEN STREET

- A protected, landscaped bikeway within the street's median
- Pedestrian amenities, including reconstruction of substandard sidewalks, curb extensions at corners, and pedestrian refuge islands
- New street trees and landscaping, street furniture, and lighting
- State-of-the-art synchronized traffic signals to expedite traffic
- Improved SEPTA bus operations and access
- A subsurface stormwater storage and infiltration system

The conceptual design phase of the project began in June 2011. It has involved over 1,600 hours of engineering and planning consulting time, three public meetings, and three Steering Committee meetings. The Steering Committee includes key stakeholders, such as local and state government agencies, bicycle and pedestrian advocacy organizations, neighborhood groups, businesses, and cultural institutions (see Supporters section on page 38). At each step in the project, PEC consulted with the Steering Committee for review and input. The Mayor's Office of Transportation and Utilities, the Philadelphia Water and Streets departments, and the Pennsylvania Department of Transportation (PennDOT) have also provided valuable on-going input to the process.



II. History & Context

PEC invited noted historic preservationist and local trails expert Bob Thomas of Campbell Thomas and Company to provide a brief history of Spring Garden Street specifically for the project.

In the 19th century, Spring Garden Street was an elegant, leafy boulevard that accommodated an interesting mix of uses. It had little through traffic since it extended only from 6th Street to the reservoir atop Fairmount Park where the Philadelphia Art Museum stands today. The early predecessor of the Spring Garden Bridge, a suspension bridge known as the Wire Bridge, linked instead to Callowhill Street.

There was a huge landscaped median with sculpture, iron fencing, trees, and fountains on the blocks from 6th to Franklin streets, and from 12th to Broad streets. Market sheds, like those on 2nd Street in Society Hill, extended all the way from Franklin to 12th streets. In this area, instead of six lanes of traffic as there are today (including turn lanes), there were only two lanes on each side of the broad median.

Many important institutions – churches, schools, and societies – lined Spring Garden Street, particularly east of Broad Street. The German Society of Pennsylvania, featured in the photograph below, is an excellent example which remains. The street hosted its share of industry as well, ranging from the Baldwin Locomotive Works to later examples such as the U.S. Mint, now part of the Community College of Philadelphia.





With the great period of industrialization following the Civil War, many of the nouveau-riche, being rejected from more established areas such as Rittenhouse Square, settled in North Philadelphia. Spring Garden Street thus saw the development of the huge brownstones and other elegant mansions west of Broad Street, many of which survive today as part of The Spring Garden Historic District.

The cross section of western Spring Garden Street resembled Commonwealth Avenue in Boston – broad sidewalks, richly landscaped front gardens (a few of which survive today), ornate iron fencing, and a grand mix of facades featuring elaborate brickwork, brownstone, marble, and limestone. Elegant stairways, complex bay windows, and richly detailed dormers are found on many of these mansions.

But what happened to the street in the 20th century? With the building of the Delaware River Bridge (now the Benjamin Franklin Bridge) in the 1920s, plans were drawn and then executed for inner and outer rings of circulator roads. Spring Garden Street was selected for this system because of its wide right-of-way. Its green medians were turned over to heavy motorized traffic. Many of the wealthy residents migrated to quieter, more suburban locales, and many of the grand homes were divided into apartments. Iron fencing was sold off or donated to war efforts, front gardens were paved over, and mature trees were not replaced. The green boulevard became a noisy urban arterial.





OTHER ISSUES THAT AFFECT SPRING GARDEN STREET:

- Vacant lots, abandoned buildings, or blank walls line 49% of the street
- Neighborhoods disconnected from each other
- Psychological barrier/safety/security
- Combined sewer overflows
- Substandard traffic signals
- Decrepit sidewalks
- Largely forgotten history (allay of trees, fountains, statues)



THESE ISSUES GIVE WAY TO OPPORTUNITIES:

- Real estate redevelopment, such as at the former State Office Building
- New businesses (for example, Union Transfer)
- Existing intersecting initiatives (North Broad vision plan, conversion of the Reading Viaduct to a linear park, Delaware River Waterfront Corporation's (DRWC) plan for the central Delaware River waterfront, casino development)
- Existing Institutions (Philadelphia Museum of Art, Community College of Philadelphia, Social Security Administration, Philadelphia Fire Marshall, Edgar Allan Poe National Historic Site)
- Strong neighborhood leadership

III. Public & Stakeholder Outreach

The SGSG design is the result of a process that included extensive public and stakeholder outreach:

- Starting in 2010, meetings with neighborhood leaders, elected officials, and staff from several City of Philadelphia departments, including Streets, Water, Planning, Mayor's Office of Sustainability, and Parks and Recreation
- In 2011 and 2012, over 25 individual meetings with property owners, businesses, schools, churches, and institutions located on Spring Garden Street and presented in front of the membership for each civic association on the corridor
- Three community meetings along the corridor, attended by over 350 people
- Over 500 posters, flyers, and postcards to businesses and residents and placed in the spokes of bicycles along Spring Garden Street
- Online presence through a project website (springgardengreenway.com), Twitter account (@SGSGGreenway), and Facebook page ([facebook.com/SpringGardenStreetGreenway](https://www.facebook.com/SpringGardenStreetGreenway), with 319 followers) with specific tools for users to register comments and share input
- Community walkability audit



springgardengreenway.com



[@SGSGGreenway](https://twitter.com/SGSGGreenway)



www.facebook.com/SpringGardenStreetGreenway

Steering Committee

At the start of the project, PEC established a Steering Committee of key government and non-governmental organization partners. PEC coordinated three critical Steering Committee meetings (August 3, 2011; November 8, 2011; and April 10, 2012) with the following agencies and non-profit partners:

- Mayor's Office of Transportation and Utilities
- Philadelphia Streets Department
- Philadelphia Water Department
- Philadelphia Parks and Recreation Department
- Philadelphia City Planning Commission
- Mayor's Office of Sustainability
- Delaware Valley Regional Planning Commission
- Pennsylvania Department of Transportation
- Southeastern Pennsylvania Transportation Authority
- Pennsylvania Department of Conservation and Natural Resources
- Delaware River Waterfront Corporation
- Schuylkill River Development Corporation
- Bicycle Coalition of Greater Philadelphia
- Center City District
- Pennsylvania Horticultural Society
- East Coast Greenway Alliance



COMMUNITY WALKABILITY AUDIT



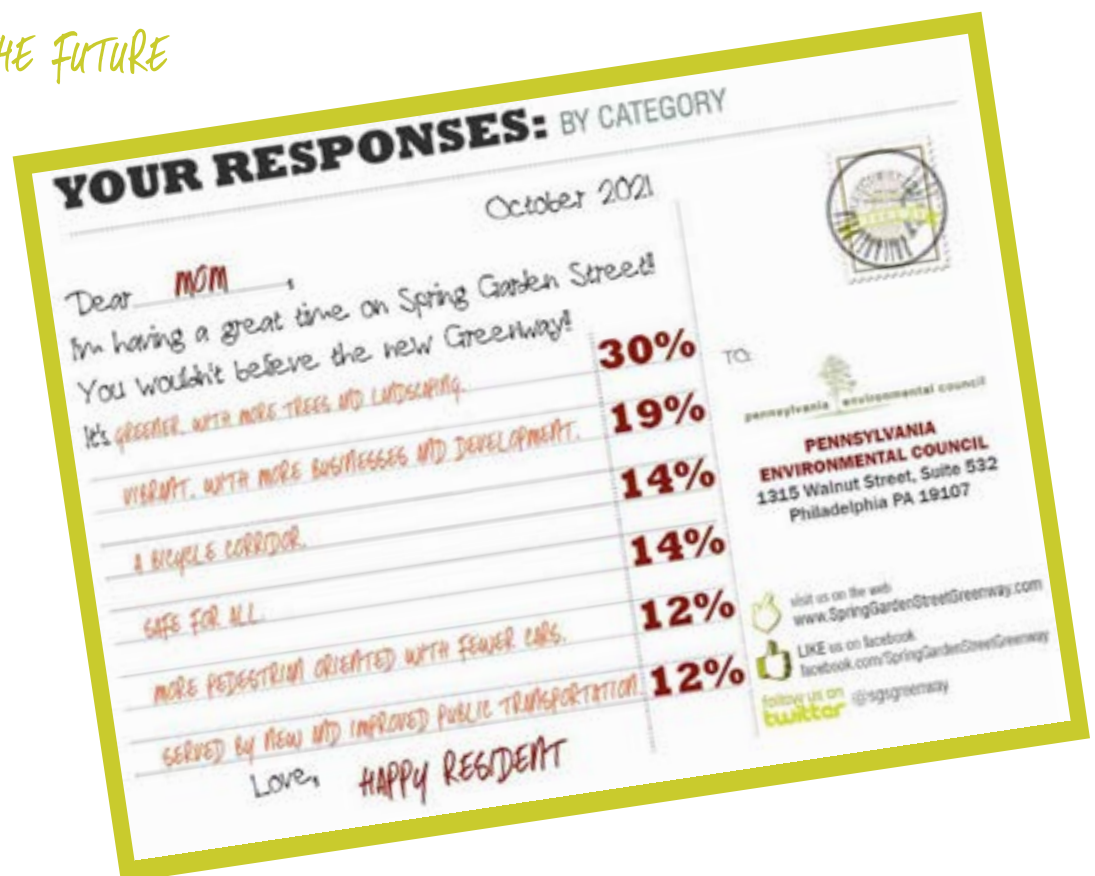
COMMUNITY MEETING 1: PROJECT BACKGROUND & CONTEXT

**October 27, 2011 – Community College of Philadelphia
(1700 Spring Garden Street)**

The project team presented the project background and context, including existing conditions and factors influencing the greenway design. Participants used stickers on a large-format poster map to indicate where they live, work, shop, and travel in the corridor. They also filled out **postcards to the future**, an exercise used to determine participants' vision for the future greenway. To help select a preferred design option, participants indicated their opinions regarding two different design options on inspiration boards with photographs of different greenway types and features.

