



## **APPENDIX**

### **Technical Memorandum 2: Needs & Opportunities**

#### Bicycle Lane Alternatives

Separated Bike Lanes via Broadway to Kingston Point Rail Trail (Option A)

Separated Bike Lanes via Jansen Avenue to Kingston Point Rail Trail (Option B)

Dedicated Bike Lanes from Liberty Street to Kingston Point Rail Trail (Option A)

Dedicated Bike Lanes from Trail Hub to Kingston Point Rail Trail (Option B)

#### Decision-making Matrices

Urban Streetscape Improvement from Pittsfield, MA



**Building a Better  
Broadway**

Broadway Corridor Conceptual Design Plan, Kingston, NY

**Bicycle Lane Alternatives**



1

Elmendorf Street

Downs Street

8' wide, parking lane  
 10' wide, NB travel lane  
 5' wide, bike lane  
 4' wide painted/median divider  
 8' wide, parking lane

14' wide, SB shared bike/travel lane  
 11' wide, NB travel lane  
 7' wide, parking lane

8' wide parking lane  
 5' wide Bike Lane  
 12' wide parking lane  
 10' wide turn lane  
 12' wide parking lane  
 5' wide Bike Lane  
 8' wide parking lane

7' wide, parking lane  
 10' wide, SB travel lane  
 12' wide, NB shared travel/  
 bike lane

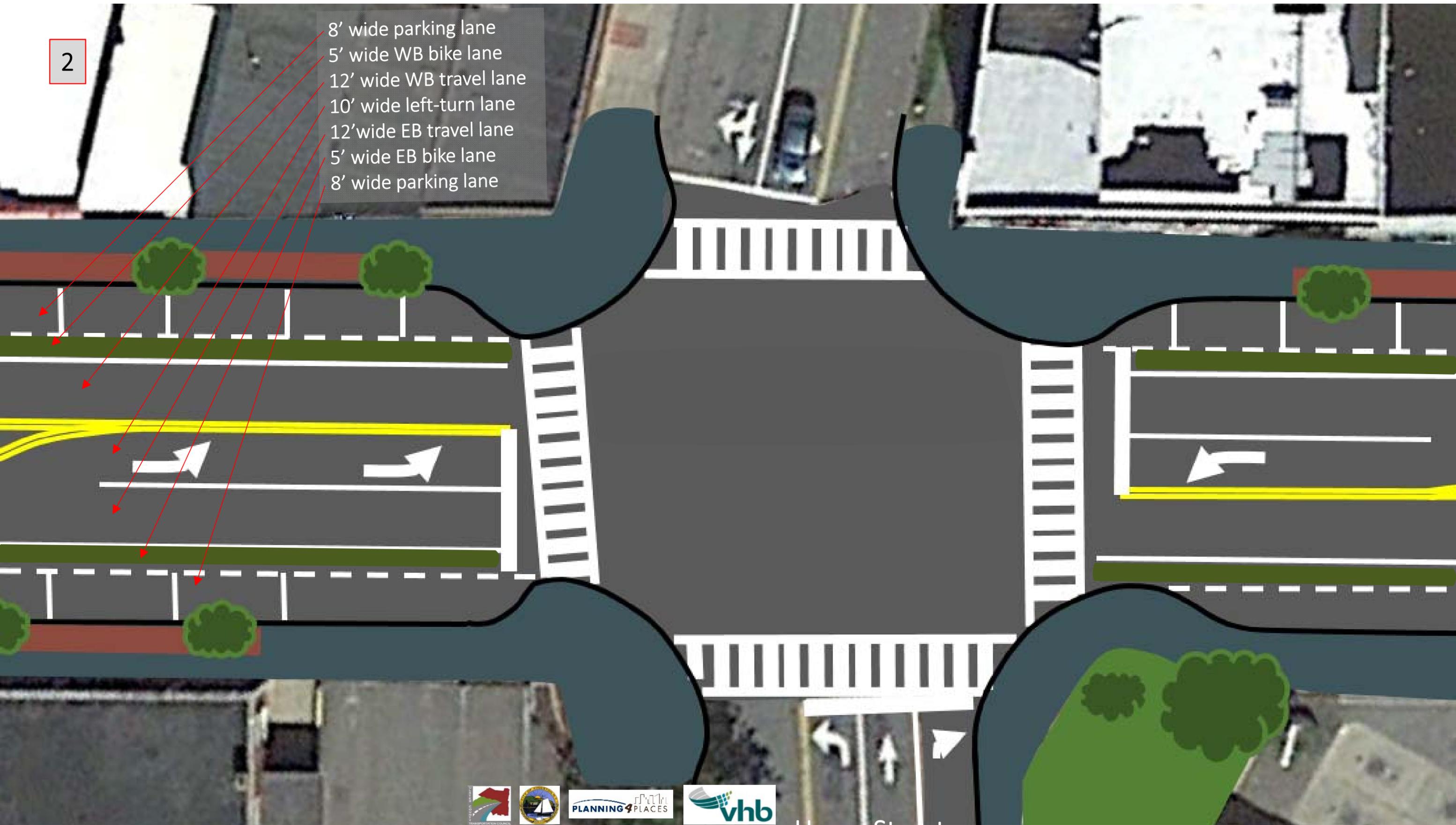
7' wide, parking lane  
 10' wide, SB travel lane  
 5' wide, SB bike lane

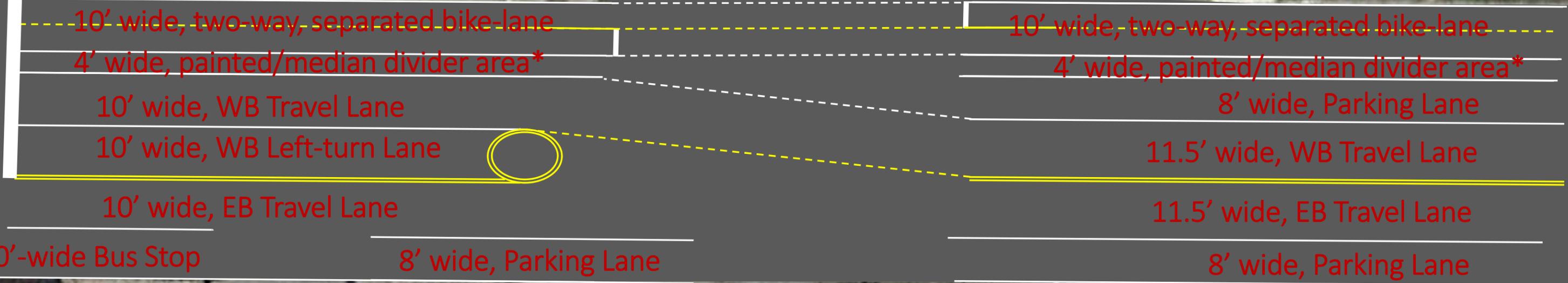
Liberty Street

Franklin Street

2

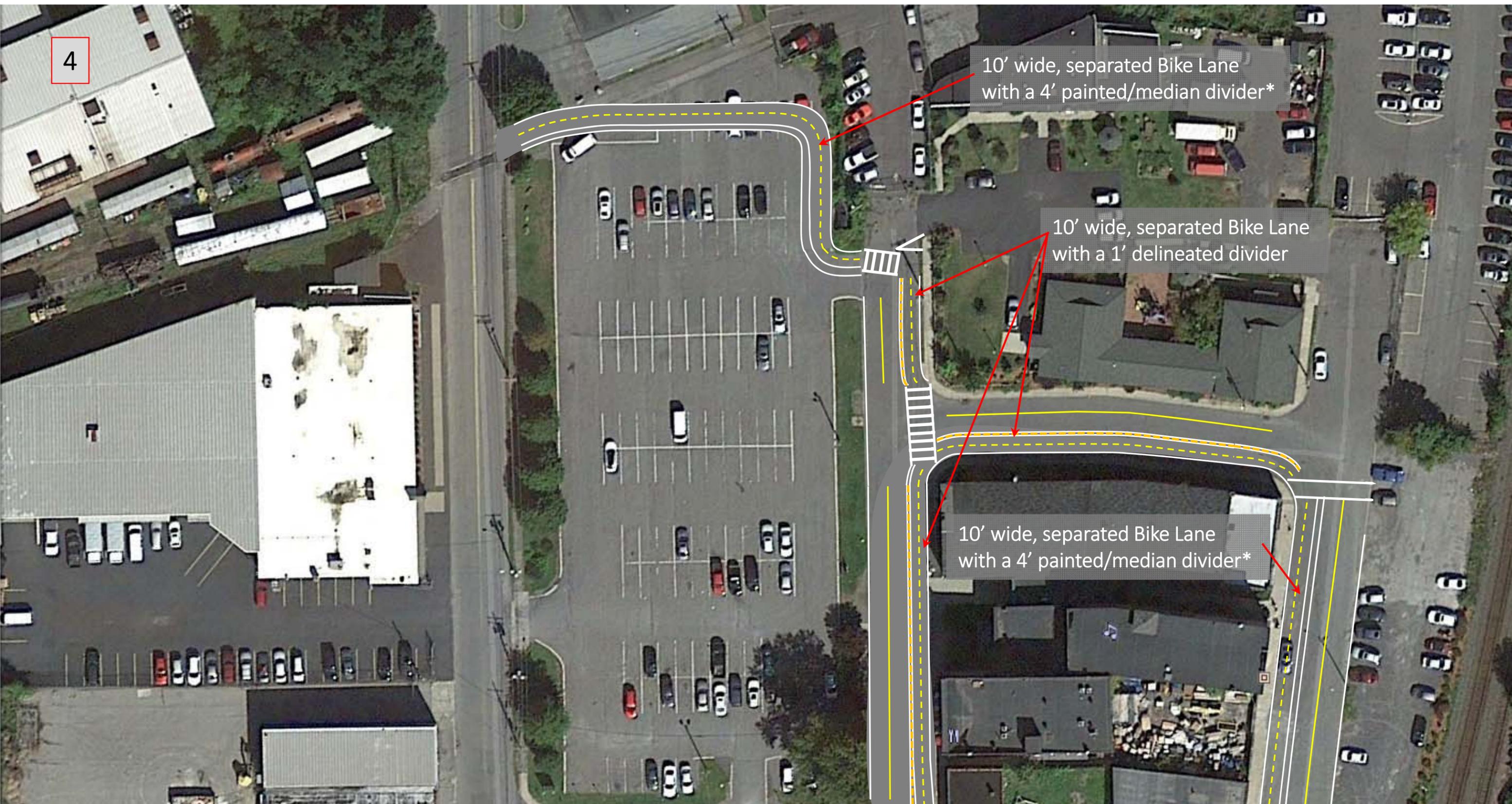
- 8' wide parking lane
- 5' wide WB bike lane
- 12' wide WB travel lane
- 10' wide left-turn lane
- 12' wide EB travel lane
- 5' wide EB bike lane
- 8' wide parking lane





