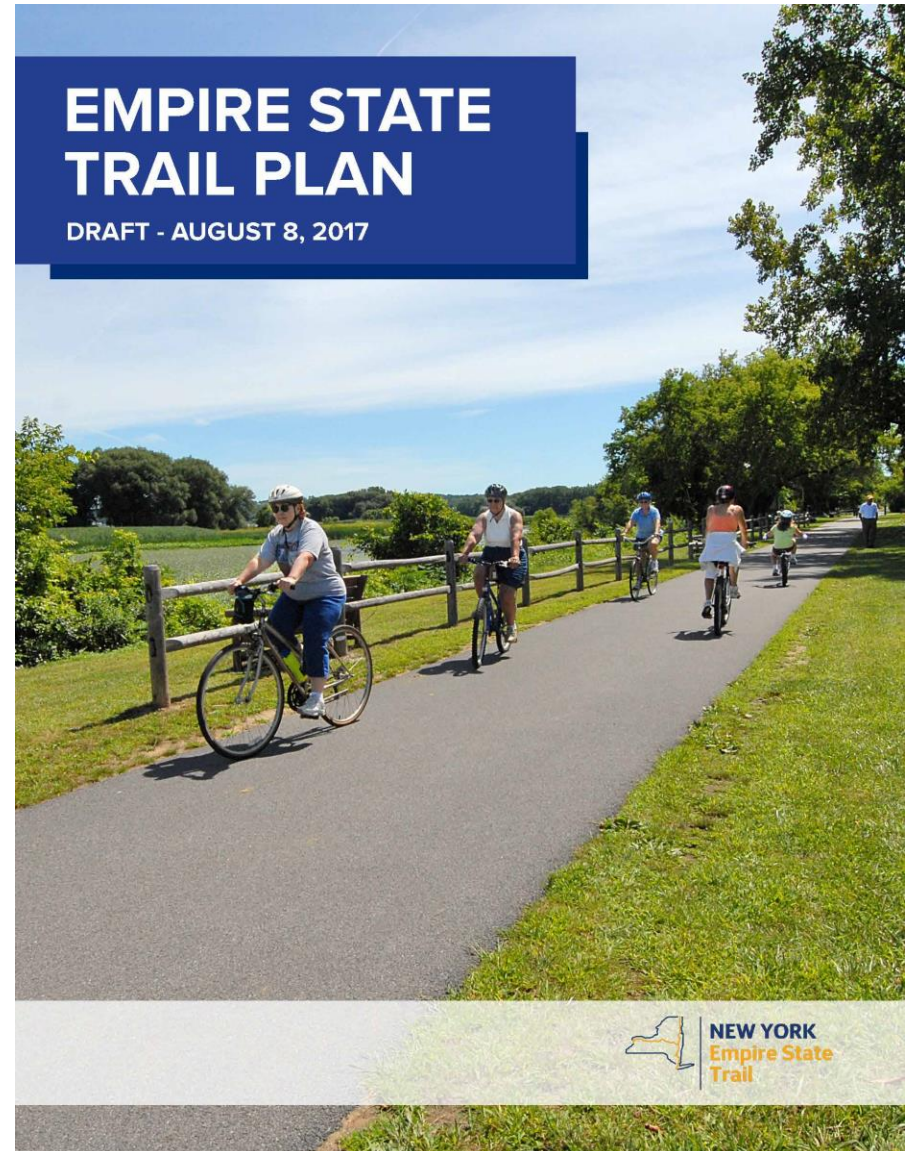




Empire State Trail Website

- Detailed information about the Empire State Trail is available on the project website:
- <https://www.ny.gov/programs/empire-state-trail>
- Maps, narrative, reports, pictures, Design Guide, etc.



