

Town of Manchester



# Trails & Connectivity Plan

*Connecting Manchester's multi-use paths*

August 2021

*Adapted and excerpted from the Town of Manchester Parks, Recreation & Facilities Masterplan*

# Trails and Connectivity Analysis

Approximately 109 miles of formal and informal trails lie within or directly adjacent to the Town. Many of the formal multiuse trails have important current and future value in connecting various neighborhoods in Town to amenities and each other. Recreational hiking trails have historically been maintained through partnerships between the Town and volunteer groups. Difficulty in recruiting volunteers, combined with increased demand and limited Town resources, have started to put pressure on these resources. The Town's goal for the trails and connectivity analysis is to outline a prioritized scheme for creating and maintaining multiuse trail connections and recreational hiking trails, including recommendation for expansion and maintenance strategies.

## Vision

The Town's vision is to connect park and recreation locations with a comprehensive network of bicycle and pedestrian facilities that benefits residents and visitors who do not have access to an automobile. This network will also function as an extension of the Town's parks, allowing residents and visitors to enjoy walking, running, and bicycling on facilities that are comfortable and safe.

## Goal

The goal of these recommendations is to identify options for realizing the parks connectivity vision in a way that is feasible for the Town to implement and maintain. All facilities proposed within these recommendations are made with consideration to the Town's ability to finance and maintain those improvements, the potential benefit of the improvements, and the potential impact to private property and environmentally sensitive areas.

The parks connectivity recommendations are focused on, and are limited to, providing new connections and completing gaps in existing facilities that will allow for a connected bicycle and pedestrian network between park and recreational facilities. The parks connectivity recommendations do not seek to establish plans for the creation or improvement of trails within the Town's parks or open spaces unless a trail provides a strategic link within the town-wide network.

## Approach

The consulting team from FHI Studio took the following approach in developing the parks connectivity recommendations:

1. **Existing Facilities:** Map the Town's park and recreation facilities. Map and gather maps of existing sidewalks, bicycle facilities, trails, greenways, and pathways.
2. **Gap Analysis:** Identify gaps in the bicycle and pedestrian network connecting to and through the Town's parks through mapping, site visits, and communication with key stakeholders.
3. **Stakeholder Input:** Identify facility needs based upon discussions with stakeholders such as residents, Commission members, Town officials, and advocates.
4. **Preferred Connections:** Identify preferred connections, both on- and off-road, while focusing on facilities that provide strategic connections through a park or between parks. Identify recommended facility types.
5. **Implementation:** Provide cost estimates and recommended phasing of improvements.



Children Bicycling on Sidewalk Along Spruce Street – Image Google Earth

## Existing Facilities

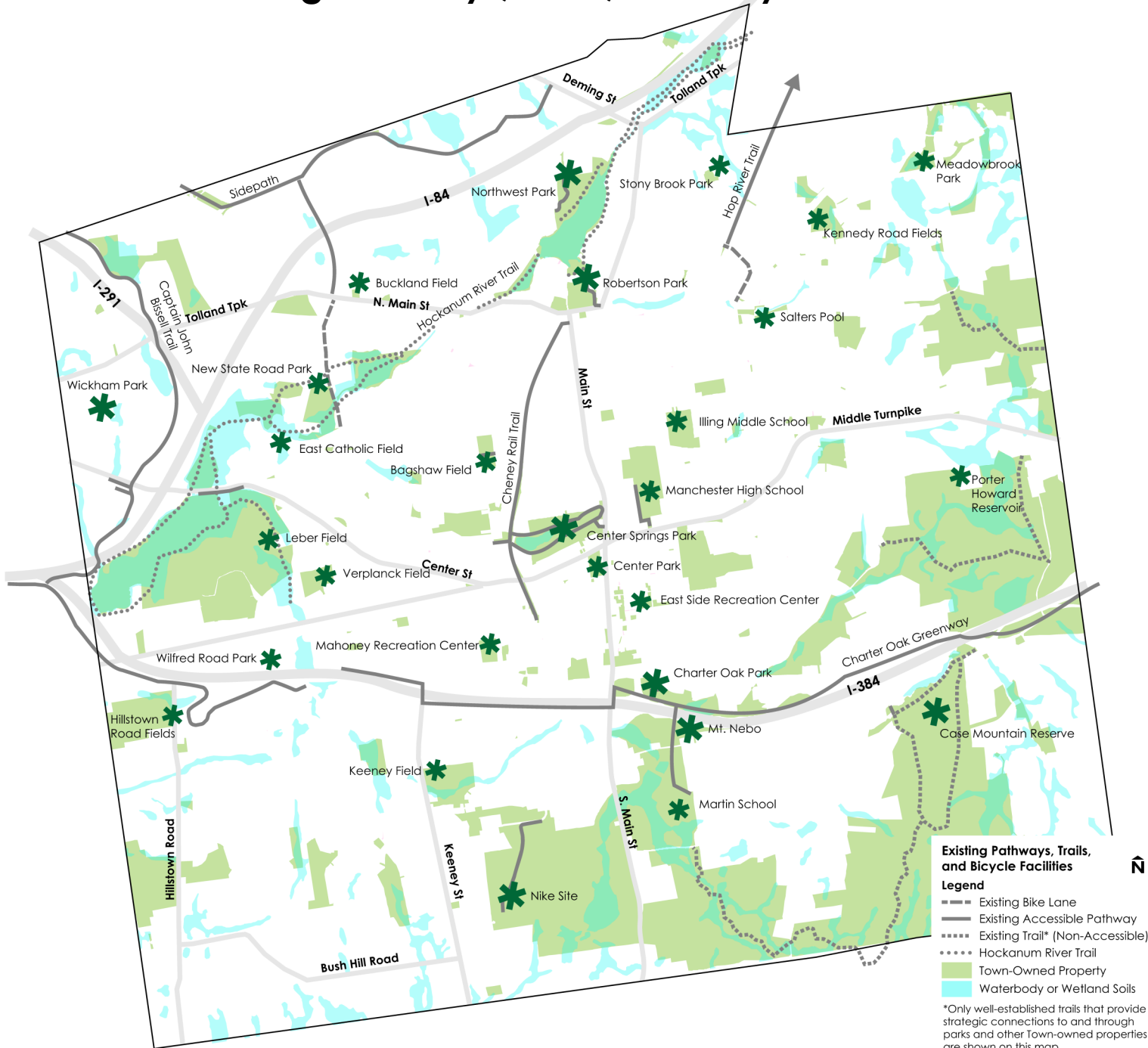
Manchester has over 25 park and recreation sites spread across the Town. Additionally, Manchester has hundreds of acres of Town-owned water company land and open space that is accessible to the public for walking, hiking, or bicycling. The Town is also home to multiple linear trails and greenways such as the Charter Oak Greenway (the East Coast Greenway is routed along this greenway), Captain John Bissell Trail, Cheney Rail Trail, Hop River Trail, and the Hockanum River Trail. Many of these trails and greenways are accessible to those with mobility constraints, such as wheelchair users. The John Bissell Trail, Cheney Rail Trail, and Hop River Trail are all accessible with paved or stone dust surfaces. Other trails, such as the Hockanum River Trail, are restricted to pedestrians without mobility constraints.

The Town is also making progress toward the establishment of on-road bicycle facilities with bike lanes being recently established on Colonial Road and Adams Street, commensurate with the Town's 2020 Draft Bicycle Master Plan. The Plan also recommends the use of shared roadway facilities on streets such as Porter Street. The Town also has a Sidewalk and Curb Plan, last approved in 2019, that identifies priority segments for the construction of new sidewalks and trails or bicycle lanes, many of which would improve connections to and between parks.

