

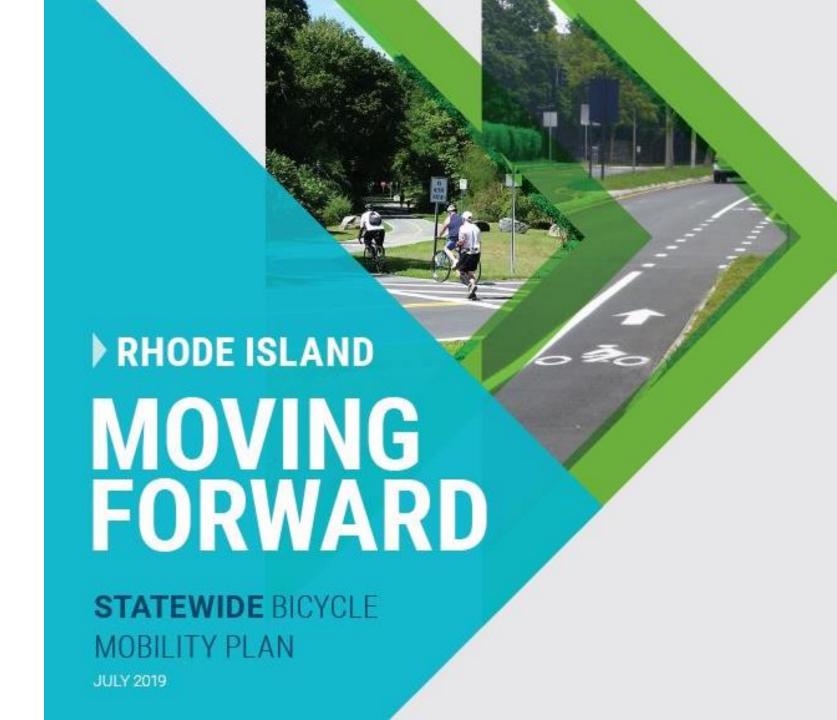
Bicycle Mobility Plan www.PlanRl.com

Transportation Advisory
Committee

October 24, 2019

## Changes since the last iteration

- Project Development Section added (DOT process)
- Section added on Bicycle Path Safety
- Consulted with towns and cities
- Section added on Bicycle Path Bridge Maintenance & Preservation
- Prioritization methodology reviewed
   more weight added to Safety
- Added section on signed bicycle routes highlighting a RIDOT study and effectiveness of signage
- Added mode e-bike legislation
- Guidelines for year round use and maintenance of bike paths



## Vision (what hasn't changed)

Riding a bicycle will be safe, fun, and practical in the Ocean State.

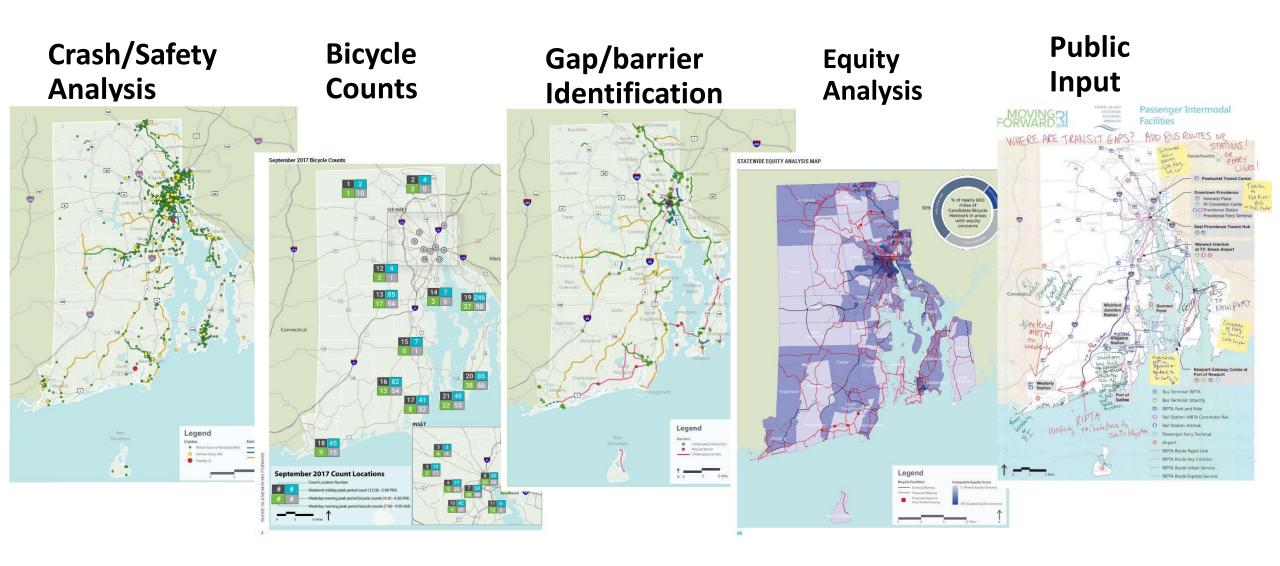
Rhode Island will be the most bikeable state in New England.