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POSTCARDS TO THE FUTURE





COMMUNITY MEETING 2 - DESIGN WORKSHOP

**December 6, 2011 – German Society of Pennsylvania
(611 Spring Garden Street)**

The workshop focused primarily on the selection of a preferred design option. Participants worked through a series of exercises to express their opinions on the strengths and weaknesses of a curbside bikeway versus a median bikeway from a number of different perspectives: that of a parent with a stroller, a resident, a new business owner, a timid cyclist, and their personal perspective. A straw poll was conducted at the end of the workshop, with participants asked to indicate their preference for a curbside or median bikeway; the vote was roughly evenly split, with no clear majority.

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5 SCENARIOS:

HELP US TEST OUT HOW THE OPTIONS WORK
FROM DIFFERENT PERSPECTIVES:





COMMUNITY MEETING 3 - PRESENTATION OF FINAL DESIGN

**June 20, 2012 – Community College of Philadelphia
(1700 Spring Garden Street)**

The project team displayed large-format drawings of the selected median-based greenway design, and project team members answered questions and discussed design details. The project team also provided details about the selection of the median greenway, estimated construction costs, and a potential implementation strategy.

AFTER



BEFORE

IV. Selection of the Median Greenway

PEC's 2009 Center City Greenway Feasibility Study identified two options for the greenway design: a **curbside option**, in which a protected bikeway would be created between the curb and parking lane, and a **median option**, in which the median would be expanded to incorporate a bikeway. An initial task for the SGSG project was to evaluate both options in detail and choose one to advance into a preliminary design.



As part of the evaluation of the two options, the following elements were analyzed in detail:

- Potential for vehicle/bicycle conflict
- Impact to parking supply
- Pedestrian improvements
- Impact on motor vehicles and bicycles turning off of Spring Garden Street
- Movements through and design of atypical locations, such as under the Reading Viaduct and I-95
- Impact to bus operations
- Mid-block conflicts at both side streets and curb cuts and also analyzed curbside activities (deliveries, lunch trucks, and parking)
- Underground utility conflicts and potential locations for stormwater structures
- Design functionality, such as intuitiveness and adequate sight lines
- Landscaping opportunities

The public and the Steering Committee provided input for the evaluation. At the second public meeting on December 6, 2011, participants identified the strengths and weakness of each option and voted for their preference. Attendees were evenly split. Similarly, in an online survey of the Steering Committee, neither option was clearly preferred over the other.

Further developing both options and conducting additional meetings with key stakeholders helped guide the project team toward a decision. The median greenway had clear advantages in the following areas:

- Pedestrian improvements
- Impact to bus operations
- Mid-block conflicts
- Impact to parking supply
- Utility conflicts
- Locations for stormwater structures



ULTIMATELY, THE FOLLOWING FACTORS LED TO THE SELECTION OF THE MEDIAN-BASED BIKEWAY AS THE PREFERRED OPTION

Pedestrian improvements

- The median design allows for consistent neckdowns, or curb extensions, at every corner along the corridor. The curbside design would vary at the corners, with floating pedestrian refuges, floating bus bulbs, or standard neckdowns, depending on the corner.

Impact to bus operations

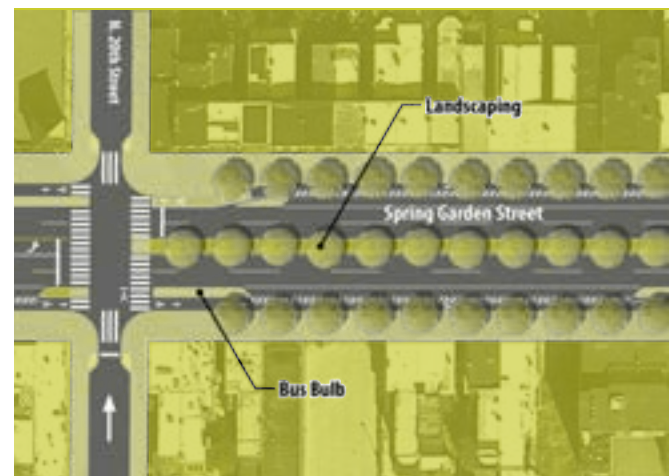
- The median option's impact on bus operations is less than the curbside option because bicyclists will be significantly distanced from bus stops. With the curbside option, bicyclists would ride between a floating bus bulb and the curb, resulting in a conflict point between bicyclists and bus passengers walking to and from the bus bulb. (Bus bulbs are described in detail on page 33.) Furthermore, under the curbside option, the existing bus layover zone under I-95 at the Southeastern Pennsylvania Transportation Authority (SEPTA) Spring Garden Station would be either eliminated or, given space constraints, bicyclists would have to cycle around buses on a standard bike lane, rather than a protected bikeway. This layout would result in a sub-standard facility with potential conflicts for both buses and cyclists.

Mid-block conflicts

- Vehicle/bicycle conflict points along the corridor consist of intersections (both signalized and unsignalized) and curb cuts. The curbside option was found to have 77 conflict points, while the median option had 25. Of the median conflict points, five of the 25 locations are unsignalized intersections, four of which are proposed to be closed in the SGSG design (as discussed on page 29 in the Minor Intersection section), thus reducing the number of median conflict points to 21.

- Additionally, under the curbside option, the parking lane would be moved approximately eight feet away from the curb to accommodate the bikeway. This floating parking lane does not meet the current PennDOT requirement that cars parallel park against a curb and could have required the construction of a second, lower curb separating parallel-parked cars from the bikeway. This second curb would increase the cost of the curbside option by several million dollars.

Proposed Median Rendering



Curbside Conceptual Rendering

Impact to Parking Supply

The addition of neckdowns and near-side bus bulbs may result in a negligible reduction in parking spaces along the corridor. There are approximately 720 parking spaces on Spring Garden Street and on the cross streets 50-feet to the north and south. With the implementation of SGSG, there would be approximately 700 spaces. However, the parking supply can be increased somewhat by replacing traditional parking meters with kiosks, which allow for greater parking flexibility.

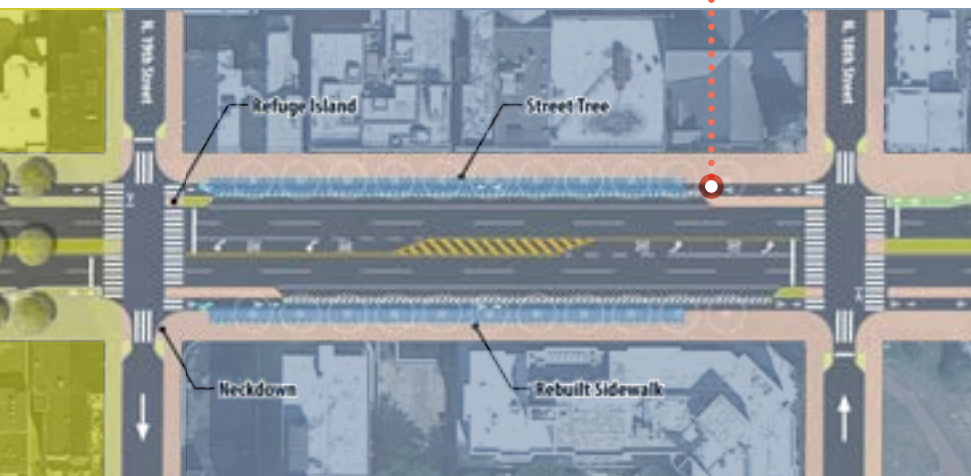


Utility conflicts and locations for stormwater structures

The design team analyzed Highway Supervisory Plans and Philadelphia Water Department (PWD) Plans to determine the location of underground utilities. The team looked for areas with few utility conflicts where stormwater storage and the new bikeway could be co-located to avoid full reconstruction of the right-of-way. The team also avoided other relevant infrastructure, such as train trestles and tunnel crossings.

■ In the curbside design option, there were significant utility conflicts on the north side of Spring Garden Street on every block as well as no areas suitable for the stormwater structures; on the south side of the street, only eight of 25 blocks had appropriate areas. In the median design option, 18 of 25 blocks had sufficient median space for stormwater structures; on the remaining seven blocks, the structures could be located under the vehicle travel lanes.

Curbside utility conflicts were ultimately the fatal flaw for the curbside option, as utility relocation costs and the risk of unexpected utility issues are likely significantly higher than they would be in the median option. Construction of stormwater structures requires significant reconstruction of the street regardless of their location, but the selection of the median option allows both the construction of the median bikeway and those structures to occur in generally the same area at a lower cost.



Curbside Stormwater Management

V. Design Features & Components

In general, the SGSG design follows a context-sensitive, Complete Street approach. A Complete Street design accommodates all potential users and serves multiple functions, consistent with adjacent land uses. In the case of SGSG, pedestrians will feel safer and more comfortable walking, the bikeway design will attract a wider range of bicyclists, stormwater will be managed in a more sustainable manner, bus access and operations will be improved, and vehicle access and connectivity will be maintained for motorists.

