BALTIMORE CITY BIKE MASTER PLAN

photo courtesy of Brian O'Doherty

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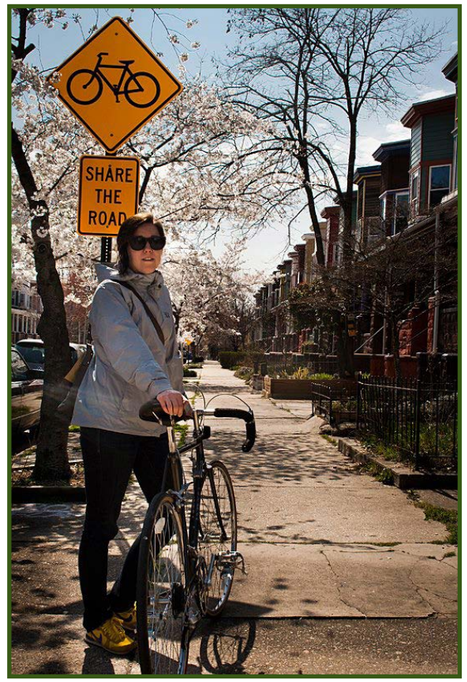

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MARCH 2015

2015 BALTIMORE CITY BIKE MASTER PLAN

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STATEMENT FROM MAYOR STEPHANIE RAWLINGS-BLAKE

Expanding Baltimore's network of sustainable transportation opportunities is a critical component of both retaining residents and attracting new families to our City. Whether they are daily commuters to downtown jobs or families out for recreational weekend rides, it's impossible to miss the growing popularity of cycling in our City. To support this sustainable transportation, our City – like other urban jurisdictions – must create an active infrastructure that is safe and comfortable for residents to use. This plan outlines bicycle infrastructure improvements that will meet many of our residents' needs going forward.

While having a rich history of cycling, Baltimore is a relative new-comer to the modern bicycle movement. In five short years, we have made incredible advances to make cycling safer and more convenient. The 2006 Bicycle Master Plan made substantial strides in adding bicycle infrastructure to our transportation system. However, as we push toward our goal of adding 10,000 families to our City, an expanded commitment to this infrastructure is needed. The 2014 Bicycle Master Plan Update outlines a detailed plan that will make biking an important part of attracting families to live in the City.

Baltimore is striving to become a more livable city, which means a more bikeable city. That goal means we need to further improve cycling conditions for families. This plan outlines a strategic use of roads for bike facilities that will make biking more comfortable and safer for existing and prospective riders. These facilities have been proven to be attractive neighborhood amenities with economic, health and social benefits.

In addition to implementing more bike infrastructure, we are proud to have our office create the Mayor's Bicycle Advisory Commission (MBAC). The MBAC will be a commission that serves to help guide the implementation of the Bicycle Master Plan Update and advise the Mayor's office on bicycle-related issues in the City.

I am proud to see the completion of the 2014 Bicycle Master Plan Update and I look forward to seeing modifications to Baltimore's streets and neighborhoods to help us achieve a vision of a bikeable city that is attractive and safe for residents.

STATEMENT FROM THE DIRECTOR OF THE DEPARTMENT OF TRANSPORTATION

The City of Baltimore holds a proud position as a vital and growing city in the Mid-Atlantic region. Now, more than ever, sustainable transportation is a key part of the story in Baltimore City. The Department of Transportation (DOT) is committed to providing a safe and sustainable multi-modal transportation system to the residents of Baltimore. The DOT seeks to support the City's goal of adding 10,000 families in 10 years and building a safe, reliable network of bicycle infrastructure is essential to creating a sustainable transportation system.

In 2006, Baltimore City adopted the first Bicycle Master Plan, and in 2015 Baltimore City DOT updated that plan with a vision to build an 8 percent mode split of commuter cycling by 2030. Approximately 1% of commuters use biking as their primary mode and bicycle commuter traffic has increased over 40% since quarterly counts began in 2009. Bicycling continues to grow as a mode within Baltimore City and across Maryland. The vision outlined in this plan will continue to promote growth in the mode and encourage people to commute by bicycle.

Our City continues to improve the bicycle network by implementing new infrastructure throughout its neighborhoods. The DOT is committed to building a more robust, connected bike network. Strategically planning and building appropriate bicycle facilities is necessary in order to encourage people of all ages and abilities to choose bicycling as their mode of transportation. The DOT is committed to building bicycle facilities that will encourage people of all ages and walks of life to ride a bike.

Bicycle infrastructure has shown to improve the quality of life on local streets and provide numerous health and economic benefits for residents and local businesses. The DOT seeks to uphold the Complete Streets policy and design streets that support our local economy and residents and promote Baltimore's unique character and culture.

The Baltimore City DOT is proud to present and adopt this vision for our City and we look forward to working diligently and aggressively towards building a safer and more comfortable bike network for Baltimore City residents.

EXECUTIVE SUMMARY

This Master Plan Update establishes the vision, reviews progress made since the 2006 Bike Master Plan, specifies goals and objectives, and provides recommendations to make Baltimore more bicycle-friendly in the next 15 years.

Vision

Bicycling is an important piece of a multi-modal urban transportation network, and provides numerous benefits and a personal, localized and regional level. Bicycling benefits an individual's health, is cost efficient, generates economic growth, conserves resources, reduces the impacts to the environment, and reduces traffic congestion. Cities across the nation have made significant improvements providing access to safe and user-friendly bicycling facilities, and Baltimore is heading in the same direction. In the next 15 years, Baltimore should experience a paradigm shift that places a higher priority on multi-modal infrastructure and more Complete Streets.

Current Conditions in Baltimore

Baltimore has a burgeoning bicycling culture and has seen significant increases in the numbers bicyclists. With dedicated funding, over 100 miles of bicycle facilities have been installed in the past decade. Furthermore, a 50% annual increase in bicycle commuter traffic has been documented with regular bicycle counts over the past few years. Recent accomplishments since the adoption of the 2006 Master Plan include a full-time Bike Planner on staff with the Baltimore City Department of Transportation, better integration of bicycles with transit and streets, increasing numbers and participation in bicycling events, and publication of the Baltimore Bike Map. However, barriers still exist, and improvements are still necessary to improve safety, connect network gaps, and balance the needs of bicyclists with other roadway users.

Promoting Complete Streets

Complete streets balance the needs of all road users, including pedestrian, bicycle, transit, and vehicular modes. In some cases, freight should also be considered as a part of the equation. Complete Streets will recognize which transportation modes have a priority and which modes may need to reduce service in order to accommodate other modes most effectively given the roadway context. Historically, vehicular modes have had a priority at the expense of non-motorized modes. However, more livable communities place a higher priority on pedestrian, bicycle, and transit modes. Making streets safer to walk or bike may require a reduction in service for automobiles. Identifying the right balance and prioritizing the limited right of way to provide improved comfort all modes may be necessary in some communities to provide more context-sensitive and complete streets.

Proposed Bicycle Routes and Facility Types

Increasing bicycle infrastructure and better integration of bicycle facilities within the roadway network will greatly improve safety for bicyclists and can help attract more people to choose biking as a viable mode of transportation. A comprehensive expansion of the bicycle route network is proposed integrating bicycle facilities with the roadway network using new innovations in bike facility design and more Complete Street principles that improve safety and livability for all roadway users.

Standards for Bicycle Oriented Development

Improving development patterns to be more bicycle-oriented can increase interest and comfort of potential bicyclists. Bicycle infrastructure and amenities, such as bike racks and Bike Share, should be incorporated in new development and redevelopment projects, and should be promoted for established developments. A formalized bicycle-friendly business recognition program can help to promote a stronger bicycle culture throughout the city. This type of development and recognition has the potential to attract economic growth with ties to the bicycling community, and make bicycling a more attractive alternative for daily commuting.

Proposed Policies for a Bicycle-Friendly City

Creating a strong, bicycle-friendly city takes more than just infrastructure. Leadership and collaboration from policy makers and their constituents are necessary. Stakeholders of bicycling in Baltimore involve many groups, including elected officials, city planners and engineers, the Police Department, the business community, advocacy groups, and Baltimore's citizens. Collaboration among all stakeholders will be important to foster the changes that make a more bicycle-friendly city. New policies are proposed that focus on legislation, engineering, culture, law enforcement, and recreation to create a more bicycle-friendly city.

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I. INTRODUCTION

This Master Plan Update establishes the Vision for the next 15 years, which is detailed in Section II. Also included within this plan is a review of progress made to date in Section III, recommendations for expanding infrastructure in Section IV, promoting more bicycle-oriented development in Section V, and establishing policies to promote a more bicycle-friendly city in Section VI. An implementation plan and checklist is outlined in Section VII.

Baltimore's first Bicycle Master Plan was adopted in 2006, and it has helped improve bicycling throughout the City. This update to the Baltimore Bicycle Master Plan illustrates the continued importance of bicycling, the successes that have occurred since the city's 2006 Bicycle Master Plan, and provides recommendations for additional infrastructure and policies to promote Baltimore as a more bicycle-friendly city. This Master Plan is built on public input and stakeholder engagement, which have helped to identify areas for improvement and build support for better bicycling opportunities. This Master Plan also incorporates some new and innovative facility types and policy recommendations that have proven successful in other cities.

Bicycling can be a safe and convenient transportation mode and recreation activity available to everyone throughout the City. Baltimore has made significant progress towards this vision since the adoption of the 2006 Bicycle Master Plan, and the City continues to make progress towards becoming a more bicycle-friendly city. However, additional goals still need to be met. All city streets, except interstate highways, are open to bicyclists, but not everyone feels safe or comfortable using the streets. Therefore, additional work is needed to attract more bicycling in Baltimore.

As bicycling in Baltimore continues to grow, new innovations and trends are being embraced to make Baltimore a more bicycle-friendly city. Bicycling numbers can become stagnant or decline if the City does not work to improve infrastructure and policies that will improve conditions for bicycling.

GOAL 1: IMPROVE BICYCLE INFRASTRUCTURE (SEE SECTION IV)

GOAL 2: IMPROVE DEVELOPMENT PATTERNS TO BE MORE BICYCLE-ORIENTED (SEE SECTION V)

GOAL 3: ENACT BICYCLE-FRIENDLY LEGISLATIVE POLICES (SEE SECTION VI)

GOAL 4: ESTABLISH AND REFINE BICYCLE FACILITY ENGINEERING POLICIES (SEE SECTION VI)

GOAL 5: BUILD A STRONGER BICYCLE CULTURE (SEE SECTION VI)

GOAL 6: STRENGTHEN LAW ENFORCEMENT TO IMPROVE BICYCLING SAFETY (SEE SECTION VI)

GOAL 7: IMPROVE BICYCLING OPPORTUNITIES IN RECREATIONAL AREAS (SEE SECTION VI)

photo courtesy of Brian O'Doherty

The Falls Road bike trail in Midtown Baltimore

Druid Hill Park Lake bike trail

Baltimore's Harbor Promenade

II. VISION

A. Why Bicycling is Important

Bicycling benefits an individual's health, is cost efficient, generates economic growth, conserves resources, reduces the impacts to the environment, and reduces traffic congestion. There are many reasons to choose biking as your mode of transportation.

1. Transportation

Bicycling as a form of transportation can be more healthy, economical, and environmentally sustainable. In an urban setting like Baltimore, it can also be quicker than driving, walking, or taking transit. When faced with congested traffic conditions, bicyclists can easily traverse the same mileage as a car in less time. Bicycling also helps makes neighborhoods more cohesive and brings people to together in positive ways. Bicycling should be a viable option for people choosing how to get to their destinations, whether it is home, work, learning or play. For every person who chooses to ride a bike, that is one less car or one less seat taken on transit, making all other modes less congested. A complete network of bicycle facilities is a necessity for the infrastructure of cities to sustain a broad set of affordability for its residents while providing choice out of necessity or emergency needs. Bicycling is a cost effective mode of transportation that can increase mobility for people without a personal vehicle. Baltimore includes pockets of disadvantaged or low-income communities with relatively high percentages of households without access to a personal vehicle. Bicycling is a viable option that can be a fast and cost-effective mode for travel throughout the city. A low-stress and safe bicycling network is important to make all people feel comfortable enough to choose bicycling as a preferred mode of transportation.

2. Health

As a low-impact, cardio-vascular exercise that will burn calories, tone muscles, and reduce stress, this type of exercise has been shown to improve moods and productivity and be therapeutic, releasing endorphins. Studies have shown that people who take up bicycling for commuting have benefitted from weight loss, higher energy levels and are more productive once they arrive to work. These changes in design and how residents use our transportation system, can have ripple effects on the health of our City.

3. Economy

Purchasing and maintaining a bicycle is much less expensive than having a car, and choosing to bike instead of drive can save money on car payments, parking, gasoline, maintenance, and insurance. Some may even save money on health related expenses such as gym memberships or medical bills because of the health benefits gained from bicycling. According to estimates by Transportation Alternatives, bicycle riding costs the frequent bicyclist only one-quarter as much as driving. The national average in savings is $1,100 per year. Estimates could be higher in parts of Baltimore where commuters pay as much as $200 or more for monthly parking costs alone.

Bicycling is also good for the local economy. Bicyclists often take shorter and more frequent trips, which puts more local money into the economy to support individual neighborhoods and feed into the City's economy as a whole. In 2008, Portland, Oregon saw $90 million in economic activity related to retail, services, manufacturing and special events. This was a 38% increase from 2006 after new bike infrastructure had been installed (AP+D, 2008.) Property values may also rise in more bicycle-friendly neighborhoods. Studies have shown that communities with good access to bike facilities are more desirable and home sales prices are 11% higher on average than communities without bicycle amenities (Lindsey et al.)

Investments to improve bicycle infrastructure are shown to have a positive economic impact on job growth as well. The Political Economy Research Institute (PERI) at the University of Massachusetts took an in depth look at the economic benefits of the bicycle culture in Baltimore. The report examines the differences in employment growth influenced by investment in pedestrian and bicycle infrastructure verses investment in infrastructure for motorized traffic. The study cites increases in jobs related to engineering, construction, material manufacturing, and bicycle shops as well as induced effects that increase jobs in other sectors such as retail, health care, and food service. For every $1 Million invested in bike lanes, Baltimore has seen an increase of 14.4 jobs. For every $1 Million invested in pedestrian infrastructure, Baltimore has seen an increase of 11.3 jobs. Comparatively, $1 Million invested in roadway repairs results in 7 jobs. The report finds that pedestrian and bicycle investment has had a higher return with a growing economy and bicycle culture (Garrett-Peltier, 2010.)

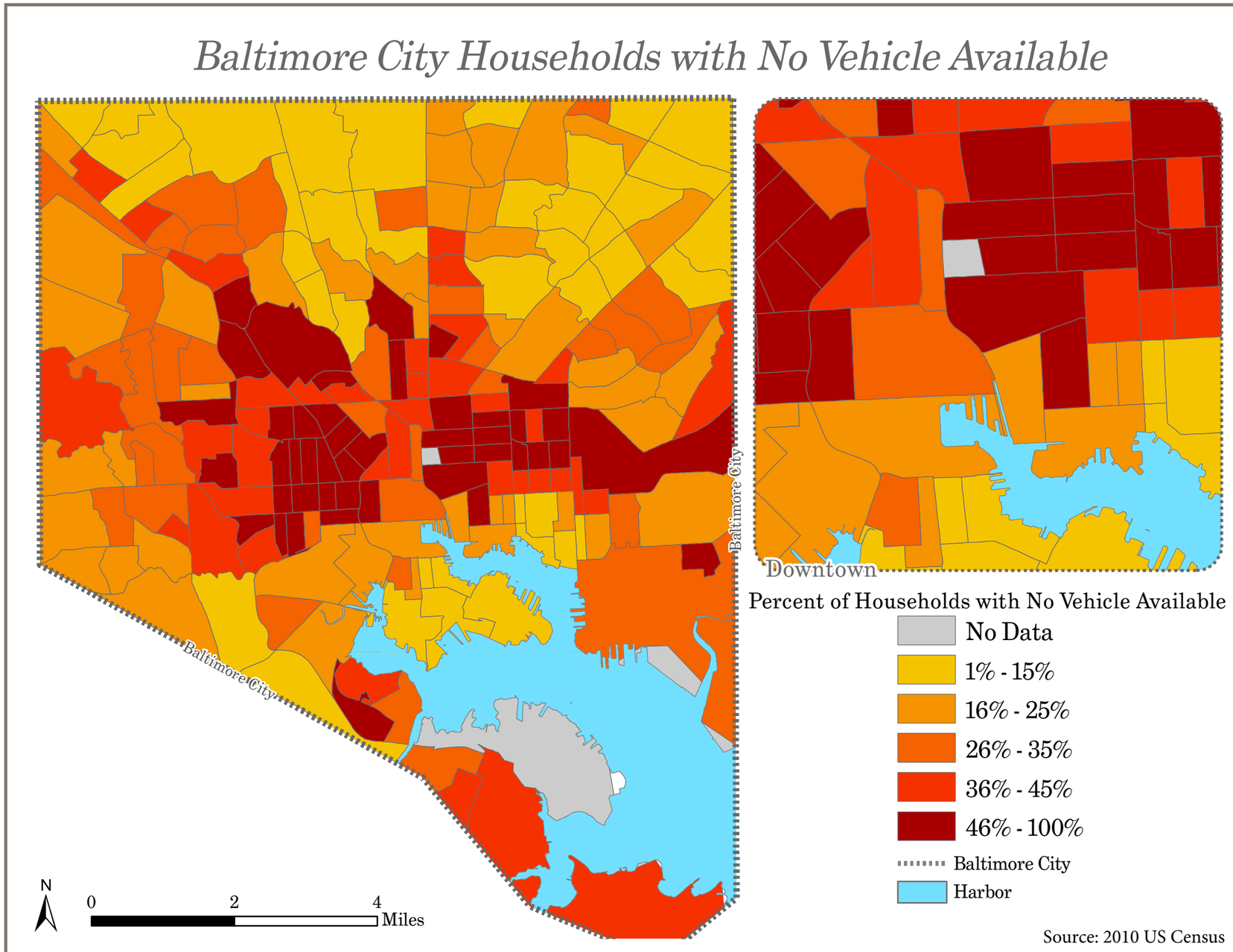
Increased economic activity and property values would be a great benefit to the City. This is particularly important as the City of Baltimore competes with surrounding jurisdictions to attract economic activity. The dense, urban fabric and grid-patterned streets present conditions ideal for biking.

Bicycling is a cost effective mode of transportation that can increase mobility for people without a personal vehicle. Baltimore includes pockets of disadvantaged or low-income communities with relatively high percentages of households without access to a personal vehicle. Bicycling is a viable option that can be a fast and cost-effective mode for travel throughout the city. A low-stress and safe bicycling network is important to make all people feel comfortable enough to choose bicycling as a preferred mode of transportation.

photo courtesy of Ken Sherman

Gwynns Falls Trails

photo courtesy of The Baltimore Sun



4. Environment

Bicycling is energy efficient and helps reduce environmental impacts and improve air quality. This human-powered and emission-free transportation mode has a very low carbon footprint. When compared to automobiles, bicycles are quieter, pollution-free, and require significantly less resources, such as tire rubber and metals. Bicycle facilities also require less space for travel lanes and parking, which limits the impact on the environment and the need to treat stormwater management for vast expanses of impervious pavement. These benefits are especially attractive in places like Baltimore, where traffic congestion, air quality, and water quality are significant issues.

The Baltimore Office of Sustainability has issued a Sutainability Plan that includes bicycle and pedestrian infrastructure and policies. This plan works to address the sustainability of Baltimore's environment and transportation system. A core part of the Plan reccomends implementing the Baltimore Bicycle Master Plan Update. Additional reccomendations and metrics in the Sustainability Plan are supported in this plan.

B. Comparing other Cities

No two cities are alike, but we can learn a lot from the innovations of other cities as they expand and improve upon their bicycle networks. Cities across the nation are improving their bicycle infrastructure and policies and seeing dramatic returns with higher bicycling numbers and improved safety.

Four cities that bring bicycling to the forefront of the city's transportation system are the District of Columbia, New York City, Chicago and Portland. Their bicycle programs are highlighted below:

National Leaders in Bicycle Infrastructure

DISTRICT OF COLUMBIA

Washington, DC has seen significant increases in bicycle infrastructure as well as bicycle ridership in recent years. The District Department of Transportation (DDOT) has a well-established and very successful Bicycle Program that is committed to providing safe and convenient bicycle access throughout the city. Washington has over 56 miles of bike lanes and 56 miles of multi-use trails, and DDOT has installed over 2,300 public bike racks since 2001. Washington also has an impressive Bike Share system that offers over 1,500 bikes at 137 stations city-wide. Bicycle commuter numbers have increased over 300% since 1990, and over 50% in the past decade. This closely correlates with the installation of new bike facilities, which has more than doubled in the past decade. (DDOT, 2012)

NEW YORK

New York City doubled bicycle commuting between 2007 and 2011, and aims to triple it by 2017. The New York City DOT has completed the City's ambitious goal of building 200 bike-lane miles in all five boroughs in just three years, nearly doubling the citywide on-street bike network while reshaping the city's streets to make them safer for everyone who uses them. A public bike share system, CitiBike, opened in May of 2013 with over 600 stations and 10,000 bikes (bicycling.com). In the first week, members had made more than 6,000 bike trips, and traveled over 13,000 miles. By its second month, CitiBike users averaged between 25,000 and 30,000 trips per day. (nyc.gov).

CHICAGO

Chicago is recognized as one the best large cities for bicycling. Chicago currently has more than 170 miles of on-street protected, buffered and shared bike lanes, many miles of off-street paths, more than 13,000 public bike racks, and sheltered, high-capacity, bike parking areas at many transit stations. Chicago's Bike Share system launched in 2013 with 300 Stations and over 4,000 bikes (ChicagoBikes.org)

PORTLAND

Portland, Oregon is recognized as a world class bicycling City with the Nation's highest percent of bicycle commuters at 8% (BikePortland.org). This has dramatically increased in recent years as bicycle infrastructure grew. Portland has been very cognizant of the benefits of bicycling and has leaded the nation in providing safety, ridership and economic growth statistics. The City is looking to further increase bicycling with new designated Bicycle Districts that promote bicycle-oriented development patterns and a new Bike Share program scheduled to open in 2014.

The accomplishments of the District of Columbia, New York City, Chicago and Portland did not happen overnight, but rather rose from plans, funding, and citizen support. Baltimore City is in line with most other cities when it comes to implementing bicycling infrastructure, policies and plans. Considering the network of connecting streets, dense residential neighborhoods near downtown, and a core of bicycle infrastructure, bicycle use for transportation could grow dramatically if we see the level of political support and infrastructure investments that the above cities have seen over the past several years.

photo courtesy of pedbikeimages.org

District of Columbia

photo courtesy of inhabit.com

New York

photo courtesy of chicagodetours.com

Chicago

photo courtesy of streetblog.net

Portland

photo courtesy of bikepittsburgh.com

Pittsburgh

photo courtesy of Bicycle Coalition of Greater Philadelphia

Philadelphia

photo courtesy of bikepedmemphis.com

Memphis

photo courtesy of westword.com

Denver

Comparing Cities Similar to Baltimore

PITTSBURGH

Pittsburgh's efforts began and continue with mayoral support, design guidelines, and mapping that is available to bicyclists for a cost. With half the population of Baltimore, the City of Pittsburgh is working towards educational programs and grants that leverage the investments they can make to support the bicycling community. The City has made great headway recently with opening new protected bike lanes throughout the downtown Golden Triangle and city wide.

MEMPHIS

Memphis has risen statistically in bicycle friendliness and is following a host of guidelines to improve bicycling to stay alongside of other cities that have miles of facilities planned and policies in place to mark bike lanes during paving and reconstruction projects alike. The city has installed new greenway trails and interconnected bike lanes and cycletracks helping to encourage a boom in bike riding throughout the city.

PHILADELPHIA

In Philadelphia, both the city and suburban streets benefit from bicyclists and available right of way. Four to six feet was often available next to existing parking lanes in outer portions of the city. With pavement markings and signage, Philadelphia was able to retrofit a significant portion of the roadway network connecting to Center City and neighborhoods. Philadelphia recently published a Complete Street Guideline giving further emphasis on bicycle accessibility, and continues to plan bicycle parking, sharing and educational efforts while prioritizing infrastructure maintenance for the increasing amount of bicyclists utilizing the network.

DENVER

Denver provides additional emphasis on staying ahead of the curve when it comes to bicycling infrastructure. With a process in place to consider bike lanes and typical bicycle enhancements and amenities in all transportation projects, Denver continues to integrate beyond the standards. Denver has embraced new innovations from NACTO's Urban Bikeway Design Guide and is implementing bike boxes and green treatments, queue jumping signals for bicyclists and separated facilities.

Baltimore is similar to each of these jurisdictions by providing support for both recreational and commuter bicycling needs spanning engineering, education, enforcement and encouragement. Like Baltimore, most cities are just beginning to expand their bicycle network, starting bike share programs, providing support for both recreational and commuter bicycling needs and increasing the numbers of area bicyclists.

C. 15 Year Vision

Baltimore can be a national leader in building better bicycle infrastructure and become a more bicycle-friendly city. Moving forward, the polices set forth to promote better infrastructure and amenities for bicycling can have a dramatic impact on neighborhood livability, economic growth, public health, and the environment. This concept has already been recognized by several policy makers throughout the City.

- The Department of Transportation's Strategic Transportation Safety Plan echoes years of requests from community groups to improve safety on our streets, especially for pedestrians and bicyclists, as key to making communities safe and enjoyable.
- Baltimore's Sustainability Plan and Climate Action Plan both call for increased walking, bicycling and transit to reduce greenhouse gas emissions and other negative environmental impacts.
- The city's Healthy Baltimore 2015 plan recognizes the importance of incorporating physical activity into our everyday lives to improve our quality of life and reduce chronic disease.
- Baltimore's Department of Transportation planners are crafting plans to expand the City's Bicycle Network to include more facilities and innovative ideas to better connect areas by bike.

In the next 15 years, Baltimore should experience a paradigm shift that places a higher priority on multi-modal infrastructure and more Complete Streets. Changes can come from the recommendations of this plan, as well as a parallel effort by the Baltimore City Department of Transportation to develop a comprehensive Complete Streets Program. Historically, vehicular modes have had a priority at the expense of non-motorized modes. However, more livable streets place a higher priority on pedestrian, bicycle, and transit modes. Making streets safer to walk and bike may require a reduction in service for automobiles, so it will be important to address the needs appropriately considering factors of safety, accessibility, community cohesion, and quality of life.

D. Planning Methodology

This Master Plan Update has been developed to identify the necessary steps in the next 15 years to build a more bicycle-friendly city. Stakeholders have been engaged throughout the process in an effort to identify issues and solutions and to bring feasible, constructible, and cost-effective projects and policies.

1. Survey

An online survey has been advertised through media, blogs, and at public meetings. It received 1248 responses from a cross section of people. Responses were collected from representatives throughout the city and beyond, and included people of various ages, economic backgrounds, and bicycle use tendencies. The survey has been extremely valuable at identifying popular routes, areas for improvement, common concerns, and preferences. A detailed summary of the survey responses can be found in Appendix A.

2. Public Outreach

Representatives from the Department of Transportation's Planning Division attended multiple public meetings throughout the city to share information and get input from the public. Nine public open house meetings were held through the spring and summer of 2013. Baltimore City Department of Transportation representatives also attended over a dozen neighborhood association meetings to discuss this plan, which allowed for a broad cross section of participation among people in neighborhoods throughout the city and people who do and do not cycle regularly. Participants shared ideas and made recommendations for potential routes and facility types.

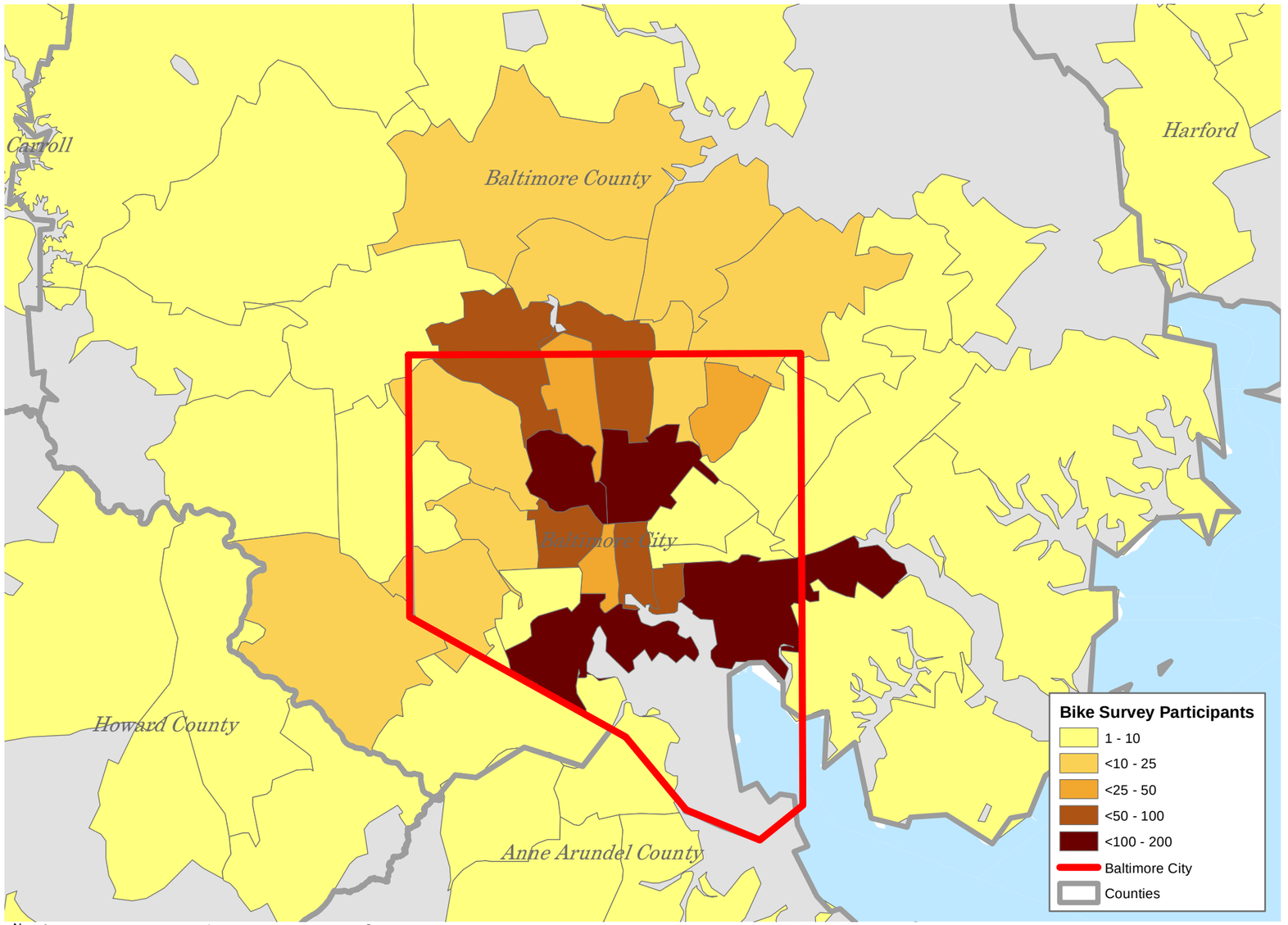
BALTIMORE BICYCLE MASTER PLAN OPEN HOUSE LOCATIONS:

- Ridgley's Delight
- Northwest (Mondawmin / Forest Park)
- Northwest (Glen)
- South Baltimore (Federal Hill)
- South Baltimore
- Mount Washington
- Morgan State University
- Belair Edison
- Coppin Heights
- And many more community association meetings

3. Steering Committee Review

During the process to draft recommendations for the Bicycle Master Plan Update, a Steering Committee of stakeholders has been involved. Steering committee members include representatives from the bicycling community and from stakeholder agencies whom will partner with the Department of Transportation to implement the recommendations of this plan.

Bicycle Survey Participants by Zip Code



III. CURRENT CONDITIONS IN BALTIMORE

A. Cyclists in Baltimore

1. Types of Bicyclists

The City of Baltimore conducted a survey of its bicyclist population to better understand bicyclists needs and why people chose to ride or not. There are generally four types of bicyclists as defined by a study conducted by the Portland Department of Transportation, the strong and fearless, the enthused and confident, the interested but concerned, and the no way now how (Geller, 2010). Creating a network that is more attractive to the interested but concerned riders will be key to making significant headway in attracting more riders and making the City more bicycle-friendly.

The survey responders for Baltimore City tended to be more representative of the existing bicyling community rather than the Baltimore City population as a whole, although each group was represented in the responses.

STRONG AND FEARLESS

The strong and fearless individual is someone who will ride their bike regardless of any conditions. This segment of the population is who many people picture as the "typical" bicyclist, although this is often a smaller percent of the bicycling community.

Approximately 22% of survey responders

ENTHUSED AND CONFIDENT

The enthused and confident population feels eager to ride their bike on most of City of Baltimore streets, but particularly those with some sort of bike accommodation, preferably a marked bike lanes or even a wider marked shared lanes. Many existing bicycle commuters fit within this segment.

Approximately 54% of survey responders

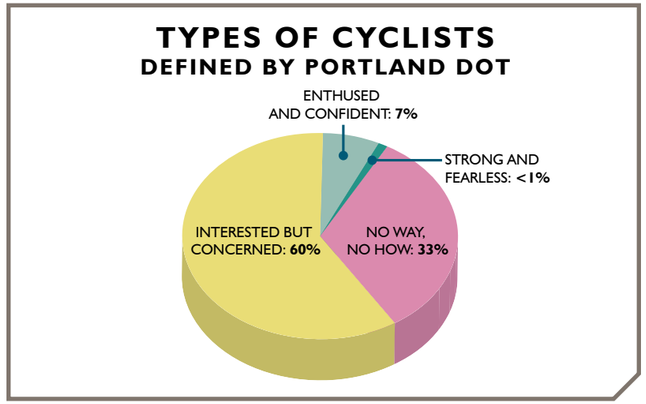
INTERESTED BUT CONCERNED

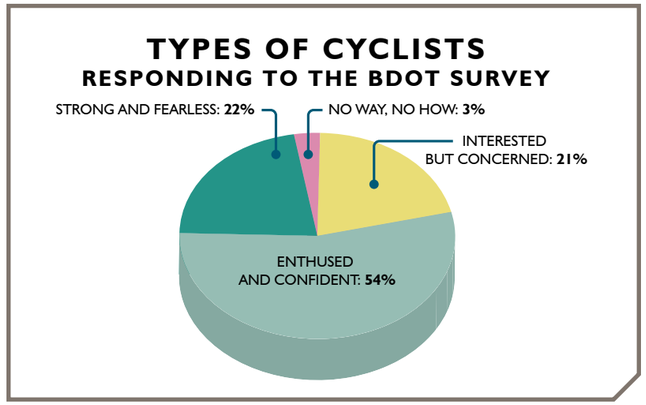
The majority of the bicycling population surveyed is interested in riding their bike, whether for work, fun, or errands, but are concerned about the safety of riding in traffic or some other barrier, such as access, personal security, or personal cleanliness. These barriers prevent them from choosing bicycling, although they would be interested in bicycling if the barrier were removed.

Approximately 21% of survey responders

NO WAY NO HOW

There is also a portion of the population that has no desire to ride a bike, regardless of the types of facilities provided.





ResultsfromBaltimoreCityDepartmentofTransportationSurvey

The Portland Office of Transportation conducted a random survey of adults in the Portland, OR metro area to identify the types of cyclists. The data were weighted by sex and age to reflect population statistics of the 2010 US Census. Therefore these results provide a more typical representation of the proportion of the types of cyclists within a metro area and is also representative of the types of cyclists nationwide. (Geller, 2010)

Approximately 3% of survey responders

photo courtesy of Brian O'Doherty

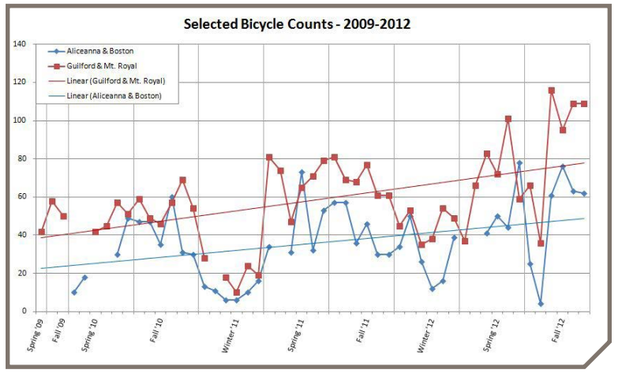
Interested but Concerned

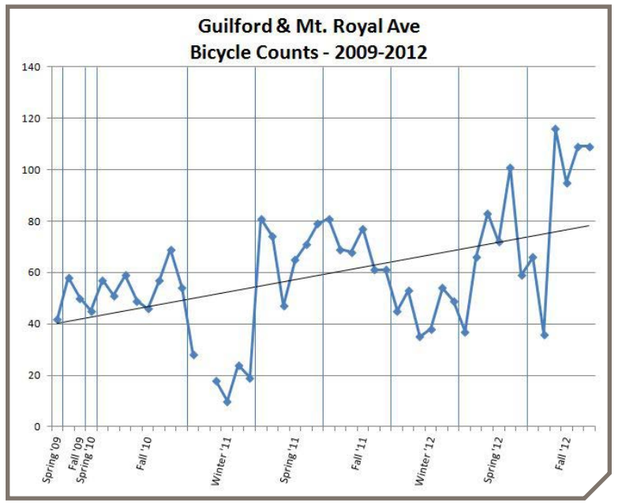
photo courtesy of Brian O'Doherty

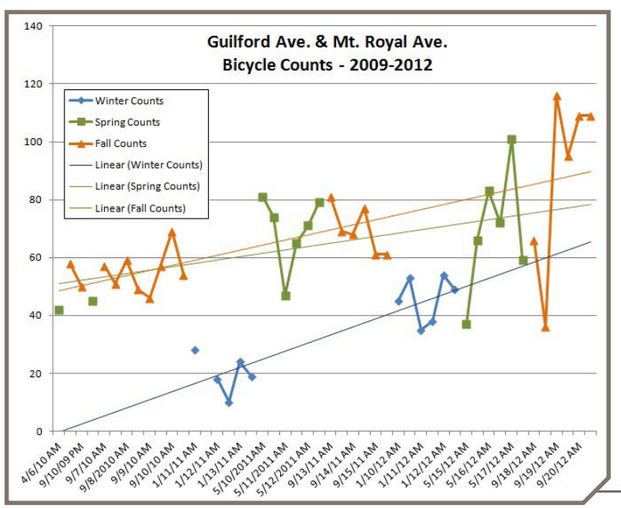
Enthused and Confident

photo courtesy of Brian O'Doherty

Strong and Fearless







2. Ridership Growth

Ridership growth has been consistently documented since the adoption of the 2006 Bicycle Master Plan. Ridership in the City of Baltimore is measured by counting bicyclists at trail heads, events, before and after locations for specific projects, and data obtained through on-going volunteers and consultant efforts conducting tri-annual bike counts. The Baltimore City Department of Transportation began registering volunteers for bike counts in the Spring and Fall since 2009 during morning and evening rush hour from 7:30 to 9:30 am and from 4:00 to 6:00 pm. Note, while volunteer counts are a good starting point, data collection has been sporadic and impacted by weather. Continuous counters can help calibrate these short term counts. Using the data collected, a 50% annual increase in bicycle commuter traffic was documented over the past few years including the winter months. Tri-annual bicycle counts have been conducted at:

- Penn Station and candler building (numbers of parked bicycles)
- Falls Road and Maryland Avenue on the Jones Falls Trail
- Guilford Avenue and Mt. Royal Avenue (junction of bicycle boulevard & future Jones Falls Trail)
- Aliceanna Street and Boston Street (Inner Harbor to Brewer's Hill bike route)
- Keswick Avenue and Wyman Park Drive
- Pratt Street and Market Place

The following locations were added to the most recent count:

- Park Avenue and Fayette Street
- Guilford Avenue and Fayette Street

The results of the bicycle counts confirmed the trend of increased bicycle ridership:

- During the most recent count in Fall of 2012, 3,002 bicycles were counted
- 381 parked bicycles were counted at Penn Station and the Candler Building
- 14.89% increase from May 2012 (up from 2,613)
- 48% increase when comparing fair Fall weather days
- 63% increase at the southern end of the new Guilford Avenue Bike Boulevard
- Percentage of woman bicyclists is up 2% from 22% in Fall 2011
- Helmet use remains constant at 67% overall, regardless of weather

Several key observations have been made during the counts.

- The greatest increase in bicycling occurred where bicycle infrastructure improvements have recently been made.
- A greater percentage of women (35-40%) are riding, which can mean that improved bike infrastructure is becoming more attractive to potential riders.
- Observing bicycle riding behavior also proved to be effective at Penn Station where cyclists are choosing to ride on the sidewalk due to challenging road conditions.
- Tracking ridership statistics has also helped to identify where higher bike volumes may indicate greater need for turning movement accommodations at intersections.

The fact that more than twice as many bicyclists were counted as in previous years was an indicator of just how much bicycling is growing in Baltimore. Documenting this change was an essential part of the effort to improve conditions for bicycling. The following chart shows the overall measured increase in bicycling since the inception of bicycling counting.

B. Progress

1. 2006 Bicycle Master Plan

The City of Baltimore's latest Bicycle Master Plan was adopted by the City Council in 2006. The plan primarily recommended a specific network of bicycle accommodations. A key recommendation was to "develop a network of bikeways" including on-street bike lanes, signed routes, wide curb lanes, and shared-use trails. The plan focused primarily on the installation of on-street bikeways and included several strategies to leverage support, including funding, staff, and the development of the Baltimore Bike Map. The recommendations also included wayfinding signage and a network of off road facilities to improving access to neighborhoods, trails, parks, and activity centers. A checklist is included in the 2006 Bike Master Plan allowing City Planners to track progress in the plan's implementation (See Appendix B).

2. Mayor's Bicycle Advisory Committee

The Mayor's Bicycle Advisory Committee (MBAC) serves City administrators by providing input on policies, coordinating outreach efforts, and serving as a liaison to the community. Much of the policy development work facilitated through MBAC helps to ensure public support and coordination in the development of laws and aligning law enforcement. The MBAC efforts are on-going, much like continued efforts in education and outreach to promote safe and healthy riding practices.

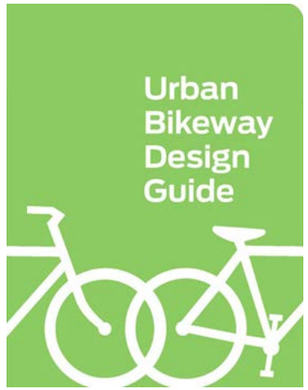
3. Full Time Bicycle and Pedestrian Coordinator

In 2008, the first full time Bicycle and Pedestrian Coordinator was hired in the Baltimore City Department of Transportation. This allows the Department to have a stronger focus on improving bicycle infrastructure and safety. Responsibilities of the City's Bicycle and Pedestrian Coordinator include:

- Plan and design bicycle routes
- Review city and development plans to ensure bicycle accommodations are included
- Assist city agencies and council to promote pro-bike policies and practices
- Promote transportation bicycling through community events and education
- Develop and publish the city's bicycle map
- Track bicycle infrastructure improvements made
- Manage bicycle rack program including monitored requests and coordinate installation
- Pursue state and federal grants to enhance bicycle network
- Coordinate quarterly bicycle counts with volunteers to track volume, gender, helmet use, and direction of travel

4. Participation in NACTO

Baltimore is a participating member of the National Association of City Transportation Officials (NACTO) and assisted in the development of the Urban Bikeways Design Guide. This Guide introduced innovative bicycle infrastructure designs suitable to complicated urban roadways, and has become nationally recognized as the standard for urban bikeway design. As a participating member, representatives from the Baltimore City Department of Transportation served on the steering committee during the development of this Guide, and provided local examples that are featured in the Guide.