Bicycle transportation will be fully integrated into the State's and municipalities' policies, programs, and improvement projects, creating a network of paths and streets that safely connect our cities, towns, villages, and other destinations.

Bicycle projects will be designed to encourage people of all ages and abilities to choose to ride a bike for both transportation and recreation.



### Comprehensive Planning & Analysis



# Prioritization and Informed decision-making

Key corridor identified in each municipality

### **Candidate Corridor Criteria**

### IMPROVED SAFETY



MAX: 25 POINTS

Number of bus stops, ferry stations, Amtrak stations, and existing/funded bicycle lanes and paths within a 1/2-mile radius of the proposed project.

### UTILITY



MAX: 15 POINTS

Number of jobs, K-12 students, college students, grocery stores, and commercial land within a 1/2-mile radius of the proposed project.

### POTENTIAL TO ADDRESS BICYCLING HAZARDS



MAX: 15 POINTS

Number of bicycle-involved crashes and public comments about bicycling hazards within a 1/4-mile radius of the proposed project.

### **READINESS**

COMMUNITY SUPPORT

### ECONOMIC DEVELOPMENT



MAX: 5 POINTS

Number of activity centers within a 1/2-mile radius of the proposed project.

### HEALTH



MAX: 10 POINTS

Percent of residents reporting poor health within a 1/2-mile radius of the proposed project.

### DENSITY



MAX: 20 POINTS

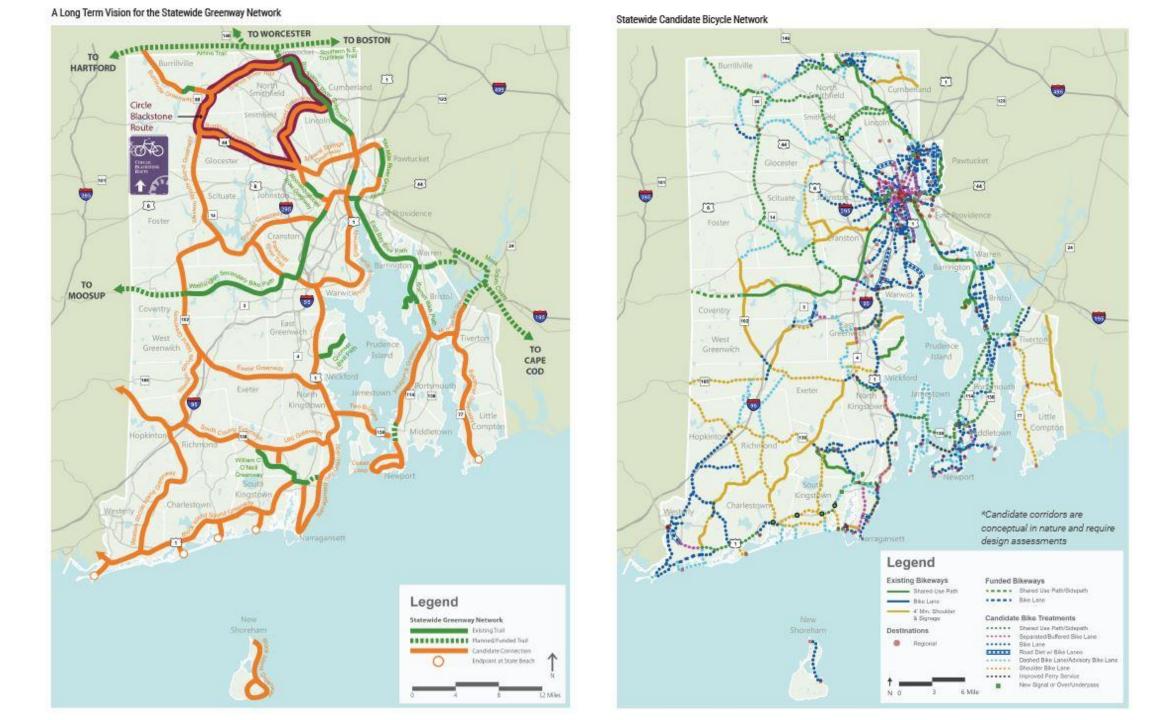
Number of Rhode Island residents per acre within a 1/2-mile radius of the proposed project.