As one of central Philadelphia's primary arterial streets, Spring Garden Street serves a critical transportation function for both through traffic and traffic needing access to adjacent neighborhoods.

The current layout of Spring Garden Street typically alternates by street block, with some blocks featuring a median (concrete or landscaped) and other blocks featuring left-turn lanes. On blocks with left-turn lanes, a concrete strip typically separates the left-turn lanes from on-coming traffic. The street's curb-to-curb width varies on either side of Broad Street. Spring Garden Street is 80 feet wide to the west of Broad Street and 88 feet wide east of Broad Street. The street includes two travel lanes in each direction for through traffic.



THE FOLLOWING ASSUMPTIONS GUIDED THE DESIGN PROCESS:

Maintain existing vehicle capacity

Early in the process, retention of the street's four travel lanes was deemed essential given its relatively high traffic volumes.

Maintain turn lanes and cross-street access

Impacts to the area's street grid, connectivity, and the functionality of the street for vehicular traffic should be minimized.

Maintain parking and curbside loading zones

Parking demand in the area is relatively high, and stakeholders requested no significant reduction in parking.

Limit impacts to bus operations

Spring Garden Street is a heavily used bus corridor where bus operations and access should be maintained or enhanced.

Implement a protected bikeway

The bikeway should be above the grade of vehicle travel lanes and separated from adjacent vehicular traffic by curbs and landscaping (exceptions to this are described on pages 24 and 25).

WHAT COULD SPRING GARDEN STREET LOOK LIKE?



Conform the design to the following dimensions:

Minimum 10-foot-wide bikeway with minimum 5-foot-wide buffer between the bikeway and vehicle lanes (exceptions to this are described in the West of Broad] section on page 22).

11-foot-wide travel lanes, reduced to 10 feet in certain locations if there is no adjacent curb.

10-foot-wide left-turn lanes.

8-foot-wide curbside parking lanes (exceptions to this are described in the [West of Broad] section on page 22).

Maintain sidewalk width

West of Broad Street, sidewalks are typically 20 feet wide, although the effective width is usually less given the presence of street trees, building stoops, etc.; sidewalks east of Broad Street are typically 16 feet wide.

Limit impacts to city services and curbside activity

The design should not hinder refuse collection, street sweeping, and snow removal. Curbside access should be maintained for the numerous food trucks serving customers from businesses and institutions along the corridor.

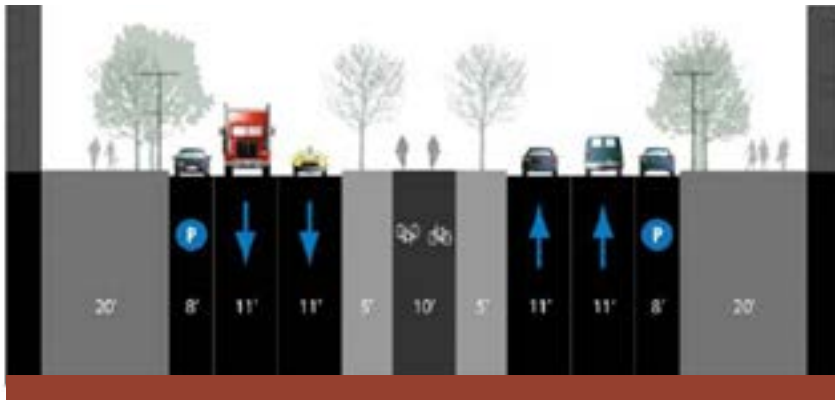
General design details for the greenway segments east and west of Broad Street, followed by additional details for atypical locations, such as the connection to Columbus Boulevard/Delaware Avenue



[West of Broad]



The design for the 0.8-mile section of Spring Garden Street west of Broad Street, which is 80 feet wide, is as follows:



Blocks without left-turn lanes

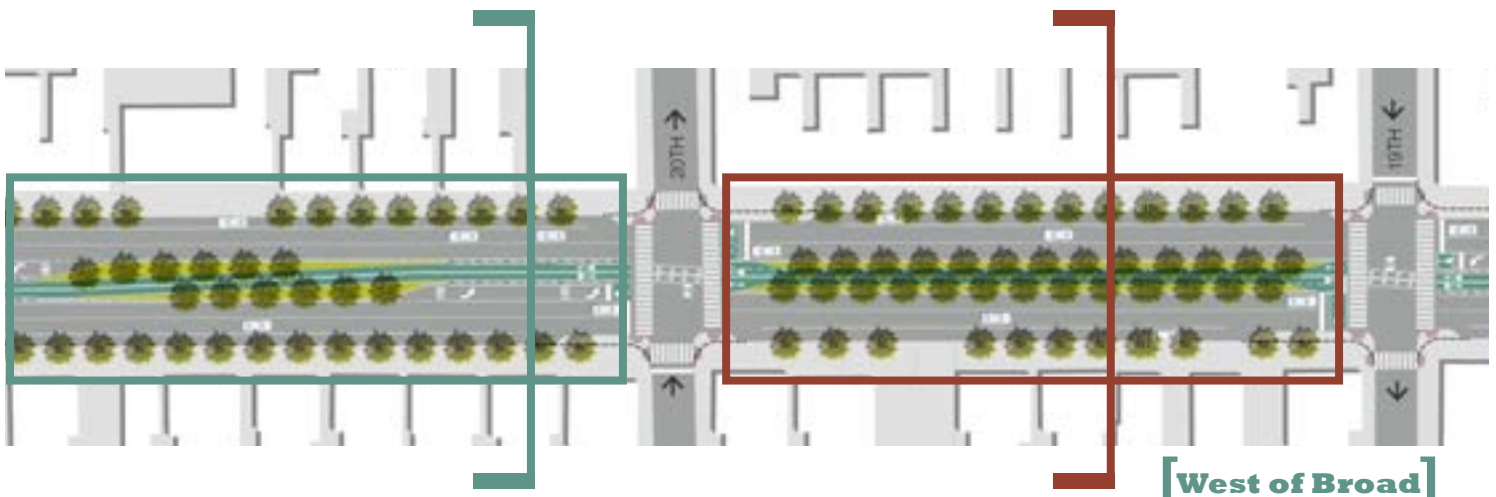
- A 20-foot-wide raised median encompassing a 10-foot-wide bikeway with five-foot-wide landscaped buffers between the bikeway and travel lanes
- Two eight-foot-wide parking lanes and four 11-foot-wide travel lanes

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Blocks with left-turn lanes

- Mid-block sections are similar to the above, with a raised and landscaped median bikeway. Adjacent to the turn lanes, space is more constrained and the bikeway is at-grade, separated from adjacent travel lanes by a striped buffer and flexible plastic posts
- These blocks also include two seven-foot-wide parking lanes and four 10-foot-wide travel lanes

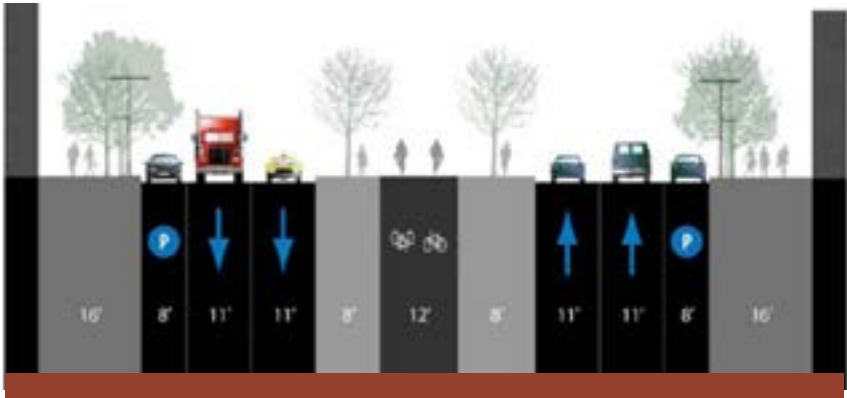




For the 1.3-mile section of Spring Garden Street east of Broad Street, which is 88 feet in width, the design is as follows:

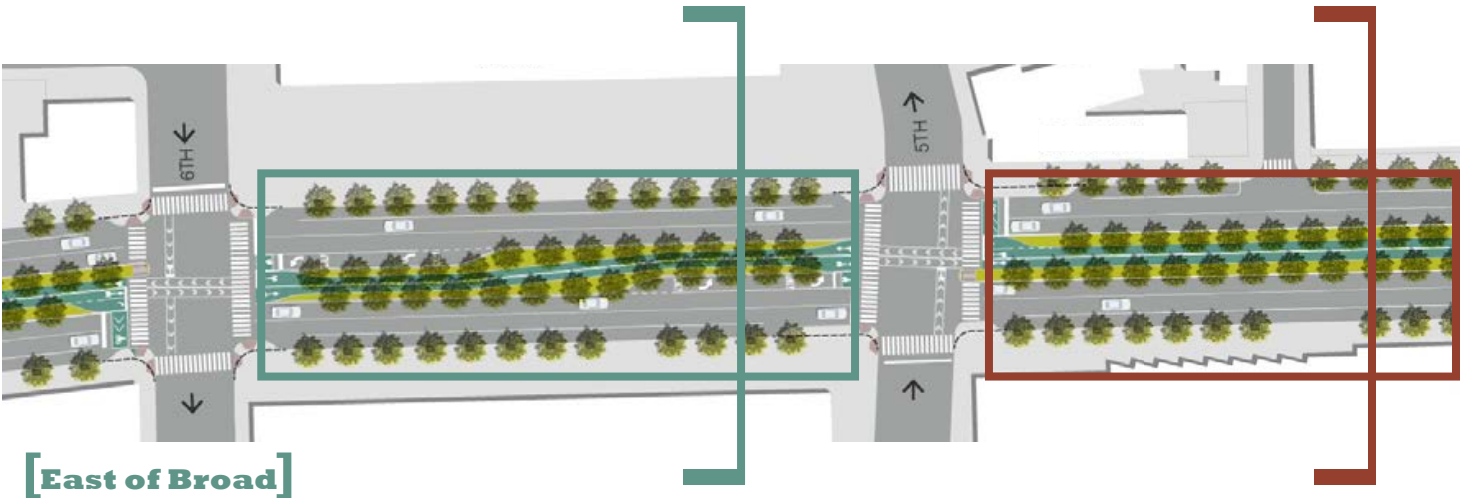
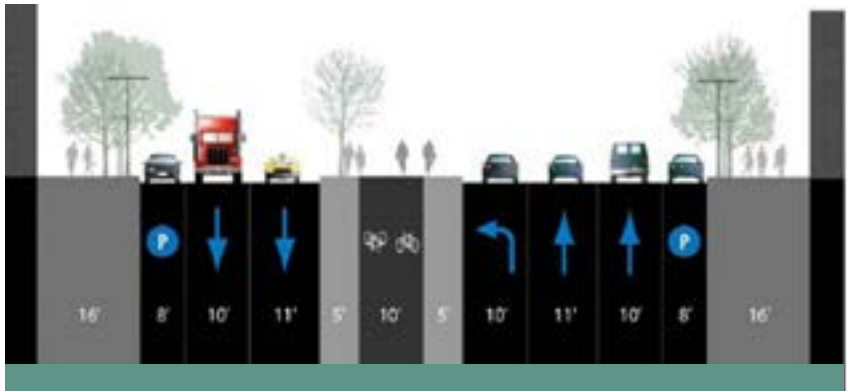
Blocks without left-turn lanes

- A 28-foot-wide raised median, encompassing a 12-foot-wide bikeway with eight-foot-wide landscaped buffers between the bikeway and travel lanes
- Two eight-foot-wide parking lanes and four 11-foot-wide travel lanes
- 16-foot-wide sidewalks



Blocks with left-turn lanes

- A 20-foot-wide raised median, encompassing a 10-foot-wide bikeway with five-foot-wide landscaped buffers between the bikeway and travel lanes
- Two eight-foot-wide parking lanes, two 11-foot-wide travel lanes, two 10-foot-wide travel lanes, and one 10-foot-wide turning lane
- 16-foot-wide sidewalks



[East of Broad]

Connection to Columbus Boulevard/Delaware Avenue

Since Columbus Boulevard/Delaware Avenue has an existing bike lane and a proposed north-south greenway on the east side of the street, the SGSG design features a number of treatments to facilitate the movement of bicyclists through the intersection and between these bicycle routes:



- For bicyclists turning from southbound Delaware Avenue onto westbound SGSG, a bike box positions them ahead of vehicular traffic, and bicycle intersection markings guide them to SGSG.
- For bicyclists turning from SGSG to southbound Columbus Boulevard, a bike box facilitates their movement to the right side of the street.
- Eastbound bicyclists seeking the northbound bike lane on Delaware Avenue or the future greenway on the east side of Delaware Avenue would cross the intersection on a separate bicycle signal phase. High-visibility bicycle intersection markings (chevrons and peg-a-traks) would guide bicyclists across the intersection and alert motorists to their presence. Westbound bicyclists traveling from northbound Columbus Boulevard would cross the intersection in a similar manner.

24 Interstate 95/Spring Garden Station

The existing configuration and proposed design of SGSG at the I-95 underpass are shown in the figures below. The Spring Garden Station on the SEPTA Market-Frankford Line is located at the I-95 underpass. To accommodate the large number of pedestrians attracted to this SEPTA bus and Market El transfer point, the design at this location includes the following:



- Dedicated bus lanes from Front Street to 2nd Street
- Given that the street is constrained by the I-95 bridge supports, the bikeway at this location is at-grade, separated from adjacent vehicle traffic by a three-foot striped buffer and flexible plastic posts.
- Sixteen-foot-wide sidewalks (as in the existing condition)



EXISTING CONDITIONS

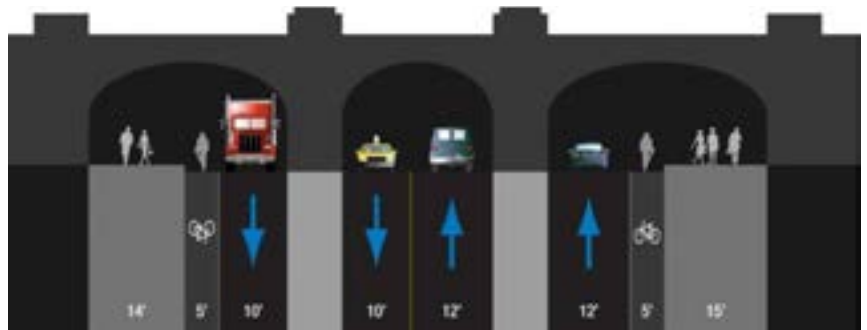


MEDIAN DESIGN

Reading Viaduct

The right-of-way at this location (between 9th and 10th streets) is particularly constrained, yet the design still maintains four 11- to 12-foot-wide travel lanes, accommodates left turns for motorists, includes a protected bikeway, and retains sidewalks. All vehicular traffic, except for left-turning vehicles, uses the two outer tunnels of the viaduct.

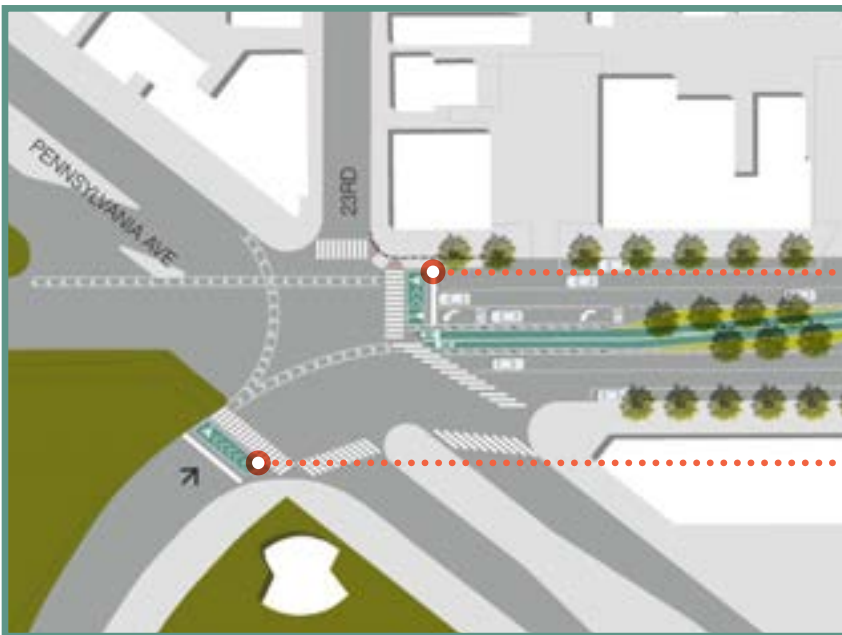
The greenway continues through the center tunnel, along with left-turning vehicles. Sidewalks are narrowed in the outer tunnels to accommodate two travel lanes, while maintaining sufficient width for pedestrians. In addition, the outside travel lanes adjacent to the sidewalks are moved closer to the centers of two outer tunnels, where the tunnel height is highest; thus clearance is improved for tall trucks.



EXISTING CONDITIONS

Connection to Pennsylvania Avenue

At Pennsylvania Avenue, a number of design features facilitate the movement of bicyclists to and from the median bikeway through the intersection:



- For westbound bicyclists heading towards the Eakins Oval, a bike box facilitates their movement from the median bikeway to the right side of the street. Bicycle intersection markings guide riders through the intersection.
- For eastbound bicyclists riding from the Eakins Oval, a bike box facilitates their movement from the right side to the left side of the street. Bicycle intersection markings guide riders into the median greenway.

Stormwater Management

The SGSG approach to landscaping reflects an ideal marriage of beautification and stormwater management and complements PEC's intent to create a world-class greenway design. The SGSG design takes an innovative and integrated approach by incorporating stormwater management techniques into the street's redesign. This approach improves infrastructure sustainability and assists PWD in meeting city-wide goals of reducing stormwater flows into the sewer system.

SGSG will incorporate tree trenches and rain gardens as stormwater features. Tree trenches will appear to be conventional on the surface, but will store rainwater below the sidewalk in specially designed trenches shared by multiple street trees. This available water will make for healthier trees and reduce the amount of runoff that burdens the sewer system. Rain gardens will be incorporated into expanded curbs at intersections. These gardens will capture water through plants, soil, and gravel and slow the flow of water into the sewer system. The gardens will also provide attractive landscaping for the corridor.

The SGSG design also includes underground structures to reduce the volume of stormwater flowing to the sewer system. The SGSG stormwater system will retain runoff from Spring Garden Street and its sidewalks. At the request of PWD, the system will also handle runoff from adjacent side streets and could accommodate future connections, such as in redeveloped vacant lots. As shown in the figure on the right, Spring Garden Street is located near the top of its sewer drainage area, making it ideal for capturing stormwater before it overloads the system.