NACTO Urban Bikeway Design Guide, first published in 2010. A second edition was published in 2012.

5. Infrastructure Built since 2006

Baltimore currently has 161.8 miles of bicycle facilities in place, with 118.7 miles having been installed since the adoption of the 2006 Bicycle Master Plan. The new bicycle infrastructure includes standard bicycle lanes and shared lane facilities, but also many innovative and new facility types never before used in Baltimore. New and innovative facility types include Bike Boulevards, Cycletracks, and Bike Boxes, which are further described in Section IV. These facility types have been very successful in improving bicycle safety.

Wayfinding signage has also been installed throughout the city helping to guide bicyclists. Wayfinding signage features the City's unique bike route symbology along with directions and distance to popular destinations. The Collegetown Loop uses its own unique signage helping to connect local colleges and universities.

6. Bike Parking

As bicycle ridership has increased throughout Baltimore, the need for bicycle parking has also increased. The City of Baltimore has installed 369 bike racks throughout the City typically at the request of local businesses or property owners. Neighborhoods have also installed their own bike parking, and the Zip Car kiosks include bike parking at each location. Bicycle parking has also expanded to Public Parking Authority garages and some private parking garages or lots.

Encouraging property owners and developers to provide bike parking is another important step in fostering more bicycle ridership. The Department of Transportation has provided employee bike parking to lead by example. In 2013, the City also modified City Code to require more long-term bicycle parking in multi-dwelling units. The former code had required one long-term bicycle parking space per four living units, and allowed the unit itself to serve as bicycle parking.

7. Integration with Streets

Baltimore has been making progress to integrate bicycling with the overall transportation network. The City's ENVISTA program allows for collaboration and coordination between city departments, which has allowed bicycle infrastructure and accommodations to be included in roadway improvement projects. Much of the bicycle infrastructure built since 2006 had been incorporated in other roadway improvement projects.

With a growing constituency demanding better bicycle facilities, the Baltimore City Council passed several bicycle related bills. The "Complete Streets Resolution" (Council Bill 09-0433) in 2010 that states:

> "Adoption of a 'Complete Streets' policy for transportation projects is especially advantageous in an urban area such as Baltimore where many people do not have regular access to a car. Ensuring that the needs of all Citizens are met by applying "Complete Streets" principles

Also in 2010, the City Council passed the "Bicycle Safe Storm Grates Bill" (Council Bill 09-0431) that requires all storm grates be bicycle compatible.

8. Integration with Transit

Bicyclists will often split their travel mode during trips with transit, so it is important that transit stations and buses accommodate bicyclist's needs. The Maryland Transit Administration (MTA) busses have been fitted with front bumper bike racks that hold up

photo courtesy of Nate Evans

Mayor Rawlings-Blake with local cyclists

photo courtesy of Nate Evans

Bike Parking at Penn Station

Example of a Front Bumper Bike Rack on an MTA bus.

photo courtesy of Nate Evans

Mini roundabout used at 22nd Street and Guilford Avenue for traffic calming along the Guilford Avenue Bike Boulevard

photo courtesy of Brian O'Doherty

Crowds for the Baltimore Bike Party

photo courtesy of Nate Evans

Temporary bike parking for Artscape

to two bikes per bus. Bikes are also allowed on Light Rail and Metro Subway (only folding bikes are allowed on weekday MARC trains.) BikeMaryland and MTA are now partnering to take bus bike rack displays to bicycling events and bike shops to help people learn how to us ethe bus bike racks. Most transit stations and park and rides also include bike parking either in protected bike lockers, sheltered parking, or standard bike rack parking. Protected bicycle parking was added to Penn Station and Camden Station in 2013, with nearly 100 spaces available at Penn Station.

9. Events

Bicycling can be more than transportation, it can be culture and it can be economic development. Baltimore has many events throughout the year that celebrates the culture of biking, and these events typically have a spill over effect within the local economy. These events also help to increase interest in bicycling by building camaraderie and introducing people to the joys of riding a bike.

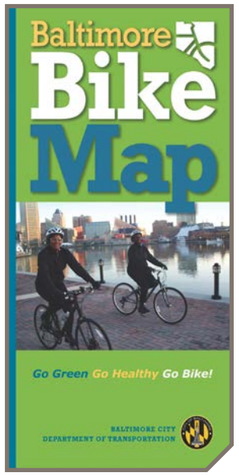
- Organized Group Rides, such as Bike Party, Family Bike Party and Neighborhood Rides
- Bike Tours, such as The Tour du Port and Tour dem Parks, Hon
- The Kinetic Sculpture Race (Human-powered moving sculptures using bicycle components)
- Bike Jam
- Ciclovias (scheduled street closures that open up access on community streets for non-motorized users)
- Bike to Work Day

C. Education and Enforcement

Education and enforcement play a critical role in fostering bicycle safety and a strong bicycle culture. Together, education and enforcement work hand in hand to make riding safer. Baltimore has taken steps to increase common knowledge of safe practices and best places to ride.

1. Baltimore Bike Map

The 2010 and 2012 versions of the Bike Map include routes, transit stations, bike shop locations, and other points of interest. Traffic rules, best practices, and bicycling resources are also summarized to help educate bicyclists. The routes mapped are the routes most commonly used and most accommodating to bicyclists. Streets that are not accommodating to bicyclists are also included as routes to be avoided. The map has been published in both English and Spanish, and a second edition was published in 2012. Over 40,000 maps have been circulated.



2. Bicycle Safety PSA

The Baltimore City Department of Transportation and Mayor's Bicycle Advisory Committee partnered with the Baltimore Police Department to produce a bicycle safety Public Service Announcement (PSA.) Produced in 2011, it is a brief video that summarizes the main safety precautions bicyclists and motorists can take to avoid accidents. The video has been shown on television and promoted through the City Department of Transportation and Police Department social media networks.

3. Event Bike Parking

Special events can greatly impact accessibility with closed streets and heavy congestion. Encouraging visitors to bike or take transit is an important means to reduce traffic and parking congestion. Baltimore's efforts to promote bicycling at Artscape, one of the Nation's largest art festivals, has helped to manage traffic and increase accessibility. Temporary bike parking plazas are incorporated into the festival layout. Over 700 bikes used the Artscape bike parking in 2009. Temporary bike parking at special events is an important consideration to increase attendance and reduce traffic congestion.

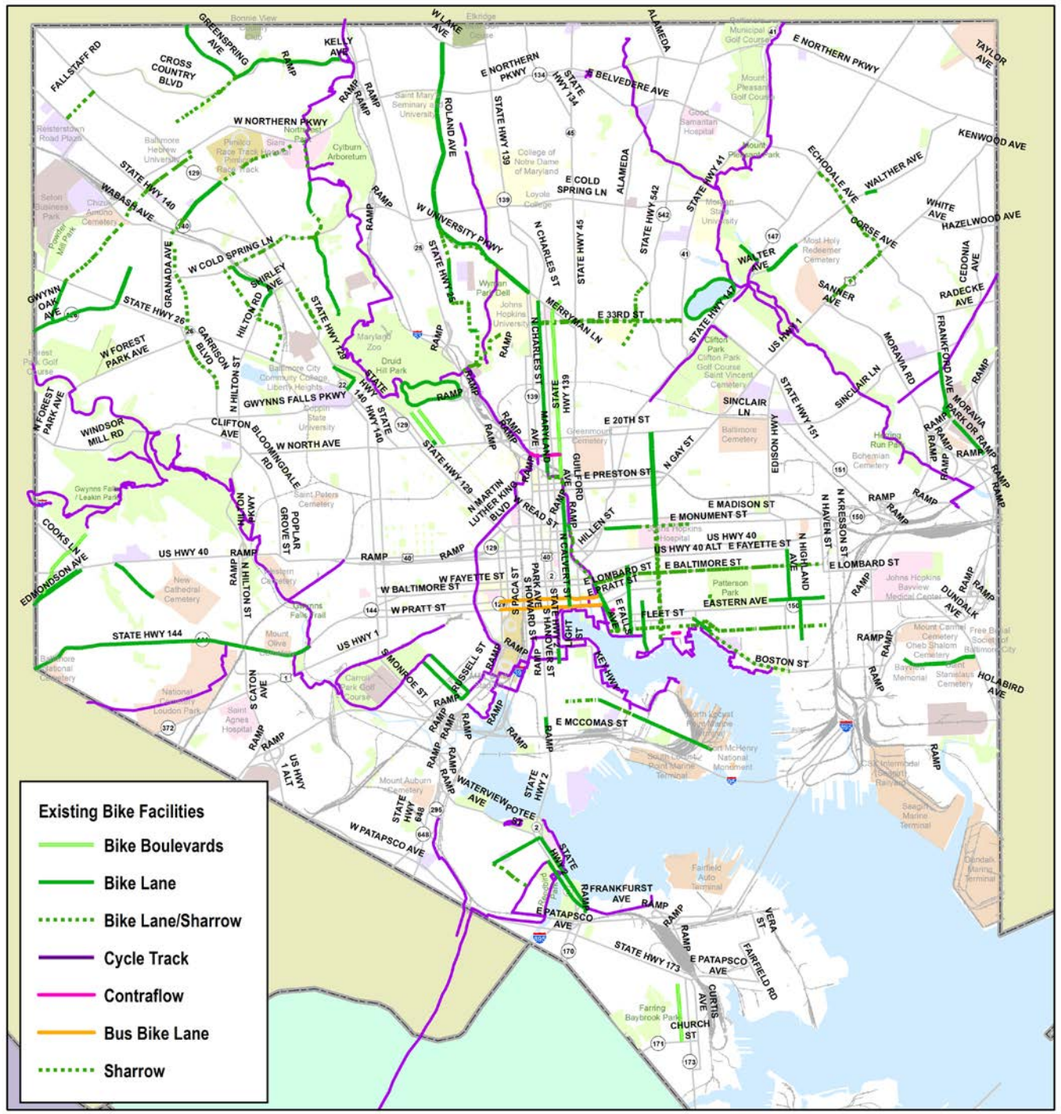
photo courtesy of Brian O'Doherty

Patrons engaged in a bicycle repair workshop made possible through a Baltimore Bike Co-op

D. Economics

Baltimore's bicycle culture grows, there has also been an increase in bicycle related business. Bicycle-related business includes retailers, mechanics, manufacturers, tourism, and special events requiring sponsorships, registration fees, and vending opportunities. New bike shops have opened during the same time period when automobile dealerships in the City are closing. Baltimore also has several Bicycle Cooperatives or "Bike Co-Ops", where patrons are able to learn the skills to fix and upgrade their bikes. Bike Co-Ops collect donated, second hand, or otherwise abandoned bikes and uses them to teach patrons how to fix and build their own bikes. Patrons can learn skills or utilize the mechanic services to have their bikes fixed. Bike Co-Ops provide a vital service for the bicycling community with job training as well as service to those who occasionally need fix ups or parts. Bike Co-Ops are a model for economic growth using ingenuity and efficiency to provide a necessary service.

Baltimore City's Existing Bike Network - 2015

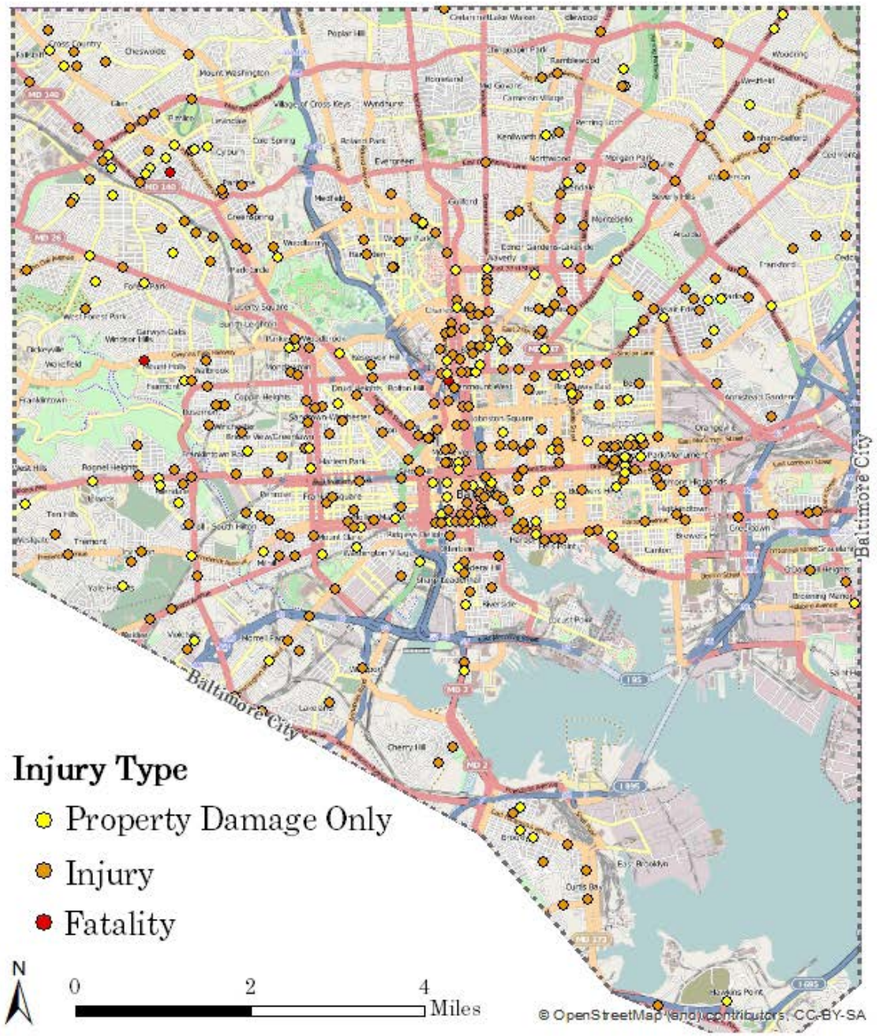


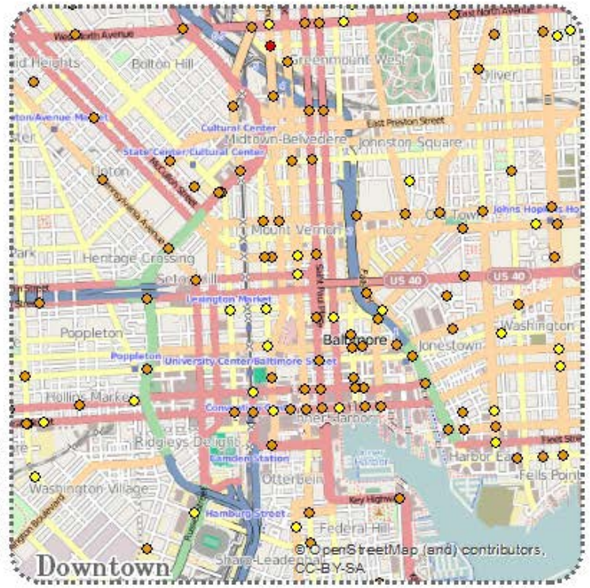
E. Network Gaps

Baltimore's current network of bikeways has encouraged some residents to bike, whether it is to work, to school, for recreation, or to run errands. However, this network may only appeal to a small segment of the population that feels safe or is familiar enough with the conditions. The bike network strives to be consistent enough to offer the appropriate facilities and perceived safety to encourage more riders. However, the "interested, but concerned" constituency may feel there are barriers to biking, and often chooses a different mode to travel. Barriers may be a lack of good quality routes, gaps within the routes, areas perceived to be less secure. Topography and weather can also affect an individual's decision whether or not to ride.

Limited approval of Bicycle facilities has resulted in facilities being concentrated largely in more affluent parts of the city, resulting in limited access for many residents. Areas in Baltimore have different levels of access to good quality bicycle facilities. Some neighborhoods have excellent access to high quality bicycle facilities while others do not. In areas without good access, ridership numbers may decline or remain stagnant, while neighborhoods with good quality facilities consistently see ridership growth.

2009 - 2011 Bicycle Crashes in Baltimore City





2009 - 2011 Bicycle Involved Crashes	
No Injury	130
Possible Injury	172
Injury	162
Disabled Injury	19
Fatality	3
Total	486

Source: Baltimore Police Department

F. High Crash Areas

Between 2009 and 2011, there were 486 police-reported bicycle crashes, 353 reported injuries to people riding bicycles, and 3 bicyclist fatalities in Baltimore. The Maryland State Highway Administration's Strategic Highway Safety Plan notes that the State's highest percentage of bicycle crashes and injuries occur in Baltimore City and its adjacent jurisdictions of Anne Arundel and Baltimore County. Drivers involved are more typically male and aged between 21 and 49 years. The greatest proportion of bicyclists injured or killed were aged 10-15 years; adults bicyclists aged 40-54 years were also overrepresented in bicyclist fatalities. (SHA, 2012)

Although many bicycle crashes continue to go unreported, with recent increased cycling activity, reporting of bicycle crashes has been on the rise. As part of future study, more comprehensive crash analyses will able to look at where, when, and how crashes are occurring, who is involved, and how the crashes can be prevented. The findings and legislation generally support more bicycle awareness and greater need for separated facilities. Bicycling has increased in the City of Baltimore over the last five years at a rate higher than other cities of similar size in the United States. Bicycle ridership has increased in Baltimore while frequency of crashes remains fairly stable in comparison. This indicates that that an increase of ridership may not result in an increase in crashes involving bicyclist. Cities across the country have found that increase in ridership can actually elevate driver's awareness of the presence of cyclist and has resulted in a more respectful relationship in sharing the road.

photo courtesy of Baltimore Brew

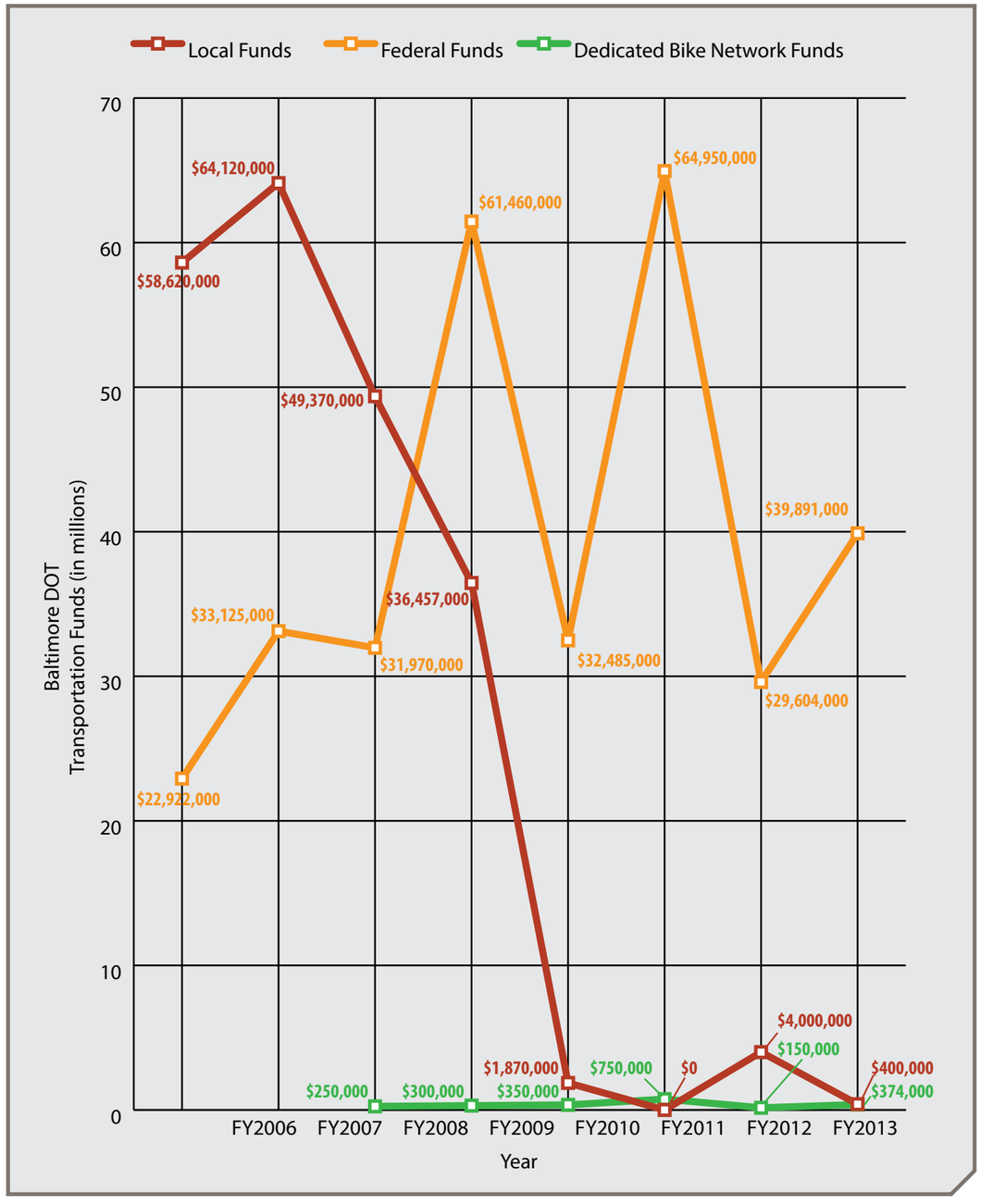
Ghost Bikes are typically placed in locations where a cyclist lost their life due to a collision with an automobile.

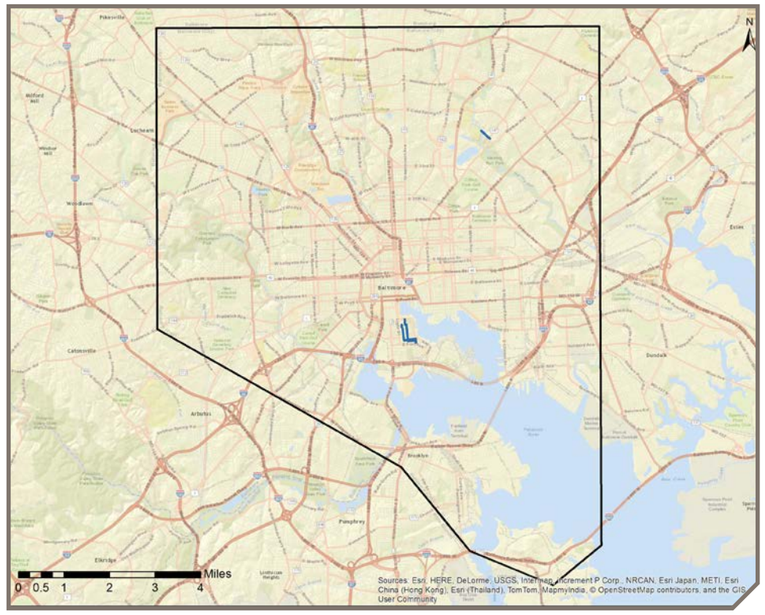
Most bicyclist crashes are unpredictable and unexpected, but not unavoidable. Over the course of a trip people transition from one mode of travel to another and are subject to similar hazards caused by unsafe behavior on the road. Therefore, everyone sharing streets is responsible for being aware of one another, obeying traffic laws, and exhibiting the necessary courtesy to avoid collisions. Vehicles are the fastest and heaviest objects on the road. So it is necessary for drivers to adhere to speed limits and yield to cyclists and pedestrians because they are more vulnerable in traffic crashes with vehicles. Furthermore, it is essential for cyclists to maintain visibility in the roadway and ride safely as well. With that in mind the Implementation Plan and Checklist located in Section VII of the Master Plan describes specific actions that will be critical to reporting and reducing crashes between motorists and cyclists. Some of these actions include increased driver education on the rights of cyclists on the road and improved and consistent collaboration between the Baltimore City Department of Transportation and Police Department.

G. Project Financing

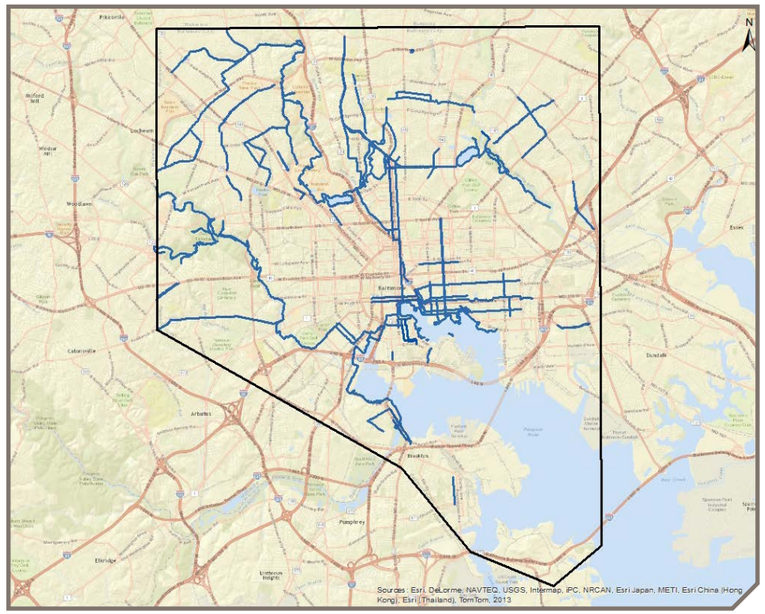
Infrastructure spending in Baltimore has fluctuated with the economy, and dedicated bicycle project funding remains a small fraction of the total Transportation budget. The Capital Improvement Project (CIP) funds have included dedicated funding for Bicycle Infrastructure, but the amount varies from year to year and is not adequate to construct all the facilities and amenities, such as bike racks, that are needed to meet the Vision of this plan. Increasing the CIP budget for bicycle infrastructure and having a reliable amount each year can help to make the program more successful.

In addition to CIP funding, federal funding is allocated through the Sate through the Maryland Department of Transportation's Bikeways Grant Program and the Maryland State Highway Administration's Transportation Alternative Grant Program. A substantial portion of Baltimore's current funding for bike infrastructure relies on these grants to fund projects.

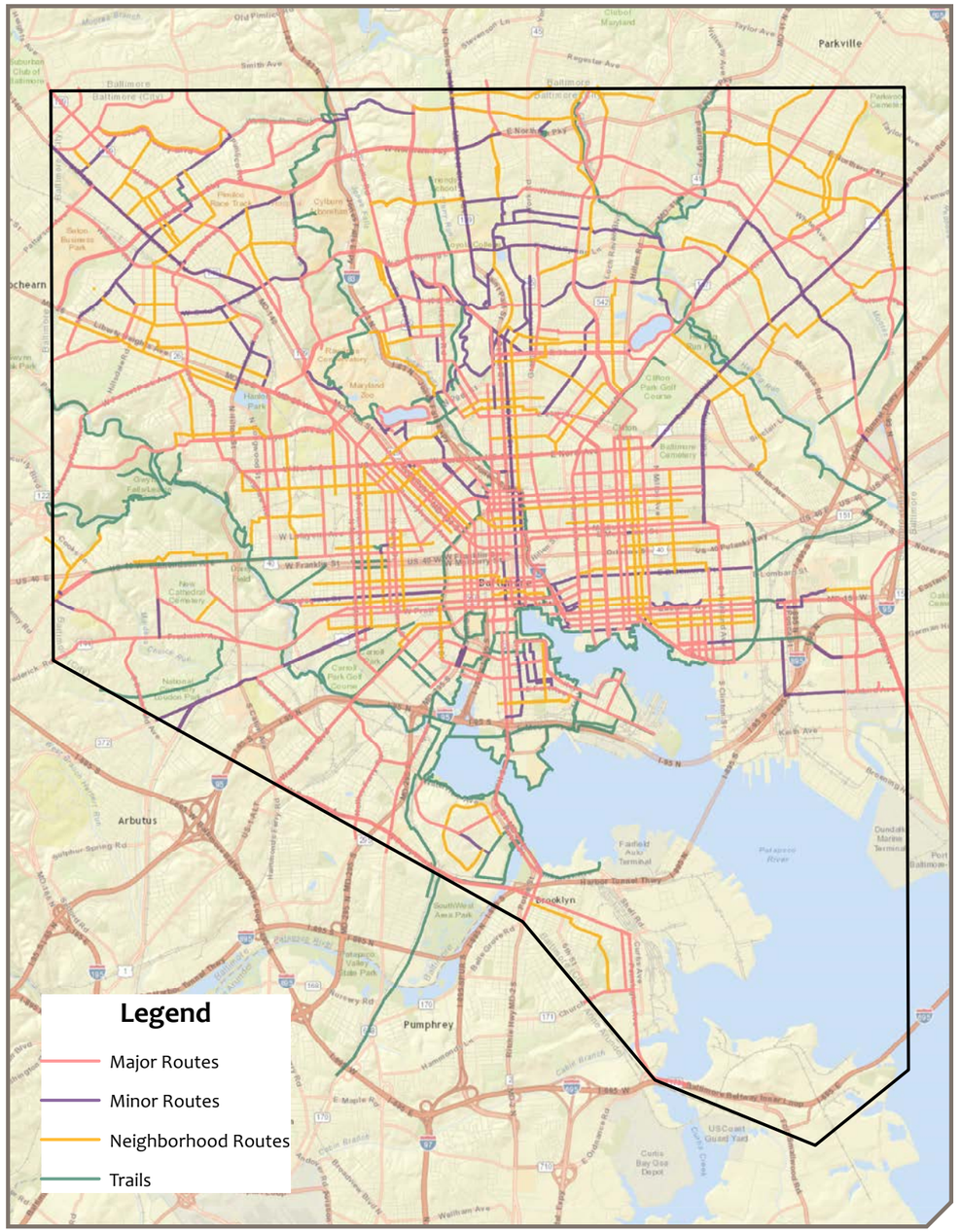




Map of Routes in 2006



Map of Routes in 2014



Map of All Routes proposed by 2030

IV. PROPOSED BICYCLE ROUTES AND FACILITY TYPES

GOAL 1: IMPROVE BICYCLE INFRASTRUCTURE

OBJECTIVES

- Increase bicycle network to include all the proposed routes by 2030 by implementing at least 16 miles of bike facilities every 2 years.
- Improve integration of bicycle facilities with the streets network by utilizing more Complete Street principles in roadway improvement projects

A. Increasing Infrastructure

OBJECTIVE: Increase bicycle network to include all the proposed routes by 2030.

Baltimore currently has just over 100 miles of bicycle facilities in place. However, an additional 253.6 miles are planned to complete the city-wide network. To complete the proposed network in the next 15 years, the City should construct on average 17 miles per year. It has been the standard practice to add bike lanes as roadways are resurfaced for maintenance needs, and this practice should continue. However, additional construction and more complicated design is necessary to complete the network, and dedicated project funding for bicycle facilities should be included in the annual transportation budget.

B. Complete Streets and Integration with the Transportation Network

OBJECTIVE: Improve integration of bicycle facilities with the streets network by utilizing more Complete Street principles in roadway improvement projects.

A multi-modal transportation approach is necessary to foster high quality and sustainable development in the City of Baltimore. Each transportation project should be designed and constructed as a Complete Street, which accommodates all of the roadway users appropriate for the setting. Balancing multi-modal considerations helps to promote choices in transportation. Complete Streets can reduce dependency on single-occupancy automobile trips with better provisions and linkages for bicycles, pedestrians, and transit. Ultimately, Complete Streets will improve livability and quality of life.

Complete Streets considerations should balance all of the roadway needs and prioritize modes based on livability standards.

A Complete Streets checklist should be developed for project designers to help determine which modes are a priority for each project, to cross reference other planned improvements for each corridor, and ensure that appropriate provisions are made for each mode of transportation.

C. Roadway Classifications

Different facility types are appropriate for different street typologies in Baltimore. Table 1 compares different street typologies and functional classifications in Baltimore. Table 2 shows possible applications for different bicycle facility types on different roadway classifications. Both Tables 1 and 2 can be reviewed on the following page.

The Baltimore City Council passed the Complete Streets Resolution in 2010, which states that: "In recognition of the fact that any effort to create more livable neighborhoods in Baltimore must include further improvements to the streets that are such a critical component of public space, a more systematic approach to inviting all people to make use of the streets must be adopted. "Complete Streets" principles require that needs of pedestrians, bicyclists, transit riders, and people of all abilities, as well as freight and motor vehicle users be taken into account when designing and implementing changes to transportation networks. The systematic application of these principles to all transportation projects would create a comprehensive framework to open up all streets to the full range of diverse users present in Baltimore, by encouraging walking, biking and transit use while promoting safe and continuous routes for all street users…"

Table 1: Street Typologies

Functional Class	Definition	Roadway Examples
Limited Access Expressway	This type of street is a principal arterial street that is designed to carry traffic in the major travel corridors to and from Baltimore City. The major feature is the degree of access control. Generally, access to and from a controlled access facility is provided by ramps. There are no traffic signals to interrupt the flow of traffic along the facility. The interstate system, expressways and parkways are typically controlled access facilities and bicycling is not permitted.	Jones Falls Expressway
Urban Arterial	This type of street may adjoin with controlled access facilities to carry the major movements of traffic to, from and through Baltimore City. They typically have at grade intersections with traffic signals at the major intersections. Urban arterials are traditionally distinguished from minor arterials in that greater priority is given to efficient vehicular travel movement along the street.	Belair Road, Harford Road, Reisterstown Road, Northern Parkway
Community Collector	This type of street combines with arterials to complete a network providing access to and from significant traffic generators in Baltimore City. This street type serves travel as a result of the land use nearby and connects neighborhood streets to arterial streets. Minor arterials carry a mix of traffic which is both local and through in nature. They are distinguished from arterial streets in that greater emphasis is placed on serving the needs of local community and fronting properties, and accommodating some through traffic.	Echodale, Fort Avenue, Garrison Boulevard
Community Main Street	This type of street provides convenient consolidated community access to the arterial street network, or within the community. Community Main Streets provide direct access to abutting land use, and the number of lanes should be directly related to the size and intensity of land use in the area they serve. Often a route designated as a Community Main Street consists of segments of more than one street. Unlike minor arterial streets, the use of neighborhood streets as links between streets in the arterial network should not be accommodated where it is disruptive to the neighborhood. Community Main Streets serve a broader area than neighborhood minor streets; generally the entire area bounded by the arterial network.	Light Street in Federal Hill, 36th Street in Hampden, E. Belvedere Avenue in Govans
Neighborhood Street	This type of street serves the abutting land use in the immediate area. Neighborhood streets do not provide as high a degree of consolidation of access within the neighborhood or between a neighborhood and the arterial network, as neighborhood principal streets. The cross-section requirements for neighborhood minor streets are related to the intensity of the immediate area.	Park Avenue in Bolton Hill, Lakewood Avenue in Canton, Beverly Road in Lauraville

Table 2: Bicycle Facility Applications

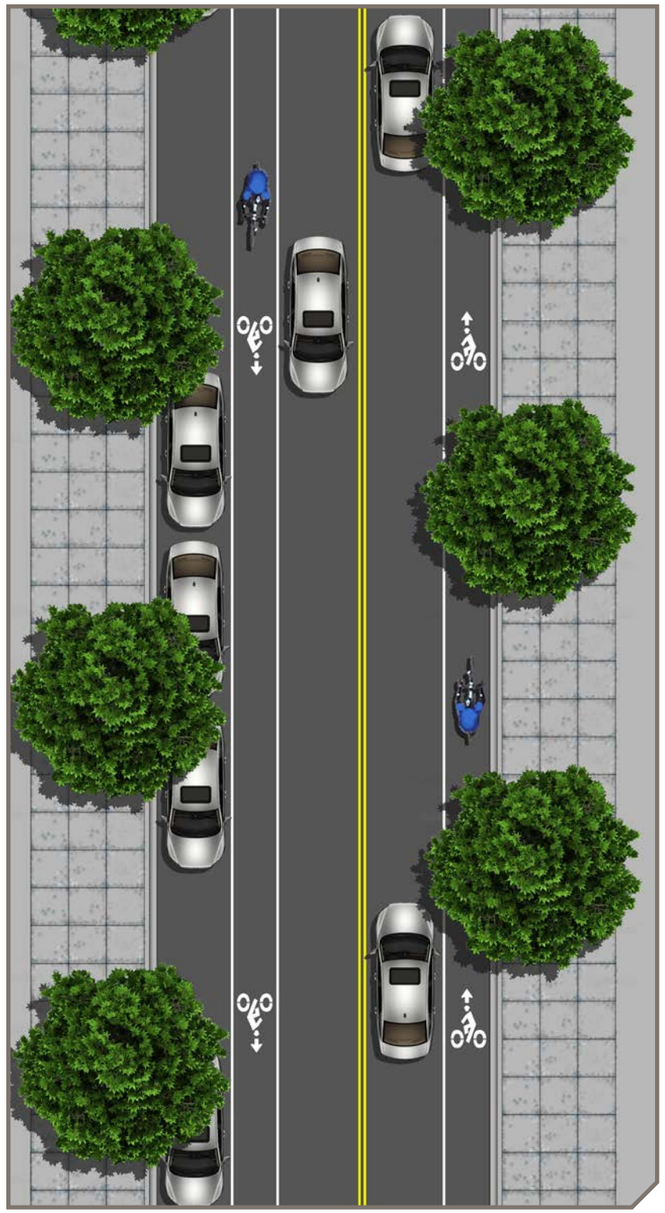
Baltimore City Roadway Classifications

	Urban Arterial	Community Collector	Community Main Street	Neighborhood Street
Side Path				
Standard Bike Lane				
Bus Bike Lane				
Buffered Bike Lane				
Contraflow Bike Lane				
Cycletrack				
Bike Boulevard				
Sharrow				
Signed Route				

Facility type not typically recommended

Facility type recommended when conditions are favorable

Facility type may be suitable under certain circumstances



Standard Bike Lane Schematic Layout with (left side) and without (right side) On-Street Parking

E. Facility Types

OBJECTIVE: Utilize innovative bicycle facility design treatments to affectively address safety and usefulness of the growing bicycle network.

The bicycle network in Baltimore includes a variety of facility types that serve different purposes and require different design solutions. Baltimore has embraced new and innovative facility designs that provide better accessibility, visibility and comfort for bicyclists. The Baltimore City Department of Transportation endorses the National Association of City Transportation Officials (NACTO) Urban Bikeways Design Guide as the standard guidelines for bicycle facility design. The following facility types are recommended for Baltimore's bicycle infrastructure.

The following facility types are based on recommendations from the NACTO Urban Bikeways Design Guide and are suggested facility types appropriate for different situations in Baltimore. In all situations, it is recommended that bicyclists and motorists follow the rules of the road.

BICYCLISTS SHOULD:

- Remain alert when using bike lanes to avoid pedestrians, errant vehicles, right turning vehicles, opening doors from parked cars, and other roadway hazards
- Obey all traffic signage and signals
- Stay to the right, follow the direction of the roadway, and never travel towards oncoming traffic
- Cyclists should pass Buses on the left, and should stay to the right when a Bus passes them
- Cyclists should stay to the left of right turning vehicles
- Avoid riding on sidewalks to the extent practicable
- Yield to pedestrians, especially on trails or in crosswalks
- Cyclists do not need to stay within the bike lane, but should make a reasonable attempt to avoid impeding traffic in the vehicular travel lanes

MOTORISTS SHOULD:

- Not drive or park cars in bike lanes.
- Always yield to cyclists when crossing a bike lane.
- Signal before crossing the lane to alert cyclists of their intention.
- Pass cyclists using bike lanes with care, and provide at least 3 feet of distance between the vehicle and bike when passing.
- When exiting a parked car, the driver and passengers should make sure there are no oncoming cyclists before opening doors that may obstruct the bike lane.
- Never drive while intoxicated or distracted, causing risk to all other users of the roadway network

President Street Bike Lane with Green Paint to Improve Visibility

Bike Lane on Roland Avenue

1. Bike Lanes

a. Bike Lanes

▸ **DESCRIPTION** –A bike lane is a dedicated lane for cyclists that is separate from vehicular travel lanes. It is delineated with striping and pavement markings on the roadway and with signage. Bike lanes typically are located to the right side of vehicular travel lanes and run in the same direction as traffic. Bike lanes typically do not have any physical separation from the vehicular travel lanes.

▸ **BEST PRACTICES**

- Bike lanes should be used when there is adequate roadway width to accommodate a full 4' to 6' dedicated lane for cyclists.
- Dashed lines should be used to delineate areas where motorists are expected to cross bike lanes.
- Bike lanes may be colored with green paint to help improve visibility and reinforce that the lane is dedicated for cyclists, especially in areas where motorists may cross bike lanes.
- Refer to the Intersection Treatments section for methods to accommodate bike lanes at intersections.
- On one-way streets bike lanes may be striped on the left to reduce conflicts with buses and doors.

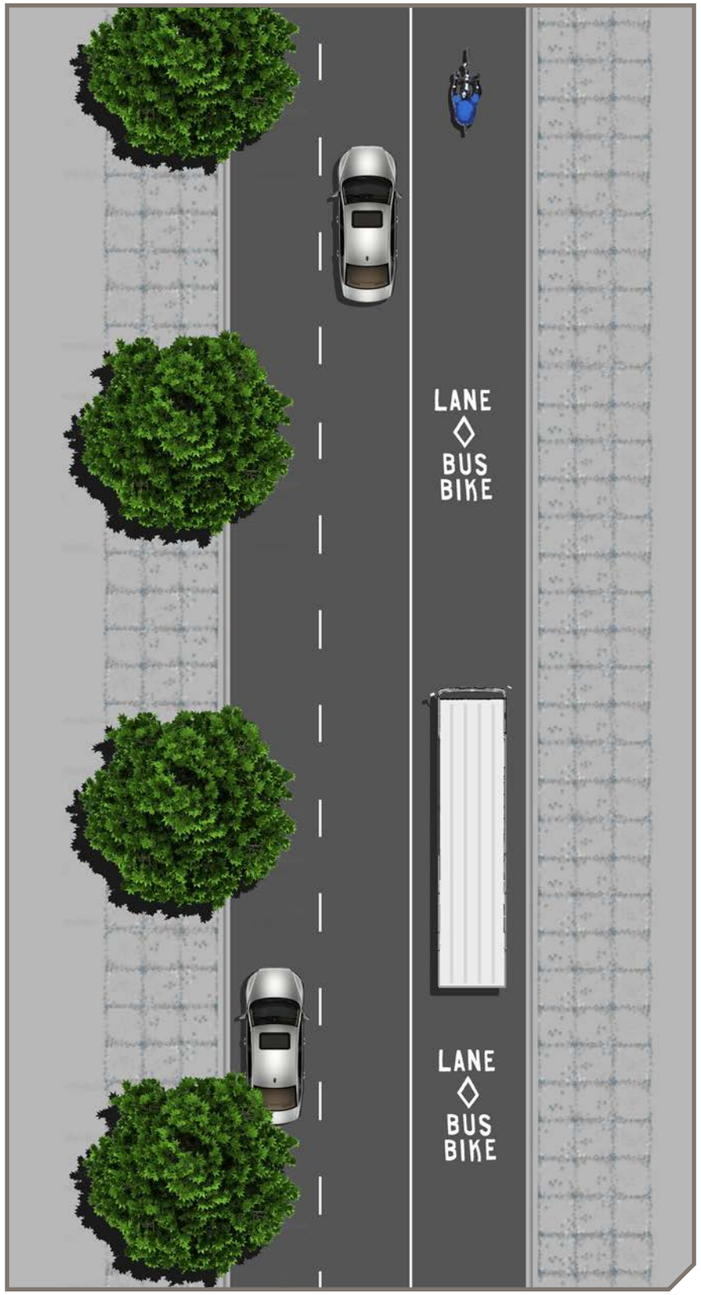
b. Bus / Bike Lanes

▸ **DESCRIPTION** – A Bus/Bike Lane designates the far right side travel lane for buses, cyclists and right turning vehicles only. All other traffic should use lanes left of the Bus/Bike Lane. This keeps traffic from impeding both buses and cyclists, and allows improved access and preferential treatment for both.