### EQUITY



MAX: 10 POINTS

Equity score within a 1/2-mile radius of the proposed project (see Section 3.1.2 for more information).



### BMP Detailed Recommendations

- New policies and policy reforms
- Additional laws promoting bicycling and bicycle safety
- RIDOT Design Guidelines
- Education and Encouragement Programs
- Candidate corridors
- Candidate treatments



**GOAL 1** 

CONNECT AND EXPAND THE STATE'S BICYCLING NETWORK



GOAL 2

INTEGRATE BICYCLING WITH TRANSIT



GOAL 3

DEVELOP STRONGER STATEWIDE BICYCLING POLICIES



GOAL 4

PROMOTE EQUITY IN BICYCLE PLANNING AND FUNDING



GOAL 5

SAFETY WITH POLICIES AND PROGRAMS\*\*



GOAL 6

LEVERAGE BICYCLING TO PROMOTE ECONOMIC DEVELOPMENT



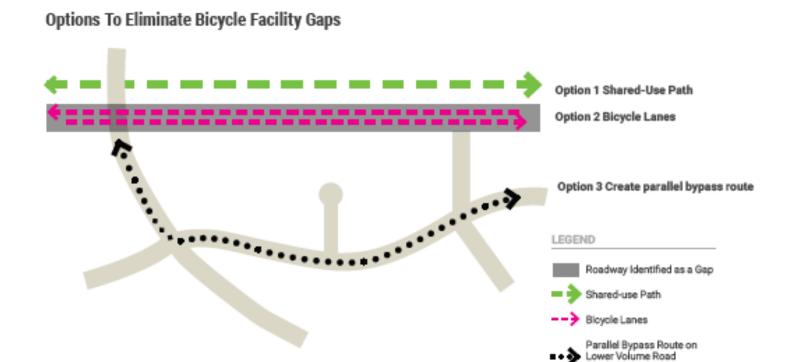
GOAL 7

IMPROVE PUBLIC HEALTH THROUGH BICYCLING



**GOAL 8** 

PROMOTE BICYCLE
TRANSPORTATION
FOR STATE OF
RHODE ISLAND
EMPLOYEES AND
VISITORS



## Toolkit for Candidate Bicycle Treatments Template to guide municipal development

### Template to guide municipal development

Toolkit of Candidate Bicycle Treatments

### SHARED BUS-BIKE I ANE

Along bus corridors with significant demand for bicycle travel, a shared bus-bike lane should be considered if a lack of roadway space precludes a bike lane. The bus-bike lane is typically 12' wide and can include colored asphalt treatment to emphasize exclusive use for buses and bicycles only. Ideally, the bus-bike lane would run along a curb to avoid encroachment from motorists seeking curbside parking. Bus drivers should also receive training from the local transit agency in order to improve interactions between the two user groups.