January, 2017: Governor Andrew Cuomo Announces the Empire State Trail Initiative



Why? Trail Benefits

- Healthy Outdoor Recreation
- Community Vitality
- Tourism-Related Economic Development
- Safe Alternative Transportation
- Civic Engagement



Empire State Trail

- 750-Mile Bicycling and Walking Trail
- 3 Legs: Erie Canalway Trail, Hudson Greenway Trail, Champlain Valley
- NYC to Buffalo (550 miles) 85% Shared- Use Path
- \$200M NYS Capital Appropriation

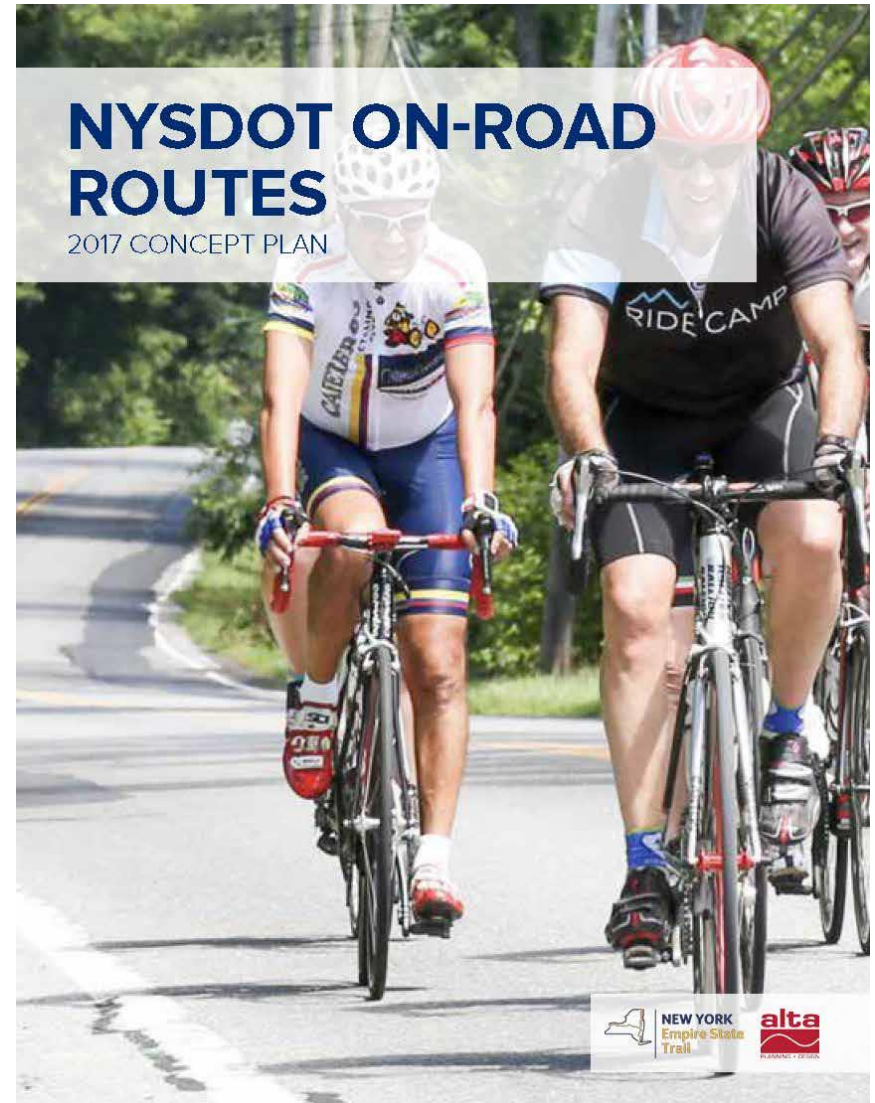


Co-Branding With Regional Trails



NYSDOT On-Road Bicycling and Pedestrian Improvements

- Seven DOT regions:
 - Region 1 (Capital Region)
 - Region 2 (Mohawk Valley)
 - Region 3 (Syracuse)
 - Region 4 (Rochester)
 - Region 5 (Buffalo)
 - Region 7 (North Country)
 - Region 8 (Hudson Valley)
- A variety of improvements on portions of the 215 miles of the Empire State Trail located along roadways.