▸ **BEST PRACTICES**

- Bus/Bike Lanes should be used along corridors that have higher volumes of bus traffic and more frequent bus stops.
- Buses and Bikes will often need to pass each other in a Bus/Bike Lane, and the width should be wider than a standard lane. 16' width is preferred but the width can be reduced.
- Bus/Bike Lanes should be clearly marked and signed to alert traffic that the lane is not a through lane. Color treatment of bus/bike lanes may be considered with proper approval.

Bus / Bike Lane Schematic Layout



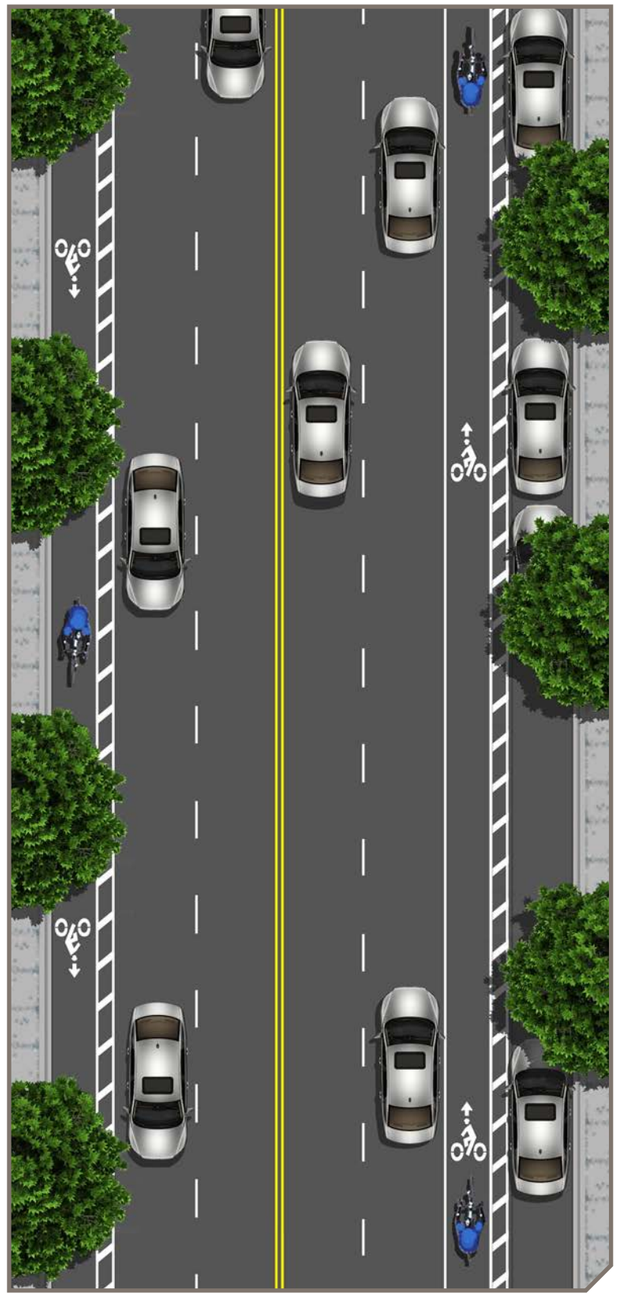
Bus / Bike Lanes in downtown Baltimore along Pratt Street and Lombard Street

photo courtesy of Flickr user "Steve Vance"

Example of Buffered Bike Lanes in Chicago

photo courtesy of Flickr user "SDOT"

Buffered bike lane example



Buffered Bike Lane Schematic Layout. Buffering can be placed between the bike lane and vehicular lane, the bike lane and parking lane, or both.

c. Buffered Bike Lanes

▸ **DESCRIPTION** – A Buffered Bike Lane is a Bike Lane with an additional painted separation from the travel lanes. This provides an extra protection for bicyclists from traffic and serves as a shy zone to be avoided by both cars and bikes. Buffering can also be used between a bike lane and parked cars, allowing space for car doors to open without blocking the bike lane.

▸ **BEST PRACTICES**

Buffered Bike Lanes are preferred for all bike lanes where there may be adequate width for buffering, and is highly recommended for roads with heavy truck traffic or average speeds above 35 miles per hour.

- The buffering should be at least 2 feet or more in width.
- Vertical delineators help to provide extra visibility and protection for bicyclists.
- When Buffered Bike Lanes are used adjacent to on street parking, it is recommended to use the buffer between the bike lane and parking lane to provide a space for car door opening without impeding the bike lane.

d. Floating Bike Lanes

▸ **DESCRIPTION** – A Floating Bike Lane is typically 15 feet wide and changes location based on the time of day. This is usually along corridors with peak parking restrictions. Durring the off-peak hours, when parking is allowed, a 5 foot bike lane is provided between the parking lane and the travel lane. Durring the peak hours, the bike lane moves next to the curb between the peak travel lane and the curb.

▸ **BEST PRACTICES**

Floating Bike Lanes are preferred on low speed streets that have high peak hour volumes but low off-peak traffic volumes.

- The curbside lane is 15 feet wide to accomodate the floating bike lane and peak hour parking lane.
- Provide appropriate signage to indicate there is a curbside bike lane in the peak hour that drivers may not encroach on.
- On corridors where the peak hour restricted parking is strongly enforced.

e. Contraflow Bike Lanes

▸ **DESCRIPTION** – A Contraflow Bike Lane is a Bike Lane that travels in the opposite direction of traffic, often used on One Way Streets. Contraflow lanes allow bicycles to travel in an opposing direction, which can improve overall accessibility and connectivity. A double yellow line separates the Contraflow Lane from opposing traffic.

▸ **BEST PRACTICES**

- The Contraflow Lane should be to the Left from opposing Traffic.
- Contraflow Bike Lanes should be separated from opposing traffic with a double yellow line, and additional buffering width up to 3 feet is desirable.
- Bicycle Lane symbols can be added to denote the lane is for bicycle use only.
- Contraflow Lanes can be combined with a Bike Lane or Sharrow with opposing traffic to allow access in both directions.
- Contraflow Lanes should not allow for bicycle access in two directions within the lane itself. Two-Way lanes would be a Cycletrack.
- Signs that note "Do Not Enter - Except Bicycles" should be posted at the entrances to Contraflow Lanes.
- "One Way - Except Bicycles" should be used instead of standard One Way signs.
- Signal timing should include phasing for opposing bicycle traffic.
- It is not preferred to combine Contraflow Bike Lanes next to on street parking. When doing so, the on street parking should be adjacent to the curb and the Contraflow Lane should be between the parking lane and the opposing traffic.

Contraflow Bike Lanes on Lancaster Street (top) and Lanvale Street (bottom)

Contraflow Bike Lane Schematic Layouts with alternative parking configurations. Diagonal parking can be used if there is adequate width to mitigate for lost parking on the left side of one way streets

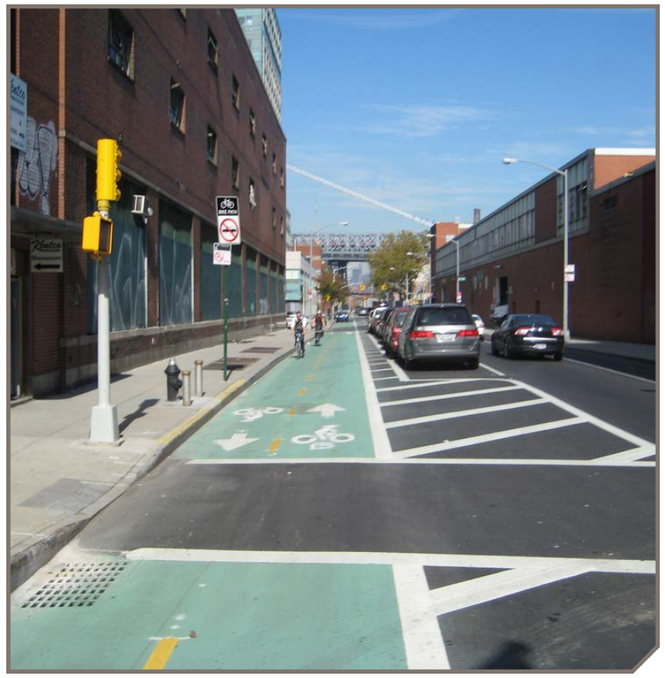


photo courtesy of Flickr user "jacobuptown"

Cycletrack Example from Portland, Oregon

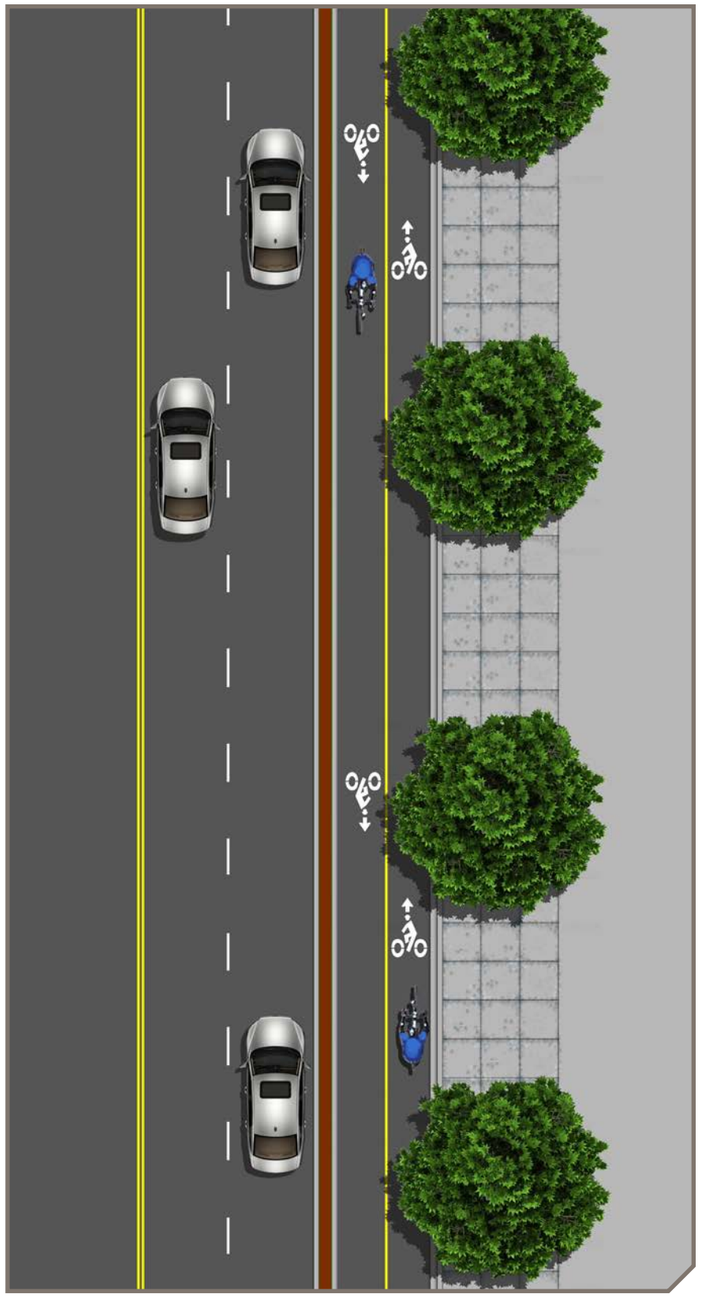
Cycletrack along the Fallsway as part of the Jones Falls Trail

2. Cycletracks

▸ **DESCRIPTION** – A cycletrack is a bike lane that is separated from the travel lanes with a physical barrier, which may be either a curb, median, parked cars, a landscaped strip, or other type of barrier that works within the streetscape's character. A One Way Cycle Track acts similar to a Bike Lane or Buffered Bike Lane, with bicycle traffic only permitted in one direction. A Two Way Cycletrack is sometimes called an on-street bike trail and allows two directional bicycle traffic side by side.

▸ **BEST PRACTICES**

- One Way cycletrack lanes should be 6' wide or more to allow room for passing.
- Two Way cycletracks should be at least 10' wide, and include a center stripe to delineate directions.
- Separations with on street parking should include a 2' to 3' striped space that buffers between parked cars and the cycletrack allowing space for car doors to open and pedestrians to exit vehicles without stepping into bicycle traffic.
- Cycletrack lanes should be marked as bike lanes, and can be painted green or made from a different material than the roadway to help differentiate the space for bicyclists.
- Bicycle signage and signals should be used to direct bicycle traffic, and bicycle traffic should be included as part of signal phasing.
- Monolithic separations can include bollards and/or landscaping.
- Curbed separations should accommodate drainage on both sides, and can also be designed to collect drainage in infiltration swales. Also, ensure the drainage openings are wide enough to allow for bicyclist to ride through in case the cycletrack is blocked.
- If pedestrian access is to be limited, proper signage should be posted to alert pedestrians that the cycletrack is for bicycles only.



Cycletrack schematic layout using a monolithic separation between bicycle and motor vehicle lanes

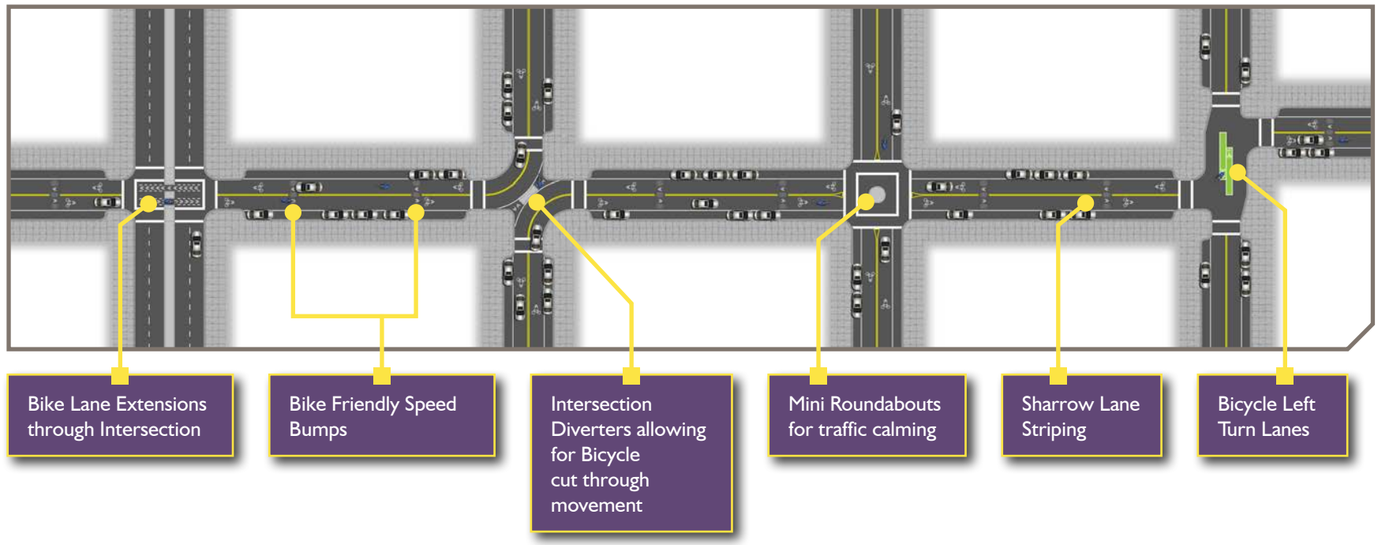
3. Bike Boulevards

▸ **DESCRIPTION** – A Bike Boulevard is a roadway that places an emphasis on bicycle access over vehicular access. They are low-traffic, low-speed roadways that often parallel heavier arterial and collector roadways, and can serve as a spine in the overall bicycle network. Traffic calming features and traffic diverters are often incorporated to help slow moving cars and keep traffic volumes low. Bike Boulevards can be an excellent facility on many of Baltimore's streets to maximize the use of the low volume, low speed network in the City.

▸ **BEST PRACTICES**

- Bike Boulevards should be several blocks or more in length to serve as a spine in the overall bicycle network attracting large numbers of bicyclists.
- Traffic calming measures should be employed to help reduce average motorist speed or deter motorists away while having limited effect on bicycle speeds and access. Curb extensions and speed bumps can help slow traffic. If speed bumps are used, it is recommended to keep a narrow, flat opening in the middle of the lane so bicyclists can traverse over without hitting the bump.
- Traffic diverters or closures can be used to limit motorists through traffic, however, bicycle through traffic should be accommodated and maintained. Bike cut-throughs can be used to divert traffic and maintain access for bicyclists and pedestrians.
- When crossing busier streets, traffic signals should be used to allow bicycles opportunity to cross.
- Mini-circles and small roundabouts can be used in lieu of 4-way or two-way stops to allow bicycles to keep pace without stopping if there is no oncoming traffic. Mini-circles need to be appropriately sized to adequately deflect traffic and slow vehicles down.
- Two-way stops requiring the bicycle traffic to stop at busier streets should be avoided.

Traffic Calming Treatments for Bike Boulevards



(photo courtesy of Nate Evans)

Mini roundabout used at 22nd Street and Guilford Avenue for traffic calming along the Guilford Avenue Bike Boulevard

Bicycle Friendly Speed Bumps allow cyclists to pass through the center of the lane without hitting the bump. Motor vehicles straddle the opening and hit the bump.

36th Street Sharrow

Aliceanna Street Sharrow

4. Sharrows

- **DESCRIPTION** – Sharrows, also known as Shared Lanes, are bicycle facilities that share the lane with vehicular traffic. By law, all roadways in the state of Maryland allow bicycles to use vehicular travel lanes, with the exception of interstate highways. Sharrows are used when there is not enough space within the roadway for a bike lane, and the roadway is specifically designated for shared use. Sharrows work best on low volume or low speed streets that connect together sections of the overall bicycle network.

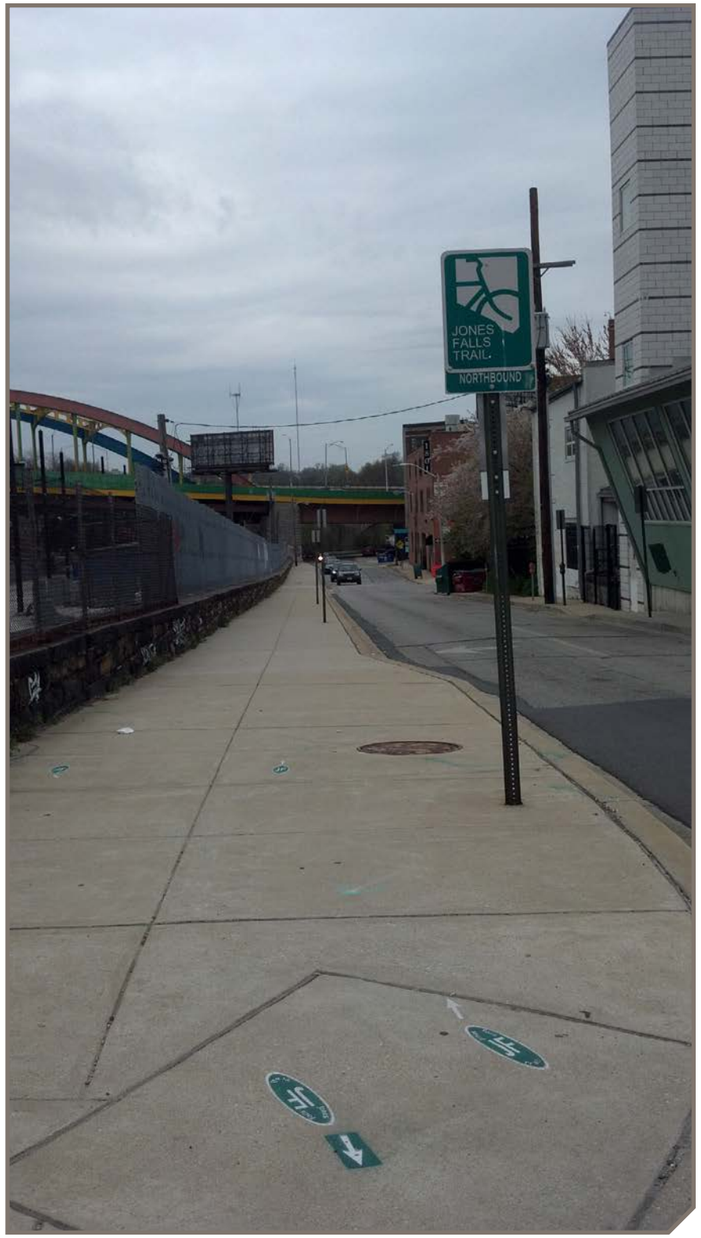
- **BEST PRACTICES**

  - Sharrows should include Sharrow roadway markings, which is a chevron bicycle marking in the lane to direct bicyclists where to ride within the roadway.
  - Sharrow markings should be placed at the beginning and middle of each block, or about every 200' for longer blocks.
  - Sharrow symbols should be placed in the middle of the travel lane so cars typically straddle the pavement marking. This helps the marking last longer and signals to motorists and bicyclists that they may use the full lane.
  - "Share the Lane" or "Bikes Can Use Full Lane" signage should be used.
  - Sharrows should only be used on roads where the observed speed is less than 25 mph.
  - When on-street parking is present, sharrows should be placed at least 12 feet from the curb.

5. Signed Routes

- **DESCRIPTION** – A Signed Route is a roadway that is specifically designated as a bike route and includes "Share the Road" signs, but no specific lane markings for bicyclists are used.
- **BEST PRACTICES**
  - Signed Routes should be used on low volume and low speed roadways to connect other segments of the bicycle network with communities.
  - Additional wayfinding signage and destination markers can be added to reinforce bicycle comfort and assist bicyclists with directions.
  - Signed routes should be branded.
  - Each signed route should be identified on maps and signed with a single, memorable, descriptive name, which will be used in an abbreviated form in wayfinding pavement markings.
  - Trail signage is also useful for on-street trails using bike lanes, sharrows and cycletracks.

Wayfinding Symbols along the Jones Falls Trail



Jones Falls Bike Trail along Falls Road

Gwynns Falls Bike Trail along the Inner Harbor

6. Trails

- **DESCRIPTION** – Trails are separate paths that allow bicycles and pedestrians, and in some cases equestrians, roller blades, skate boards and other non-motorized traffic. Side Path Trails run parallel to roadways, and Off Road Trails have their own alignment independent of any roadways. Designated trails are not sidewalks, which are intended for pedestrian use only. Trail sections may also be connected with cycletracks or Bike Lanes.

- **BEST PRACTICES**

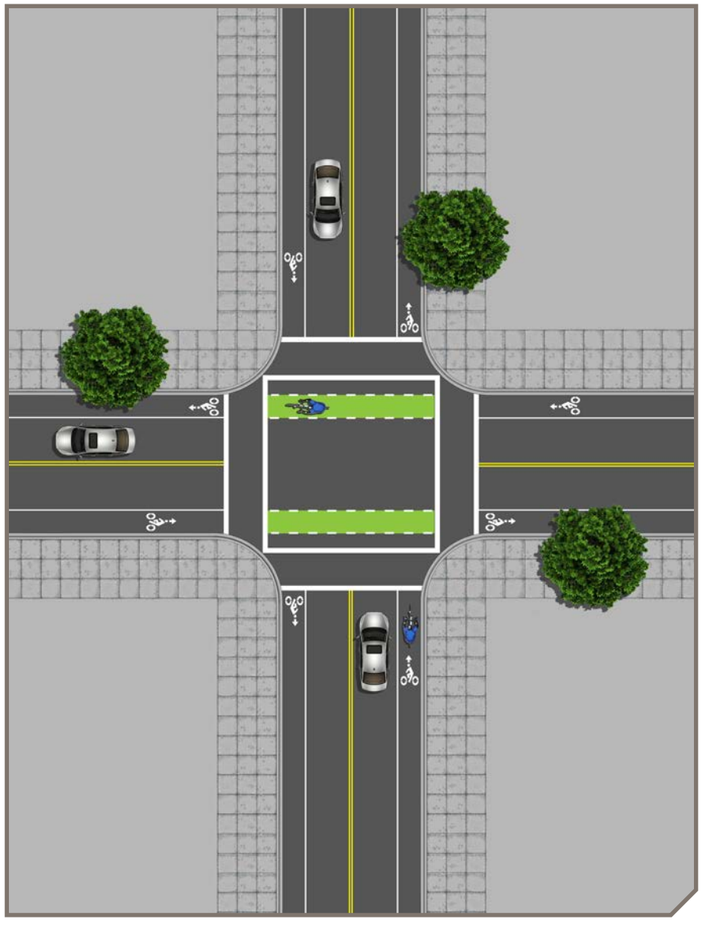
- Trails should be a minimum of 8' wide, but 10' or more is desirable.
  - Trails with heavy pedestrian traffic should be 15' wide or more, or a separate pedestrian sidewalk can be added adjacent to the trail.
  - Trails must meet all ADA accessibility requirements including slopes, widths, ramps, and detectable warning surfaces.
  - Trails should be marked as multi-purpose trails with signage, decorative pavement markings, or a combination of both.
  - Trails should include wayfinding signage, mile markers, and trail maps. Informational kiosks with trail rules, interpretive, and educational information are also desirable.
  - Trails should include a crosswalk when crossing roadways. Crossings should be well marked, well lit, and signed for Pedestrian and Bicycle crossing, not Pedestrian crossing only.
  - Trails may include a center line to differentiate the direction of traffic.
  - Off Road Trails should include a 2' graded shoulder and clear zone on either side of the trail edges.
  - Off Road Trail entrances should include a bollard in the center of the trail to prevent motor vehicle access. Bollards may be removable for instances when a maintenance vehicle needs to access the trail.
  - Trails should include adequate lighting for night time use where feasible. Trails in more urban areas should include lighting throughout.

7. Intersection Treatments

The following innovative design treatments may be used as a part of the bike route infrastructure design to help bicyclists safely traverse through intersections.

a. Continuation of Bike Lanes

Bike lanes will continue through an intersection and may be marked to delineate the bicycle zone from the motorist's zone through an intersection. In areas where vehicles are anticipated to cross over bike lanes, such as through intersections or in front of driveways, the edges of the bike lane should be dashed. The bike lanes may also be colored green or include painted chevron symbols to further differentiate the difference between the bicycle zone and vehicular zone. Motorists should always yield to bicyclists when crossing bike lanes, even within the intersection.



Schematic Layout using green paint for a Bike Lane Continuation

photo courtesy of Flickr

Bike Lane Continuation Example using Sharrow Symbols

b. Bike Box

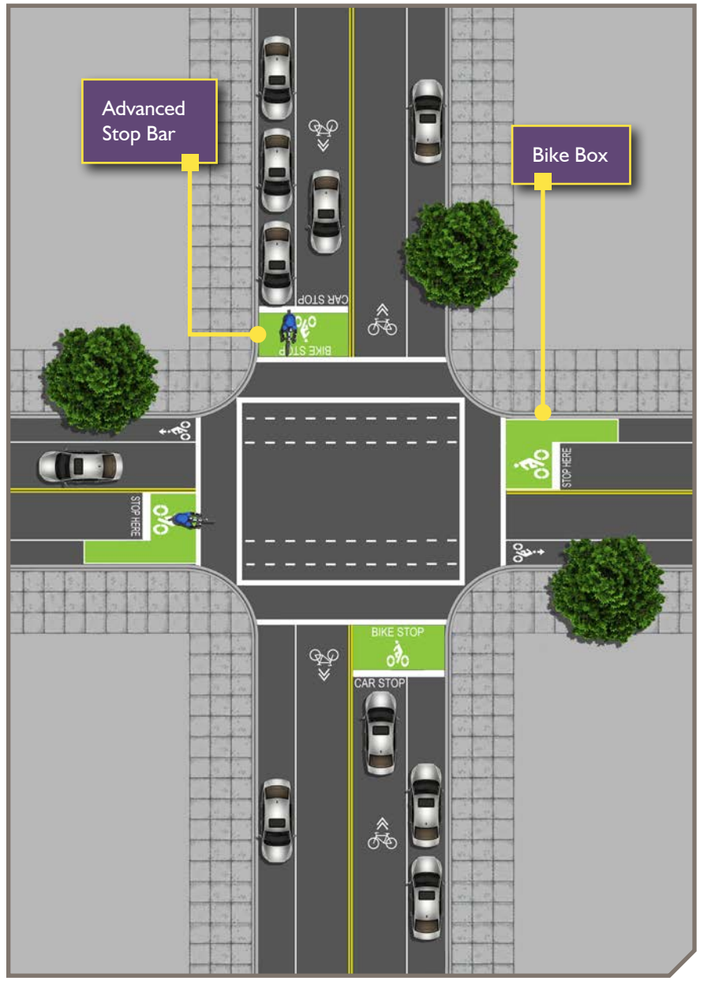
A Bike Box provides a space placed ahead of the vehicular stop bar allowing bicyclists to wait in front of motorists at intersections. The Bike Box extends the entire width of the lanes from the center line to the curb, which allows bicyclists to make left turn movements or clear the intersection before motor vehicle traffic.

c. Bike Signal

Bike Signals provide a phase in the overall intersection signal timing for the bicycle movement, which allows bicyclists to make turns or clear the intersection before oncoming or advancing motor vehicle traffic.

d. Advanced Stop Bar

An Advanced Stop Bar may be used to allow bicyclists space to wait ahead of the motor vehicle traffic at intersections. This can allow bicyclists to clear the intersection before oncoming or advancing motor vehicles, and allows the bicyclists a space to wait without blocking a vehicular right turn.



Schematic Layout for a Bike Box and Advanced Stop Bar

Bike Box at Wyman Park Drive and Keswick Avenue

e. Right Turn Lane Treatments

Bike routes are typically along the right side of roadways, and right turning vehicles will need to cross bike lanes. When a bike lane continues straight, it should be placed left of the right turn lane. The zone where the right turn lane crosses the bike lane should be clearly marked as a bike lane with striping, which should be dashed in areas where vehicles are anticipated to cross. Green coloring and/or painted chevrons could also be used to further delineate the space for bicyclists. Bicyclists may share the right turn lane when making right turns, and motorists should always yield to bicyclists when crossing a bike lane or approaching a bicyclist.

If there is not adequate space for a separate bike lane and right turn lane, the lanes can be combined. The bike lane should stay on the left side of the turn lane with a solid line on the left edge, and a dashed line on the right edge. Green coloring and/or painted chevrons could also be used to further delineate the space for bicyclists. Cars may drive in the bike lane when shared with a right turn lane, but motorists should always yield to bicyclists when in the bike lane.

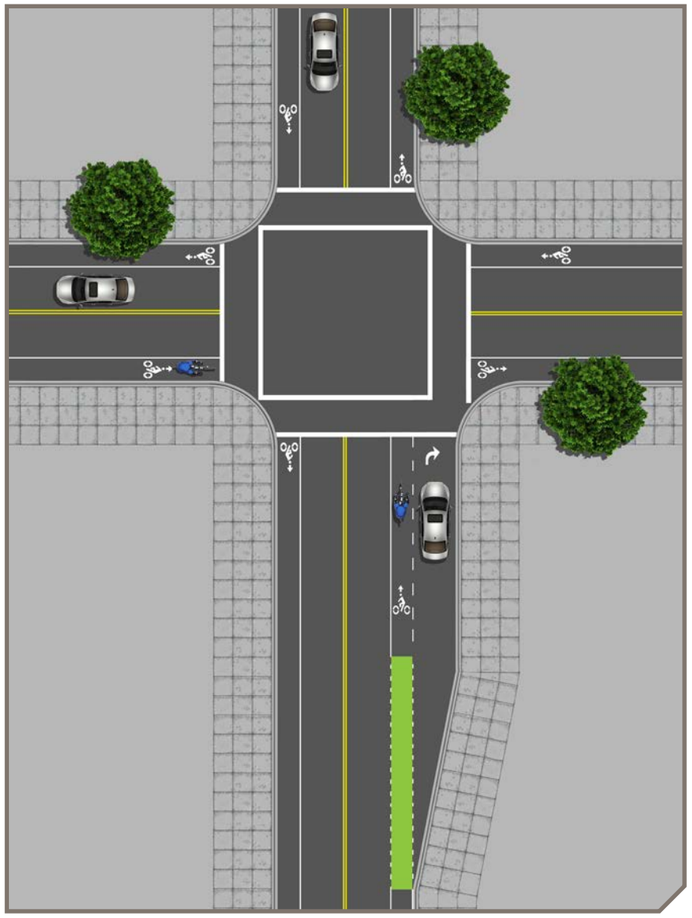
photo courtesy of Flickr user "Luton"

Combined Bike Lane and Right Turn Lane

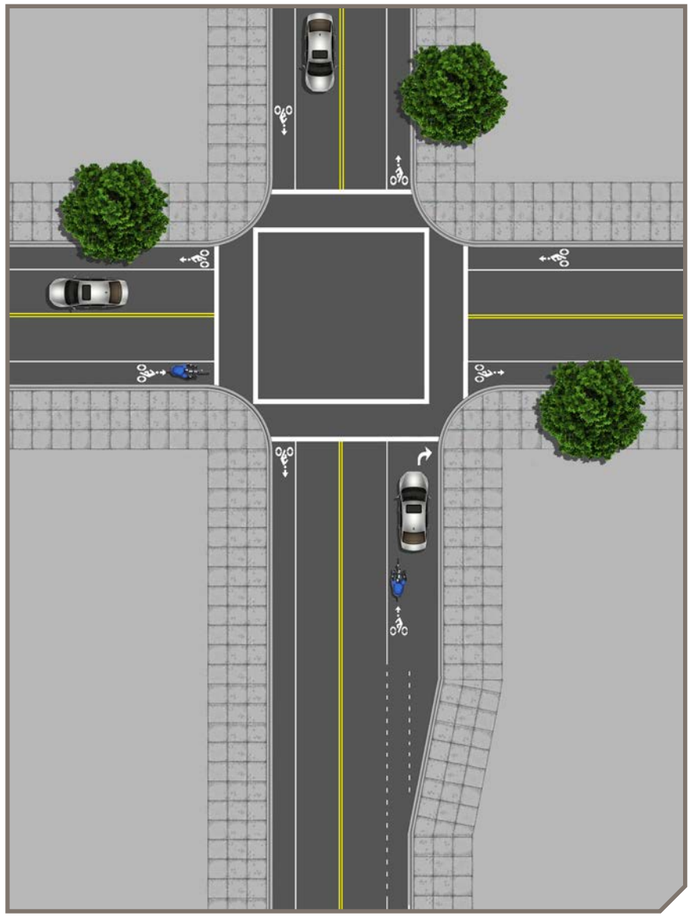
photo courtesy of Flickr user "Sweet One"

Separated bike lane and right turn lane

Right Turn Lane Treatments



When width can accommodate separate bike lane and turn lane



When width requires a combined bike lane and turn lane

photo courtesy of Nate Evans

Left Turn Lane on Guilford Avenue at North Avenue

f. Left Turn Lane Treatments

Bicycle left turn lanes may be used at intersections when a route crosses a perpendicular route, or when a route takes a left turn. Bicycle left turn lanes are best used on streets with sharrows or shared lane signage, when bicyclists are encouraged to take the full travel lane.

g. Two-Stage Turn Queue Box

Sometimes referred to as the "Copenhagen Left Turn", the two-stage turn queue box allow bicyclist to turn left from a cycletrack or bike lane on the right side of the road. The two-stage turn queue box direct bicyclist to a box on the far side of the intersection where they wait for the light to turn green on the cross street. This allows bicyclist to get in position to go in the direction they would be heading if they turned left without merging across lanes of traffic.

Two Stage Turn Queue Box, NACTO

h. Bike Cut Through

A bike cut-through allows bicyclists to cross areas where motorists are not permitted to pass. Cut-throughs can be located at streets cut off from traffic and across areas without roads, such as through parks or developments. Cut-throughs can also be used at busier streets with a median refuge island for bicyclists and pedestrians. When a cut-through crosses a road, it should not permit vehicular through traffic. Cut-throughs at street crossings should have a well-marked crosswalk that is well lit and signed for pedestrian and bicycle crossing, not pedestrian crossing only.

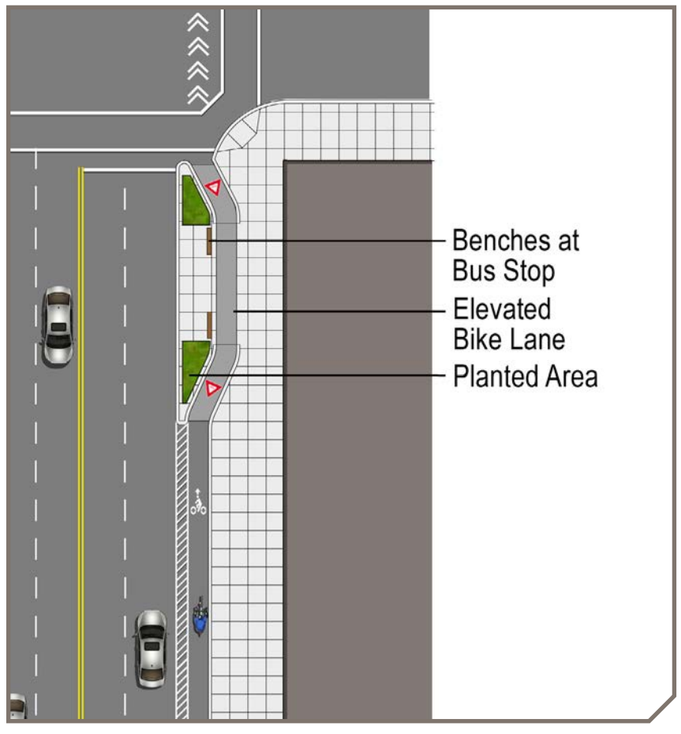
i. Bus Stop Accommodations

Bus stops present a potential conflict with bicycle movements since bicyclists are typically traveling to the right side of a street where most buses need to stop to pick up and drop off passengers at the curb line to the right. Special accommodations may be provided at bus stops providing for a safer through movement for bicyclists to avoid a weave pattern where cyclists must pass buses to the left of the bus. A sidewalk extension bump out along with moving the bike lane behind the bus waiting area can allow bicyclists to pass buses to the right of the bus without getting between the bus and its riders or weaving in and out of motor traffic. In situations where the bike lane is moved up onto the sidewalk area, bicyclists should always yield to pedestrians and crosswalk symbols should be provided to alert pedestrians to the potential of oncoming bicycle traffic.

Ramsay Street road closure currently does not allow for a Bike Cut Through because the planters are spaced too close. Staggering planters with wider spaces can allow for a Bike Cut Through while still preventing motor vehicles from passing.

Bike Cut Through on Lexington Street at Martin Luther King Boulevard uses a shared crosswalk with pedestrians

photo courtesy of Nate Evans

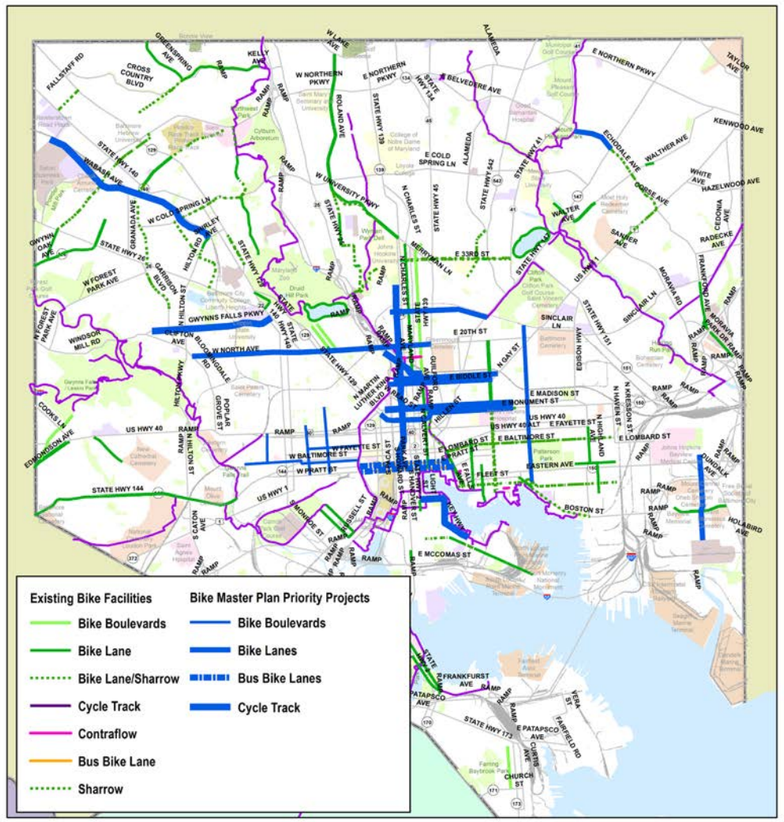


Special accommodations should be considered at bus stops. This conceptual schematic layout shows how a bike lane can be integrated into a bus stop area

Rendering of Street Closure with a Bike Cut Through at Ramsay Street.

