

# Protected Infrastructure 2021

## New Bike Lanes on Harvard's Campus



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# Today's Topics:

- Types of Bike Infrastructure
- New Lanes on Campus in 2021
- Routing Options
- Bike Sharing Locations



# Who are we encouraging to ride?

## Types of Bicyclists

### Interested but Concerned

Often not comfortable with bike lanes, may bike on sidewalks even if bike lanes are provided; prefer off-street or separated bicycle facilities or quiet or traffic-calmed residential roads. May not bike at all if bicycle facilities do not meet needs for perceived comfort.

### Somewhat Confident

Generally prefer more separated facilities, but are comfortable riding in bicycle lanes or on paved shoulders if need be.

### Highly Confident

Comfortable riding with traffic; will use roads without bike lanes.



Low Stress Tolerance

High Stress Tolerance

## Bicycling Comfort Level

*Tier 1*  
**Comfortable for most people**  
(including beginner bicyclists)

E.G. Shared-use Paths (Trails), neighborhood streets

*Tier 2*  
**Comfortable for many people**

E.G. Protected Bike Lanes, some buffered and conventional bike lanes, low volume roadways

*Tier 3*  
**Comfortable for some people**

E.G. buffered and conventional bike lanes, sharrows, and collector roadways

*Tier 4*  
**Comfortable for few people**

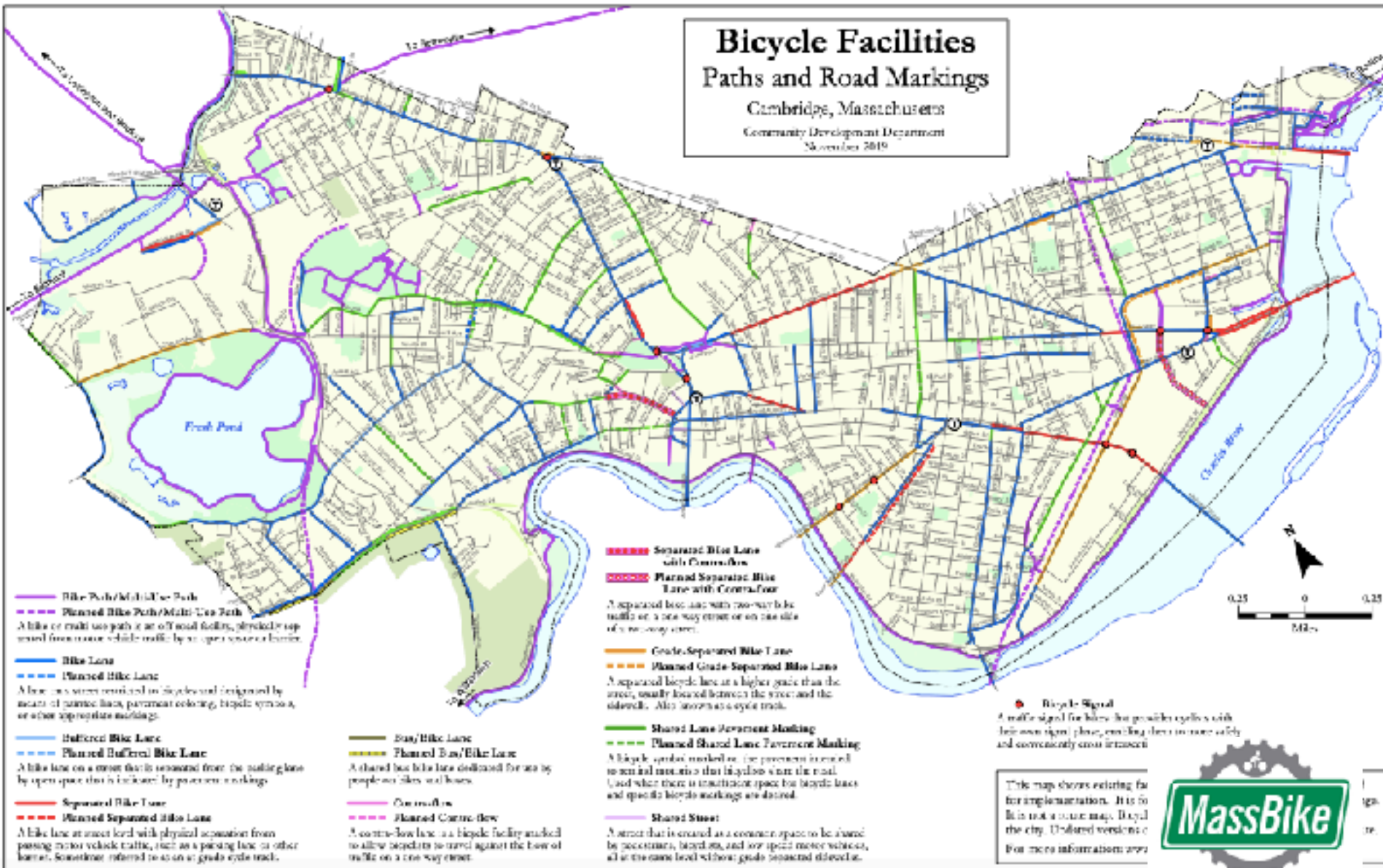
E.G. trunkline roads with no infrastructure