### **BI-DIRECTIONAL BIKE ACCESS ON ONE-WAY** STREET

Along one-way residential streets with low traffic volumes, bi-directional bicycle access should be considered to enhance network connectivity. "Except Bicycles" plaques should be added to "Do Not Enter" signs at intersecting streets and, if space allows, short stretches of bicycle contraflow lanes could be added to reinforce the opportunity for two-way bicycle travel. Elsewhere, shared lane markings should be included to remind motorists that bicycles may be traveling in both directions.



### BIKE BOULEVARD

Cities and towns throughout the state could designate a group of neighborhood streets as a Bicycle Boulevard. The ultimate desired goal is to create a low-stress bicycle route by reducing traffic volume and/or speed. Traffic calming elements that slow and divert through traffic provide a more comfortable and safer environment for a wider variety of bicyclists. A Bicycle Boulevard utilizes a range of context-sensitive bicycle improvements for streets that are typically residential with low traffic volumes/speeds and run parallel to a busier roadway.

### HORIZONTAL + VERTICAL DEFLECTION

Horizontal traffic calming devices cause drivers to slow down by constricting the roadway space or by requiring careful maneuvering. Speed humps can also be used to slow traffic, especially when paired with a crosswalk.



MUTCD R4-11, Bikes May Use Full Lane signs can help encourage motorists to defer to bicyclists on low volume streets









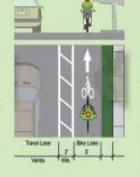


## Template to guide municipal development

Toolkit of Candidate Bicycle Treatments

### BUFFERED BICYCLE LANE (More comfortable)

Buffered bicycle lanes are conventional bicycle lanes paired with a striped buffer space separating the bicycle lane from the adjacent travel lane and/ or adjacent parking lane. The buffers provide an enhanced visual separation from passing traffic and/or protection from the opening of car doors in the adjacent motor vehicle parking aisle. Buffers are especially critical on roadways with a high volume of truck traffic or in business districts with high parking turnover.





### STREET-LEVEL SEPARATED BICYCLE LANE (More comfortable)

These bikeways are at street-level and use a variety of methods for physical separation from passing traffic. A striped buffer plus a motor vehicle parking aisle, flexible delineator posts, or other vertical elements provide the physical separation from motor vehicle traffic. A separated bicycle lane treatment is one of the best ways to create an "all ages and abilities" bicycling environment on busy streets.





### STREET-LEVEL BI-DIRECTIONAL SEPARATED BICYCLE LANE/CYCLE TRACK

(More comfortable)

These bicycle facilities are physically separated and allow two-way travel for bicyclists on one side of the street. Additional design considerations at driveway and side-street crossings are required to reduce conflicts. Bi-directional separated bicycle lanes work best on one-way roads and/or roads with long blocks and few curb cuts and also on roads with destinations mostly on one side of the street.





### SIDEWALK-LEVEL SEPARATED BICYCLE LANE

(Very comfortable)

Raised separated bicycle lanes are vertically separated from street-level travel lanes by a curb with an adjacent grass strip, landscaped buffer, or furniture zone. At intersections, the raised bicycle lane can either be dropped down to the street level or paired with a raised crosswalk.





## Template to guide municipal development

Toolkit of Candidate Bicycle Treatments

### (Most comfortable)

Whereas shared-use paths run within former rail corridors, along rivers, and through parks, sidepaths are located adjacent to and parallel with a roadway. Sidepaths can offer a high-quality experience for users of all ages and abilities compared to on-road facilities in heavy traffic environments. While more expensive than on-street bikeways, shared-use paths and sidepaths can help promote bicycle tourism and economic development. Additional design considerations at driveways and side street crossings are also needed for sidepaths to address conflicts.





### BICYCLES IN ROUNDABOUTS

At single lane roundabouts it is important to indicate to motorists, bicyclists, and pedestrians the right-of-way rules and the correct way for them to circulate, using appropriately-designed signage, pavement markings, and geometric design elements. For single lane roundabouts with low vehicle speeds, bicyclists can be accommodated with either shared lane markings or a transition to an off-street path. An off-street path can be a sidewalk that has been widened to handle bicycle and pedestrian traffic.