The inventory and assessment of facilities focuses on those that are accessible to a wide array of users, including pedestrians, wheelchair users, bicyclists, and Rollerblade or skateboard users. While the Town has multiple miles of trails, many of those are only accessible to walkers, hikers, trail runners, and mountain bikers. Trails such as the Hockanum River Trail are not accessible to wheelchair users or bicyclists. Other trails, such as at Case Mountain Reserve and at the Porter Howard Reservoir, are also primarily accessible only to hikers or mountain bikers. These trails hold promise for connecting to a larger bicycle and pedestrian network but might have limited potential for accommodating a diversity of users. In some locations, a specific trail or segment of a trail might be feasible for improvement to expand accessibility.



# Existing Pathways, Trails, and Bicycle Facilities

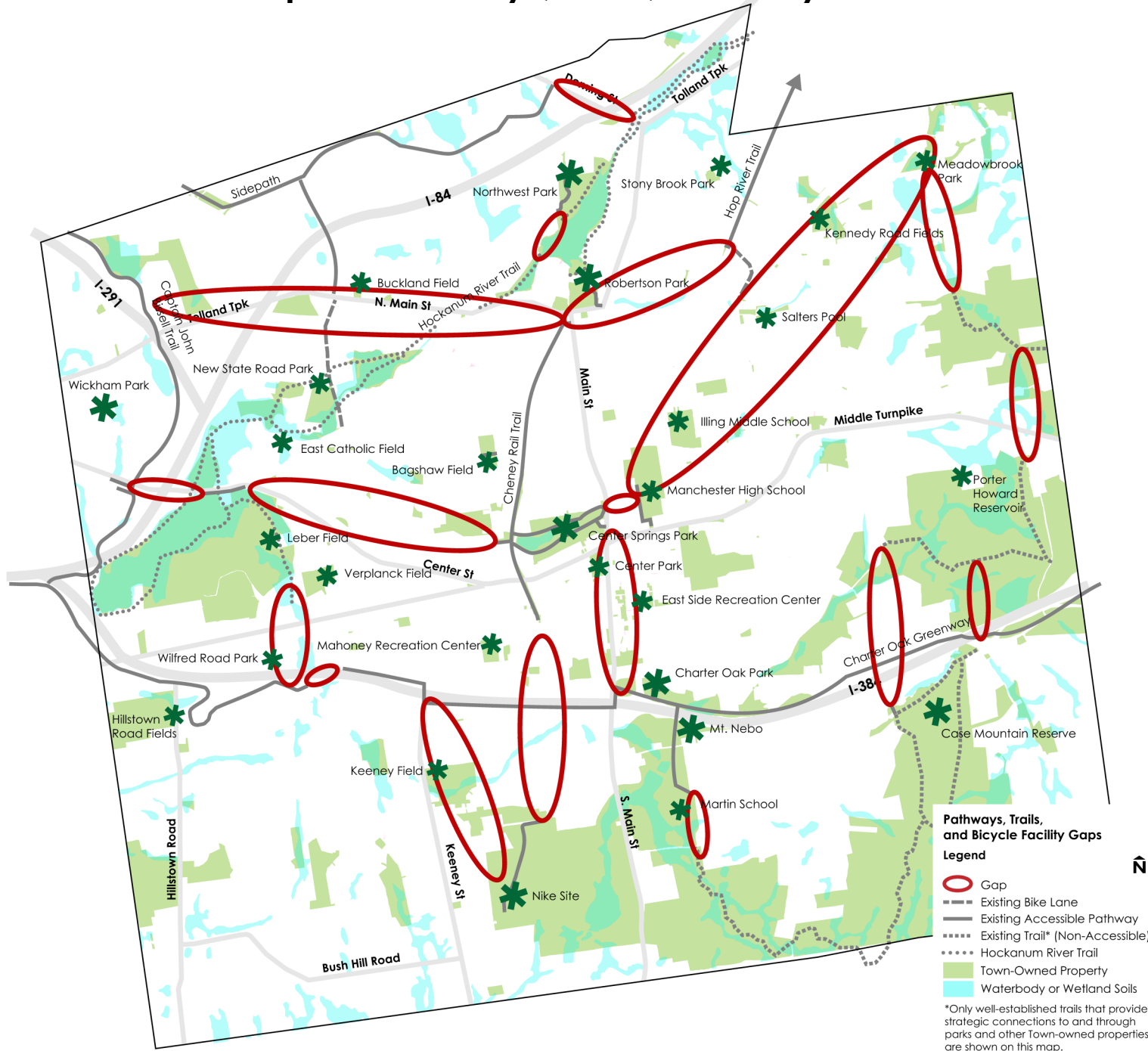


## Gap Analysis

A gap analysis is a method of identifying the missing links in a mobility system. It is a relatively simple exercise of identifying the general areas that could provide links within a network. Planning a connected parks network requires identifying areas of preferred connections. Once those areas are identified, appropriate facilities can be planned for accommodating users given the conditions in that area.

The Town has a robust sidewalk, greenway, pathway, and trail network, but it lacks direct connections between many of its parks. While the Town's sidewalk network connects most of its parks, not all of those roadways are suitable to bicyclists or are ideal for recreational use. The gaps in the Town's bicycle and pedestrian network include small gaps such as the gap in the Charter Oak Greenway between Hartford Road and Bidwell Street, and larger gaps such as between the Cheney Rail Trail and the Hop River Trail, Charter Oak Greenway, and Captain John Bissell Trail.

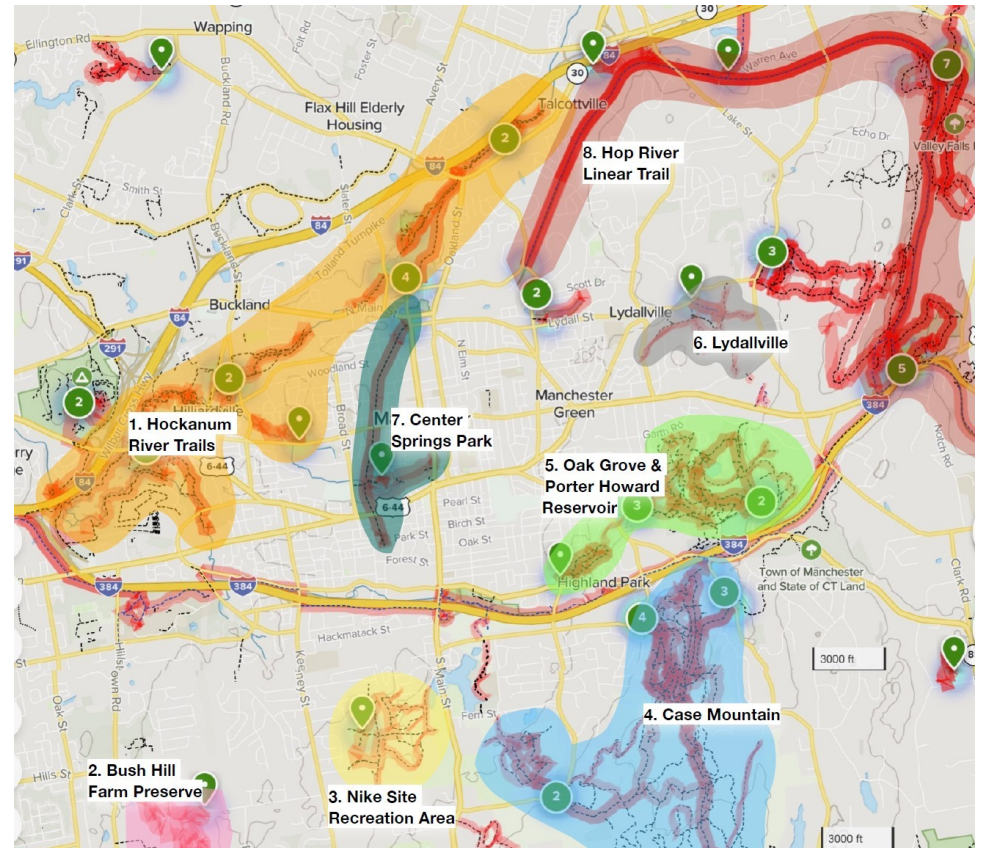
# Gaps in Pathways, Trails, and Bicycle Facilities



