



# Appendix C | Network Description

princeton bicycle master plan appendices | **2016**

# Proposed Network

The full Proposed Bicycle Network Map is shown on the opposite page. This map illustrates the proposed on-road bicycle facilities, shared-use path improvements, and intersection improvements recommended as part of the Princeton BMP. A closer look at the proposed network through the center of the Princeton is provided on page C5.

The following sections summarize each component of the bicycle network, including facility types, primary corridors, and additional bicycle network links to improve network connectivity. Each section provides a closer look at the proposed improvements in each area of the Municipality and how they work together to develop a comprehensive, interconnected network. For each corridor or roadway segment, a brief summary is provided highlighting the proposed changes, how the segment fits into the larger network, and how the proposed changes impact stress level.

## Bicycle Facility Improvement Typologies

Development of the proposed bicycle network will include the types of bicycle improvements described below. Chapter 5 of the Princeton BMP provides additional design guidance and resources for each bicycle facility type.

### Improved Shared Use Paths

The existing shared-use paths provide a valuable starting point for developing the Princeton bicycle network. However, as discussed in Chapter 4, many of the existing shared-use paths in Princeton are generally an insufficient width, lack lighting, and/or have poor surface conditions. The facilities should be improved and maintained to the standards laid out in Chapter 5, including a typical minimum width of 10 feet (8 feet in constrained areas). From the perspective of traffic stress, these facilities are already rated a low stress, LTS 1 facility in their existing conditions due to the separation from traffic that they provide. However, the proposed improvements will significantly enhance the paths' functionality and bicyclists and pedestrian

comfort and safety, and bring the paths up to current standards. Unless otherwise noted, shared-use paths are provided only on one side of the road and accommodate two-way traffic for both pedestrian and bicycle travel. Improved shared-use paths are shown as a solid blue line on Map C1.

### New Shared Use Paths

As discussed in Chapter 5, shared-use paths should provide a typical width of at least 10 feet (8 feet in constrained areas), they should be well lit to facilitate continued use beyond daylight hours, and surfaces should be level and paved using a pervious paving technique (where appropriate). The proposed new shared-use paths should be built to the standards laid out in Chapter 5. Proposed shared-use paths are symbolized by a dotted blue line on Map C1. The paths are proposed in locations where an on-street facility would not be feasible due to roadway width or other constraints, a new off-street facility would provide an extension of an existing path, or an on-street facility would not be advisable given high roadway volumes and/or speeds. These paths provide critical linkages in the Princeton bicycle network. As with all other routes in the network, wayfinding and intersection design are critical elements to maximizing the utility these paths provide to riders. Unless otherwise



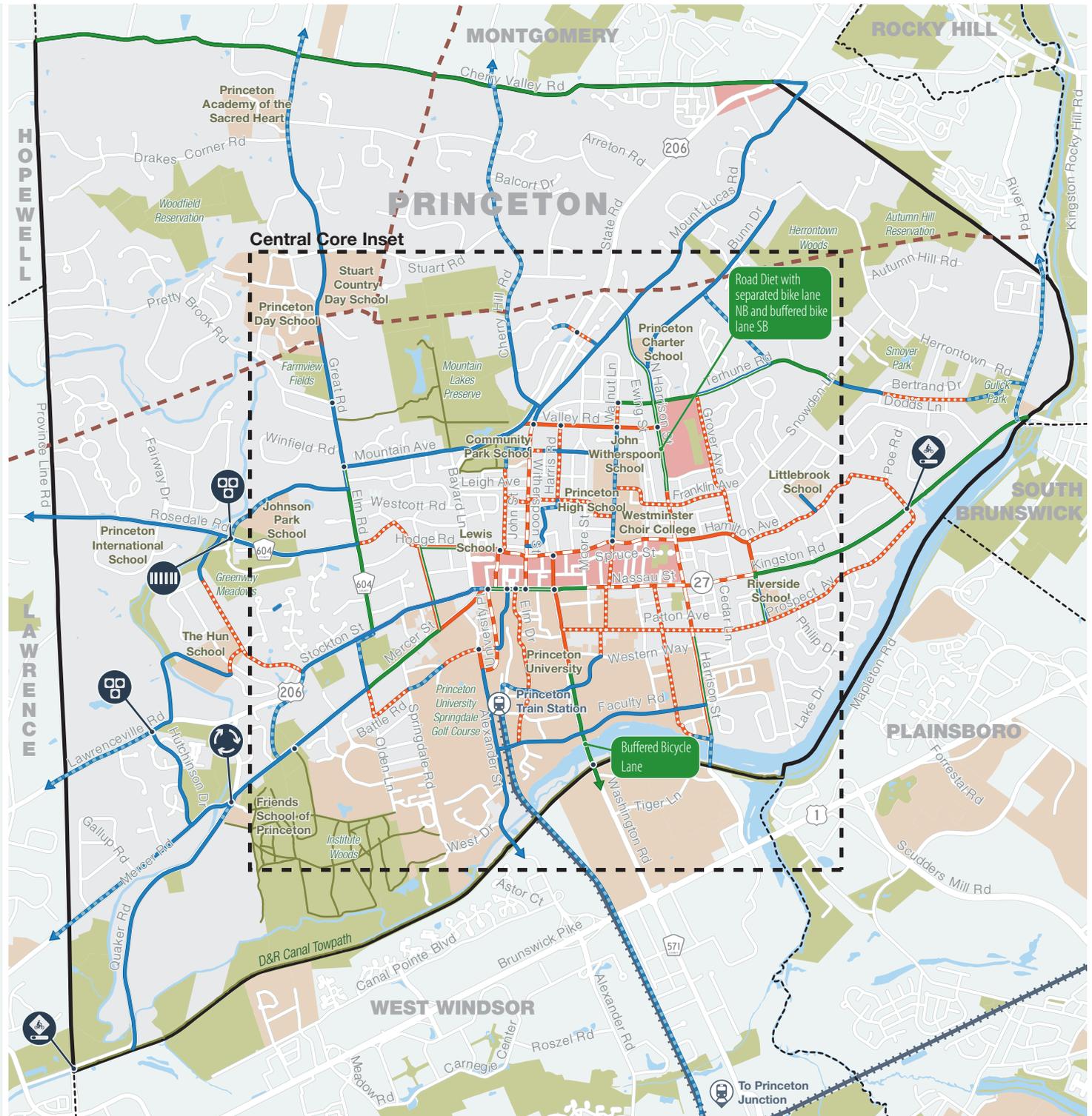
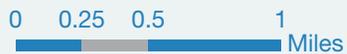
# PRINCETON bicycle master plan

## Map C1 Proposed Bicycle Network

- Improved Shared-Use Path
- New Shared-Use Path
- Separated Bike Lanes
- Bicycle Lane
- Bicycle Lane + Path
- Bicycle Lane + Shared Lane
- Bicycle Boulevard
- Shared-Lane Markings
- Enhanced Shared Markings
- Pipeline Trail
- School
- Park
- Commercial Area
- Existing Trail

### Intersection Improvement

- Roundabout
- RRFB
- HAWK
- Bike Box
- Crosswalk Enhancements
- Inset Intersection Improvement



Road Diet with separated bike lane NB and buffered bike lane SB

Buffered Bicycle Lane

noted, shared-use paths are provided only on one side of the road and accommodate two-way traffic for both pedestrian and bicycle travel.

## Separated Bicycle Lanes

Bicycle lanes are shown in white lines with a green edge on Map C1. Separated bicycle lanes provide a dedicated, on-road space for bicyclists with a physical, vertical separation between bicyclists and motorists. The vertical separation from vehicular traffic creates an attractive, low stress facility for bicyclists of all ability levels. Implementation of separated bicycle lanes generally requires a wide existing cartway width and/or reconfiguring the existing cartway space (e.g., a road diet or moving on-street parking).

## Bicycle Lanes

Bicycle lanes are shown in green lines on Map C1. Bicycle lanes provide a dedicated, on-road space for bicyclists. Bicycle lanes are recommended in areas where they fit within the existing cartway width or to accompany future roadway widening and resurfacing projects.

## Bicycle Lane + Path

A hybrid facility, with a bicycle lane in one direction and shared-use path in the other, is shown in a combined blue and green line on Map C1. The hybrid treatment provides a dedicated on-road facility in one direction of travel and an

off-road facility in the other. This type of hybrid facility is applicable in areas where the cartway is too constrained to permit dedicated on-road facilities in both directions, and where an existing path or sufficient right-of-way is available to accommodate an off-road facility. It provides low stress facilities in each direction of travel, encouraging bicyclists to ride in the same direction as traffic. Facilitating on-road travel in one direction also reduces potential conflicts between passing cyclists or pedestrians, particularly where an existing shared-use path is relatively narrow (less than 8 feet).

## Bicycle Lane + Shared Lane

A hybrid facility, with a bicycle lane in one direction and shared-lane markings in the other, is shown in a combined red and green line on Map C1. The hybrid treatment provides a dedicated bicycle facility in one direction of travel and is applicable for locations with constrained cartways where a bike lane in both directions is not feasible. It is particularly useful on roadways with hills, creating a more comfortable facility for cyclists traveling uphill using the bicycle lane, while the shared-lane marking is used in the downhill direction, where speed differential between cyclists and motorists is lower.

## Bicycle Boulevards

Bicycle boulevards are shown in a red line with white dots on Map C1. Bicycle boulevards are low speed, low volume roadways that are designed to prioritize bicycle movement. As described in Chapter 5, bicycle boulevards use a combination of signage, pavement markings, traffic calming, and/or volume management tools to create a comfortable, low stress environment for bicycle travel. The specific mix of traffic calming and/or volume management design elements should be decided on a project-by-project basis based on the unique context, needs, and traffic patterns of a given street, and follow the best practice guidance outlined in Chapter 5 and detailed in NACTO's Urban Bikeway Design Guide.

