



## Draft Life Sciences Center Bicycle Network

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**Completed:** 1/21/16

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### Recommendation

Receive stakeholder input and provide feedback on the Draft Life Sciences Center Bicycle Network Proposal.

#### Summary

A network of low-stress routes connecting people to the places they want to go without exceeding their tolerance for traffic stress is needed to support bicycling as a mainstream mode of travel. The Life Sciences Center Bicycle Network Proposal would create a low-stress bicycling network that circulates throughout the Life Sciences Center area, connecting to the proposed Corridor Cities Transitway (CCT) stations, major destinations such as Crown Farm and Shady Grove Adventists Hospital, future activity centers such as the proposed Johns Hopkins University Belward Campus and a redeveloped Public Safety Training Academy site (PSTA), and to the surrounding residential neighborhoods. It also proposes two long term bicycle storage facilities at future CCT stations.

#### Background

The Bicycle Master Plan Team is advancing work both in the White Flint Sector Plan area and Life Sciences Center Area due to the fast pace of change in these areas so that opportunities to construct segments of a separated bike lane network can be pursued in conjunction with development and capital projects before the Bicycle Master Plan is approved. The White Flint Separated Bike Lane Network was discussed by the Planning Board on December 3, 2015.

At the request of the Great Seneca Science Corridor Implementation Advisory Committee (GSSC IAC), the Bicycle Master Plan began with an early focus on the Life Sciences Center in April 2015.

#### Why are Separated Bike Lanes Needed?

Traditionally, bicycle planning in Montgomery County has consisted of two types of bikeways (conventional bike lanes, and shared use paths); however, each has drawbacks that limit their ability to encourage bicycling, especially in urban areas:

- Conventional bike lanes are a portion of a roadway that has been designated by striping, signing and pavement markings intended exclusively for bicycling use.
  - Drawback: Many people are deterred from bicycling in conventional bike lanes when traffic volumes or speeds are high, as striping does not offer sufficient protection from traffic. And in urban areas, riding in bike lanes can be stressful if the bike lane is blocked by a delivery vehicle or when motorists pull in and out of on-street parking.
- Shared use paths are a paved surface that is typically 10 feet wide, designated for shared use by bicycles and pedestrians.
  - Drawback: While shared use paths may be a comfortable bikeway type in areas with less activity, they are less comfortable for both bicyclists and pedestrians in activity centers due to the number of users.

Over the past five years, separated bike lanes (also known as cycle tracks or protected bike lanes) have been embraced in urban areas as a preferred bikeway because they provide dedicated space for bicycling that is physically separated from motor vehicles and pedestrians. In the Washington DC region separated bike lanes exist on multiple roads, including:

- District of Columbia: Pennsylvania Avenue, 15<sup>th</sup> Street NW, L Street NW, M Street NW, and 1<sup>st</sup> Street NE.
- Arlington: Eads Street and South Hayes Street.

The first separated bike lane in Montgomery County opened on Woodglen Drive in White Flint in 2014.



*The Woodglen Drive Separated Bike Lane*

## The Proposed Network

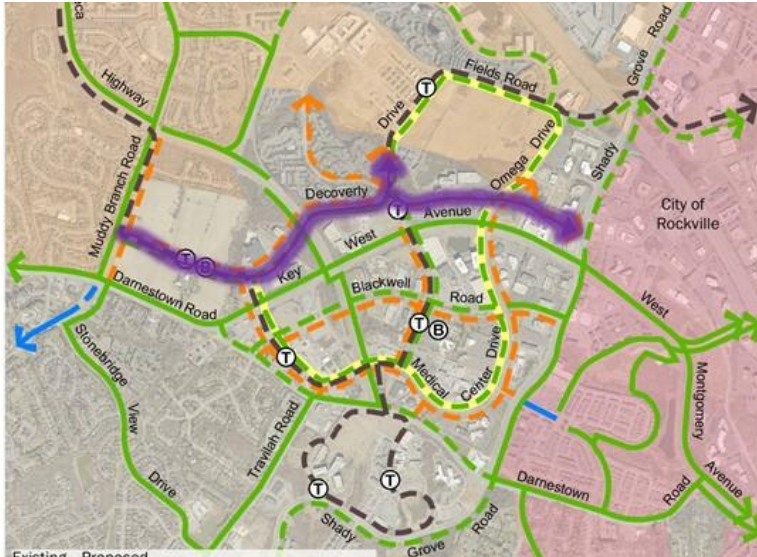
The bicycle network proposed for the Life Sciences Center is shown in the image below and includes separated bike lanes (orange), shared use paths (green), and bike lanes (blue). It also includes the master-planned alignment for the CCT (grey) with the stations represented by the letter “T”. Proposed secure bicycle parking stations are represented by the letter “B”.



The proposed Separated Bike Lane network is composed of four major corridors.

The **Northway Separated Bike Lane** is an east-west bikeway that would travel along the proposed Belward Campus Drive and Decoverly Drive between Muddy Branch Road and Shady Grove Road.

- Destinations: Washingtonian Woods, JHU Belward Campus (fut), Crown Farm, Millennium Trail.
- Access to Future CCT Stations: LSC Belward and DANAC.



The **Southway Separated Bike Lane** is an east-west bikeway that would travel along existing and proposed segments of Blackwell Road between Darnestown Road and Shady Grove Road.

- Destinations: Hunting Woods, Public Safety Training Academy (PSTA) site, National Cancer Institute, Johns Hopkins Montgomery Campus, Fallsgrove neighborhood, Millennium Trail.
- Access to Future CCT Stations: LSC West and LSC Central.



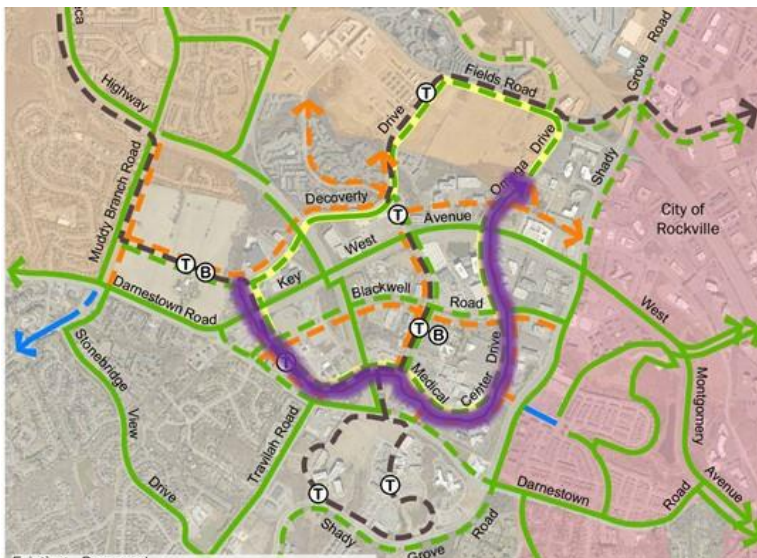
The **Midway Separated Bike Lane** is a north-south bikeway that would travel along the proposed Broschart Road and Diamondback Drive between Medical Center Drive and the City of Gaithersburg.:

- Destinations: Shady Grove Adventist Hospital, Johns Hopkins Montgomery Campus, National Cancer Institute, Crown Farm.
- Access to Future CCT Stations: LSC Central and DANAC.

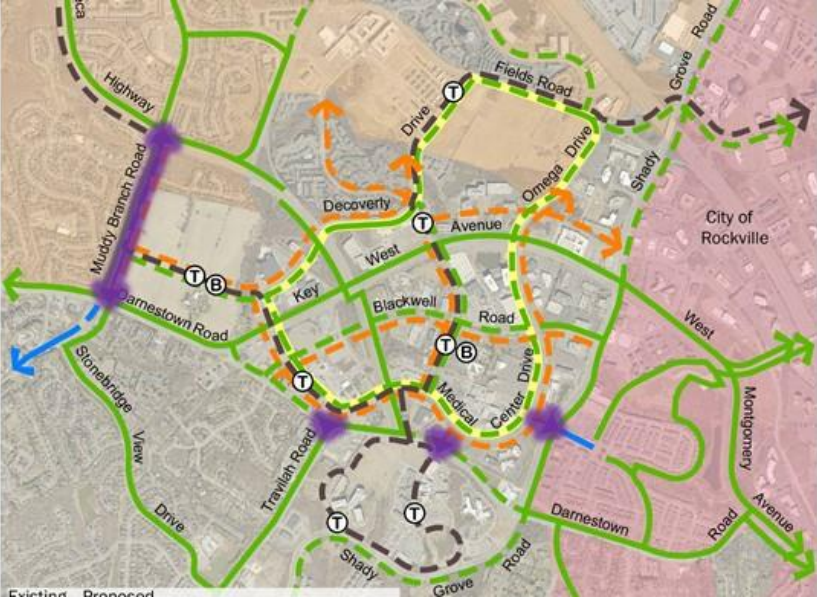


The **Lower Loop Separated Bike Lane** is a crescent-shaped bikeway that would travel along John Hopkins Drive, Medical Center Drive, and Omega Drive between the future Johns Hopkins Belward Campus and the City of Gaithersburg.

- Destinations: Johns Hopkins Belward Campus (future), PSTA site, Shady Grove Adventist Hospital, Johns Hopkins Montgomery Campus, National Cancer Institute.
- Access to Future CCT Stations: LSC West.