E. Existing and Proposed Routes

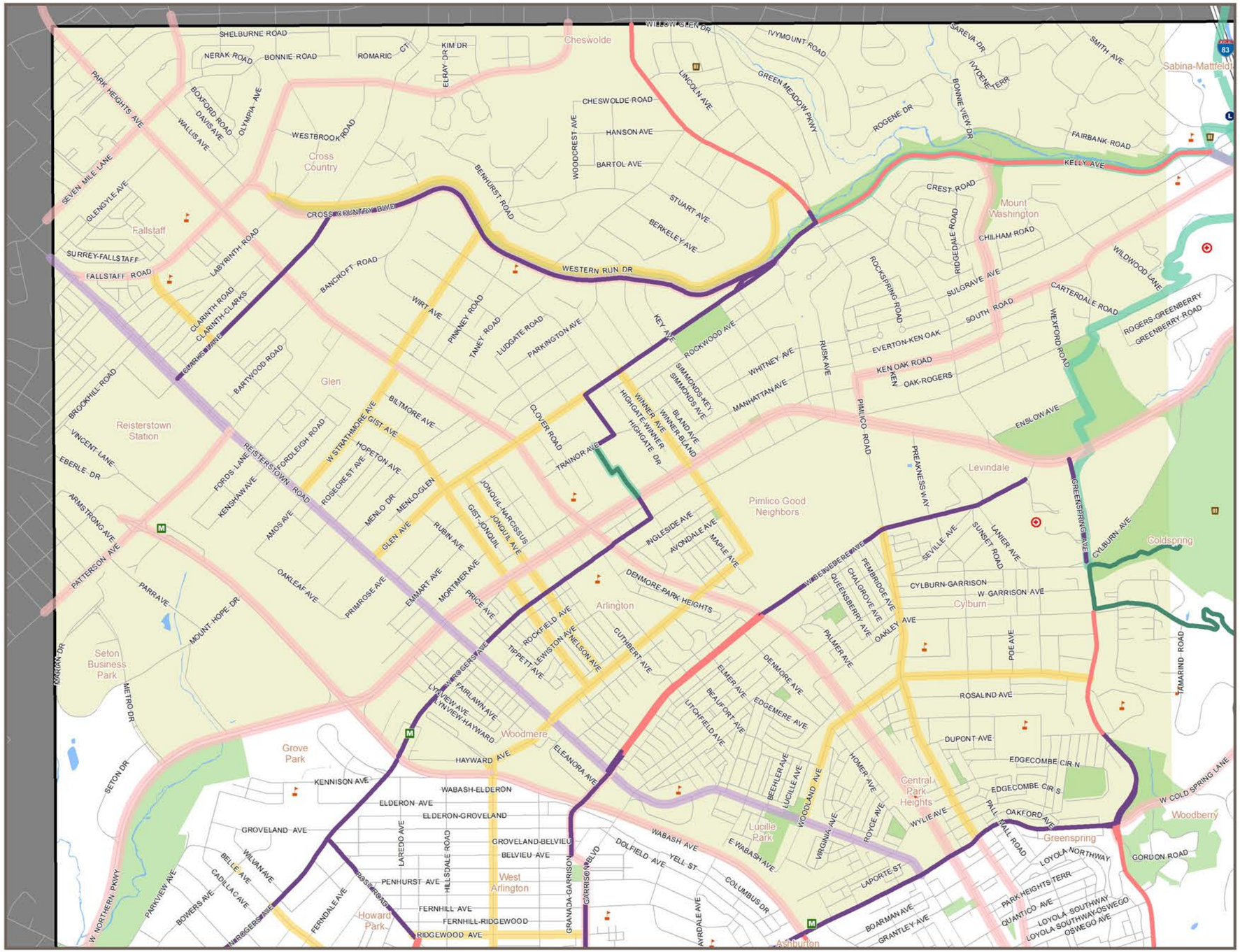
To create a more complete network, a new set of routes are proposed to better connect all areas of the city with bicycle infrastructure. The following Table 3 highlights the highest priority routes to be implemented within the next 5 years. The following maps depict all proposed routes disaggregated by either main routes, minor routes, neighborhood routes, and trails. The facility types for a main route would typically be either a bike lane, buffered bike lane, or cycle track. The facility type for a minor route would typically be a sharrow, shared bus/bike lane, or a contraflow lane. The facility type for a neighborhood route would typically be a bike boulevard or a bike cut-through. Trails would typically be off road trails or designated sidepath trails. Facility types for each route are suggestions, but should be determined after a more detailed feasibility study is conducted.

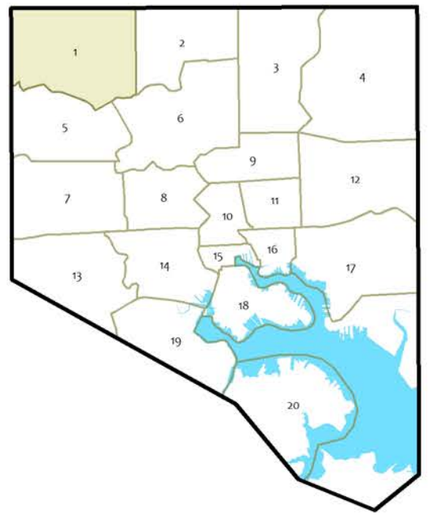


Existing Bicycle Network and Priority Projects, 2015

Table 3: Priority Bike Routes for Implementation

Roadway	Limits	Facility Type
Maryland Avenue	29th Street to Pratt Street	Two-way Protected Cycle Track
Lombard/Pratt Street	Frederick Avenue to South Broadway	Bus/Bike lanes
Preston and Biddle	Eutaw Street to N. Gay Street	Bike Lanes
Madison/ Monument/ Centre	Eutaw Street to Washington Street	Bike Lane/ Cycle Track
West Baltimore Bike Boulevards	Various	Bike Boulevard
Key Highway	Light Street to Lawrence Street	Protected cycle track or buffered bike lanes
Mount Royal Avenue Cycle Track	St. Paul Street to Lafayette	Two-Way Cycle Track on North Side
North Avenue	Hilton to Greenmount	Bike Lane
25 th Street	Charles to Hillen Road	Bike Lane
Martin Luther King Jr. Boulevard Sidepath	Eutaw Street to Washington Boulevard	Side Path
Gwynns Falls Parkway	Chelsea Terrace to Pennsylvania Avenue	Protected Bike Lanes
Echodale	Harford to Herring Run	Bike Lanes
Patterson Park Ave	Sinclair Lane to Essex Street	Sharrows/Climbing Bike Lanes
Gus Ryan	Holabird to Bank Street	Bike Lanes
Wabash Avenue	Patterson Avenue to Hilton Road	Protected Bike Lanes





1 - Northwest

Legend

- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

1 inch = 1,500 feet

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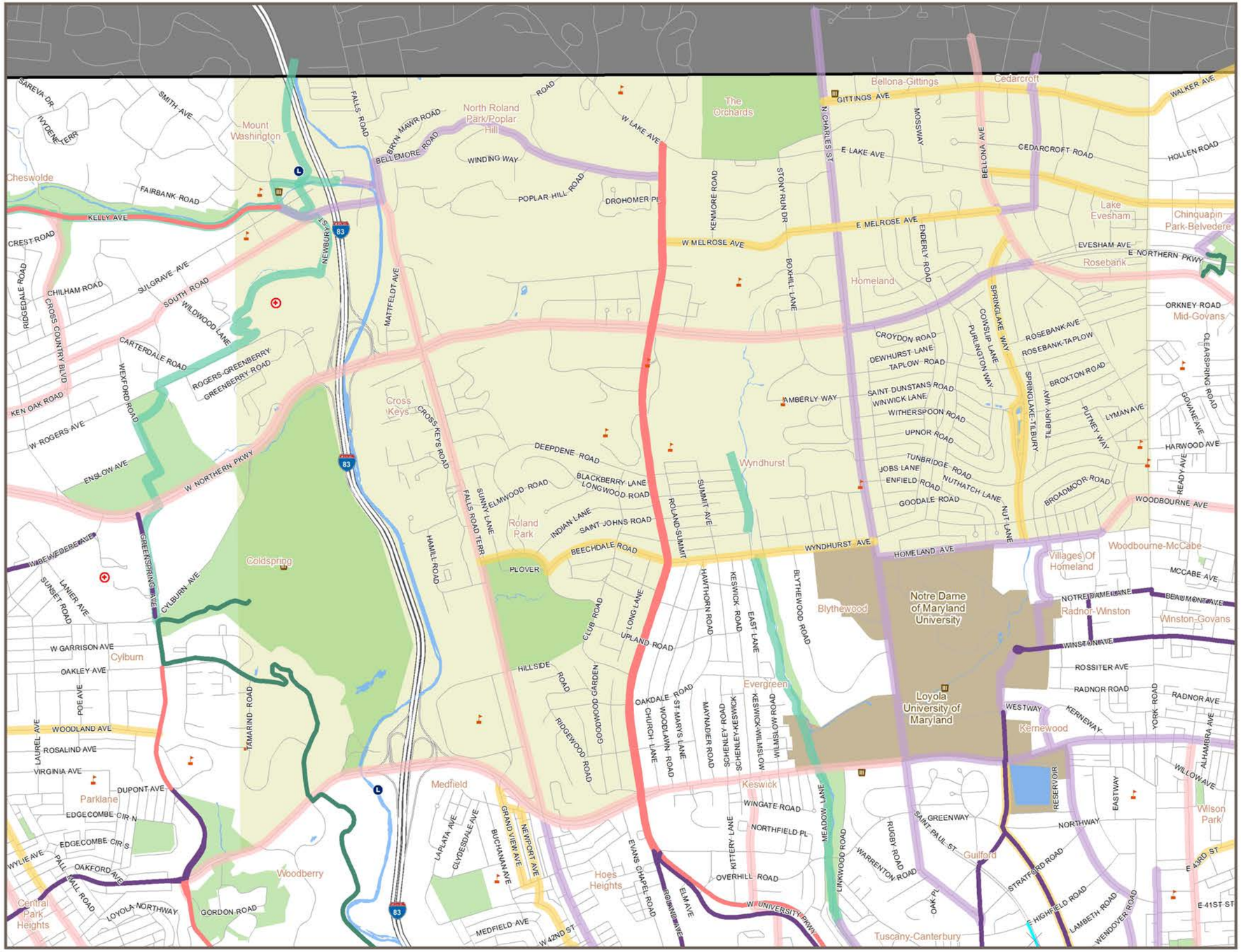
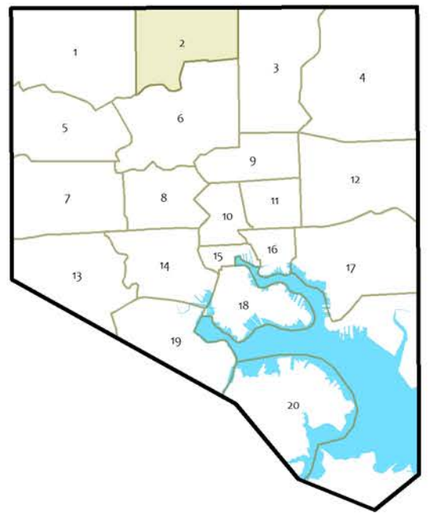
0 1,500 3,000 Feet





2 - North

Legend

- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
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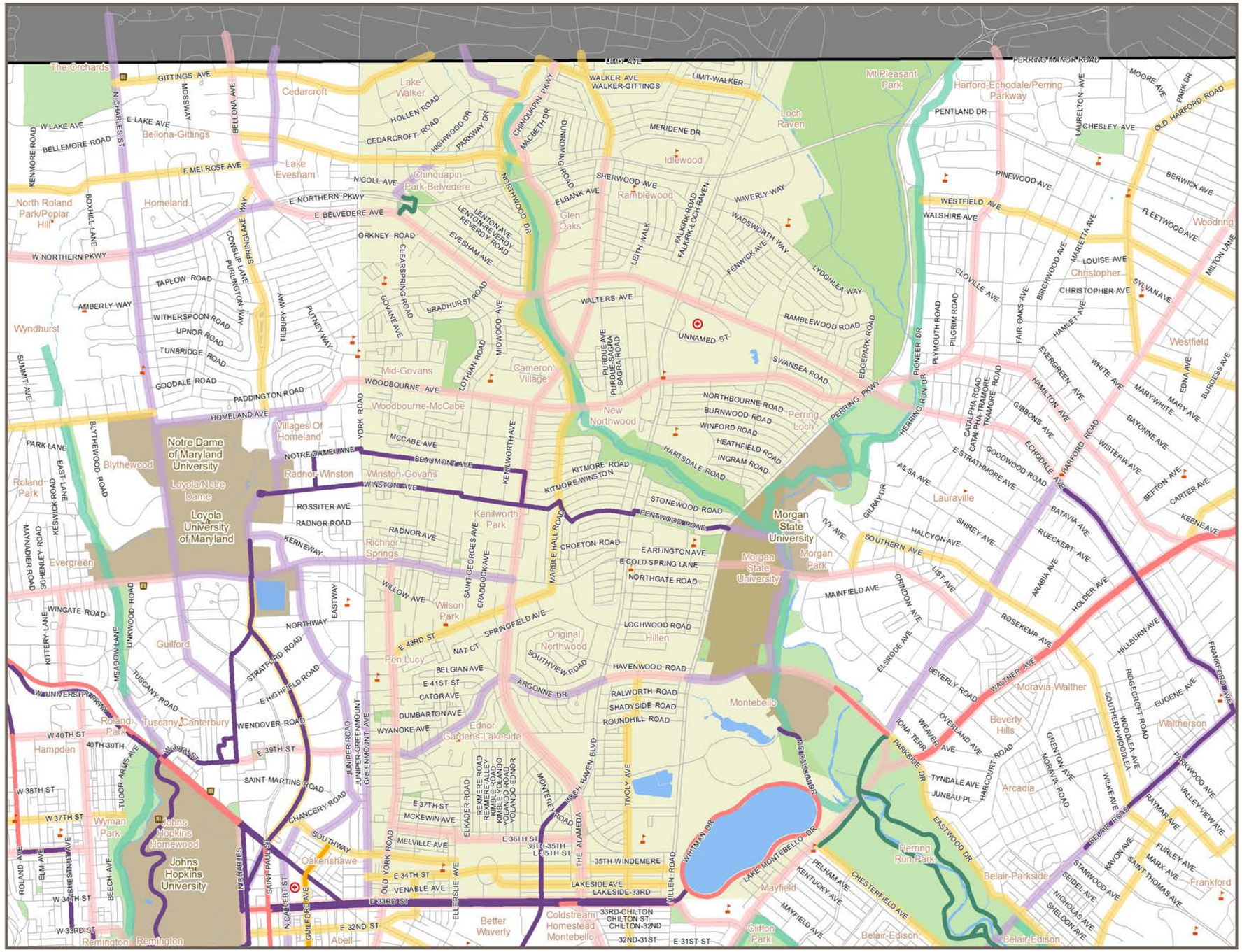

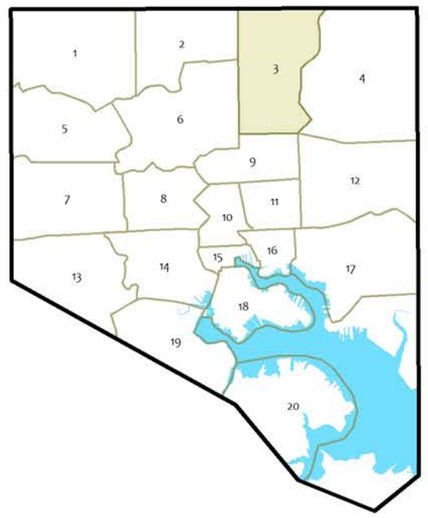

3 - Greater Northwood Area

Legend

- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
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	Existing Bike Network	Proposed Bike Network
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Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

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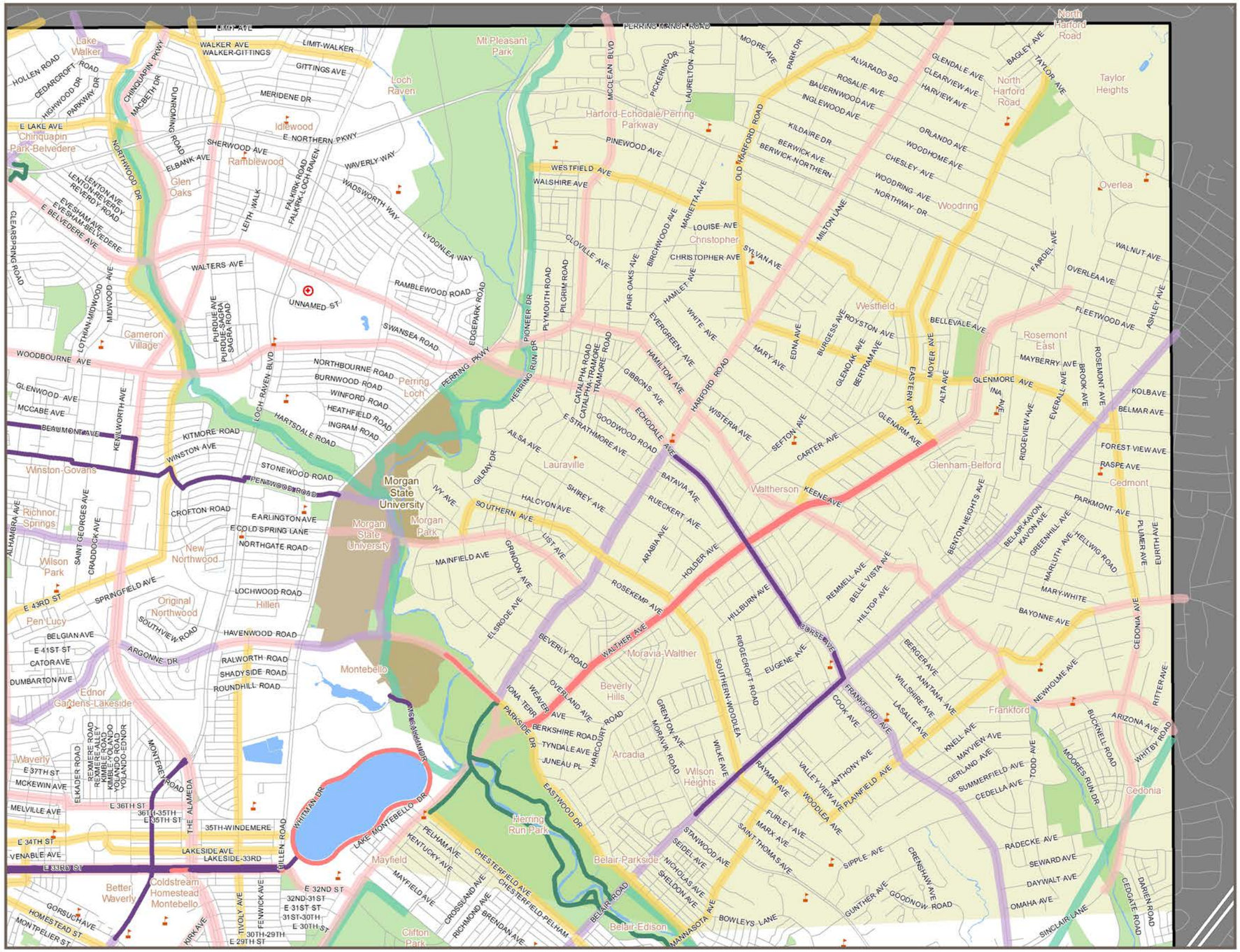
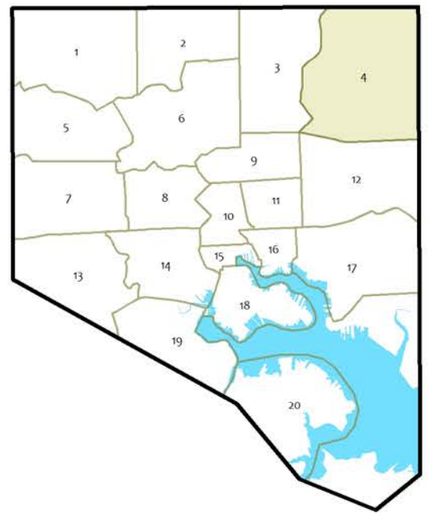
1 inch = 2,000 feet

0 2,000 4,000 Feet





4 - Northeast

Legend

- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
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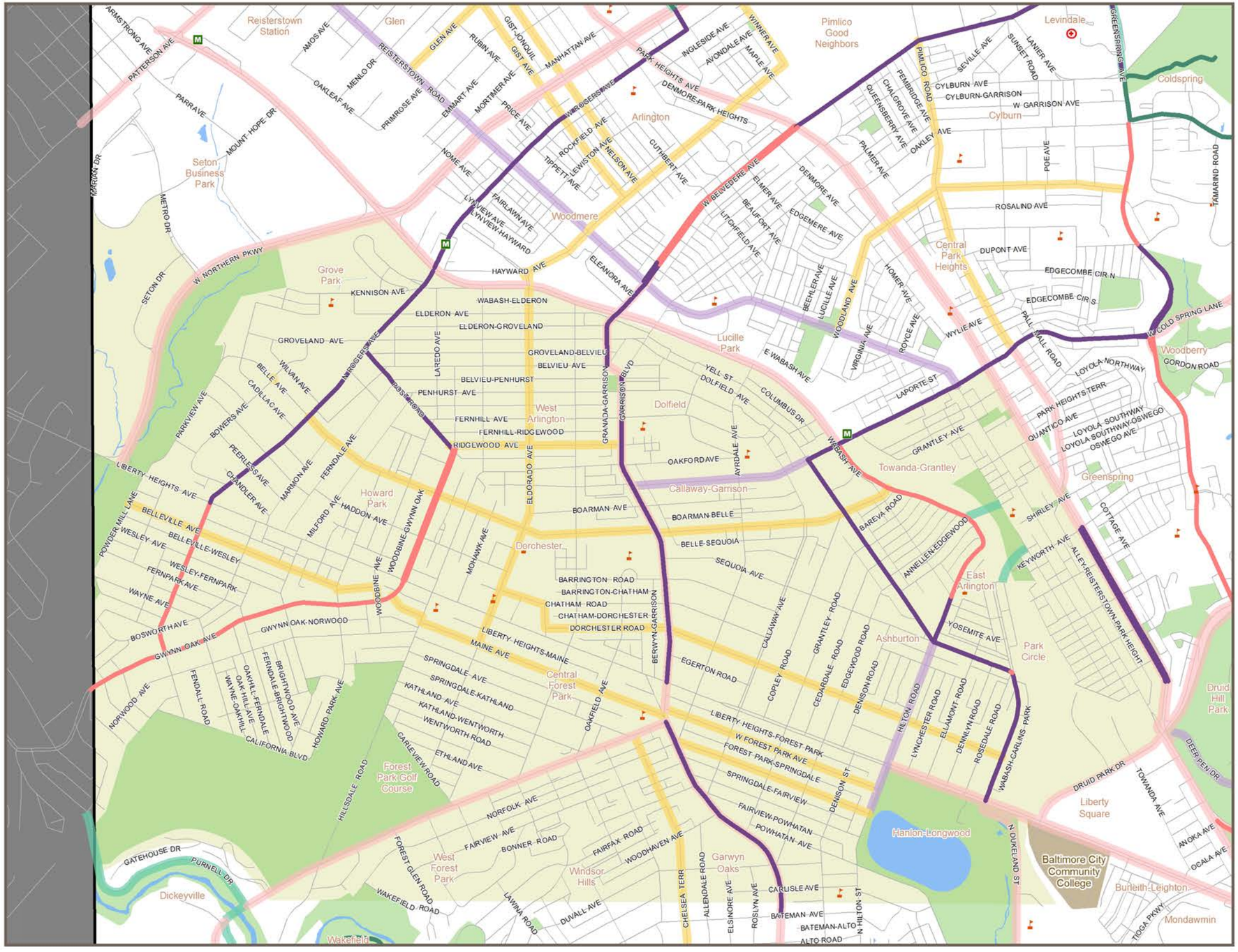
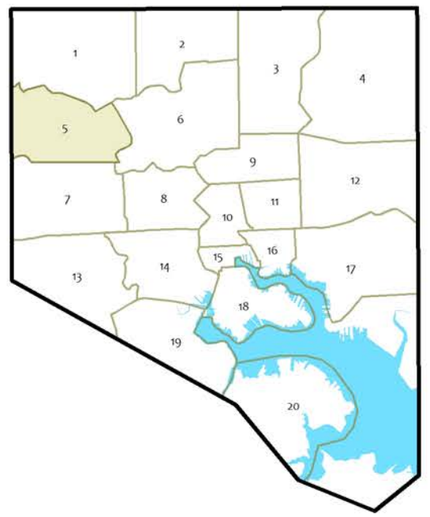
1 inch = 2,000 feet

N

0 2,000 4,000 Feet





5 - Greater Liberty Heights Area

Legend

- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

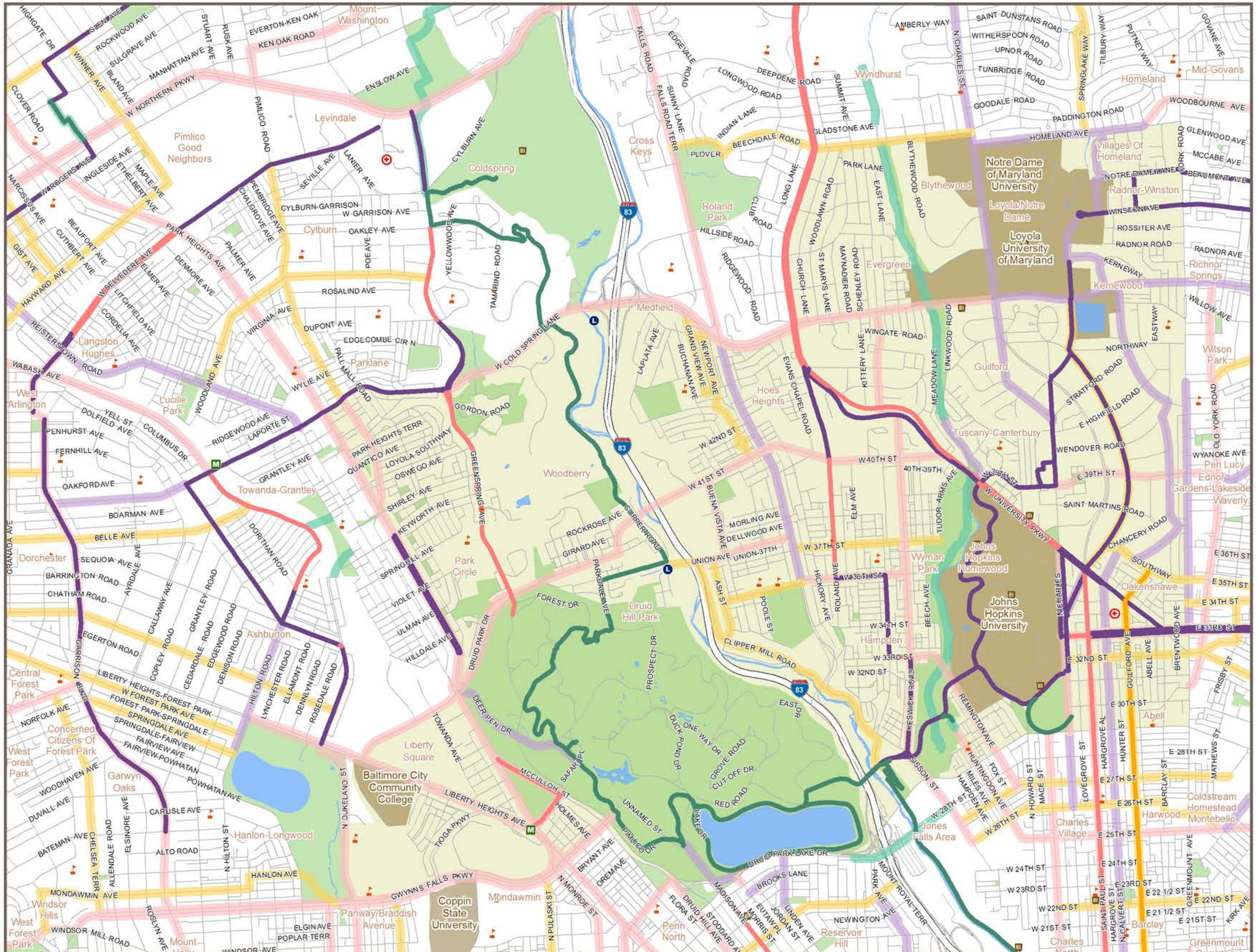
	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

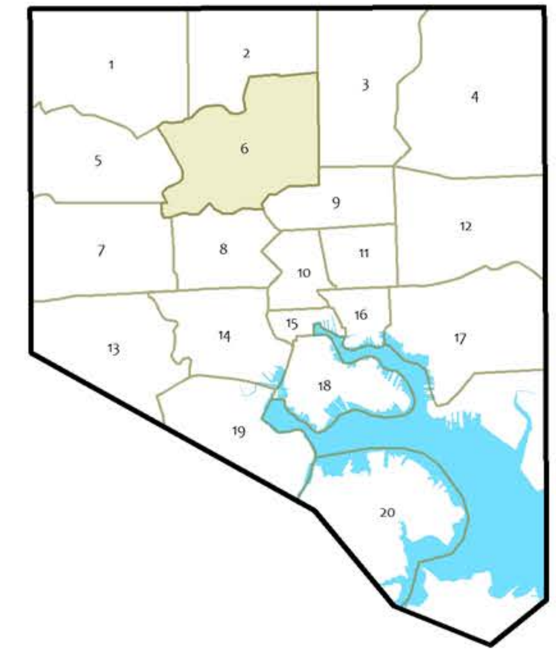
Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

1 inch = 1,500 feet

N

0 1,500 3,000 Feet





6 - Jones Falls Valley

Legend

- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

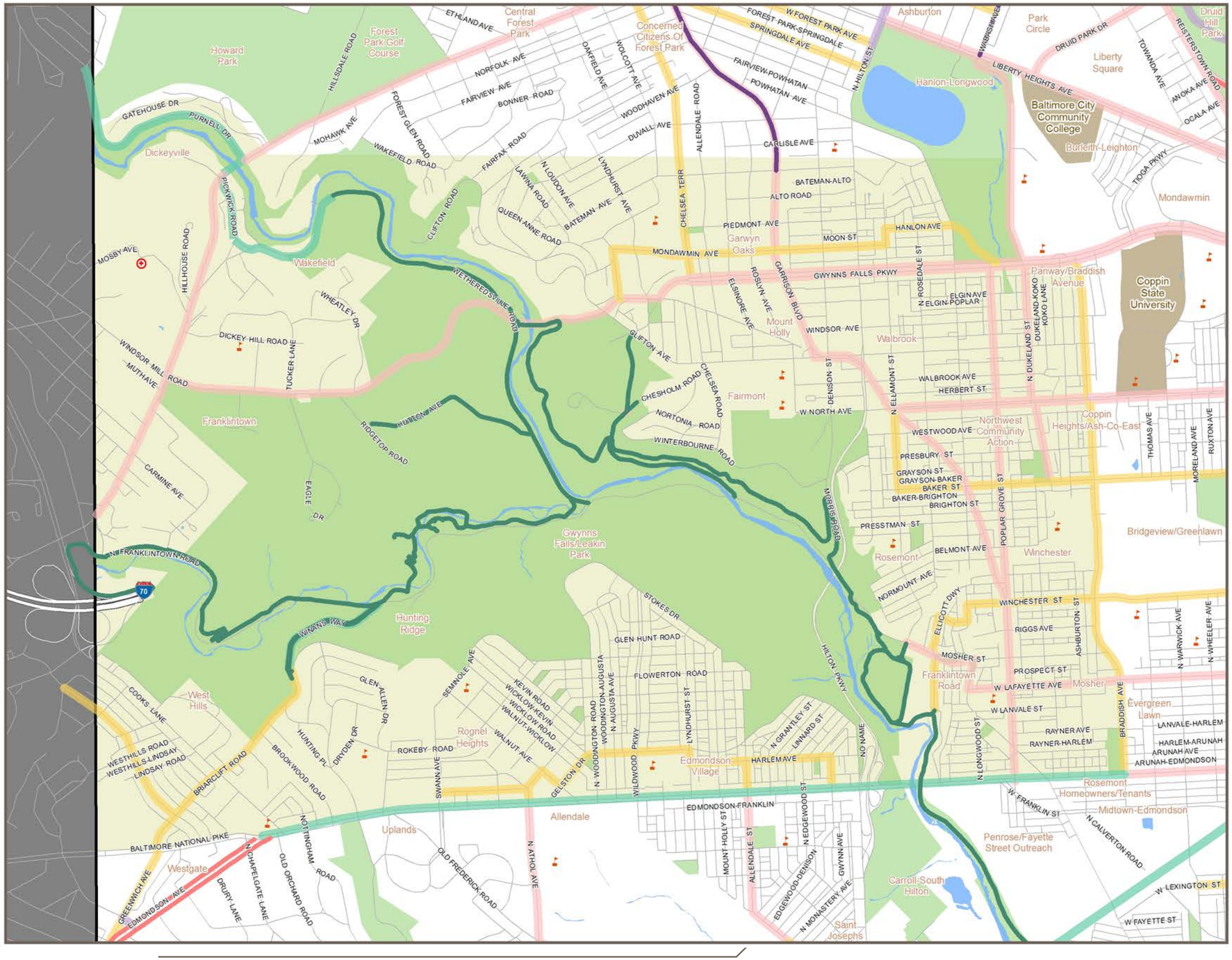
Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

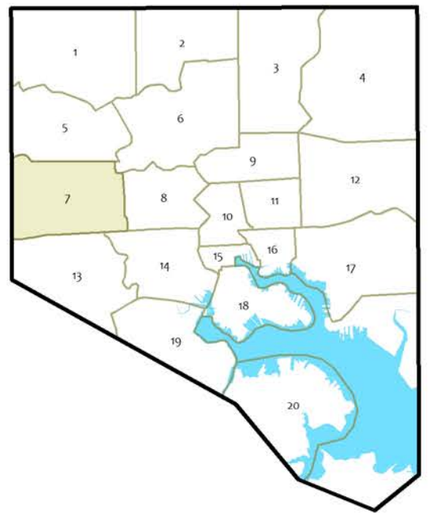
1 inch = 2,000 feet

0 2,000 4,000 Feet

N

PROPOSED ROUTES





7 - Gwynns Falls/Leakin Park Area

Legend

- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

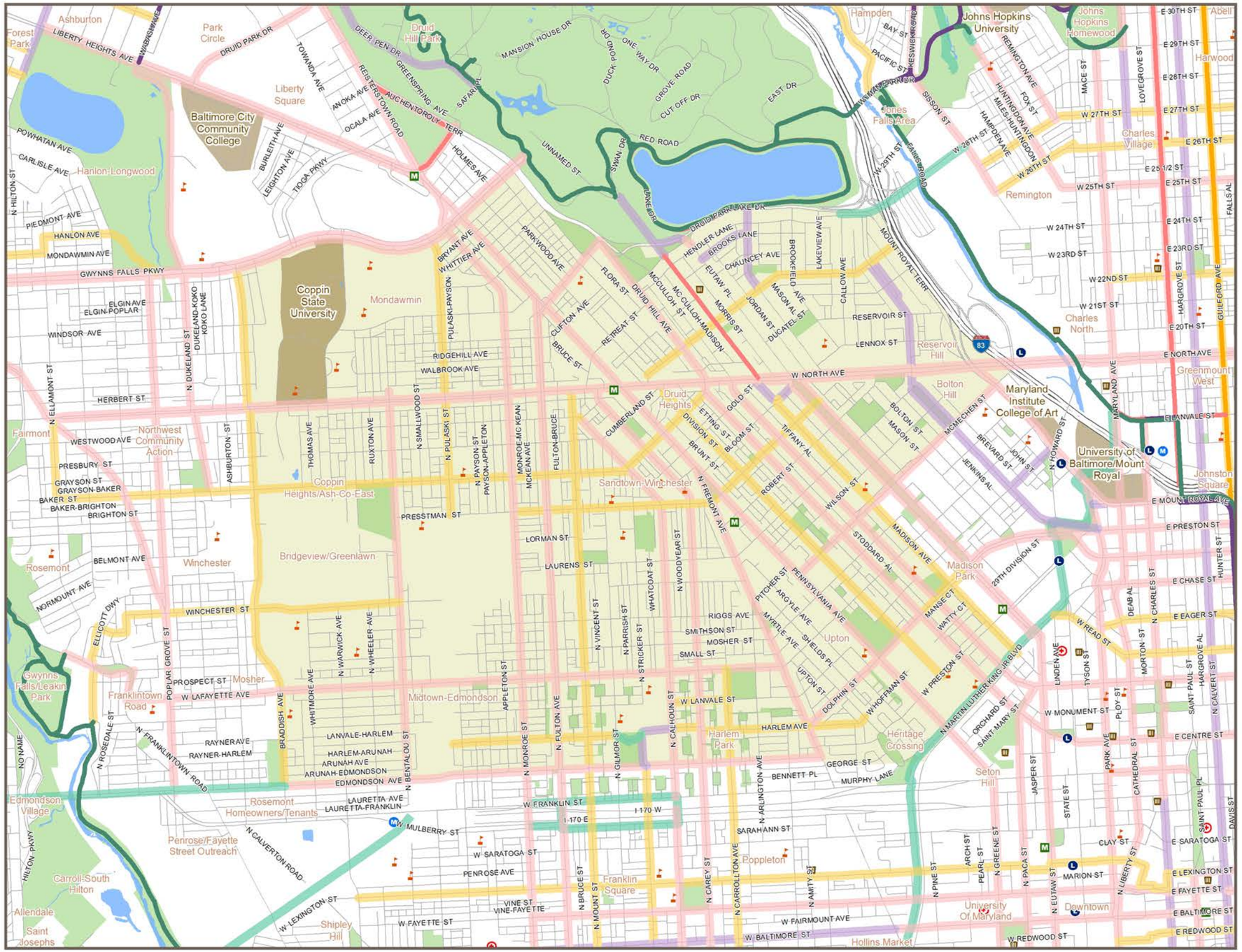
	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

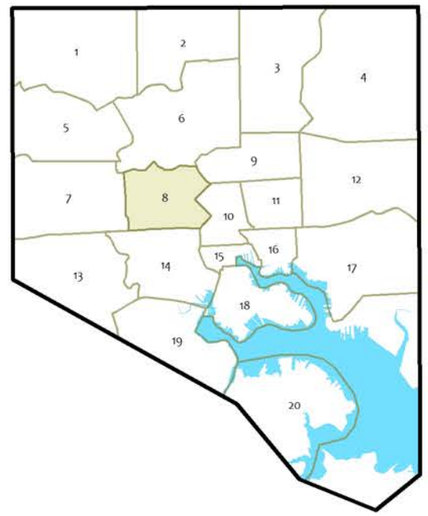
Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

1 inch = 1,500 feet

N

0 1,500 3,000 Feet





8 - Sandtown/Winchester Area

Legend

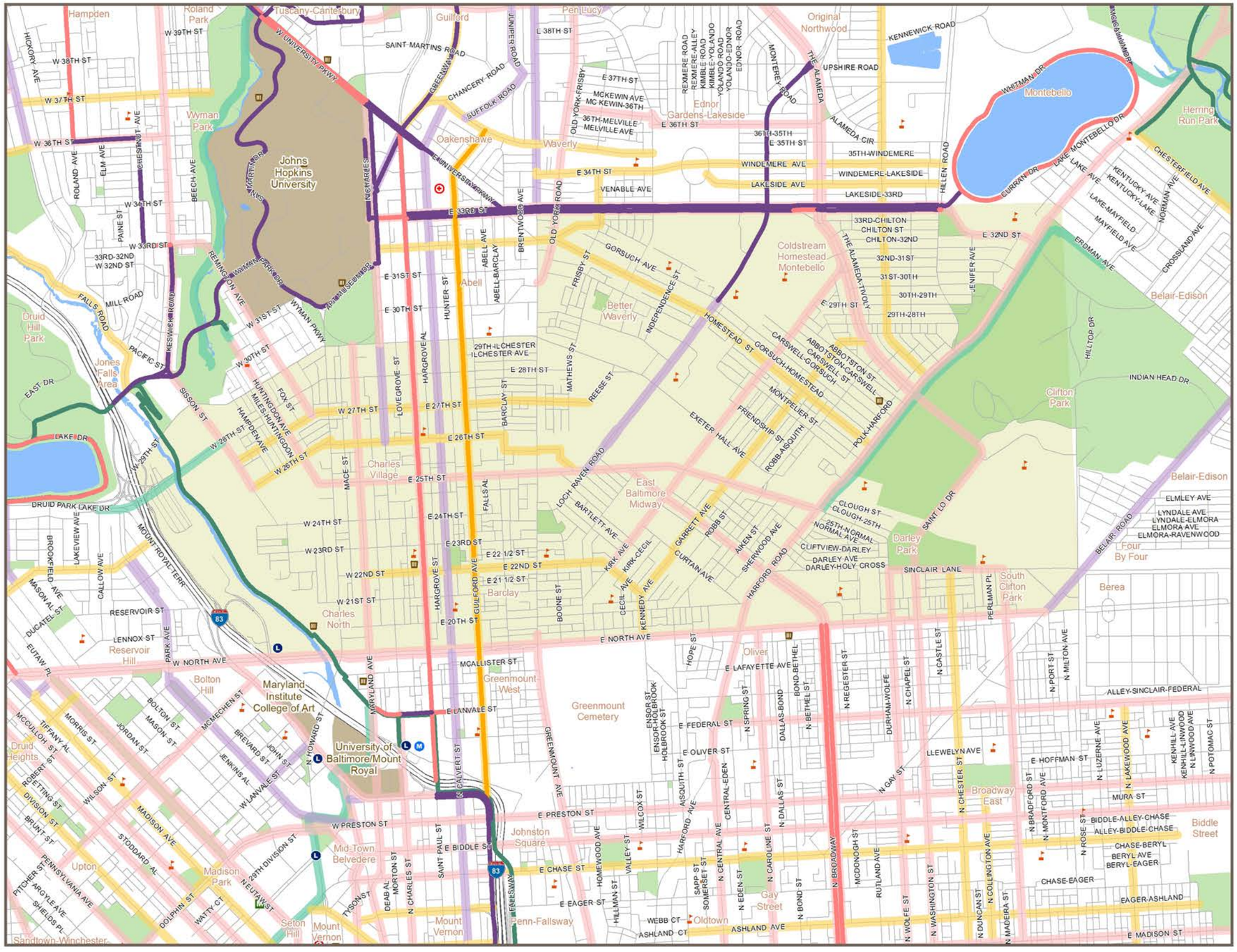
- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

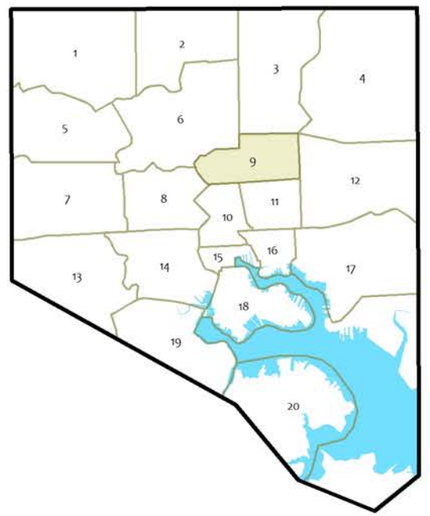
	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