Common design elements for all bicycle boulevards in Princeton include:

- Maximum speed limit of 20mph (reinforced by appropriate traffic calming measures)
- Cohesive, Municipality-wide wayfinding system to simplify navigation and to ensure that routes and destinations are clearly marked



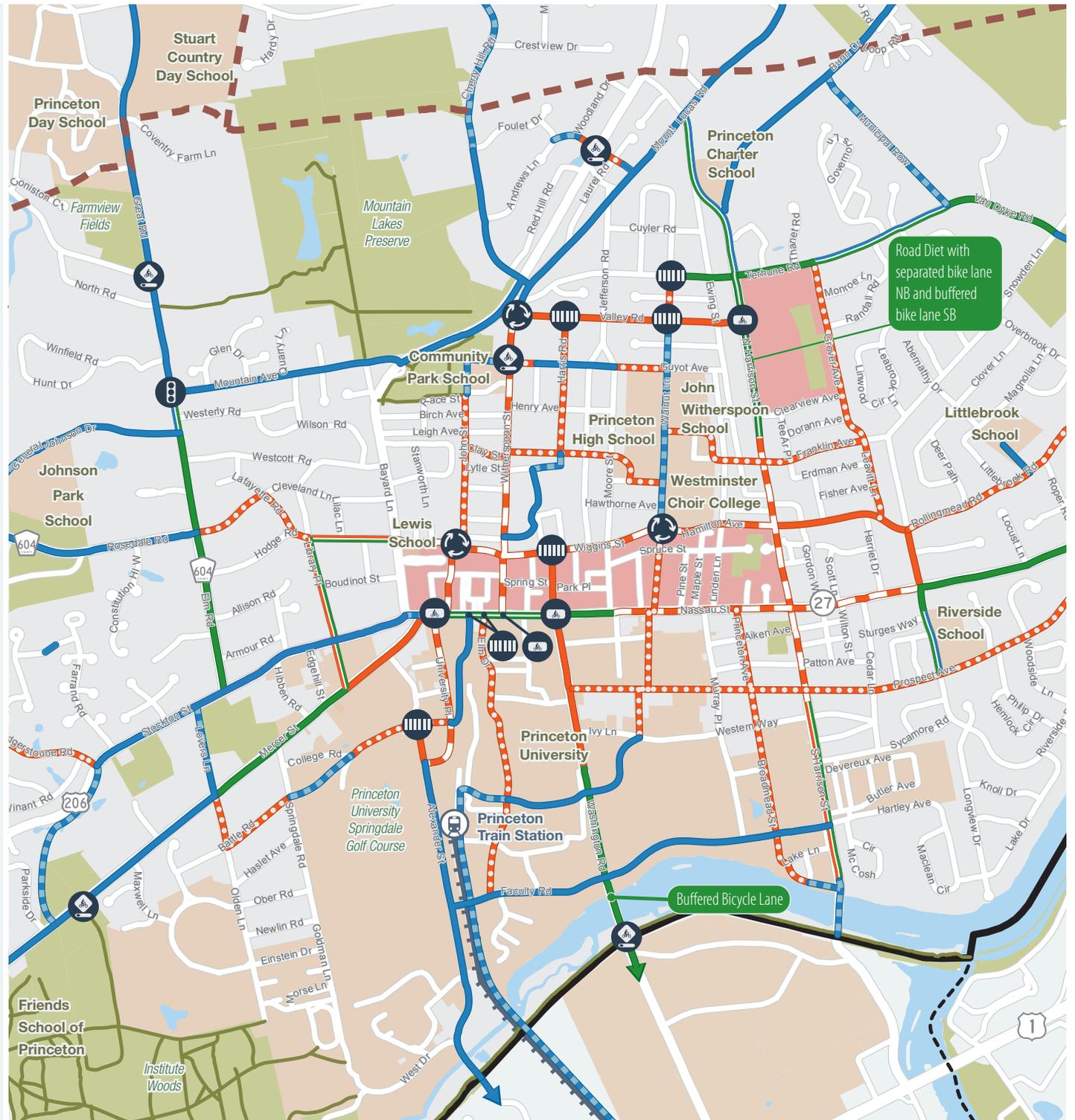
# PRINCETON bicycle master plan

## Map C2 Proposed Bicycle Network: Central Core

- Improved Shared-Use Path
- New Shared-Use Path
- Separated Bike Lanes
- Bicycle Lane
- Bicycle Lane + Path
- Bicycle Lane + Shared Lane
- Bicycle Boulevard
- Shared-Lane Markings
- Enhanced Shared Markings
- Pipeline Trail
- School
- Park
- Commercial Area
- Existing Trail

### Intersection Improvement

- |            |                        |                |
|------------|------------------------|----------------|
|            |                        |                |
| Roundabout | RRFB                   | HAWK           |
|            |                        |                |
| Bike Box   | Crosswalk Enhancements | Traffic Signal |



## Shared-Lane Markings

Shared-lane markings are shown in red on Map C1. Shared-lane markings are recommended on roadways where the cartway is too constrained to accommodate a dedicated bicycle facility and off-road alternatives are not available. Shared-lane markings are not a facility type in and of themselves, but rather a type of pavement marking to improve awareness of bicycle activity. Shared lane markings improve bicycle accommodations within constrained right-of-ways by alerting motorists of potential bicycle activity, instructing bicyclists where to position themselves within the travel lane, and reducing wrong-way bicycling.

Because shared-lane markings do not provide a dedicated facility for bicyclists, they have no impact on a roadway segment's bicycle level of traffic stress. Shared-lane markings are utilized in the recommended bicycle network to make short connections between proposed and existing bicycle facilities and key origins/destinations.

## Enhanced Shared-Lane Markings

Enhanced shared-lane markings are shown in dashed red lines on Map C1. Enhanced shared-lane markings are recommended on critical network links that have significant corridor constraints, high traffic volumes, high demand for

bicycle access, and limited alternative routes. Enhanced shared-lane markings are more visible than standard shared-lane markings, improving the awareness of bicycle activity and reinforcing bicycle priority on roadways in the central core. Similar to standard shared-lane markings, however, they have no impact on a roadway segment's bicycle level of traffic stress because they do not provide a dedicated facility.

## Intersection Improvements

Intersection improvements are critical to the connectivity and performance of the proposed low-stress network and overall user comfort. A high-stress intersection can create a significant barrier on an otherwise low-stress corridor, causing the network to become fragmented and discontinuous. Improvements are recommended to support the corridor recommendations and develop a network that is accessible for cyclists of all ages and abilities.

## Primary Corridors (East/West)

The Proposed Bicycle Network consists of several primary east/west corridors. The improvements along each of these corridors is described below moving from west to east along the corridor.

### Cherry Valley Road Corridor

This east/west corridor provides a bicycle route along the northern border of Princeton, improving connections between neighborhoods, Montgomery Township, and other network connections.

#### **Cherry Valley Road (Province Line Road to U.S. Route 206) | Bicycle Lanes**

Provides dedicated space for bicyclists along the more rural and higher traffic speed northern municipal border, connecting to shared-use paths at Great Road and Cherry Hill Road. The section between U.S. Route 206 and George Drive has been recently improved with a typical cartway width of 34-feet, consisting of two 12-foot travel lanes and five-foot shoulders. In the short-term, the shoulder should be marked as a bicycle lane. In the long-term, the roadway should be restriped with 11-foot travel lanes and six-foot bicycle lanes, and this cross

section extended along the length of the corridor.

## College Road Corridor

This east/west corridor provides a parallel route to the Mercer Street and an alternative way to access Princeton University and the downtown core from the southwestern portion of the Municipality. Segments of this corridor include:

### **Lovers Lane (U.S. Route 206 to Marquand Park) | New Shared-Use Path**

Proposed shared-use path would connect the existing Lovers Lane path south of Marquand Park to the U.S. 206 shared-use path. The new path along the perimeter of the park would permit use beyond the “dawn to dusk” operational hours of the park. The facility maintains an LTS 1 for the segment.

### **Lovers Lane (Marquand Park to Mercer Road) | Improved Shared-Use Path**

The existing shared-use path along the northbound side connects Mercer Road shared-use path, proposed Mercer Street bicycle lanes, and proposed Olden Road/Battle Road bicycle boulevard to Marquand Park and onward to U.S. Route 206 shared-use path and proposed Elm Road bicycle lanes (via proposed path extension). The existing path is asphalt

and approximately 5 feet wide. The following path improvements should be made to provide a more comfortable and safe facility:

- Path should be widened to maintain an 8-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Path surface should be resurfaced to remove bumps and cracks that result from tree root growth and regular wear and tear

### **Olden Lane/Battle Road (Mercer Road to Princeton University) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. Maintains existing LTS 1.

### **Princeton Graduate College Path (Battle Road to College Road) | New Shared-Use Path**

Proposed shared-use path would leverage existing paths at the Princeton Graduate College to provide a direct connection between the proposed Battle Road and College Road bicycle boulevards and improve access from the southwest to the central core and Princeton University. This off-road facility is an LTS 1.

### **College Road (Mercer Street to Alexander Street) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. Maintains existing LTS 1. It is owned and maintained by Princeton University.

### **College Road at Alexander Street) | Crosswalk Enhancements**

To improve conditions for the bicycle boulevard crossing of Alexander Street, a raised intersection should be installed at this location. Maintains existing LTS 1.

### **College Road (Alexander Street to University Place) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. Maintains existing LTS 1.

### **Princeton University Path (College Road to NJ Route 27) | Improved Shared-Use Path**

The existing shared-use path uses the Princeton University campus path network to connect the College Road bicycle boulevard to NJ Route 27, providing an off-road alternative to University Place. The path is generally in

good condition and features pedestrian-level lighting. The path should be widened as needed to maintain a minimum width of 8 feet. As with the rest of the network, a wayfinding system should be implemented to improve navigation.

## D&R Canal Trail Corridor

The D&R Canal Trail is a hub of recreational activity and a key component of the regional trail network. One of the most heavily used segments of the D&R Canal Trail is through Princeton. To better accommodate demand for this popular facility, the Municipality should work with the Delaware and Raritan Canal Commission and local partners (West Windsor Township, Princeton University) to investigate opportunities for trail improvements to the east/south side of the Canal, particularly between Alexander Street and Harrison Street. Worn paths indicate that this area is already used informally, and trail improvements would effectively “double track” this part of the Canal to increase capacity and more comfortably accommodate trail users.

The Municipality should also work with the Delaware and Raritan Canal Commission and local partners to investigate improvements that would enhance the ability of the D&R Canal Trail to meet the needs of non-recreational cyclists. The trail provides a parallel corridor to U.S. Route 1 with regional connections to the Princeton Forrestal Campus and Forrestal Village

to the north and commercial and employment hubs to the south in West Windsor and Lawrence Townships. The feasibility of improvements such as porous pavement surfacing to improve conditions during and after wet weather should be examined. Providing lighting and removing the existing dusk-to-dawn use restriction should also be considered to better meet the needs of commuters.

## Mercer Road / Mercer Street Corridor

This east/west corridor provides a connection from the southwest portion of the Municipality to the downtown core. It provides direct access to the Friends School of Princeton, Princeton Battlefield State Park, Princeton Seminary School, the downtown, and residential neighborhoods. Improvements along this corridor include:

### **Mercer Road (Lawrence Township to Gallup Road) | New Shared-Use Path**

Proposed shared-use path would extend the existing path on the westbound side to Lawrence Township. The facility reduces the stress level from LTS 4 to LTS 1.

### **Mercer Road (Gallup Road to Quaker Road) | Improved Shared-Use Path**

The existing path is paved but is an insufficient width and often features an uneven surface. The following path

improvements should be made to provide a more comfortable and safe facility:

- Path should be widened to maintain 8-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Low-profile lighting should be installed to allow use of path after sunset
- Path should be resurfaced to remove bumps and cracks that result from tree root growth and regular wear and tear

### **Quaker Road at Mercer Road | Roundabout**

The existing configuration of this intersection is confusing for motorists and uncomfortable for bicyclists and pedestrians. The installation of a roundabout would provide a more understandable and safe intersection for all users. It would also slow vehicular traffic through the intersection as it approaches the Princeton Friends School and the narrow bridge crossing over the Stony Brook.

### **Mercer Road (Quaker Road to Lovers Lane) | Improved Shared-Use Path**

The existing path is paved but is an insufficient width and often features an uneven surface. The following path improvements should be made to provide a more comfortable and safe facility:

- Path should be widened to maintain

8-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians

- Low-profile lighting should be installed to allow use of path after sunset
- Path should be resurfaced to remove bumps and cracks that result from tree root growth and regular wear and tear

### **Mercer Road at Princeton Battlefield State Park | Rectangular Rapid Flashing Beacon**

The existing crossing is LTS 4 due to high vehicle speeds along Mercer Road. An RRFB should be installed, along with high-visibility continental crosswalk striping, and advanced warning signage to create a lower stress crossing across and improve visibility at this trail crossing location.