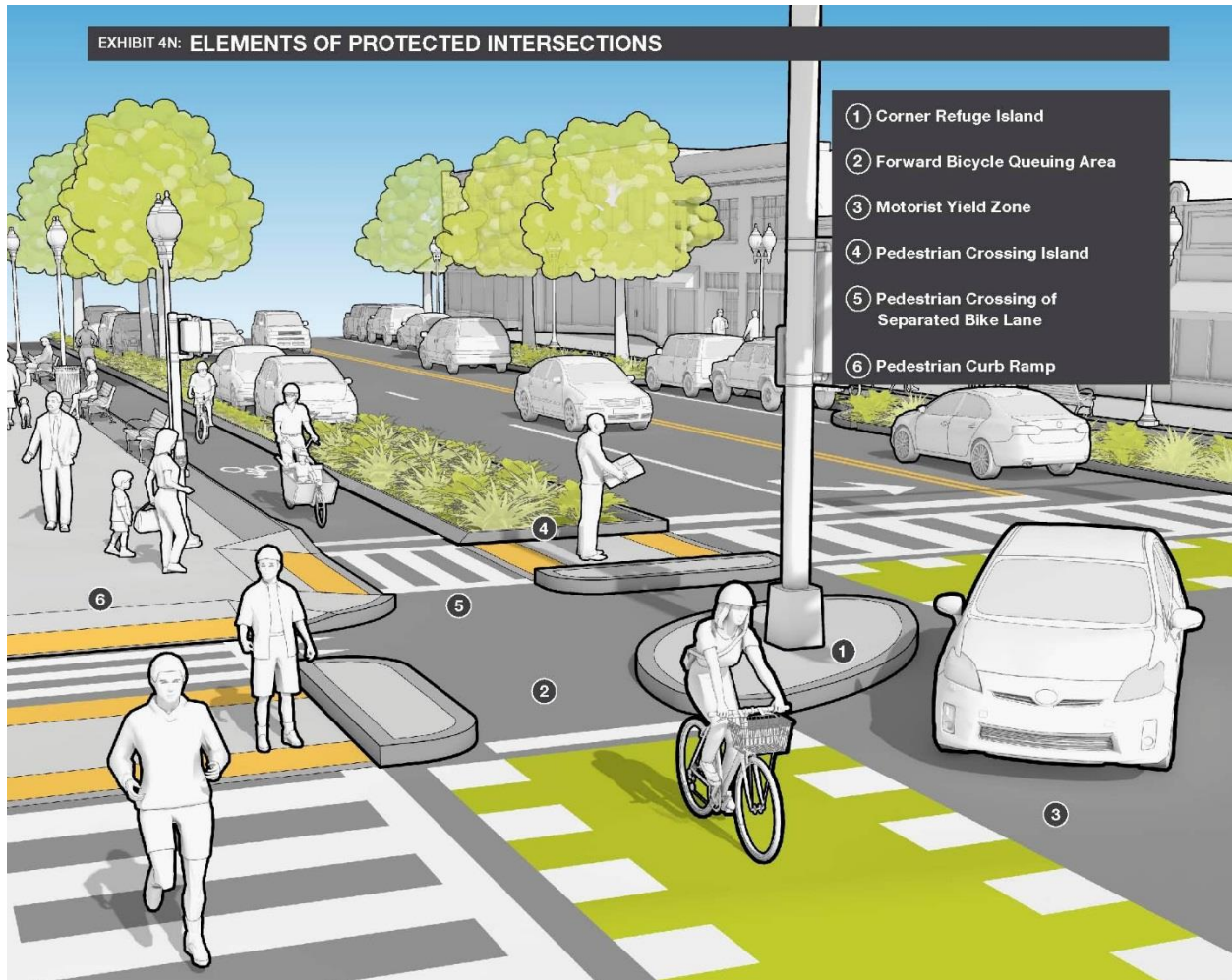


In addition, there is a recommendation for two-way separated bike lanes on the east side of Muddy Branch Road, and several spurs connecting the proposed network to the surrounding area.



## Protected Intersections

Protected intersections are an emerging innovation that extends the protection of separated bike lanes to the intersection and should be evaluated at all major crossings in the Life Sciences Center area. The benefit of protected intersections is that they physically separate bicyclists as they make right turns, simplify bicycle-through movements and left turns, increase the visibility of cyclists, provide separate refuges for pedestrians and cyclists waiting to cross the street and provide pedestrians and cyclists with a head start as they cross the street.



*Rendering of a Protected Intersection*

To assess the potential implementation of protected intersections, a consultant for the Planning Department developed design concepts for protected intersections at two locations (see Attachment A). These are illustrative concepts only that need to be evaluated by the Department of Transportation, Department of General Services, and the Maryland Transit Administration.

- Muddy Branch Road and Belward Campus Drive (future intersection)
- Blackwell Road Extended and Medical Center Drive Extended (future intersection)

## Secure Bicycle Parking

Another component of the Bicycle Master Plan is evaluating the potential for long-term, secure bicycle parking facilities at major transit stations and activity centers. Bicycling is a way to expand access to jobs and transit for people that live and work beyond the half-mile distance that most people will walk to a transit station. But without secure options for storing their bicycle, many people are reluctant to leave their bicycle locked to a standard “inverted-u” rack for extended periods.

Communities and transit providers throughout the country are opening long-term, secure bicycle parking stations (not to be confused with Capital Bikeshare stations) as a means to increase bicycling to jobs and transit. In the metropolitan Washington region, bicycle parking stations exist at the Union Station, College Park and Wiehle-Reston East Metrorail stations and are under construction at the East Falls Church and Vienna Metrorail stations. While Capital Bikeshare stations address internal circulation and short trips by bike, secure bicycle parking can appeal to the market of suburban cyclists who prefer to use their own bicycles and those who live in neighborhoods where Capital Bikeshare may not be feasible.

Long-term bicycle parking stations are recommended to be located directly adjacent to the LSC Belward and LSC Central stations of the proposed Corridor Cities Transitway (CCT). Both stations are proposed to accommodate approximately 100 bicycles. While the spatial requirements of such facilities will be determined through a more detailed evaluation, it is estimated that each station will be around 2,500 square feet in size.



*Interior of the Union Station Bike Station (Washington, DC)*





*Capital Metro Bike Shelter (Austin, Texas)*

### **Coordination with Other Projects**

The Planning Department has coordinated the Life Sciences Center Bicycle Network extensively with the CCT project and the design guidelines for the Life Sciences Center (LSC) Loop Trail. The 30% design for the CCT reflects the separated bike lane network where the CCT project is reconstructing the roadway, including portions of Discoverly Drive, Diamondback Drive, and Medical Center Drive. The original concept for the LSC Loop envisioned a trail for pedestrians and most cyclists. Since the separated bike lane network will attract many cyclists, the LSC Loop Trail is now intended for slower cyclists, including families.

### **Comments from County Agencies**

Comments and responses from the Montgomery County Department of Transportation and the Montgomery County Department of General Services are included as Attachment B.

### **Outreach**

While the Bicycle Master Plan did not officially begin until July 1, 2015, an early focus on the Life Sciences Center began in April 2015. A public meeting was held on April 20, 2015 at which the staff discussed the reasons for the early focus on the Life Sciences Center and its relationship to the Bicycle Master Plan overall. A second public meeting was conducted on December 15, 2015 in which both the Life Sciences Center Bicycle Network Proposal and the Life Science Center Loop Trail Design Guidelines

were presented. Presentations were made to the GSSC IAC on March 26, 2015 and December 8, 2015 and to two of the CCT Area Advisory Committees on May 13, 2015 and May 20, 2015.

### **Next Steps**

The bikeway network recommended in this document and any comments from the Planning Board will be incorporated into a Working Draft of the Bicycle Master Plan in late 2016.

Attachment A: Conceptual Illustrations of Protected Intersections

Attachment B: Responses to Comments



THE  
BICYCLE  
MASTER PLAN

DRAFT LIFE SCIENCES CENTER  
BICYCLE NETWORK  
PROPOSAL

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JANUARY 2016

THE MONTGOMERY COUNTY PLANNING DEPARTMENT 

# **Draft Life Sciences Center Bicycle Network Proposal**

## January 2016

### **Abstract**

This draft report proposes a network of separated bike lanes and long-term bicycle parking stations for the Life Sciences Center area and explains the reasons for its locations, designs and details. Separated bike lanes create a low-stress environment for cyclists because they provide physical separation between cyclists and vehicular traffic and pedestrians. Long-term bicycle parking stations provide secure bicycle storage at transit stations and other activity centers where commuters can leave their bicycles, thereby extending the reach of transit beyond the half-mile that most people will walk.

Source of Copies:  
[montgomeryplanning.org/bikeplan](http://montgomeryplanning.org/bikeplan)

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LEFT LANE  
MUST  
TURN LEFT

CULTURAL



Indianapolis Cultural Trail

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# **Bicycling as a mode of transportation is experiencing a resurgence throughout the United States, especially in urbanized areas.**

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Driven by changing travel patterns, investments in low-stress bicycling infrastructure and popularity of bikeshare programs, the number of trips by bicycling has grown steadily over the past 15 years.

Montgomery County continues to make substantial investments in bicycling infrastructure and is well-positioned to emerge as a leader in bicycling among suburban jurisdictions. A high-quality bicycling network is a critical component of achieving a number of County performance metrics, including non-auto driver mode share (NADMS) goals required in the staging elements of several master plans, and air quality and public health indicators. Furthermore, a separated bicycle network is increasingly a driver of economic activity and a way to expand the reach of the planned Corridor Cities Transitway stations beyond the typical half-mile that most people are willing to walk. Several surveys reveal that the public increasingly wants to live in walkable and bikeable places with convenient access to amenities and transit.



## Bicycle Infrastructure

The Montgomery County Planning Department began working on the Bicycle Master Plan in July 2015 with the goal of developing a low-stress bicycle network that can make cycling a mainstream choice for the majority of the County's residents and workers. One component of this plan is evaluating bikeway types that were not a part of the planning toolkit when the Countywide Bikeways Functional Master Plan (a precursor to the current Bicycle Master Plan) was approved in 2005.