\*Median Divider will raise winter maintenance liability issues

4



10' wide, separated Bike Lane with a 4' painted/median divider\*

10' wide, separated Bike Lane with a 1' delineated divider

10' wide, separated Bike Lane with a 4' painted/median divider\*

\*Median Divider will raise winter maintenance liability issues

5

11' NB travel lane  
 11' SB travel lane  
 4' painted/median divider  
 10' 2-way bike lane  
 7' Existing Sidewalk

Railroad Ave

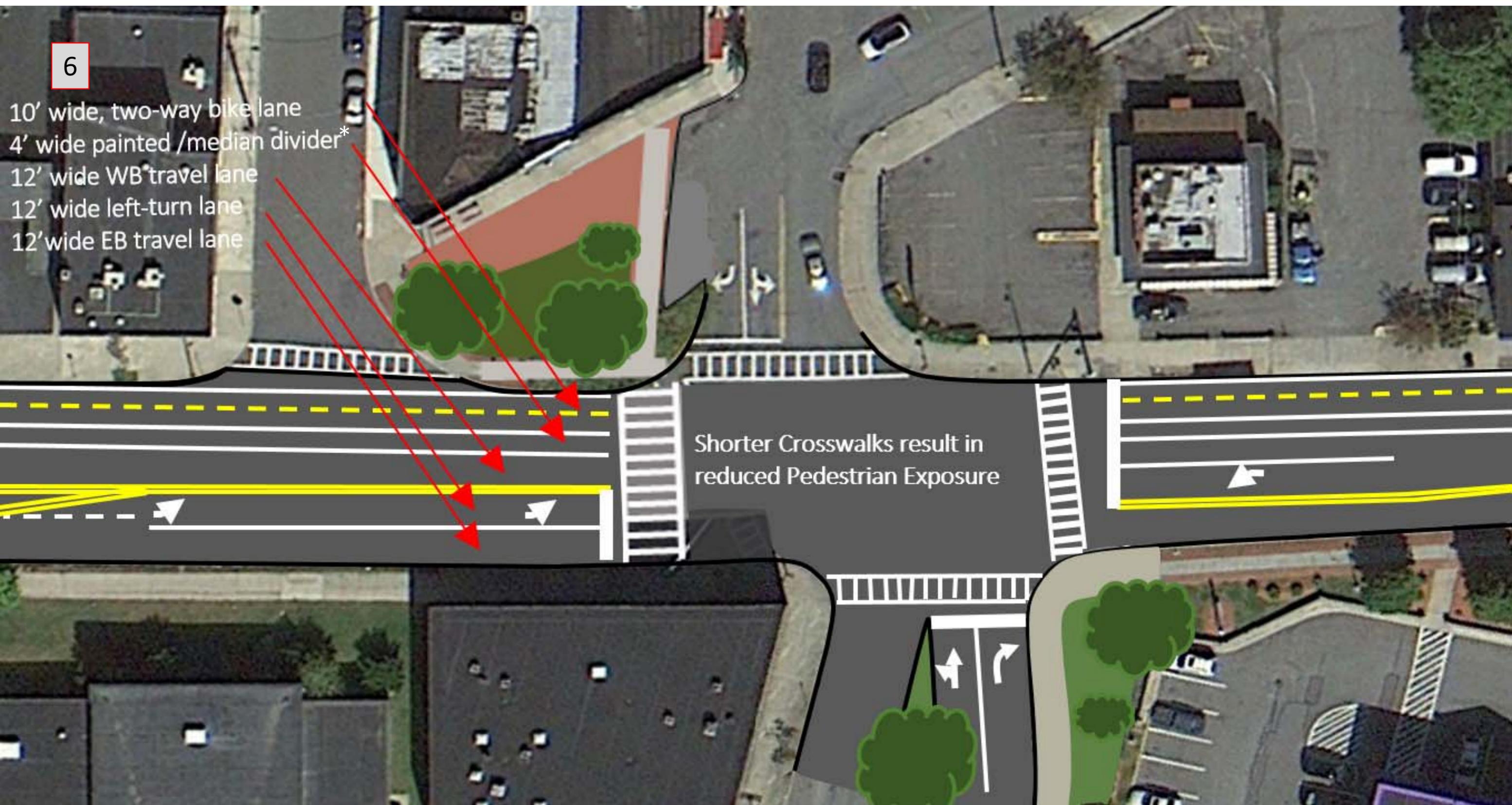
10' NB travel lane  
 10' SB travel lane  
 1' boxbeam divider  
 10' 2-way bike lane  
 5' Sidewalk

10' NB travel lane  
 10' SB travel lane  
 10' 2-way bike lane  
 8' Existing Sidewalk & Verge

1' Boxbeam div

6

- 10' wide, two-way bike lane
- 4' wide painted /median divider\*
- 12' wide WB travel lane
- 12' wide left-turn lane
- 12' wide EB travel lane