## Stakeholder Input

The focus group discussions regarding Town trails reinforced the findings in the gap analysis but also revealed that some preferred connections were not identified in the gap analysis. In general, stakeholders expressed interest in linking the Town's trails and pathways in a connected system that could be used for recreation and transportation purposes. Some specific recommendations made include:

- Extend the Cheney Rail Trail south to connect with the Charter Oak Greenway
- Connect the Charter Oak Greenway to Case Mountain Reserve
- Provide connections to and through the Nike Site
- Provide connections to Wickham Park
- Improve and maintain the Hockanum River Trail
- Provide connections to Water Company lands such as at the Porter Howard Reservoir
- Integrate parks connectivity improvements with the Town's bicycle plan
- Create a Bigelow Brook Greenway through the Parkade property
- Connect to the Bush Hill Farm Preserve
- Improve multiple other trails through the Town



Map of Trail Networks Recommended for Improvement and Connection  
Provided by Michael Farina.



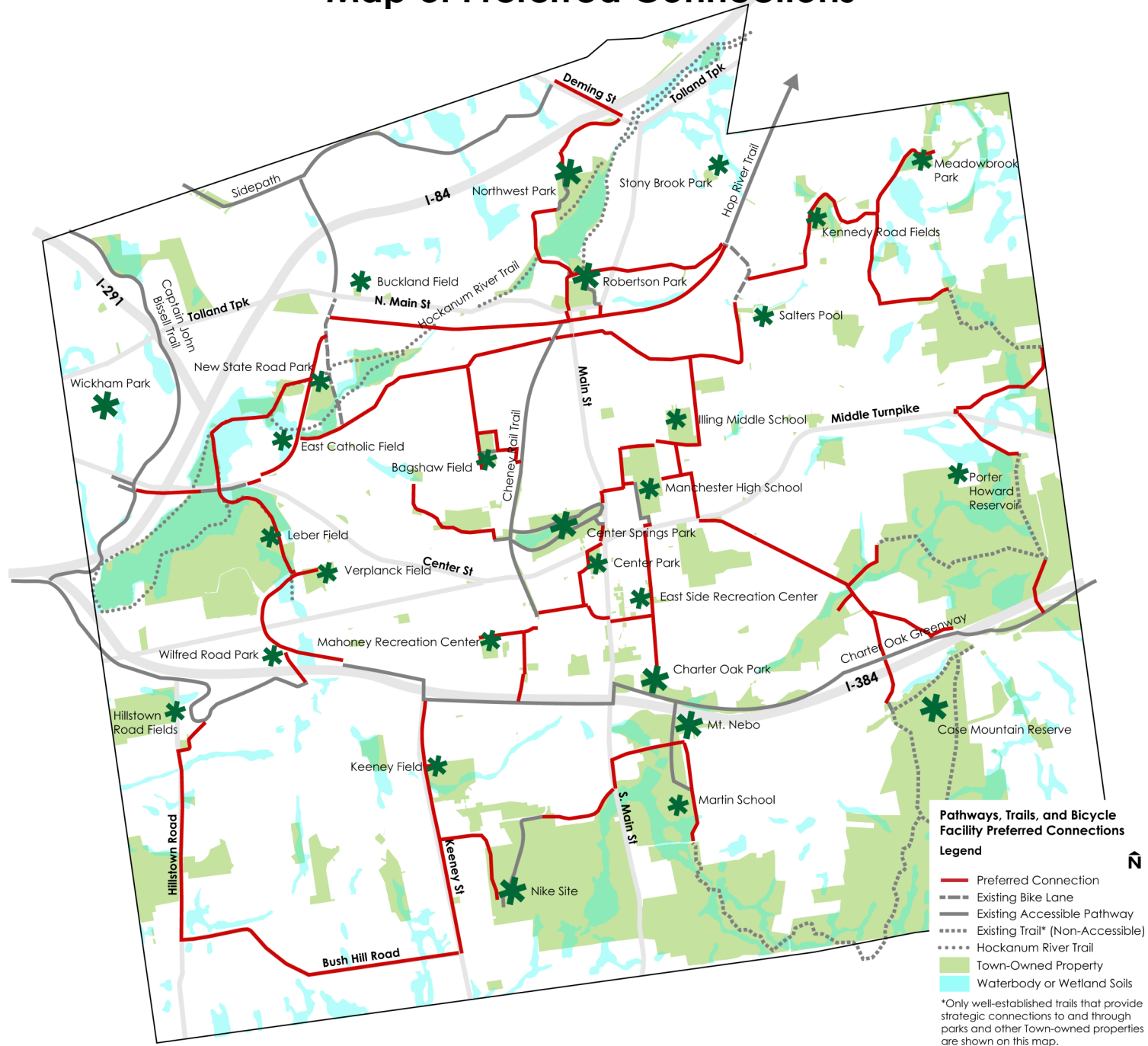
## Preferred Connections

The identification of preferred connections builds upon the gap analysis and feedback received from stakeholders. The first step in identifying preferred connections is to locate existing trails, pathways, sidewalks, roadways, rail lines, or other corridors or properties that would be suitable for the development or improvement of facilities to accommodate a wide array of users. Multiple factors are considered in selecting routes and identifying appropriate facility types. These include:

- **Property ownership:** There is a preference for use of Town property and right-of-way over private property, as the Town has control of the property.
- **Property conditions:** Wetlands, flood zones, and steep topography should be avoided due to potential environmental impacts and the cost of providing improvements in those conditions.
- **Right-of-way width:** The width of the right-of-way might limit the ability to accommodate a sidepath or expand the roadway to accommodate bicycle lanes.
- **Roadway width:** The feasibility of on-road bicycle facilities is limited by existing roadway width. The expansion of road width to accommodate bike lanes is costly and reduces feasibility.
- **Traffic conditions:** Traffic volume and speed impact the suitability of accommodating bicyclists and other users on the roadway. Higher volume and speed roadways require separated facilities such as a sidepath or bicycle lane. Lower traffic volume and speed roadways may be suitable for users to walk or bicycle on the roadway.
- **Sidewalks:** The presence of sidewalks impacts the choice of facilities. Corridors with sidewalks accommodate pedestrians and wheelchair users. Bicyclists may need to be accommodated on the roadway, or sidewalks could be replaced with sidepaths to accommodate all users.

The preferred connections map identifies corridors that are most feasible for providing new connections or improving existing connections. The map is the basis from which appropriate facility types are selected for each corridor or segment of a corridor.

# Map of Preferred Connections



## Facility Types

Multiple facility types are recommended for use in connecting the Town's parks. This includes shared use pathways, sidepaths, bike lanes, and shared roadways. These facilities are ADA accessible and would improve park access for a wide array of users: pedestrians, wheelchair users, skaters, and bicyclists.