A one-way separated bike lane in Boulder, Colorado. (Source: denverurbanism.com)

### Separated Bike Lanes

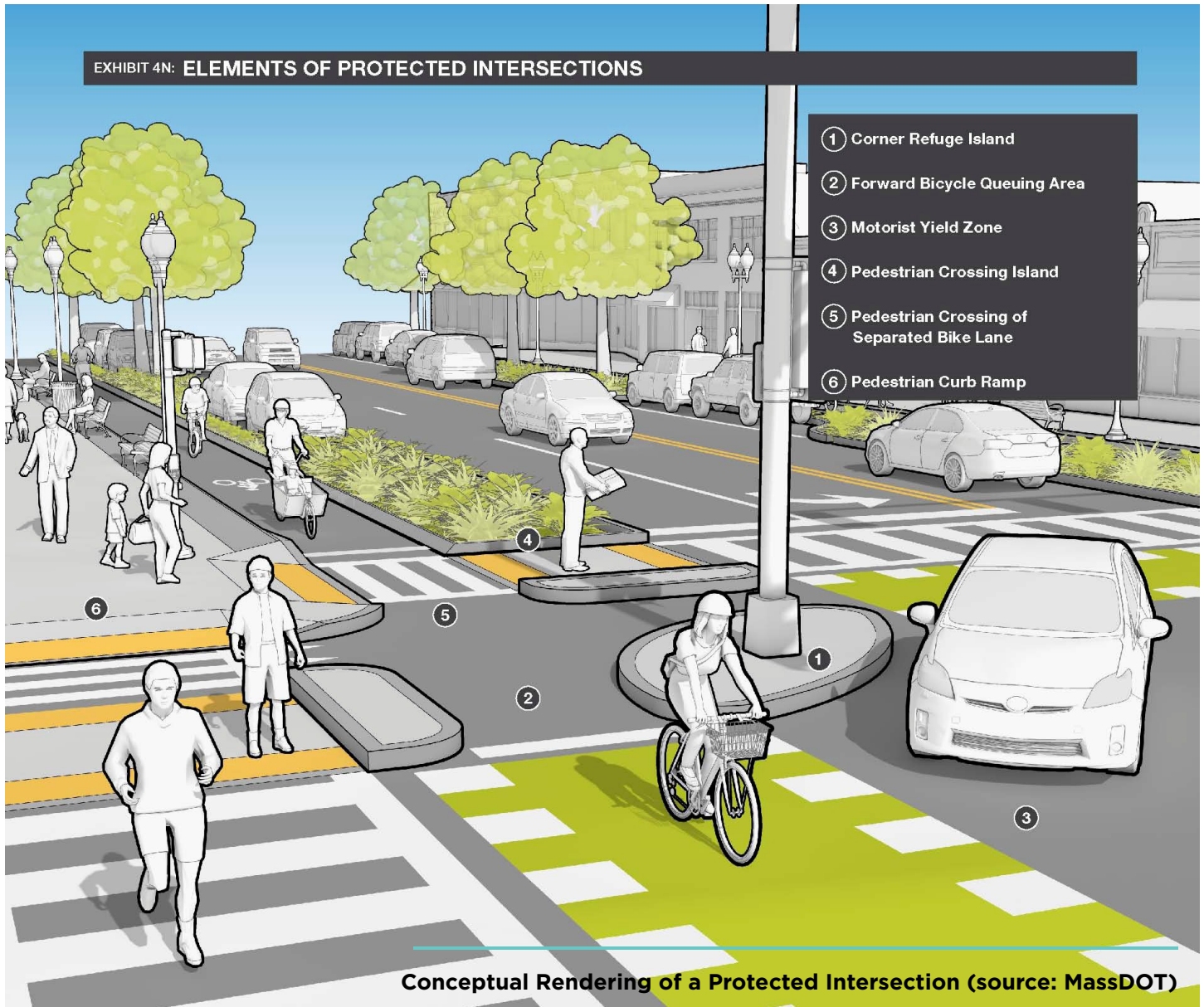
Separated bike lanes (also known as cycle tracks or protected bike lanes) are preferred in many urban areas because they establish physical separation between cyclists and motor vehicles and pedestrians. This separation may be vertical, such as curbs or bollards; horizontal, such as a landscape panel or a parking lane; or a combination of both. Separated bike lanes may be in a one-way or a two-way configuration.

While this report is focused on separated bike lanes, the proposed network will connect to conventional bike lanes, buffered bike lanes, shared use paths and bicycle boulevards outside of the Life Sciences Center area as part of the larger network.



## Protected Intersections

Protected intersections are an emerging innovation that extends the protection of a separated bike lane to the intersection and should be evaluated at all major crossings in the Life Sciences Center area. The first protected intersection in the United States opened in Davis, California, in August 2015. The benefit of protected intersections is that they physically separate bicyclists as they make right turns, simplify bicycle-through movements and left turns, increase the visibility of cyclists, provide a refuge for cyclists waiting to cross the street and provide cyclists with a head start as they cross the street.



## Secure Bicycle Parking

Another component of the Bicycle Master Plan is evaluating the potential for providing long-term, secure bicycle parking facilities at major transit stations and activity centers. Bicycling is a way to expand access to jobs and transit for people that live and work beyond the half-mile distance that most people will walk. But without secure options for storing their bicycle, many people are reluctant to leave their bicycle locked to a standard “inverted-u” rack for extended periods.



Capital Metro Bike Shelter, Austin, Texas (Source: Jeff Owen)

Communities and transit providers throughout the country are opening long-term, secure bicycle parking stations (not to be confused with Capital Bikeshare stations) as a means to increase bicycling to jobs and transit. In the metropolitan Washington region, bicycle parking stations exist at the Union Station, College Park and Wiehle-Reston East Metrorail stations and are under construction (as of September 2015) at the East Falls Church and Vienna Metrorail stations.

## Life Sciences Center Loop

The Montgomery County Life Sciences Center (LSC) Loop is a proposed 3.5-mile loop trail that will serve as an organizing element and placemaking feature for the Life Sciences Center district. Much more than a standard shared use path, the LSC Loop Trail will function as an identifiable public amenity that helps make the Life Sciences Center an attractive place to live, work and visit. The trail will incorporate distinctive design elements—special paving, furniture, landscaping, art, signage and stormwater management features—as well as public amenity/park spaces adjacent to the trail route. A central feature of the Great Seneca Science Corridor Master Plan, the LSC Loop Trail also constitutes a major staging requirement for advancing implementation of the Master Plan and must be fully funded prior to opening Stage 2 of Master Plan development. The typical LSC Loop Trail cross-section includes a 12-foot-wide shared use path with planted buffers on both sides of the trail, with a 10-foot-wide shared use path in the most constrained trail segments.



## Summary

Montgomery County residents and workers are more likely to bicycle in low-stress environments with secure bicycle storage, so improving bicycling throughout the County requires developing safe, low-stress connections between activity centers, transit facilities and neighborhoods, and providing long-term, secure bicycle parking options. Based on staff analysis, the bike recommendations proposed in the Great Seneca Science Corridor Master Plan (2010) are insufficient to create a low-stress bicycling network. The Life Sciences Center would benefit greatly from separated bike lanes, which would encourage cycling as a mainstream choice.

Due to the rapid pace of change in the Life Sciences Center area, the Planning Department is advancing work in this area so that meaningful opportunities to construct segments of the preferred bike network are not lost before the Bicycle Master Plan can be completed. This effort will enable coordination with development approvals and the design of the Corridor Cities Transitway (CCT).

This document identifies a network of separated bike lanes and bicycle parking stations that will enable employees and residents within and surrounding the Life Sciences Center area to access jobs, retail destinations and future CCT bus rapid transit stations. This network will also connect to existing bicycle facilities, such as the Carl Henn Millennium Trail in the City of Rockville, and the shared-use path network that exists (with gaps) on many of the major highways in the area (Great Seneca Highway, Key West Avenue and Darnestown Road, among others).

The proposed Separated Bike Lane network is composed of:

### **The Northway Separated Bike Lane:**

- Alignment: East-west.
- Connections: Washingtonian Woods, Johns Hopkins University Belward Campus, Millennium Trail.
- Access to Future CCT Stations: LSC Belward and DANAC.

### **The Southway Separated Bike Lane:**

- Alignment: East-west.
- Connections: Hunting Woods, Public Service Training Academy (PSTA) site, National Cancer Institute, Fallsgrove, Millennium Trail.
- Access to Future CCT Stations: LSC West and LSC Central.

### **The Midway Separated Bike Lane:**

- Alignment: North-south.
- Connections: Shady Grove Adventist Hospital, Crown Farm.
- Access to Future CCT Stations: LSC Central DANAC.

### **The Lower Loop Separated Bike Lane:**

- Alignment: Crescent-shaped corridor.
- Connections: Johns Hopkins University Belward Campus, PSTA site, Shady Grove Adventist Hospital.
- Access to Future CCT Stations: LSC West.

In addition to these routes, an additional separated bike lane would be constructed on Muddy Branch Road, between Great Seneca Highway and Darnestown Road. As currently planned, this facility would be a two-way separated bike lane on the east side of Muddy Branch Road to accommodate a future widening of the road from four to six lanes. However, the two-way bikeway provides challenges in connecting to the conventional bike lanes on Muddy Branch Road south of Darnestown Road and the planned bike lanes north of Great Seneca Highway. Since conventional bike lanes are planned on both sides of the road, a person traveling in the southbound direction on Muddy Branch Road would have to cross from the west side of Muddy Branch Road to the east side at Great Seneca Highway, travel south alongside the Belward Farm, and then cross back over to the west side of the road at Darnestown Road. Therefore, if it is determined at a later date that Muddy Branch Road does not need to be widened to six lanes, the separated bike lanes should be one-way on both sides of the road.



Two long-term, secure bicycle parking stations should be located directly adjacent to the future LSC Belward and LSC Central stations of the CCT. These station locations were selected because:

- They draw transit passengers from up to 3 miles away, expanding the reach of transit.
- They are located on either side of Key West Avenue, a major barrier for cyclists.
- They are spaced so as not to draw from overlapping areas.
- Potential LSC development could provide space for the bicycle parking stations directly adjacent to the CCT stations.