On-Road Empire State Trail Sections



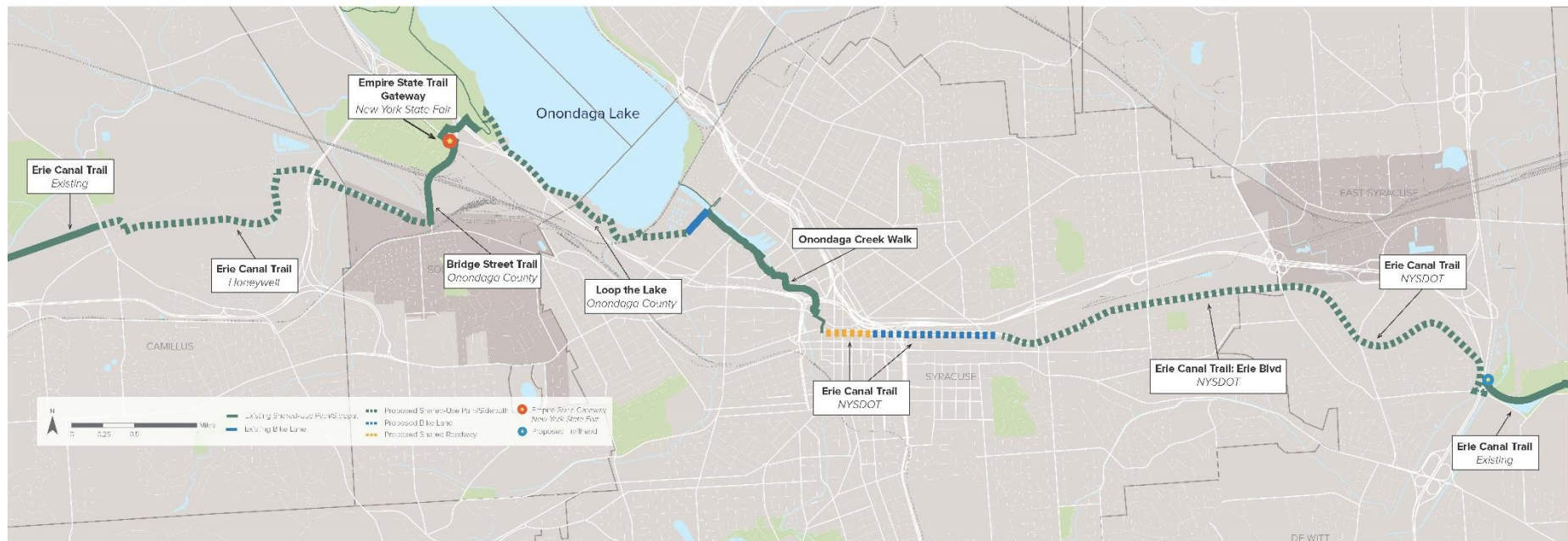
Project Delivery

- Participating state agencies: Hudson Greenway, NYSDOT, Canal Corporation, State Parks, Metro-North Railroad.
- Local governments role.
- 56 construction projects, large and small, are moving through design and construction.
- Ambitious schedule to complete all construction projects by December, 2020.



Syracuse EST Projects

Empire State Trail: Camillus to Syracuse to Dewitt



EST Design Guide

- 180-page guidance document, download link on Empire State Trail website:
www.ny.gov/programs/empire-state-trail
- Compiles state-of-the-art information on trail design, trail/road crossings, and on-road bike/ped facilities.