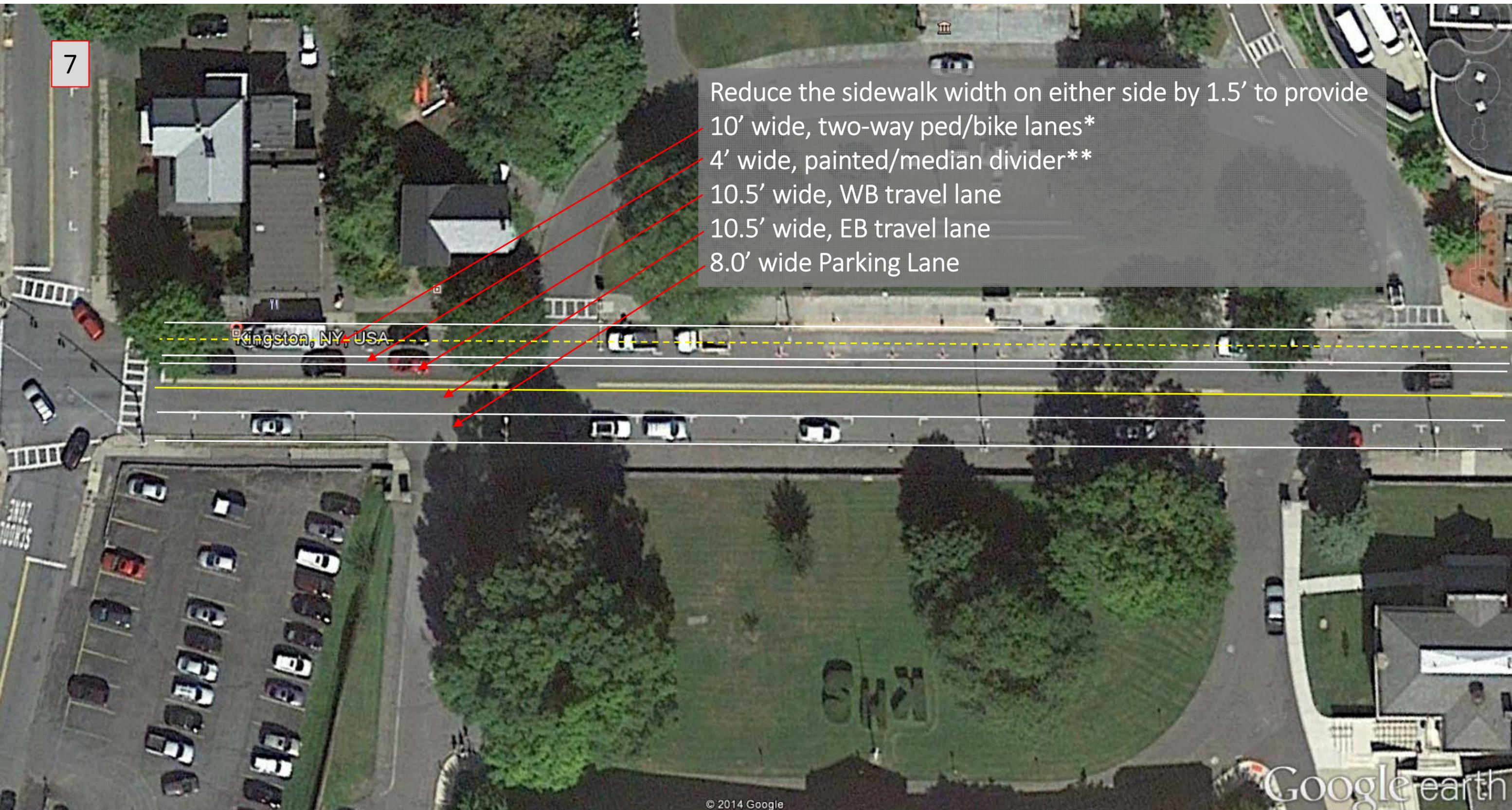


Shorter Crosswalks result in reduced Pedestrian Exposure

\*Median Divider will raise winter maintenance liability issues

7

Reduce the sidewalk width on either side by 1.5' to provide  
10' wide, two-way ped/bike lanes\*  
4' wide, painted/median divider\*\*  
10.5' wide, WB travel lane  
10.5' wide, EB travel lane  
8.0' wide Parking Lane



Kingston, NY, USA

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Google earth

\*Significant investment in utility relocation

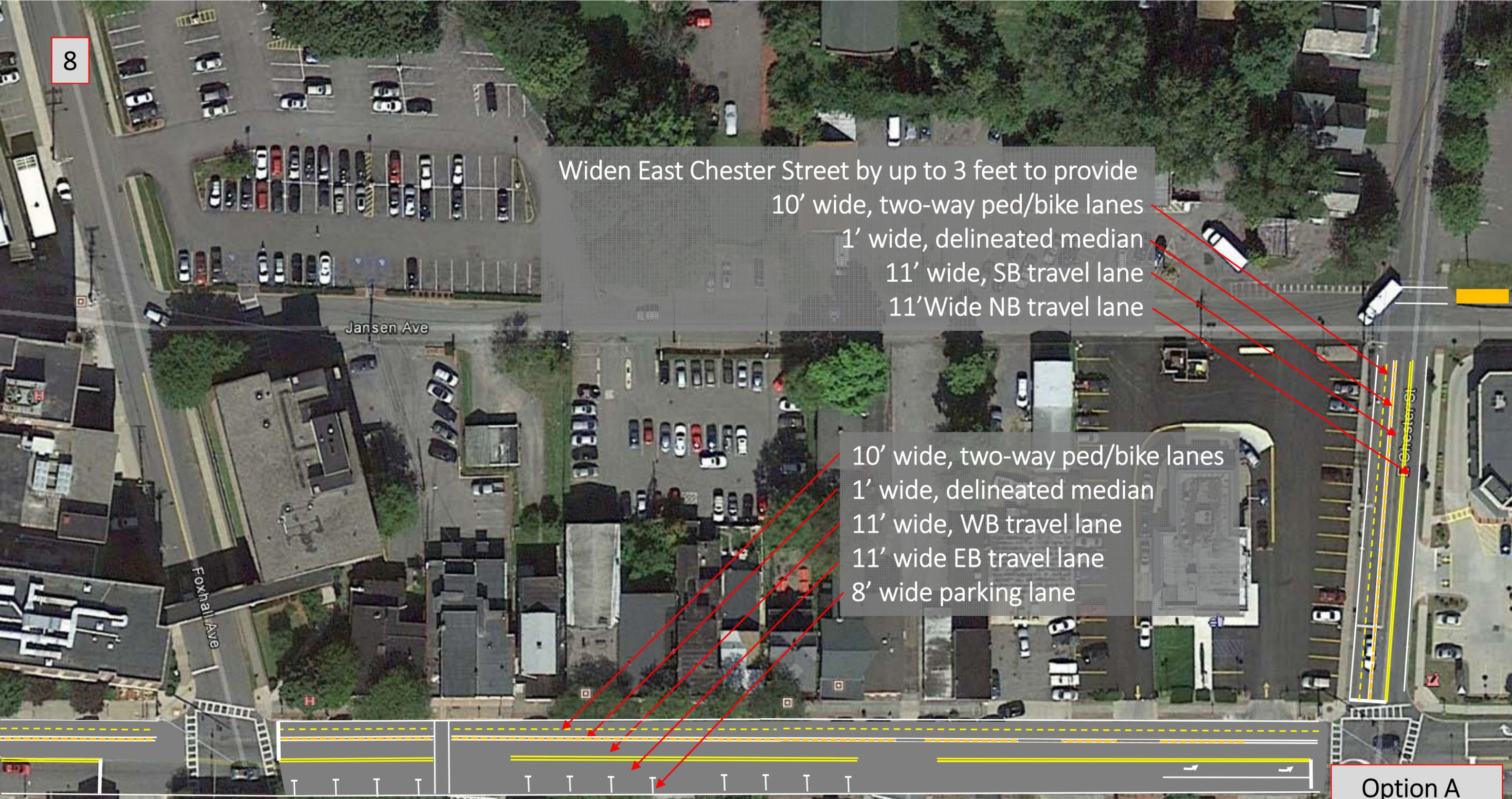


\*\*Median Divider will raise winter maintenance liability issues

Widen East Chester Street by up to 3 feet to provide  
 10' wide, two-way ped/bike lanes  
 1' wide, delineated median  
 11' wide, SB travel lane  
 11' Wide NB travel lane

10' wide, two-way ped/bike lanes  
 1' wide, delineated median  
 11' wide, WB travel lane  
 11' wide EB travel lane  
 8' wide parking lane

Option A





9

Trip Diversions  
(approximately 80 vph per direction)  
Removed  
Added

Widen Jansen Avenue by 3 feet to provide  
10' wide, two-way ped/bike lanes  
3' wide, painted/median divider\*  
10' wide, one-way WB travel lane

10' wide, two-way ped/bike lanes  
4' wide, painted/median divider\*  
16' wide, one-way SB travel lane

Option B

\*Median Divider will raise winter maintenance liability issues



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Imagery Date: 9/19/2013 41°55'32.51" N 73°59'34.09" W elev 191 ft



1

Elmendorf Street

Downs Street

8' wide, parking lane  
 10' wide, NB travel lane  
 5' wide, bike lane  
 4' wide painted/median divider  
 8' wide, parking lane

14' wide, SB shared bike/travel lane  
 11' wide, NB travel lane  
 7' wide, parking lane

8' wide parking lane  
 5' wide Bike Lane  
 12' wide WB Travel Lane lane  
 10' wide turn lane  
 12' wide EB Travel Lane lane  
 5' wide Bike Lane  
 8' wide parking lane

7' wide, parking lane  
 10' wide, SB travel lane  
 12' wide, NB shared travel/  
 bike lane