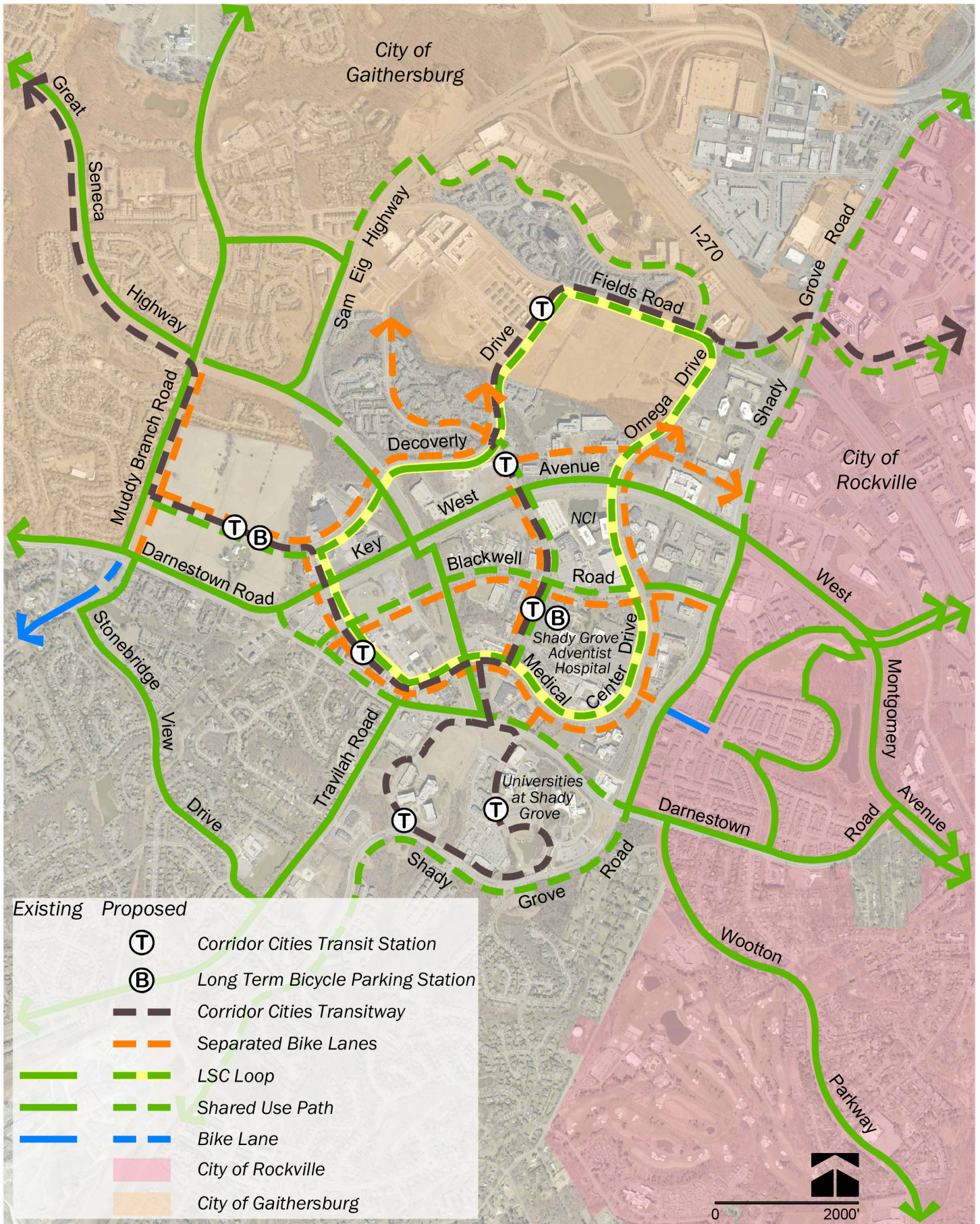
Each station would accommodate at least 100 bikes in a secure storage facility and provide bicycle support features, such as changing rooms, showers, fix-it stations and potential bicycle retail. A facility of this size would encompass roughly 1,600 square feet and a site of roughly 2,500 square feet is recommended that will include site access and other features.

A bicycle parking station is also recommended at the Shady Grove Metro Station, but is outside of the Life Science area and will be included in the overall Bicycle Master Plan update.

**The map (right) shows the proposed separated bike lane network and long-term bicycle parking station locations.**



# PROPOSED SEPARATED BIKE LANE & PARKING NETWORK



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# STATUS OF PROPOSED SEPARATED BIKE LANE NETWORK

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The following table (right) shows the location, distance and current status of each segment of the proposed separated bike lane network. Of the total 12 lane miles of separated bike lanes proposed in the Life Sciences Center area, 3.6 miles (or about 30 percent) are identified for implementation as part of the Corridor Cities Transitway or development projects.



| BIKEWAY           | STREET NAME                   | FROM                          | TO                            | PROPOSAL                      |
|-------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| NORTHWAY          | Belward Campus Road           | Muddy Branch Road             | Johns Hopkins Drive           | One-Way, both sides of street |
|                   | Belward Campus Road           | Johns Hopkins Drive           | Great Seneca Highway          | One-Way, both sides of street |
|                   | Decoverly Drive               | Great Seneca Highway          | Diamondback Drive             | One-Way, both sides of street |
|                   | Decoverly Drive               | Diamondback Drive             | City of Gaithersburg          | One-Way, both sides of street |
|                   | Street B-2                    | Diamondback Drive             | Omega Drive                   | One-Way, both sides of street |
| SOUTHWAY          | Blackwell Road                | Darnestown Road               | Medical Center Drive Extended | One-Way, both sides of street |
|                   | Blackwell Road                | Medical Center Drive Extended | Great Seneca Highway          | One-Way, both sides of street |
|                   | Blackwell Road                | Great Seneca Highway          | Broschart Road                | One-Way, both sides of street |
|                   | Blackwell Road                | Broschart Road                | Medical Center Drive          | One-Way, both sides of street |
|                   | Blackwell Road                | Medical Center Drive          | Shady Grove Road              | One-Way, both sides of street |
| MIDWAY            | Broschart Road                | Medical Center Drive          | Blackwell Road                | One-Way, both sides of street |
|                   | Broschart Road                | Blackwell Road                | Key West Avenue               | One-Way, both sides of street |
|                   | Diamondback Drive             | Key West Avenue               | Decoverly Drive               | One-Way, both sides of street |
|                   | Diamondback Drive             | Decoverly Drive               | City of Gaithersburg          | One-Way, both sides of street |
| LOWER LOOP        | Johns Hopkins Drive           | Belward Campus Drive          | Key West Avenue               | One-Way, both sides of street |
|                   | Medical Center Drive Extended | Key West Avenue               | Great Seneca Highway          | One-Way, both sides of street |
|                   | Medical Center Drive          | Great Seneca Highway          | Broschart Road                | One-Way, both sides of street |
|                   | Medical Center Drive          | Broschart Road                | Blackwell Road                | One-Way, both sides of street |
|                   | Medical Center Drive          | Blackwell Road                | Key West Avenue               | One-Way, both sides of street |
|                   | Omega Drive                   | Key West Avenue               | City of Gaithersburg          | One-Way, both sides of street |
| MUDDY BRANCH ROAD | Muddy Branch Road             | Darnestown Road               | Great Seneca Highway          | Two-Way, east side of street  |

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# TECHNICAL DISCUSSION

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The analysis in this report is based on an approach that quantifies the stress and anxiety that bicyclists feel when they ride close to vehicular traffic. This level of traffic stress (LTS) methodology was developed in 2012 by the Mineta Transportation Institute and San Jose State University.<sup>2</sup> It assigns a numeric stress level to streets (and other places where people can bicycle, like trails) based on attributes which include traffic speed, traffic volume, number of lanes, frequency of parking turnover, ease of intersection crossings and other characteristics. A quiet residential street with a 25 mph speed limit presents a low-stress setting for cyclists riding in the roadway, but a six-lane highway with a 40-mile-per-hour speed limit creates a high-stress environment for cyclists who must share the roadway with traffic.

The following proposed network of separated bike lanes would create a low-stress bicycling environment through much of the Life Sciences Center area.

<sup>2</sup>Mekuria, Maaza, Peter G. Furth and Hilary Nixon, Low-Stress Bicycling and Network Connectivity, San Jose, CA: Mineta Transportation Institute, 2012.



# NORTHWAY SEPARATED BIKE LANE

▶ The Northway Separated Bike Lane travels along the proposed Belward Campus Drive and Decoverly Drive between Muddy Branch Road and Shady Grove Road.

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## BELWARD CAMPUS DRIVE (FUTURE) (MUDDY BRANCH ROAD TO JOHNS HOPKINS DRIVE)

Belward Campus Drive will be the main road through the future Johns Hopkins University Belward Campus. It will be a four-lane arterial with two additional lanes for the Corridor Cities Transitway in the median.

- **Number of Through Lanes:** 6 lanes planned at build-out (including 2 transit lanes).
- **Target Speed:** 30 mph.
- **On-Street Parking:** None.
- **Functional Classification:** Arterial.
- **Master-Planned Right-of-Way:** 150 feet, including Corridor Cities Transitway.



**Level of Traffic Stress:** Without a separated bikeway, bicycling on the future Belward Campus Drive would be a high-stress experience only acceptable to about 1-4 percent of the population, due to the speed and likely volume of traffic.

**Status:** The Montgomery County Planning Department, Montgomery County Department of Transportation (MCDOT) and Maryland Transit Administration (MTA) have agreed to pursue one-way separated bike lanes along Belward Campus Drive as part of the inconcept and the Johns Hopkins Belward Campus development. Implementation will be pursued as part of the development review process.

## BELWARD CAMPUS DRIVE

(JOHNS HOPKINS DRIVE TO GREAT SENECA HIGHWAY)

Belward Campus Drive is an existing, stub road between Johns Hopkins Drive and Great Seneca Highway, where the road steeply drops. Today, it is a two-lane road with on-street parking, but the Great Seneca Science Corridor Master Plan recommends converting the on-street parking to two additional traffic lanes.



Looking east toward Great Seneca Highway.

- **Number of Through Lanes:** 2 existing, 4 planned at build-out.
- **Target Speed:** 25 mph.
- **On-Street Parking:** Existing on both sides of street, but will be converted to additional traffic lanes.
- **Functional Classification:** Arterial.
- **Master-Planned Right-of-Way:** 100 feet.