1 inch = 1,500 feet

0 1,500 3,000 Feet





9 - Central

Legend

- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

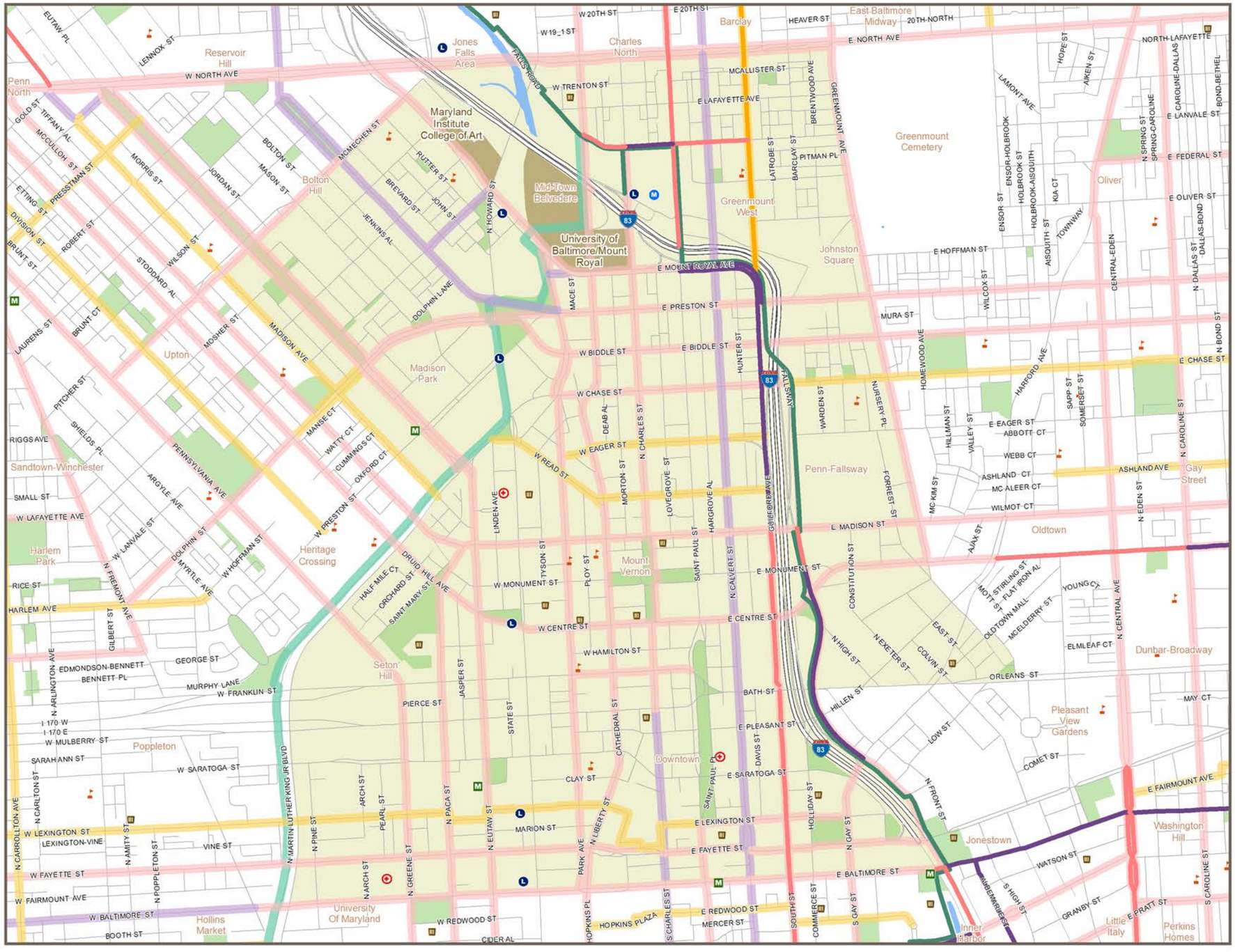
	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

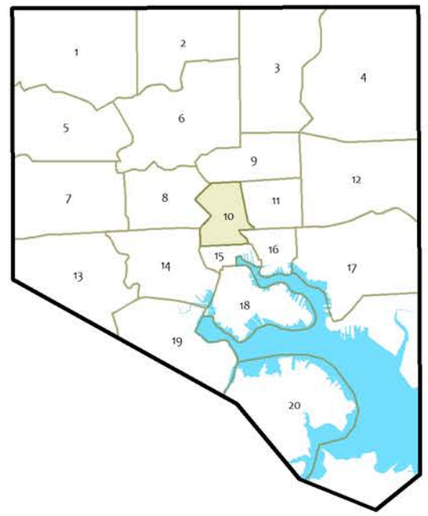
Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

1 inch = 1,500 feet

N

0 1,500 3,000 Feet





10 - Midtown

Legend

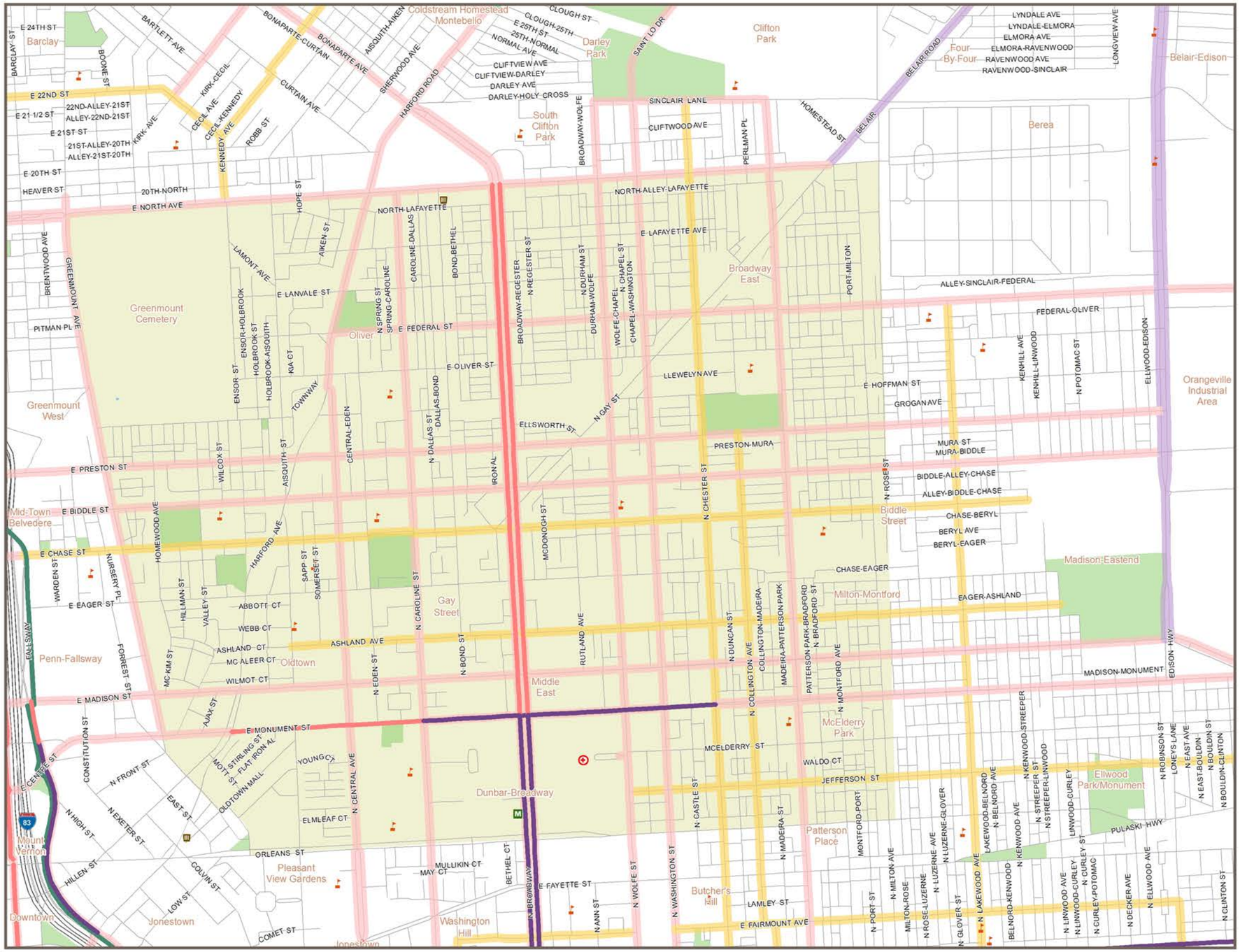
- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

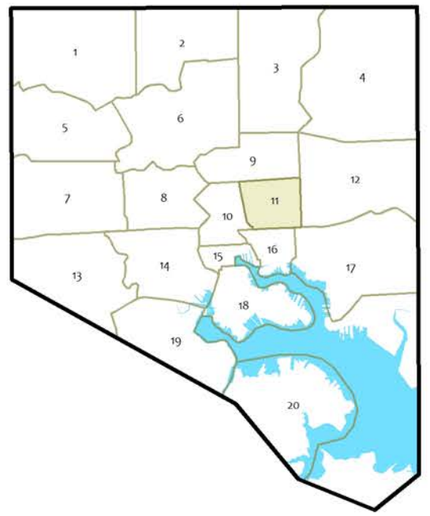
	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

1 inch = 1,000 feet

0 1,000 2,000 Feet





11 - North Broadway

Legend

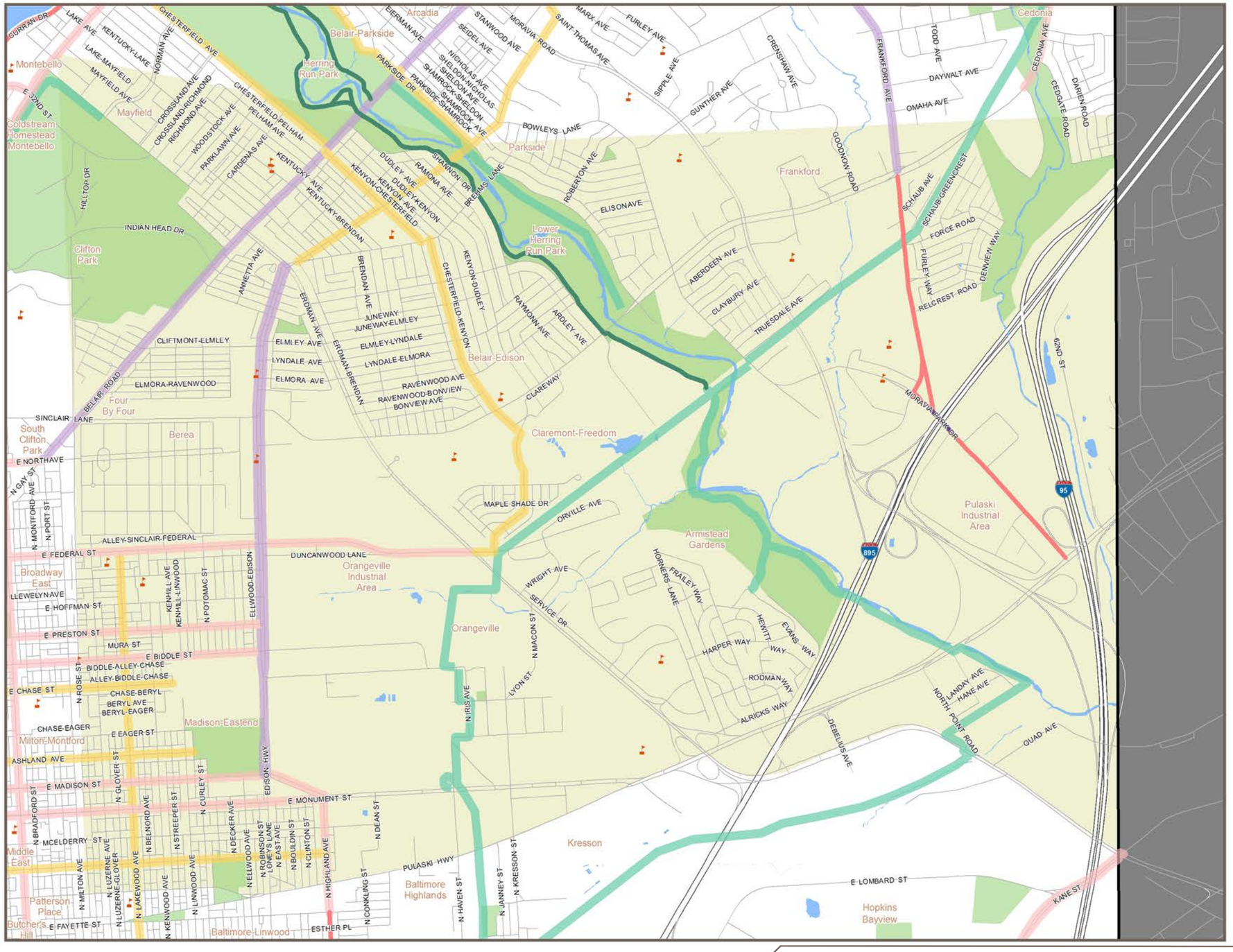
- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

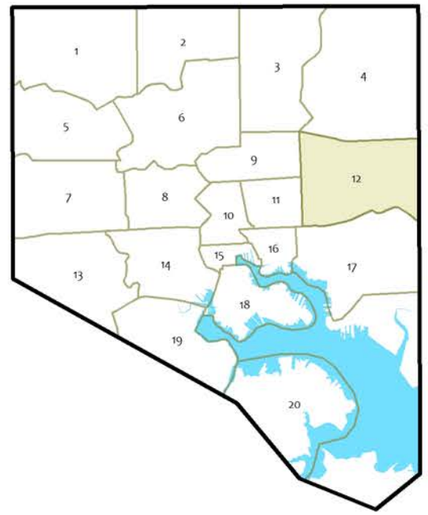
	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

1 inch = 1,000 feet

0 1,000 2,000 Feet





12 - East

Legend

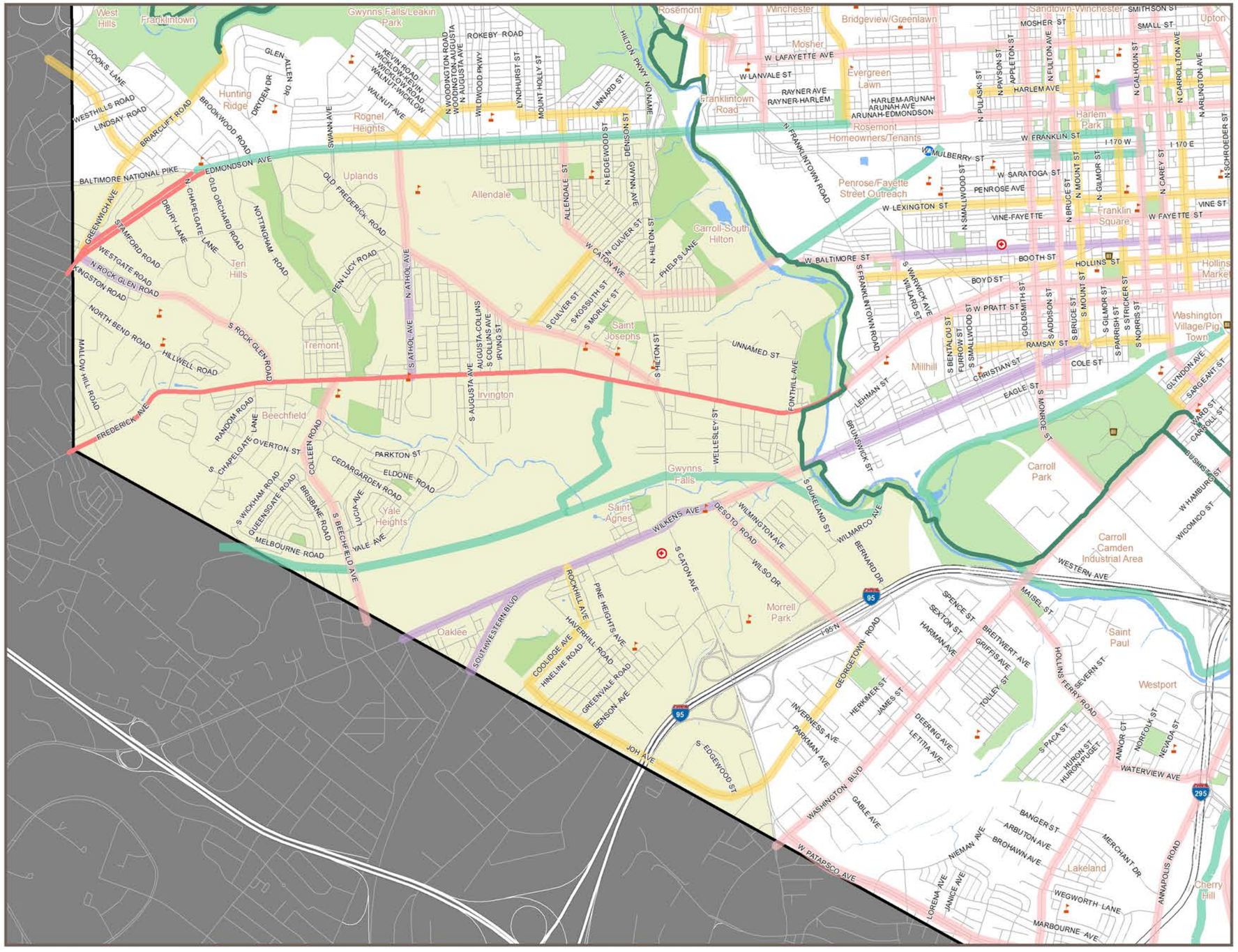
- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

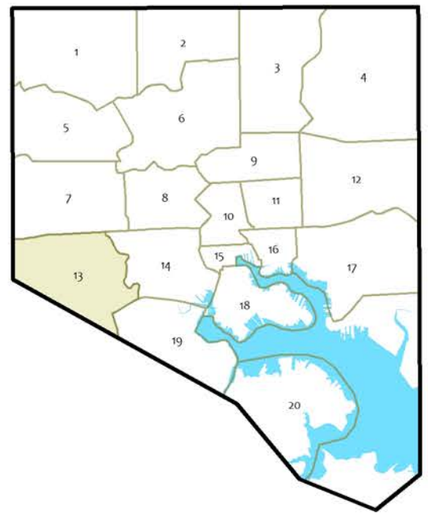
	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

1 inch = 1,500 feet

0 1,500 3,000 Feet





13 - Outer West

Legend

- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

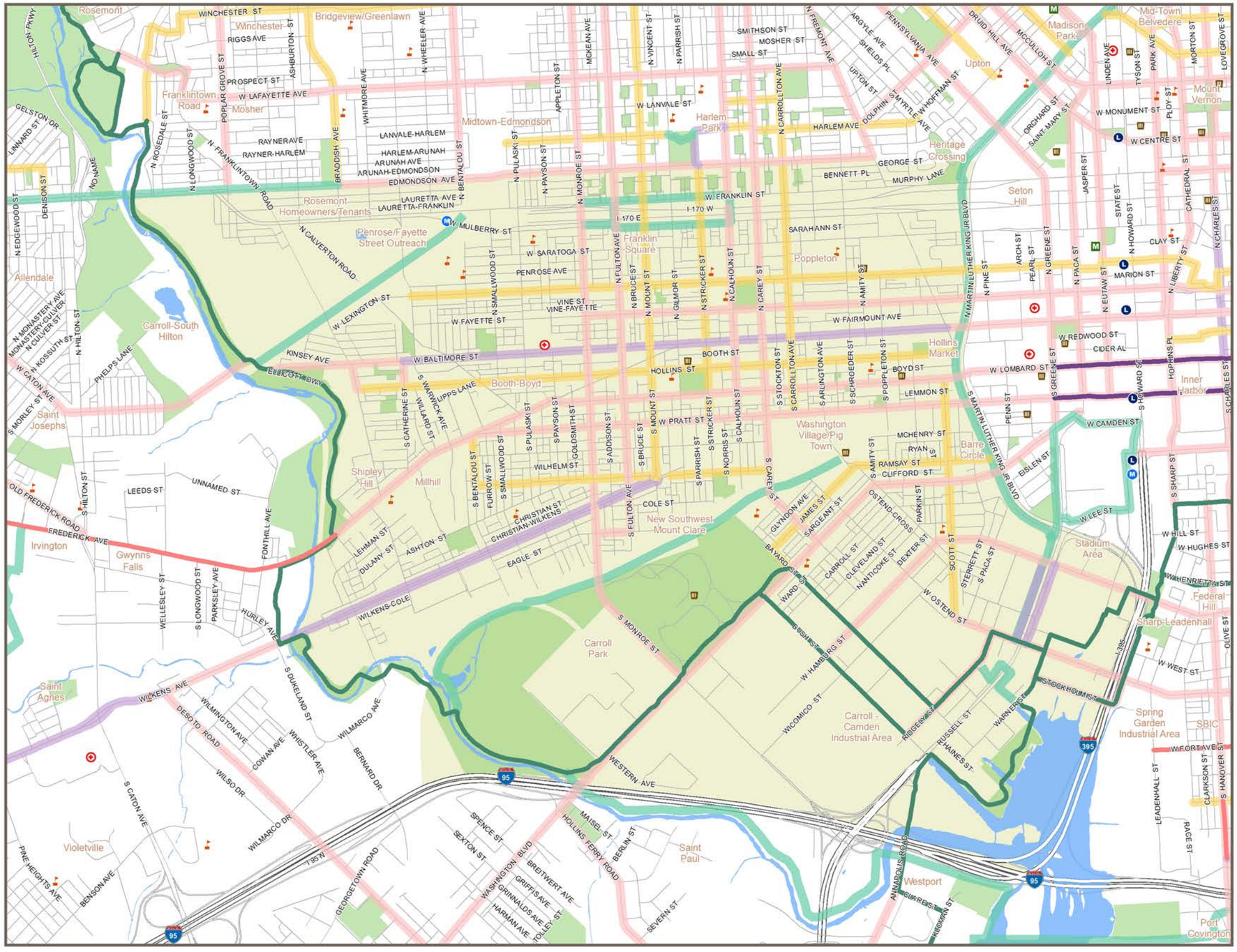
	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

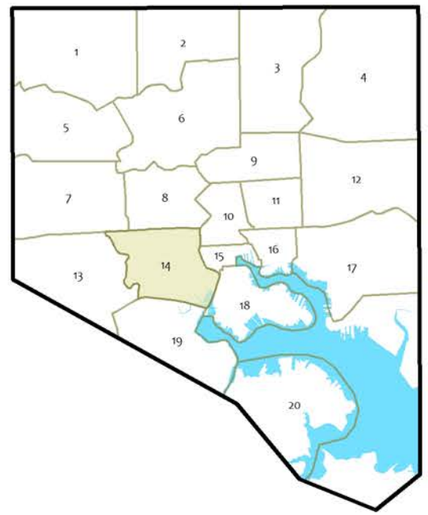
Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

1 inch = 2,000 feet

N

0 2,000 4,000 Feet





14 - West Baltimore

Legend

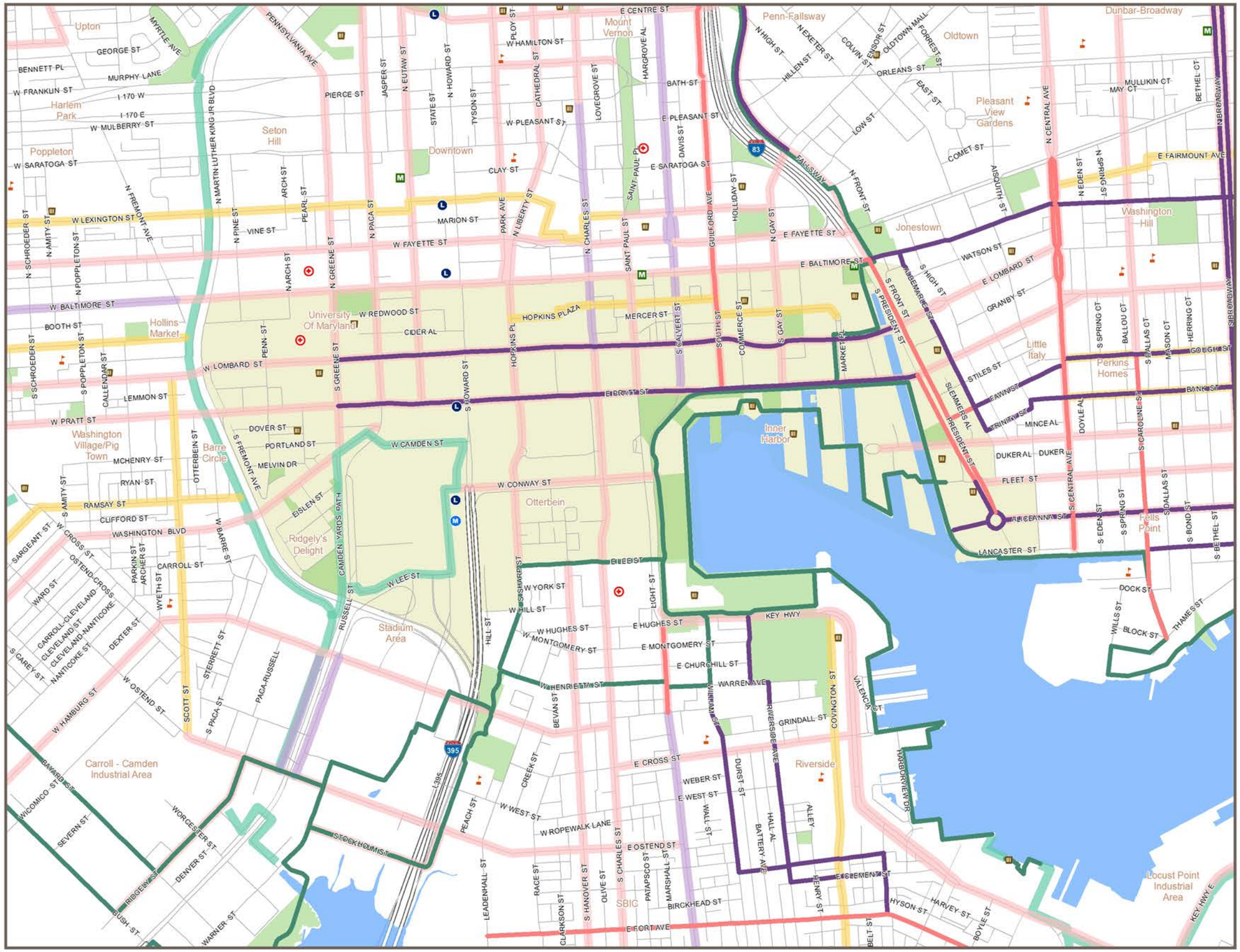
- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

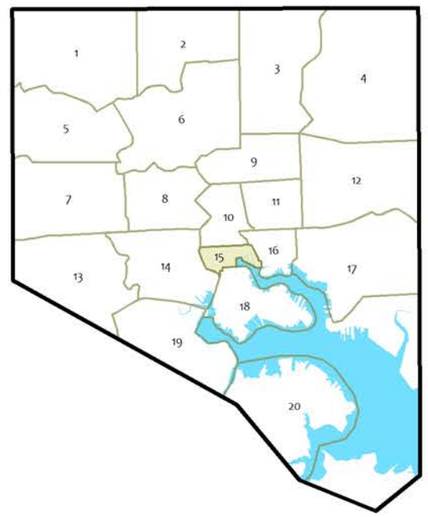
	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

1 inch = 1,500 feet

0 1,500 3,000 Feet





15 - Inner Harbor Area

Legend

- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

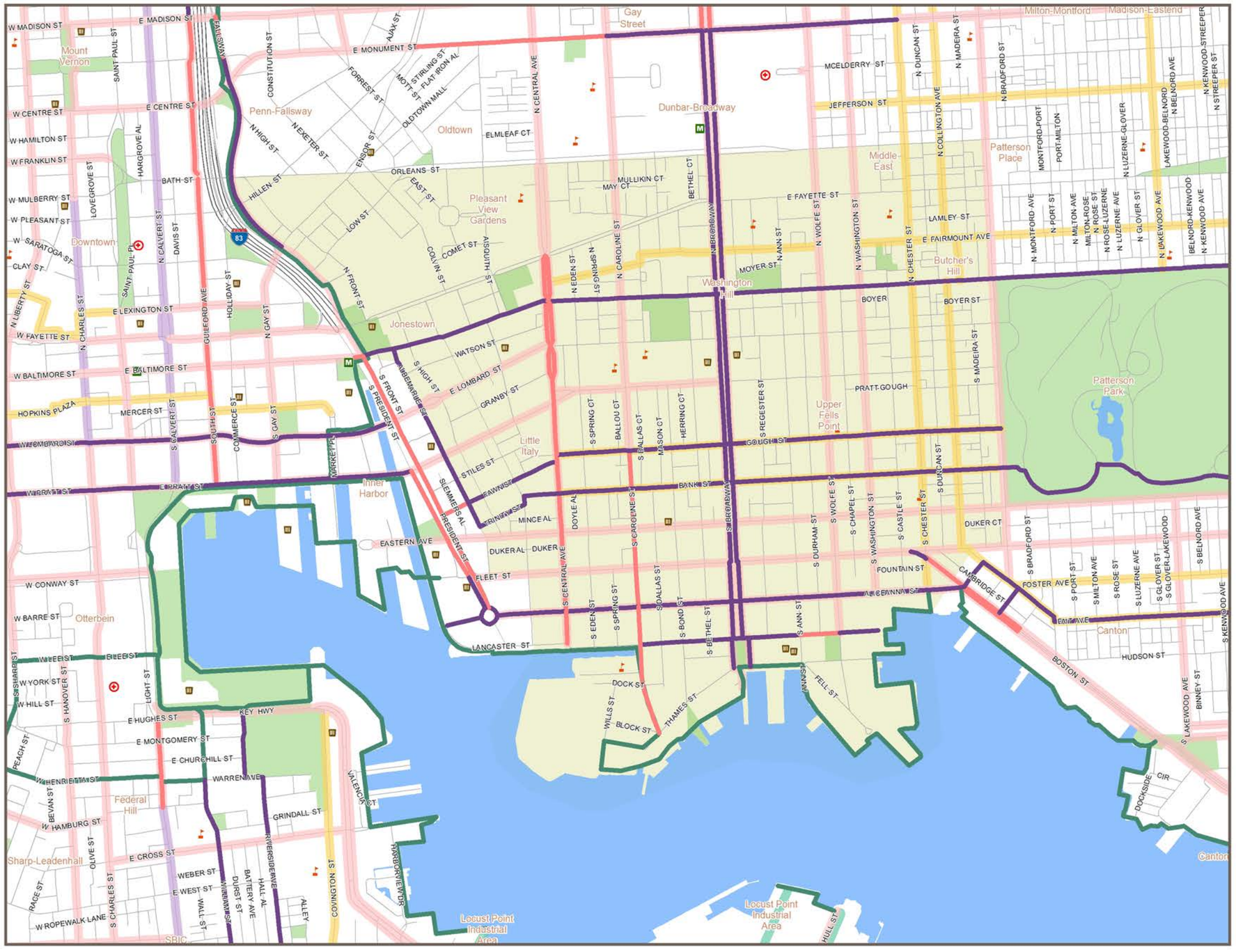
	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

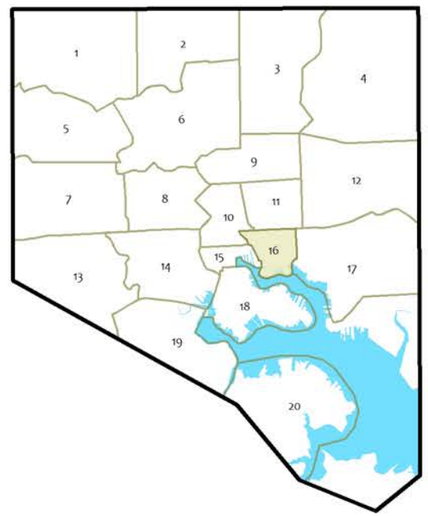
Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

1 inch = 1,000 feet

N

0 1,000 2,000 Feet





16 - Fells Point Area

Legend

- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

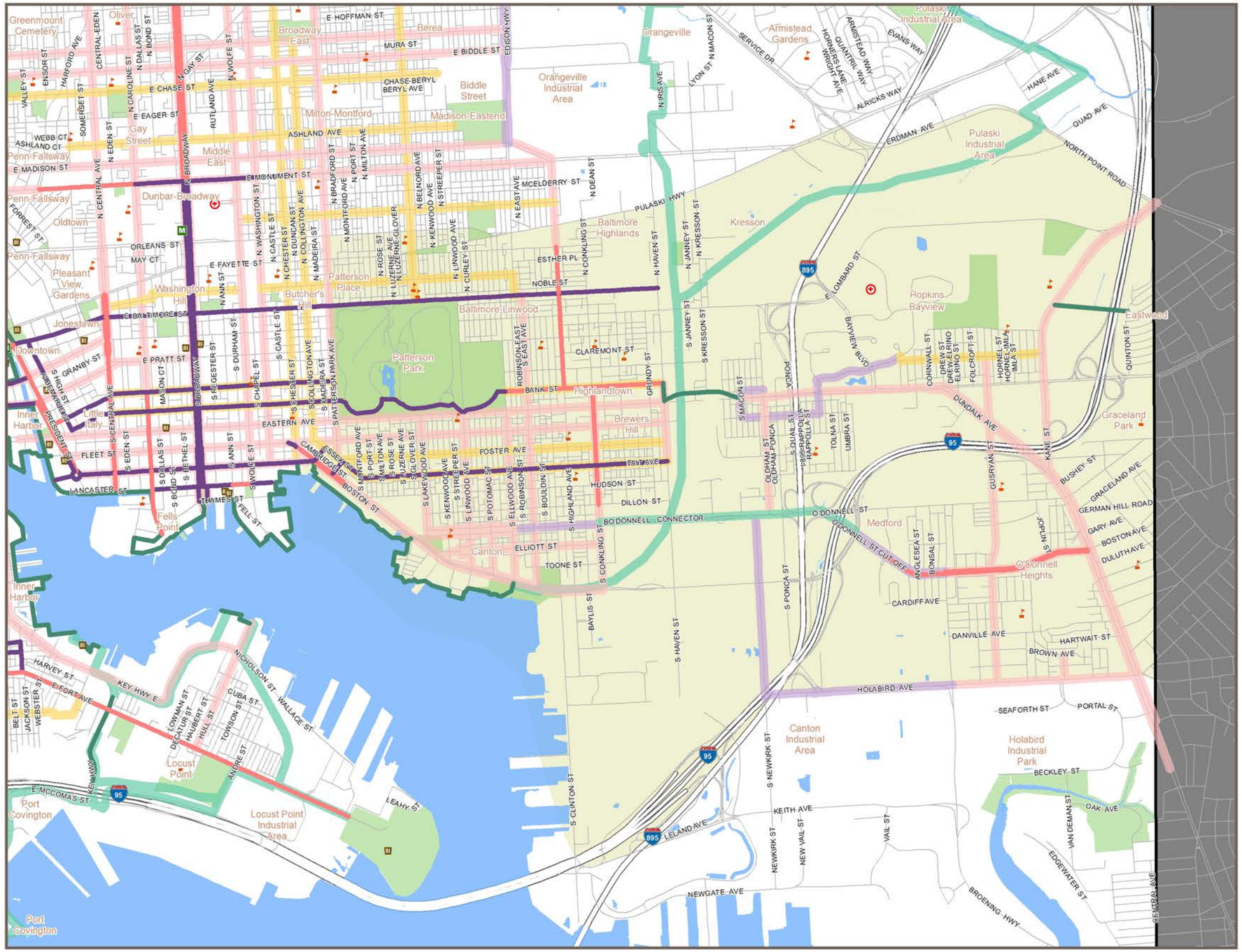
	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

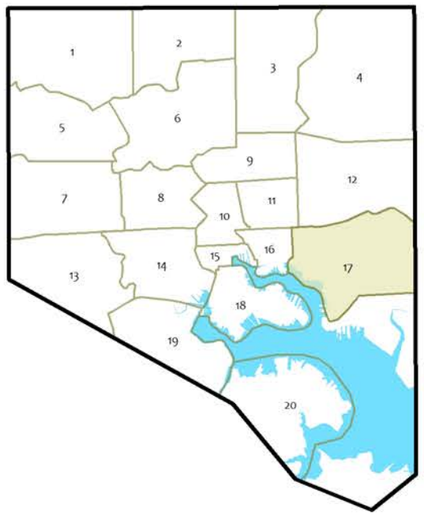
Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

1 inch = 1,000 feet

N

0 1,000 2,000 Feet





17 - Canton/Highlandtown Area

Legend

- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

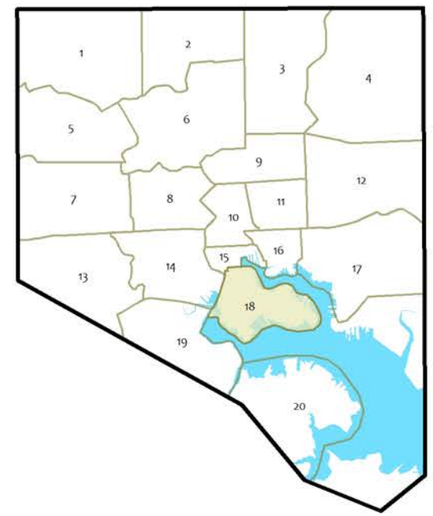
	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

1 inch = 2,000 feet

N

0 2,000 4,000 Feet



18 - Federal Hill/Locust Point Area

Legend

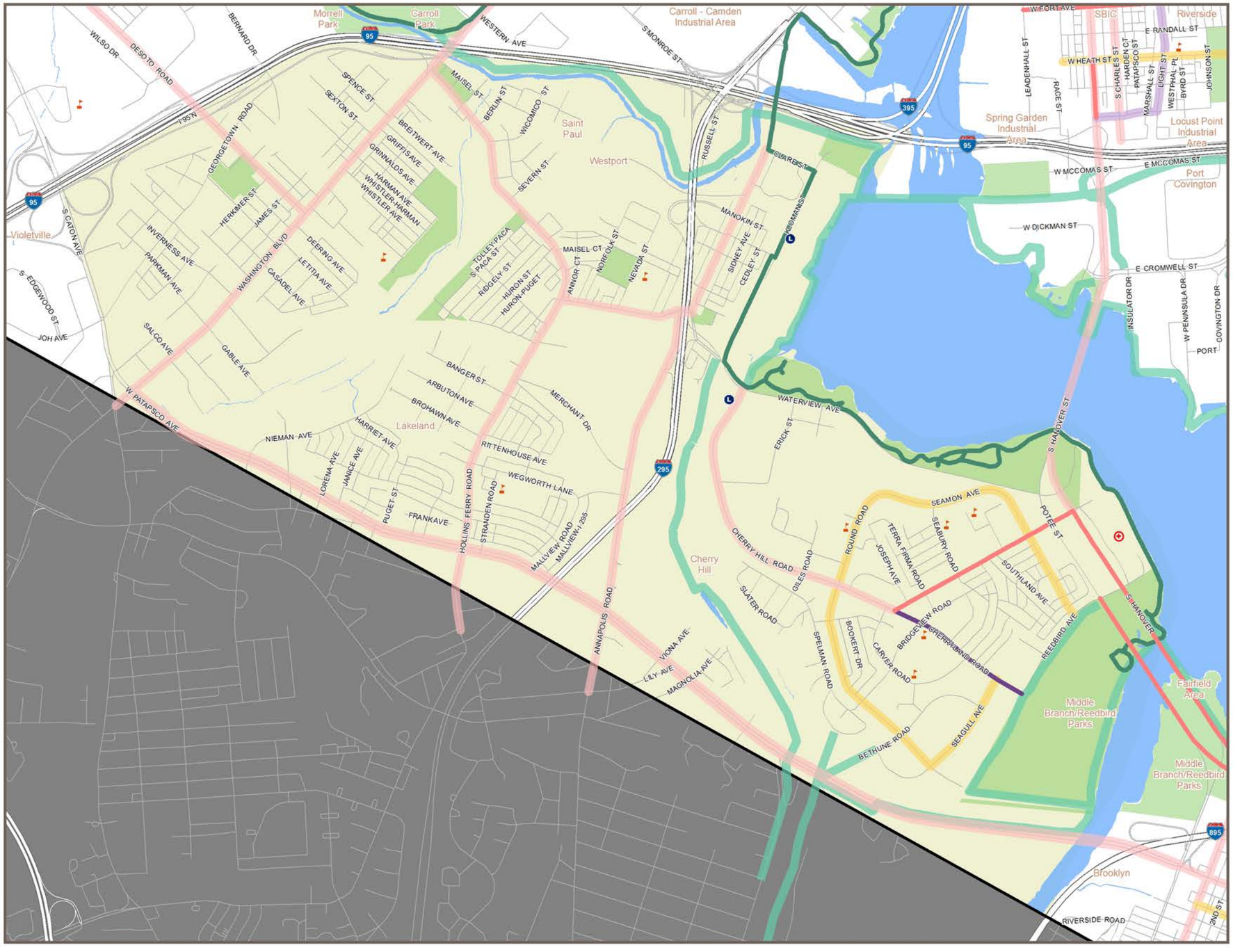
- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

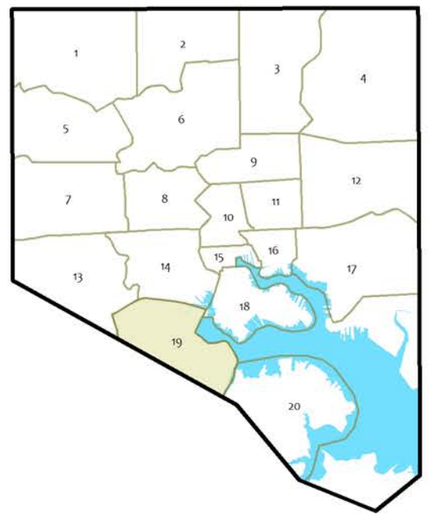
	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

1 inch = 1,500 feet

0 1,500 3,000 Feet





19 - Cherry Hill/Westport Area

Legend

- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

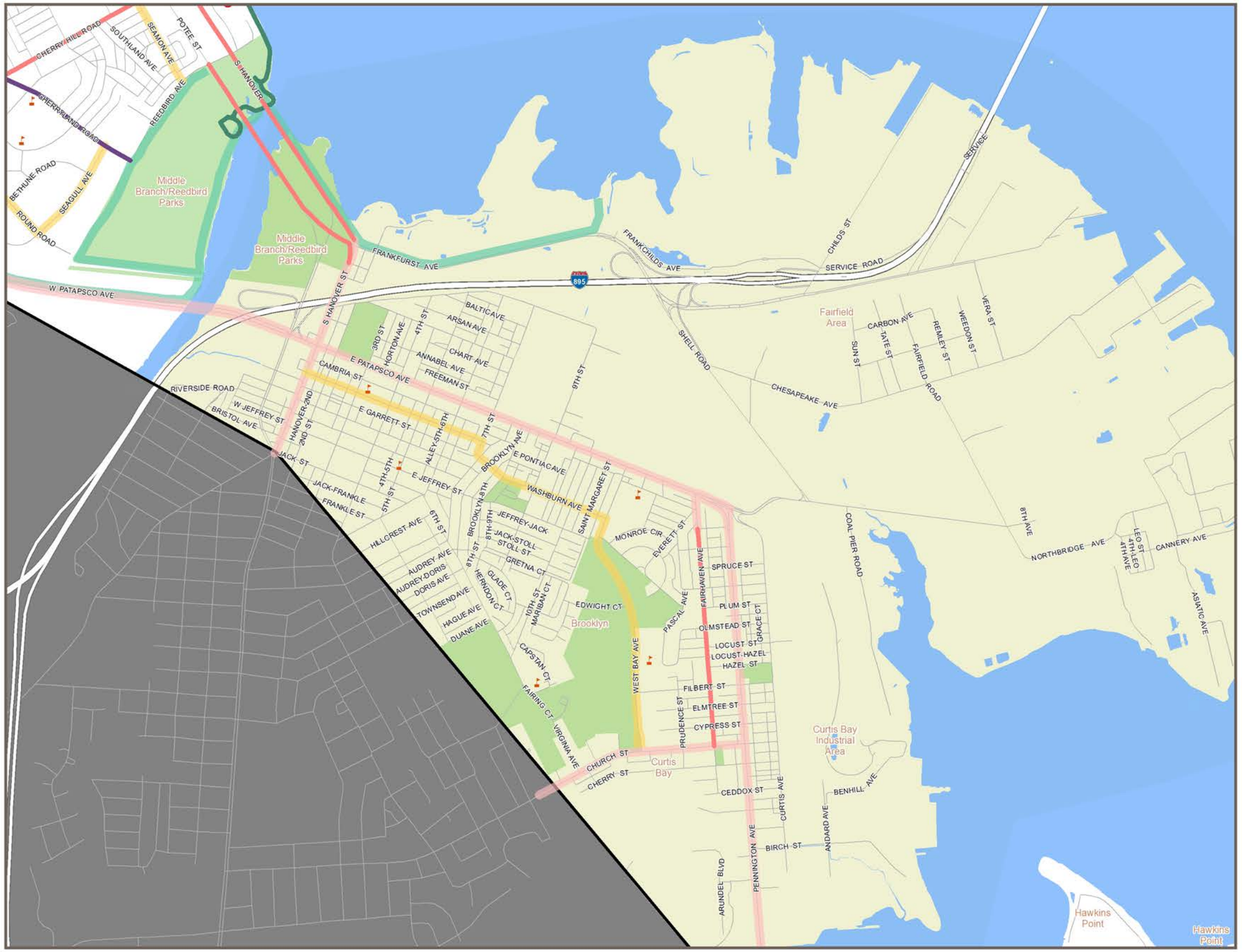
	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

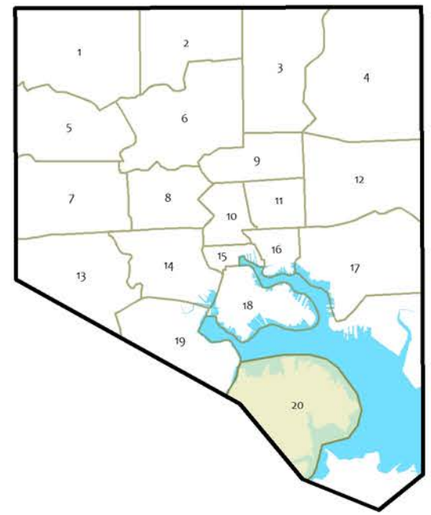
Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

1 inch = 1,500 feet

N

0 1,500 3,000 Feet





20 - Brooklyn Area

Legend

- K-12 Schools
- Light Rail Stations
- MARC Stations
- Metro Subway Stations
- Museums
- Hospitals
- Universities
- Interstates
- Ramps
- Roads
- Baltimore City Boundary
- Parks
- Water

	Existing Bike Network	Proposed Bike Network
Main Routes *(Bike Lanes, Buffered Bike Lanes, Cycletracks)*		
Minor Routes *(Sharrows, Shared Bus Bike, Signed Routes, Contraflows)*		
Neighborhood Routes *(Bike Boulevards and Bike Cut-Thru's)*		
Trails *(Off-Road Trails and Sidepaths)*		

Note: Bicycles are allowed on all Baltimore City streets except for Interstates. Facility types are typical suggestions for each route type, but other facility types may be explored in the design process.