Most Philadelphia streets are crowned, or sloped, in order to drain stormwater from the center of the street to the curb and then into drainage inlets at the downslope corner of each block. Similarly, sidewalks generally slope towards the street, allowing stormwater to drain to the curb and into the same inlets. These corner inlets then connect to a local collection system that connects to the larger, regional collection system.

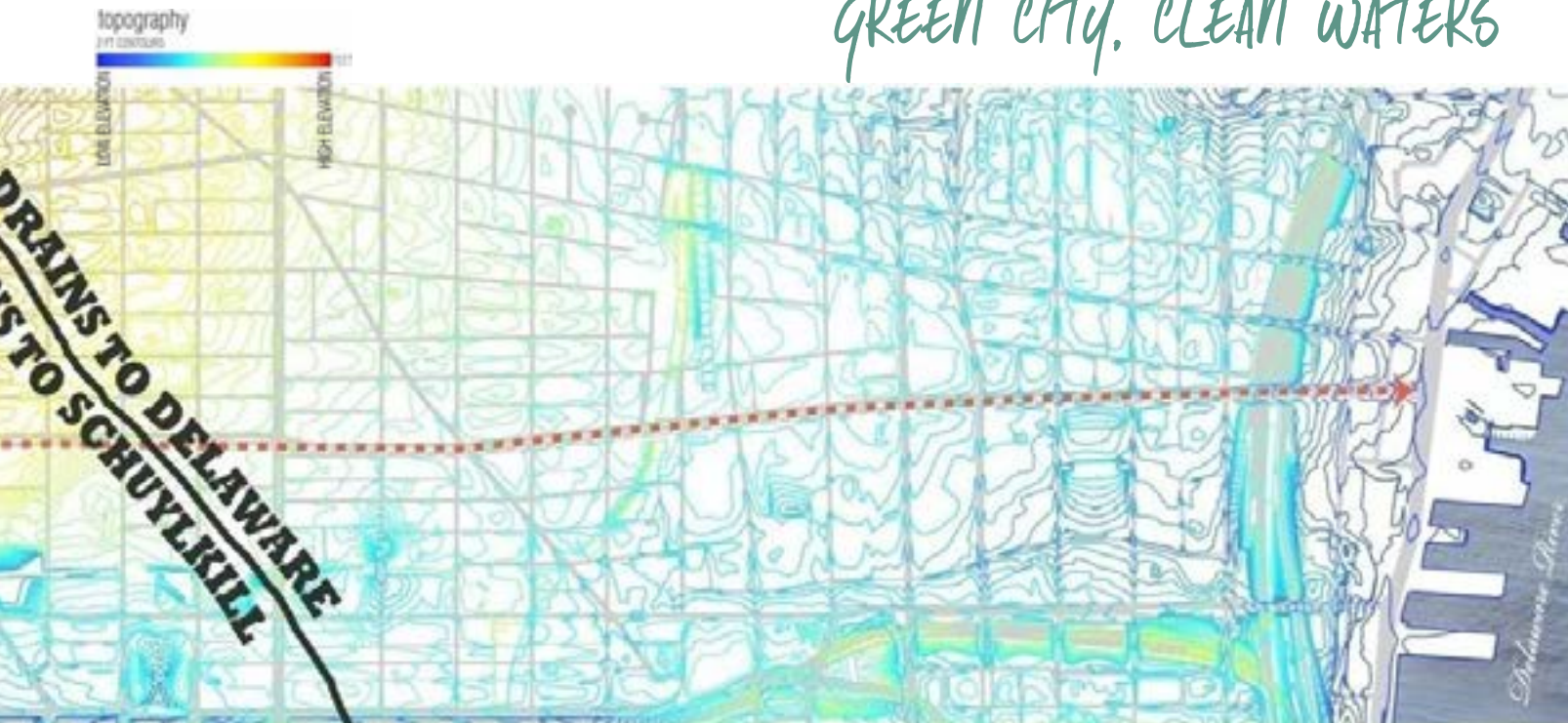
In a combined sewer system, which is common in many older cities such as Philadelphia, the stormwater collection system handles both stormwater and sewage in the same pipes. During



dry weather the pipe contains only sewage, which flows into water treatment plants. When it rains, however, stormwater falling on the surface runs into storm inlets and is added to the system. This eventually fills the pipes beyond their capacity and as a result, some of this sewage-stormwater is discharged directly into local rivers and streams through an overflow system.

The proposed SGSG stormwater management system will capture up to 1.5 inches of rainfall and divert it to an alternative drain system. Based on current City design standards, rainfall will be captured via green inlets. Green inlets are located upslope of existing inlets where they can divert and intercept runoff into a subsurface trench system. The subsurface trench system retains and infiltrates stormwater rather than allowing it to flow directly into the combined sewer system. A typical subsurface system trench will be under the center of the street on each block, and about 208 feet long, nine feet wide, and four feet deep. The trench is filled with stone and wrapped in a permeable geotextile liner; stormwater fills the voids between the stones. When rainfall exceeds 1.5 inches and fills the alternative drain system to capacity, curbside stormwater would flow past the now full green inlets and into the existing corner inlets.

GREEN CITY. CLEAN WATERS



The system envisioned for Spring Garden Street would capture 126,000 cubic feet of stormwater falling over 1,008,000 square feet, helping implement the City's "Green City, Clean Waters" plan. That's a surface area equivalent to 21 football fields with the volume of approximately 1½ Olympic-size swimming pools!

The benefits of building this new system are clear: the project would help prevent combined sewer overflow events that pollute Philadelphia's rivers and cause flooding – at the same time making Spring Garden one of the greenest, most livable streets in the city.

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VI. Design Functionality

Motor Vehicles



Bicycles



Pedestrians



Buses



Motor Vehicles

Given that four travel lanes and nearly all left-turn lanes are maintained in the SGSG design, future motor vehicle operations on the corridor are similar to existing conditions. The project team, however, proposed a number of traffic calming treatments and signal modifications to improve safety on the street. Modifications affecting motorists include the following:

A Improved pedestrian crossing times

The signal timing at each intersection would be modified to provide the recommended pedestrian crossing time per the latest updates to the Manual on Uniform Traffic Control Devices (MUTCD), which assumes an average walking speed of 3.5 feet per second. The signal cycle lengths along the corridor would be increased at most intersections from 60 seconds to 90 seconds. For the street segment between Broad Street and 12th Street/ Ridge Avenue, the cycle length would increase to 120 seconds due to higher cross-street volumes, additional signal phases, and longer crossing times (existing cycle varies between 60 and 120 seconds, depending on the intersection).

B Neckdowns

Neckdowns would be provided at each intersection along the corridor. These design features would effectively reduce pedestrian crossing distances, reduce pedestrian exposure to vehicles, and slow the speed of turning vehicles. Turning radii remain sufficient to still allow larger vehicles to turn the street corners.

C Narrower travel lanes

To accommodate the expanded median with a bikeway and landscaped buffers, the width of through travel lanes east of Broad Street would be narrowed from 12 feet to 10 or 11 feet, depending the presence of left-turn lanes. Reduced lane widths have been shown to reduce vehicle speeds and improve safety. West of Broad Street, existing 10- and 11-foot-wide lanes are maintained.

D Left-turn bay length

In order to maximize the mid-block space for the landscaped, above-grade bikeway, left-turn bays are shortened to the minimum length necessary to accommodate peak volumes of left-turning vehicles. Preliminary analysis of five left-turn bays indicates that the turn bay lengths may generally be reduced without negatively impacting traffic operations. For instance, the westbound left-turn lane at 21st Street and the eastbound left-turn and at 22nd street, both which are currently 200 feet, could be shortened to 105 feet and 125 feet respectively based on analysis of peak hour queue lengths.



E Left-turn traffic signalization

Left-turn signals generally operate with protected-permitted left-turn phasing. This means that vehicles can turn left from Spring Garden Street during one of two phases: (1) the protected phase in which motorists have a left-turn arrow, or (2) the subsequent phase in which they are permitted to turn left after yielding to oncoming through traffic once the turn arrow changes to a solid green light. With implementation of the median bikeway, the left-turn phasing would be modified from protected-permitted to a protected left-turn phase in order to protect cyclists from vehicles turning left across the bikeway. Bicyclists and opposing through traffic would stop while vehicles turn left from Spring Garden Street, and eastbound and westbound left-turning vehicles would be stopped when bicyclists and through traffic have a green light. Eliminating the permitted left-turn phase results would delay left-turning vehicles, but at an acceptable level based on level of service standards.

G Signal Progression

Although a few intersections on Spring Garden Street are coordinated, currently it appears that the traffic signals generally operate independently of each other and that the timing is not designed to minimize travel time or vehicle delay. SGSG will allow for signal timing to be adjusted and coordinated to improve the traffic flow and travel times on the corridor for both vehicles and bicyclists. Signal timing makes it possible to travel through several intersections without encountering a red light. The signal coordination analysis for SGSG is based on an assumed vehicle travel speed of 26 mph (the speed limit on Spring Garden Street is 25 mph) and a bicycle speed of 13 mph.

F Minor intersection closure/signalization

To protect bicyclists from vehicles turning left across the bikeway, left turns by vehicles would be allowed at signalized intersections only where they have a protected left-turn phase, as described previously. While almost all of the Spring Garden Street intersections are signalized, left turns are currently permitted from eastbound Spring Garden Street at five unsignalized minor intersections east of Broad Street: Beach Street, Front Street, Hope Street, American Street, and Marshall Court. Under the proposed SGSG design, the Front Street intersection would be signalized and the left turn maintained. At the other minor streets, the intersections would be closed to left-turning vehicles from eastbound Spring Garden Street, resulting in minimal traffic impact.