### **Mercer Street (Lovers Lane to Library Place) | Bicycle Lanes**

Typical cartway width of approximately 30 feet can accommodate 5-foot bicycle lanes with 10-foot travel lanes. To accommodate the change, on-street parking would be prohibited along the segment. Improves traffic stress from LTS 3/4 to LTS 1.

### **Mercer Street (Library Place to NJ Route 27) | Shared-Lane Markings**

Connects Mercer Street bike lanes to NJ Route 27 separated bike lanes. Maintains existing LTS 3.

## Prospect Avenue Corridor

This east/west corridor connects NJ Route 27 to Washington Road, providing a low stress alternate route to NJ 27 across the southeastern portion of Princeton, improving access to Princeton University, the downtown, and Princeton Train Station.

### **Prospect Avenue (Washington Road to NJ 27) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. LTS decreases from LTS 2 to LTS 1.

Prospect Avenue is envisioned as a traditional bicycle boulevard between Murray Place and NJ 27, supporting a traffic calmed, residential street that prioritizes bicycle movement and creates a comfortable environment for children to bike to Riverside Elementary School.

Between Washington Road and Murray Place, the long-term vision for Prospect Avenue is for a shared street. In a shared street, strict divisions between modes are removed to allow greater mixing of pedestrians, bicyclists, and motorists.

Greater use of the street as public space is encouraged. Curbs are removed, allowing all roadway users to operate at the same grade. Informal divisions of the street are created by green stormwater facilities, street furniture, bike parking, vehicle parking, and transit stops. Without curbing, pedestrians can easily follow desire lines and cross the street as needed, improving pedestrian circulation among Princeton University buildings. The raised roadway, mixing of modes, and street activity encourages slow vehicle speeds.

The shared street would serve as a gateway between the residential neighborhood and Princeton University campus. It would discourage through traffic from Washington Road through the residential section of Prospect Avenue, and better link the University section of the roadway with the core campus via a raised intersection at Washington Road.]

### **Prospect Avenue/Poe Road at NJ Route 27 | Rectangular Rapid Flashing Beacon**

The existing crossing is LTS 4 due to high vehicle speeds along NJ Route 27. An RRFB should be installed, along with high-visibility continental crosswalk striping and advanced warning signage across NJ Route 27 to create a lower stress crossing between bicycle boulevards on Poe Road and Prospect Avenue and bicycle lanes on NJ Route 27.

## Pipeline Trail Corridor

The proposed Pipeline Trail provides an opportunity to significantly improve network connectivity in the northern portion of the Municipality. It follows utility easements to create a continuous regional east/west trail across the northern portion of Princeton, with connections into Montgomery and Lawrence Townships. A second pipeline easement intersects the east/west trail to provide a north/south trail into Montgomery Township. The pipeline corridors are cleared and would require agreements with the property owners and utility owners for trail construction. The trail could be built out in sections and completed over time. The section from Great Road to Cherry Hill Road, for example, would offer an additional east/west link for that part of the network. The trail would provide an off-road LTS 1 facility.

## Rosedale Road / Hamilton Avenue Corridor

This east/west corridor provides a continuous bicycle route across Princeton from Lawrence Township to NJ Route 27. It provides direct access to the downtown commercial core, Johnson Park and Littlebrook Elementary Schools, Westminster Choir College, parks, residential neighborhoods, and connections to the Middle and High

Schools. It also supports regional linkages to the Lawrence-Hopewell Trail to the west and the D&R Canal Trail and the Freedom Trail in South Brunswick Township to the east. Improvements along this corridor include:

### Rosedale Road (Province Line Road to General Johnson Drive) | Improved Shared-Use Path

The existing shared-use path along the westbound side is often too narrow for comfortable use by multiple users. Additionally, a bumpy asphalt surface and lack of path lighting can make the path difficult to traverse. The following path improvements should be made to provide a more comfortable and safe facility:

- Path should be widened to maintain 8-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Low-profile lighting should be installed to allow use of path after sunset
- Path should be resurfaced to remove bumps and cracks that result from tree root growth and regular wear and tear

### General Johnson Drive (Johnson Park Elementary School) at Rosedale Road | Pedestrian Hybrid Beacon (HAWK)

The existing crossing is LTS 4 due to high vehicle speeds along Rosedale Road. A pedestrian hybrid beacon should be installed, along with high-visibility continental crosswalk striping and advanced warning signage to create a lower stress crossing across Rosedale Road, between shared-use paths on Rosedale Road, General Johnson Drive, the Johnson Park Elementary School, and the Greenway Meadows Path. Upgrade the existing striped right-turn island at Greenway Meadows to a raised pedestrian refuge island to provide additional traffic calming.

### Rosedale Road (General Johnson Drive to Elm Road) | Improved Shared-Use Path

The existing shared-use path along the westbound side is often too narrow for comfortable use by multiple users. Additionally, a bumpy asphalt surface and lack of path lighting can make the path difficult to traverse. The following path improvements should be made to provide a more comfortable and safe facility:

- Path should be widened to maintain 8-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians

- Low-profile lighting should be installed to allow use of path after sunset
- Path should be resurfaced to remove bumps and cracks that result from tree root growth and regular wear and tear

### **Cleveland Lane/Lafayette Road (Elm Road to Hodge Road) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. Maintains existing LTS 1.

### **Hodge Road (Library Place to U.S. Route 206) | Bicycle Lane + Shared-Lane**

With a typical width of 28 feet, a bicycle lane in each direction is not feasible. A bicycle lane is recommended in the eastbound direction, and a shared-lane in the westbound direction. To accommodate the change, on-street parking would be prohibited along the corridor (currently permitted on the eastbound side). The hybrid facility would provide an LTS 1 in the eastbound direction, and maintain the existing LTS 2 in the westbound direction.

### **Paul Robeson Place (U.S. 206 to John Street) | Enhanced Shared-Lane Markings**

Upgrade existing shared-lane markings to enhanced shared-lane markings through the busy central core of the Municipality. Maintains existing LTS 3.

### **Paul Robeson Place at John Street | Roundabout**

This location is a gateway from U.S. Route 206 into downtown Princeton via the Paul Robeson Place/Wiggins Street/Hamilton Avenue corridor. The existing intersection configuration is very wide due to two channelized right-turn islands and horizontal curvature of the roadways. Conversion of the roadway from a traffic signal to a roundabout will provide traffic calming for the corridor, smooth vehicular circulation, minimize intersection delay, and shorten crossings for pedestrians.

### **Paul Robeson Place (John Street to Witherspoon Street) | Enhanced Shared-Lane Markings**

Upgrade existing shared-lane markings to enhanced shared-lane markings through the busy central core of the Municipality. Maintains existing LTS 3.

### **Wiggins Street (Witherspoon Street to Vandeventer Avenue) | Enhanced Shared-Lane Markings**

Upgrade existing shared-lane markings to enhanced shared-lane markings through the busy central core of the Municipality. Maintains existing LTS 3.

### **Wiggins Street at Vandeventer Avenue | Crosswalk Enhancements**

The Wiggins Street corridor carries high traffic volumes during peak hours, which can make crossings for bicyclists and pedestrians difficult. To improve the crossing, small curb extensions should be installed at the southeast and southwest corners of the intersection to improved pedestrian visibility and provide a traffic calming element to support the 25 mph speed limit and shared-lane markings along the corridor. A high visibility crosswalk and accompanying ADA-compliant curb ramps should also be installed at the eastbound approach of the intersection, which currently lacks crossing accommodations.

### **Hamilton Avenue (Vandeventer Avenue to Chestnut Street) | Enhanced Shared-Lane Markings**

Upgrade existing shared-lane markings to enhanced shared-lane markings through the busy central core of the Municipality. Maintains existing LTS 3.

### **Hamilton Avenue at Chestnut Street | Roundabout**

This location is a key junction in the Paul Robeson Place/Wiggins Street/Hamilton Avenue corridor, providing a link to the proposed Walnut Lane shared-use path/bicycle boulevard and access to the Middle and High Schools and Westminster Choir College. Installation of a mini-roundabout will provide traffic calming along corridor, encouraging lower vehicle speeds and supporting a more comfortable environment bicyclists.

### **Hamilton Avenue (Chestnut Street to Harrison Street) | Enhanced Shared-Lane Markings**

Upgrade existing shared-lane markings to enhanced shared-lane markings through the busy central core of the Municipality. Maintains existing LTS 3.

### **Hamilton Avenue (Harrison Street to Snowden Lane) | Shared-Lane Markings**

Maintains existing shared-lane markings and existing LTS 2.

### **Rollingmead Road/Littlebrook Road/Tyson Lane/Poe Road (Snowden Lane to NJ 27) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. Provides access to Littlebrook Elementary School. Maintains existing LTS 1.

### **NJ Route 27 at Poe Road/Prospect Avenue |Rectangular Rapid Flashing Beacon**

The existing crossing is LTS 4 due to high vehicle speeds along NJ Route 27. An RRFB should be installed, along with high-visibility continental crosswalk striping and advanced warning signage across NJ Route 27 to create a lower stress crossing between bicycle boulevards on Poe Road and Prospect Avenue and bicycle lanes on NJ Route 27.

### **Terhune Road Corridor**

This east/west corridor provides a connection from the northeastern portion of the Municipality towards the center Princeton, improving access to several parks, the Princeton Shopping Center, schools, residential neighborhoods, and regional connections to South Brunswick Township. Improvements along this corridor include:

### **Terhune Road (Walnut Lane to Grover Avenue) | Bicycle Lane**

Typical cartway width of approximately 30 feet can accommodate 5-foot bicycle lanes with 10-foot travel lanes. The addition of bicycle lanes lowers the traffic stress to a consistent LTS 1 throughout the corridor.

### **Terhune Road (Grover Avenue to Journey's End Road) | Bicycle Lane + Shared-Use Path**

Connects full bike lanes along Terhune Road between Journey's End Road and Thanet Road. Portions of this segment are below the 30-foot cartway width typical of the rest of the corridor. Along this section, a bike lane is provided in the eastbound direction, and the existing westbound sidewalk is widened to provide a viable shared-use path. The facility provides an LTS 1 facility in both directions of travel.

### **Van Dyke Road (Journey's End Road to Snowden Lane) | Bicycle Lanes**

Typical cartway width of approximately 30 feet can accommodate 5-foot bicycle lanes with 10-foot travel lanes. The bicycle lane should be accompanied by a speed limit reduction from 35 mph to 30 mph, consistent with the rest of the corridor east of Harrison Street. The addition of

bicycle lanes lowers the traffic stress to a consistent LTS 1 throughout the corridor. Without the accompanying speed limit reduction, the segment maintains an LTS 3.

### **Terhune Road (Snowden Lane to Bertrand Drive) | Improved Shared-Use Path**

The existing path connects proposed Terhune Road/Van Dyke Road bicycle lanes and NJ Route 27 (via proposed bicycle boulevard and shared-use path) through the Van Dyke Wright woods. The existing path is paved and in fair condition. The following path improvement should be made to provide a higher level facility:

- Path should maintain an 8 to 10-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Low-profile lighting should be installed to allow use of path after sunset

### **Terhune Road (Bertrand Drive and Concord Lane) | Bicycle Boulevard**

Roadway is essentially a rear alley between homes on Bertrand Drive and Dodds Lane and currently serves no function for motor vehicle circulation. Access should be limited to non-motorized users, providing a connection between shared-use paths to Snowden Lane and to NJ Route 27. Maintains existing LTS 1.

