

# BALTIMORE CITY SEPARATED BIKE LANE NETWORK ADDENDUM TO 2015 BIKE MASTER PLAN UPDATE

FEBRUARY 2017  
**DRAFT**



Photo Credit: Elvert Barnes





# EXECUTIVE SUMMARY

Baltimore  
bike share

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# ACKNOWLEDGMENTS

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**PART 1**  
**A BETTER WAY TO PLAN**  
**FOR PEOPLE ON BIKES**



ASSUME  
THEY HAVE  
THE SAME  
NEEDS AS  
EVERYONE  
ELSE



# DEFINING AND RESPECTING BASIC TRAVEL NEEDS

## Background

The 2015 Baltimore Bike Master Plan Update was a comprehensive document with good recommendations for every neighborhood in Baltimore. This Low Stress and Separated Facility Network addendum seeks to build on that work by identifying and prioritizing a set of projects that will dramatically increase the number of people in Baltimore City who can meet many of their basic travel needs by bike over the next two to five years. This section describes the general methodology used to plan a bike network that the general population will use. The application of this thinking to Baltimore's specific context is described in Part 2.

Fundamentally, people will only travel in a way that:

1. Gets them where they need to go
2. Feels safe to them

"I'm never quite sure if I'll arrive alive" is not a condition that anyone will willingly tolerate for their morning commute.

When we design streets for cars, we honor these basic travel needs by:

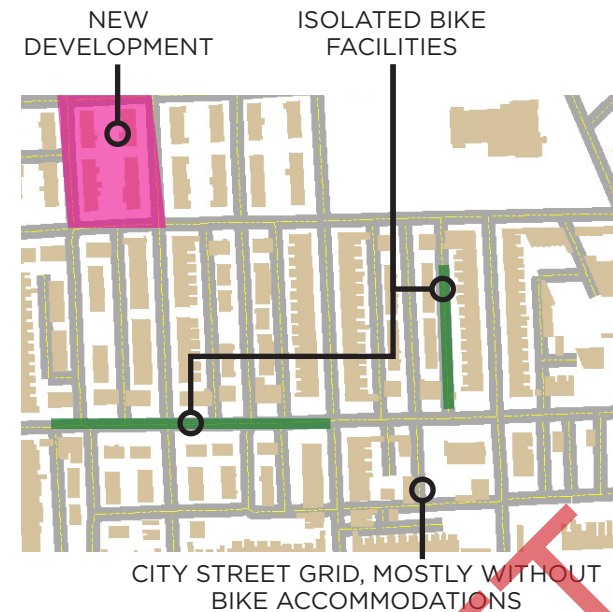
1. Connecting the new streets to the broader street network
2. Following engineering and design standards that ensure that the streets both are safe and feel safe to drivers

The Americans with Disabilities Act and other sidewalk standards also recognize these needs for pedestrians, even if implementation is imperfect.



The way we traditionally plan bike facilities, however, often fails to meet one or both of these basic travel needs. Somewhere between the potential bike rider's home and the school, office, park, or grocery store that they're trying to reach, one of two things occurs:

1. A lack of bicycle facilities, or gaps between bicycle facilities requires people on bikes to ride in mixed traffic on streets where that feels dangerous
2. The bicycle facilities that do exist are designed in such a way that they don't feel safe, either because they're too close to traffic, they're frequently obstructed, or the doors of parked cars open into them



These shortcomings of traditional bike planning occurred for a variety of reasons, including perceptions that bicycling is primarily a recreational activity and not a valid transportation mode, misunderstandings about what street conditions make bicyclists feel unsafe, and bicycle planning methodologies that focus on single corridors, causing the facility gaps mentioned above.

The growing research into the attitudes, habits, and perception of safety of people who want to ride bikes for transportation suggests a relatively simple methodology for improving comprehensive bicycle planning so that it can better achieve the goal of allowing more people to travel by bike:

1. Identify the network of "low stress" streets where people already feel safe riding bikes
2. Identify strategic corridors that would connect places of interest most efficiently
3. Identify the correct facility type to allow people riding bikes to feel safe on strategic corridors
4. Prioritize construction of facilities on these strategic corridors based on how much of the existing low stress network they "unlock" to bike travel. Prioritize projects that connect other existing or planned facilities.