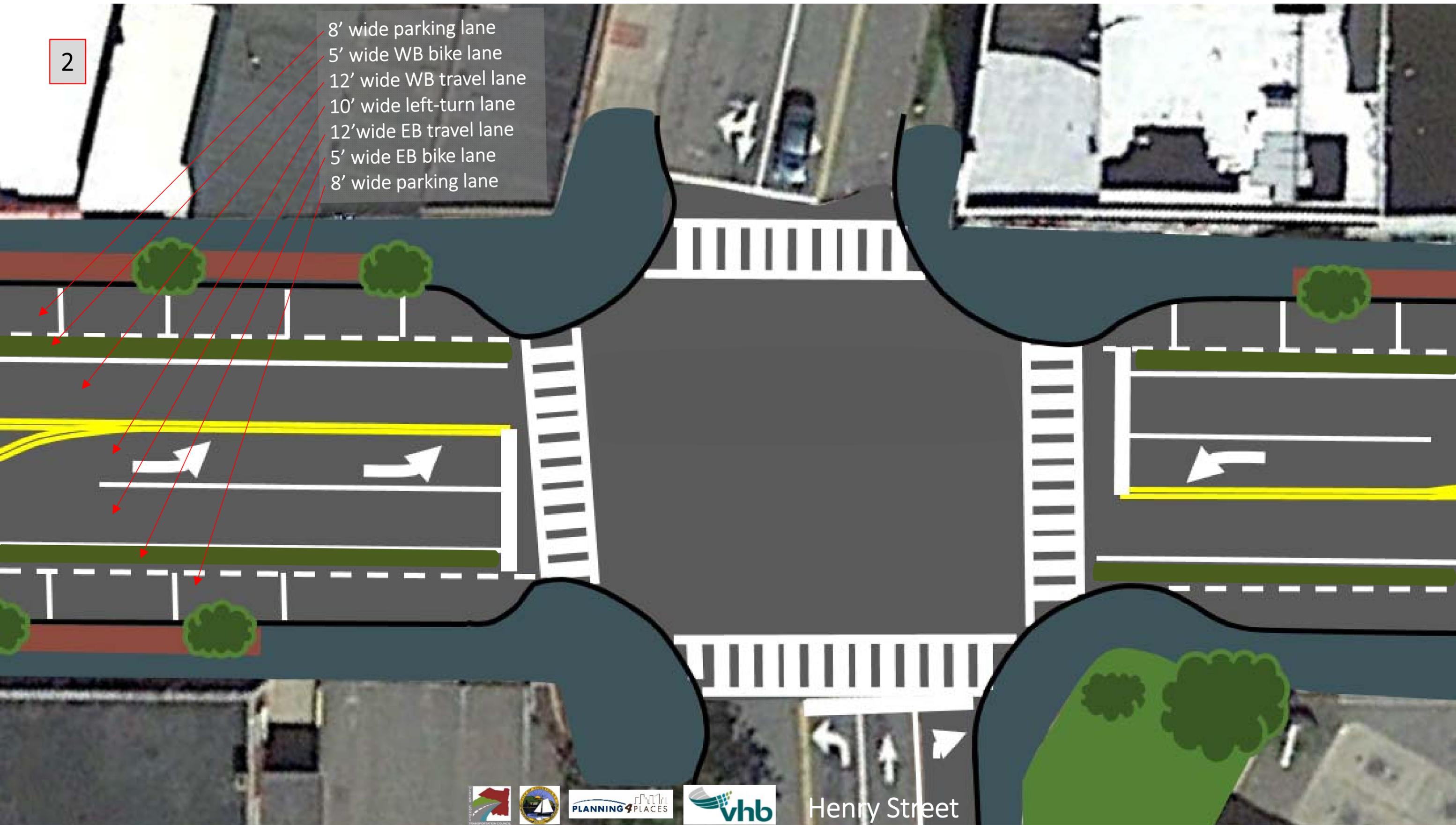
7' wide, parking lane  
 10' wide, SB travel lane  
 5' wide, SB bike lane

Liberty Street

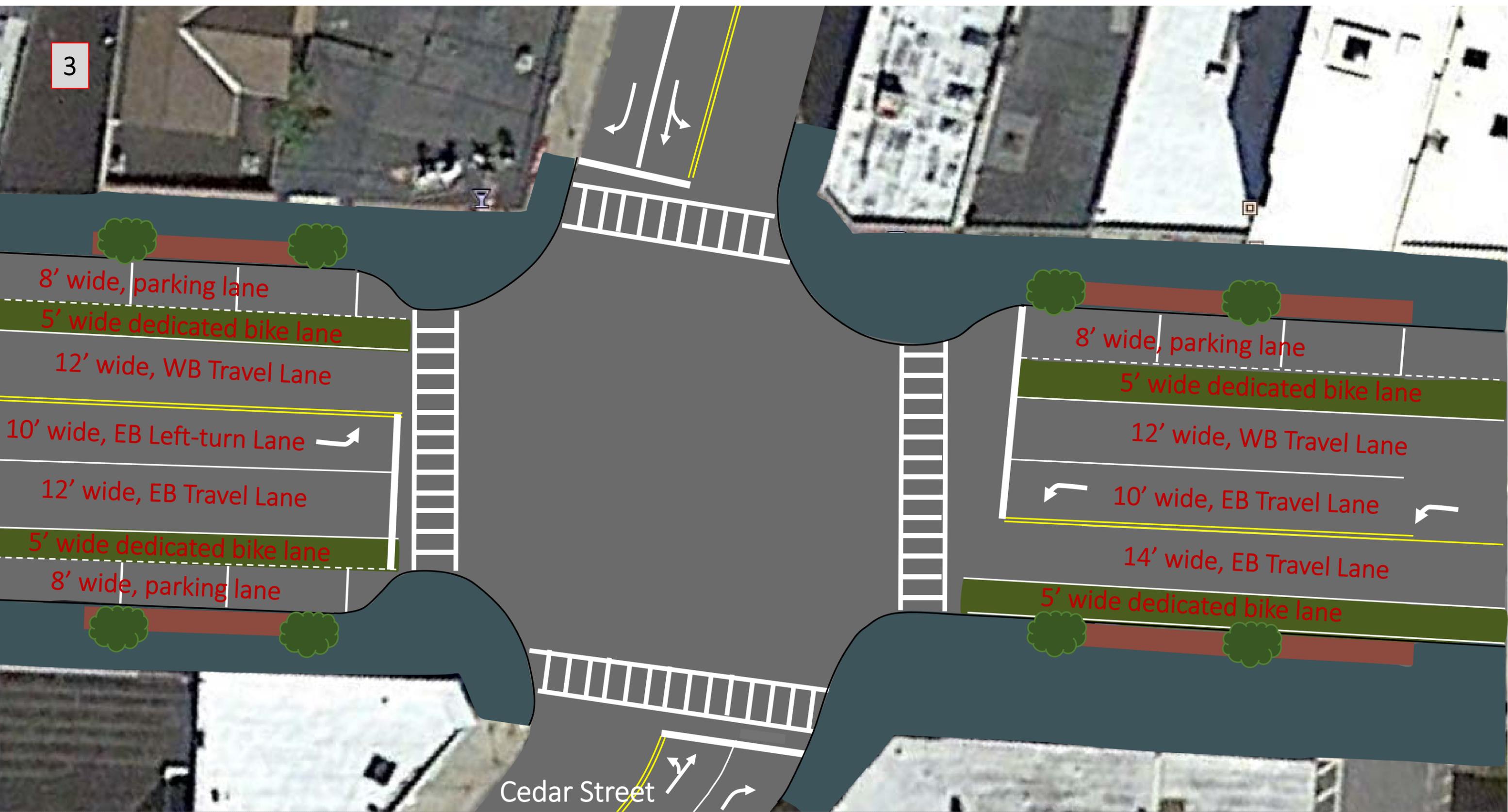
Franklin Street

2

- 8' wide parking lane
- 5' wide WB bike lane
- 12' wide WB travel lane
- 10' wide left-turn lane
- 12' wide EB travel lane
- 5' wide EB bike lane
- 8' wide parking lane