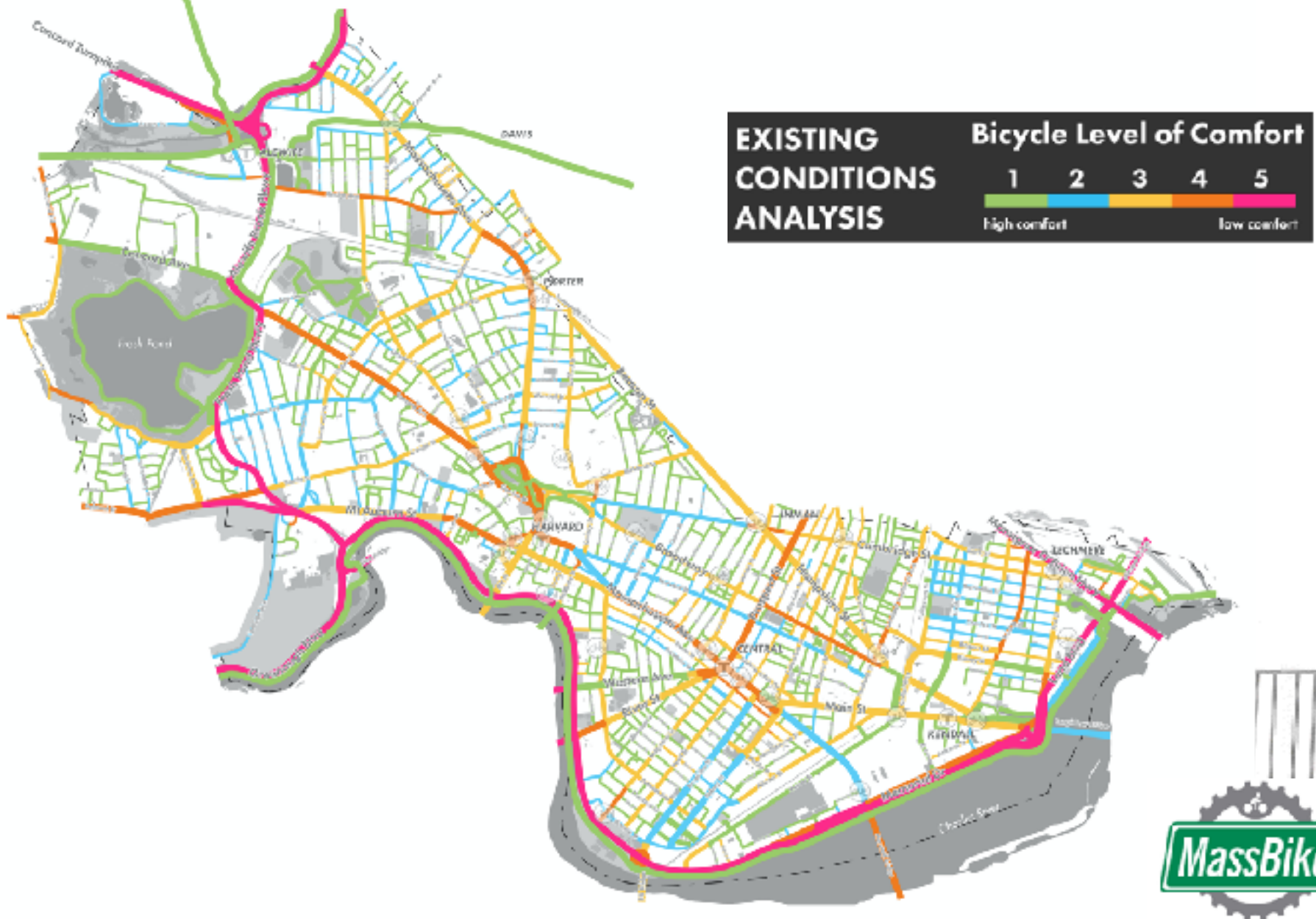
# Cambridge Bicycle Map

## Bicycle Facilities Paths and Road Markings

Cambridge, Massachusetts  
Community Development Department  
November 2019



# Cambridge Road Comfort Level

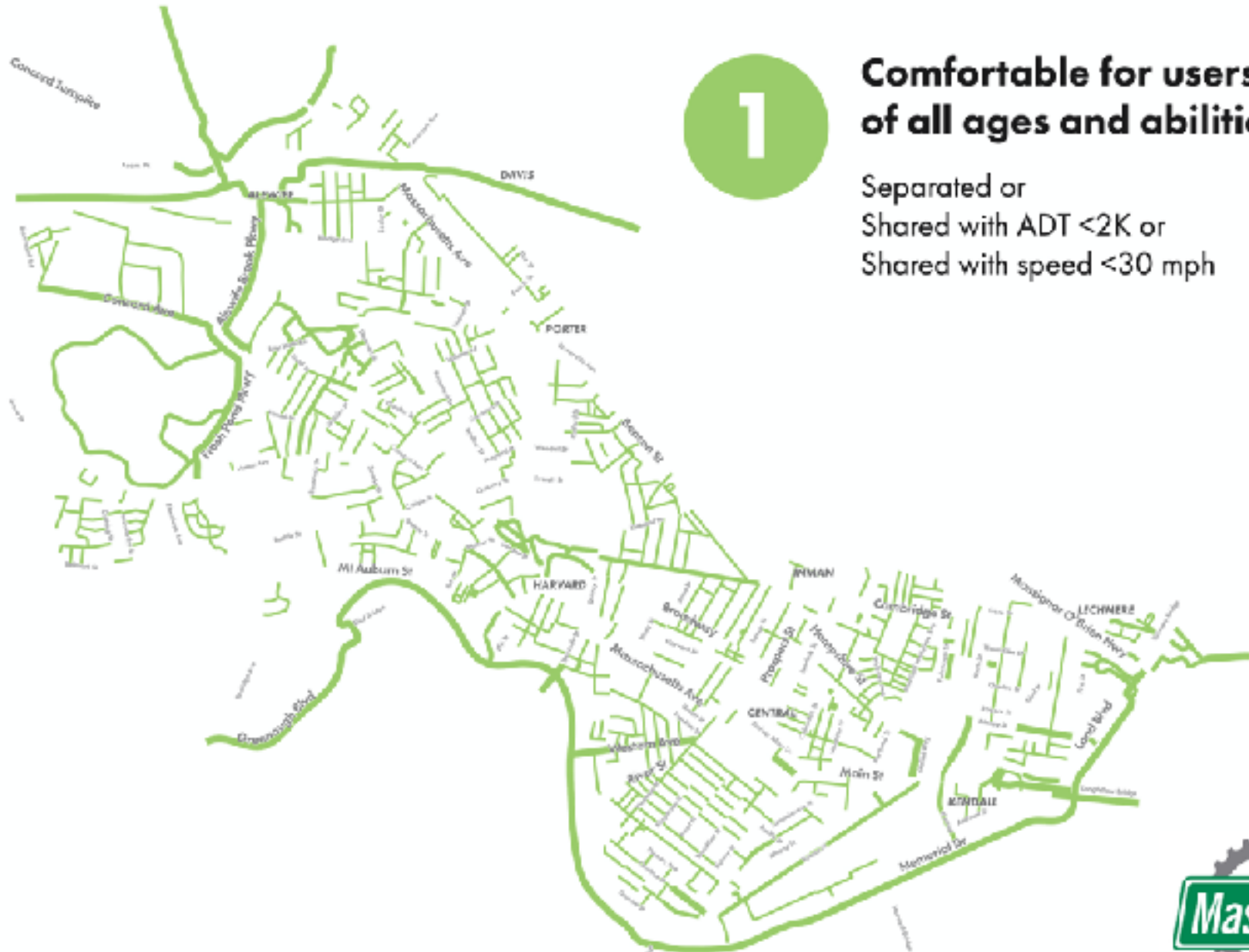


# Lower Stress Roads in Cambridge

1

**Comfortable for users  
of all ages and abilities**

Separated or  
Shared with ADT <2K or  
Shared with speed <30 mph





# Lower Stress Roads in Cambridge

2

**Comfortable for adults  
who don't often ride a  
bicycle**

Separated with mixing zones or  
Wide/Buffered Bike Lane or  
Bike Lane w/o parking adjacent or  
Shared with ADT 2-4K or  
Shared with speed <30 mph