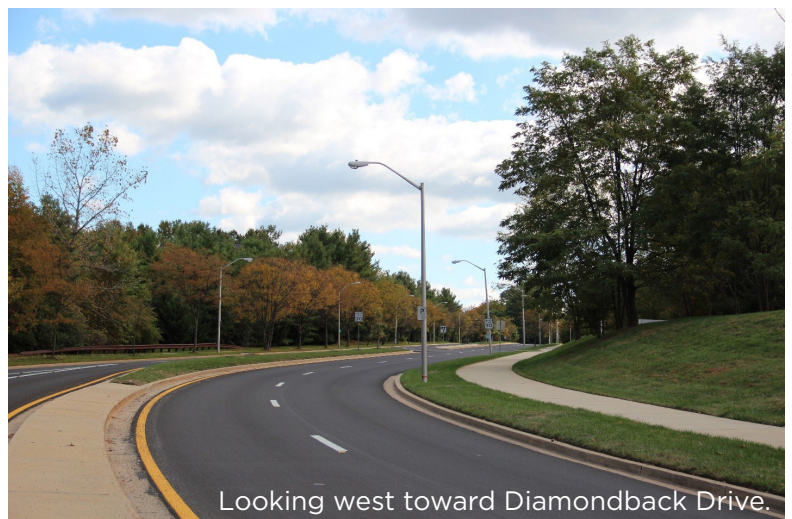
**Level of Traffic Stress:** Without a separated bikeway, bicycling on this segment of Belward Campus Drive will be a moderate-stress experience only acceptable to about 10 percent of the population, due to the speed and likely volume of traffic once the area is built-out.

## DISCOVERLY DRIVE

(GREAT SENECA HIGHWAY TO DIAMONDBACK DRIVE)

Discoverly Drive is an existing, four-lane road between Great Seneca Highway and Diamondback Drive.

- **Number of Through Lanes:** 4 existing.
- **Target Speed:** 30 mph.
- **On-Street Parking:** None.
- **Functional Classification:** Arterial.
- **Master-Planned Right-of-Way:** 100 feet.



Looking west toward Diamondback Drive.

**Level of Traffic Stress:** Bicycling on Discoverly Drive is a high-stress experience only acceptable to about 1-4 percent of the population, due to the speed and number of traffic lanes.

## DISCOVERLY DRIVE

(DIAMONDBACK DRIVE TO CITY OF GAITHERSBURG)

Discoverly Drive is an existing, north-south road between Diamondback Drive and the City of Gaithersburg. Today, it is a two-lane road with on-street parking, but ultimately it will become a four-lane road with two additional lanes for the Corridor Cities Transitway running in the median. As of October 2015, this road remains blocked to through-traffic due to the Crown Farm development project.



Looking east toward the City of Gaithersburg.

- **Number of Through Lanes:** 2 existing, 6 planned at build-out (including 2 transit lanes).
- **Target Speed:** 30 mph.
- **On-Street Parking:** Existing on both sides of street, but will be converted to additional traffic lanes.
- **Functional Classification:** Arterial.
- **Master-Planned Right-of-Way:** 100 feet, including Corridor Cities Transitway.

**Level of Traffic Stress:** Without a separated bikeway, bicycling on Discoverly Drive will be a high-stress experience only acceptable to about 1-4 percent of the population, once the extension to Crown Farm is open to traffic.

**Status:** The Planning Department, MCDOT and MTA have agreed to one-way separated bike lanes along Discoverly Drive. The northbound separated bike lane is reflected in the 30 percent design plans for the CCT. However, the northbound separate bike lane should be expanded into a two-way separated bike lane until the southbound separated bike lane can be implemented.

## STREET B-2

(DIAMONDBACK DRIVE TO OMEGA DRIVE)

Street B-2 will connect Diamondback Drive to Omega Drive. It will be a two-lane road with a row of on-street parking. With a planned 60-foot right-of-way, it will be a challenge to incorporate a bikeway on this road.

- **Number of Through Lanes:** 2 planned.
- **Target Speed:** 30 mph.
- **On-Street Parking:** One side of the street.
- **Functional Classification:** Business District Street.

## RESEARCH BOULEVARD

(OMEGA DRIVE TO SHADY GROVE ROAD)

Research Blvd is an existing four-lane street.

- **Number of Through Lanes:** 4 existing.
- **Target Speed:** 30 mph.
- **On-Street Parking:** none.
- **Functional Classification:** Industrial Street.
- **Master Planned Right-of-Way:** 80 feet.

**Level of Traffic Stress:** Without a separated bikeway, bicycling on Research Blvd will be a high-stress experience only acceptable to about 1-4 percent of the population.

# SOUTHWAY SEPARATED BIKE LANE

The Southway Separated Bike Lane travels along the proposed Blackwell Road between Darnestown Road and Shady Grove Road.

## BLACKWELL ROAD

(DARNESTOWN ROAD TO GREAT SENECA HIGHWAY)

Blackwell Road will be constructed from Darnestown Road to Great Seneca Highway as part of the Public Safety Training Academy (PSTA) redevelopment project. It will be a two-lane road with on-street parking.

- **Number of Through Lanes:** 2 planned.
- **Target Speed:** 30 mph.
- **On-Street Parking:** 2 sides of the street.
- **Functional Classification:** Business District Street.
- **Master-Planned Right-of-Way:** 70 feet.

**Level of Traffic Stress:** Bicycling on Blackwell Road will be a moderate-stress experience only acceptable to about 10 percent of the population. Conventional bike lanes could create a low-stress bicycling environment, especially if on-street parking turnover is low. However, separated bike lanes are preferred because they would ensure a very low-stress bicycling environment that is suitable for most people and tie into the separated bike lane recommended to the east of Great Seneca Highway.

## BLACKWELL ROAD

(GREAT SENECA HIGHWAY TO BROSCART ROAD)

Blackwell Road is an existing, two-lane road with on-street parking between Great Seneca Highway and Broschart Road. The Great Seneca Science Corridor Master Plan recommends expanding it to a four-lane road with on-street parking.

- **Number of Through Lanes:** 2 existing, 4 planned at build-out.
- **Target Speed:** 30 mph.
- **On-Street Parking:** 2 sides of the street of existing parking.
- **Functional Classification:** Business District Street.
- **Master-Planned Right-of-Way:** 100 feet.



**Level of Traffic Stress:** Bicycling on Blackwell Road is currently a moderate-stress experience suitable for about 10 percent of the population. If the road is widened to four lanes, it will become a high-stress experience only acceptable to about 1-4 percent of the population.

## BLACKWELL ROAD

(BROSCHART ROAD TO MEDICAL CENTER DRIVE)

Blackwell Road is an existing, two-lane stub road with on-street parking between Broschart Road and Medical Center Drive. The Great Seneca Science Corridor Master Plan recommends expanding it to a four-lane road with on-street parking.

- **Number of Through Lanes:** 2 existing, 4 planned at build-out.
- **Target Speed:** 30 mph.
- **On-Street Parking:** 2 sides of the street.
- **Functional Classification:** Business District Street.
- **Master-Planned Right-of-Way:** 100 feet.



Looking east toward Medical Center Drive.

**Level of Traffic Stress:** When Blackwell Road is completed as a through street with four lanes and on-street parking, it will be a high-stress experience only acceptable to about 1-4 percent of the population.

## BLACKWELL ROAD

(MEDICAL CENTER DRIVE TO SHADY GROVE ROAD)

Blackwell Road is an existing, two-lane stub-road with on-street parking between Medical Center Drive and Shady Grove Road. The Great Seneca Science Corridor Master Plan recommends expanding it to a four lanes with on-street parking.

- **Number of Through Lanes:** 2 existing, 4 planned at buildout.
- **Target Speed:** 30 mph.
- **On-Street Parking:** 2 sides of the street exist.
- **Functional Classification:** Business District Street.
- **Master-Planned Right-of-Way:** 100 feet.

**Level of Traffic Stress:** When Blackwell Road is completed as a through street with four lanes and on-street parking, it will be a high-stress experience only acceptable to about 1-4 percent of the population.

# MIDWAY SEPARATED BIKE LANE

▶ The Midway Cycle Track travels along the proposed Broschart Road and Diamondback Drive between Medical Center Drive and the City of Gaithersburg.

## BROSCHART ROAD

(MEDICAL CENTER DRIVE TO BLACKWELL ROAD)

Broschart Road is an existing, two-lane road with on-street parking between Medical Center Drive and Blackwell Road. The Great Seneca Science Corridor Master Plan recommends converting the on-street parking to two additional traffic lanes. The Corridor Cities Transitway will run along the east side of Broschart Road in this location.

- **Number of Through Lanes:** 2 existing, 6 planned at build-out (including two transit lanes).
- **Target Speed:** 30 mph.
- **On-Street Parking:** Existing, but will be replaced with two traffic lanes.
- **Functional Classification:** Arterial.
- **Master-Planned Right-of-Way:** 150 feet, including Corridor Cities Transitway.



**Level of Traffic Stress:** Bicycling on Medical Center Drive is currently a moderate-stress experience suitable for around 10 percent of the population, but will become a high-stress experience when the existing on-street parking is converted to traffic lanes.

## BROSCART ROAD

(BLACKWELL ROAD TO KEY WEST AVENUE)

Broschart Road is an existing four-lane road between Blackwell Road and Key West Avenue. The Corridor Cities Transitway will run along the west side of Broschart Road in this location.



Looking north toward Key West Avenue

- **Number of Through Lanes:** 4 existing, 6 planned at build-out (including 2 transit lanes).
- **Target Speed:** 30 mph.
- **On-Street Parking:** None.
- **Functional Classification:** Arterial.
- **Master-Planned Right-of-Way:** 150 feet, including Corridor Cities Transitway.

**Level of Traffic Stress:** Bicycling on Medical Center Drive is currently a high-stress experience only acceptable to 1-4 percent of the population, due to the posted speed limit and the number of traffic lanes.

## DIAMONDBACK DRIVE

(KEY WEST AVENUE TO DECOVERLY ROAD)

Diamondback Drive is an existing, four-lane road with multiple turn lanes between Key West Avenue and Discoverly Drive. The Corridor Cities Transitway will run along the west side of this road. The LSC DANAC station will be located just south of the intersection with Discoverly Road.

- **Number of Through Lanes:** 4 existing, 6 planned at build-out (including 2 transit lanes).
- **Target Speed:** 30 mph.
- **On-Street Parking:** None.
- **Functional Classification:** Arterial.
- **Master-Planned Right-of-Way:** 150 feet, including Corridor Cities Transitway.



Looking north toward Discoverly Drive.

**Level of Traffic Stress:** Bicycling on Diamondback Drive is currently a high-stress experience only acceptable to 1-4 percent of the population, due to the posted speed limit and the number of traffic lanes.

**Status:** The Planning Department, MCDOT and MTA have agreed to one-way separated bike lanes along Diamondback Drive. The southbound separated bike lane is reflected in the 30 percent design plans for the CCT. However, the separated bike lanes on this road should be two-way on both sides of the road to facilitate access to the LCS DANAC station and to connect Discoverly Drive with Street B-2 and Research Boulevard.