3



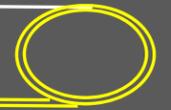


8' wide, Parking Lane

5' wide, Bike Lane

12' wide, WB Travel Lane

10' wide, WB Left-turn Lane



14' wide, EB Travel Lane

5' wide, Bike lane

8' wide, Parking Lane

5' wide, bike lane

12' wide, WB Travel Lane

4' wide, painted median

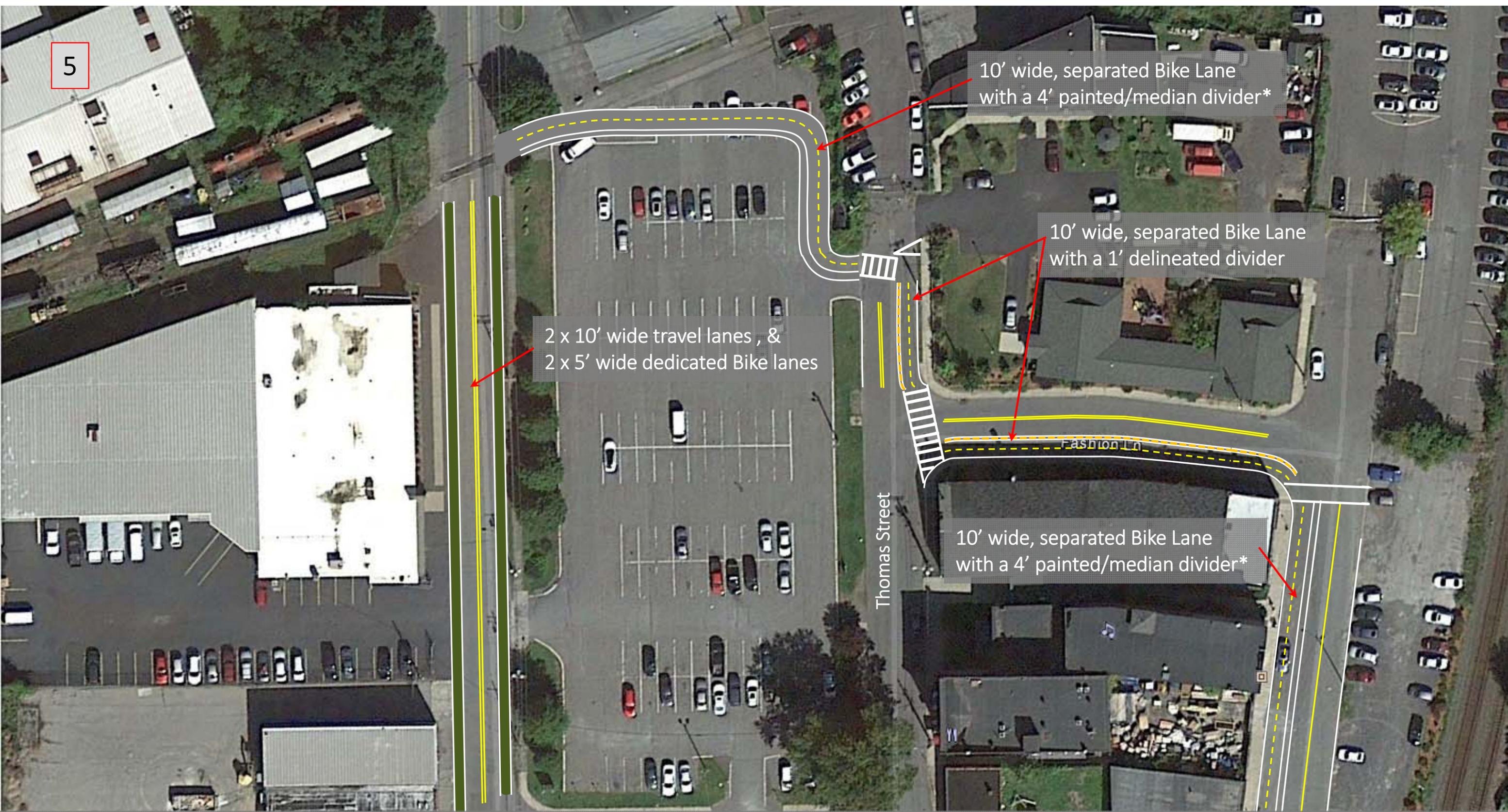
12' wide, EB Travel Lane

5' wide, bike lane

8' wide, Parking Lane



5



10' wide, separated Bike Lane with a 4' painted/median divider\*

10' wide, separated Bike Lane with a 1' delineated divider

2 x 10' wide travel lanes, & 2 x 5' wide dedicated Bike lanes

10' wide, separated Bike Lane with a 4' painted/median divider\*

Thomas Street

Fashion Ln

\* Median Divider will raise winter maintenance liability issues

6

11' NB travel lane  
 11' SB travel lane  
 4' painted/median divider  
 10' 2-way bike lane  
 7' Existing Sidewalk

Railroad/Greenkill Avenue

10' NB travel lane  
 10' SB travel lane  
 4' painted/median divider  
 10' 2-way bike lane  
 5' Sidewalk

10' NB travel lane  
 10' SB travel lane  
 4' painted/median divider  
 10' 2-way bike lane  
 8' Existing Sidewalk & Verge

7

5' wide dedicated WB Bike lane  
10' wide WB through lane  
5' wide EB dedicated Bike Lane

10' wide EB Left-turn lane  
10' wide EB through lane  
10' wide EB right-turn lane

Prohibit Parking on either side to provide  
2 x 15' wide Travel lanes with Sharrows  
2 x 10' wide SB lanes with Sharrows  
1 x 16' wide NB Lane with Sharrows

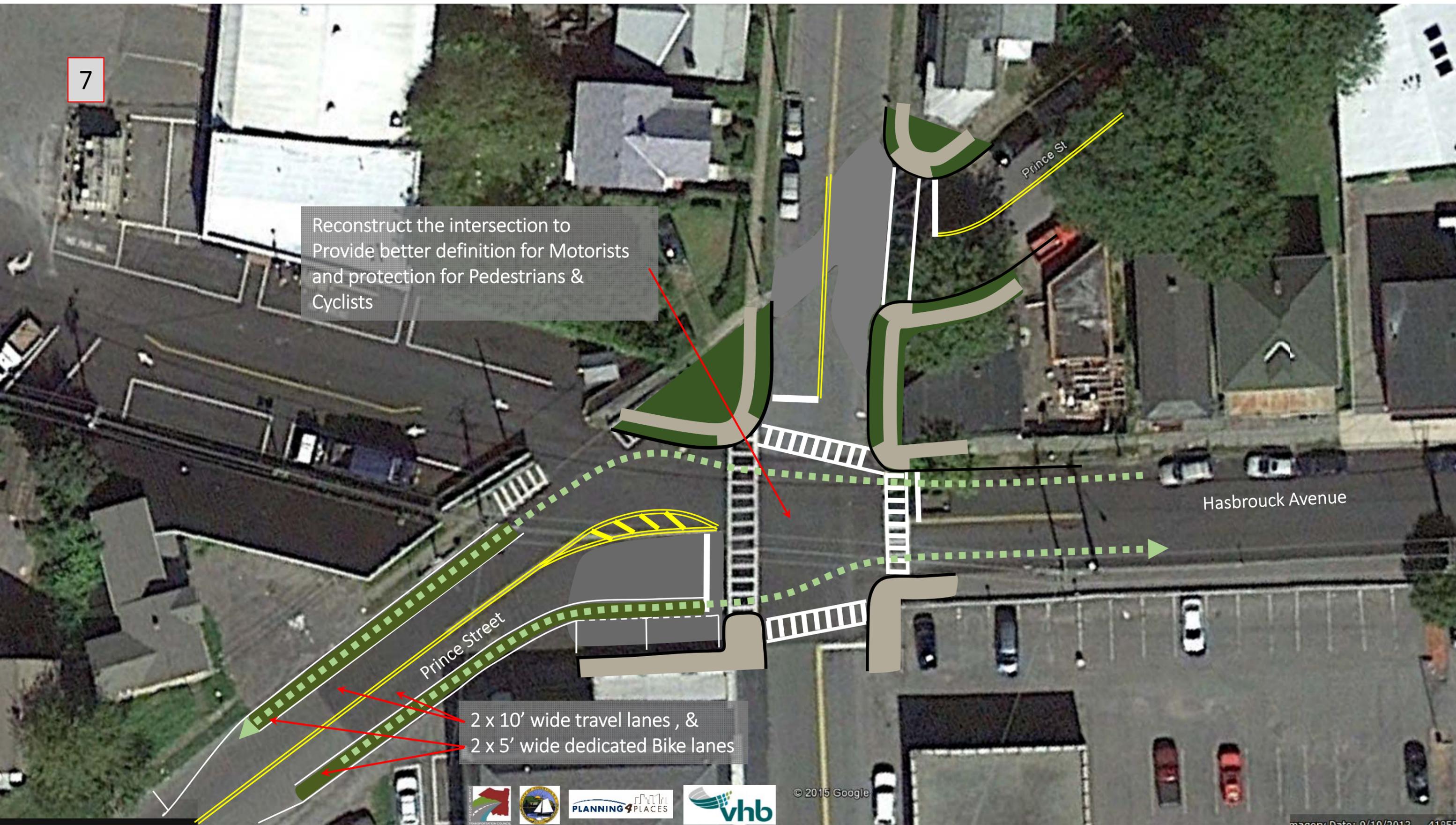
Grand Street

Prince Street

7

Reconstruct the intersection to Provide better definition for Motorists and protection for Pedestrians & Cyclists