# Area to Focus on Today





# Types of Bicycle Infrastructure

- Sharrow
- Bike Lane
- “Puffered” Bike Lane
- Parking Protected Bike Lane
- Bollard Protected Bike Lane
- Bus/Bike Lane
- Contraflow Bike Lane
- Left-Side Bike Lane
- Bicycle Signal at Intersections / Wayfinding Signs
- Box-Turn and Bike Boxes
- Lead Pedestrian Interval
- Shared Street / Slow Street / “Woonerf”
- Raised Separated Bike Lane
- Multi-Use Path



## BIKE PATHS



Kittie Knox Bike Path

## SEPARATED BIKE LANES



Main St and Third St around One Broadway



Cambridgepark Drive eastbound



Ames St from Broadway to Main St

## BIKE LANES



Gordon St westbound from Concord Ave to Huron Ave



Mass Ave westbound from Bigelow St to Lee St



Mt. Auburn St westbound from Brattle St to Belmont St



Belmont St northbound from Mt. Auburn St to Belmont Line



Cameron Ave northbound from Mass Ave to Scoville Line

## IMPROVEMENTS TO EXISTING FACILITIES



Peabody St separated bike lane



Mt. Auburn St bike lane widening, bike signal



(Little) Concord Ave centerline, shared lane markings, signage



Albany St green-backed shared lane marking



## SHARED LANE MARKINGS



Garden St eastbound from Hurler Ave to Concord Ave



Brattle St from Craigie St to Mason St



Fulkerson St from Charles St to Dinney St



Inman St from Hampshire St to Broadway



Mt Auburn St eastbound & westbound from Belmont St to Coolidge Ave

## GREEN INTERSECTION TREATMENTS



Mass Ave between Beech St and Newfane Brook Pkwy



Hampshire St @ Portland St/ Cardinal Medeiros Ave



Broadway @ Technology Square



Brattle St @ Palmer St



Mass Ave @ Harvard Square crosswalks



Brattle St @ Brattle Square/ Eliot St



JFK St @ Mt Auburn St



Mass Ave @ Shepard St, Garfield St, Roseland St, & Flagstaff Park entrance



Cambridge St @ Third St



Garden St from Concord Ave to Hurler Ave



# Sharrow



Shared Lane Markings (SLMs), or “sharrows,” are road markings used to indicate a shared lane environment for bicycles and automobiles. Among other benefits, SLMs reinforce the legitimacy of bicycle traffic on the street, recommend proper bicyclist positioning, and may be configured to offer directional and wayfinding guidance.



# Bike Lane



Bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signage. The bike lane is located adjacent to motor vehicle travel lanes and flows in the same direction as motor vehicle traffic. Bike lanes are typically on the right side of the street. Benefits include providing obvious space on the road for cyclists and sending a message to other road users to expect cyclists.



# “Puffered” Bike Lane



Buffered bike lanes are conventional bicycle lanes with a designated buffer space separating the bicycle lane from the parking lane. Benefits include reduced risk of “dooring” and greater space for cyclists to maneuver. Potential disadvantage is that motorists and delivery vehicles are more likely to illegally park in the lane.





# Parking Protected Bike Lane



Separated bike lanes are at street level and use a variety of methods for physical protection from passing traffic. A protected bike lane may use a parking lane or other barrier between the bike lane and the motor vehicle travel lane. Benefits include a reduced risk of “dooring,” preventing double-parking, reducing risks from motorists entering/existing parking spaces, and more comfortable for bicyclists of all levels and ages.



# Bollard Protected Bike Lane



Separated bike lanes are at street level and use a variety of methods for physical protection from passing traffic. A protected bike lane may use a parking lane or other barrier between the bike lane and the motor vehicle travel lane. Benefits include a reduced risk of “dooring,” preventing double-parking, reducing risks from motorists entering/existing parking spaces, and more comfortable for bicyclists of all levels and ages.



# Two-Way Separated Bike Lane



Two-way separated bike lanes allow bicycle movement in both directions on one side of the road, with a physical separation from the road. This facility dedicates and protects space for bicyclists by improving perceived comfort and safety. A two-way facility usually requires less space than two one-way facilities, and can make maintenance easier.