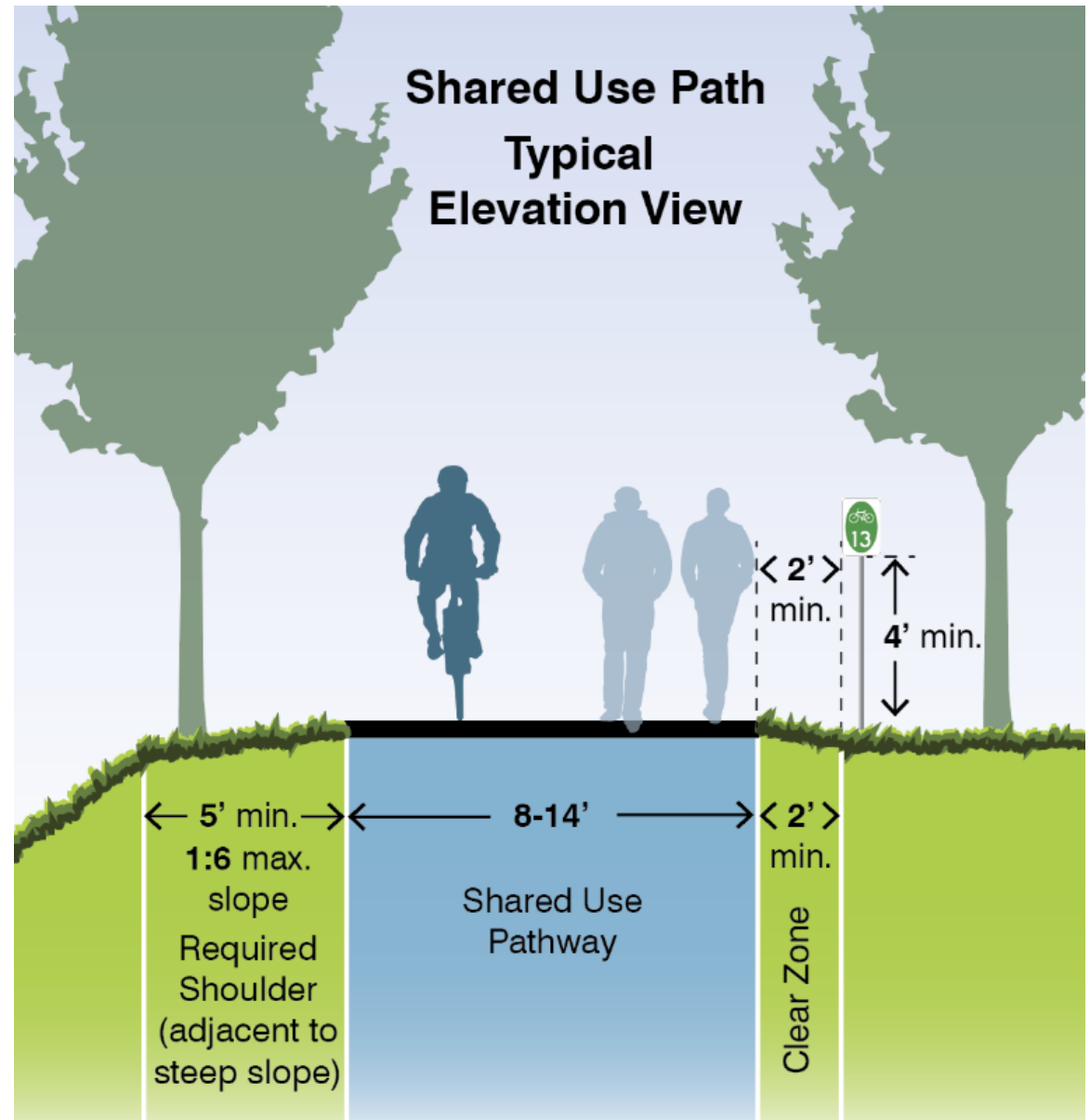
This plan does not recommend the development of new non-accessible trails as part of the park connectivity network. The development, expansion, improvement, and maintenance of trails will continue to be an important component of the parks system that might contribute to parks connectivity but is not the focus of this plan. Future planning should be conducted for the Town's trail system (hiking, mountain biking, and non-ADA accessible trails). The trails system requires a comprehensive inventory and assessment of conditions. Existing mapping is incomplete and out of date, as many trails are blazed or abandoned from year to year.

## Shared Use Pathways

Shared use pathways provide a separated facility for the shared use of bicycles and pedestrians. Paths are typically recreational in nature but can also be effective facilities for transportation. Examples of shared use pathways in the Town include the Cheney Rail Trail, Hop River Trail, segments of the Charter Oak Greenway, and the Captain John Bissell Trail. Other characteristics of shared pathways include:

- They are typically separated from the roadway by a significant distance and have few roadway crossings.
- They often travel through open space areas and along natural features such as rivers and waterbodies.
- They are sometimes developed along former rail corridors and may travel along the rear of residential, commercial, and industrial properties.

They vary in width but must be a minimum of 8 feet wide with 10 feet as the preferred minimum width.