### CONTRA-FLOW BICYCLE LANE

Contra-flow bicycle lanes allow for two-way bicycle movements along one-way streets. In order to distinguish the different directions of travel, a double yellow line or yellow hatched area must be included between the minimum 5'-wide bike lane and the travel lane. Also, depending on the roadway width, volume and speed, the contra-flow lane can be paired with either a bike lane, shared lane or advisory bike lane in the opposite direction.



### BICYCLE CLIMBING LANE

In order to accommodate bicycles on sloped streets without space for bike lanes on both sides, a climbing lane should be striped in the uphill direction. The climbing lane provides space for slow-moving riders going uphill to have dedicated space and allow vehicles to pass. Typically, the



### Template to guide municipal development

Toolkit of Candidate Bicycle Treatments

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### Chokers



### Raised Crossing



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### **VOLUME REDUCTION STRATEGIES**

Maintaining motor vehicle volumes below 3,000 per day (1,000-1,500 is ideal) greatly improves bicyclists' comfort. To manage volume, physical or operational measures can be implemented on routes that have been identified as a bicycle boulevard.

### Traffic Restriction Signage



The most straight forward traffic volume reduction strategies are changing flow from two-way to oneway, implementing time-of-day turning restrictions, or considering truck/commercial vehicle restrictions.

### Median Traffic Diverters



Median traffic diverters restrict through motor vehicle movement while providing a refuge for bicyclists to cross the busier roadway in two stages.

### INTERSECTION IMPROVEMENTS\*

Striping bicycle facilities at or through intersections can provide a more comfortable bicycling environment by providing bicyclists with guidance on where to wait for a signal to change or a well-marked route through the intersection to a continuation of the bikeway. By establishing a clear boundary, intersection lane markings effectively mark the paths of travel for through bicyclists and turning bicyclists, as well as through and turning motor vehicles. The use of green colored pavement raises awareness for all road users to potential conflict areas.

### Bike Box



A bike box places riders in a designated area ahead of queuing traffic during the red signal phase, also helping to reduce right-hook conflicts.

### Two-Stage Turn Box



For bicyclists uncomfortable sharing lanes with turning traffic, a two-stage turn boxes offers a more comfortable left-turn option.

### Bicycle Signal



Bicycle signals facilitate bicyclist crossings of roadways by clarifying when to enter and by restricting other movements during the bicycle phase.

\*Potential treatments shown here have received Interim Approval from FHWA

### Roadway Resurfacing







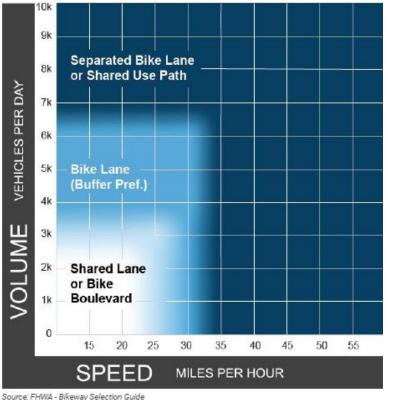


**Bridge & Pavement Asset** Maintenance

### **Traffic** Safety **Planning**

### Preferred Bikeway Type for Urban, Urban Core, Suburban and Rural Areas

(Assumes operating speeds are similar to posted speeds. Advisory bike lanes may be an option where traffic volume is under 3,000 ADT.)



### THE SIX BICYCLE PROGRAM E'S

Implementation

Evaluation

Monitoring efforts to increase active transportation and planning for the

Education



Equipping people with the knowledge and confidence to bicycle in Rhode Island

Enforcement



Building safe and responsible behaviors on the road and building respect among all of Rhode Island's Users

Encouragement



Fostering a culture that supports and encourages active transportation to school, work, and recreational destinations

Engineering



Creating safe, connected, and comfortable places for bicycling



Bringing bicycle facilities and programs to a diverse mix of communities

Municipal level bicycle plans and design