# Bus/Bike Lane



Bus/Bike lanes are shared lanes that are restricted for general traffic, which allow for buses to have a clear lane for quicker movement and provide a lane-width of space for bicycling. Benefits include a reduced risk of conflict with general traffic, though bus drivers must share the lane with bicyclists and bicyclists must be comfortable riding in mixed traffic.



# Contraflow Bike Lane



Contra-flow bicycle lanes are bicycle lanes designed to allow bicyclists to ride in the opposite direction of motor vehicle traffic. They convert a one-way traffic street into a two-way street: one direction for motor vehicles and bikes, and the other for bikes only. One advantage is that they can provide more direct connections for cyclists.



# Left Side Bike Lane



Left-side bike lanes are conventional bike lanes placed on the left side of one-way streets or two-way median divided streets. They are usually done where the majority of bicycle traffic is going straight or accessing streets or other connections more easily from the left side. Benefits include avoidance of potential right-side bike lane conflicts on streets, such as parking or buses.





# Bicycle Signals + Wayfinding



Bicycle signals and beacons facilitate bicyclist crossings of roadways. Bicycle signals make crossing intersections safer for bicyclists by clarifying when to enter an intersection and by restricting conflicting vehicle movements. A bicycle wayfinding system consists of signing and/or pavement markings to guide bicyclists to their destinations.



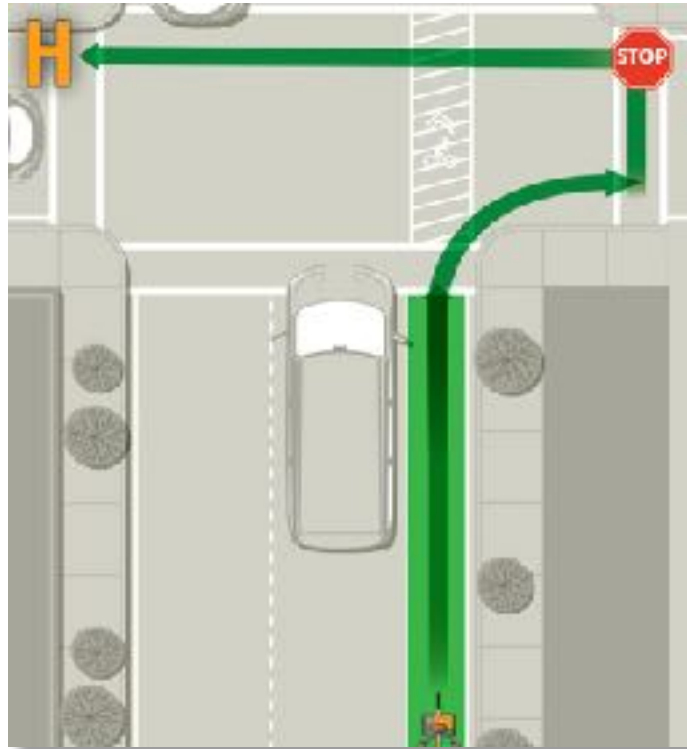
# Box Turns and Bike Boxes



A bike box is a designated area at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase. They increase visibility of bicyclists and reduce signal delay for bicyclists. Bike boxes that extend across an entire intersection can also facilitate bicyclist left turn positioning during red lights.



# Left Turn, Bike-Box





# Lead Pedestrian Interval



A Leading Pedestrian Interval (LPI) typically gives pedestrians a 3–7 second head start when entering an intersection with a corresponding green signal in the same direction of travel. LPIs enhance the visibility of pedestrians in the intersection and reinforce their right-of-way over turning vehicles, especially in locations with a history of conflict.



# Shared Street



A shared street in this meaning is one where there is no curbed delineation between the roadway and the sidewalk and all users share the space. Vehicle volumes are either low or discouraged. The concept is also known as a “woonerf” (a Dutch term loosely translated to “living street”).



# Raised Separated Path



Raised cycle tracks are bicycle facilities that are vertically separated from motor vehicle traffic. Many are paired with a furnishing zone between the cycle track and motor vehicle travel lane and/or pedestrian area. Benefits include that motorists are kept from easily entering and it is more attractive to a wider range of bicyclists at all levels and ages than less separated facilities.