### **Gulick Park Path (Terhune Road to River Road) | New Shared-Use Path**

Proposed shared-use path would connect the corridor to River Road and NJ Route 27. Path would utilize open space and existing dirt trails in Gulick Park. Path should consist of an 8 to 10 foot permeable asphalt surface. The path creates an LTS 1 facility.

### **U.S. Route 206 / NJ Route 27 Corridor**

This east/west corridor provides a continuous bicycle route across Princeton from Lawrence Township to South Brunswick Township. It provides direct access to the downtown commercial core, Princeton University, the Hun School, several parks, and residential neighborhoods. It also supports regional linkages to the Lawrence-Hopewell Trail to the west and the D&R Canal Trail and the Freedom Trail in South Brunswick Township to the east. Improvements along this corridor include:

### **U.S. Route 206 (Lawrence Township to Hutchinson Drive) | New Shared-Use Path**

Proposed shared-use path would connect the existing Hutchinson Drive pathway, Hun School path, and Stony Brook Bicycle and Pedestrian path with neighboring Lawrence and the Lawrence-Hopewell Trail (LHT), providing a critical regional

connection. The cartway width and high vehicle speeds along this corridor make an on-road facility infeasible, and the sidepath is in keeping with existing facilities along this roadway. The shared-use path would be constructed on the westbound side of the roadway and accommodate both pedestrian and bicyclists. Due to the separation the proposed facility provides, the level of stress is reduced from an LTS 4 to LTS 1.

### **NJ Route 206 at Hutchinson Drive | Pedestrian Hybrid Beacon (HAWK)**

Existing residential developments, bus stops on both sides of U.S. 206, and the proposed trail enhancements leading to this intersection, as well as high motor vehicle volumes and speeds along U.S. 206, necessitate an enhanced crossing treatment to improve to the existing striped crosswalk. A pedestrian hybrid beacon (HAWK) should be installed across U.S. Route 206 to provide a safe and comfortable crossing for bicyclists, pedestrians, and transit riders. This should be accompanied by a pedestrian refuge island, utilizing the existing striped median space, to help slow traffic and create a more comfortable crossing.

### **The Hun School Path (Hutchinson Drive to Winant Road) | Improved Shared-Use Path**

The existing shared-use path connects The Hun School and the adjacent neighborhood to the Hutchinson Drive neighborhood via the Stony Brook Regional Bicycle and Pedestrian Pathway Bridge. The existing path features a crushed stone and dirt surface that can become muddy and impassible in the rain. The following path improvements should be made to provide a quality facility in different weather conditions and time of day:

- Path should maintain a 10-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Low-impact lighting options should be considered to allow use of the path after sunset
- Path should be reconstructed with permeable asphalt

### **Winant Road (Hun School Path to Edgerstoune Road) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. Maintains existing LTS 1.

### **Edgerstoune Road (Hun Road to U.S. Route 206) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. Maintains existing LTS 1.

### **U.S. Route 206 (Edgerstoune Road to Lovers Lane) | Improved Shared-Use Path**

The existing path is asphalt and of variable width. The path is along the westbound side and accommodates both bicyclists and pedestrians. The following path improvements should be made to provide a more comfortable and safe facility:

- Path should be widened to maintain an 8 to 10-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Lighting should be installed to facilitate use of path after sunset
- Path surface should be resurfaced to remove bumps and cracks that result from tree root growth and regular wear and tear

### **U.S. Route 206 (Lovers Lane to Elm Street) | Improved Shared-Use Path (westbound side only)**

The existing path is asphalt and of variable width. The path is along the

westbound side and accommodates both bicyclists and pedestrians. The following path improvements should be made to provide a more comfortable and safe facility:

- Path should be widened to maintain an 8 to 10-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Lighting should be installed to facilitate use of path after sunset
- Path surface should be resurfaced to remove bumps and cracks that result from tree root growth and regular wear and tear

### **U.S. Route 206 (Lovers Lane to Elm Street) | New Shared-Use Path (eastbound side only)**

Proposed shared-use path would connect the Lovers Lane improved and new shared-use path segments to the Elm Road signalized intersection along the perimeter of Marquand Park. The connection to the signalized intersection would provide a controlled crossing opportunity for bicyclists to access the Elm Road corridor and the primary shared-use path along the westbound side of U.S. Route 206. The new path along the perimeter of the park would permit use beyond the “dawn to dusk” operational hours of the park. As an alternative, the existing path through the park to Elm Road could be improved (widened and

resurfaced) and park policy adjusted to allow through traffic after dark in order to provide this network connection. The facility maintains an LTS 1 for the segment.

### **U.S. Route 206 (Elm Road to NJ Route 27) | Improved Shared-Use Path**

The existing path is asphalt and of variable width. The path is along the westbound side and accommodates both bicyclists and pedestrians. Although the U.S. 206 cartway width could accommodate bicycle lanes between Elm Road and NJ Route 27, the high traffic volumes, heavy truck volumes, and difficult circulation patterns and constraints at the U.S. 206/NJ Route 27/Mercer Street intersection make improvements to the shared-use path network the preferred, lower stress alternative. The following path improvements should be made to provide a more comfortable and safe facility:

- Path should be widened to maintain an 8 to 10-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Lighting should be installed to facilitate use of path after sunset
- Path surface should be resurfaced to remove bumps and cracks that result from tree root growth and regular wear and tear

### **NJ Route 27 (U.S. 206 to University Place) | New Shared-Use Path**

Proposed path is along the westbound side only and would accommodate both pedestrians and bicyclists. An on-road option is not feasible due to the constrained cartway width and difficult circulation pattern at the U.S. 206/Nassau Street (NJ 27)/Mercer Street intersection. Widening the existing 6-foot sidewalk may require removing on-street parking approaching the University Place intersection and/or eliminating left-turns from Nassau Street to Mercer Street, which would allow the curb line to be adjusted and more space to be allocated to pedestrians and bicyclists. Details of the design will need to be integrated with the proposed separated bicycle lanes on Nassau Street to ensure bicyclists are appropriately diverted to the bicycle-only facility as they travel east on Nassau Street and to minimize potential conflicts with pedestrians. Due to the separation the proposed facility provides, the level of stress is reduced from LTS 4 to LTS 1.

### **NJ Route 27 at University Place | Bike Box**

A two-stage bike box and accompanying bicycle signal would accommodate bicyclists turning left from the proposed westbound separated bicycle lane on Nassau Street (NJ 27) onto University Place.

### **NJ Route 27 (University Place to Washington Road) | Separated Bicycle Lanes**

This section of Nassau Street (NJ 27) is the center of the community, with its vibrant downtown, shops, and restaurants on one side and the Princeton University campus on the other. As the primary hub of community activity, there is a strong demand and need for improved bicycle access with minimal impact to traffic circulation, parking, and pedestrian street life. This section of Nassau Street (NJ 27) also has the widest cartway width, which allows for some flexibility in roadway configuration, as well three parking garages in close proximity that provide additional off-street parking capacity.

Two concept alternatives are provided for incorporating separated bike lane facilities into the downtown, providing a low-stress facility to the area of peak demand. Both alternatives recommend reversing the traffic flow on South Tulane Street from northbound to southbound. This change would eliminate the demand for left-turns and a turn bay from Nassau Street (NJ 27) eastbound, which allows more design flexibility, and would provide an alternative route option for motorists exiting the Spring Street garage.

The cross sections for the two alternatives are described in the following sections, and illustrated in Chapter 6 of the Princeton BMP.

### **Alternative 1: Two-Way Separated Bicycle Lanes [see attached PDF for example cross sections]**

Between University Place and the Nassau Presbyterian Church in the eastbound direction, the existing 6-foot sidewalk is widened to 12 feet to provide a shared-use path. Widening would require taking space from the buffer between the curb and sidewalk, and acquiring right-of-way from Princeton University.

At the Nassau Presbyterian Church, bicycles are transitioned on-road to two-way separated bike lanes. The existing taxi stand would be relocated to another area.

Between Witherspoon and Washington Road, on-street parking is reconfigured from parallel parking on both sides to reverse angle parking on the westbound side only. The need for two travel lanes eastbound is eliminated.

At Washington Road, the two-way facility must then connect with the proposed one-way standard bicycle lanes. At the Washington Road westbound intersection approach, cyclists are diverted to the two-way separated bicycle lanes on the opposite side of the roadway via a two-stage bike turn box.

### **Alternative 2: One-Way Separated Bicycle Lanes [see attached PDF for example cross sections]**

Between University Place and the Nassau Presbyterian Church, on-street parking is removed from the eastbound direction. This allows the vehicular lanes to shift towards the eastbound curb. On-street parking is maintained along the westbound side adjacent to businesses. The remaining roadway space is allocated to one-way westbound separated bicycle lane between the curb and parking. Eastbound cyclists are accommodated by a raised separated bicycle lane between the sidewalk and street trees. As with the two-way separated bicycle lane alternative, widening would require taking space from the buffer between the curb and sidewalk and acquiring right-of-way from Princeton University.

At the Nassau Presbyterian Church, eastbound bicycles are transitioned on-road to a one-way separated bike lane. The existing taxi stand would be relocated to another area. Parking is removed from the westbound side, and the westbound one-way separated bicycle lane continues along the curb.

Between Witherspoon and Washington Road, on-street parking is reconfigured from parallel parking on both sides to reverse angle parking on the westbound side only, and separated bicycle lane is provided on each side of the street.

Approaching Washington Road, the separation along the eastbound side ends to provide a right-turn lane. A standard bicycle lane continues eastbound between the right-turn lane and through lane.

At Washington Road, the separated bicycle lane connects with the proposed standard bicycle lanes east of Washington Road.

### **Other design factors**

- The switch from parallel parking to reverse-angle parking between Washington Road and Witherspoon Street is not mandatory for implementation of either concept, but allows parking to be concentrated closest to demand (businesses).
- Loading zones are maintained in their current location in Alternative 1. In Alternative 2, the loading zone would be concentrated at the northeast corner of Witherspoon Street intersection, and the northwest corner eliminated. A second loading zone could be relocated between Palmer Square and Chambers Street (in lieu of on-street parking), or loading could be accommodated through policy changes to encourage off-peak deliveries.
- At transit stops, buses would typically stop in the travel lane during boarding/alighting. The bike lane would be marked with dashed striping to indicate a mixing area between cyclists and transit passengers. Alternatively, the transit stops could

be relocated west of Palmer Square (in lieu of on-street parking).

### **NJ Route 27 at Palmer Square | Crosswalk Enhancements**

Installation of a pedestrian refuge island at the west side of Palmer Square would create a shorter and more comfortable crossing for pedestrians and bicyclists approaching Nassau Street (NJ 27) and the downtown from the proposed Princeton University Campus path connection. The refuge island would require shortening the existing left-turn bay.

### **NJ Route 27 at Palmer Square/Elm Drive | Crosswalk Enhancements**

Installation of a pedestrian refuge island at the east side of Palmer Square would create a shorter and more comfortable crossing for pedestrians and bicyclists approaching Nassau Street (NJ 27) and the downtown from the proposed Elm Drive bicycle boulevard. The refuge island would be located within an existing striped median.