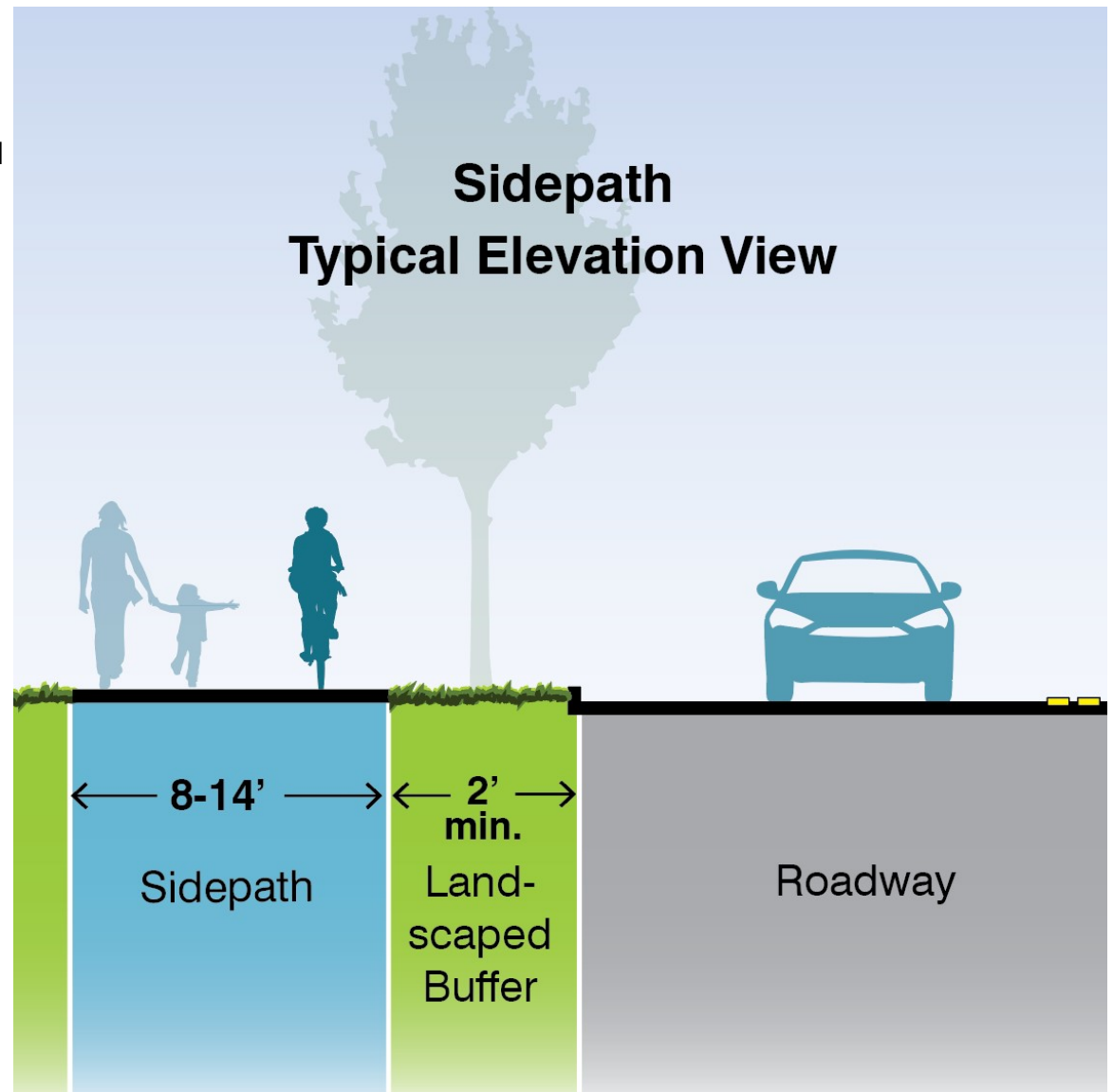
Shared Use Path



## Sidepaths

Sidepaths parallel a roadway where a sidewalk would be located. They are similar to shared use pathways and allow bicyclists and pedestrians to share the space. Examples of sidepaths in the Town include segments of the Charter Oak Greenway at Hartford Road and Highland Street and sidepaths along Buckland Hills Drive and Buckland Street. Other characteristics of sidepaths include:

- There is physical separation from motor vehicles by a landscaped buffer, curb, or a barrier.
- They are often connected to recreational pathways and are both recreational and transportation facilities.
- They may also be used to close gaps in a bicycle network created by features such as a highway interchange.
- They are a good solution for accommodating bicyclists along high-volume and/or high-speed roadways.
- They vary in width but must be a minimum of 8 feet wide with 10 feet as the preferred minimum width.

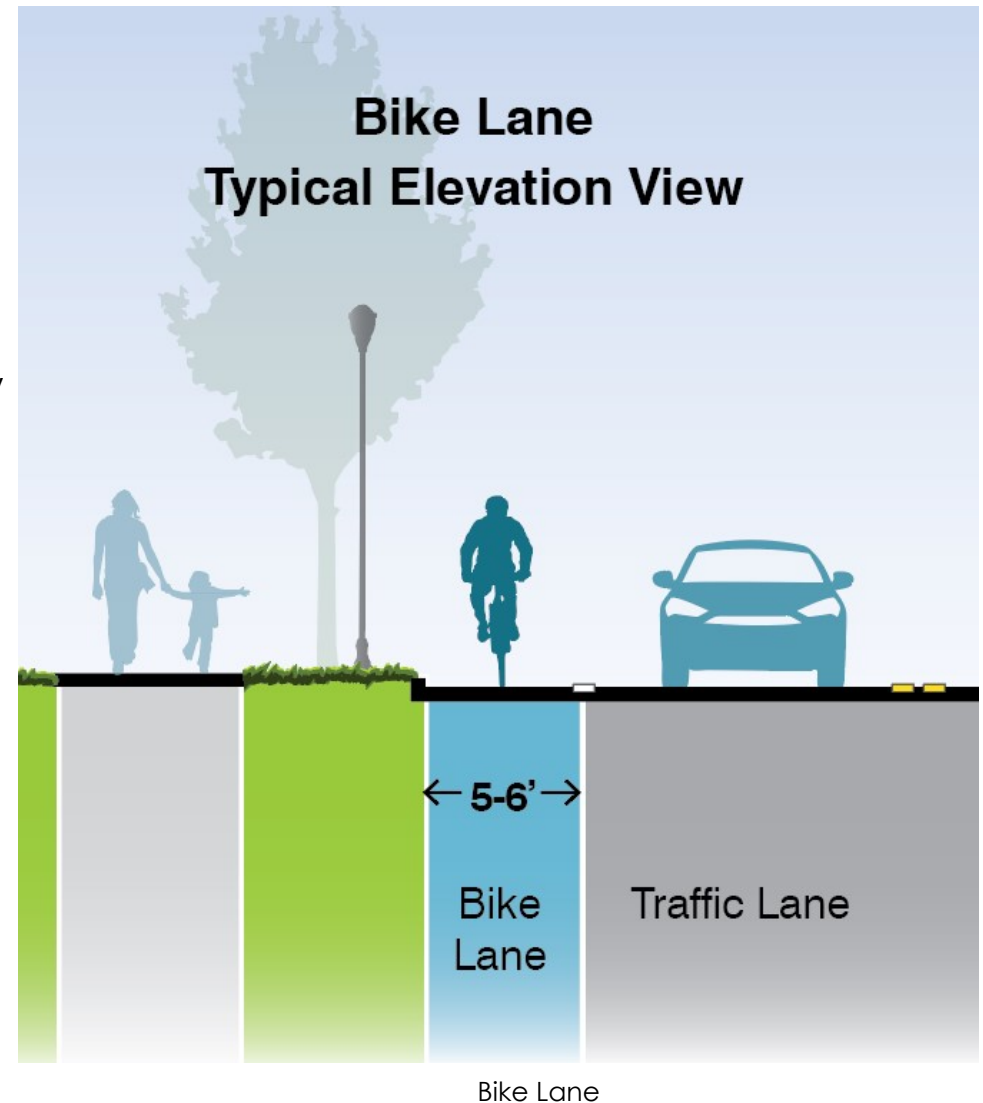


Sidepath

## Bike Lanes

Bike lanes designate an exclusive space on the roadway for bicycle travel, which is signified by pavement markings and signage. Examples of bike lanes in the Town include those on Colonial Road and Adams Street. Bike lanes are most effective for use in a parks connectivity network on roadways that are already served by sidewalks so that all users are provided access. Other characteristics of bike lanes include:

- They are typically located between a motor vehicle travel lane and the curb, road edge, or parking lane.
- They are used for one-way travel in the same direction as the adjacent traffic lane.
- They are most appropriate for low to moderate traffic volume (less than 10,000 vehicles per day) and speed conditions (85<sup>th</sup> percentile speeds of 35 mph or less).
- They are typically five to six feet wide with a minimum width of five feet.

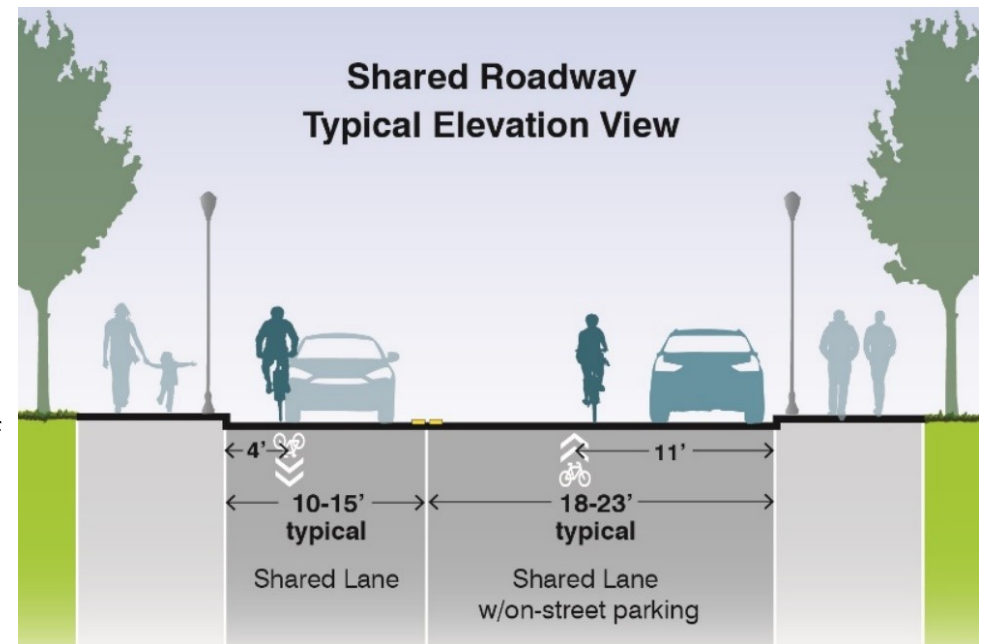


## Shared Roadways

Shared roadways allow bicyclists and motor vehicles to use the same roadway space without separate lane designations. Shared roadways guide bicyclists to the roadways that are safest for their use and provide motorists with a greater awareness of bicyclists compared to roadways that lack bicycle pavement marking or signage. Other characteristics of shared roadways include:

- They should be used where the provision of dedicated bike lanes or other dedicated bicycle facilities is not warranted by traffic conditions or is not feasible due to geometric or right-of-way constraints.
- They should only be designated on low volume (fewer than 5,000 vehicles per day) and low speed conditions (85<sup>th</sup> percentile speeds of 30 mph or less).
- They may be used on roadways with or without on-street parking and with or without yellow center line markings.