2 x 10' wide travel lanes , & 2 x 5' wide dedicated Bike lanes

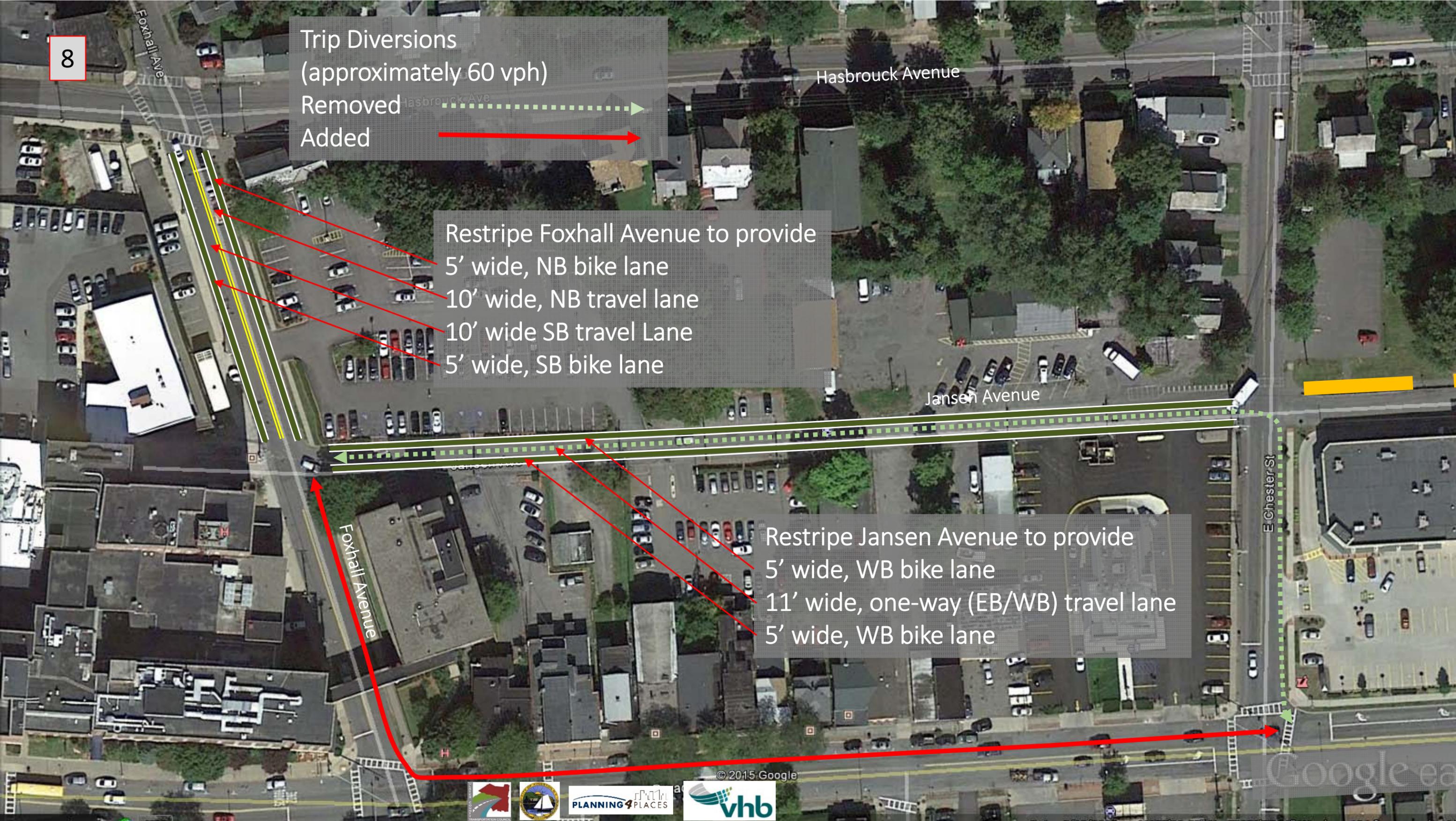


8

Trip Diversions  
(approximately 60 vph)  
Removed   
Added 

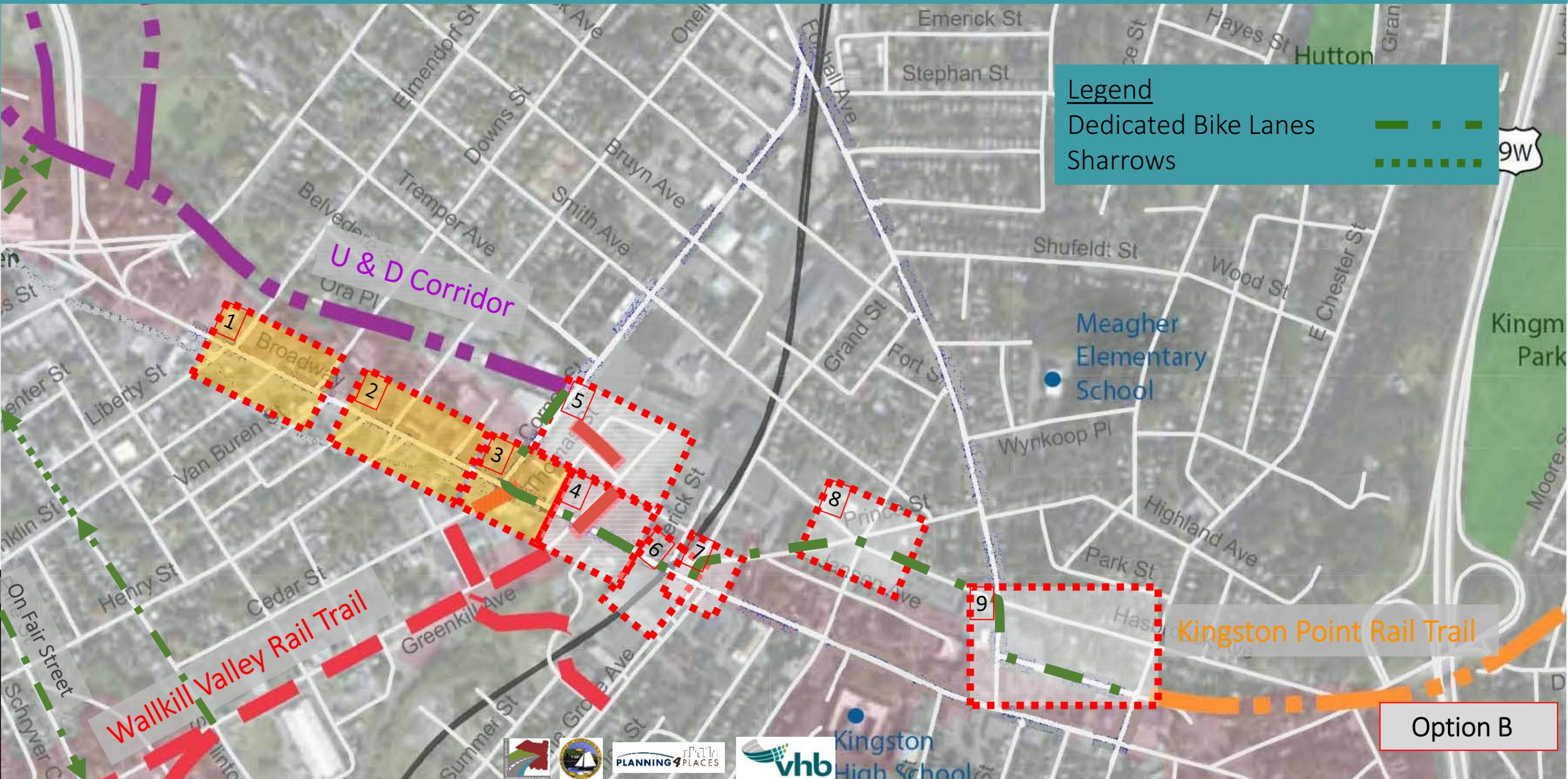
Restripe Foxhall Avenue to provide  
5' wide, NB bike lane  
10' wide, NB travel lane  
10' wide, SB travel lane  
5' wide, SB bike lane

Restripe Jansen Avenue to provide  
5' wide, WB bike lane  
11' wide, one-way (EB/WB) travel lane  
5' wide, WB bike lane