### **NJ Route 27 at Witherspoon Street | Bike Box**

A two-stage bike box and accompanying bicycle signal would accommodate bicyclists turning left from the proposed eastbound separated bicycle lane on Nassau Street (NJ 27) onto Witherspoon Street.

### **NJ Route 27 at Washington Road | Bike Box**

A two-stage bike box would accommodate bicyclists turning left from the proposed eastbound separated bicycle lane on Nassau Street (NJ 27) onto Vandeventer Avenue.

### **NJ Route 27 (Washington Road to Moore Street) | Bicycle Lanes**

Provides dedicated space for bicyclist through the central core, connecting to enhanced shared-lane markings to the east and separated bicycle lanes to the west. The existing 46-foot cartway width would be divided with 8-foot parking lanes, 5-foot bicycle lanes, and 10-foot travel lanes. LTS is lowered from LTS 3 to LTS 2.

### **NJ Route 27 (Moore Street to Harrison Street) | Enhanced Shared-Lane Markings**

Upgrade existing shared-lane markings to enhanced, connecting NJ 27 bicycle lanes to the east and west. Speed limit reduced from 30/35 to 25 along the entire corridor, creating a consistent driver expectation and appropriate for the surrounding land use context. Maintains existing LTS 3/4 throughout.

### **NJ Route 27 (Harrison Street to Snowden Lane) | Enhanced Shared-Lane Markings**

Upgrades existing shared-lane markings to enhanced, connecting NJ 27 bicycle lanes to the east and west. Speed limited reduced from 30/35 to 25 along the entire corridor, creating a consistent driver expectation and appropriate for the surrounding land use context. Maintains existing LTS 3/4 throughout.

### **NJ Route 27 (Snowden Lane to Poe Road/Prospect Avenue) | Bicycle Lanes**

The existing shoulders should be marked as bike lanes and striped to provide a minimum 5-foot width in each direction. The addition of a bike lane along would have no impact on LTS. If the speed limit is lowered from 45 mph to 35 mph, which would be consistent with the surrounding residential land uses, the LTS would be lowered from LTS 4 to LTS 3.

### **NJ Route 27 at Poe Road/Prospect Avenue |Rectangular Rapid Flashing Beacon**

The existing crossing is LTS 4 due to high vehicle speeds along NJ Route 27. An RRFB should be installed, along with high-visibility continental crosswalk striping and advanced warning signage across NJ Route 27 to create a lower stress crossing between bicycle boulevards on Poe Road and Prospect Avenue and bicycle lanes on NJ Route 27.

## **NJ Route 27 (Poe Road/ Prospect Avenue to South Brunswick border) | Bicycle Lanes**

The existing shoulders should be marked as bike lanes and striped to provide a minimum 5-foot width in each direction. The addition of a bike lane along would have no impact on LTS. If the speed limit is lowered from 45 mph to 35 mph, which would be consistent with the surrounding residential land uses, the LTS would be lowered from LTS 4 to LTS 3.

## Primary Corridors (North/South)

The Proposed Bicycle Network consists of several primary north/south corridors. The improvements along each of these corridors is described below moving from north to south along the corridor.

### Alexander Street / University Place Corridor

This north/south corridor connects the downtown to Princeton University, the Princeton Train Station, the Lawrence Apartments, and the D&R Canal Trail, and provides regional connections south into West Windsor. Segments of this corridor include:

## **University Place at NJ Route 27 | Bike Box**

Two types of bike boxes would be installed at this location. A standard bike box at University Place northbound would improve the visibility of bicyclists turning onto Nassau Street (NJ 27). A two-stage bike box and accompanying bicycle signal would accommodate bicyclists turning left from the proposed westbound separated bicycle lane on Nassau Street (NJ 27) onto University Place.

## **University Place (NJ Route 27 to Alexander Street) | Enhanced Shared-Lane Markings**

Install enhanced shared-lane markings through the busy central core of the Municipality. Maintains existing LTS 2.

## **Alexander Street (University Place to D&R Canal Trail) | Improved Shared-Use Path**

The existing shared-use path along the southbound side connects Princeton University, the downtown area, and Princeton Train Station to the Lawrence Apartments, Turning Basin Park, and the D&R Canal Trail. This is a popular facility for utilitarian and recreational trips by both pedestrians and bicyclists. However, it is currently too narrow to comfortably accommodate all users. The following path improvements should be made to provide a more comfortable and safe facility:

- Path should be widened to maintain a 10-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Path surface should be resurfaced to remove bumps and cracks that result from tree root growth and regular wear and tear

## Cherry Hill Road Corridor

This north/south corridor provides bicycle access to the northern neighborhoods of Princeton and regional connections to Montgomery Township. Segments of this corridor include:

## **Cherry Hill Road (Cherry Valley Road to Foulet Drive) | New Shared-Use Path**

Proposed shared-use path would connect the existing pathway (currently terminating at Foulet Drive) to Cherry Valley Road, providing a key link from the northwestern neighborhoods of the Municipality towards the town center. The narrow cartway width makes an on-road facility infeasible, and the sidepath alternative is in keeping with the existing infrastructure and rural character of the roadway. This long-term improvement involves right-of-way and topographic constraints. Due to the separation the proposed facility provides, the level of stress is reduced from an LTS 3 to LTS 1.

## **Cherry Hill Road (Foulet Drive to U.S. 206) | Improved Shared-Use Path**

The existing path is asphalt, in fair condition, and typically 6 feet wide. The following path improvements should be made to provide a more comfortable and safe facility:

- Path should be widened to maintain an 8 to 10-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Low-profile lighting should be installed to facilitate use of path after sunset

## **Edgerstoune Road Corridor**

This north/south corridor improves access to Johnson Park Elementary School, the Hun School, Greenway Meadows, and the Princeton Battlefield State Park in the western portion of the Municipality. Segments of this corridor include:

### **General Johnson Drive Path (Elm Road to Johnson Park Elementary School) | Improved Shared-Use Path**

The existing shared-use path provides an important connection between Elm Road and Johnson Park Elementary School, improving walking and biking access from residential areas northeast of the

school. It also provides a link in the off-road network between points north (via Great Road and Mountain Avenue), points south (via Green Meadows Path), and points west (via Rosedale Road). While the existing path is wider than most in Princeton, the surrounding vegetation is encroaching on the path and the asphalt surface is in poor condition. The following improvements should be made to provide a more comfortable and safe facility:

- Path should be widened to maintain 8 to 10 foot cross section and vegetation trimmed back to facilitate two-way travel and use by both bicyclists and pedestrians
- Low-profile lighting should be installed to allow use of path after sunset
- Path should be resurfaced to remove bumps and cracks that result from tree root growth and regular wear and tear

### **General Johnson Drive (Johnson Park Elementary School to Rosedale Road) | New Shared-Use Path**

The existing sidewalk along the Johnson Park Elementary School driveway should be widened to 10 feet, creating a shared-use path that can accommodate both bicyclists and pedestrians, and provide a comfortable, safe facility for children bicycling to the school.

### **General Johnson Drive (Johnson Park Elementary School) at Rosedale Road | Pedestrian Hybrid Beacon (HAWK)**

The existing crossing is LTS 4 due to high vehicle speeds along Rosedale Road. A pedestrian hybrid beacon should be installed, along with high-visibility continental crosswalk striping and advanced warning signage to create a lower stress crossing across Rosedale Road, between shared-use paths on Rosedale Road, General Johnson Drive, the Johnson Park Elementary School, and the Greenway Meadows Path. Upgrade the existing striped right-turn island at Greenway Meadows to a raised pedestrian refuge island to provide additional traffic calming.

### **The Greenway Meadows Path (Rosedale Road to Hun Road) | Improved Shared-Use Path**

The existing path is paved and generally in fair condition. The following path improvements should be made to provide a quality facility in different weather conditions and time of day:

- Path should maintain a 10-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Low-impact lighting options should be considered to allow use of the path after sunset

## **Edgerstoune Road (Hun Road to U.S. Route 206) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. Maintains existing LTS 1.

## **Princeton Battlefield State Park/D'Ambrisi Property Path (U.S. Route 206 to Mercer Road) | New Shared-Use Path**

Proposed shared-use path would connect the Princeton Battlefield State Park to U.S. Route 206 and the proposed Edgerstoune bicycle boulevard via the former D'Ambrisi property. It would improve the connectivity of the bicycle network by providing an additional north/south link. This off-road facility is an LTS 1.

## **Great Road / Elm Road Corridor**

This north/south corridor provides a bicycle route through the western portion of the Municipality. It links the northwestern neighborhoods of the Municipality with the Princeton Academy of the Sacred Heart, the Princeton Day School, the Stuart County Day School, and the town center. It also provides a regional connection to Montgomery Township. Segments of this corridor include:

## **Great Road (Cherry Valley Road to Drakes Corner Road) | New Shared-Use Path**

Proposed shared-use path would connect the existing pathway (currently terminating near Drakes Corner Road) with Cherry Valley Road. This path extension is in keeping with the existing cross section to the south. It would be located on the northbound side and accommodate both bicyclists and pedestrians. This long-term improvement involves right-of-way and topographic constraints. Due to the separation the proposed facility provides, the level of stress is reduced from an LTS 4 to LTS 1.

## **Great Road (Drakes Corner Road to Mountain Avenue) | Improved Shared-Use Path**

The existing path is along the northbound side of the roadway. While the existing path is wider than most in Princeton, the following improvements should be made to provide a more comfortable facility:

- Path should be widened to maintain 8 to 10-foot cross section to facilitate two-way travel and use by both bicyclists and pedestrians
- Low-profile lighting should be installed to allow use of path after sunset
- Path should be resurfaced to remove bumps and cracks that result from tree root growth and regular wear and tear

## **Great Road at Farmview Fields | Rectangular Rapid Flashing Beacon**

The existing crossing is LTS 4 due to high vehicle speeds along Great Road. An RRFB should be installed, along with high-visibility continental crosswalk striping and advanced warning signage to create a lower stress crossing across Great Road, connecting the improved shared-use path to Farmview Fields.

## **Great Road at Mountain Avenue | New Traffic Signal**

A new traffic signal is planned for this intersection. The signal will facilitate connections between the corridor and Mountain Avenue for bicyclists and pedestrians, as well as motorists.

## **Elm Road (Mountain Avenue to General Johnson Drive Path) | Bicycle Lanes + Shared-Use Path**

A new shared-use path will be installed on the southbound side, completing the off-road connection to the General Johnson Drive Path from the Mountain Avenue and Great Road paths. To maintain continuity of the proposed on-road bicycle lane to the new traffic signal from the southern portion of Elm Road, bicycle lanes will be provided in both the northbound and southbound directions. Reduces traffic stress from LTS 2 to LTS 1 between Mountain Avenue and Rosedale Road.

## Elm Road (Mountain Avenue to U.S. Route 206) | Bicycle Lanes

Typical cartway width of approximately 30 feet can accommodate 5-foot bicycle lanes with 10-foot travel lanes. Maintains existing LTS 1 in the southern segment (Rosedale Road to U.S. 206), which has a narrow shared-use path facility. Reduces traffic stress from LTS 2 to LTS 1 between Mountain Avenue and Rosedale Road.