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## DIAMONDBACK DRIVE

(DECOVERLY ROAD TO CROWN FARM)

Diamondback Drive is an existing, four-lane road between Key West Avenue and Decoverly Drive, with off-peak parking.

- **Number of Through Lanes:** 4 existing.
- **Target Speed:** 30 mph.
- **On-Street Parking:** Off-peak on both sides of the street.
- **Functional Classification:** Arterial.
- **Master-Planned Right-of-Way:** 100 feet.



**Level of Traffic Stress:** Bicycling on Diamondback Drive is currently a high-stress experience only acceptable to 1-4 percent of the population, due to the posted speed limit and the number of traffic lanes.



# LOWER LOOP SEPARATED BIKE LANE

▶ The Lower Loop Separated Bike Lane travels along the Johns Hopkins Drive, Medical Center Drive, and Omega Drive between Belward Campus Drive and the City of Gaithersburg.

## JOHNS HOPKINS DRIVE (BELWARD CAMPUS DRIVE TO KEY WEST AVENUE)

Johns Hopkins Drive is an existing, two-lane road with on-street parking. The Great Seneca Science Corridor Master Plan recommends expanding the road to four lanes by eliminating the on-street parking. The Corridor Cities Transitway will operate in the median.



- **Number of Through Lanes:** 2 existing, 6 planned at build-out (including 2 transit lanes).
- **Target Speed:** 25 mph.
- **On-Street Parking:** Existing, but will be converted to traffic lanes.
- **Functional Classification:** Arterial.
- **Master-Planned Right-of-Way:** 150 feet, including Corridor Cities Transitway.

**Level of Traffic Stress:** Bicycling on Johns Hopkins Drive is currently a low-stress experience suitable for most adults because it lacks through connections. However, when the road becomes a through street and when the existing on-street parking is converted to two additional traffic lanes, it will become a moderate stress road only acceptable to around 10 percent of the population.

**Status:** The Planning Department, MCDOT and MTA have agreed to one-way separated bike lanes along Belward Campus Drive. The northbound separated bike lane is reflected in the 30 percent design plans for the CCT.

## MEDICAL CENTER DRIVE EXTENDED

(KEY WEST AVENUE TO GREAT SENECA HIGHWAY)

Medical Center Drive Extended will be constructed from Key West Avenue to Great Seneca Highway as part of the redevelopment of the Public Safety Training Academy (PSTA) redevelopment project. It will be a four-lane road with the Corridor Cities Transitway running in the median.

- **Number of Through Lanes:** 6 planned (including 2 transit lanes).
- **Target Speed:** 30 mph.
- **On-Street Parking:** None.
- **Functional Classification:** Arterial.
- **Master-Planned Right-of-Way:** 150 feet, including Corridor Cities Transitway.

**Level of Traffic Stress:** Level of Traffic Stress: Bicycling on Medical Center Drive will be a high-stress experience only acceptable to 1-4 percent of the population, due to the speed limit and likely traffic volume.

## MEDICAL CENTER DRIVE

(GREAT SENECA HIGHWAY TO BROSCART ROAD)

Medical Center Drive is an existing, two-lane road with on-street parking. The Great Seneca Science Corridor Master Plan recommends expanding it to a four lanes by removing the on-street parking and adding two lanes for the Corridor Cities Transitway in the median of the road.



Looking east toward Broschart Road.

- **Number of Through Lanes:** 2 existing, 6 planned at build-out.
- **Target Speed:** 30 mph.
- **On-Street Parking:** Existing, but will be converted to traffic lanes.
- **Functional Classification:** Arterial
- **Master-Planned Right-of-Way:** 150 feet, including Corridor Cities Transitway.

**Level of Traffic Stress:** Bicycling on Medical Center Drive is currently a moderate stress experience, suitable for 10 percent of the population. When the existing on-street parking is converted to two additional traffic lanes, Medical Center Drive will become a high-stress bicycling experience only acceptable to only 1-4 percent of the population.

**Status:** The Planning Department, MCDOT and MTA have agreed to one-way separated bike lanes along Belward Campus Drive. The eastbound separated bike lane is reflected in the 30 percent design plans for the CCT.

## MEDICAL CENTER DRIVE

(BROSCHART ROAD TO BLACKWELL ROAD)

Medical Center Drive is an existing, two-lane road with on-street parking. The Great Seneca Science Corridor Master Plan recommends expanding it to a four lanes by removing the on-street parking.

- **Number of Through Lanes:** 2 existing, 4 planned at build-out.
- **Target Speed:** 30 mph.
- **On-Street Parking:** Existing, but will be converted to traffic lanes.
- **Functional Classification:** Arterial.
- **Master-Planned Right-of-Way:** 100 feet.



Looking north toward Blackwell Road.

**Level of Traffic Stress:** Bicycling on Medical Center Drive is a moderate stress experience, suitable for 10 percent of the population. When the existing, on-street parking is converted to two additional traffic lanes, Medical Center Drive will become a high-stress bicycling experience only acceptable to 1-4 percent of the population.

## MEDICAL CENTER DRIVE

(BLACKWELL ROAD TO KEY WEST AVENUE)

Medical Center Drive is an existing, two-lane road with on-street parking. The Great Seneca Science Corridor Master Plan recommends expanding it to a four lanes by removing the on-street parking.

- **Number of Through Lanes:** 2 existing, 4 planned at build-out.
- **Target Speed:** 30 mph.
- **On-Street Parking:** Existing, but will be converted to traffic lanes.
- **Functional Classification:** Arterial.
- **Master-Planned Right-of-Way:** 100 feet.



Looking north toward Key West Avenue.

**Level of Traffic Stress:** Bicycling on Medical Center Drive is a moderate stress experience, suitable for 10 percent of the population. When the existing, on-street parking is converted to two additional traffic lanes, Medical Center Drive will become a high-stress bicycling experience only acceptable to 1-4 percent of the population.

## OMEGA DRIVE (KEY WEST AVENUE TO RESEARCH BLVD)

Omega Drive is an existing, four-lane road.



- **Number of Through Lanes:** 4 existing.
- **Target Speed:** 35 mph.
- **On-Street Parking:** None.
- **Functional Classification:** Arterial
- **Master-Planned Right-of-Way:** 100 feet.

**Level of Traffic Stress:** Bicycling on Omega Drive is a high-stress experience only acceptable to 1-4 percent of the population.

# MUDDY BRANCH ROAD SEPARATED BIKE LANE

▶ The Muddy Branch Road Separated Bike Lane travels along Muddy Branch Road between Darnestown Road and Great Seneca Highway.

## MUDDY BRANCH ROAD (DARNESTOWN ROAD TO GREAT SENECA HIGHWAY)

Muddy Branch Road is an existing, four-lane major highway. The Great Seneca Science Corridor Master Plan recommends expanding it to a six-lane road with the Corridor Cities Transitway in the median. An interchange is recommended at the intersection of Great Seneca Highway and Muddy Branch Road.



Looking north toward Great Seneca Highway.

- **Number of Through Lanes:** 4 existing, 8 planned at build-out (including 2 transit lanes).
- **Target Speed:** 45 mph.
- **On-Street Parking:** None.
- **Functional Classification:** Major Highway
- **Master-Planned Right-of-Way:** 170 feet, including Corridor Cities Transitway.

**Level of Traffic Stress:** Level of Traffic Stress: Bicycling on Muddy Branch Road is a high-stress experience only acceptable to 1-4 percent of the population.

**Status:** The Planning Department, MCDOT and MTA have agreed to pursue two-way separated bike lanes on the east side of this road as part of the Corridor Cities Transitway and Belward Campus development.

# LONG-TERM BICYCLE PARKING RECOMMENDATIONS

Long-term bicycle parking stations are recommended to be located directly adjacent to the LSC Belward and LSC Central CCT stations. Both stations should accommodate approximately 100 bicycles. While the spatial requirements of such facilities will be determined through a more detailed evaluation, it is estimated that each station will be around 2,500 square feet in size.

These estimates were determined by:

1. Identifying the AM peak boardings at the CCT stations.
2. Determining the percent of bicycle parking for each CCT station based on the number of dwelling units within a 0.5 to 2.0 mile catchment area of the station.
3. Assuming 5 percent of total 2030 peak boardings for the CCT could be made by bicycle resulting in 488 bicycle parking spaces.<sup>3</sup>
4. Determining the allocation of bicycle parking spaces to station areas based on housing distribution.
5. Assuming that 67 percent of AM peak boardings by bicycle would require long term storage.<sup>4</sup>
6. Clustering the long-term parking into 3 locations.
7. Estimating the square footage requirement of each station based on 9 square feet per space, an additional 700 square feet per facility for support services, and adding space for site access and ancillary facilities.

| STATION      | A.M. PEAK BOARDINGS | DWELLING UNITS IN STATION AREA |             | BICYCLE PARKING SPACES |            |            | LONG TERM BICYCLE PARKING SPACES BY AREA |            |         |
|--------------|---------------------|--------------------------------|-------------|------------------------|------------|------------|--|------------|---------|
|              |                     | NO.                            | PERCENT     | TOTAL                  | LONG-TERM  | SHORT-TERM | TOTAL                                    | ROUNDED    | SQ. FT. |
| LSC BELWARD  | 465                 | 4,032                          | 27%         | 133                    | 89         | 44         | 89                                       | 100        | 2,400   |
| LSC WEST     | 591                 | 2,908                          | 20%         | 96                     | 64         | 32         | 103                                      | 100        | 2,400   |
| LSC CENTRAL  | 600                 | 1,118                          | 8%          | 37                     | 25         | 12         |  |            |         |
| DANAC        | 180                 | 592                            | 4%          | 20                     | 14         | 6          |  |            |         |
| CROWN FARM   | 1,614               | 890                            | 6%          | 29                     | 19         | 10         | 136                                      | 140        | 2,900   |
| WEST GAITHER | 816                 | 324                            | 2%          | 11                     | 7          | 4          |  |            |         |
| EAST GAITHER | 234                 | 1,748                          | 12%         | 58                     | 38         | 20         |  |            |         |
| SHADY GROVE  | 5,265               | 3,211                          | 22%         | 106                    | 72         | 34         |  |            |         |
| <b>TOTAL</b> | <b>9,765</b>        | <b>14,824</b>                  | <b>100%</b> | <b>488</b>             | <b>328</b> | <b>162</b> | <b>328</b>                               | <b>340</b> |         |

<sup>3</sup> Association of Pedestrian and Bicycle Professionals (APBP) guidelines recommend 2 percent of boardings for short-term parking and 7 percent for long-term parking. For purposes of this planning framework, 5 percent is used to consolidate the range of parking required; Source: APBP Bicycle Parking Guidelines 2nd Edition, 2010.