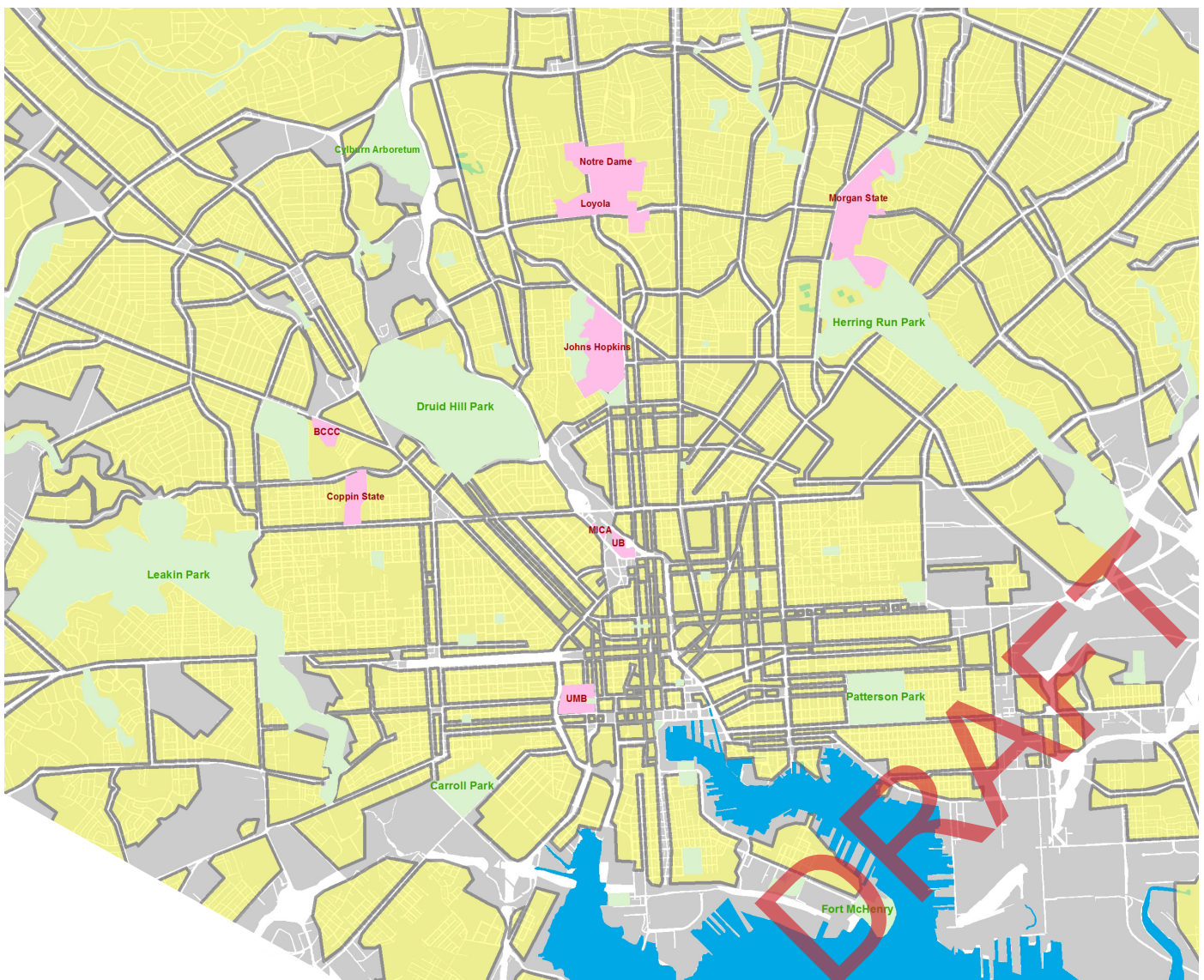
# VISUALIZING THE LOW STRESS NETWORK

## [1] Identify Existing Low Stress Streets

The effort to identify the existing low stress street network is simplified by the fact that people on bikes are vulnerable street users, and the presence of any one of several factors that make them feel unsafe is enough to render a street effectively off-limits to them. The factors that make bicyclists feel too unsafe to use a street or bike facility include:

- › Interactions with fast moving traffic (greater than 30 mph, approximately)
- › Frequent interactions with traffic of any speed (greater than 8,000 vehicles per day, approximately)
- › Obstructions in a bike facility that force a bicyclist into traffic (debris, illegally parked vehicles, vehicles creeping forward from driveways in order to make turns, etc.)
- › Dangerous pavement conditions (inadequate snow/ice removal, frequently broken asphalt, slippery gravel or maintenance plates, wheel-catching storm grates, etc.)