## Harrison Street Corridor

This north/south corridor provides a continuous bicycle route from Mount Lucas Road to the D&R Canal Trail. It provides direct access to the Princeton Charter School, the Princeton Shopping Center, downtown core, and the D&R Canal Trail. Segments of this corridor include:

### Ewing Street/North Harrison Street (Mount Lucas Road to Terhune Road) | Bicycle Lane + Shared-Use Path

Typical cartway width of approximately 28 feet. A bicycle lane is provided in the southbound direction, and the existing northbound shared-use path is widened. The facility provides an LTS 1 facility in both directions of travel.

## North Harrison Street (Clearview Avenue to Terhune Road) | Separated Bicycle Lanes

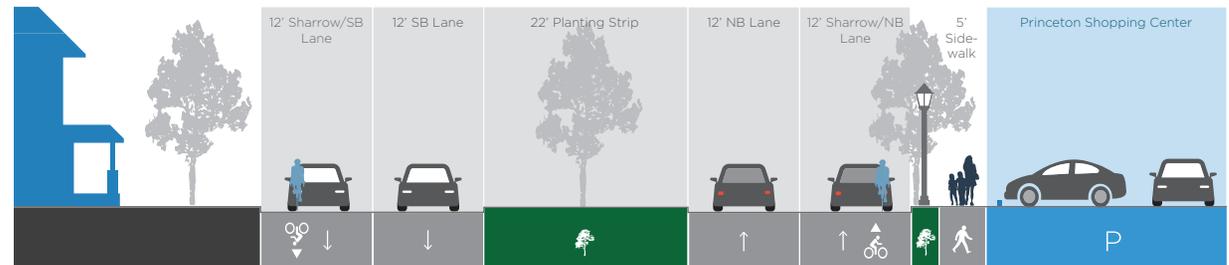
This segment of North Harrison Street is configured as a boulevard, with a tree-lined median separating two 12-foot travel lanes in both the northbound and southbound directions. To accommodate bicycle lanes, a road diet is proposed to provide one travel lane in each direction, which is consistent with the rest of the Harrison Street corridor. A road diet allows a Complete Streets retrofit, with the addition of a buffered bicycle lane and

sidewalk in the southbound direction, and a separated bicycle lane in the northbound direction. The existing and proposed cross sections are shown below. The addition of bicycle lanes lowers the traffic stress from LTS 4 to LTS 1.

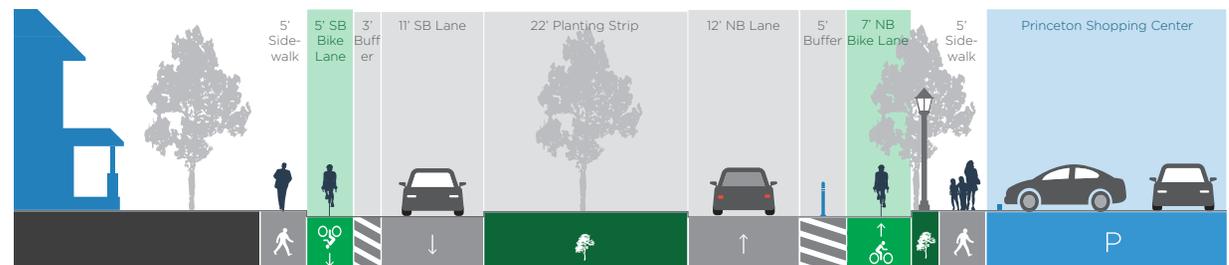
## Harrison Street at Valley Road | Bike Box

Two types of bike boxes would be installed at this location. A standard bike box at the southbound, eastbound, and westbound approaches would improve the visibility of bicyclists for all turning movements. The eastbound and

Harrison Street - Existing Condition



Harrison Street - Proposed Complete Street



westbound approaches would be paired with a short bike lane as the roadway widens at the intersection, providing access to the bike box. A two-stage bike box would accommodate bicyclists turning left from the proposed northbound separated bicycle lane on Harrison Street onto Valley Road.

### **Harrison Street (Clearview Avenue to NJ Route 27) | Enhanced Shared-Lane Markings**

Upgrades existing shared-lane markings to enhanced, connecting Harrison Street bike lanes and hybrid lane. Maintains existing LTS 3.

### **Harrison Street (NJ Route 27 to Prospect Avenue) | Enhanced Shared-Lane Markings**

Upgrades existing shared-lane markings to enhanced, connecting Harrison Street bike lanes and hybrid lane. Maintains existing LTS 3.

### **South Harrison Street (Prospect Avenue to Carnegie Lake) | Bicycle Lane + Shared-Lane Markings**

Typical cartway width of approximately 28 feet can accommodate a bicycle lane in the uphill direction (northbound) and a shared-lane in the downhill direction (southbound). To accommodate the change, on-street parking would be

prohibited along the corridor. The hybrid facility would provide an LTS 1 in the northbound direction, and maintain the existing LTS 3 in the southbound direction.

### **Harrison Street Bridge (Carnegie Lake to D&R Canal Trail) | New Shared-Use Path**

Proposed shared-use path would provide an improved connection from Princeton to the D&R Canal Trail. The D&R Canal Trail is not only used for recreation, but is an off-road link to the University Medical Center, Forrestal Campus, and residential developments on the east side of Carnegie Lake. The path is a long-term vision for the bridge to be retrofitted with a 12-foot shared-use path on the southbound side. As an interim solution, the travel lanes on the bridge could be narrowed and the sidewalk widened 2 feet to create an improved shared-use facility. Due to the separation the proposed facility provides, the level of stress is reduced from LTS 3 to LTS 1.

### **Mount Lucas Road / Witherspoon Corridor**

This north/south corridor provides a bicycle route through the center of the Municipality. It connects residential neighborhoods to the north with the downtown core and Princeton University. Segments of this corridor include:

### **Mount Lucas Road (Montgomery Township to Valley Road) | Improved Shared-Use Path**

The existing path between Valley Road and Ewing Street was recently resurfaced and is in good conditions. North of Ewing Street, the condition and width of the asphalt path is variable, and there are several network gaps. The following path improvements should be made to provide a more comfortable and safe facility:

- Existing gaps in the route should be completed
- Path should maintain a 8 to 10-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Low-profile lighting should be installed to allow use of path after sunset
- Path should be resurfaced to remove bumps and cracks that result from tree root growth and regular wear and tear

### **Witherspoon Street at Valley Road | Roundabout**

This location is a gateway from U.S. Route 206 into Princeton via Witherspoon Street and Valley Road. Valley Road in particular is flat, straight roadway that encourages higher vehicle speeds. Conversion of the roadway from a traffic signal to a roundabout will provide traffic calming for the corridor, smooth vehicular circulation, and minimal intersection delay.

### **Witherspoon Street (Valley Road to Guyot Avenue) | Enhanced Shared-Lane Markings**

Upgrades existing shared-lane markings to enhanced. Maintains existing LTS 2.

### **Witherspoon Street at Guyot Avenue | Rectangular Rapid Flashing Beacon**

An RRFB should be installed, along with high-visibility continental crosswalk striping, curb extensions and advanced warning signage to create a lower stress crossing across Witherspoon Street and improve visibility at this trail crossing location. This is a critical crossing location along the Guyot Avenue path/bicycle boulevard corridor for children going to school and Community Park.

### **Witherspoon Street (Guyot Avenue to Wiggins Street) | Enhanced Shared-Lane Markings**

Upgrades existing shared-lane markings to enhanced. Maintains existing LTS 2.

### **Witherspoon Street (Wiggins Street to NJ Route 27) | Enhanced Shared-Lane Markings**

Upgrades existing shared-lane markings to enhanced. Maintains existing LTS 2.

### **Witherspoon Street at NJ Route 27 | Bike Box**

A two-stage bike box and accompanying bicycle signal would accommodate bicyclists turning left from the proposed eastbound separated bicycle lane on Nassau Street (NJ 27) onto Witherspoon Street.

### **Princeton Avenue Corridor**

This north/south corridor connects the downtown core and the D&R Canal Trail to residential neighborhoods in the southeast and provides an alternate route to Harrison Street. Segments of this corridor include:

#### **Princeton Avenue/Broadmead Street/Lake Drive (NJ Route 27 to Harrison Street Connector Path) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. Maintains existing LTS 1.

#### **Lake Drive Connector Path (Lake Drive to Harrison Street) | New Shared-Use Path**

Proposed shared use path would connect the proposed Lake Drive/Princeton Avenue bicycle boulevard to Harrison

Street and the D&R Canal Trail. The proposed connection follows an existing informal trail and utilizes an existing culvert crossing. This short connector improves overall network connectivity to create a low stress corridor from Nassau Street (NJ 27) to the Canal. This off-road facility is an LTS 1.

### **Walnut Lane / Chestnut Street / Olden Street / Dinky “Rail with Trail” Corridor**

This north/south corridor provides a continuous bicycle route from Terhune Road through the downtown core to Princeton Junction. It provides direct access to the Middle and High Schools, Westminster Choir College, downtown commercial core, Princeton University, Princeton Station, the D&R Canal Trail, residential neighborhoods, and the train station and employment centers in West Windsor. Segments of this corridor include:

#### **Walnut Lane at Terhune Road | Crosswalk Enhancements**

To improve the crossing for cyclists, the existing two-way stop control should be reversed, so that the stop condition is for traffic along Terhune Road. This will slow traffic along the corridor, and facilitate left-turns for cyclists turning from the Terhune Road bicycle lanes to the Walnut Lane bicycle boulevard.

### **Walnut Lane (Terhune Road to Valley Road) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. Maintains existing LTS 1.

### **Walnut Lane at Valley Road | Crosswalk Enhancements**

Valley Road is a long, straight corridor that encourages traffic speeds above the 25 mph speed limit. To improve conditions for shared-lane markings and support the 25 mph speed limit on Valley Road and the bicycle boulevard on Walnut Lane, a raised intersection should be installed at this location.

### **Walnut Lane (Valley Road to Hamilton Avenue) | New Shared-Use Path**

Proposed shared-use path would connect the Middle School, High School, and Westminster Choir College to the downtown and residential neighborhoods. Due to the variable cartway width and pick-up/drop-off circulation patterns at the schools, accommodating an on-street bicycle facility is challenging. The proposed shared-use path would widen the existing sidewalk along the northbound side, using right-of-way along the Westminster Choir College and the Middle School. It would be along the northbound side of the street only,

and accommodate both bicyclists and pedestrians. With the expected higher numbers of pedestrians and bicyclists, the path should be designed with a width greater than the 10-foot minimum (12-14-foot design target), where feasible, particularly approaching the schools between Guyot Avenue and Houghton Road. Due to the separation the proposed facility provides, the level of stress is reduced from LTS 2 to LTS 1.

### **Walnut Lane at Hamilton Avenue | Roundabout**

This location is a key junction in the Paul Robeson Place/Wiggins Street/Hamilton Avenue corridor, providing a link to the proposed Walnut Lane shared-use path/bicycle boulevard and access to the Middle and High Schools and Westminster Choir College. Installation of a mini-roundabout will provide traffic calming along corridor, encouraging lower vehicle speeds and supporting a more comfortable environment for bicyclists.

### **Chestnut Street (Hamilton Avenue to NJ Route 27) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. LTS decreases from LTS 2 to LTS 1 from Hamilton Avenue to NJ 27, creating an LTS 1 facility throughout.

### **Olden Street/Roper Lane (NJ Route 27 to Western Way) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. LTS decreases from LTS 2 to LTS 1 from Hamilton Avenue to NJ 27, creating an LTS 1 facility throughout.