EST Design Guide: Examples



Typologies

EMPIRE STATE TRAIL - DESIGN GUIDELINE

GENERAL DESIGN PRACTICES

A shared use path provides a travel area separate from motorized traffic for bicyclists, pedestrians, skaters, wheel chair users, joggers, and other users. Shared use paths are desirable for bicyclists of all skill levels preferring separation from traffic. These off-road travelways generally provide routes and connections not provided by existing roadways. Most shared use paths are designed for two-way travel of multiple user types.

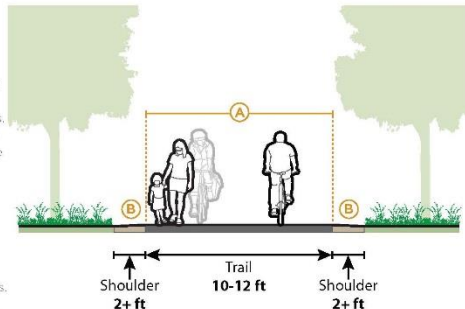
TYPICAL APPLICATION

Shared use paths are typically located in independent rights of way, separate from roadways.

Refer to guidance on sidepaths for information on shared use paths adjacent to roadways.

DESIGN FEATURES

- Standard shared use path width is 12 ft (3.6 m), which is suitable for heavy use with high concentrations of multiple user types. This width is needed to enable a bicyclist to pass another path user going the same direction, while another path user is approaching from the opposite direction. Where volumes are extremely high, a separate path of 5 ft (1.5 m) can be provided to separate pedestrian circulation.
- The minimum width of a shared use path is 10 ft (3.0 m), which is adequate for moderate use, or a low level of mixing between bicyclists and pedestrians (AASHTO Bike Guide Section 5.2.3).



- In rare circumstances a constrained minimum width of 8 feet may be used. This should only be considered in constrained conditions, for short distances (AASHTO Bike Guide Section 5.2.1).
- A 2 ft (0.6 m) or greater shoulder on both sides of the path should be provided free of obstacles.
- MUTCD requires 2 ft (0.6 m) lateral clearance from the edge of path for post-mounted sign faces or other traffic control devices. Standard clearance of overhead signs and traffic control devices should be 8 ft (2.4 m).

New York State Standards and Guidelines for Trails - Trails Technical Document #1

	Vertical Clearance	Corridor Clearance	Treadway Width	Trail Development Standards	Trail Length	Sight Distance	Grade	Turning Radius
Biking Class 1 (Greenway Trail)	8-10 ft*	10-12 ft, (1 lane) 12-16 ft, (2 lane) 16-20 ft, (2 lane - high volume)	6 ft, (1 lane) 8-10 ft, (2 lane) 12-14 ft, (2 lane - high volume)	Smooth pavement, asphalt, concrete, crushed stone, clay or stabilized earth.	Min. - 5 mi. loop (1.5-2 hour) 15-25 mi., of linear or loop trails (day trip)	Min of 50 ft. up to 100 ft. on downhill curves or road crossings	0-5% Max; 5-10% sustained; 15% shorter than 50 yr; 0-2 slope of 2-4%	8-14 ft. depending on speed, depending upon speed.

* 2 additional feet needed for snowmobiles, snowshoeing, and equestrian trails.

** See New York State Standards and Guidelines for Trails for further details.

FURTHER CONSIDERATIONS

- Under most conditions, centerline markings are not necessary. Centerline markings should only be used if necessary for clarifying user positioning or preferred operating procedure; solid line = no passing, dashed line = lane placement.
- Trails with a high volume of bidirectional traffic should include a centerline. This can help communicate that users should expect traffic in both directions and encourage users to travel on the right and pass on the left.
- Where there is a sharp blind curve, painting a solid yellow line with directional arrows reduces the risk of head-on collisions.
- Worn pavement markings should be applied differently on a path context than on a roadway.
- Small scale signs should be used in path environments (MUTCD 9B.02).
- Terminate the path where it is easily accessible to and from the street system, preferably at a trail head, controlled intersection or at the beginning of a dead-end street.
- Planners and designers should also reference [Standards and Guidelines for Trails](#) where applicable.