The most widely used methodology for determining the existing low stress network is the Level of Traffic Stress Methodology. This methodology was applied to the entire street network of Baltimore City, and then supplemented with volume data where available, to visualize all of the “islands” of connected low stress neighborhoods within the City. This visualization allows the strategic selection of corridors for low stress bike facilities based on how efficiently they connect these islands to one another and to the existing and planned Downtown Bike Network. The map below shows a section of Baltimore City’s connectivity islands, in yellow, with the barriers between them shown in white.





# LEVERAGING LOW STRESS ASSETS

## [2] Identify Strategic Corridors for Interventions

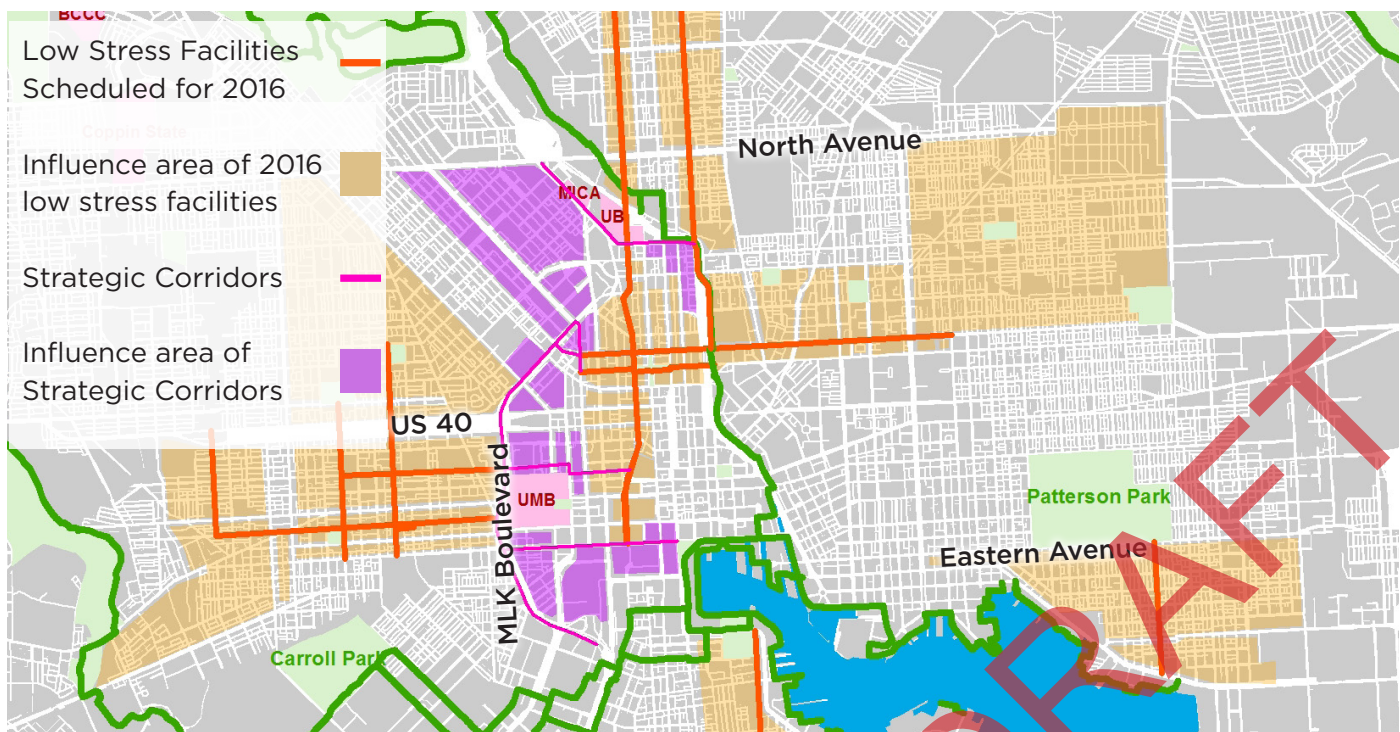
Knowing where people already feel safe riding bikes is crucial to strategic bike facility planning because it reflects the way people would actually use a bike for transportation. They will start at their home, which is likely to be on one of these low stress streets, wind through their neighborhood on streets they are familiar with and eventually hit a higher order roadway.