They are designated using shared roadway pavement markings (sharrows) and signage.



Shared Roadway

## Road Crossings

Sidepaths and shared use pathways that cross roadways require facilities such as curb ramps, marked crosswalks, signage, and appropriate traffic signal devices, such as pedestrian crossing signal heads at signalized intersections. Pathway crossings are similar crossings for sidewalks. Multiple examples are found in the Town at road crossings of the Captain John Bissell Trail, Charter Oak Greenway, Cheney Rail Trail, and Hop River Trail.



Road Crossing – Recently improved mid-block crossing of Middle Turnpike West by the Cheney Rail Trail. *Image credit: Google Earth*



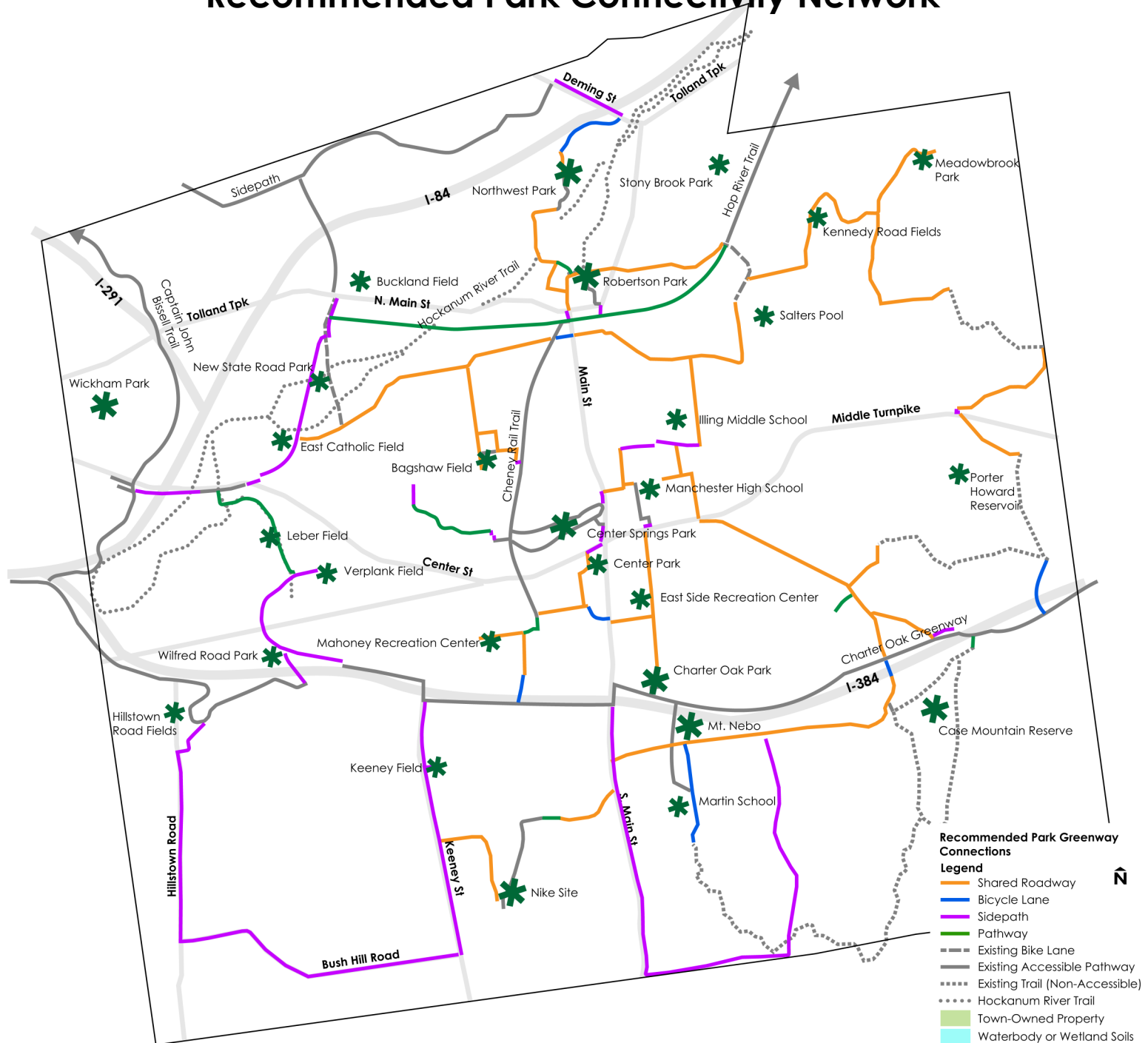
## Recommended Parks Connectivity Network

The recommended parks connectivity network seeks to link all park and recreation sites with facilities that can safely and comfortably accommodate a wide array of users. The recommended network includes multiple facility types as described above. This recommended network spans across the Town and is accessible from all areas of Manchester.

In total, this plan recommends development of the following:

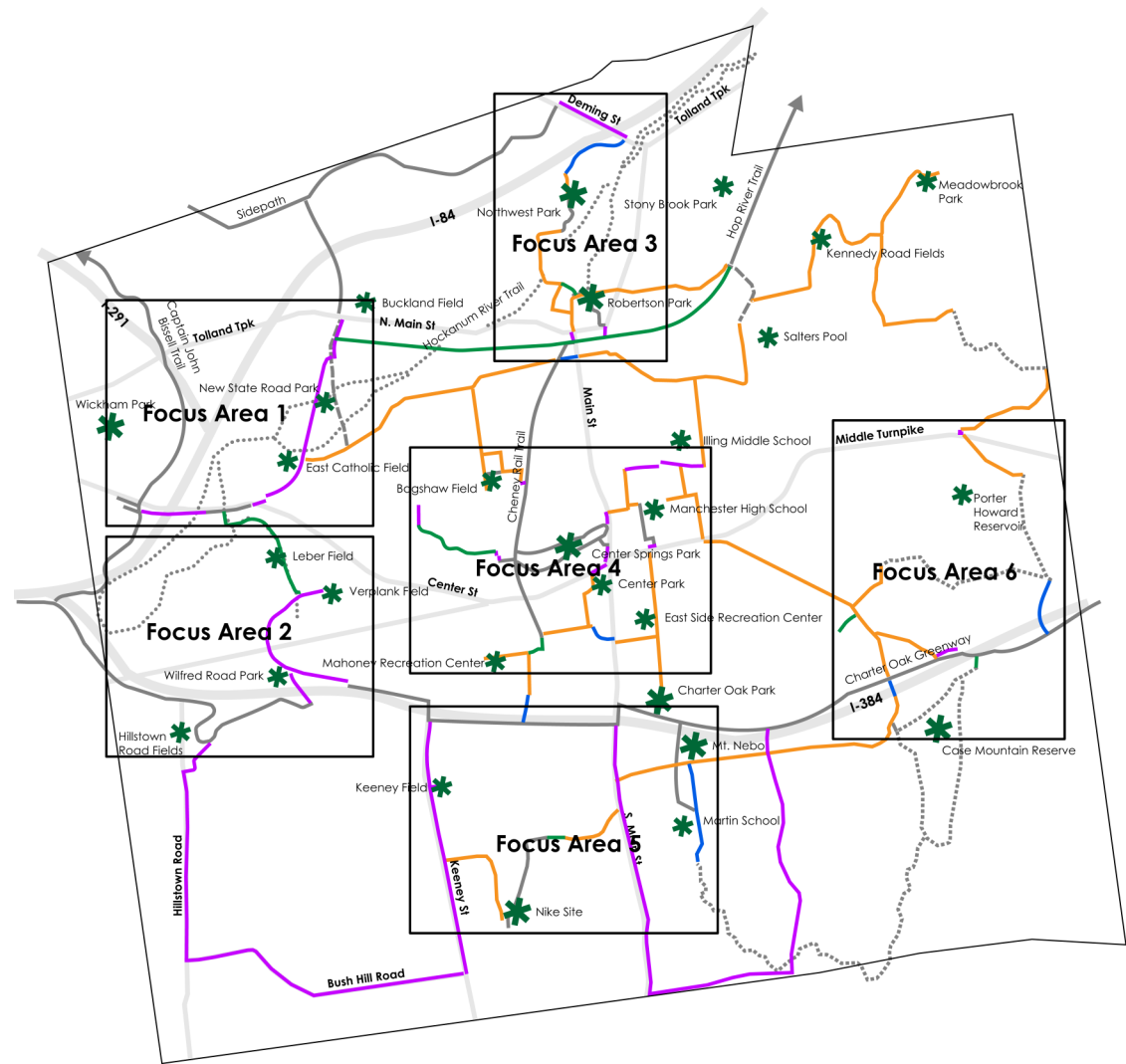
- 4.1 miles of shared use pathways
- 9.1 miles of sidepaths
- 1.8 roadway miles of bike lanes
- 18.6 roadway miles of shared roadways
- 5 intersection and roadway crossing improvements

# Recommended Park Connectivity Network



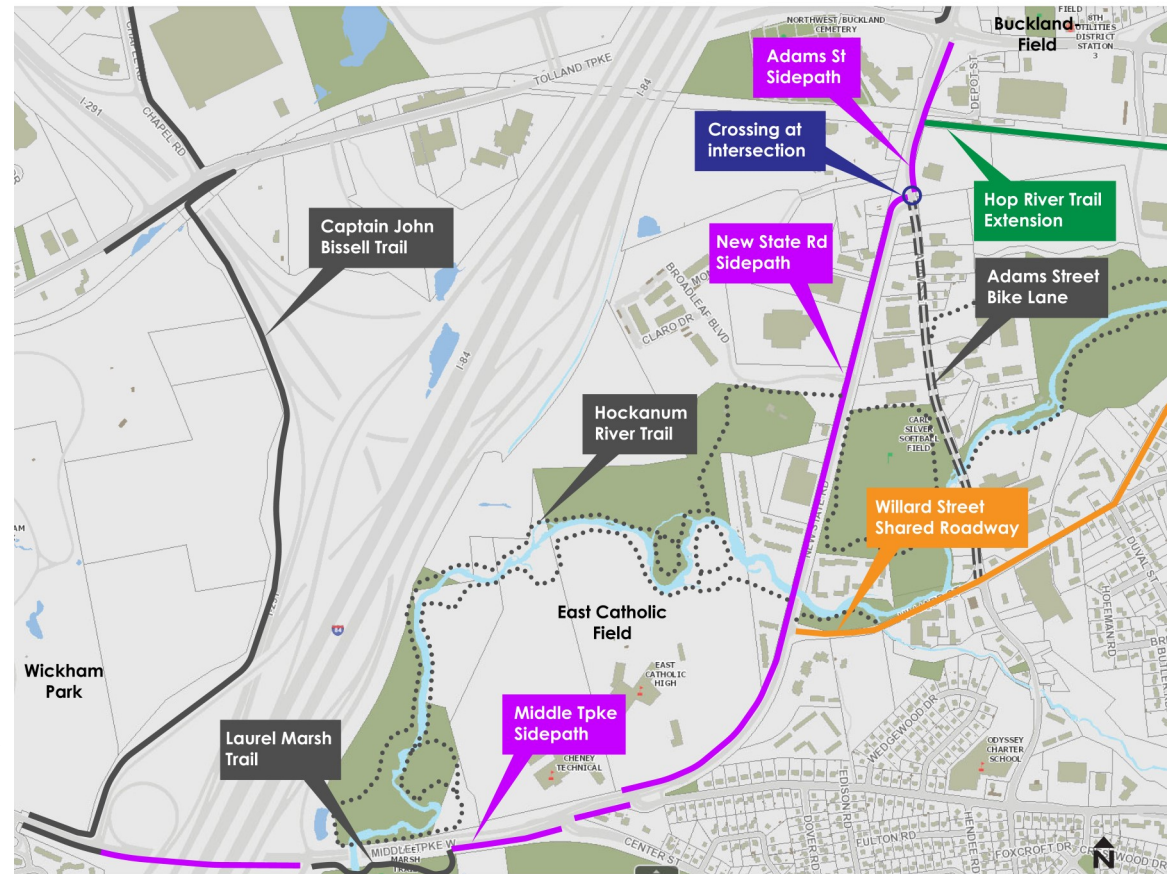
# Focus Area Plans

The parks connectivity plan on the preceding page is presented on the following pages in a series of focus areas that allow important details such as roadway crossings and local streets to be viewed. A total of six focus areas are presented. The map below provides a reference for the areas that the focus area plans cover.



## Focus Area 1

Recommended improvements in Focus Area 1 link Wickham Park to East Catholic fields and Buckland Field. The Captain John Bissell Trail is also linked to the Hockanum River and Laurel Marsh Trails by a sidepath. Improvements in this area involve a continuous sidepath on the south side of Middle Turnpike West, west side of New State Road, and east side of Adams Street. This facility would also connect to the existing Adams Street bike lane. Also recommended is an extension of the Hop River Trail along the existing rail line connecting to Adams Street and potentially traveling west to the Captain John Bissell Trail in a subsequent phase. A shared roadway is recommended on Willard Street; this would connect to the Cheney Rail Trail as an alternate route to the Hop River Trail extension. Existing roadway crossings would be used at most intersections except for New State Road at Adams Street, where crosswalk and signal improvements would be needed at the existing signalized intersection.