H Parking

The addition of neckdowns and near-side bus bulbs may result in a negligible reduction in parking spaces along the corridor. There are approximately 720 parking spaces on Spring Garden Street and on the cross streets 50 feet to the north and south. With the implementation of SGSG, there would be approximately 680 spaces. However, the parking supply can be increased somewhat by replacing traditional parking meters with kiosks, which allow for greater parking flexibility.





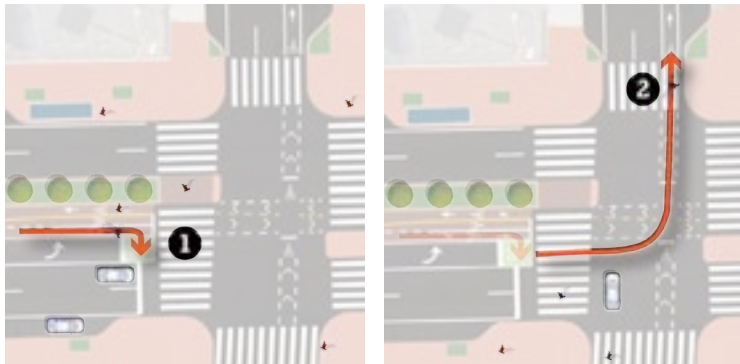
Bicycles

The SGSG project would widen the existing median of Spring Garden Street by removing the existing bike lanes and narrowing the vehicle travel lanes. The median would include a 10- to 12-foot-wide bikeway, separated from adjacent travel lanes by five- to eight-foot-wide landscaped buffers or, on the blocks west of Broad Street with left-turn lanes, three-foot-wide striped buffers with flexible plastic posts.

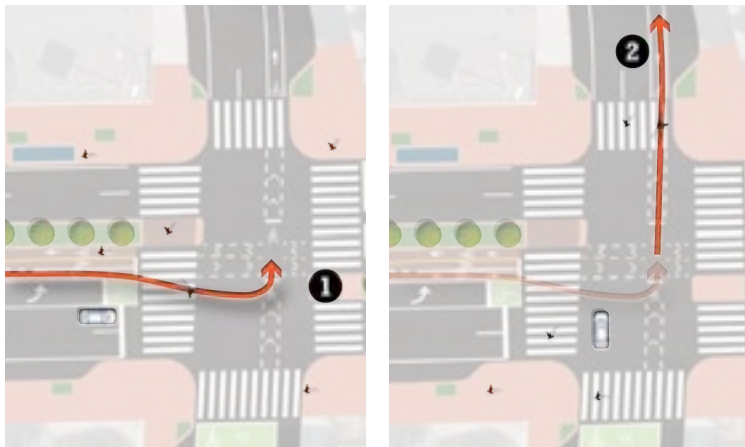
For bicyclists turning from the bikeway to a side street, the design includes several features to facilitate this movement:

A Bicyclists turning left (Two Options)

Move to the bike box in the vehicle left-turn bay when the left-turn signal is red and the cross-street signal is green (i.e., not yellow). And then, when the left-turn signal is green, turn left in advance of left-turning vehicles.

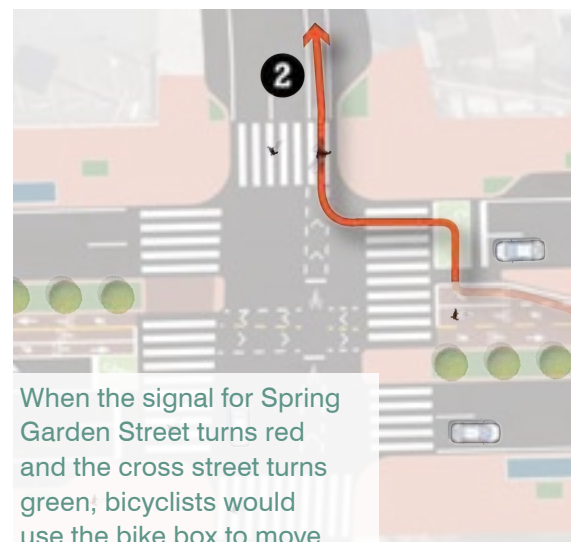
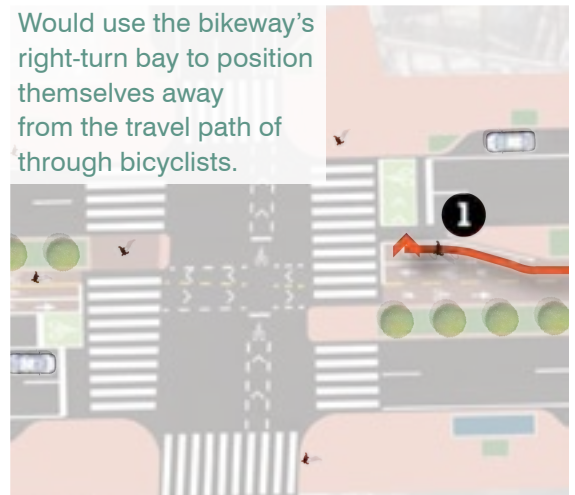


If the signal for through traffic on Spring Garden Street is green, move to the bicycle queue box within the intersection. When the cross-street signal turns green, complete the left turn by proceeding through the intersection. This movement is known as a two-stage left turn or a Copenhagen left.



B Bicyclists turning right

Would use the bikeway's right-turn bay to position themselves away from the travel path of through bicyclists.



When the signal for Spring Garden Street turns red and the cross street turns green, bicyclists would use the bike box to move towards the sidewalk and complete their right turn onto the cross street.



The SGSG design includes high visibility bicycle intersection markings (chevrons and peg-a-traks) to facilitate bicyclists' movement through the intersection and to alert motorists to watch for bicyclists within the intersection.

There are a number of existing bicycle routes that intersect Spring Garden Street at several cross streets, and additional cross-street bicycle routes are identified for future implementation in the City's bicycle master plan. The SGSG design includes bicycle intersection markings for these cross-street bicycle routes at Columbus Boulevard/Delaware Avenue; 2nd, 5th, 6th, 11th, 13th, 15th, 21st, and 22nd streets; and Ridge Avenue.





Pedestrians

The SGSG design incorporates numerous features to improve the corridor's appeal, comfort, and safety for pedestrians, including the following:



A Crosswalks

High-visibility crosswalks to alert drivers to be aware of pedestrians

B Vehicle Stop Bars

Relocation of vehicle stop bars to 10 feet in advance of crosswalks to improve pedestrian visibility and reduce vehicle encroachment into crosswalks

C Sidewalk Safety

Replacement of substandard, broken, or missing sidewalks and reconstruction of all corners to make them compliant with the Americans with Disabilities Act

D Neckdowns

Neckdowns would be provided at each intersection along the corridor. These design features would effectively reduce pedestrian crossing distances, reduce pedestrian exposure to vehicles, and slow the speed of turning vehicles.

E Refuge Islands

Pedestrian refuge islands east of Broad Street, where the street is wider – these islands are effectively median extensions that provide waiting space for pedestrians who may not have time to fully cross the street in one signal phase

F Traffic Signals

Retiming of traffic signals to MUTCD pedestrian standards, described above (see Motor Vehicles section, page 28)

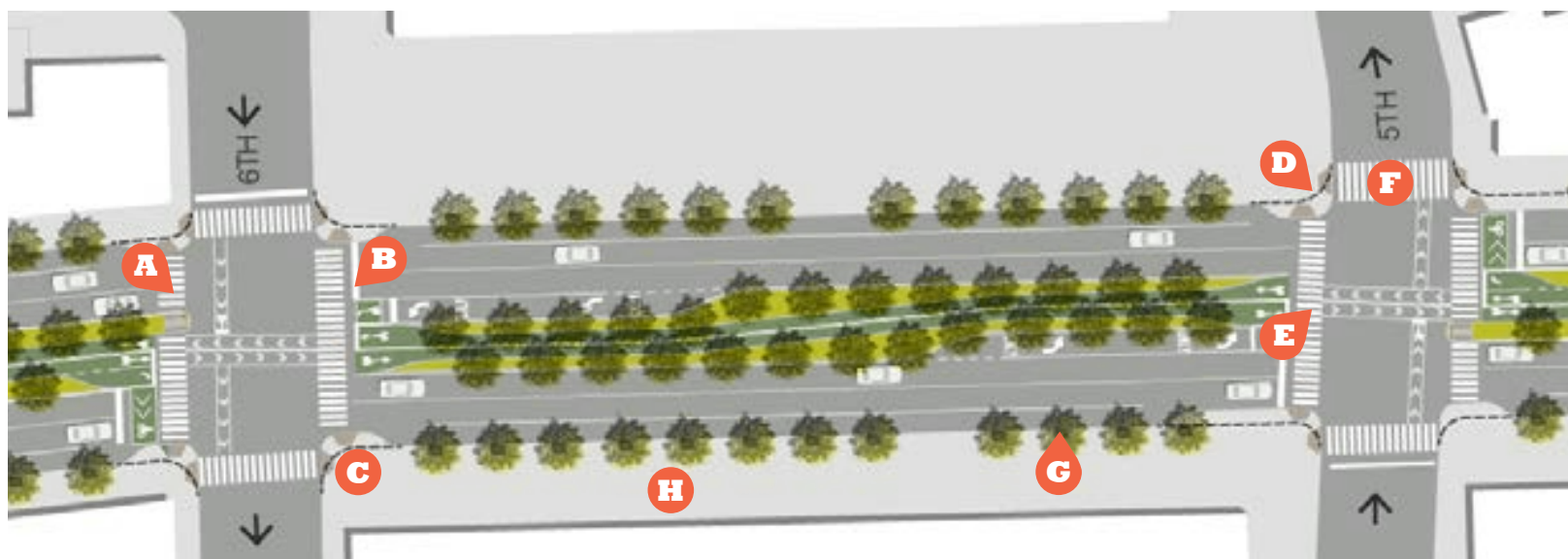
G Landscape

New street trees and landscaping

H Lighting

New lighting to improve safety and security for businesses, residents, motorists and greenway users

In addition, the traffic calming effect of other elements in the design (narrowed travel lanes, expanded median, etc.) should reduce vehicle speeds. A pedestrian's mortality risk in a crash increases exponentially with vehicle speed, and even a small vehicle speed reduction can significantly improve pedestrian safety.