This higher order roadway can either serve as a barrier or a connection, depending on whether it has an appropriate and well-designed low stress bike facility.

The higher order roadways that most directly connect residential neighborhoods to job centers, downtown, and other important locations are usually in high demand as motor vehicle corridors, as well. For this reason, reclaiming some of the right of way from motor vehicle or parking usage is almost always a significant political battle. Thus, it is crucial to fight this battle on corridors that “unlock” the most network for the most potential riders. This necessity leads to a few important selection principles.

1. **Leverage existing low stress network when planning low stress bicycle facilities.**
2. **Carefully consider building low stress facilities that are not connected to the rest of the low stress network.** While taking advantage of opportunities to build facilities is important, it is also crucial to plan projects to connect these facilities to the wider low stress facility network so that they are accessible to more potential riders, and better connect to important destinations.
3. **Minimize out of direct travel in the low stress bicycle network;** people on bikes travel more slowly than people in cars, so detours are a more significant deterrent to bicycle travel.
4. **Provide comprehensive wayfinding and markings where detours are unavoidable.**
5. **Identify opportunities to create low stress off-street bicycle connections through land uses that are barriers to auto travel** (parks, schools, city-owned parcels).

### HOW TO IDENTIFY STRATEGIC CORRIDORS



The map above shows the parts of Central Baltimore that can access a low stress bike facility (orange lines) via low stress streets. The magenta highlighted corridors are planned for low stress facilities. Strategic intervention on those corridors would enable bike travel from most of West Baltimore to Downtown and beyond.

# SELECTING LOW STRESS FACILITIES

## [3] Identify Appropriate Facility Type

Once the most strategic corridors for intervention have been determined, a facility type that will yield a low stress condition must be selected for the corridor. This is simpler in a network focused approach than in traditional approaches. Succinctly put:

- › If a street has high motor volumes, only a physically separated bicycle facility will make inexperienced bike riders feel safe and comfortable.
- › If the motor vehicle traffic on a street is fast-moving, only a physically separated bicycle facility will make inexperienced bike riders feel safe and comfortable.
- › Standard five-foot or six-foot bike lanes in the door zone of parked cars are never low stress facilities.
- › Standard or buffered non-separated bike lanes are only low stress facilities when they are next to the curb and average traffic speeds are approximately 30 mph or less; if there is space for a buffered bike lane, it is best to add a vertical element to the buffer to create a separated facility.
- › Bike lanes that buses must frequently pull through to reach their stop are not low stress facilities.





## [4] Select Where to Build First

The Level of Traffic Stress methodology and resulting mapping are useful for determining strategic corridors, but each of the resulting projects must be designed, funded, and constructed. Selecting which projects to advance through this process should first be based on a combination of technical and community factors.

The technical factors for prioritizing construction are very similar to those used to select the most crucial corridors, just with added consideration for which other projects can be assumed to be built at the time the project is constructed. If a project earlier in the implementation time line is stalled or canceled, a previously viable project may no longer provide much additional network connectivity, or may become an “orphaned” facility. Connectivity to the wider low stress facility network is critically important in prioritizing projects..

The inclusion of community factors when prioritizing projects is meant to recognize that residents are invested in the physical environment in their neighborhood, and how its transportation infrastructure is used. These decisions affect their everyday lives, and their voices should be heard. However, street space is the public realm and must be managed according to the priorities of the City as a whole, as well. The below prioritization factors will be refined with public input in February 2017.

Technical Factors	Community Factors
Number of “low stress islands” that are connected to the broader low stress network	Provides low stress bicycle access to low car ownership neighborhoods
Connection to Downtown Bike Network	Provides low stress bicycle access to low-income neighborhoods
Connection to existing low stress facilities	Provides low stress bicycle access to job centers
Connection to transit facilities (bus and rail)	Provides low stress bicycle access to neighborhood-serving retail
Connection to Baltimore Bike Share stations	Supported by community residents and businesses

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