1 inch = 1,500 feet

N

0 1,500 3,000 Feet

V. STANDARDS FOR BICYCLE ORIENTED DEVELOPMENT

GOAL 2: IMPROVE DEVELOPMENT PATTERNS TO BE MORE BICYCLE-ORIENTED

OBJECTIVES

- Incorporate bicycle infrastructure and amenities in Transit Oriented Development projects.
- Increase installation of Bike Racks to meet demands.
- Develop standard bike rack design and placement guidelines to ensure effective installation and usefulness.
- Convert underutilized parking spaces to on street bike corrals where bike parking is in demand.
- Install Bike Corrals at all Baltimore City designated Main Streets by 2020.
- Provide additional bicycle amenities and comforts in popular bicycling areas.
- Establish a B'More Bicycle Friendly Business Program to encourage local business to cater to the bicycling community.
- Begin operations of the Charm City Bike Share by 2014 in popular bicycling areas in downtown, midtown, and southeast Baltimore.
- Expand the Charm City Bike Share service city wide by 2020.

Bicycle oriented development (BOD) is a culture paired with a development patterns that cater to bicycle transportation. Bicycle-friendly culture accepts and promotes bicycle use with amenities and policies. Amenities may include ample parking, air pumps, drinking water fountains, and showering facilities. It is important that bicycle oriented development also include major bike routes allowing access to the area, and that all roadways within the area accommodate bicyclists. Development that is located in close proximity to major cycling routes and offers bicycle related amenities would be considered as bicycle oriented development. This type of development has the potential to attract economic growth with ties to the cycling community, and make cycling a more attractive alternative for daily commuting.

The City of Portland's Bicycle Plan for 2030 takes an innovative step forward in promoting bicycle oriented development. The plan designates "Bicycle Districts" throughout the city as areas where the city intends to make bicycle travel more attractive than driving. These are typically dense areas and neighborhoods, often with important commercial, cultural, institutional and/or recreational destinations. Within Bicycle Districts, some roadways are classified as Major City Bike Routes, but all roads should be accommodating and comfortable for bicyclists as well as pedestrians. Additional amenities, such as ample bike parking, are also important features within Bicycle Districts.

photo courtesy of Brian O'Doherty

The bike parking shelter at Union Station in Washington, DC

A. Bicycle Oriented Development with Transit Oriented Development

GOAL: Incorporate bicycle infrastructure and amenities in Transit Oriented Development projects.

BOD can be placed in areas that are not linked with transit, however, combining bicycle-oriented development with transit oriented development (TOD) is a practical and efficient means to increase multi-modal connectivity. TOD as defined by the Maryland Legislature in the 2008 TOD Law notes that this type of development should "serve a transportation purpose" and "create more livable communities, improve transportation options, reduce the carbon footprint, support resource based industry, invest in green technologies, preserve valuable resource lands, and restore the health of the Chesapeake Bay." The typical TOD de-emphasizes vehicular transportation, which is also good for bicyclists and pedestrians. Promoting better bicycle transportation can be a key component in reaching these goals within the TOD program.

Several TOD locations have been built and exemplify some good bicycle oriented development features, but more emphasis can be made to provide more interconnected routes into and throughout these areas and better amenities within the developments. The Maryland Department of Transportation has designated three locations in Baltimore City as state supported TOD sites, and development plans are ongoing. They include the Reisterstown Plaza, State Center Complex, and Westport area. As these sites are developed, stronger bicycle oriented development features should be incorporated to promote a more multi-modal and bicycle-friendly atmosphere.

Transit Oriented Development should incorporate bicycle amenities

TYPICAL TRANSIT-ORIENTED DEVELOPMENT FEATURES THAT ARE GOOD FOR BICYCLE ORIENTED DEVELOPMENT (BOD)

- **Compact and walkable development patterns**
- **Attractive and human scale streetscape design**
- **Improved multi-modal connections and accessibility**
- **Mix of land uses that can combine commercial, retail, institutional, and residential buildings along with usable open space.**
- **Additional Features that should be Standard in Transit Oriented Developments**
- **Bicycle infrastructure incorporated in the street network**
- **Convenient and prominently located bicycle parking**
- **Bike share stations in close proximity to the transit stations**
- **Transit vehicles that permit bicycles on board**
- **Wayfinding signage for bicycle routes and popular destinations**

B. Site Amenities within Bicycle Oriented Development

1. Bike Parking

GOAL: Increase installation of Bike Racks to meet demands

Bicycle parking is an important piece of BOD. The Baltimore City Department of Transportation has installed 369 bike racks city-wide. The City has been able to fund installation of several bike racks each year, and there is a waiting list with 52 proposed locations. Parking should be made available to all property owners who request a bike rack in a timely fashion. However, the City's ability to respond to multiple requests may be limited by an annual budget. All requests should be accommodated as soon as possible, with highest priority given to requests that show a strong demand for additional bicycle parking.

2. Rack Placement

GOAL: Develop standard bike rack design and placement guidelines to ensure affective installation and usefulness.

GOAL: Convert underutilized parking spaces to on street bike corrals where bike parking is in demand.

GOAL: Install Bike Corrals at all Baltimore City designated Main Streets by 2020.

Placement of bike racks is equally as important as location and design. Poorly placed bike racks can affect usefulness and capacity. Rack locations should be convenient, visible, and accessible. The most convenient locations are adjacent to building or destination entrances, or centrally located in a commercial district. Racks should be placed within view of a window or security officer, if possible. If not possible, then the rack should be placed beside high pedestrian traffic in well lighted areas. Indoor bike parking is convenient for better security and protection from weather.

On street bike parking, or Bike Corrals, are a good alternative to provide bike parking in commercial areas. Pedestrian accessibility should not be sacrificed for bike parking, and narrow sidewalks may not be suitable locations for bike racks. Bike Corrals use on street parking space to provide parking for as many as 18 bikes in the space that would otherwise accommodate a single car. Bike corrals make an efficient use of space in the urban environment where parking for bicycles is at a premium and should be installed immediately adjacent to destinations and business entrances.

Baltimore City has several designated Main Streets that are neighborhood-scale commercial strips. Bike parking is at a premium along these neighborhood Main Streets, and ideal locations for Bike Corrals. Baltimore City plans to have at least one bike corral in each designated Main Street area by the year 2020.

In addition to bike parking at businesses and main streets, covered bike parking facilities should be implemented at stadiums, light rail, MARC, subway stations and other major destinations. The City should also strive to add at least 5 bike racks to all schools, where feasible, by 2020.

3. Additional Bicycle-Friendly Amenities

GOAL: Provide additional bicycle amenities and comforts in popular bicycling areas.

Other bicycling amenities also contribute to BOD. Amenities may include:

- Tire air pumps,
- Secure bike parking, preferably covered,
- Drinking water fountains,
- Bike share stations,
- Ample street lighting,
- Access to showers and locker rooms at places of employment, and
- Access to bicycle mechanics.

Streetscapes in BOD should be at a human scale with ample lighting, landscaping, and bicycle-friendly businesses. Bicycle-friendly businesses can provide biking necessities and conveniences, and support employee and customer bicycle use. Bicycle Oriented Development can also create a hub of bicycle-friendly activity and street life.

photo courtesy of Nate Evans

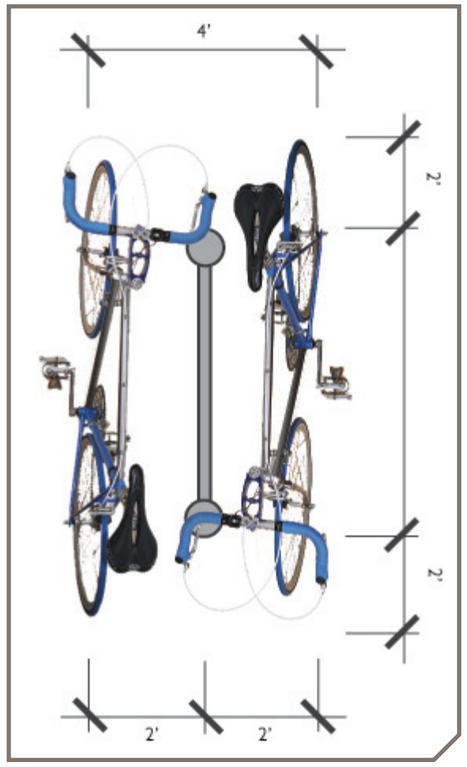
Bike Corral Example

Site for Possible Bike Corral on Charles Street Baltimore's Mount Vernon Neighborhood

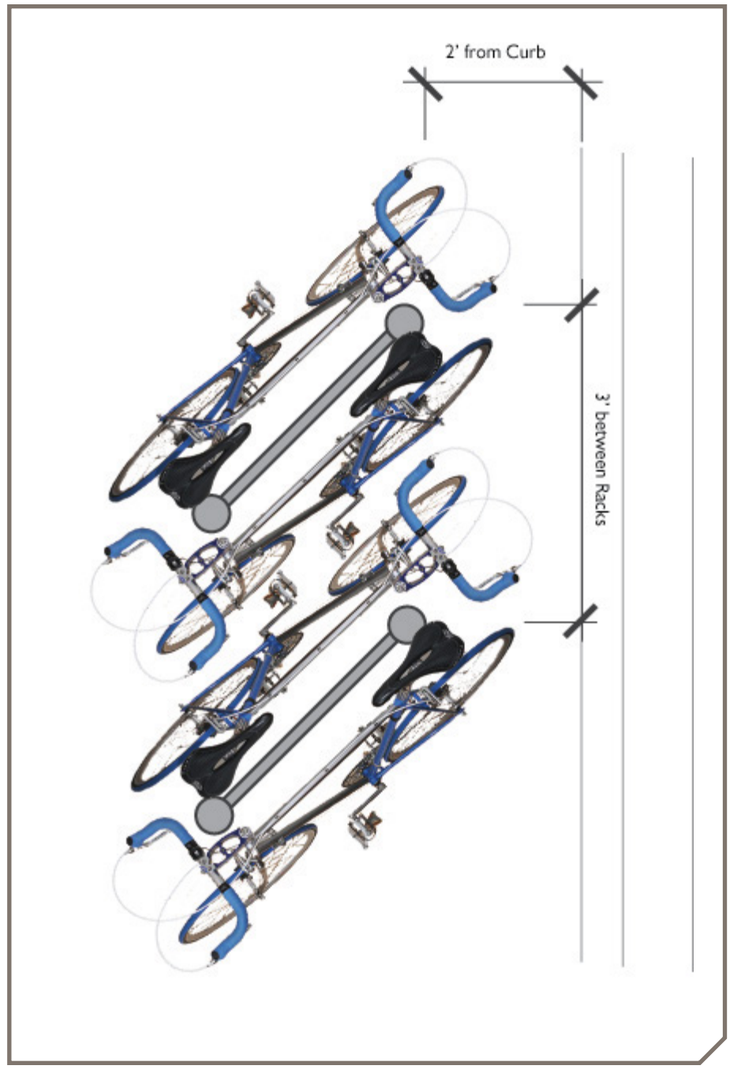
Covered Bike Parking Example

Best Practices for Bike Rack Installation

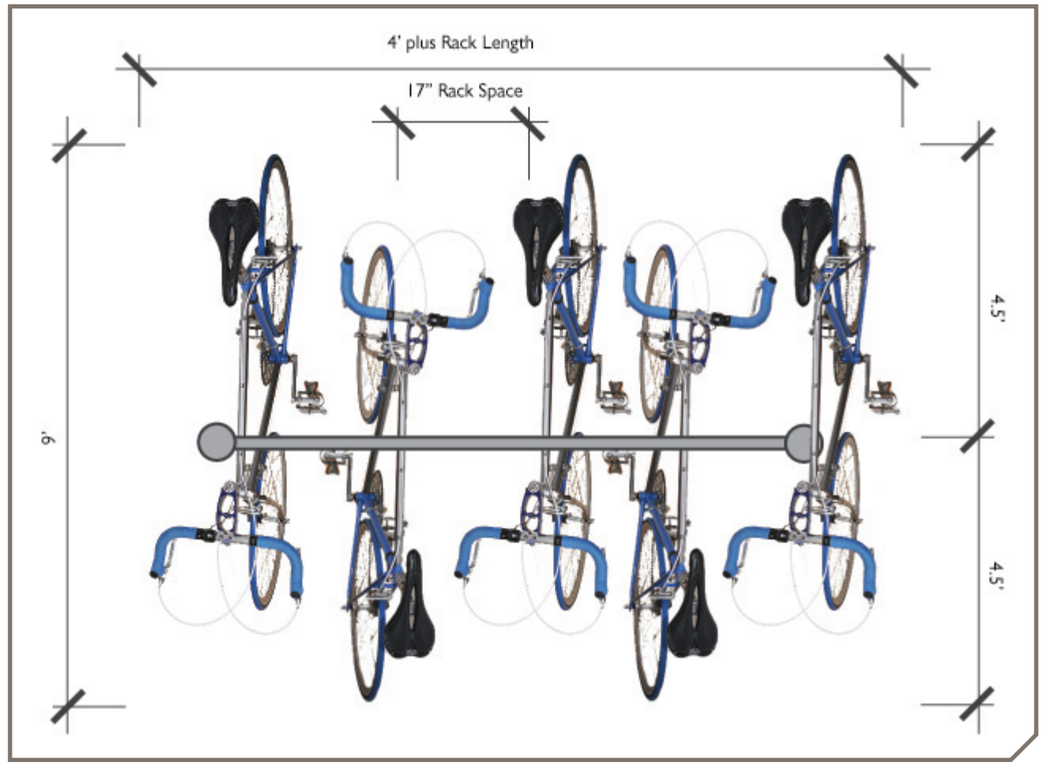
Single inverted "U" bike rack



Multiple inverted "U" bike racks



Grid or "campus style" bike rack



Typical Bike Rack Dimensions

Examples of bicycle parking integrated into commercial properties using street, sidewalk and indoor spaces.

C. B'More Bicycle-Friendly Business Program

GOAL: Establish a B'More Bicycle-Friendly Business Program to encourage local business to cater to the bicycling community.

Businesses that are bicycle-friendly will serve as a vital component within a successful bicycle oriented development. These businesses will provide the amenities that bicyclists seek, such as bike racks, air pumps and other such amenities as described above, and have spare equipment, such as tire tubes or bicycle tools, on hand and available for loan when needed. They will also actively welcome bicyclists as patrons and employees.

The Baltimore City Council and Mayor's Office should encourage businesses to actively promote cycling through a Bicycle-Friendly Business Program with a Council Resolution. The program would establish standards for bicycle-friendly business practices and certify businesses through an application process. Certified Bicycle-Friendly Businesses should receive a display plaque and be listed in a Bicycle-Friendly Business Directory included on future editions of the Baltimore Bike Map and other promotional materials.

The non-profit advocacy group, Bike Maryland, offers Bike Minded training programs to businesses across the state. The Bike-Minded training is funded by the Maryland State Highway Administration and includes a review of safety information and tips for safe riding and commuting by bike.

D. Charm City Bike Share

GOAL: Begin operations of the Charm City Bike Share in popular bicycling areas in downtown, midtown, and southeast Baltimore.

GOAL: Implement Phase I of the Charm City Bike Share service by 2016.

GOAL: Create an equitable bike share system that is accessible to low income residents.

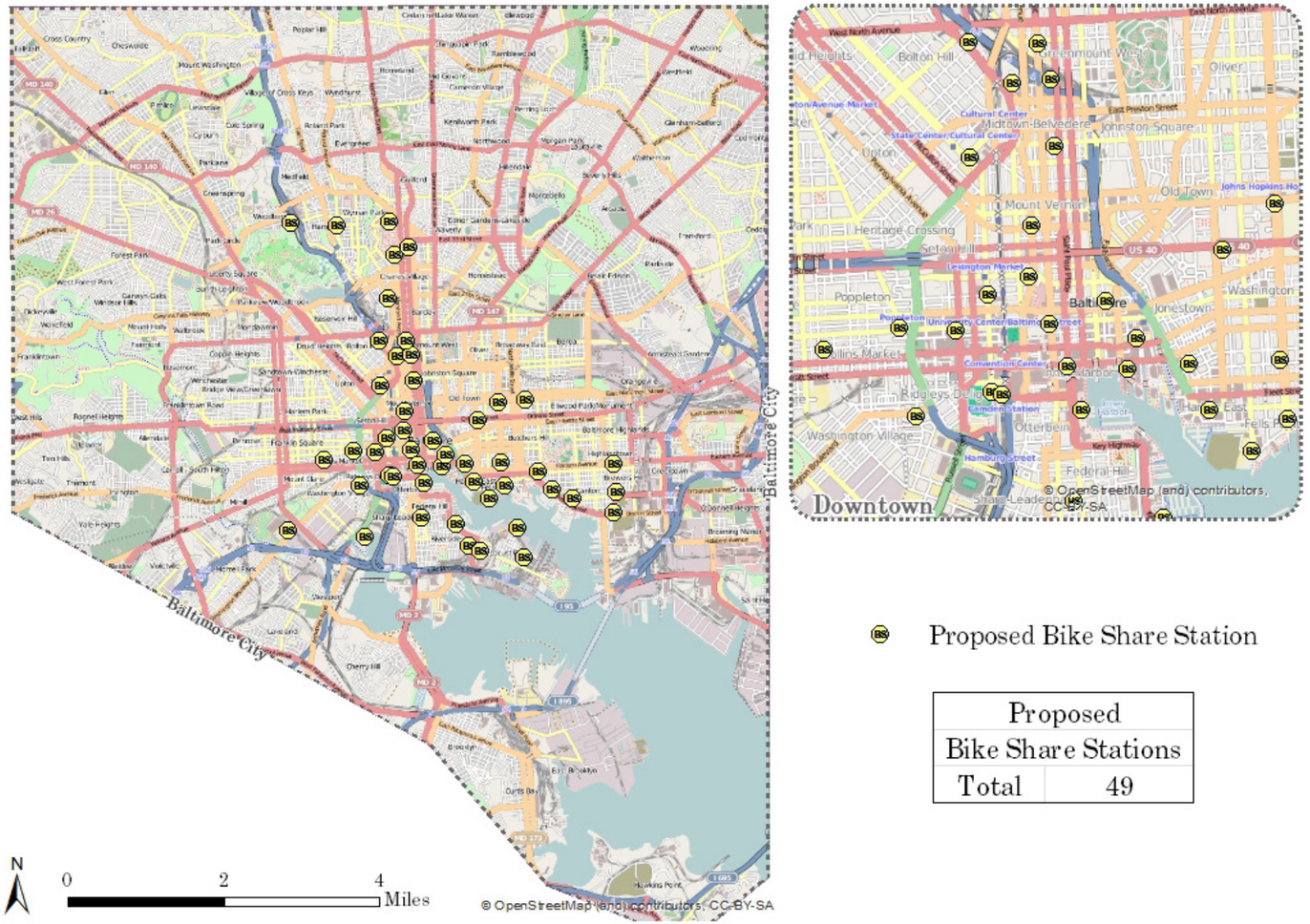
Modern bike sharing programs have the potential to transform American cities. They offer large fleets of sturdy bicycles designed for short-term use at a low cost. In 2010, Chicago, Minneapolis, Denver and Washington DC all opened new Bike Share systems, the first in the nation. Each of these cities have seen a lot of success with increased ridership and economic development. Cities across the nation are following the lead. In a short time frame, bike share has gone from a novelty to an integral part of an urban transportation network.

Bike sharing is good for cities in many ways. It delivers all the health, environmental, economic, and mobility benefits of bicycling. In addition, bike sharing has unique advantages, such as:

- It is more convenient and affordable than bike ownership for many residents;
- It's more accessible to tourists and visitors who would otherwise not have an available bike;
- It helps overcome barriers to using a bike in a city, such as theft and storage;
- It generates revenue for municipalities and private companies;
- It creates new jobs and generates economic growth;
- It can connect to and relieve pressure on transit;
- It provides branding for a city; and
- It introduces new audiences to bicycling.

Baltimore is planning to initiate a public Bike Share system. The "Charm City Bike Share" will strive to provide over 250 bikes at 25 stations in Phase I. The stations are primarily located in the downtown, midtown, and southeast areas of the city where bike ridership is high, but the network is expected to grow.

Proposed Bicycle Share Stations in Baltimore City



VI. PROPOSED POLICIES FOR A BICYCLE-FRIENDLY CITY

GOAL 3: ENACT BICYCLE-FRIENDLY LEGISLATIVE POLICES

OBJECTIVES

- Increase funding for Baltimore City's bicycle program.
- Target grant sources to supplement funding for the Baltimore City bicycle program.
- The City Council and Mayor officially recognize the Mayor's Bicycle Advisory Committee in legislation with an established mission and goals.
- Waive the Minor Privilege Fee for any private bike rack installations on public right of way.
- Adopt the Transform Baltimore revised zoning code with specific bicycle related components required in development and redevelopment projects.
- Monitor bicycle usage and trends, and adapt zoning codes and ordinances appropriately to meet the needs of a growing bicycle community.
- Offer Bicycle Commuter Tax Credit to city employees who bicycle as a primary mode of transportation.
- Encourage Baltimore area employers to offer the Bicycle Commuter Tax Credit.

GOAL 4: ESTABLISH AND REFINE BICYCLE FACILITY ENGINEERING POLICIES

OBJECTIVES

- Develop a formal Complete Streets training program and manual for Baltimore City Department of Transportation staff and consultants.
- Track accident locations and identify any common causes for accidents.
- Develop a standardized roadway safety audit program for city streets, and utilize the audit to identify hazardous conditions.
- Target high accident areas for safety improvements.
- Develop a Standard Policy on the use and implementation of Sharrows.
- Develop and adopt a standard for the roadway markings used for bikeways.
- Establish a Neighborhood Slow Zone pilot program by 2015, and make this program available to communities by 2018.
- Increase installation of Bike Boulevards City wide as a part of the growing bicycle network.
- Develop a numbered route system for the main bicycle routes throughout the City.
- Promote these routes with signage and mapping.
- Coordinate with surrounding jurisdictions to ensure bicycle infrastructure is continuous across City/County lines.

GOAL 5: BUILD A STRONGER BICYCLE CULTURE

OBJECTIVES

- Encourage local economic development organizations to support and attract bicycle related businesses.
- Support the launch and continued operations of the Charm City Bike Share.
- Reduce the fees required to host a Ciclovia event in Baltimore to encourage more street closure events.
- Establish an "Adopt-A-Bike Lane" Program.
- Develop bicycle safety education programs for Baltimore area schools.

GOAL 6: STRENGTHEN LAW ENFORCEMENT TO IMPROVE BICYCLING SAFETY

OBJECTIVES

- Target dangerous areas with high crash rates for increased traffic safety law enforcement.
- Conduct walking and biking audits on areas with high crash rates.
- Establish a comprehensive traffic safety public education campaign targeting the general public and high risk populations.
- Establish a comprehensive education program on bicycle safety and related laws as a part of the annual Baltimore City officer training program.
- Make bicycle crash data available to the public on CityView.
- Track bicycle thefts and target bike rack improvements and increased enforcement at high risk locations.
- Encourage bicyclists to record their bicycle registration number and establish an online bicycle registration to keep track of registration ownership and any unique identifying features for an individual's bike.
- Publicize bikes reported as stolen online.
- Establish an Abandoned Bicycles policy to identify, remove, and donate abandoned bicycles.
- Establish a new policy to relax the prohibition of bike riding on sidewalks.
- Increase lighting along popular bike routes and trails.

GOAL 7: IMPROVE RECREATIONAL BICYCLING OPPORTUNITIES

OBJECTIVES

- Establish a new policy allowing bicycle access to the Waterfront Promenade.
- Prepare a detailed design plan and construct mountain bike routes in City parks.
- Improve lightings along trails, and establish a policy to allow bicycle access to trails after dark.

photos courtesy of Brian O'Doherty

photo courtesy of Brian O'Doherty

photo courtesy of Brian O'Doherty

Bike Activities at Artscape

Creating a strong, bicycle-friendly city takes more than just infrastructure. Leadership and collaboration from policy makers and their constituents is necessary. Stakeholders of bicycling in Baltimore involve many groups, including elected officials, city planners and engineers, the Police Department, the business community, advocacy groups, and Baltimore's citizens. Collaboration among all stakeholders will be important to foster the changes that make a more bicycle-friendly city.

A. Legislation

Legislative policies can affect the success of Bicycle Oriented Development. Instituting bicycle friendly legislation is a means to steer the city in the direction of becoming more bicycle-friendly. Legislative priorities to promote better Bicycle Oriented Development should include:

1. Increase Funding

OBJECTIVE: Increase funding for Baltimore City's bicycle program.

OBJECTIVE: Target grant sources to supplement funding for the Baltimore City bicycle program.

In order to receive grants, the City must show it is serious about building bicycle infrastructure by first dedicating portions of its CIP to bicycle facilities. Funders and grant programs are cautious of jurisdictions that seek funds but do not provide their own matching funds. The City may also show that it is serious about success in other ways, such as having a full-time dedicated bicycle coordinator.

Dedicated funding for bicycle infrastructure has dropped in recent years, as shown above in Section III. More funding is needed to implement and fully realize the goals of this plan. Supplemental funding can also be used through grant sources. Grant sources should be tracked and potential projects should be categorized and prioritized for certain grant programs. Potential grant-funded projects should be brought to a state where they are shelf ready when various grant application periods open to fully take advantage of the funding opportunities.

2. Mayor's Bicycle Advisory Commission

OBJECTIVE: Establish a Mayor's Bicycle Advisory Commission to replace the "unofficial" Bicycle Advisory Committee. The Mayor and City Council can officially recognize the Mayor's Bicycle Advisory Committee through legislation by establishing it as a Bicycle Advisory Commission tasked to advise City government on issues related to bicycling and to monitor the implementation of the Bicycle Master Plan and Capitol Projects.

The Mayor's Bicycle Advisory Committee (MBAC) was established during the administration of Mayor Kurt Schmoke (1987 to 1999), and has continued informally since then. The Committee was originally comprised of individuals appointed by the Mayor to provide guidance on bicycle related issues, programs, events, and legislation. MBAC has continued as a volunteer effort by concerned citizens, but meeting schedules and attendance can be irregular or can wane without strong leadership. Because the Committee has not been fully recognized by changing Mayoral administrations, and the appointments are voluntary, it has not been effective.

MBAC can be improved by officially recognizing the committee in legislation. The Administration should define the Commission's mission and ensure that the Commission includes members representing a cross section of bicycling stakeholders and City agencies. Representatives from the Police Department, the Planning Department, and the Department of Transportation are necessary. The Commission should also include appointed members from throughout the City to ensure participation from different areas of the City. Advocacy organizations, tourism groups, and local cycling business should also be represented on the commission. Commission members would be responsible for implementing the Commission's mission.

PROPOSED MISSION OF THE MAYOR'S BICYCLE ADVISORY COMMISSION

- **To coordinate with City agencies to support implementation of the Bicycle Master Plan**
- **To coordinate with DOT to update the Bicycle Master Plan as needed**
- **To promote bicycling throughout the City**
- **To provide guidance to the Mayor's Office and City Council on policies and designs needed to support bicycling in Baltimore to identify bicycling trends and opportunities applicable to the City of Baltimore to support and advocate for bicycling rights**

3. Waive Minor Privilege Fee

OBJECTIVE: Waive the Minor Privilege Fee for any private bike rack installations on public right of way.

A Minor Privilege Fee is assessed on any private developer wishing to install a bike rack on City right of way. The original purpose of the Minor Privilege Fee was to raise city revenues through leasing areas within public right of way for private use. However, bike racks could be considered a public amenity. This fee is a significant deterrent that prevents private property owners from providing bike racks, and is counter-productive to the City's goals to increase more bicycle-friendly development. This fee should be waived for private entities who wish to provide bike racks and that are in accordance with the bike rack style and placement guidelines as noted previously in Section V.

4. Bicycle-Friendly Building Ordinances

OBJECTIVE: Adopt the Transform Baltimore revised zoning code with specific bicycle related components required in development and redevelopment projects.

OBJECTIVE: Monitor bicycle usage and trends, and adapt zoning codes and ordinances appropriately to meet the needs of a growing bicycle community.

Building ordinances are the rules and requirements for building construction, rehabilitation, and development. The purpose of building ordinances are to ensure public health and safety as well as ensuring that development is appropriate for its context and land use. As the City moves in a more bicycle friendly direction, development patterns may need to

adapt to the changes in transportation patterns. Cities and communities across the nation are adopting new bicycle-friendly building ordinances. Most bicycle-related ordinances deal with bike parking, and Baltimore is not an exception.

The City is heading in the direction of making more bicycle-friendly building ordinances. The new proposed zoning code, "Transform Baltimore", supports bicycling in the City by requiring bike parking near places, such as schools, libraries, and businesses. New guidelines for the size, location, and design of bike parking are also included. Ordinances should permit bike parking indoors or encourage bike parking to be covered and located in a highly visible and convenient location. Additional bicycling amenities, such as public showers or air pumps, should also be permitted and encouraged in building ordinances.

The city has also recently adopted Green Building Standards in 2009. These standards apply to commercial and multi-family residential buildings over 10,000 square feet being either newly constructed or extensively modified buildings. New buildings and renovations must meet the Leadership in Energy and Environmental Design (LEED) certification requirements to at least a Silver Level, although obtaining official certification is not necessary. Points in the LEED certification program can be obtained in a variety of ways that promote energy efficient and environmentally sustainable construction practices. Providing bicycle amenities, such as bike racks, do earn points in the LEED certification process, but are not a requirement.

It is important that the City continue to address the evolving needs of the bicycling community, and it is recommended that city planners continue to monitor bicycle growth, safety, and their evolving needs to ensure that the city continues on a path to become more bicycle friendly. Adopting the proposed zoning changes in "Transform Baltimore" and promoting the bicycle related components of the Green Building Standards will be a significant step in this direction. Developers should also be encouraged to go above and beyond any of these requirements to offer better bicycle amenities.

5. Federal Bicycle Commuter Tax Credit

OBJECTIVE: Offer Bicycle Commuter Tax Credit to city employees who bicycle as a primary mode of transportation.

OBJECTIVE: Encourage Baltimore area employers to offer the Bicycle Commuter Tax Credit.

In 2008, the Bicycle Commuter Act passed as a part of the Federal Renewable Energy Tax Credit legislation. The intent of this Act is to provide a simple, equitable solution allowing bicyclists to receive tax credits similar to others who receive qualified transportation benefits for taking transit to and from work or parking their cars at work. Eligible bicyclists must work at a participating employer, use a bicycle as their main transportation to and from work for over 50% of their commuting trips, and not receive any other transportation benefit.

This tax credit can be used to defray the costs related to purchasing a bike, helmet, accessories (lock, lights, air pump, etc), bike parking, showering facilities, bike share program membership, and bike maintenance. The tax credit requires that the bicyclists submit receipts and a statement that they bicycle commuted over 50% of their commuting trips or at least three days during a five day work week. Some employers may also require a commuting log. The expenses incurred are then subtracted from one's taxable income.

The Bicycle Commuter Act is a Federal program, but is not commonly utilized by many Baltimore area employers, including departments within the City of Baltimore. However, the transit and parking tax credits are common. The Bicycle Commuter tax credit should be standardized within the City of Baltimore and should be promoted to all Baltimore area employers to give more parity to bicycle commuters when compared to the tax credit programs for other commuter modes.

B. Engineering

Improvements to transportation infrastructure will require some flexibility and judgment to balance project needs. Engineering policies must address considerations related to safety, accessibility, sustainability, aesthetics, and cost.

1. Complete Streets Policy Guidance

OBJECTIVE: Develop a formal Complete Streets training program and manual for Baltimore City Department of Transportation staff and consultants.

OBJECTIVE: Develop and adopt a complete streets design guide that establishes speed and volume thresholds for appropriate facilities based on 85th percentile speeds.

The Complete Streets Resolution passed by the Baltimore City Council in 2010 promotes a transportation network that is not only safe and efficient, but also equitable and sustainable. This resolution formally requires that the Baltimore City Department of Transportation implement Complete Streets.

Complete Streets are streets that balance the needs for all roadway users and create more livable streets. Mode prioritization and context-sensitive solutions determine the design of a Complete Street. Appropriate accommodations for each of the priority modes are incorporated in a Complete Street, and integrating all modes may require some reductions in Level of Service or roadway capacity. Typically, a Complete Street in an urban context or neighborhood setting places an increased prioritization on pedestrian, bicycle and transit modes to promote safe and equitable transportation choices. However, each street is unique and should be designed to meet the individual project needs.

The Baltimore City Department of Transportation can expand on the current Complete Street resolution. Formal guidance and training for best practices and design standards would help to institutionalize this policy. More specifically, developing guidelines that emphasize appropriate design based on measured speeds and volumes can help maximize the effectiveness of the Complete Streets policy.

2. Strategic Safety Improvements

OBJECTIVE: Track crash locations and identify any common causes for crashes.

OBJECTIVE: Develop a standardized roadway safety audit program for city streets, and utilize the audit to identify hazardous conditions.

OBJECTIVE: Target high accident areas for safety improvements.

Crashes involving bicycles account for a very small proportion of reported crashes in Baltimore City, but the number of bicyclists is increasing dramatically, doubling over the past three years in the most consistently studied locations. Research in other locations has found "safety in numbers" with crash rates declining as the number of bicyclists increases,

photo courtesy of Brian O'Doherty

Complete Streets improves accessibility and safety for all users.

photo courtesy of Brian O'Doherty

Baltimore's next generation will need more Complete Streets.

A Complete Streets example with pedestrian and bikeway facilities incorporated in the street design.

but it is important to improve safety conditions as the number of bicyclists increases in order to help reduce injuries and fatalities as the number of bicyclist's increases. Bicycle riders of all ages and abilities often operate in the same right-of-way as motorized vehicles moving at significantly higher speeds.

Providing safe bicycling infrastructure, including dedicated bike lanes, trails, bike parking, rentals, and lockers has become an important part of the modern urban fabric and improving urban mobility and quality of life. According to organizations like Bike Maryland, there is a strong indication that many more bicycling incidents go unreported. Most of the injuries and fatalities that do occur are the result of collisions with motor vehicles and their frequency and severity can be reduced with well-designed new bicycle facilities, retrofits of existing bicycle routes, targeted public outreach, and broad education campaigns. Increasing the amount and protection of bicycle routes on City roadways, and increasing the number of bicyclists on the roadways are proven methods for increasing bicycle visibility and safety.

3. Sharrow Policy

OBJECTIVE: Develop a Standard Policy on the use and implementation of Sharrows.

Sharrows are designated on street bike routes that share the lane for both motor vehicles and bicycles. Sharrows use a painted Sharrow Symbol to designate the path for bicycles to follow within the travel lane. Sharrows have been used throughout the City to reinforce streets as bike routes, particularly in cases where there is not adequate space for dedicated bike lanes. Sharrow symbols have been used on different road types throughout the City, ranging from low-volume and low-speed neighborhood streets to higher volume and higher speed collector streets.

Not all streets are ideal for sharrow use. Standardizing sharrow implementation can reduce potential safety conflicts between bicyclists and traffic by limiting their use only for the most appropriate applications. Low-volume and low-speed streets are better suited for sharrows, and it is not recommended to use sharrows on high-volume or high speed streets, except in situations where a short segment of the road is used to connect a larger route or other bike facilities. Sharrows are generally not recommended for streets with observed speeds above 30mph, or above 25,000 average daily traffic (ADT) volumes. Additionally, sharrows should not be placed in the door zone when adjacent to parking.

4. Standardize Bicycle Route Roadway Markings

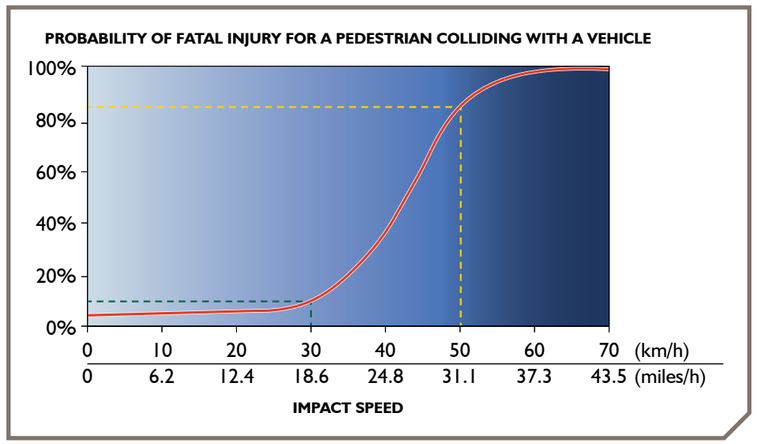
OBJECTIVE: Develop and adopt a standard for the roadway markings used for bikeways.

The Baltimore City Department of Transportation utilizes the Maryland Manual of Uniform Traffic Control Devices (MUTCD) as the established standard for roadway markings. It is important that roadway users, including motorists, pedestrians, and bicyclists, understand what traffic markings means. Universal acceptance for roadway markings is important so that roadway users know how to behave and can anticipate how other roadways users will behave while traveling through the streets. However, there is currently no established standard for bike lanes or roadway markings associated with bike lanes and other types of bike routes. This is particularly important for intersection treatments where there is the highest potential for the different roadway users to cross paths.

5. Neighborhood Slow Zones

OBJECTIVE: Establish a Neighborhood Slow Zone pilot program by 2015, and make this program available to communities by 2018.

The severity of accidents and risk of fatalities during traffic collisions greatly increase as traffic speeds increase. The World Health Organization has shown that accident severity dramatically increases when traffic speeds reach 30 km/h (18.6 m/h) or higher. Risk of pedestrian fatality during traffic accidents remains at about 10% when travel speeds are below 30 km/h (18.6 m/h), but soars to 85% at 50 km/h (31 m/h). Pedestrians struck by motorists traveling at 25 m/h are at a 40% risk of fatality (WHO, 2008.)



Speed limits in neighborhood areas are typically posted at 25 mph, but actual speeds can vary depending on the roadway characteristics. Neighborhood streets serve multiple functions beyond transportation, because they are often where people gather and children play. Many bicyclists prefer to use these low-speed and low-volume neighborhood streets as alternative routes because they feel safer. Traffic speeds at 25 m/h can still be very dangerous to communities with active street life and popular cycling routes.

A Neighborhood Slow Zone Program could help improve safety with reduced traffic speeds in local communities. Slow Zones are most suitable on neighborhood streets that have low volume and minimal vehicular through traffic, but bicycle through traffic would still be encouraged. Traffic calming measures and other safety improvements can also be incorporated in slow zones to enforce the expected travel speeds.

New York City recently established a Neighborhood Slow Zone program, where local communities can request that their neighborhood streets be posted with a 10 m/h reduction in speed limits. The City's Department of Transportation reviews and approves Slow Zone requests, and works with the communities to implement other traffic calming measures and safety improvements.

6. Bike Boulevards

OBJECTIVE: Increase installation of Bike Boulevards City wide as a part of the growing bicycle network.

Bike Boulevards are streets where bicycle accommodations are optimized creating a safer and more comfortable bicycling atmosphere. Low volume and low speed streets are ideal for bicycle access minimizing conflicts between bicyclists and drivers. Bike Boulevards discourage vehicular traffic with traffic calming measures such as mini-circles, bump outs, speed humps, chicanes, and traffic diverters with openings allowing pedestrians and bicycles to cut through. Other aesthetic amenities may also be incorporated, such as ample lighting and tree cover for shade, which can improve community aesthetics along with bicyclist comfort. Bike Boulevards can attract inexperienced or uneasy bicyclists to bike on City streets in a low-risk atmosphere. Furthermore, city streets can be retrofitted into Bike Boulevards relatively inexpensively when compared to the costs for off road trails or roadway widening for bike lanes.

Bike Boulevards can be an ideal solution in Baltimore to increase bicycle access for a more risk-averse bicycling community. Baltimore has a significant network of community collector roads and neighborhood streets with relatively low traffic volumes. This provides an ideal network of bicycling routes using the roads less traveled. Where speed is an issue, additional traffic calming measures can be incorporated to improve safety. By the year 2028, Bike Boulevards should be installed in neighborhoods throughout the City to create an interconnected bicycling network as well as more livable neighborhood streets.

photo courtesy of Flickr user Payton Chung

Guilford Avenue bike boulevard

C. Bicycle Route System

OBJECTIVE: Develop a clearly identifiable route system for users for the main bicycle routes throughout the City.

OBJECTIVE: Promote these routes with signage and mapping.

OBJECTIVE: Coordinate with surrounding jurisdictions to ensure bicycle infrastructure is continuous across City/County lines.