Buses

SEPTA bus route 43 follows the length of Spring Garden Street. Additionally, other bus routes travel on shorter segments of the street, with numerous routes crossing Spring Garden Street on intersecting streets. The SGSG design includes several design features intended to improve bus operations on the street.

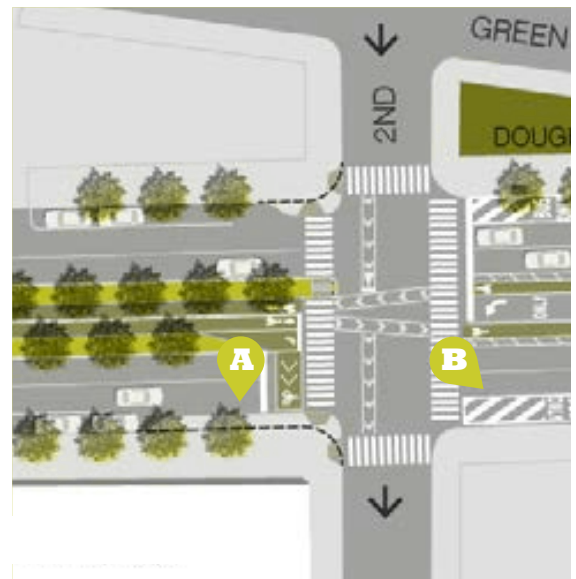


Currently, buses maneuver from the outside travel lane to curbside bus stops. Many of the no-parking zones within the bus stops are too short for buses to properly access the bus stop. With the bus at an angle to the curb, rather than parallel to it, boarding and exiting the bus can be inconvenient, particularly for those with disabilities. It also takes time for buses to maneuver in and out of stops.

A Bus Bulbs

To address these issues, the SGSG design includes bus bulbs at the bus stops along the corridor. Bus bulbs effectively extend the sidewalk into the bus stop/curbside parking lane, allowing buses to pull close to the bus stop without maneuvering out of the travel lane. This speeds bus travel and allows for convenient and efficient boarding and exiting of the bus, as the side of the bus is flush with the curb.

As shown in the above figure, the bus bulbs are located at the existing bus stops on the near side of the intersection. While not included in the design due to stakeholder concerns, relocating the bus stops to the far side is generally considered a best practice among transit planners and could improve bus operations by reducing bus delay at red lights. Bus stop consolidation can further improve bus speeds by removing five low ridership stops of the 24 existing bus stops on Spring Garden Street – at 6th, 9th, 13th, 18th, and 21st streets.



B Bus Lay-By Area

As discussed previously, the SGSG design replaces the no parking/ bus zone between 2nd and Front streets with a wider (10 foot) dedicated bus lane/bus lay-by area. Bus activity is heavy at this location as it is a transfer point to the Spring Garden Station of the SEPTA Market-Frankford Line.

VII. Costs & Benefits

The required capital investment to construct the preferred option is estimated to be \$20,300,000. Annual maintenance costs are estimated to be \$15,638.

Implementation of SGSG would have a number of positive impacts on the surrounding neighborhood and the city. The project team conducted a detailed cost-benefit analysis, the results of which are summarized here. The benefits that are leveraged by this investment include the following:

Increased employment and economic activity related to the construction of SGSG

Real Estate Strategies (RES) estimated the economic impact of constructing SGSG using the Regional Input-Output Modeling System developed by the U.S. Department of Commerce Bureau of Economic Analysis. These benefits represent an addition of nearly \$40 million in economic activity, including \$6 million in earnings and the creation of 127 jobs during the construction period.

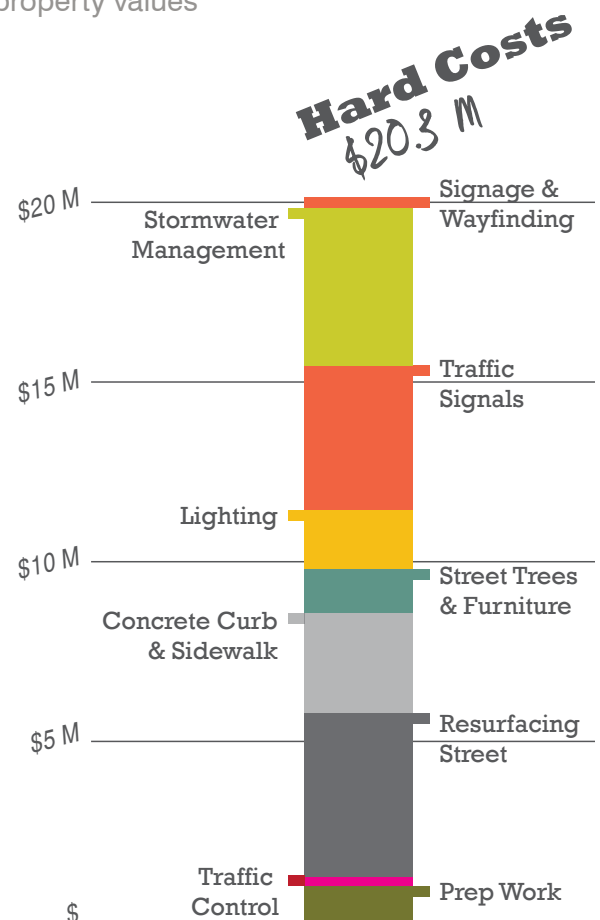
Increased property values, real estate, and transfer tax revenues

Several academic studies have documented increased property values associated with proximity to green space, streetscape improvements, and the installation of improved pedestrian and bicycle facilities. One of the most recent and rigorous analyses was completed in 2006 by University of Pennsylvania researchers Susan Wachter and Kevin Gillen. Wachter and Gillen found that property values for Philadelphia properties located adjacent to “green” streetscape improvements have values 28 percent higher than similar parcels on unimproved streets.

RES reviewed the September 2011 Office of Property Assessment (OPA) file of market and assessed valuation for the 455 parcels fronting Spring Garden Street. Contiguous parcels under the same ownership as the parcel fronting Spring Garden Street were also included. The OPA market value for all properties (taxable and tax-exempt) totaled \$357.2 million. Applying the 28 percent premium to the OPA market values of these parcels results in the following:

- Increased real estate market value of more than \$100 million
- Increased assessed valuation of \$13.2 million based on current assessments of taxable real estate
- Increased annual real estate tax revenues (from taxable properties) of \$1.25 million
- Increased total real estate transfer taxes collected from sales of property along SGSG, as a result of higher property sales prices

This analysis only considers the impact on existing properties. New development will add to the tax base as well, subject to any tax abatement period in effect.

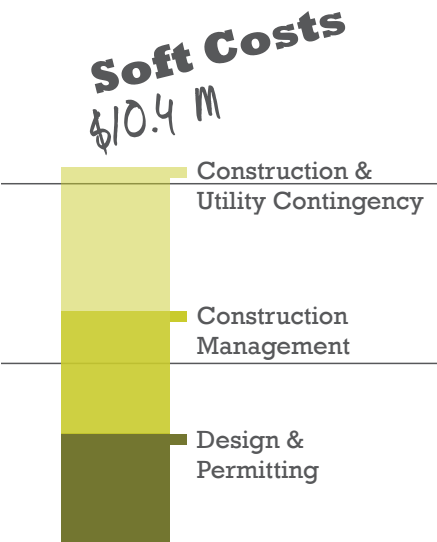


Increased retail sales and sales tax receipts

University of Pennsylvania researchers concluded that transformation of Spring Garden Street into a Complete Street would result in increased levels of bicycle and pedestrian activity over current conditions. The Penn Health Impact Assessment (HIA) cited studies of areas with improved cycling and pedestrian facilities that found that people who bike or walk to a business visit more often and spend more than those who drive.

The Philadelphia City Planning Commission (PCPC) tracks 382 commercial corridors in Philadelphia. Four of the PCPC-defined commercial corridors would be impacted by implementation of SGSG: 20th and Green streets; 15th and Spring Garden streets; 5th and Spring Garden streets, and 2nd Street and Fairmount Avenue. An Econsult study indicated that these corridors had more than \$30 million in sales in 2005. Implementation of SGSG should result in incremental sales above existing levels, particularly in those corridors east of Broad Street.

The City of Philadelphia collects a 2 percent sales tax on many retail items, and additional retail sales will result in increased sales tax revenue to the City.