### **Campus Path (Western Way to Princeton Station) | Improved Shared-Use Path**

The existing shared-use path on the Princeton University campus provides a crossing of Washington Road for bicyclists and pedestrians via the Streicker Bridge, and connects the eastern portion of the Municipality to the Princeton Train Station. The path is generally in good condition, appropriate width, and features pedestrian-level lighting. As with the rest of the network, a wayfinding system should be implemented to improve navigation.

### **“The Dinky” Rail Line (Princeton Station to Princeton Junction Station) | New Shared-Use Path**

Proposed shared-use path would create a new path adjacent to the Princeton to Princeton Junction rail line. This “rail with trail” concept would improve regional network connectivity by providing an off-road connection over

U.S. Route 1 and an alternative to Washington Road and Alexander Street. It would improve bicycle connectivity between Princeton and the Princeton Junction train station, employment centers, and residential neighborhoods in West Windsor and Princeton Junction. Due to the separation the proposed facility provides, the level of stress is LTS 1, compared the LTS 4 currently provided via Washington Road or Alexander Street. An additional study and feasibility assessment is recommended to advance this concept.

## Washington Road Corridor

This north/south corridor connects the central downtown core to Princeton University, the D&R Canal Trail, and to West Windsor. Segments of this corridor include:

### **Vandeventer Avenue (Wiggins Street to NJ Route 27) | Shared-Lane Markings**

Connects Wiggins Street corridor to the downtown and NJ Route 27 corridor. Maintains existing LTS 2.

### **Washington Road at NJ Route 27 | Bike Box**

Two types of bike boxes would be installed at this location. A standard bike box at the westbound approach would improve the visibility of bicyclists turning left from the proposed standard bicycle

lane onto Washington Road. A two-stage bike box would accommodate bicyclists turning left from the proposed eastbound separated bicycle lane on NJ Route 27 onto Vandeventer Avenue.

### **Washington Road (NJ Route 27 to Goheen Walk) | Shared-Lane Markings**

Provides connection to NJ Route 27 corridor. Maintains existing LTS 3.

### **Washington Road (Goheen Walk to D&R Canal) | Bicycle Lane**

The typical cartway width of approximately 38 feet accommodates buffered bicycle lanes (5-foot bicycle lane with 3-foot striped buffer) and 11-foot travel lanes in each direction. In conjunction with the proposed bicycle lanes, the speed limit should be reduced from 40 mph to 25 mph along the corridor. This would be supported by an improved crossing and gateway treatment at the D&R Canal Trail crossing. The existing traffic stress is LTS 1 due to a shared-use path, which is narrow and does not meet current standards. The buffered bicycle lanes would provide a comfortable on-road option and separate bicyclists and pedestrians. The combination of a buffered bicycle lane and speed limit reduction would provide an LTS 1 facility. Without the speed limit reduction, the buffered bicycle lane would be an LTS 4.

### **Washington Road at D&R Canal Trail | Crosswalk Enhancements**

The existing crossing is LTS 4 due to high vehicle speeds along Washington Road. There is also a history of bicycle and pedestrian crashes at this trail crossing. This trail crossing should be designed as a gateway into Princeton, providing visual cues to motorists that they are transitioning from a high speed roadway (Washington Road) and regional highway (U.S. Route 1) into a dense downtown environment and university campus with high pedestrian and bicyclist activity. An RRFB should be installed, along with high-visibility continental crosswalk striping, and advanced warning signage to create a lower stress crossing across and improve visibility at this trail crossing location. Other gateway elements, such as a pedestrian refuge island and “Welcome to Princeton” sign, should also be installed to provide traffic calming elements.

# Additional Network Links

Improvements to several shorter sections of the roadway network will enhance overall network connectivity and improve bicycle access to major destinations or areas of the Municipality not otherwise served by the primary corridors. Improvements to these roadways are summarized below. For roadways that include multiple treatment types, the improvements are described from north to south or west to east.

## Alexander Street

Provides a connection between the College Road corridor and the University Place/Alexander Street corridor.

### **Alexander Street (University Place to College Road) | Shared-Lane Markings**

Install shared-lane markings. Maintains existing LTS 2.

## Breckridge Road

This short segment provides a bicycle and pedestrian only connection between the residential neighborhoods along Farrand Road and Brearly Road, and improves connectivity and access for the Farrand Road neighborhood to the Edgerstoune bicycle boulevard and the rest of the bicycle network.

### **Breckridge Road (Brearly Road to Farrand Road) | Improved Shared-Use Path**

The existing short path connects the two neighborhoods to provide bicycle and pedestrian access. The path is approximately 5 feet wide, asphalt, in fair condition, and has one pedestrian scale light fixture along it. The following path improvements should be made to provide a higher quality facility:

- Path should be widened to maintain an 8 to 10-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Low-profile lighting or additional pedestrian scale fixtures should be installed to improve lighting and use of the path after sunset
- Path surface should be resurfaced to remove bumps and cracks that result from tree root growth and regular wear and tear

## Bunn Drive

This north/south roadway connects the Karl Light Boulevard residential development, several parks, and several employment centers to the Harrison Street corridor.

### **Bunn Drive (Poor Farm Road to North Harrison Street) | Improved Shared-Use Path**

The existing shared-use path is along the northbound side, asphalt, approximately 6 feet wide, and typically in good condition. The following path improvements should be made to provide a higher quality facility:

- Path should be widened to maintain an 8 to 10-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Low-profile lighting or additional overhead utility pole-mounted fixtures should be installed to improve lighting and use of the path after sunset

## Chambers Street

Provides a north/south connection through the central core between the Rosedale Road/Hamilton Avenue and NJ Route 27 corridors.

### **Chambers Street (Paul Robeson Place to NJ Route 27) | Enhanced Shared-Lane Markings**

Install enhanced shared-lane markings. Maintains existing LTS 2.

## Elm Drive

This north/south roadway connects Faculty Road to the NJ Route 27 corridor through the Princeton University Campus. It provides direct access to the University and downtown core, and an alternate route to the Princeton Train Station. It is owned and maintained by Princeton University.

### **NJ Route 27 at Palmer Square/Elm Drive | Crosswalk Enhancements**

Installation of a pedestrian refuge island at the east side of Palmer Square would create a shorter and more comfortable crossing for pedestrians and bicyclists approaching NJ Route 27 and the downtown from the proposed Elm Drive bicycle boulevard. The refuge island would be located within an existing striped median.

### **Elm Drive (NJ Route 27 to Faculty Road) | Bicycle Boulevard**

The existing low speed, low volume campus roadway is suitable for bicycle boulevard designation and supportive improvements. Maintains existing LTS 1.

## Faculty Road

This roadway provides an east/west network link across the southern portion of the central core and Princeton University campus. It is owned and

maintained by Princeton University. Improvements include:

### **Faculty Road (Alexander Street to Harrison Street) | Improved Shared-Use Path**

The existing path is along the westbound side. Its surface is asphalt and typically 6 feet wide. Adjacent roadway lighting is insufficient to accommodate path users. The following path improvements should be made to provide a higher level facility:

- Path should be widened to maintain a 8 to 10-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Lighting should be installed to facilitate use of path after sunset

## Franklin Avenue

This roadway provides connects from residential neighborhoods from the west and east to the Middle and High Schools. Roadway segments include:

### **Clay Street/Franklin Avenue (John Street to Walnut Lane) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. Connects John Street bicycle boulevard to Walnut Lane shared-use path, providing a low stress route from residential neighborhoods to the

Middle School and High School. Maintains existing LTS 1.

### **Franklin Avenue (Walnut Lane to Grover Avenue) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. Connects Grover Avenue bicycle boulevard to Walnut Lane shared-use path, providing a low stress route from residential neighborhoods to the Middle School and High School. Maintains existing LTS 1.

## Grover Avenue/Leavitt Lane

This roadway connects the proposed Terhune Road bicycle lanes and shared-use paths to the proposed Franklin Avenue bicycle boulevard and the Rosedale Road/Hamilton Avenue corridor. It provides an alternative route to Harrison Street and provides direct access to the Princeton Shopping Center and Grover Park.

### **Grover Avenue/Leavitt Lane (Terhune Road to Hamilton Avenue) | Bicycle Boulevard**

Connects Terhune Road bike lanes and shared-use paths to Franklin Avenue bicycle boulevard and Hamilton Avenue corridor. Provides a north/south route parallel to North Harrison Street, with

access to the Princeton Shopping Center and Grover Park.

## Guyot Avenue

This roadway and path provides an east/west alternative to Valley Road and provides direct access to the Middle and High Schools. Improvements include:

### **Guyot Path Extension (John Street to Witherspoon Street)**

Proposed share-use path would provide circulation from the proposed John Street bicycle boulevard to Witherspoon Street and the existing Guyot Path corridor. It would also provide direct access from the existing Guyot Path corridor to Community Park and the Community Park Elementary School. This off-road facility is an LTS 1.

### **Witherspoon Street at Guyot Avenue | Rectangular Rapid Flashing Beacon**

An RRFB should be installed, along with high-visibility continental crosswalk striping, curb extensions and advanced warning signage to create a lower stress crossing across Witherspoon Street and improve visibility at this trail crossing location. This is a critical crossing location along the Guyot Avenue path/bicycle boulevard corridor for children going to school and Community Park.

### **Guyot Avenue (Witherspoon Street to Carnahan Place) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. Maintains existing LTS 1.

### **Guyot Path (Carnahan Place to Moore Street) | Improved Shared-Use Path**

The existing path is asphalt, of variable width, and uneven. An adjacent stream constrains improvement opportunities. The following path improvements should be made to provide a more comfortable and safe facility:

- Path should be widened to maintain an 8-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Low-profile lighting should be installed to allow use of path after sunset
- Path surface should be resurfaced with permeable pavement to remove bumps and cracks that result from tree root growth and regular wear and tear

### **Guyot Avenue (Moore Street to Walnut Lane) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. Maintains existing LTS 1.

## Harris Road / Princeton Cemetery Path

This roadway and path connection connects northern neighborhoods to the downtown and provides a lower stress alternative north/south route to Witherspoon Street. Roadway and path segments include:

### **Harris Road at Valley Road | Crosswalk Enhancements**

Valley Road is a long, straight corridor that encourages traffic speeds above the 25 mph speed limit. To improve conditions for shared-lane markings and support the 25 mph speed limit, the existing curb extension at Harris Road should be widened to create a more pronounced narrowing of the roadway.

### **Harris Road (Franklin Avenue to Valley Road) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. Connects Valley Road to Guyot shared-use path, Franklin Avenue bicycle boulevard, and Princeton Cemetery path. Provides lower stress alternative to Witherspoon Street. Maintains existing LTS 1.

### **Princeton Cemetery Path (Witherspoon Street to Franklin Avenue) | Improved Shared-Use Path**

Proposed shared-use path would connect the proposed Franklin Avenue bicycle boulevard to Witherspoon Street near the Wiggins Street intersection and improve connectivity between the Middle and High Schools and the library and downtown. The path would utilize the existing path through the cemetery, and create a new entrance on the north side to Franklin Avenue. Due to the separation the proposed facility provides, the level of stress is reduced from LTS 2 to LTS 1, compared to the existing route via Witherspoon Street.