<sup>4</sup> Recommended adjustments to Washington Metropolitan Area Transit Authority (WMATA) bicycle parking guidelines suggest two-tiered high capacity parking comprise 65 percent of total bicycle parking at the Silver Spring Metrorail station. For purposes of this planning framework, 67 percent two-tiered parking is used; Source: Toole Design Group, 2014



A separated bike lane in Austin, Texas  
(Source: Jeff Owen).



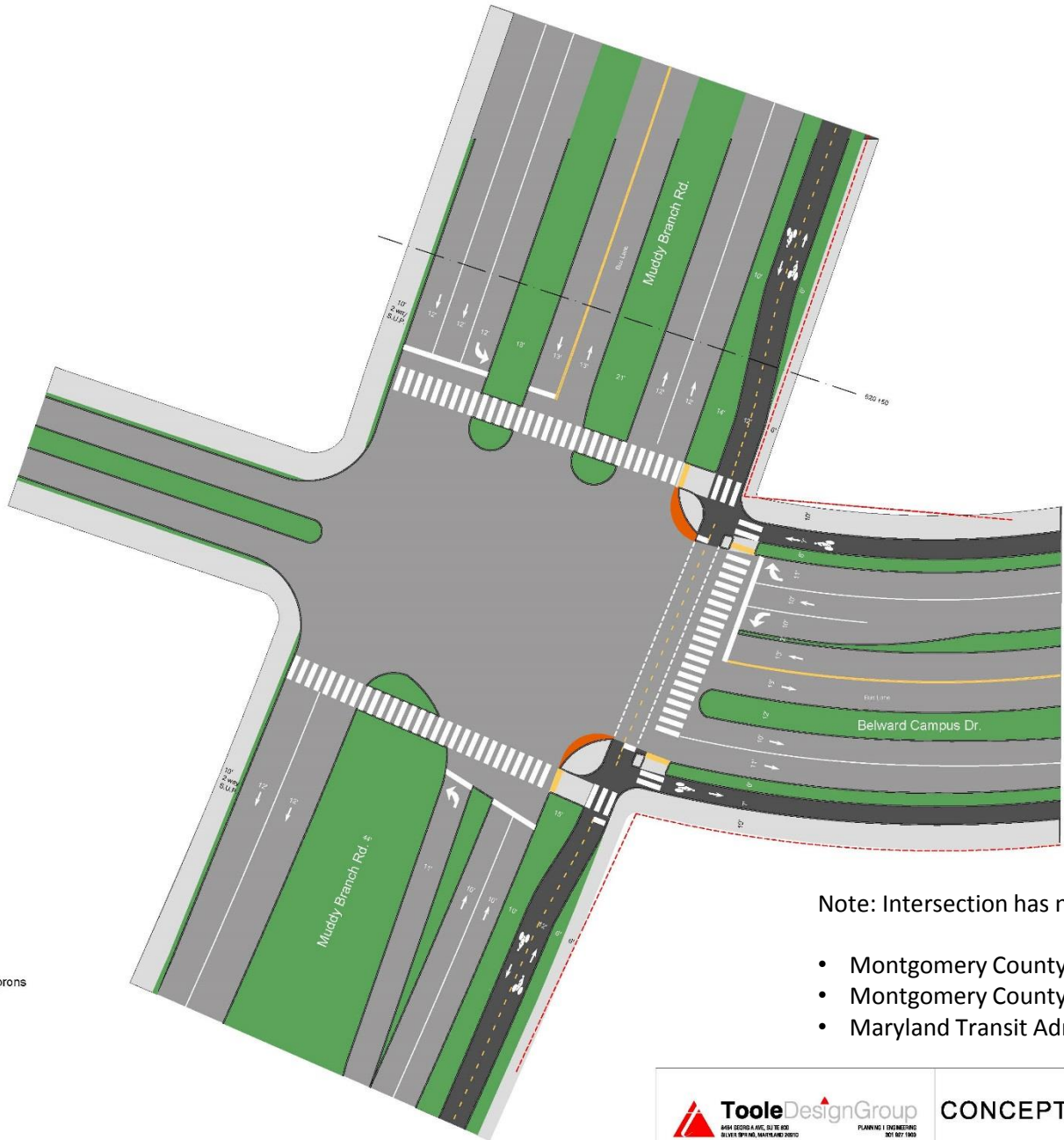
**DRAFT LIFE SCIENCES CENTER  
BICYCLE NETWORK PROPOSAL**  
JANUARY 2016

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THE MONTGOMERY COUNTY PLANNING DEPARTMENT 



# ATTACHMENT A: Conceptual Design for Future Intersection of Muddy Branch Rd & Belward Campus Dr

|       |                                    |           |              |
|-------|------------------------------------|-----------|--------------|
| STATE | PROJECT                            | SHEET NO. | TOTAL SHEETS |
| MD    | MD, DC, LOW STRESS DRIVING NETWORK | CD1       | 303          |



### Legend

-  Buffers and Medians
-  Sidewalks and Islands
-  Separated Bike Lane
-  Road
-  Mountable Medians and Aprons
-  Pedestrian Crosswalks
-  Bike Crosswalks
-  Right Of Way

Note: Intersection has not yet been evaluated by

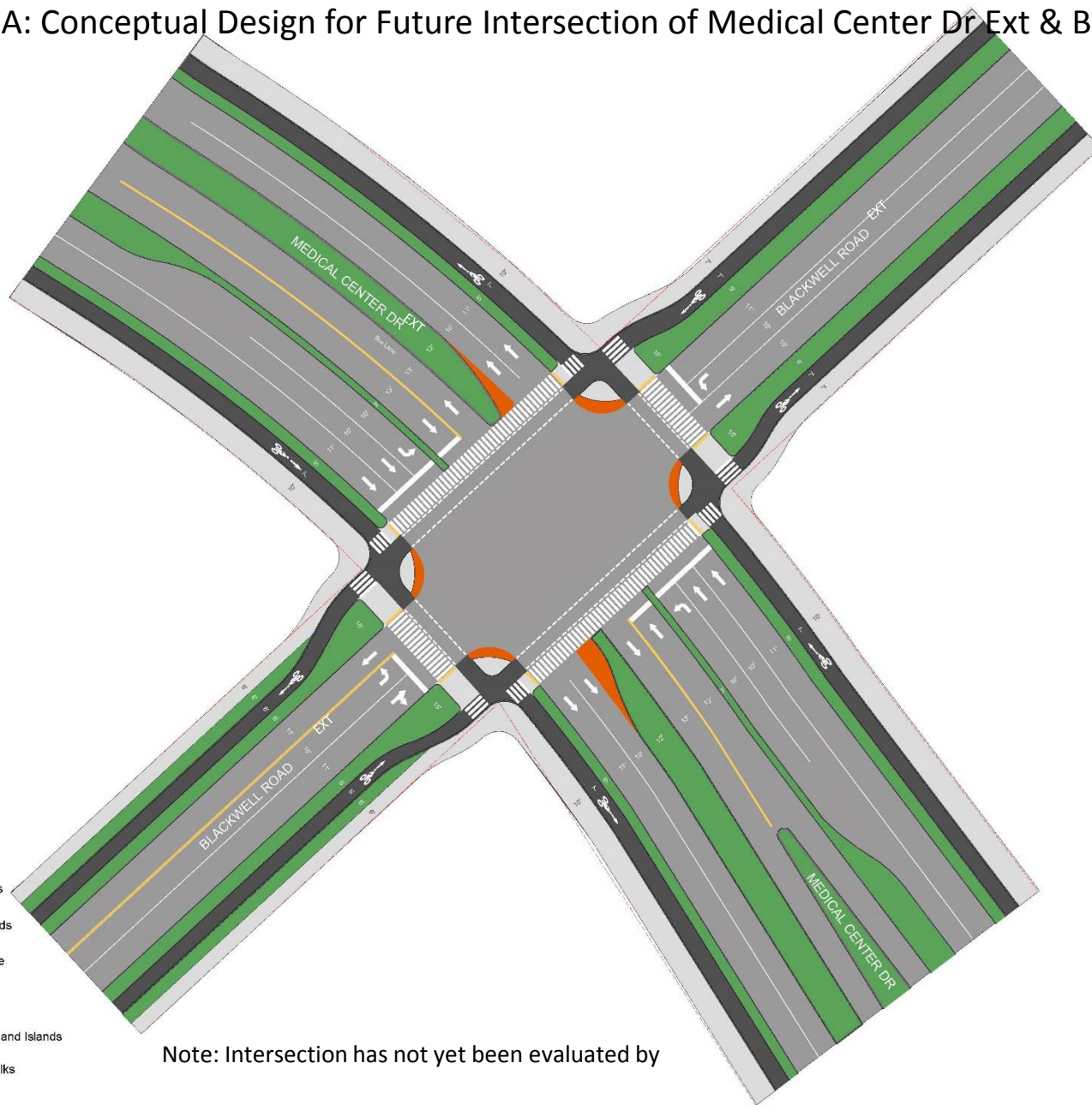
- Montgomery County Dept of Transportation
- Montgomery County Dept of General Services
- Maryland Transit Administration




CONCEPT JANUARY 15, 2016

# ATTACHMENT A: Conceptual Design for Future Intersection of Medical Center Dr Ext & Blackwell Dr Ext

|       |         |       |       |
|-------|---------|-------|-------|
| STATE | PROJECT | SHEET | TOTAL |
| MD    | MDOT    | 003   | 003   |



Legend

-  Buffers and Medians
-  Sidewalks and Islands
-  Separated Bike Lane
-  Road
-  Mountable Medians and Islands
-  Pedestrian Crosswalks
-  Bike Crosswalks
-  Right Of Way