Improved mobility and recreation and health benefits

For each \$1.00 invested in implementing SGSG, the project yields between \$1.18 and \$1.92 in improved mobility and health benefits. Mobility benefits are quantified based on the premium research shows bicycle commuters are willing to “pay” for the opportunity to ride on protected bike lanes rather than riding on a street with no bicycle lanes and parallel-parked cars. Health benefits are quantified based on the median value of findings from ten separate studies on the medical costs of physical inactivity. The model applies this figure to the estimated number of new cyclists generated by establishment of the bicycle facility. If recreation benefits are added to the analysis, then the benefit generated for each \$1.00 invested increases to between \$3.42 and \$25.18. Recreation benefits are calculated based on the concept of implied value of a recreational activity over and above the value of time spent to take part in the activity. University of Minnesota researchers reviewed an extensive body of literature on the economic value consumers ascribe to many forms of outdoor recreation, including cycling. The values estimated in the literature cluster around \$10 per hour, and this is the figure used in the model, assuming one hour of cycling activity per day. The calculation is based on the total of new cyclists less new commuters generated by the establishment of the bicycle facility.

An improved real estate development environment

The corridor’s development potential improves thanks to increased property values, a more functional and attractive streetscape environment, and the opportunity for relief from stormwater fees and mitigation/retrofit costs potentially offered by the stormwater management features of SGSG. The implementation of SGSG, in conjunction with the improving real estate market in the areas surrounding Center City Philadelphia, may spur development projects along Spring Garden Street that have been on hold for years.

VIII. Implementation

SGSG will require investments from public agencies at the city, state, and federal level as well as private sources. By aligning investments already programmed for Spring Garden Street, such as street resurfacing and signal replacements, the overall project costs can be distributed among multiple agencies.

Phase 1:

YEAR 1

Short Term Improvements & Final Design | 2 years

The City of Philadelphia has designed bicycle and pedestrian improvements for the western end of Spring Garden Street from the Art Museum/Kelly Drive to the intersection of Spring Garden and 25th streets. Funded in part by the William Penn Foundation through PEC, these improvements include new directional signage, bicycle lane striping, and pavement markings. These changes are expected in late 2013 or early 2014.

On the east end of Spring Garden Street, DRWC is in the process of designing sidewalk improvements on Spring Garden Street from 2nd Street to Delaware Avenue. Artist Leni Schwendinger has also been hired to design a light installation under I-95 to make the SEPTA Spring Garden Street Station a more inviting gateway to Northern Liberties and the Delaware River waterfront. DRWC will invest \$2 million in these improvements in 2014.

Amenities such as banners, new trees, bicycle parking, and other low-cost improvements are being discussed along the corridor.

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Finally, PEC and PWD are jointly applying for funding to produce final engineering designs on a four-block section. These final designs will also yield detailed cost estimates that can be extrapolated across the corridor and provide a better sense of the total funding required.

Phase 2:

YEAR 4

Public & Private Fundraising | 4 years

SGSG will require investments from public agencies at the city, state, and federal level as well as private sources. The Parks and Recreation Department has indicated willingness to plant new trees for the corridor, and PWD is prepared to commit significant resources to install underground stormwater retention basins as part of their Green City, Clean Waters program.

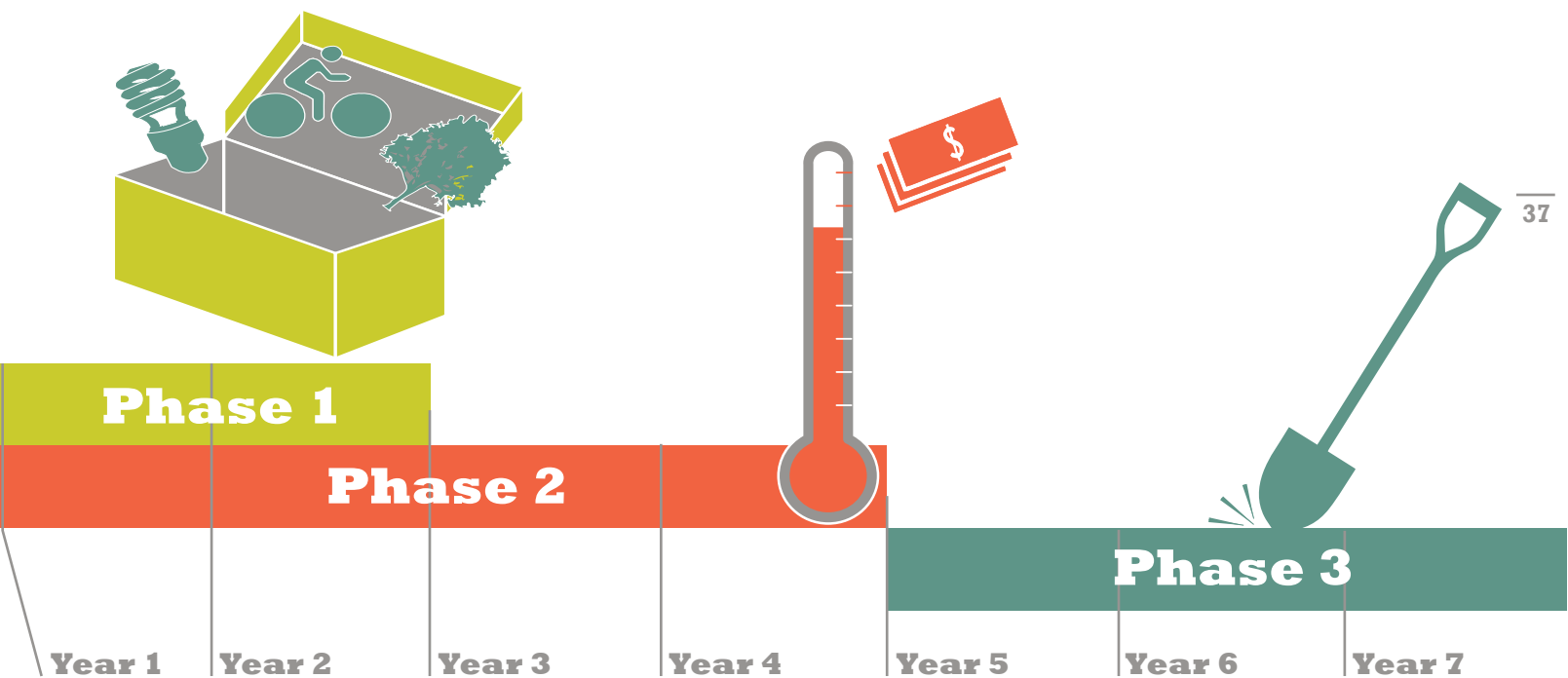
In January 2013, PEC convened the Greenway Leadership Group (GLG). Composed of business owners, civic associations, and institutional leaders, the GLG represents a broad coalition of stakeholders with a committed interest in seeing Spring Garden Street revitalized. The GLG meets on a quarterly basis to review progress and make strategic decisions about how to proceed with the project development. PEC provides staff support to the GLG.

PEC and the GLG will be working with elected officials to place the project on the region's Transportation Improvement Plan, which makes it eligible for federal transportation funding. Grant applications to the Pennsylvania Department of Conservation and Natural Resources and Department of Community and Economic Development will be submitted. Project sponsors will also work with city council members to place elements such as sidewalk repairs, lighting, and neckdowns in the City's Capital Improvement Plan. Grants will also be submitted to private foundations to supplement public funding streams.

Phase 3:

Construction | 3 years

SGSG could be constructed in two sections – Delaware Avenue to Broad Street or Broad Street to Pennsylvania Avenue – however, significant cost savings can be generated by packaging the construction into one phase. The earliest construction is expected to begin in 2017 following at least one year of final engineering design and permitting. While parking impacts would be kept to a minimum during the construction phase, there may be traffic delays on certain blocks where the median is being rebuilt. Additional community meetings and clear communication to the public and property owners would be provided in advance of this phase.



Relationship to Other Planning Efforts

SGSG is not only a 2.1-mile river-to-river greenway, but also key component of other planning efforts to improve connectivity, mobility, accessibility, recreation, and open space and spur economic revitalization in Philadelphia and the region. These include the following City initiatives:

- Trail Master Plan
- Callowhill - Chinatown North Strategic Plan
- Master Plan for the Central Delaware
- Green2015 Action Plan for parks, recreation, and open space

IX. Supporters

The **Greenway Leadership Group (GLG)** is a partnership among public, private, and non-profit organizations working to make the Spring Garden Street Greenway a reality. Please reach out to PEC to learn how your organization can be involved.

Civic Associations

- Spring Garden Civic Association
- Logan Square Neighborhood Association
- West Poplar Community Development Corporation
- Callowhill Neighborhood Association
- Northern Liberties Neighbors Association

Non-Profit & Cultural Institutions

- Community College of Philadelphia
- Spring Garden Senior Center Advisory Council
- Bicycle Coalition of Greater Philadelphia
- East Coast Greenway Alliance

Government

- National Park Service – Edgar Allan Poe House

Business

- Thomson Reuters
- Stantec
- Finnigan's Wake

For a complete list of supporters, go to the project website: www.SpringGardenStreetGreenway.com

SUPPORT THE SPRING GARDEN STREET GREENWAY PROJECT



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SEND A LETTER OF SUPPORT

Write to Deputy Mayor Rina Cutler announcing your organization's official endorsement of the project



ATTEND A PUBLIC MEETING

Sign up at SpringGardenStreetGreenway.com to receive email updates on upcoming events



MAP YOUR THOUGHTS

Go to SpringGardenStreetGreenway.com to Map Your Thoughts to share place-specific insights



GIVE US A CALL!

Want to contact us directly to offer support for the project – or just to voice your opinion? Contact the Pennsylvania Environmental Council at (215) 545-4570.



SPRING GARDEN STREET GREENWAY

RIVER TO RIVER. NEIGHBORHOOD TO NEIGHBORHOOD