Strategically placed wayfinding signage has improved bicycle accessibility, and can be expanded to include additional areas and destinations throughout Baltimore. As the bicycle network continues to grow, bicyclists will have more opportunity to access new places previously inaccessible by bike. Bicycle routes can also become more simplified with a numbering system, similar to State route numbers for highways. In addition, this shows the importance of coordinating with neighboring jurisdictions to facilitate safe travel by bicycle when existing roads or trails connect the city and counties.

photo courtesy of Nate Evans

Baltimore's standardized bicycle wayfinding signage

D. Culture

Bicyclists benefit when there is a stronger bicycle culture. Research has shown that as numbers of bicyclists increase, accident rates either decrease or stay flat. "Safety in Numbers" was first coined in 2003 by public health researcher, Peter Jacobsen, who noted a strong correlation between safety and volume for pedestrians and bicyclists. More recent data verifies this theory. Portland Oregon shows in their 2009 Bicycle Count Report that bicycle accidents have remained somewhat steady between the years 1991 and 2008, while the number of trips have grown more than 400%. It's a well-established fact that there is safety in numbers for bikers. With more bicyclists out and about, more drivers are accustomed to sharing the road. Similarly, New York City's bike network has increased by more than 400 miles, including more than 300 miles over just the last five years. Despite the four-fold increase in bike riding over the last decade, serious bike crashes remained flat, representing a 73% reduction in risk to riders (NYCDOT, 2013)

1. Economic Development

OBJECTIVE: Encourage local economic development organizations to support and attract bicycle related businesses.

OBJECTIVE: Support the launch and continued operations of the Charm City Bike Share.

OBJECTIVE: Partner with the Office of Sustainability and/or academic researchers to study the economic impact of cycle tracks in Baltimore.

A strong bicycle culture will have strong economic benefits. A report by the Political Economy Research Institute (PERI) at the University of Massachusetts took an in depth look at the economic benefits of the bicycle culture in Baltimore. The report examines the differences in employment growth influenced by investment in pedestrian and bicycle infrastructure verses investment in infrastructure for motorized traffic. The study cites increases in jobs related to engineering, construction, material manufacturing, and bicycle shops as well as induced effects that increase jobs in other sectors such as retail, health care, and food service. For every $1 Million invested in bike lanes, Baltimore has seen an increase of 14.4 jobs. For every $1 Million invested in pedestrian infrastructure, Baltimore has seen an increase of 11.3 jobs. Comparatively, $1 Million invested in roadway repairs results in 7 jobs. The report finds that pedestrian and bicycle investment has had a higher return with a growing economy and bicycle culture (Garrett-Peltier, 2010.)

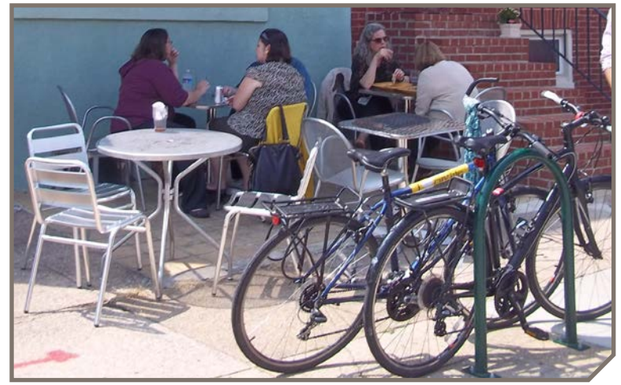


photo courtesy of Nate Evans

Restaurants can benefit with greater bike access and parking.

The Roland Avenue Ciclovia is a popular and celebrated event.

photo courtesy of Brian O'Doherty

Kids enjoy biking and should have many opportunities to ride.

photo courtesy of Brian O'Doherty

Baltimore has several Bicycle Cooperatives or "Bike Co-Op", where patrons are able to fix and upgrade their bicycles and are welcome to learn the skills of a bike mechanic, or just learn how to perform routine maintenance on their own bikes. Bike Co-Ops provide a vital service for the bicycling community with job training as well as service to those who occasionally need fix ups or parts. Bike Co-Ops are a model for economic growth using ingenuity and efficiency to provide a necessary service.

Baltimore's proposed Bike Share program will also help increase jobs above and beyond what was predicted in the PERI Report. The proposed Bike Share system is anticipated to employ people in program management, information technology, bike mechanics, marketing, and sales. Furthermore, the Bike Share program will greatly increase access to bicycles throughout the city and help promote a stronger bicycle culture.

2. Tourism

OBJECTIVE: Provide bicycle route and amenities information at the Visitor's Center, at hotels, and local tourist destinations.

OBJECTIVE: Develop an interactive website and mobile application to provide local route guidance and bicycle directions.

Tourism is one of Baltimore's largest industries, and it continues to grow. According to the Visit Baltimore 2012/2013 Annual Report and Business Plan, Baltimore welcomed 22.3 million visitors in 2011. 17.9 million of those visits included leisure activities, such as sight-seeing. Bicycling is an attractive and low-cost way for visitors to sight see across the City allowing them more flexibility to explore the City's destinations. Bicycling opportunities will increase with improved infrastructure and a Bike Share system, and Bicycle Rentals could also flourish in popular tourist areas such as the Inner Harbor. Bicycling maps and resource information should be readily available at hotels, the Visitor Center, the Convention Center, and popular tourist destinations. With better bicycling opportunities, the tourism industry will be strengthened with more opportunities to explore the City and visit new places.

Wayfinding signage can be helpful for tourists and newcomers to navigate the City's streets. However, new technologies are also available with online and mobile applications and GPS technology available at one's fingertips. An interactive website and mobile application can be developed to provide readily available directions and suggested route guidance.

3. Ciclovias

OBJECTIVE: Reduce the fees required to host a Ciclovia event in Baltimore to encourage more street closure events.

The City Council issued the B'More Streets for People Resolution in 2009 to establish official ciclovia events in the City. These are special events where city streets are temporarily closed to motor vehicle traffic and open to pedestrians, bicyclist, skate boarding "and other people-engaging activities" in the roadway. These events require collaborative commitments from the Departments of Transportation, Police, Health, General Services, and the Office of Promotion. These special events offer opportunities for communities to gather together in a festival-like atmosphere.

Ciclovia events require substantial investment from the Police to enforce the temporary traffic closures. Under the current resolution, no funding is available and community associations are required to provide the funding to hold ciclovia events. The community of Roland Park has held four successful ciclovias on Roland Avenue, but no other communities have been able to raise the funds to make these events happen. Ciclovias could become more popular if funding were available to assist communities in paying the police department fees for traffic enforcement.

Ciclovia *(Sĭ'-klō-vē-ah)* **- A permanent or temporary use of the street where motorized traffic is restricted allowing full access for pedestrians, bicyclists and other non-motorized traffic.**

4. Adopt-a-Bike Lane Program

OBJECTIVE: Establish an "Adopt-A-Bike Lane" Program.

Increasing community participation and support of the City's bicycle infrastructure can improve the conditions and culture for bicycling. Programs like "Adopt a Bike Lane" can be implemented to engage local advocates and community members as a watch-dog for the conditions and maintenance of bicycle infrastructure. An "Adopt a Bike Lane" Program would encourage local citizens, neighborhood groups and advocacy organizations to be the local eyes and ears for the City and regularly check on the conditions of designated areas. Any deficiencies would be reported as needed to City Officials. Groups who "Adopt a Bike Lane" can also serve as advocates to promote cycling in their communities and keep data on ridership growth and other improvements.

"ADOPT A BIKE LANE" DEFICIENCIES TO BE REPORTED:

- **Unsafe Drainage Grates,**
- **Pot holes,**
- **Worn pavement markings,**
- **Insufficient lighting,**
- **Illegally parked cars,**
- **Overgrown vegetation,**
- **Missing or inadequate signage,**
- **Patterns in crime,**
- **Areas of concern for pedestrian access and safety, or**
- **Other hindrances to safe bicycle use.**

Incentives can also be incorporated into the program to make it more enticing. The program may include tax breaks or opportunities for advertising local businesses with signs or through the City's television and social media outlets.

A City sponsored program within the Department of Transportation would establish the parameters, methods, and frequency of reporting. Online and mobile applications may be used as a convenient way to engage citizens in the program, and provide real time and geo-coded data with great accuracy. The program would also require that City officials respond appropriately and in a timely manner.

5. Promotion at Schools

OBJECTIVE: Develop bicycle safety education programs for Baltimore area schools.

Formal bicycle education incorporated as part of the school curriculum can promote biking as a viable transportation alternative and reinforce safe habits. Transportation related topics are included in the core curriculums from pre-school through all grade levels, but the benefits of bicycling and safe habits are not always covered. It is recommended that guidelines for a formal program be developed and incorporated into local school curriculum. The guidelines should provide age appropriate learning benchmarks and sample lessons, which can be designed to relate to science, math, social behavior, and physical education. Baltimore has existing resources and participation in the National Safe Routes to School program, which means city and school officials can continue to improve coordination and execution of these initiatives.

Educational programs should combine lessons from the classroom with experiences in the street. Baltimore has established a Safety City program through partnerships with schools, the Department of Transportation and non-profit advocacy groups. The program teaches kids through video simulations and outside experiences, and teaches students important rules, skills to use the roads safely either walking or on a bike, and helps build self-esteem.

Much of the information learned in school can be shared with parents at home. All bicycle-related education programs should also include take-home materials that can also educate the student's family about safe bicycling.

Schools who participate in fun bicycle-related activities will reinforce the lessons learned in the classroom about healthy and environmentally sustainable transportation. All schools should include bike racks and accommodate students and staff who wish to use bikes as their transportation to and from school. Also, schools can host "Bike to School" days and "Bike Rodeos". These events can be celebrated as fun, school activities that bring together students and staff.

"Bike to School" events are actively promoted as special occasions where biking to school is celebrated. Schools can plan these events and share routes, meet-up times, and safety skills ahead of time. Participants can receive snacks, t-shirts, or promotional gifts. These events help introduce biking as a viable transportation alternative and show that biking can be a fun, healthy, and environmentally sustainable way to get to school.

"Bike Rodeos" are clinics geared for children who are just learning how to bike. Children who participate can practice their abilities and learn appropriate behavior in a safe, supervised environment to build confidence and skills.

LESSONS FOR KINDERGARTEN THROUGH GRADE 2

- How to behave around traffic and safely cross the street
- Health and environmental benefits of bicycling and other forms of active transportation

LESSONS FOR GRADES 3 THROUGH 6

- Health and environmental benefits of bicycling and other forms of active transportation
- Safe bicycling and pedestrian habits and skills

LESSONS FOR MIDDLE AND HIGH SCHOOL AGES

- Health and environmental benefits of bicycling and other forms of active transportation
- Safe bicycling and pedestrian habits and skills
- How to drive safely and share the road with bicyclists and pedestrians
- Bicycle repair and maintenance

6. Self-Organized Rides

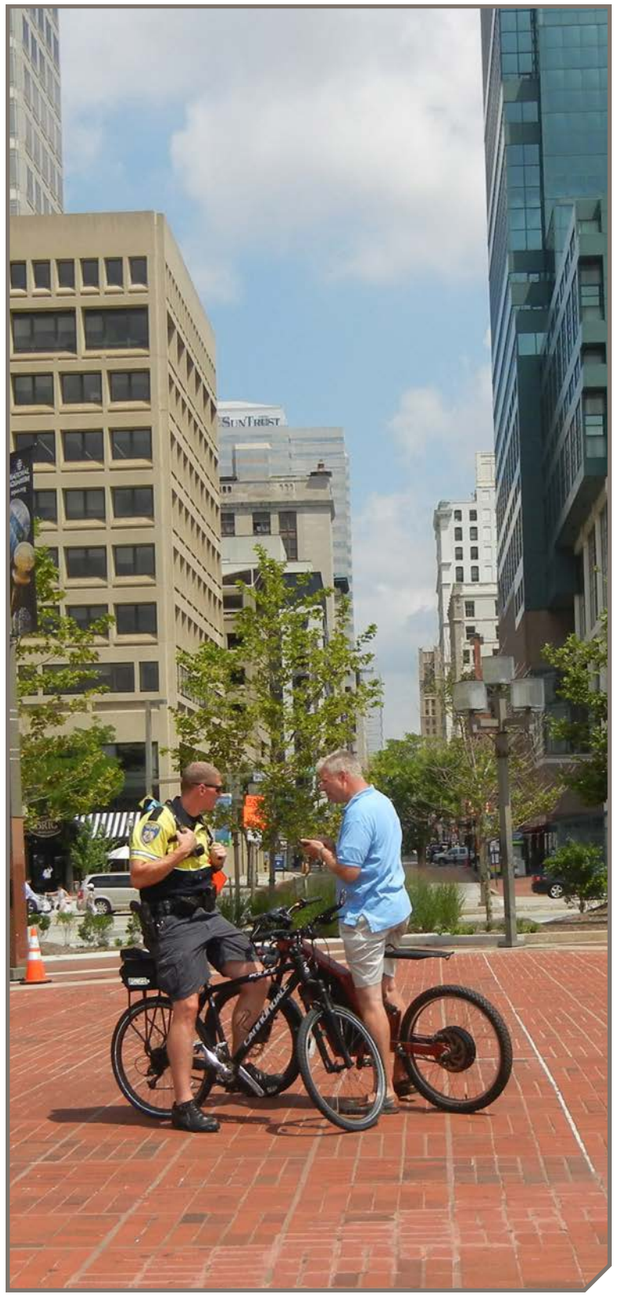
OBJECTIVE: Create programs and policies that support self-organized rides.

Baltimore's growing bicycling culture can be dedicated, in part, to self-organized rides such as critical mass, Baltimore Bike Party and Family Bike Party. These rides have risen in such popularity that the number of riders creates a strong presence on the roads during the ride. While these rides are typically held during times when traffic is low, the interaction between cyclist and drivers for a mobile event must be managed safely.

Self-organized rides are important because they raise bike awareness and normalize biking. They give people of all ages and ability the opportunity to try riding a bike in the City in a group setting and encourages that biking can be a fun activity be it for commuting or recreational riding. It also provides a free, healthy activity for residents and tourists to enjoy.

photo courtesy of Nate Evans

A bike rodeo teaching safe cycling skills to 4th grade students.



Baltimore Police Officer on Bike Patrol

E. Enforcement

Law enforcement plays a key role in fostering a bicycle-friendly city, and the Baltimore Police Department is responsible for enforcing many laws related to bicycle safety. Some of the top concerns for Baltimore area bicyclists in the Bike Plan Survey were being hit by a car (65%), hostility from drivers (44%), being a victim of crime (38%), and getting their bikes stolen (28%). These concerns are each related to law enforcement, and a perception of unsafe conditions can be a significant hindrance when people make decisions whether to travel by bike.

1. Targeting Dangerous Behavior

OBJECTIVE: Target dangerous behavior and high crash areas for increased traffic safety law enforcement.

The Police Department is charged with protecting the safety and welfare of the community, including cyclists. Traffic laws are in place to ensure safety and allow all road users to anticipate what other road users will do. It is important that all roadway users act predictably by following the traffic laws for everyone's safety and well being.

TRAFFIC LAWS THAT MOTORISTS SHOULD FOLLOW TO IMPROVE BICYCLE SAFETY:

- **Do not drive while distracted, especially by mobile devices**
- **Allow bicyclists the use of a full travel lane, and provide at least 3' of space when passing bicyclists**
- **Signal before all turns, and check for bicyclists on the right or left before making turns or changing lanes**
- **Before opening car doors into the street, check for approaching bicyclists**

TRAFFIC LAWS THAT BICYCLISTS SHOULD FOLLOW TO IMPROVE BICYCLE SAFETY:

- **Ride in the direction of traffic, do not ride in lanes of opposing traffic**
- **Stop at all red lights and stop signs**
- **Use hand signals when making turns**
- **Yield to Pedestrians**
- **Use White Lights and Reflectors in the front of the Bike, and Red Lights and Reflectors on the Back of the Bike**

2. Public Education

OBJECTIVE: Establish a comprehensive traffic safety public education campaign targeting the general public and high risk populations.

Educational programs related to bicycle safety should be developed to target high risk groups over represented in accident statistics. As noted above in Section III, drivers involved in accidents with bicycles are more typically male and aged between 21 and 49 years. The greatest proportion of bicyclists injured or killed were aged 10-15 years, but adults bicyclists aged 40-54 years were also overrepresented in bicyclist fatalities. (SHA, 2012)

Additionally, educational programs should target the four main constituency groups that may be affected with bicycle-safety related law enforcement, including motorists, bicyclists, communities with bicycling facilities, and police officers. Each educational program should be geared for its targeted audience, and the topics should include general awareness as well as specific suggestions for safe interactions. Specific topics for each target audience may include:

Motorist education should include the following topics:

- Statistics about increases in bicycle use, and reasons why more people choose to ride bikes
- When to yield and when to pass bicyclists
- Where to look for bicyclists and pedestrians
- Purpose of bike lanes, and where to park in relation to bike lanes
- How to avoid common mistakes
- The dangers of distracted driving
- Repercussions for unlawful driving

Bicyclist's education should include the following topics:

- Where cycling is permitted and not permitted
- What to look for and how to avoid potential accidents
- How to signal turns and ride predictably
- Avoiding risky habits and abiding by traffic laws commonly broken by cyclists
- Repercussions for unlawful cycling
- Best practices for locking bicycles

The educational programs should be developed as a series readily available online in brief but informative and entertaining segments. Links to the programs can be publicized through websites and social media outlets for the City of Baltimore's Department of Transportation and Police Department, Bicycling Advocacy Groups, Neighborhood Groups, and traditional media outlets in the form of a Public Service Announcement (PSA). Supplemental fact sheets or brochures can also be made available online and in hard copy to be distributed along with the Baltimore Bicycle Map.

3. Law Enforcement Officers Education

OBJECTIVE: Establish a comprehensive education program on bicycle safety and related laws as a part of the annual Baltimore City officer training program.

As with the general community, law enforcement officers may not always know the details of laws that relate to bicycle safety and how bicycle and motor vehicle traffic laws relate. The Baltimore Police Department requires annual training for all officers to refresh their knowledge and learn about new laws and trends. The annual training covers many topics, including traffic laws. It is recommended that laws specific to bicycle safety be incorporated in the annual training program to make sure that officers have a thorough understanding of bicycle related laws and are able to properly enforce them.

4. Bicycle Theft Reporting and Recovery

OBJECTIVE: Track bicycle thefts and target bike rack improvements and increased enforcement at high risk locations.

OBJECTIVE: Encourage bicyclists to record their bicycle registration number and establish an online bicycle registration to keep track of registration ownership and any unique identifying features for an individual's bike.

OBJECTIVE: Publicize the ability to report stolen bikes online.

Bicycle theft is an issue in Baltimore City, and bicyclists are often victims of opportunity when bikes are not locked securely. Hundreds of bikes are reported stolen in Baltimore City each year, however, this number may not be representative of all bicycle thefts since often times the crime goes unreported. Many bicyclists feel that there is little chance of retrieving their stolen bikes and simply don't bother to call the police. Using sturdy U-Locks, locking bikes by the frame, and better placement of bicycle racks in highly visible areas can help reduce theft. It is also recommended that bike theft always be reported so that the Police Department have the data they need to identify trends in crime and are able to develop appropriate strategies to deter crime.

It can be difficult for the police to retrieve stolen bikes without some unique identifying characteristics. All bikes should have a frame number, similar to a VIN number on a car. This number is unique to each bike and can be used to identify stolen bikes. However, many bicyclists are unaware of their frame number. It is recommended that the City's Police Department develop a voluntary bicycle registration where bike owners can register their bikes using the frame number. Should the bike be stolen, the Police will have access to the number and any other identifying characteristics of the missing bike. The registration process should be online and promoted to the cycling community through the City's websites and social media outlets and through bike shops and bicycle advocacy organizations.

5. Abandoned Bicycles

OBJECTIVE: Establish an Abandoned Bicycles policy to identify, remove, and donate abandoned bicycles.

Abandoned bicycles have a negative effect on the community. They take up valuable bike parking space and can be an eyesore. Baltimore City currently has no policy for the removal of abandoned bicycles, and it becomes incumbent upon the local community to address them. It is recommended that the Police Department develop an official abandoned bicycle policy that formally defines an abandoned bicycle based on the length of time unattended. Salvageable bikes and parts should be donated, preferably to one of the city's established bicycle repair non-profit cooperatives. Reporting can occur through the City's 311 one call line.

6. Bike Riding on Sidewalks

OBJECTIVE: Establish a new policy to relax the prohibition of bike riding on sidewalks.

Current Baltimore City Law states that bicycles are prohibited from riding on the sidewalk under all circumstances. The purpose of this law is to protect pedestrians walking on the sidewalk from errant bicyclists. However, often times, a bicyclist will be safer on the sidewalk than in the street, and can ride safely on the sidewalk without endangering any pedestrians. Young bicyclists also would be safer learning to ride on a sidewalk than in streets. It is recommended that the City of Baltimore study options and adopt a new policy that grants more flexibility for bicycle use on sidewalks.

Two potential alternatives to the current policy include:

Alternative 1- Sidewalk Riding as a Secondary Offense: The current law prohibits all bicycle use on sidewalks, and would qualify as a primary offense. A primary offense is a violation that in itself can be cause to issue a citation. A secondary offense is only subject to citation if the subject is also breaking other laws, such as reckless endangerment to pedestrians or damaging property. A change to the severity of the offense allows law enforcement officers the flexibility to use judgment before issuing citations. This also allows responsible bicyclists the ability to lawfully use the sidewalk if it is deemed a safer alternative than using the street.

Alternative 2 – Zones for No Biking on the Sidewalk: Sections of Baltimore City have high volumes of pedestrians, and bicyclists may have difficulty riding smoothly without endangering pedestrians. Zones may be established where bike riding on the sidewalks remains prohibited, while other sections of the city allow sidewalk riding. Zones should be located in non-residential, commercial areas with high pedestrian volumes, and should generally be made smaller into confined areas so that bicyclists may have more opportunity to use the sidewalk when it is a safer alternative than using the road.

photo courtesy of Nate Evans

Participants in a Baltimore Bike Party

photo courtesy of Brian O'Doherty

Mountain Bike Trails attract recreational riders near and far

The Harbor Promenade

The District of Columbia has established a zone encompassing the Central Business District where bicycles are prohibited from using the Sidewalk. This is the area with the highest concentrations of pedestrians, and is also where most tourists congregate. All other sidewalks in the City allow bicycle access. This law has helped minimize conflicts between pedestrians and cyclists while also allowing cyclists the ability to use the sidewalk in other areas.

7. Design Considerations for Crime Prevention

OBJECTIVE: Increase lighting along popular bike routes and trails.

Crime Prevention through Environmental Design (CPTED) is a movement using urban design principles to promote safer and more secure communities. Unfortunately, bicyclists have been targeted and victimized, although such crimes are rare. When using CPTED principles, a primary goal is to promote visibility and active use of public space. People conducting illicit behavior prefer not to be seen, and when people can watch over a space, criminals tend to leave the space. Personal security can be a concern to potential bicyclists, so it is important that bicycle facilities are designed to be accessible and well lighted. Criminals targeting bicyclists will have fewer opportunities to attack if routes are heavily populated and well lit.

Visibility and accessibility is also a concern for trail facilities that pass through more remote forested areas. Areas with less traffic can be appealing to bicyclists who want to avoid conflicts with motorists, but can leave bicyclists feeling abandoned or unsafe. All bicycle routes should include ample street lighting. Trails should also include lighting and multiple access points to adjacent communities. Trails without lighting should not be open to the public after dusk or before dawn. It is encouraged to install lighting in remote trail sections so that morning and evening commuters and recreational riders can take advantage of trail access in the dark.

F. Recreational Bicycling

The Department of Recreation and Parks can play a pivotal role in promoting Baltimore as a bicycle-friendly city. With a mission to provide recreational opportunities and connections to nature, promoting more bicycling is a natural fit for this Department.

1. Bicycle Access to the Waterfront Promenade

OBJECTIVE: Establish a new policy allowing bicycle access to the Waterfront Promenade.

The Waterfront Promenade is one of Baltimore's greatest amenities and free tourist attractions. The Promenade follows the waterfront from Canton to Federal Hill for over eight miles offering sweeping views of the Baltimore Harbor and connections to the waterfront communities. Bicyclists are not permitting to use the Promenade during peak pedestrian hours, and is only open to bicyclists between 6:00am and 10:00am on weekdays and Saturdays and 6:00am to 11:00am on Sundays.

The Promenade is already a popular cycling route. However, the Promenade includes several gaps and other hindrances for bicycle access. There are segments of public and private properties, and some private properties along the Promenade specifically restrict access to pedestrians only within the property deed. Furthermore, there are signs with conflicting information that either state bicycling is permitted during certain times only bicycling is not permitting, or designating the Promenade as a bike route. Police officers on bicycles are often present along the Promenade to enforce rules and laws, but the bicycling restricting rule is typically not enforced.

The Promenade should be officially open to bicycles, but some restrictions should still be in place to maintain pedestrian safety. Restrictions may include:

- Speed limits for bicycles at 7 miles per hour (approximately 9 minutes per mile)
- Limited access from 6:00am and 10:00am on weekdays and Saturdays and 6:00am to 11:00am on Sundays only within the Inner Harbor between the Maryland Science Center and Pier Five, allowing full time access to bicyclists along the outer edge of the Inner Harbor along the Gwynns Falls Trail and Jones Falls Trail.

2. Mountain Bike Routes

OBJECTIVE: Prepare a detailed design plan and construct mountain bike routes in City parks.

The City of Baltimore boasts an extensive network of large and linear parks. These parks offer recreational opportunities as well as riparian buffers that provide natural habitat and absorb pollutants before they enter the streams. Several city parks include some informal, natural surface trails used by hikers and mountain bikers. If these trails are neglected, they can erode creating gullies or landslides that break the trail and add sediment and other pollutants into streams. Hikers and mountain bikers are often left to create new trails that are susceptible to the same problems.

The Baltimore City Department of Parks and Recreation worked with the International Mountain Biking Association (IMBA) in 2012 to conduct an assessment of the natural surface trails and make recommendations to improve conditions for mountain biking. The study found that there was not a high demand for mountain biking because the trails are mostly not in desirable conditions. However, the report notes that there is strong potential to create high quality mountain biking routes with "remarkably beautiful scenery" and strong connectivity to neighborhoods.

EFFORTS ARE NECESSARY TO ENSURE ADEQUATE ACCESS FOR BICYCLISTS ON THE PROMENADE. THE FOLLOWING EFFORTS WILL PROMOTE GREATER BICYCLE ACCESS AND SAFETY:

- Fill in missing promenade gaps as new development occurs along the waterfront
- Work with property owners to allow bicycle access at properties where access is excluded. Support from the Mayor's Office would be helpful to work with these property owners to change property deeds to allow bicycle access.
- Reinforce the rule that bicyclists should yield to pedestrians
- Remove signage that prohibits cycling, and provide new Wayfinding Signage to follow along the path, to direct users to other nearby destinations, and note new rules that may allow full time bicycle access and bicycle speed limits
- Provide more Bike Racks
- Provide "Bicycle Crossing" connections with signage and roadway striping where designated bike routes parallel or terminate at the Promenade
- Designate the Gwynns Falls Trail and Jones Falls Trail sections parallel to Key Highway, Light Street and Pratt Street as the main bicycle route, and provide signage directing bicyclists to use this Outer Trail.
- Mark the Outer Trail with bike lane markings to denote that the trail is to be used primarily by cyclists, and guide pedestrians to use the adjacent sidewalks.
- Allow Bicycles to be carried onto Water Taxis – outfit Water Taxis with designated bicycle storage areas.

THE IMBA RECOMMENDATIONS INCLUDE:

- Realign trails away from abandoned roadbeds and utility corridors to create more of a relationship with nature and more scenic viewsheds
- Provide opportunities for trails to loop, and use stacked loops to create more progressively difficult or longer loops from the same starting point
- Connect to hard surface trails allowing for a side trip or change in scenery
- Incorporate rocky outcrop areas along trail alignments because they can be very stable and can provide scenic vistas
- Avoid or limit trail alignments on steep slopes or poorly drained areas
- Design signage and loops to promote a single directional flow to avoid conflicts between people moving in opposite directions
- Improve wayfinding signage
- Prevent erosion and trail incision with better soil stabilization techniques
- Remove invasive plants and promote a native landscape
- Include educational or interpretive signage at cultural landmarks or unique natural areas

The Department of Parks and Recreation has begun to work towards implementation of these recommendations in Gwynns Falls and Leakin Park. These recommendations can also be applied to Stony Run, Herring Run, Chinquapin Run, and Druid Hill Parks.

3. Nighttime Trail Access Policy

OBJECTIVE: Improve lightings along trails, and establish a policy to allow bicycle access to trails after dark.

The Multi-Purpose Trails in Baltimore's parks are only open from dawn until dusk. Many sections of these trails traverse through remote forested areas and are not lit. It is encouraged to install lighting along all trail sections so that the trails can remain open 24 hours a day, or at least in the early morning and evening hours, so that cyclists can take advantage of trail access in the dark. This is especially important for commuters or recreational riders who use trails in the morning before the workday or in the evening after the workday. In addition to adding lighting, the City should seek to encourage policies that allow all trails to remain open 24 hours a day.

Trail head of the Gwynns Falls Trail

Pump tracks at the Rockburn Skills Park in Howard County

Mountain bike route at Loch Raven Reservoir

4. Pump Tracks

OBJECTIVE: Design and install recreational pump tracks in City parks.

Riding Pump Tracks are an increasingly popular cycling activity, but there are no Pump Tracks available in the City of Baltimore. Pump Tracks combine bumps, banks, and curves into a continuous loop for off-road biking. Riders use momentum and agility to stay on track. They are a great training area for people just learning new skills, to get exercise, cross train, and to participate in BMX-style competitions. Pump Tracks provide great family-oriented entertainment.

Building Pump Tracks in Baltimore's parks will provide opportunities for people of all ages a fun place to practice riding and to get some exercise. Pump tracks can be designed to fit within a relatively small area with minimal impact. Building local Pump Tracks in Baltimore's parks will establish a great community resource that can help promote more biking in Baltimore.

A pump track was recently built in Howard County, MD and has been successfully attracting families and bicyclists of all skill levels to come and ride. The Howard County Department of Recreation and Parks partnered with Mid-Atlantic Off Road Enthusiasts (M.O.R.E) and International Mountain Biking Association (IMBA) to build a skills area in Rockburn Branch Park.

Howard County dedicated the land in Rockburn Branch Park for the project; IMBA flew in world-class trail engineers and designers; and MORE raised the funding, managed the project, and provided hundreds of hours of volunteer effort. The final product was donated to the park system on June 2, 2012 and is free for the public to use. The park includes a pump track and three downhill lines: one for beginners, one for intermediate riders, and one for more advanced riders. This is a family-first facility where Howard County kids and adults can hone their bicycle riding skills.

photo courtesy of urbanvelo.org

photo courtesy of franklinmtb.org

photo courtesy of prescottmtb.com

photo courtesy of wellnessworld.it

DEVELOP A COMPREHENSIVE AND SAFE NETWORK OF BICYCLE FACILITIES

MAKE BICYCLING SAFE AND INVITING THROUGHOUT BALTIMORE.

Implement proposed bicycle route network.

		RESPONSIBILITY	TIMEFRAME
☐	Provide sufficient funding through the Capital Improvement Program (CIP) for implementation of independent bicycle improvement project identified in this plan	Department of Transportation	Ongoing
☐	Install recommended bicycle facilities implementing on average 17 miles of bicycle routes per year to reach the goal of 253.6 bike route miles by 2028	Department of Transportation	Ongoing
☐	Utilize NACTO Urban Bikeway Design Guidelines to retrofit streets and intersections to improve and expand bicycle routes	Department of Transportation	Ongoing
☐	Develop a strategic plan to replace all unsafe storm water inlet grates with bicycle-compatible inlets	Department of Transportation	Within 1 Year 2015
☐	Increase wayfinding signage as new routes are installed	Department of Transportation	Ongoing
☐	Consider the bicycle master plan and bicycle facility planning in all roadway reconstruction projects using the cities ENVISTA program	Department of Transportation	Ongoing
☐	Add 311 function for maintenance of bike lanes and paths.	Department of Transportation	Within 1 Year 2015

Develop a Comprehensive and Safe Network of Bicycle Facilities

		RESPONSIBILITY	TIMEFRAME
☐	Develop a Complete Streets guidance manual and training program for DOT Staff and Consultants	Department of Transportation	Within 1 Year 2015
☐	Prepare a Complete Streets Checklist for DOT project planners and designers	Department of Transportation	Within 1 Year 2015
☐	Prepare a Complete Streets Scorecard for DOT completed projects	Department of Transportation	Within 1 Year 2015

Monitoring and Evaluation

		RESPONSIBILITY	TIMEFRAME
☐	Conduct seasonal bike counts at key intersections around the City using volunteer support	Department of Transportation	Ongoing
☐	During the bicycle count weeks, coordinate with MTA to count Multimodal trips, nicluding bicycling	Department of Transportation	Within 1 year 2015
☐	Install one or more fixed bicycle counters on popular bike routes throughout the City	Department of Transportation	Within 2 years 2015
	Share bicycle use and bicycle crash data on an annual basis with CitiStat	Department of Transportation	Within 2 Years

Implement policies that promote a safer and more integrated bicycle network.

		RESPONSIBILITY	TIMEFRAME
☐	Establish a Formal Sharrow Policy	Department of Transportation	Within 1 Year 2015
☐	Establish a Neighborhood Slow Zone Program and Pilot Study	Department of Transportation	Within 2 Years 2016
☐	Develop a Bicycle Signal Policy and Pilot Study	Department of Transportation	Within 2 Years 2016
☐	Update the City Code to allow bike riding on sidewalks under certain circumstances	Mayor and City Council	Within 5 Years 2020
☐	Ensure that Street Closures allow for pedestrian and bicycle access before permit is approved	Department of Transportation	Immediately

INCREASE THE AVAILABILITY OF BICYCLE PARKING AND BIKE SHARE RENTALS AT DESTINATIONS ACROSS BALTIMORE.

Promote bicycle parking initiatives

		RESPONSIBILITY	TIMEFRAME
☐	Install racks at existing public destinations at all schools, libraries, parks, office buildings, and elsewhere along bicycle routes.	Department of Transportation	Within 5 Years 2020
☐	Install racks at all Transit Stations and Park and Ride locations within Baltimore	Maryland Transit Administration	Within 1 Year 2015
☐	Provide installation by request at existing locations open to the general public	Department of Transportation	Immediately
☐	Advise employers, developers, and land owners in providing bicycle parking	Department of Transportation	Immediately

☐	Waive the Minor Privilege Fee for property owners who want to install bike racks.	Mayor and City Council	Immediately
☐	Adopt bicycle-friendly building ordinances that encourage bicycle parking and amenities in new construction and building renovation projects.	Department of Planning, Mayor, and City Council	Within 5 Years 2020

Implement a Bike Share Program

		RESPONSIBILITY	TIMEFRAME
☐	Open the Charm City Bike Share program at key locations in Baltimore	Department of Transportation	Within 1 Year 2015
☐	Expand the Charm City Bike Share program City-Wide	Department of Transportation	Within 10 Years 2025

DEVELOP AND IMPROVE OFF-ROAD PATHS TO CREATE A MORE CONNECTED TRAIL SYSTEM

Complete ongoing trail development projects

		RESPONSIBILITY	TIMEFRAME
☐	Implement recommendations to Waterfront Promenade Access Study	Department of Transportation	Within 1 Year 2015
☐	Complete proposed Multi-Purpose Trails	Department of Transportation	Within 5 Years
☐	Install a Mountain Bike Loop in Herring Run Park	Department of Recreation and Parks	Within 5 Years 2020
☐	Install additional Mountain Bike Loops in Parks throughout the City	Department of Recreation and Parks	Within 10 Years 2025
☐	Install 3 Pump Tracks in a City Park	Department of Recreation and Parks	Within 5 Years 2020
☐	Install additional Pump Tracks in Parks throughout the City	Department of Recreation and Parks	Within 15 Years 2030

Improve community access to trails

		RESPONSIBILITY	TIMEFRAME
☐	Improve lighting for off road trails to allow night-time access	Department of Recreation and Parks	Within 5 Years 2020
☐	Install wayfinding signs from neighborhoods and nearby attractions to trails.	Department of Transportation	Within 5 Years 2020
☐	Create solutions to existing physical barriers between neighborhoods and trails.	Department of Recreation and Parks	Within 5 Years 2020

INCREASE PARTNERSHIPS AND COLLABORATION BETWEEN STAKEHOLDER GROUPS

Utilize the Mayor's Bicycle Advisory Committee

		RESPONSIBILITY	TIMEFRAME
☐	Adopt legislation that officially recognizes the Mayor's Bicycle Advisory Committee and establishes a Mission	Mayor and City Council	Within 1 Year
☐	Appoint Representatives from the Police Department, Planning Department, and Department of Transportation	Mayor	Within 1 Year
☐	Appoint a representative from City Council and leaders in the community.	City Council	Within 1 Year
☐	Hold monthly meetings that are advertised and open to the public	Mayor's Bicycle Advisory Committee	Ongoing
☐	Provide regular reports or briefs to the Mayor and City Council	Mayor's Bicycle Advisory Committee	Ongoing

COLLABORATE WITH THE POLICE DEPARTMENT TO IMPROVE ENFORCEMENT OF LAWS RELATED TO BICYCLING

Increase enforcement targeting risky behavior

		RESPONSIBILITY	TIMEFRAME
☐	Expand established motor vehicle citations to include parking in bike lanes, dooring bicyclists, and sideswiping bicyclists	Police Department	Within 1 Year
☐	Treat risky driving behavior as a serious offense and increase enforcement	Police Department	Within 1 Year
☐	Target bicycle riding in opposing traffic, and bicycles failing to stop at a stop sign or red light.	Police Department	Within 1 Year

Provide training for Baltimore police officers regarding bicycle safety laws and issues faced by on-street bicyclists

		RESPONSIBILITY	TIMEFRAME
☐	Develop a bicycle safety module for the Baltimore Police annual training program	Police Department	Within 1 Year
☐	Increase number of police on bicycle mounted patrol in neighborhood patrols.	Police Department	Within 5 Years

Track data to identify ways to decrease bicycle thefts

		RESPONSIBILITY	TIMEFRAME
☐	Develop a voluntary, online bicycle registration database to help identify stolen bikes	Police Department	Within 1 Year
☐	Publicize the voluntary bicycle registration database	Police Department and Mayor's Bicycle Advisory Committee	Within 1 Year
☐	Encourage victims to report bicycle thefts	Police Department	Within 1 Year
☐	Track patterns in bicycle thefts and develop deterrent strategies	Police Department	Within 1 Year

EDUCATE THE PUBLIC (MOTORISTS, BICYCLISTS, AND PEDESTRIANS) ABOUT BICYCLE SAFETY AND OPERATION IN URBAN TRAFFIC CONDITIONS.