MAINTENANCE

Trail width can influence maintenance vehicle access. Asphalt is the most common surface for bicycle paths. The use of concrete for paths has proven to be more durable over the long term. Saw cut concrete joints rather than troweled improve the experience of path users.

REFERENCES

AASHTO: Guide for the Development of Bicycle Facilities, 2012.
FHWA: Manual on Uniform Traffic Control Devices, 2009.
Flinn, C. Greenways: A Guide To Planning, Design And Development, 1993.
NYSDOT: Standards and Guidelines for Trails, in NYSDOT, 2010.

EST Design Guide: Examples

Shared Use Path Crossings

RAISED CROSSWALK

Raised crosswalks combine a marked crosswalk with raised speed table geometry to increase yielding rates and clarify road user priority with geometric design.

TYPICAL APPLICATION

The **NYSDOT EI 13-018** on raised crosswalks states that raised crosswalks may be used on midblock crosswalks that have or will have very high pedestrian volumes.



DESIGN FEATURES

- Raised crosswalks that may slow motorists should be paired with a **Marked Crosswalk and Advanced Yield Line** crossing treatment package.
- Ⓐ Raised crossing creates vertical deflection that may slow motorists and encourage yielding to path users, while high-visibility crosswalk markings establish a legal crosswalk away from intersections. Refer to **Standard Sheets 608-07** for specific guidance on the design of raised crosswalks.
- Where parking lanes exist, curb extensions should be used to shorten crossing distance and position users in a visible location. Parking should be prohibited between the yield line and marked crosswalk.



This trail crossing combines a median safety island with raised crosswalk.



Raised crossings help to prioritize pedestrian movements across roadways.

FURTHER CONSIDERATIONS

- In areas with high pedestrian demand, data acquisition to determine pedestrian volumes for raised crosswalks should be performed in accordance with **NYSHDM Chapter 5 Basic Design, Section 5.2.1.1**. At locations where bicycles will routinely use the crossing, cycling volume data may be acquired in the same way.
- The approach to designing path crossings of streets depends on an evaluation of vehicular traffic, line of sight, pathway traffic, use patterns, vehicle speed, road type, road width, and other safety issues such as proximity to major attractions.
- Installation of a raised crosswalk must meet accessibility guidelines. Refer to **NYSDOT TSMI 17-02** for information on ADA Applicability of various crossing treatment countermeasures.
- For a curbed roadway, introduction of raised crossings may require adjustments to drainage catch basins.

MAINTENANCE

The raised crosswalk should use a sinusoidal profile to facilitate snow plow operation.

REFERENCES

NYSDOT HDM Ch. 25: Traffic Calming.
NYSDOT EI 13-018: Raised Crosswalks. 2013.
NYSDOT TSMI 17-02: Applicability of ADA Guidelines to PSAP Countermeasures. 2017.

Further Guidance Available

HDM
Ch 25

NYSDOT
EI 13-018

NYSDOT
TSMI

EST Design Guide: Examples

On-Road at-Road

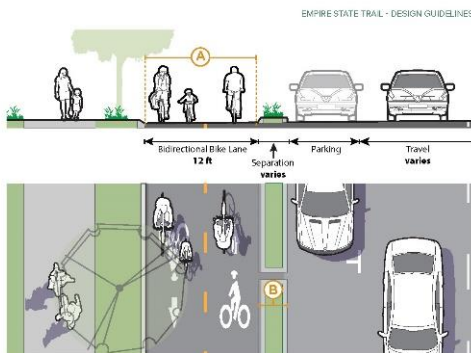
SEPARATED BIKE LANE (BIDIRECTIONAL)

Bidirectional separated bike lanes are bicycle facilities that allow bicycle movement in both directions on one side of a road. These facilities are also on-grade with the adjacent roadway, within the road ROW, and physically separated by a vertical element. Two-way separated bikeways share some of the same design characteristics as one-way separated bicycle lanes, but may require additional considerations at driveway and side-street crossings.