# Multi-Use Path



A shared-use path is defined as a trail permitting more than one type of user. Paths function as transportation facilities as well as recreational facilities. A shared-use path is physically separated from motor vehicular traffic by open space or a barrier. In dense urban areas such as Cambridge, the width of the path should be 14' (plus 2' shoulders).



# Area to Focus on Today



# Western Ave





# Western Ave Connector



# Mass Ave in Hvd Sq



# Mt. Auburn Street Corridor





# Mt. Auburn Street Corridor



# Mt. Auburn Street Corridor





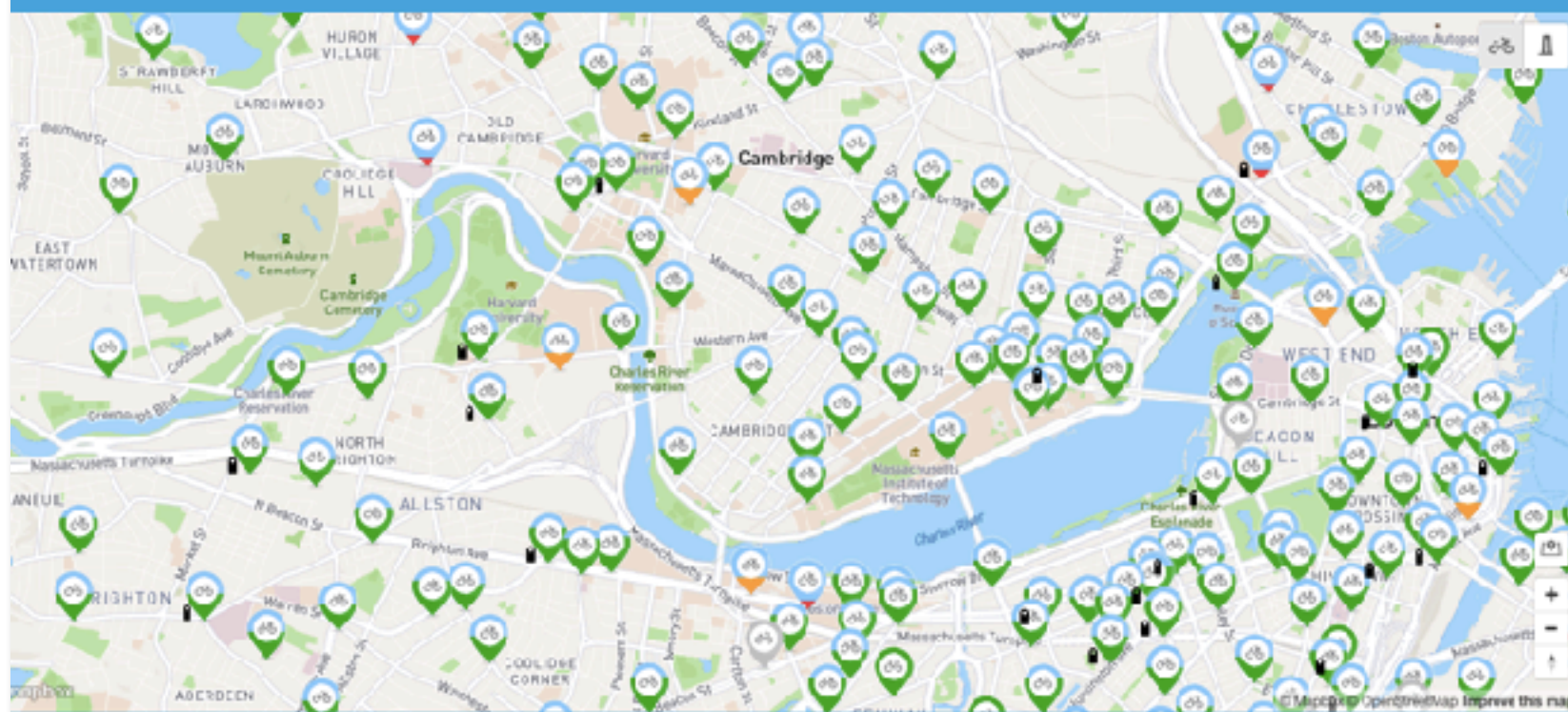
# Mt. Auburn Street Corridor





Find a station on

[Suggest station](#)



## Meet the Bikes

The Bluebikes bicycles were designed for easy riding in an urban environment. They were built to be comfortable for any type of rider, regardless of height or riding ability.



# But Remember....

- “Life is like riding a bicycle. To keep your balance, you must keep moving.”  
– Albert Einstein



# Questions?

Stay in touch

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