# Dedicated Bike Lane Connecting Trails

With bike lanes and sharrows to the Stockade



1

Elmendorf Street

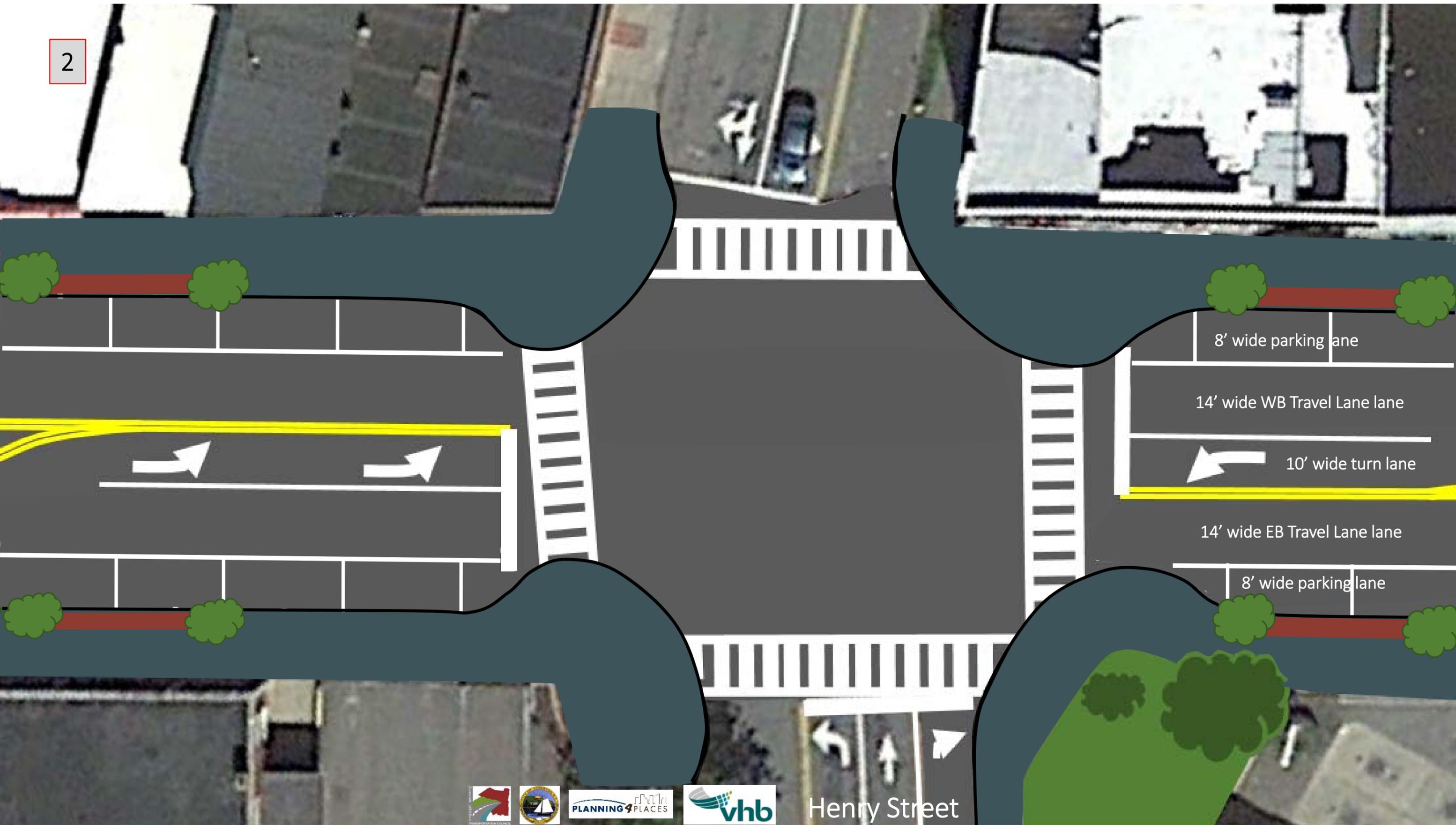
Downs Street

Liberty Street

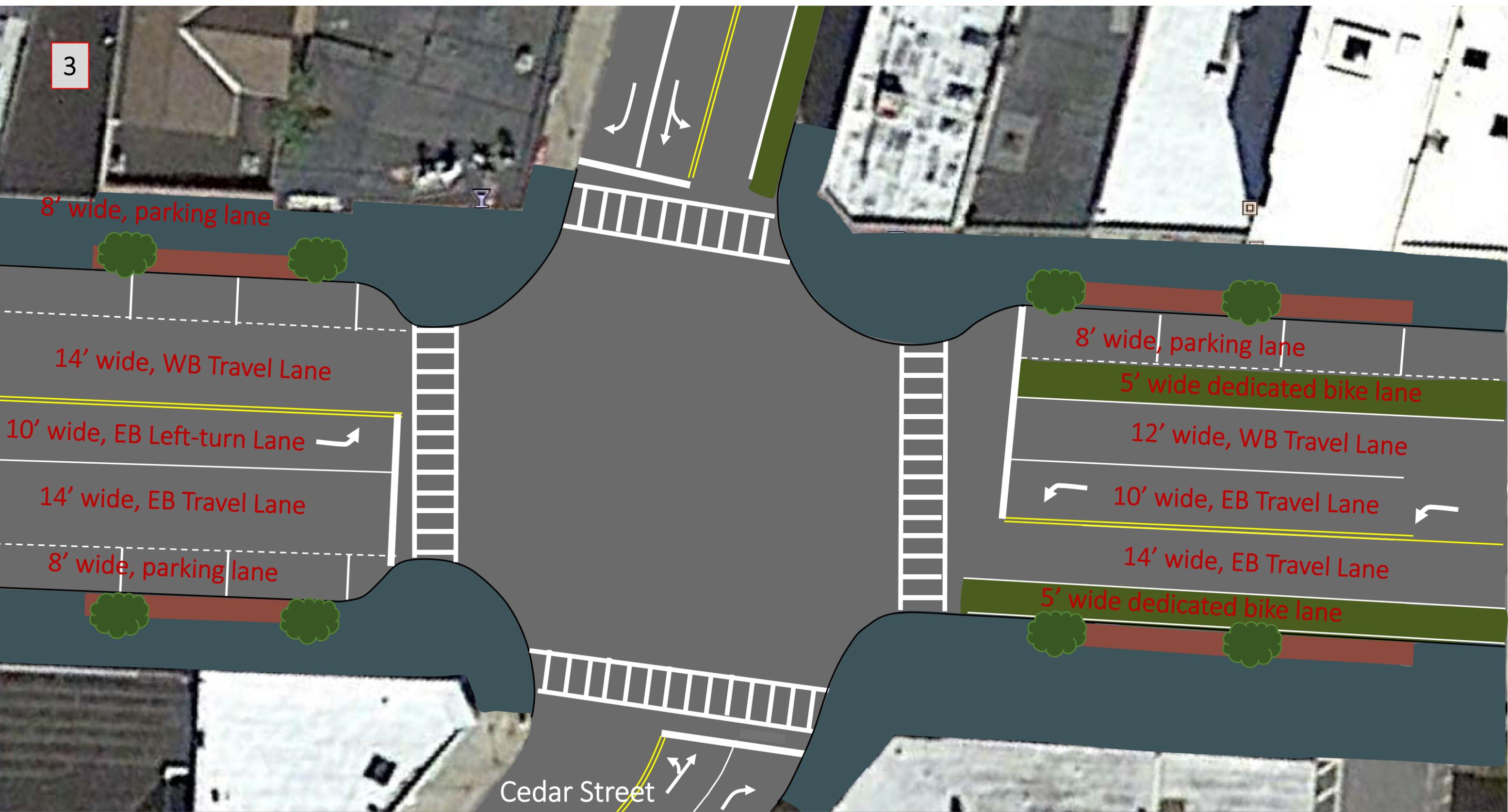
Franklin Street

8' wide parking lane  
14' wide WB Travel Lane lane  
10' wide turn lane  
14' wide EB Travel Lane lane  
8' wide parking lane

2



3





**Building a Better  
Broadway**

Broadway Corridor Conceptual Design Plan, Kingston, NY

Decision-making Matrices

City of Kingston Broadway Corridor Conceptual Design Plan  
 Framework for Decision Making & Priority Setting  
 Streetscaping Matrix

Estimated Cost  
(Million)

No.	Contemplated Element	Objective Advanced (See 1, 2 or 3 below)	How Objective is Advanced	Critical/Cumulative	Priority (Top, High, Low)
1	Provide healthy, viable street trees along the corridor	all	Inventory existing street trees; provide replacement of dead or dying trees, provide tree grates and suitable growing conditions	Cumulative	high priority
2	Provide unified street lighting in appropriate locations to improve safety and aesthetics	all	Inventory existing street lights, provide consistent lighting for safety, aesthetics, minimize glare.	Cumulative	high priority
3	Provide bus shelters at heavily used stops, and consistent street furniture/signage at bus stops	2	Design and install consistent bus shelters (to be coordinated with other streetscape improvements, complete streets improvements and zoning)	Cumulative	low priority
4	Improve pavement and hardscape surface quality and aesthetics	all	Perform inventory of poor pavement/sidewalk conditions and recommend consistent materials (to be coordinated with pedestrian safety improvements and zoning)	Critical/Cumulative	top priority
5	Provide benches, bike racks, waste receptacles, planters and bollards for aesthetics and safety	2	Design and install consistent benches, bike racks and street furniture (to be coordinated with complete streets improvements and zoning, as well as with municipal functions such as snow removal)	Cumulative	high priority
6	Provide way finding signage for safety, aesthetics and to unify the corridor and its image within the City	all	Inventory and analyze potential locations for signage, design and install signs to be consistent with other streetscape improvements and to represent an historic or unified theme for the corridor.	Cumulative	low priority (still desirable)
7					
8					
9					
10					
11					
12					
13					
14					
15					

0.09

0.77

0.3

1.50

0.29

0.01

2.96 Total

Objectives:

- (1) to improve mobility, accessibility, and safety for pedestrians, bicyclists, and motorists along and adjacent to the corridor
- (2) be consistent with complete streets concepts and community goals/expectations
- (3) be developed in conjunction with and supplemental to the current efforts to update the City's Comprehensive Plan

City of Kingston Broadway Corridor Conceptual Design Plan  
 Framework for Decision Making & Priority Setting  
 Traffic Operations and Parking Matrix

Estimated Cost  
(Million)

No.	Contemplated Element	Objective Advanced (See 1, 2 or 3 below)	How Objective is Advanced	Critical/Cumulative	Priority (Top, High, Low)
1	Optimize Existing Traffic Signal Timings	1,2	Perform a traffic signal timing and clearance interval study at each signalized intersection. Improves safety and increases capacity.	Cumulative	High priority because of vehicular safety issues, and potential to provide increased pedestrian crossing times
2	Traffic calming to slow speeds	1,2	Traffic calming treatments, such as curb bumpouts treatments, to improve safety by reducing speeds	Critical	High priority because of pedestrian safety issues
3	Traffic signal coordination and optimization to provide signal coordination and reduce rear-end crashes	1,2	Perform a Traffic Signal Optimization Study. Provides additional capacity to accommodate a revitalized Broadway consistent with the Comprehensive Plan. Reduces wait times, fuel consumption, emissions.	Critical	Top priority for community goals
4	Traffic signal coordination and optimization with elimination of signal at Elmendorf Street	1,2	Perform a Traffic Signal Optimization Study. Provides additional capacity to accommodate a revitalized Broadway consistent with the Comprehensive Plan. Reduces wait times, fuel consumption, emissions.	Critical	Top priority for community goals
5	Investigate additional turning lanes to reduce overtaking crashes (Road Diet)	1,2	Perform traffic studies of the effects of restriping Broadway. Reduces overtaking accident, reduces speeds.	Cumulative	High priority because of vehicle safety
6	Rethink parking regulations, fares and strategies to encourage parking on adjacent blocks	1,3	Perform a comprehensive parking study. Optimizes parking resources to serve a reinvigorated/redeveloped Broadway.	Cumulative	Low priority because it does not affect mobility or safety, but may be a high priority for community goals
7	Bus route and service enhancements	1,2,3	Perform bus operations and planning studies to determine ridership increases resulting from changes in routes and service merger with UCAT	Cumulative	High priority because of community goals/expectations plus the need for improved transit on complete streets
8	Separated Bike lanes, Option A	1, 2, 3	Improves mobility for cyclists, consistent with complete streets policy and supports Comp Plan redevelopment efforts.	Critical	Top priority for community goals
9	Separated Bike lanes, Option B	1, 2, 3	Improves mobility for cyclists, consistent with complete streets policy and supports Comp Plan redevelopment efforts.	Critical	Top priority for community goals
10	Dedicated Bike lanes, Option A	1, 2, 3	Improves mobility for cyclists, consistent with complete streets policy and supports Comp Plan redevelopment efforts	Critical	Top priority for community goals
11	Dedicated Bike lanes, Option B (or Separated Bike Lanes with this Option - wider sidewalks in west)	1, 2, 3	Improves mobility for cyclists, consistent with complete streets policy and supports Comp Plan redevelopment efforts	Critical	Top priority for community goals
12	Separated/dedicated Bike lanes, with <b>Roundabout</b> at Henry St.	1, 2, 3	Improves mobility for cyclists, consistent with complete streets policy and supports Comp Plan redevelopment efforts	Critical	Top priority for community goals
13					
14					
15					
16					