To simplify operations concerns, bidirectional separated bike lanes function best on the left side of one-way streets.

TYPICAL APPLICATION

- Generally to low speed and volume ranges for directional separated bike lanes.
- Functions well on all gaps in shared use path corridors.
- Functions well on streets with few conflicts such as driveways or cross-streets on one side of the street.



DESIGN FEATURES

- A Standard bidirectional separated bike lane width is 12 ft (3.6 m) (FHWA Separated Bike Lane Guide 2015). Reduced width is 10 ft (3.0 m) (NACTO Bike Guide 2012).
- B Separation width depends on physical separation method. Minimum separation width next to parking is 3 ft (0.9 m) to accommodate opening doors (NACTO Bike Guide 2012).
- In constrained conditions for short segments, minimum width is 8 ft (2.4 m) (AASHTO Bike Guide 2012).



The bidirectional separated bike lane is separated from both the sidewalk, as well as the roadway. A bidirectional separated bike lane does not necessarily need to be on-grade with the adjacent roadway.

PEDESTRIAN ACCOMMODATION

- Bidirectional separated bike lanes are not intended for use by pedestrians and pedestrians are expected to travel along a separate pedestrian facility such as a sidewalk or path. In the absence of a pedestrian facility, pedestrians may legally walk along the roadway.

FURTHER CONSIDERATIONS

- Federal recognition and guidance on separated bike lanes can be found in the FHWA Separated Bike Lane Planning and Design Guide 2015. Separated bike lane buffers and barriers are covered in the MUTCD as preferential lane markings (section 3D.01) and channelizing devices (section 3H.01). If buffer area is 4 feet or wider, white chevron or diagonal markings should be used (section 9C.04). Curbs may be used as a channeling device, refer to NY State Supplement to the MUTCD section on traffic divisional islands (section 3I.01).
- Two-way bikeways introduce additional complexities at intersections and driveways. Protected signalization, modified geometric design or other markings and signs may be necessary to mitigate conflicts. Refer to Separated Bike Lanes at Intersections in this guide.
- Refer to the FHWA Separated Bike Lane Guide 2015 for information on the treatment of transit stops, accessible parking, and loading zones (pgs. 92, 97, and 99).

MAINTENANCE

Bidirectional separated bike lanes tend to be easier to maintain due to increased bikeway width, and all bicycle facilities should be cleared of snow and debris through routine maintenance operations.

REFERENCES

AASHTO Guide for the Development of Bicycle Facilities 2003
FHWA Manual on Uniform Traffic Control Devices 2008
FHWA Separated Bike Lane Planning and Design Guide 2015
FHWA State and Local Multimodal Networks 2015
NACTO Urban Bikeway Design Guide 2012

Further Guidance Available



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Annual Trail User Projection

- Statistical projection of anticipated EST trail use numbers, based on actual counts conducted at 50+ trail locations in NYS.
- When completed in 2020, the Empire State Trail will host a projected 8.6 million annual visitors.
- Projected trail user mix is 65% pedestrians and 35% bicyclists.



Branding & Marketing

- Develop EST logo, signage, wayfinding, and amenities package to create a consistent experience across 750-mile route – integrated with the local identity of each trail segment.
- Create a sophisticated mobile website, including interactive mapping, to promote the trail.
- Promote connecting trails, nearby amenities, tourism destinations, and adjacent businesses.



Spurring Trails Investments

- Federal Funds: \$140M NYSDOT TAP/CMAQ grant round; \$2M annual RTP grants.
- State Funds: \$40M NYS REDC Consolidated Funding Application (CFA) Annual Grants (State Parks, Canal Corp, DOS, Hudson River Valley Greenway).
- Private Foundations and Corporations.