Note: Intersection has not yet been evaluated by

- Montgomery County Dept of Transportation
- Montgomery County Dept of General Services
- Maryland Transit Administration



CONCEPT JANUARY 15, 2016

Attachment B: Responses to Comments on Life Sciences Center Bicycle Network Proposal

|    | <b>Agency</b> | <b>Comment</b>   | <b>Staff Response</b>  |
|----|---------------|--|--|
| 1. | MCDOT         | Comments shared at this time assume that these are draft recommendations that have not been reviewed by the Planning Board nor adopted by the County Council. Additional reviews by MCDOT will be needed prior to final design and implementation.   | We understand.   |
| 2. | MCDOT         | The document assumes that the CCT will pass by Belward Farm. Therefore, numerous changes should be done throughout the document.   | We agree.  |
| 3. | MCDOT         | One of the changes that needs to be done, due to above assumption, is to indicate what should be done with the big proposed bike accommodation at Belward Farm.  | We disagree. While the 30% design for the Corridor Cities Transitway no longer include a transitway through the Belward Farm, the master plan recommendation for a transitway through the Belward Farm remains. Therefore, we do not envision changing this recommendation in light of the changes to the CCT 30% design.  |
| 4. | MCDOT         | In the table of page 13, it is mentioned that the CCT 30% design drawings include the segment on John Hopkins Dr, from Belward Campus Dr to Key West Ave. In the same table, it is not mentioned that the CCT 30% design drawings include the section on Broschard Rd, from Medical Center Dr to Key West Ave. | The chart will be updated to reflect that the CCT 30% designs no longer include separated bike lanes on Belward Campus Drive and Johns Hopkins Drive because MTA has removed the transitway from the Belward Farm.   |
| 5. | MCDOT         | Consider adding a note to table on page 13 indicating why no reference is being made to the section between Diamondback Dr and Shady Grove Blvd on the Northway cycle track. Also in the same table, add a note referring to the absence of the spurs.   | Street B-2 was inadvertently left off the table on page 13. We will add it.  |
| 6. | MCDOT         | Page 15 "Status..MCDOT and MTA have agreed" – Please revise this statement to note that MCDOT and MTA have agreed in concept. Final design and implementation will depend upon Master Plan adoption and available right-of-way.  | We will change the status of the Belward Campus Drive section to:<br><br>"The Montgomery County Planning Department, Montgomery County Department of Transportation (MCDOT) and Maryland Transit Administration (MTA) have agreed in concept to pursue one-way separated bike lanes along Belward Campus Drive as part of the Johns Hopkins Belward Campus development. Implementation will be pursued as part of the development review process." We do not agree that implementation is dependent upon Master Plan adoption, since the purpose of this proposal was to come to a consensus on a bikeway network in this area in advance of the adoption of the plan. |
| 7. | MCDOT         | Page 18 " Level of Traffic Stress re: Blackwell Road" Recommend changing "Once the road is widened to four lanes" to "if the road is widened to four lanes as planned."  | We agree.  |
| 8. | MCDOT         | Map, p. 11: To help orient readers would suggest map of LSC bikeway network on Page 11 include   | We agree.  |

Attachment B: Responses to Comments on Life Sciences Center Bicycle Network Proposal

|     | Agency | Comment   | Staff Response   |
|-----|--------|---|--|
|     |        | labels on I-270, Sam Eij Hwy, and perhaps a few other key features in the area (e.g., SG Adventist Hospital, NCI, JHU, USG, Rio(?))   |  |
| 9.  | MCDOT  | On-street parking: This can help buffer cyclists and pedestrians from auto traffic. In a number of instances existing on-street parking is referenced in the Bicycle Network Plan as being recommended in the GSSC plan to be eliminated to provide additional traffic lanes. Since this bikeway plan is re-examining elements of the GSSC Master Plan is it possible some of those streets could be recommended to retain (or add) on-street parking – esp where there is no separated bikeway proposed? (Sample of this use of on-street parking as buffer is featured in the final photo from Austin at end of the document.)  | There are existing and proposed bike lanes on several major highways in the Life Sciences Center area (Muddy Branch Rd, Key West Ave, Darnestown Rd, Shady Grove Rd), but these are not appropriate for on-street parking since the posted speed limits are 40 and 45 mph.   |
| 10. | MCDOT  | <p>Secure/Long Term Bike Parking Stations Recommendations</p> <ul style="list-style-type: none"> <li>• Page 10 references 2 such facilities and map shows 2. Intro to this section on p. 28 also references 2:</li> <li>• LSC Belward &amp; LSC Central CCT stations, but Item #6 in that discussion references 3 locations and chart also shows 3 locations.</li> <li>• In addition the numbers in the chart seem to indicate a need for 328 long term bike parking spaces which could only be provided with 3 bike parking stations.</li> <li>• Where is 3rd location?</li> <li>• If the 3rd bike parking station site is outside the scope of this plan that should be clarified.</li> <li>• Could a 3rd bike parking facility be recommended for one of CCT stations on the other side of Darnestown Road – e.g., at USG campus – so that those communities would not need to cross Darnestown Road to access such a facility?</li> </ul> | <p>Our analysis shows that a third bicycle parking station is needed between the Crown Farm and Shady Grove Road CCT stations. This is outside of the scope of the Life Sciences Center Bicycle Network Proposal, but will be investigated as part of the Bicycle Master Plan.</p> <p>While a bicycle parking station at the Universities of Shady Grove campus may benefit cyclists traveling to and from the campus, it would not likely benefit cyclists that are accessing the CCT. Most cyclists would likely ride to a bicycle parking station at the LSC Central station where the CCT headway will be about 6 minutes on the mainline instead of riding to the USG campus where the headways on the spur service are about 15 minutes.</p> |
| 11. | MCDOT  | The protected intersection comment is meant to be applied to those intersections where two major separated bikeway facilities intersect.  | Not necessarily. The MassDOT Separated Bike Lane Planning & Design Guide (page 88) indicate that protected intersections are appropriate where separated bike lanes transition to shared lanes and conventional bike lanes.  |
| 12. | MCDOT  | Maintenance requirements and recommendations for the separated bikeways should be included in the document. Include guidance as to how the plan envisions maintenance, particularly for facilities above & beyond a standard application.   | Master plans do not typically discuss maintenance requirements.  |
| 13. | MCDOT  | The adjacent LSC loop concepts should be referenced in the text of each master plan link recommendation.  | We agree. This will be included in the staff's Working Draft Plan.   |

Attachment B: Responses to Comments on Life Sciences Center Bicycle Network Proposal

|     | Agency | Comment   | Staff Response   |
|-----|--------|---|--|
| 14. | MCDOT  | Page 21 – Status: MCDOT sees challenges with the recommendation that the separated bike lanes on Diamondback Drives should be two-way on both sides of the road.  | We need more information about what the challenges are before we can address them.   |
| 15. | MCDOT  | Confirm that no bicycle-focused facilities are proposed or desired along the CCT loop through the USG area.   | We will reconsider bikeway recommendations on the CCT loop through the Universities of Shady Grove area as part of the staff’s Working Draft Plan.   |
| 16. | MCDOT  | Be mindful of any case where additional ROW is required, or if modifications to the curb lines are necessary. Both will significantly increase costs and reduce the speed of implementation. Any impacts to existing tree lines will have the potential of losing existing trees.   | There are many ways to achieve separated bike lanes. Staff have developed one approach to prove that the concept is feasible largely within the existing right-of-way. As we move toward implementation either through facility planning projects or development approvals all of these issues will need to be considered.   |
| 17. | MCDOT  | It appears that separated bike lanes and shared use paths are both proposed along many corridors. While we recognize this may be the intent (particularly along the LSC loop), note that having the option to reallocate ~3-5 ft of pavement (beyond a standard sidewalk) from shared use paths toward separated bike lanes could, generally speaking, offer the potential to reduce implementation costs (and subsequently increase speed of implementation).  | We agree that there is overlap between the benefits provided by separated bike lanes and those provided by shared use paths. We will be evaluating this in the coming months and may ultimately recommend removing shared use paths where they parallel separated bike lanes on the same road as part of the Working Draft Bicycle Master Plan. However, until that evaluation is complete we are leaving the shared use paths in the plan. Furthermore, the separated bike lanes are in areas that will have a high amount of pedestrian activity that requires wider sidewalks, so the reallocation of space may not be advisable. |
| 18. | DGS    | Page 13 – The row for Medical Center Drive Extended from Key West Avenue to Great Seneca Highway includes multiple specific suggestions, including one-way bikeways on both sides of the street. The cell under “Status” for the Medical Center Drive Extended bikeway from Key West Avenue to Great Seneca Highway states that the “County will pursue with PSTA redevelopment.” As redevelopment of the PSTA site is still in the very early stages, please remove this sentence from future drafts. DGS will continue to work with M-NCPPC, MCDOT, MTA, and other relevant parties as plans for PSTA redevelopment progress. | We will make this change.  |
| 19. | DGS    | Page 13 – Footnote 1 states that there has been agreement to certain segments of the proposed bike network as part of the Corridor Cities Transitway. While DGS has been involved in initial discussion on the bikeways as part of the CCT, no final agreements have been made. Please remove this footnote from future drafts.   | We will make this change.  |
| 20. | DGS    | Page 24 – Under the Medical Center Drive Extended from Key West Avenue to Great Seneca Highway section, the Status portion states the   | We will make this change.  |

Attachment B: Responses to Comments on Life Sciences Center Bicycle Network Proposal

|     | Agency | Comment   | Staff Response            |
|-----|--------|---|---------------------------|
|     |        | MCDGS has agreed to implement one-way separated bike lanes when the current PSTA site redevelops. Again, DGS has been involved in initial discussion only regarding redevelopment of the PSTA site, including appropriate cross sections. Please remove the “Status” sentence from future drafts.   |                           |
| 21. | DGS    | Additionally, on page 13, the cell under “Status” for the Belward Campus Road bikeway from Muddy Branch Road to John Hopkins Drive states that the “County will pursue with JHU development.” This is a private development; the County will make comments and be involved as it would in any other development review capacity. To avoid confusion, we recommend that this sentence be removed from future drafts. | We will make this change. |