**0.0096**  
See  
**Complete Streets matrix**

**1.6**

**1.43**

**0.05**

**0.05**

**0.50**

**1.67**

**1.69**

**1.64**

**1.65**

**1.72**

**\$ 2.07** to  
**\$ 2.32** Total Cost  
(depending on selection)

Objectives:

- (1) to improve mobility, accessibility, and safety for pedestrians, bicyclists, and motorists along and adjacent to the corridor
- (2) be consistent with complete streets concepts and community goals/expectations
- (3) be developed in conjunction with and supplemental to the current efforts to update the City's Comprehensive Plan

City of Kingston Broadway Corridor Conceptual Design Plan  
 Framework for Decision Making & Priority Setting  
 Complete Streets Matrix

Estimated Cost  
(Million)

No.	Contemplated Element	Objective Advanced (See 1, 2 or 3 below)	How Objective is Advanced	Critical/Cumulative	Priority (Top, High, Low)
1	School signage and school pedestrian warning signage approaching High School	1,2	Install signage	Cummulative	High priority because of vulnerable users
2	Pedestrian warning signage	1,2	Install signage	Cummulative	High priority because of vulnerable users
3	8' to 10' advanced stop bars at signalized intersections to provide improved visibility between stopped motorists and pedestrians within crosswalks	1,2	Restripe stop bars; also could be a city-wide policy	Cummulative	High priority because of vulnerable users
4	Traffic calming (curb extensions, median refuge areas/ped islands, neckdowns, parking lane stripes, transit and bike signage and markings)	1,2	Design, analyze effects of, and construct traffic calming treatments	Critical	Complete street design is a top priority of the plan
5	More visible street signage	1,2	Replace existing signs	Cummulative	Low among most users, but high priority among older drivers who have challenges seeing signs
6	Install 12" lenses on traffic signals	1	Replace existing signal heads	Cummulative	High - Demonstrated effective safety improvement
7	Consider turn prohibitions to increase pedestrian safety, where applicable	1,2	Analyze effects of, and install signage	Cummulative	High priority, if it can be demonstrated that a certain left turn cannot be protected and is attributable to multiple pedestrian crashes
8	Increase safety for pedestrians at uncontrolled crossings (midblock as needed by desire lines, or at intersections)	1,2	Install signage, striping or activated beacons such as Rectangular Rapid Flashing or HAWK	Critical	Pedestrian safety is a top priority of the plan
9	Move bus stops to far side to improve intersection traffic operations and improve pedestrian safety (visibility to passing vehicles)	1	Coordinate with bus operations and planning staff and City of Kingston Engineering to move bus stops	Cummulative	Low, because there are few buses on the corridor
10	Make pedestrian ramps ADA compliant	1,2	Perform inventory of ramp slopes and dimensions; install truncated domes/tactile warning strips	Cummulative	Top priority because of ADA requirements
11	Design driveways so that cross slope does not exceed 2% and sidewalk continues across	1,2	Perform inventory of driveway geometries; also could result in a typical driveway drawing adopted by City	Cummulative	Low, because there are few driveways on the corridor, i.e., <1 per block
12	Limit driveways and consolidate access	all	Perform access management study and compliance with existing/proposed zoning	Cummulative	Low, because there are few driveways on the corridor, i.e., <1 per block
13	Improve pavement and hardscape surface quality for all users	all	Perform inventory of poor pavement/sidewalk conditions and recommend repaving, new concrete or new blue slate (to be coordinated with streetscaping improvements and existing/proposed zoning)	Critical	Top priority because of ADA requirements
14	Provide benches and bike racks	all	Design and install consistent benches and bike racks (to be coordinated with streetscaping improvements and existing/proposed zoning)	Cummulative	High priority because of community expectations that come with complete street plans
15	Provide bus shelters at heavily-used bus stops	all	Design and install consistent bus shelters (to be coordinated with streetscaping improvements and existing/proposed zoning)	Cummulative	High priority because of community expectations that come with complete street plans

0.004

0.021

0

0.2

0.026

0.84

0

0.231

0.005

0.052

0.005

0.05

See Streetscapes Matrix

See Streetscapes Matrix

See Streetscapes Matrix

\$ 1.43 Million, Total

Objectives:

- (1) to improve mobility, accessibility, and safety for pedestrians, bicyclists, and motorists along and adjacent to the corridor
- (2) be consistent with complete streets concepts and community goals/expectations
- (3) be developed in conjunction with and supplemental to the current efforts to update the City's Comprehensive Plan

City of Kingston Broadway Corridor Conceptual Design Plan  
 Framework for Decision Making & Priority Setting  
 Complete Streets Matrix

No.	Contemplated Element	Objective Advanced (See 1, 2 or 3 below)	How Objective is Advanced	Critical/ Cumulative	Priority (Top, High, Low)
1	Provide an environment conducive to on-street civic involvement related to arts, entertainment, and business	3	Upgrade pedestrian infrastructure to provide a more appealing environment. Provide more public spaces with Pocket parks	Critical	High priority as it relates directly to the Comprehensive Plan and the Mayor's BEAT initiative Plan

Estimated Cost  
(Million)

See  
Complete  
Streets  
Matrix

Objectives:

- (1) to improve mobility, accessibility, and safety for pedestrians, bicyclists, and motorists along and adjacent to the corridor
- (2) be consistent with complete streets concepts and community goals/expectations
- (3) be developed in conjunction with and supplemental to the current efforts to update the City's Comprehensive Plan



**Building a Better  
Broadway**

Broadway Corridor Conceptual Design Plan, Kingston, NY

Urban Streetscape Improvement from Pittsfield, MA

## Urban Streetscape Improvement – The Pittsfield, MA Experience

(from the desk of C.J. Hoss, Pittsfield City Planner)

In addition to \$15 million in streetscape projects, the City of Pittsfield has invested in the Beacon Cinema and Colonial Theatre projects, as well as provided tax increment financing packages for a few development projects.



There was little interest in downtown commercial and residential opportunities before the City made a concerted effort to invest in the downtown beginning in the late 1990's, early 2000's. In the last 10 years the City has seen an increase in investment/reinvestment in downtown properties. The last few mixed-use redevelopment projects downtown have been a success, especially from a residential perspective with units typically absorbed within the first two weeks of opening for business. The City still has

challenges with first floor commercial vacancies and office spaces operating in first floor commercial spaces in our downtown core, but there is a good core of businesses and institutions. Overall, City Planning believes there is more interest in downtown Pittsfield from a residential and commercial perspective as a result of streetscape and other public investments in the downtown area.



While there has been some impact to businesses during construction, City Planning does not see any evidence that these businesses closed specifically because of the construction impacts. The City has made concerted efforts to meet with property and business owners in each section to attempt to mitigate potential concerns, and also has been active in assistance with marketing during construction. Overall, the business community and the downtown business collaborative, Downtown Pittsfield Inc., understands there will be short term impacts. However, they continue to be supportive of the streetscape improvements, recognizing the overall long term benefits of the aesthetic and safety improvements.



The below excerpt is from our successful MassWorks grant application for Streetscape Phase 4:

“Launched in 2005 under the leadership of the Department of Community Development, a Downtown Streetscape Master Plan was developed with a blueprint for four manageable phases. Three of the four phases are successfully completed. Streetscape Phase 4 is the link that will connect the previous completed phases together. Since 2006, when the Streetscape Phase 1 project started approximately \$15 million has been spent: \$5.8 million federal, \$3.9 million state and \$5.5 million in city capital funding.

The magnitude of the Streetscape Phase 4 project is elevated because of the successful completion of Streetscape Phases 1, 2, 3 and the positive, organic and financial impact that these projects have had on the downtown business district. Private developers and property owners have already begun to invest in the Phase 4 area in anticipation of this project. Private investment, market rate housing, potential passenger rail service between Pittsfield and Grand Central Station in New York City and an \$12 million investment in a 45 room boutique hotel are some of the projects being planned.

There are approximately 35,759 people living within a 2 mile radius of the project area and it is bordered by two predominately low and moderate income neighborhoods, the Westside and Morningside. The residents living in this area depend on the North Street connection to the downtown. There are a large number of residents in the area that walk to work and use public transportation. Streetscape improvements planned such as sidewalk, roadway improvements, bike lanes and lighting will be a benefit to those who depend on this travel corridor.”

**STREETSCAPE PHASE 4 PROJECT AREA  
EXISTING CONDITIONS**