Educate existing motorists and bicyclists about mutual rights and responsibilities

		RESPONSIBILITY	TIMEFRAME
☐	Develop a series of Public Service Announcement segments to educate motorists about bicycle safety and related laws	Mayor's Office	Within 5 Years
☐	Develop a series of Public Service Announcement segments to educate bicyclists about bicycle safety and related laws	Mayor's Office	Within 5 Years
☐	Ensure campaigns are presented in English, Spanish and other pertinent languages across Baltimore	Mayor's Office	Within 5 Years
☐	Post Public Service Announcement links on YouTube and promote the links through traditional and social media	Mayor's Office	Within 5 Years
☐	Create safe cycling information brochure for distribution	Baltimore City Department of Tansportation	Within 5 Years

Educate future motorists, bicyclists, and pedestrians

☐	Support and expand existing safety education programs (Department of Transportation's Safety City, Baltimore City Traffic Safety Coalition, Washington Area Bicyclists Association's safety trailer)	Mayor's Office	Within 5 Years
☐	Encourage greater participation in Baltimore City Public Schools with bicycle related information included in the curriculum, during assemblies, and in Bike Rodeos	Mayor's Office	Within 5 Years
☐	Develop age specific brochures to youth education.	Mayor's Office	Within 5 Years

ENCOURAGE INCREASED BICYCLING BY PROMOTING HEALTH, RECREATION, TRANSPORTATION, AND TOURISM OPPORTUNITIES

Partner with Baltimore Department of Parks and Recreation to promote recreational bicycling opportunities

		RESPONSIBILITY	TIMEFRAME
☐	Promote bicycle trails, events, rental locations, and the planned Charm City Bike Share with maps, brochures and staff recommendations at City Recreation Centers and on websites	Department of Recreation and Parks	Within 5 Years
☐	Host bicycle publicized related events in City Parks	Department of Recreation and Parks	Ongoing

PARTNER WITH BALTIMORE AREA CONVENTION AND VISITORS ASSOCIATION AND THE BALTIMORE OFFICE OF PROMOTION AND THE ARTS TO PROMOTE BICYCLING OPPORTUNITIES

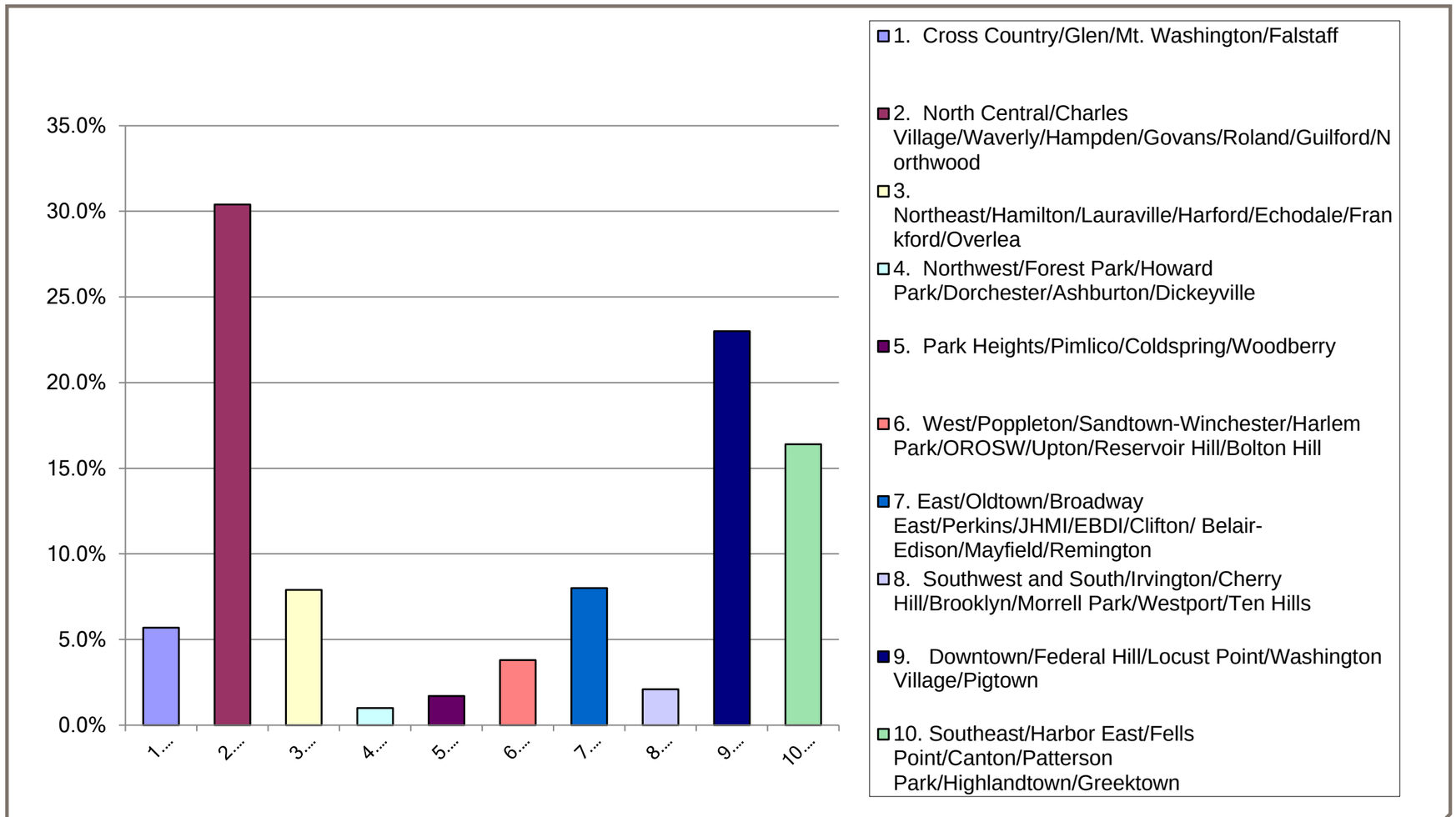
		RESPONSIBILITY	TIMEFRAME
☐	Promote bicycle trails, events, rental locations, and the planned Charm City Bike Share with maps, brochures, staff recommendation at The Visitors' Center and on websites.	Baltimore Area Convention and Visitors Association	Ongoing
☐	Develop recreational trail route brochures with maps, photos and descriptions	Department of Recreation and Parks	Within 5 Years
☐	Develop a bicycle rental station at the Inner Harbor (possibly at Visitors Center) that provides various bicycles for all age groups and amenities such as helmets, tag-along trailers, child seats, etc.	Private Sector	Within 5 Years
☐	Encourage hotels to house and distribute bicycle related information, allow storage of bicycles, and have key cycling equipment on hand to lend to hotel patrons.	Baltimore Area Convention and Visitors Association	Ongoing

PARTNER WITH LOCAL HEALTH ORGANIZATIONS TO PROMOTE BICYCLING AS HEALTHY TRANSPORTATION			
		RESPONSIBILITY	**TIMEFRAME**
☐	Identify partnering public health advocacy group	??	Within 1 Year
☐	Address organizations and city health goals through joint research, funding request, and safety and health promotion campaigns	?? and Health Partner	Within 5 years

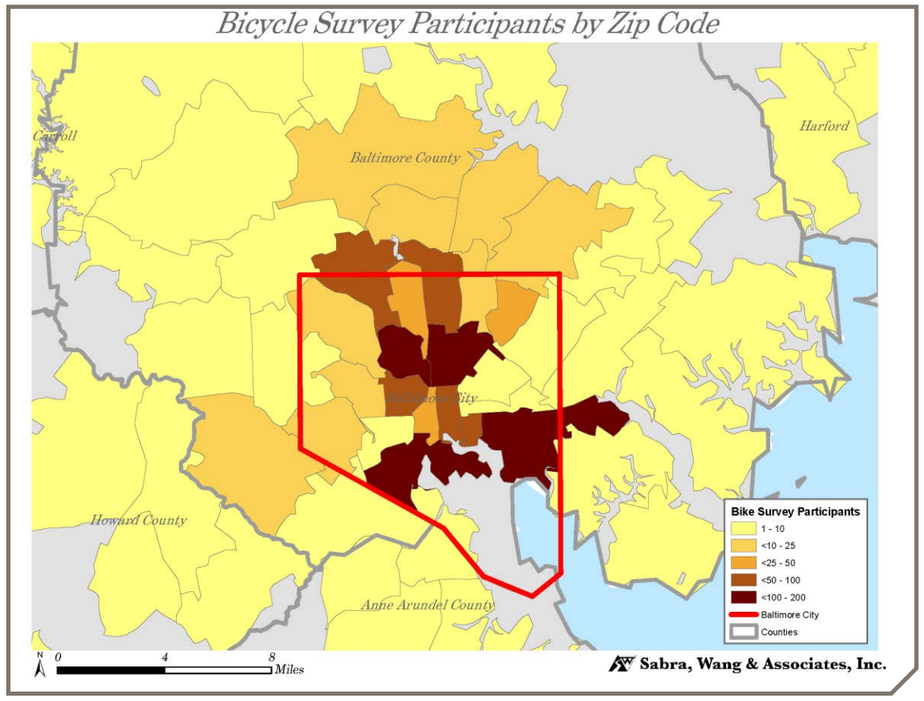
INCREASE POTENTIAL FOR ECONOMIC DEVELOPMENT AND RETURNS ON INFRASTRUCTURE INVESTMENT			
Incorporate Bicycle Oriented Development components in Transit Oriented Development projects			
		RESPONSIBILITY	**TIMEFRAME**
☐	Prepare and provide a bicycle amenities guide to be provided to developers	Department of Transportation / Department of Planning	Within 1 Year
☐	Have route maps and wayfinding signage conspicuously located with transit oriented development locations	Department of Transportation / Department of Planning	Ongoing, as development occurs
☐	Prioritize installation of bicycle infrastructure with transit oriented development	Department of Transportation / Department of Planning	Ongoing, as development occurs
Start a B'More Bike-Friendly Businesses Program			
☐	Develop guidelines for businesses to be bike friendly	Office of Sustainability	Within 5 Years
☐	Develop a Bike-Friendly business certification and promotions program	Office of Sustainability	Within 5 Years

APPENDIX A: SURVEY RESULTS

Question 1: In which part of Baltimore neighborhood do you live or frequent? (see map below)



Question 2: In what Baltimore neighborhood do you live or frequent?



Top 15 Zip Codes of Survey Participants

Zip Codes	Frequency
21218	184
21211	146
21230	120
21224	108
21209	69

Zip Codes	Frequency
21231	65
21217	63
21202	56
21212	53
21210	44

Zip Codes	Frequency
21201	40
21214	28
21215	25
21204	16
21229	15

Question 3: Based on your experience, which specific streets in your neighborhood are best for bicycling?

Street	Mentions
Guilford Ave	181
Baltimore St	95
Roland Ave	86
Maryland Ave	68
Fort Ave	63
Falls Rd	60
Bank St	50
Gough St	47
University Pkwy	44
Pratt St	38
Charles St	35
Walther Ave	35
Calvert St	34
Fleet St	34
Key Hwy	33
Light St	31
Boston St	28
Broadway	25
36th St	23
33rd St	22

Street	Mentions
Park Ave	22
St. Paul St	19
Eastern Ave	15
Greenway	14
Lake Montebello	13
Loch Raven Blvd	12
Greenmount Ave	10
Lake Ave	10
Northern Pkwy	10
York Rd	8
Hillen Rd	6
Harbor Promenade	6
Eutaw Pl	5
Gwynns Falls Pkwy	5
Hollins St	5
Hudson St	4
Mount Royal Ave	4
Edmondson Ave	3
Frederick Ave	1
Harlem Ave	1

Question 4: Which streets in your neighborhood are worst for bicycling?

Street	Mentions
Eastern Ave	119
Charles St	114
Light St	98
Calvert St	75
Harford Rd	70
33rd St	66
Pratt St	60
Fleet St	52
Baltimore St	49
Northern Pkwy	49
York Rd	48
North Ave	40
Cold Spring Ln	40
Falls Rd	39
St. Paul St	39
Washington St	38
Lombard St	37
Hanover St	36
Greenmount Ave	36
Howard St	35

Street	Mentions
Boston St	35
University Pkwy	29
Fort Ave	28
Fayette St	27
All	25
Downtown	20
Belair Rd	18
Orleans St	18
Broadway	18
MLK Blvd	18
Wolfe St	17
President St	15
Roland Ave	15
Madison St	10
Monument St	6
Gwynns Falls Pkwy	4
Liberty Heights Ave	3
Frederick St	1
Fulton Ave	1
Potee St	1

Question 5: What are the best off-street routes (trails or sidewalks) in your neighborhood?

Street	Mentions
Gwynns Falls Trail	49
Promenade	49
Lake Montebello	39
Falls Rd	34

Street	Mentions
Fort McHenry	18
NCR Trail	5
B & A Trail	4
Thomas Ave	1

Question 6: What are the worst off-street routes (trails or sidewalks) in your neighborhood?

Street	Mentions
Federal Hill Park	130
Sidewalks	120
Fells Point	90
Patterson Park	62
Downtown	51
Promenade/Trolley Lane	16
Jones Falls Trail	15
Herring Run Tail	13
Wyman Park	13

Street	Mentions
Pratt St	13
Druid Hill Park	4
Hanover Street/Bridge	4
Lake Montebello	3
Fayette St	2
Franklin Square Park	2
Calvert St	1
Lake Roland	1

Question 7: On which streets would you like to see bicycle lanes or other bicycle improvements?

Street	Mentions
Charles St	97
Falls Rd	78
Eastern Ave	73
Pratt St	68
Key Hwy	66
Harford Rd	60
Calvert St	55
33rd St	55
Fleet St	48
Boston St	43
Lombard St	41
York Rd	41
Light St	39
Hanover St	34
St. Paul St	34
Fort Ave	34
All	33
Maryland Ave	33
North Ave	31
Fayette St	30
Northern Pkwy	30

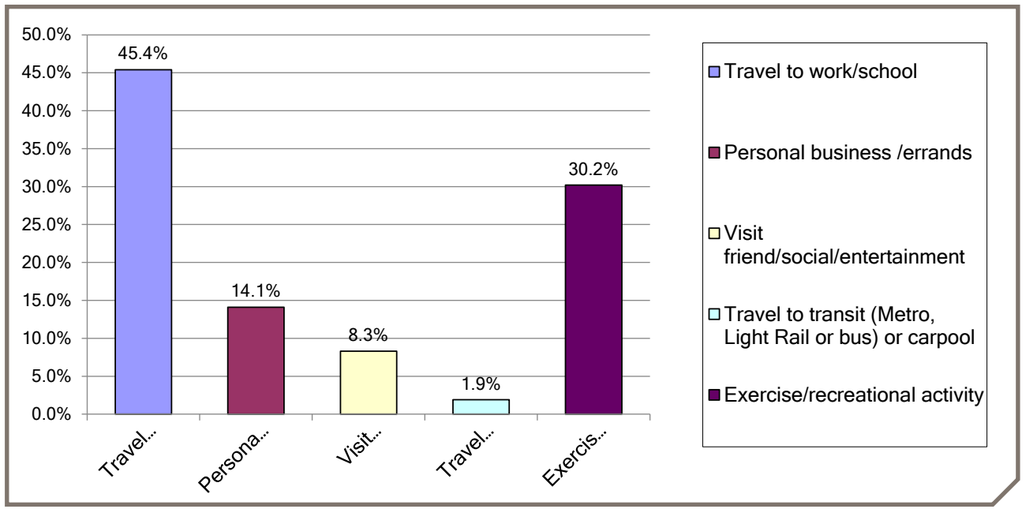
Street	Mentions
Cold Spring Ln	29
Greenmount Ave	24
Broadway	20
Howard St	19
Aliceanna St	19
25th St	17
Wolfe St	16
MLK Blvd	16
Keswick Rd	15
Orleans St	13
Monument St	12
Washington St	10
Roland Ave	9
Gwynns Falls Pkwy	8
President St	8
Guilford Ave	7
Hillen Rd	6
Edmondson Ave	6
Frederick Ave	4
Liberty Rd	1

Question 8: At which locations would you like to see additional bicycle parking (racks or lockers) provided? (Provide a neighborhood, address, intersection or business name)

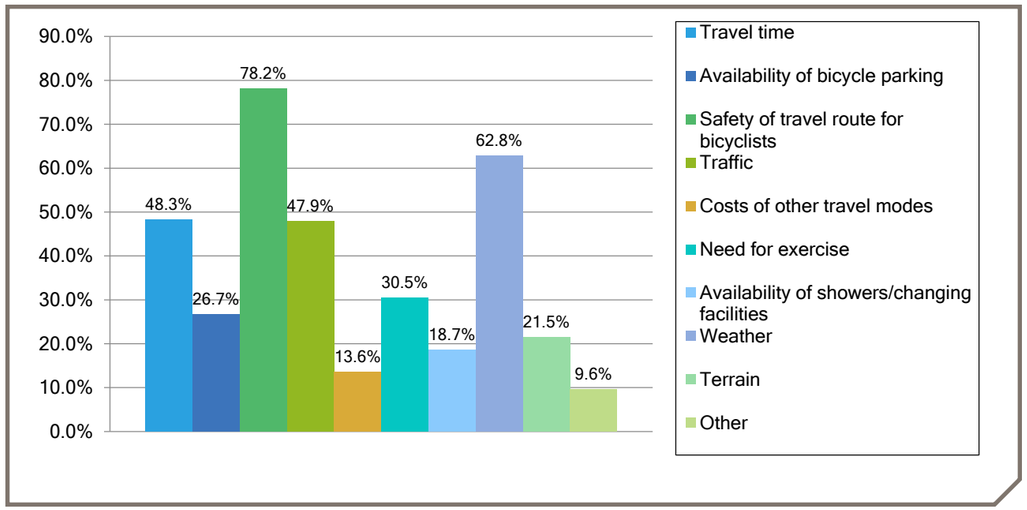
Street	Mentions
Parks	263
Fells Point	150
Hampden	145
Harbor	140
Mt. Vernon	129
Canton	115
Markets / Grocery Stores	91
Downtown	77
Waverly	49
Light Rail	35
City Offices	32
Charles	32
Broadway	29
Hopkins Hospital	26

Street	Mentions
36th St	23
Camden Yards	20
Eastern Ave	10
Schools	9
Thames St	9
Cross St Market	7
Light St	6
Courthouse	4
Korean Memorial	2
UMB	2
MICA	2
South side	1
Gallery Place	1
Poly / Western	1

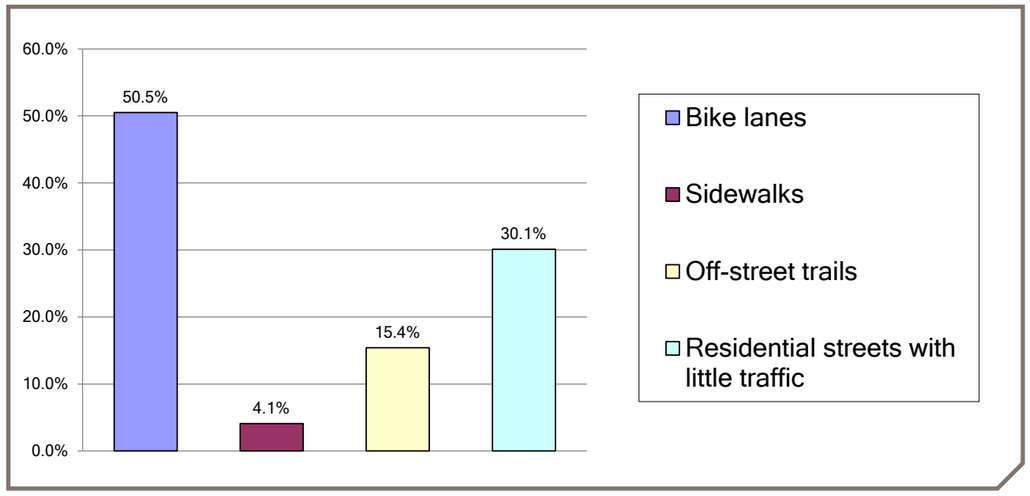
Question 9: What was the primary purpose of your last bicycle trip?



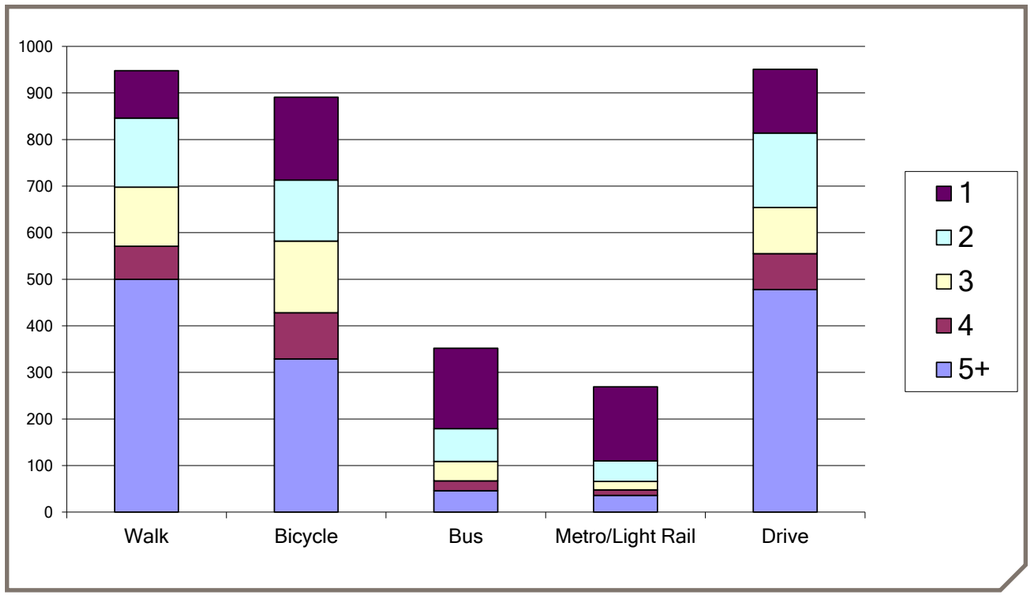
Question 10: Which of the following factors plays a role in whether or not you ride your bike to your destination?



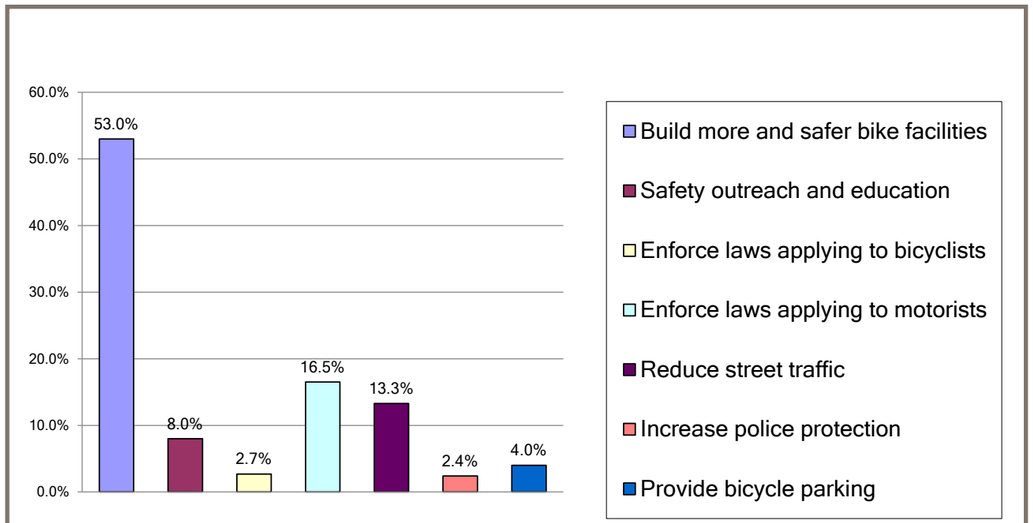
Question 11: When making a bicycle trip, which of the following do you prefer to use?



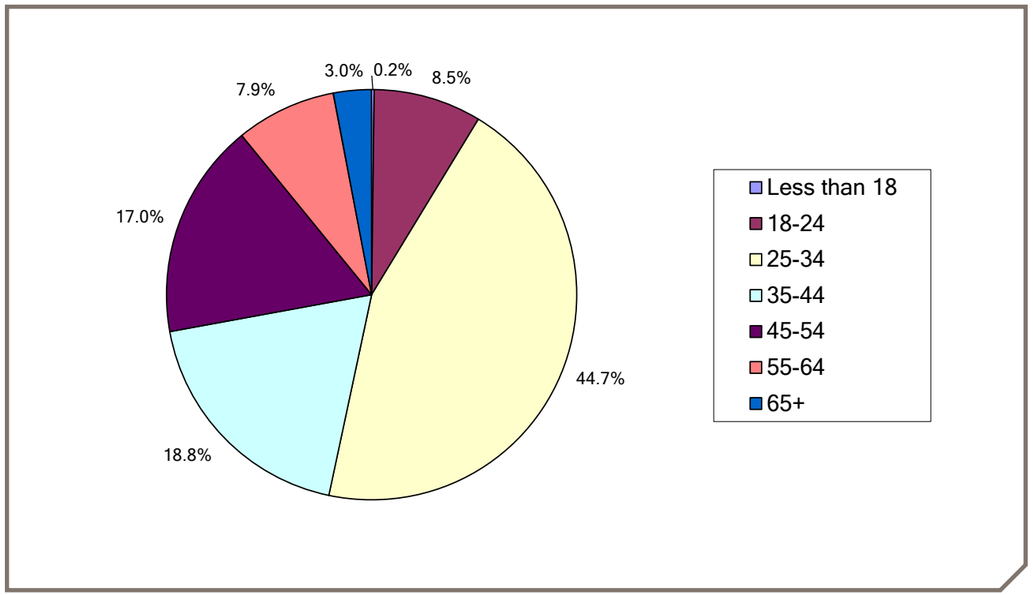
Question 12: How many times during the last week did you use the following forms of transportation?



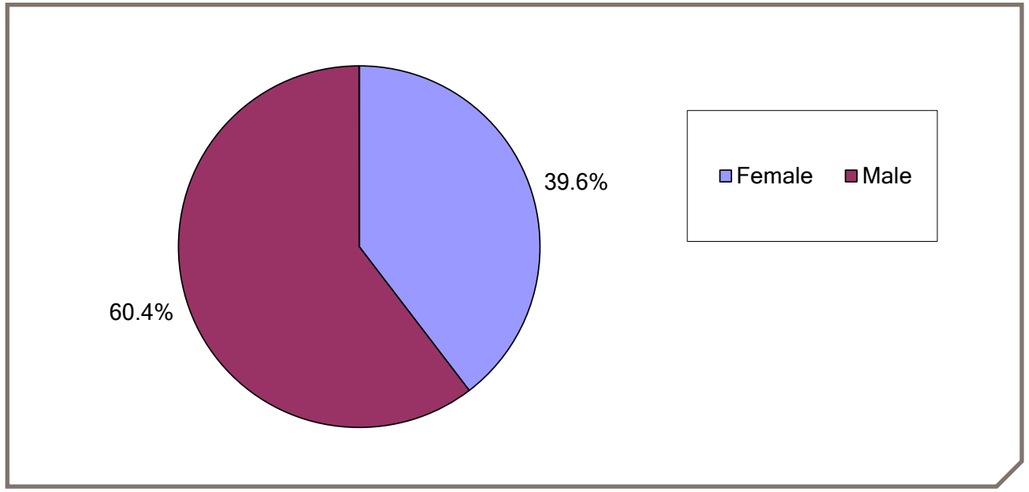
Question 13: Which of the following factors do you think would do the most to encourage bicycling in the City of Baltimore?



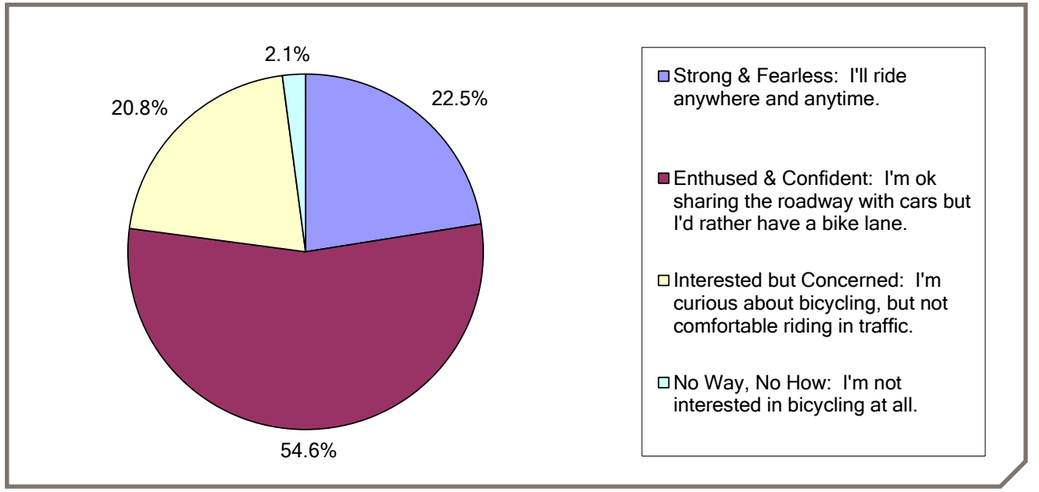
Question 14: What is your age?



Question 15: What is your gender?



Question 16: What type of bicyclist do you consider yourself to be?



APPENDIX B: 2006 CHECKLIST

2006 Summary of Goals and Objectives

Accomplishments since the 2006 Bicycle Master Plan

GOAL 1

DEVELOP A COMPREHENSIVE NETWORK OF FACILITIES FOR BICYCLISTS

OBJECTIVE 1: MAKE BICYCLING SAFE AND INVITING ON THE STREETS OF BALTIMORE

1) IMPLEMENT PROPOSED BICYCLE ROUTE NETWORK
- ■ Install recommended bicycle facilities
- ■ Retrofit unsafe storm water inlets grates and address difficult intersections
- ☐ Ensure continuity and sufficient access through downtown, to transit stations and across bridges
- ■ Create a wayfinding system with the proposed signage protocol
- ☐ **Measureable Outcome:** Install the introductory network using Motor Vehicle Revenue and other fiscal means

2) IMPROVE CONTINUITY OF ON-STREET NETWORK BY OVERCOMING NEGATIVE IMPACT OF BARRIERS
- ■ Allocate MVR funds annually to design safety improvements at complex intersections and construct off-road paths
- ■ Address barriers created by freeways, railroad lines, industry, large developments, street discontinuity, stream valleys and one-way streets
- ■ **Measureable Outcome:** Identify barriers and address at the same time as design of connecting bicycle routes

3) CONSIDER THE ADOPTED BICYCLE ROUTE NETWORK IN PRIORITIZING STREET RESURFACING, RECONSTRUCTION AND STREETSCAPE PROJECTS
- ■ **Measureable Outcome:** Implemented street improvements that overlap the Bicycle Route Network and include bicycle accommodations in design.

4) COORDINATE PLANNING, DESIGN AND IMPLEMENTATION OF BICYCLE FACILITIES WITH OTHER CITY PLANS, SNAP PLANS AND OTHER PLANNING ENDEAVORS
- ■ Consider bicycle master plan and bicycle facility planning in all roadway reconstruction projects,
- ■ **Measureable Outcome:** Bicycle accommodations will be included in all city plan documents and discussions.

5) COORDINATE PLANNING, DESIGN AND IMPLEMENTATION OF BICYCLE IMPROVEMENTS NEAR THE CITY LINE WITH BALTIMORE COUNTY, ANNE ARUNDEL COUNTY, MARYLAND STATE HIGHWAY ADMINISTRATION (SHA) AND BALTIMORE METROPOLITAN COUNCIL
- ■ **Measureable Outcome:** A regionally continuous bicycle network

OBJECTIVE 2: INCREASE THE AVAILABILITY OF BICYCLE PARKING AND SUPPORT FACILITIES AT DESTINATION ACROSS THE CITY.

1) LAUNCH A BICYCLE PARKING INITIATIVE
- ■ Install racks at existing destinations, in city retail districts, at all public school and libraries and elsewhere along bicycle routes.
- ■ Provide installation by request at existing locations open to the general public
- ■ Advise employers in providing bicycle parking across bridges
- ■ Adopt policy requiring city government offices to provide bicycle parking
- ☐ **Measureable Outcome:** Install 100 racks per year

2) REQUIRE NEW DEVELOPMENT TO PROVIDE BICYCLE PARKING
- ■ Include bicycle parking requirements in Comprehensive Rezoning initiative based on motorized vehicle parking standards
- ■ Enforce bike parking initiative through Site Plan Review Committee and the Development Guidebook
- ■ **Measureable Outcome:** All new development with motorized vehicle parking requirements includes bicycle parking; starting summer 2008.

3) IMPROVE BICYCLE PARKING AT TRANSIT STATIONS IN SUPPORT OF A MULTI-MODAL TRANSIT SYSTEM
- ■ Evaluate needs and existing equipment at subway, light rail, MARC, train and bus transfer stations
- ■ **Measureable Outcome:** All transit stations have adequate bicycle parking by 2009.

4) DEVELOP BICYCLE COMMUTING/RENTAL CENTERS TO PROVIDE FOCAL POINTS FOR BICYCLE TRANSPORTATION SERVICES AND PROMOTION
- ☐ Establish Bicycle stations at college campuses, high density neighborhoods, major employment centers, major tourist destinations and transit hubs.
- ☐ Develop threshold and standards for commuting centers at government offices
- ☐ **Measureable Outcome:** Create 2 commuting/rental centers by 2012.

OBJECTIVE 3: FULLY INTEGRATE BICYCLING WITH ALL PUBLIC TRANSIT FACILITIES AND SERVICES.

1) WORK WITH THE MARYLAND TRANSIT ADMINISTRATION (MTA) TO ACCOMMODATE BICYCLES ON ALL PUBLIC TRANSIT IN SUPPORT OF MULTI-MODAL TRANSIT SYSTEM.
- ■ Address bus yard space issues and rack acquisition to allow all busses to be equipped with bicycle racks
- ☐ Create space for bicycles on MARC trains across bridges
- ☐ Encourage MTA to host weekend regional bicycle tour promotions
- ■ **Measureable Outcome:** Bike racks on all city busses and all types of bicycles permitted on MARC trains by 2008.

2) EXPLORE THE POTENTIAL FOR BICYCLE ACCOMMODATIONS ON THE WATER TAXI
- ■ **Measureable Outcome:** Determine issues and address for allowing bicycles on water taxi.

OBJECTIVE 4: DEVELOP OFF-ROAD PATHS TO CREATE A CONNECTED TRAIL SYSTEM

1) COMPETE ONGOING TRAIL DEVELOPMENT PROJECTS
- ☐ **Measureable Outcome:** Complete Jones Falls Trail by 2010. Complete plans for Herring Run and Western Run Greenway by 2008.

2) DEVELOP NEW AND EXTEND EXISTING TRAILS
- ☐ **Measureable Outcome:** Identify all possible trails by 2008. Keep at least one trail segment in design and construction each year.

3) IMPROVE NEIGHBORHOOD ACCESS TO TRAILS
- ■ Install wayfinding signs from neighborhoods and nearby attractions to trails.
- ☐ Create solutions to existing physical barriers between neighborhoods and trails.
- ☐ **Measureable Outcome:** All neighborhoods adjacent to trails will have identified access routes to these trails

GOAL 2

IMPLEMENT SAFETY, EDUCATION AND ENCOURAGEMENT PROGRAMS TO INCREASE BICYCLE USAGE

OBJECTIVE 1: IMPROVE ENFORCEMENT OF TRAFFIC LAWS RELATED TO BICYCLING

1) DEVELOP PARTNERSHIP WITH THE BALTIMORE CITY TRAFFIC SAFETY COALITION, DEPARTMENT OF TRANSPORTATION SAFETY DIVISION, BALTIMORE CITY POLICE DEPARTMENT AND THE MAYOR'S BICYCLE ADVISORY COMMITTEE TO IDENTIFY AND ADDRESS BICYCLE-VEHICLE SAFETY MEASURE WITH ENFORCEMENT AND NEW OR AMENDED LAWS.
   - ☐ **Measureable Outcome:** Convene committee and implement recommendations by 2008.

2) PROVIDE TRAINING FOR BALTIMORE POLICE OFFICERS REGARDING BICYCLE SAFETY LAWS AND ISSUES FACED BY ON-STREET BICYCLISTS.
   - ■ Assess existing bicycle training for police officers
   - ☐ Ensure understanding of bicycles as vehicles, how to determine fault in and document crashes, and bicycle-motorized vehicle interaction.
   - ☐ Increase number of police on bicycle mounted patrol.
   - ■ **Measureable Outcome:** Police academy curriculum and ongoing training will include bicycle law and safety information by 2007.

3) IDENTIFY THE MOST COMMON CONFLICTING MOVEMENTS BETWEEN BICYCLE AND VEHICLE USERS AND DETERMINE ENFORCEMENT MECHANISMS TO MITIGATE THESE CONFLICTS.
   - ■ Develop counter measures program including training for officers, public service announcements, engineering, etc.
   - ☐ **Measureable Outcome:** Development an amendment for the law restricting bicycle riding on sidewalks and the park rule restricting bicycle riding on park paths.

4) CONVENE AGENCY STAKEHOLDER GROUP TO DEFINE LEGISLATIVE RECOMMENDATIONS (7 MPH SPEED LIMIT ON SIDEWALKS, YIELD TO PEDESTRIANS, DOWNTOWN NO-SIDEWALK-RIDING ZONE)
   - ☐ **Measureable Outcome:** City parks rule adjustment proposed in 2008. Legislation for sidewalks introduced in 2008.

OBJECTIVE 2: EDUCATE THE PUBLIC (MOTORISTS, BICYCLIST AND PEDESTRIANS) ABOUT BICYCLE AND VEHICLE OPERATION IN URBAN TRAFFIC CONDITIONS.

1) EDUCATE EXISTING MOTORISTS AND BICYCLES ABOUT MUTUAL RIGHTS AND RESPONSIBILITIES
   - ■ Create information campaigns to clarify the right and requirement of bicyclists to operate in the street like a motor vehicle
   - ■ Encourage motorists and bicyclists to exhibit respect and to share the road equitably.
   - ☐ Ensure campaigns are presented in English, Spanish and other pertinent languages across bridges
   - ■ Create safe cycling information brochure for distribution
   - ☐ **Measureable Outcome:** Launch at least 2 distinct public information campaigns by 2008

2) EDUCATE FUTURE MOTORISTS, BICYCLES AND PEDESTRIANS
   - ☐ Support and expand existing safety education programs (Department of Transportation's Safety City, Baltimore City Traffic Safety Coalition, Washington Area Bicyclists Association's safety trailer)
   - ☐ Encourage greater participation by teachers of students grades 3-5 (bicycle riding age)
   - ☐ Distribute bicycle helmets, coordinate youth bike rides and develop age specific brochures to youth education.
   - ☐ **Measureable Outcome:** Create brochures and public service announcements. Set specific safety agenda for implementation

3) USING NEW FEDERAL FUNDING, CREATE AND IMPLEMENT SAFE ROUTES TO SCHOOL PROGRAM.
   - ☐ Partner with Baltimore City Public School System to increase bicycle safety through sidewalk and street crossing improvements, teaching safe bicycling and promoting healthier lifestyles.
   - ■ Target elementary schools first and then extend to middle and high schools.
   - ☐ Use new Federal Transportation money dedicated for this activity to fund the program outlined above.
   - ☐ **Measureable Outcome:** Physical improvements and school-targeted safety, education and encouragement programs by 2007.

OBJECTIVE 3: ENCOURAGE INCREASED BICYCLING BY PROMOTION HEALTH, RECREATION, TRANSPORTATION AND TOURIST OPPORTUNITIES

1) ESTABLISH PARTNERSHIPS WITH HEALTH ORGANIZATIONS TO PROMOTE BICYCLING AS HEALTHY TRANSPORTATION
   - ☐ Address organizations and city health goals through joint research, funding request, and safety and health promotion campaigns
   - ☐ **Measureable Outcome:** With health partner, launch 1-2 efforts to promote bicycling and safety
   - ☐ Promote bicycling for commuting, errands, socializing and exercising
   - ☐ Create a program and target higher education, city government and other employers to encourage bicycle commuting to work or school
   - ■ Support recreational bicycle rides
   - ☐ Use innovative means to encourage bicycling for errands and socializing (admission to the Bicycle movies Series at the Creative Alliance is discounted if you ride to the performance)
   - ☐ **Measureable Outcome:** Work with One Less Car to support and expand their employer encouragement program in 2009.

3) DEVELOP AND MARKET A CITY OF BALTIMORE BICYCLE MAP
   - ■ **Measureable Outcome:** Develop Bicycle Map for the internet and seek funding for making print copies available by 2009

4) PARTNER WITH BALTIMORE AREA CONVENTION AND VISITORS ASSOCIATION AND THE BALTIMORE OFFICE OF PROMOTION AND THE ARTS TO PROMOTE BICYCLING OPPORTUNITIES.
   - ■ Promote bicycle trails, events, and rental locations via brochures, staff recommendation at visitors' center, and on websites.
   - ☐ Develop a bicycle rental station at the Inner Harbor (possibly at Visitors Center)
   - ☐ Encourage hotels to house and distribute bicycle related information
   - ☐ **Measureable Outcome:** Create bike rental station with BACVA by 2008. Develop bicycle information fliers and distribute through BACVA by 2008.

GOAL 3

INSTITUTE POLICES THAT SUPPORT IMPLEMENTATION OF BIKE MASTER PLAN GOALS AND OBJECTIVES WITH COMMUNITY SUPPORT AND INPUT

OBJECTIVE 1: CREATE STRUCTURE TO IMPLEMENT THE BIKE PLAN GOALS AND OBJECTIVES

1) CREATE A BICYCLE COORDINATOR POSITION IN THE DEPARTMENT OF TRANSPORTATION TO GUIDE AND FACILITATE THE IMPLEMENTATION OF THE BIKE MASTER PLAN

a) Responsibilities of this position would include, but not limited to:

- ■ Reviewing street projects for bicycle facilities and network compatibility
- ■ Reviewing development projects for bicycle parking and access;
- ☐ Coordinating safety, education and encouragement programs;
- ■ Staffing Mayor's Bicycle Advisory Committee
- ■ Developing, with other agency input, city policy and procedure amendments to support Bike Master Plan goals and objectives;
- ☐ Coordinating 311 spot improvement program
- ■ Managing the implementation of the Bicycle Master Plan and Route Network
- ■ **Measureable Outcome:** Staff positions, locations, and individuals identified and in place by 2007.

b) Position could be partially funded by the Maryland Comprehensive Traffic Safety Program and/or Safe Routes to School

2) SUPPORT MAYOR'S BICYCLE ADVISORY COMMITTEE

- ■ Shift staffing from Department of Planning to Department of Transportation
- ☐ Diversify membership
- ☐ Update mission statement
- ☐ **Measureable Outcome:** In 2006, develop list of desired types of members and launch targeted membership drives. The MBAC shall provide an annual report on progress.

3) REVIEW AND UPDATE THE BICYCLE MASTER PLAN EVERY 6 YEARS

- ☐ Annually identify goals met and broadcast within city government, to the bicycling community and media.
- ☐ **Measureable Outcome:** Regular updates will go to public and government. Formal review of the Bicycle Master Plan will be financially programmed in to FY 2011.

OBJECTIVE 2: INSTITUTE NEW POLICIES AND PROCEDURES IN THE DEPARTMENT OF TRANSPORTATION AND PLANNING TO SUPPORT BIKE MASTER PLAN GOALS

1) UTILIZE MAP C, TOOLKIT AND NATIONAL DESIGN GUIDES

- ■ Update roadway design policies and specification with information provided in these documents.
- ■ Review and adjust scope, design and cost estimating specification of roadway resurfacing, reconstruction and streetscaping projects to incorporate bicycle facility accommodation
- ■ Assure all consultant teams hired have sufficient capacity to design bicycle facilities.
- ■ **Measureable Outcome:** New road projects include bicycle facilities as per information in the identified documents.

2) PROVIDE SUFFICIENT FUNDING THROUGH THE CAPITAL IMPROVEMENT PROGRAM (CIP) FOR IMPLEMENTATION OF INDEPENDENT BICYCLE IMPROVEMENT PROJECT IDENTIFIED IN THIS PLAN

- ☐ Establish Introductory Network by 2010 (including design, construction and installation)
- ■ Complete special projects to ensure connectivity
- ☐ **Measureable Outcome:** Introductory network and connectivity solutions are completed by 2010 through CIP funding

3) BUILD INTERNAL CAPACITY TO DESIGN AND IMPLEMENT BICYCLE FACILITIES BY PROVIDING ONGOING TRAINING FOR CITY STAFF.

- ☐ **Measureable Outcome:** Through 2009, at least one training per year by a recognized bicycle facility design professional shall be conducted for city staff. After 2009, specific training needs will be determined and provided by bicycle coordinator.

4) ADOPT POLICY REQUIRING NEW DEVELOP TO MITIGATE TRAFFIC IMPACT BY PROVIDING BICYCLE FACILITIES OR CONTRIBUTING TO A FUND THAT IS DEDICATED FOR BICYCLE FACILITIES AND IMPROVEMENTS

- ☐ Include new bike facility development requirement in Development Guidebook and Site Plan Review Committee requirements lists.
- ☐ **Measureable Outcome:** Convene committee to determine bicycle facility expectations for Development Guidebook and Site Plan Review Committee and develop calculation for non-compliance fee.

5) BEGIN A BICYCLE DATA COLLECTION PROGRAM

- ■ Analyze police crash data to find problems to address with the safety programs.
- ■ Determine basic data points to assist in prioritizing bicycle projects and creating baseline for identifying trends.
- ■ **Measureable Outcome:** Identify pertinent data points to bicycle safety and facility use. Collect and use to prioritize program and facility implementation.

OBJECTIVE 3: UPDATE STREET AND TRAIL REPAIR AND MAINTENANCE PRACTICES TO ENSURE BICYCLISTS SAFETY AND COMFORT.

1) DEVELOP PROCEDURES FOR MAINTAINING PUBLIC BICYCLE FACILITIES

- ☐ Include street and trail sweeping, trimming/clearing vegetation, replacement of bike lane stripes and symbols, inspection and repair of signs.
- ☐ Train operation and maintenance crews and supervisors in identifying conditions of concern to bicyclists: small potholes, glass, pavement cracks, overgrown vegetation, improperly installed signs, crumbling curbs and dangling wires.
- ☐ Include bicycle facilities in street sweeping and snow removal strategy.
- ☐ **Measureable Outcome:** Develop maintenance guidelines with visuals and create small version for distribution to maintenance crews by 2008.

2) ESTABLISH BICYCLE RELATED SERVICE REQUEST VIA THE 311 CALL CENTER AND ONLINE CITI TRACK SERVICE REQUEST SYSTEM

- ☐ Develop system, identify agency and department for addressing specific concerns and create new 311 forms
- ☐ Create category to designate callers as bicyclists.
- ■ **Measureable Outcome:** Track storm grate inlet retrofit and other bicycle related maintenance request through 311 by 2009.

3) UPDATE SPECIFICATION FOR ROUTINE AND EMERGENCY STREET RESURFACING AND REPAIR TO ENSURE SAFE TRAVELING ROUTES AND SURFACES FOR BICYCLIST.

- ■ Include bicycle traffic in Maintenance of Traffic plans for all trail and street repairs that interrupt a trail or on-street bicycle route.
- ■ Identify unsafe specifications and update per the design guides recommended herein resurfacing, reconstruction and streetscaping projects to incorporate bicycle facility accommodation
- ☐ Assure specifications for road repair prevent pavement break-up, heaving or cracking which create dangerous conditions for bicyclists.
- ☐ **Measureable Outcome:** Bicycle facilities are included and protected in ongoing repair projects.

APPENDIX C: BIBLIOGRAPHY

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