### **Hutchinson Drive**

This roadway connects the Mercer Road corridor to the proposed U.S. Route 206 shared-use path, which provides connections to the Lawrence Hopewell Trail. Improvements Include:

#### **Hutchinson Drive (U.S. Route 206 to Mercer Road) | Improved Shared-Use Path**

The existing shared-use path along the southbound side provides a connection between The Hun School, U.S. Route 206, and Mercer Road, the Quaker Road Path, and the D&R Canal Trail. The existing path provides a paved and level surface.

The following path improvements should be made:

- Path should maintain an 8 to 10-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Low-profile lighting should be installed to allow use of path after sunset

### **John Street**

This roadway is one-way northbound, providing a connection from the downtown to Community Park as an alternative to Witherspoon Street.

#### **John Street (Paul Robeson Place to Community Park) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. Maintains existing LTS 1.

### **Library Place**

Connects the Mercer Street, U.S. Route 206/NJ Route 27, and Rosedale Road/Hamilton Avenue corridors, which provides an alternate route around the U.S. 206/NJ Route 27/Mercer Street intersection for trips to/from the central core from/to the southeast section of Princeton.

### **Library Place (Mercer Street to Hodge Road) | Bicycle Lane + Shared-Lane Markings**

With a typical width of 28 feet, a bicycle lane in each direction is not feasible. A bicycle lane is provided in the uphill direction (northbound), and a shared-lane in the downhill direction (eastbound). To accommodate the change, on-street parking would be prohibited along the corridor (currently permitted on the eastbound side). The hybrid facility would provide an LTS 1 in the northbound direction, and maintain the existing LTS 2 in the southbound direction.

### **Littlebrook Elementary School Path**

The existing shared-use path provides a short connection for bicyclists and pedestrians between the Littlebrook Elementary School and residential neighborhoods to its east and the proposed Rollingmead Road/Littlebrook Drive bicycle boulevard.

#### **Littlebrook Elementary School Path (Littlebrook Road to Littlebrook Elementary School) | Improved Shared-Use Path**

The following path improvements should be made to provide a more comfortable and safe connection to the school for bicyclists and pedestrians:

- Path should be widened to maintain a 10-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Pedestrian-level lighting should be installed to facilitate use of path after sunset, providing more comfortable and secure access for after-school activities
- Path surface should be resurfaced to remove bumps and cracks that result from tree root growth and regular wear and tear
- Circulation to the from the path to the main school entrance should be improved

## Mansgrove Road

This east/west road provides a connection between the Mount Lucas Road / Witherspoon corridor and residential neighborhoods along Foulet Drive, Andrews Lane, and the Cherry Hill Road area, improving network connectivity in the area and decreasing trip length for bicyclists. Improvements along this roadway include:

### **New Path (Andrews Lane/ Foulet Drive to Mansgrove Road) | New Shared-Use Path**

Proposed shared-use path would create a bicycle and pedestrian-only connection from Mansgrove Road to an existing path between Andrews Lane and Foulet Drive, following an existing “paper street.”

### **Mansgrove Road (New Path to end) | Bicycle Boulevard**

The existing low speed, low volume residential street is suitable for bicycle boulevard designation and supportive improvements. The existing bicycle and pedestrian-only connection to the east side of U.S. Route 206 should be widened and resurfaced. In conjunction with U.S. route 206 crossing improvements, provides LTS 1 facility.

### **Mansgrove Road at U.S. Route 206 | Rectangular Rapid Flashing Beacon**

The existing crossing is LTS 4 due to high vehicle speeds along U.S. Route 206. An RRFB should be installed, along with high-visibility continental crosswalk striping and advanced warning signage across U.S. Route 206 to create a lower stress crossing between the bicycle boulevard segments of Mansgrove Road.

### **Mansgrove Road connection to Mount Lucas Road | Improved Shared-Use Path**

An existing 4-foot concrete sidewalk currently connects Mansgrove Road (dead end) to Mount Lucas Road. The following path improvements should made to provide a higher quality facility:

- Path should be widened to maintain an 8 to 10-foot cross section where possible to facilitate two-way travel

and use by both bicyclists and pedestrians

- Lighting options should be considered to improve use of the path after sunset

## Mountain Avenue

This roadway connects the Great Road/ Elm Road corridor to Community Park, Cherry Hill Road, and the Mount Lucas / Witherspoon Corridor. Improvements include:

### **Mountain Avenue (Great Road to U.S. 206)**

The existing asphalt path is narrow and in poor condition. The following path improvements should made to provide a more comfortable and safe facility:

- Path should be widened to maintain an 8 to 10-foot cross section where possible to facilitate two-way travel and use by both bicyclists and pedestrians
- Low-profile lighting should be installed to allow use of path after sunset
- Path surface should be resurfaced to remove bumps and cracks that result from tree root growth and regular wear and tear

## Municipal Right-of-Way Path

This existing municipal right-of-way provides a connection between the

Terhune Road corridor and the Bunn Drive shared-use path, improving network connectivity in the northeast portion of the municipality.

### **Municipal Right-of-Way Path (Bunn Drive to Terhune Road) | New Shared-Use Path**

Proposed shared-use path would follow an existing, cleared municipal right-of-way. Path construction should use a permeable pavement and maintain a width of 10 feet. As an off-road facility with no vehicular traffic, the level of stress is an LTS 1.

## Quaker Road

This roadway connects the Mercer Road corridor to the D&R Canal Trail, provides direct access to the Friends School of Princeton, and improves access to commercial centers at Mercer Mall and the Nassau Park Pavilion in Lawrence and West Windsor Townships. Improvements include:

### **Quaker Road at Mercer Road | Roundabout**

The existing configuration of this intersection is confusing for motorists and uncomfortable for bicyclists and pedestrians. The installation of a roundabout would provide a more understandable and safe intersection for all users. It would also slow vehicular traffic through the intersection as it approaches the Princeton Friends School and the narrow bridge crossing over the

Stony Brook.

### **Quaker Road (Mercer Road to Friends School of Princeton) | New Shared-Use Path**

Proposed shared-use path would complete the key connection between existing paths on Mercer Road and Quaker Road. The cartway width and high vehicle speeds along this corridor make an on-road facility infeasible, and the sidepath is in keeping with the existing facility along this roadway. The shared-use path would be along the northbound side and accommodate both bicyclists and pedestrians. Due to the separation the proposed facility provides, the level of stress is reduced from an LTS 4 to LTS 1.

### **Quaker Road (Friends School of Princeton to D&R Canal Trail) | Improved Shared-Use Path**

The existing shared-use path along the northbound side provides a connection between the Friends School of Princeton, Institute Woods, Princeton Battlefield State Park, and the D&R Canal Trail. The existing path features a crushed gravel surface that is severely eroded, uneven, and muddy following rain events. The following path improvements should be implemented to provide a higher quality facility:

- Path should maintain an 8 to 10-foot cross section where possible to facilitate two-way travel and use by

both bicyclists and pedestrians

- Path should be reconstructed with permeable asphalt
- Low-profile lighting should be installed to allow use of path after sunset

### **Quaker Road at D&R Canal Trail | Rectangular Rapid Flashing Beacon**

The existing crossing lacks crosswalk striping and has very poor visibility between drivers and trail users. An RRFB should be installed, along with high-visibility continental crosswalk striping and advanced warning signage across Quaker Road to provide drivers advanced warning of crossing trail users. Coordinate proposed improvements with the Delaware and Raritan Canal Commission and Lawrence Township.

## Riverside Drive

Connects NJ Route 27 to Prospect Avenue, providing direct access to the Riverside Elementary School. Improvements include:

### **Riverside Drive (NJ Route 27 to Prospect Avenue) | Bicycle Lane + Shared-Use Path**

The approximately 35-foot cartway width could accommodate 11-foot travel lanes and 6.5-foot bicycle lanes. However, due to parking demands and drop-off/pick-up activity at the school, a hybrid

option would allow more flexibility for vehicle circulation. A bicycle lane would be provided in the southbound direction, and the northbound sidewalk would be widened to create a shared-use path to accommodate pedestrians and northbound bicyclists. On-street parking would be prohibited along the southbound side of this segment. Maintains an LTS 1.

## River Road

Provides a regional connection between the NJ Route 27 corridor, the proposed Gulick Park Path, and Montgomery Township.

### **River Road – Mercer County 605 (NJ Route 27 to Montgomery Township) | New Shared-Use Path**

Path should consist of an 8 to 10 foot permeable asphalt surface. Path lighting should also be installed to ensure that path is safe and usable after sunset. Due to the separation the proposed facility provides, the level of stress is reduced from an LTS 4 to LTS 1.

## Valley Road

Connects U.S. Route 206 to Witherspoon Street, linking several north/south corridors and providing direct access to the Princeton Shopping Center. Improvements include:

### **Valley Road (U.S. Route 206 to Witherspoon Street) | Shared-Lane Markings**

Install shared-lane markings. Similar to the recently completed Hamilton Avenue resurfacing project, a marked parking lane would be provided in the eastbound direction, and a narrow shoulder in the westbound direction. Maintains existing LTS 2.

### **Valley Road at Witherspoon Street | Roundabout**

This location is a gateway from U.S. Route 206 into Princeton via Witherspoon Street and Valley Road. Valley Road in particular is flat, straight roadway that encourages higher vehicle speeds. Conversion of the roadway from a traffic signal to a roundabout will provide traffic calming for the corridor, smooth vehicular circulation, and minimal intersection delay.

### **Valley Road (Witherspoon Street to Harris Road) | Shared-Lane Markings**

Install shared-lane markings. Similar to the recently completed Hamilton Avenue resurfacing project, a marked parking lane would be provided in the eastbound direction, and a narrow shoulder in the westbound direction. Maintains existing LTS 2.

### **Valley Road at Harris Road | Crosswalk Enhancements**

Valley Road is a long, straight corridor that encourages traffic speeds above the 25 mph speed limit. To improve conditions for shared-lane markings and support the 25 mph speed limit, the existing curb extension at Harris Road should be widened to create a more pronounced narrowing of the roadway.

### **Valley Road (Harris Road to Walnut Lane) | Shared-Lane Markings**

Install shared-lane markings. Similar to the recently completed Hamilton Avenue resurfacing project, a marked parking lane would be provided in the eastbound direction, and a narrow shoulder in the westbound direction. Maintains existing LTS 2.

### **Valley Road at Walnut Lane | Crosswalk Enhancements**

Valley Road is a long, straight corridor that encourages traffic speeds above the 25 mph speed limit. To improve conditions for shared-lane markings and support the 25 mph speed limit on Valley Road and the bicycle boulevard on Walnut Lane, a raised intersection should be installed at this location.

### **Valley Road (Walnut Lane to Harrison Street) | Shared-Lane Markings**

Install shared-lane markings. Similar to the recently completed Hamilton Avenue resurfacing project, a marked parking

lane would be provided in the eastbound direction, and a narrow shoulder in the westbound direction. Maintains existing LTS 2.

### **Valley Road at Harrison Street | Bike Box**

Two types of bike boxes would be installed at this location. A standard bike box at the southbound, eastbound, and westbound approaches would improve the visibility of bicyclists for all turning movements. The eastbound and westbound approaches would be paired with a short bike lane as the roadway widens at the intersection, providing access to the bike box. A two-stage bike box would accommodate bicyclists turning left from the proposed northbound separated bicycle lane on Harrison Street onto Valley Road.

appendix c – network description  
princeton bicycle master plan | **2016**