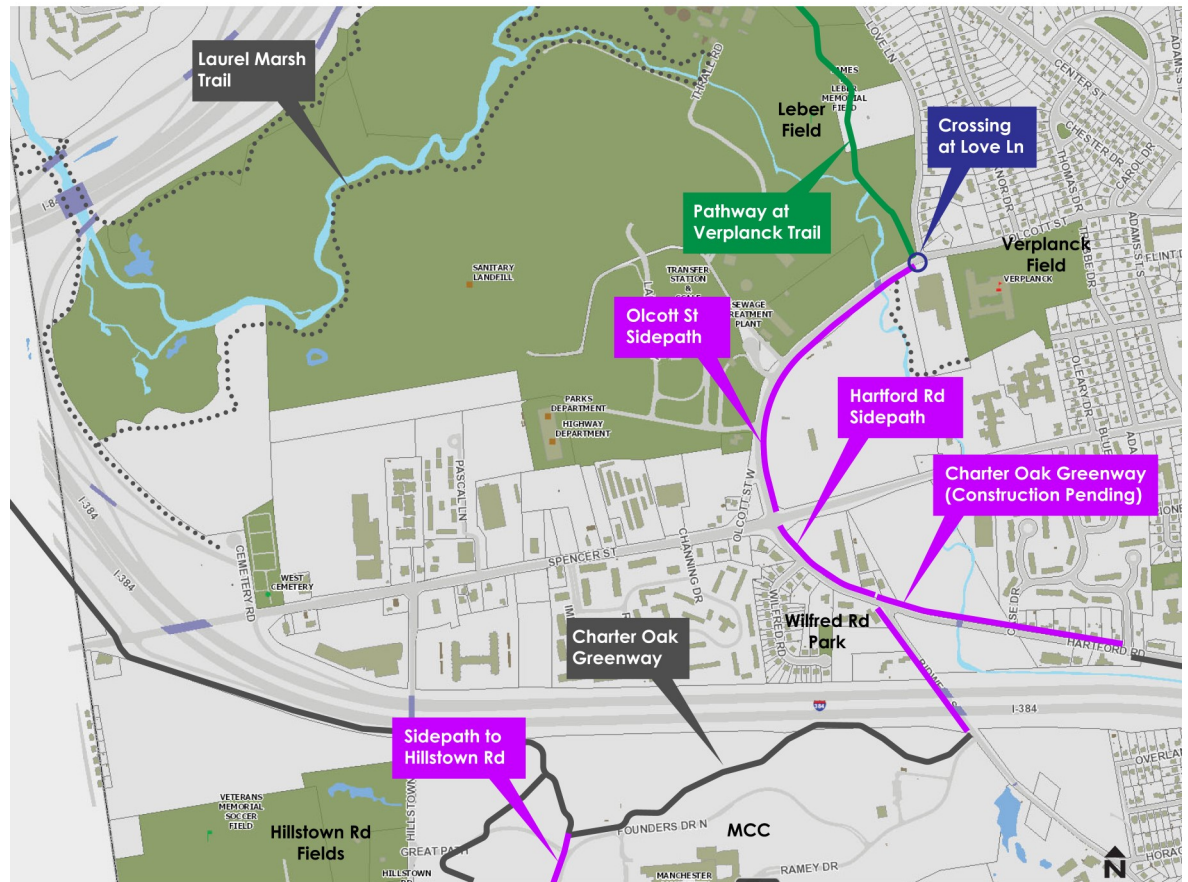


Focus Area 1



## Focus Area 2

Recommended improvements in Focus Area 2 would link the Hillstown Road Fields, Manchester Community College, Leber Field, and Verplanck Field. The improvements would also connect the Charter Oak Greenway to the Laurel Marsh Trail system. Improvements include sidepaths on the east side of Hillstown Road, Hartford Road, and Olcott Street. An accessible pathway is also recommended in place of the existing Verplanck Trail on the east side of Laurel Marsh. This pathway would provide connection north to Leber Field and the Captain John Bissell Trail. Improvements to the Charter Oak Greenway are currently planned in this area and will include a continuous sidepath from Hartford Road to Bidwell Street in place of a sidewalk that currently hosts the Greenway route. Improvements in this area would use existing road crossings with the exception of a crossing that would be needed from the Olcott Street sidepath to the Verplanck pathway.

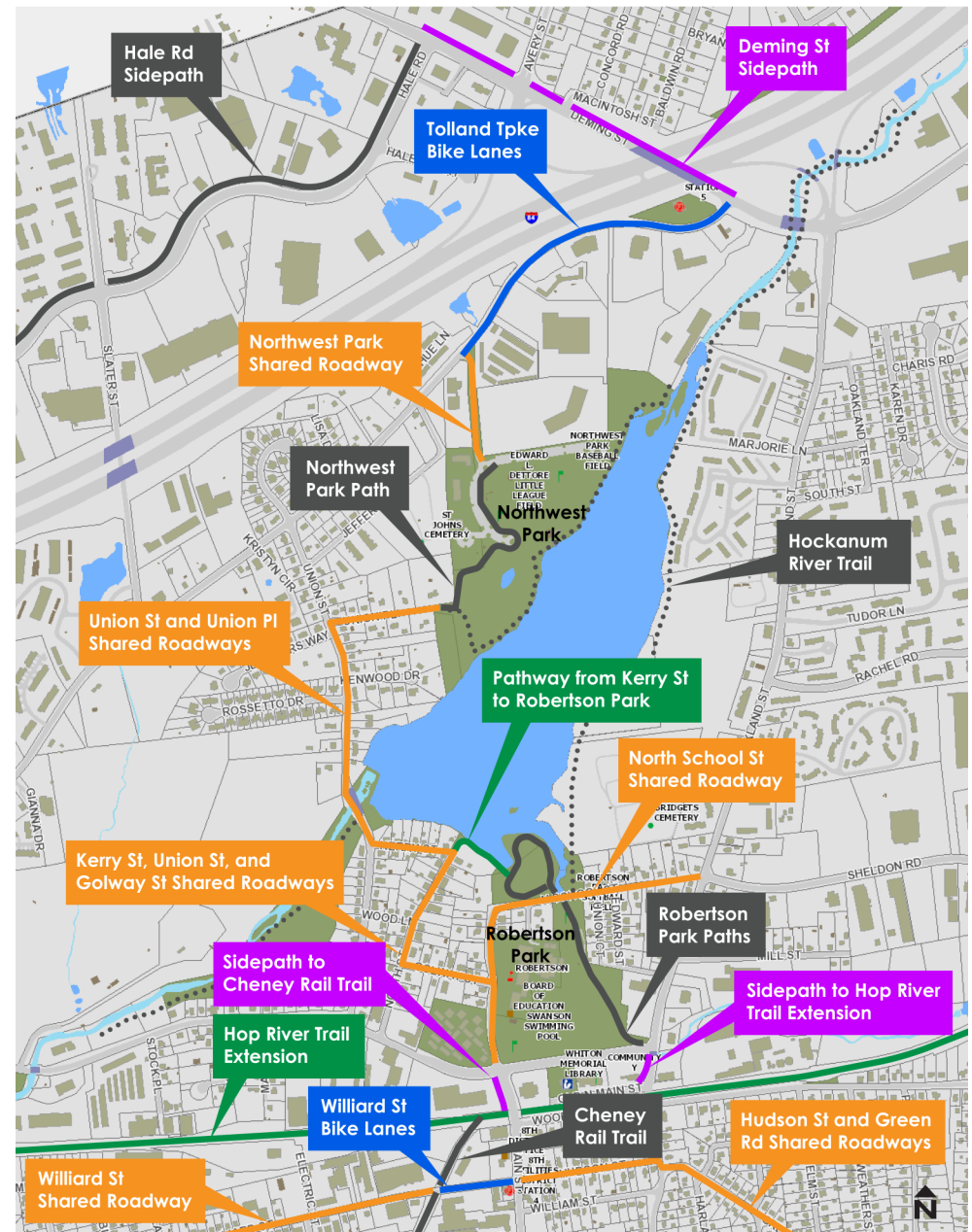


Focus Area 2

### Focus Area 3

Recommended improvements in this area seek to link sidepaths in the Buckland Hills area, Northwest Park, Robertson Park, and the Cheney Rail Trail. Several facility types are recommended including pathways, sidepaths, bike lanes, and shared roadways. The connection between the Hale Road sidepath and Northwest Park would be provided by a sidepath that would replace the existing sidewalk on the north side of Deming Street. Bike lanes would connect that sidepath to the Northwest Park entrance road, where a shared roadway would guide users to Northwest Park.

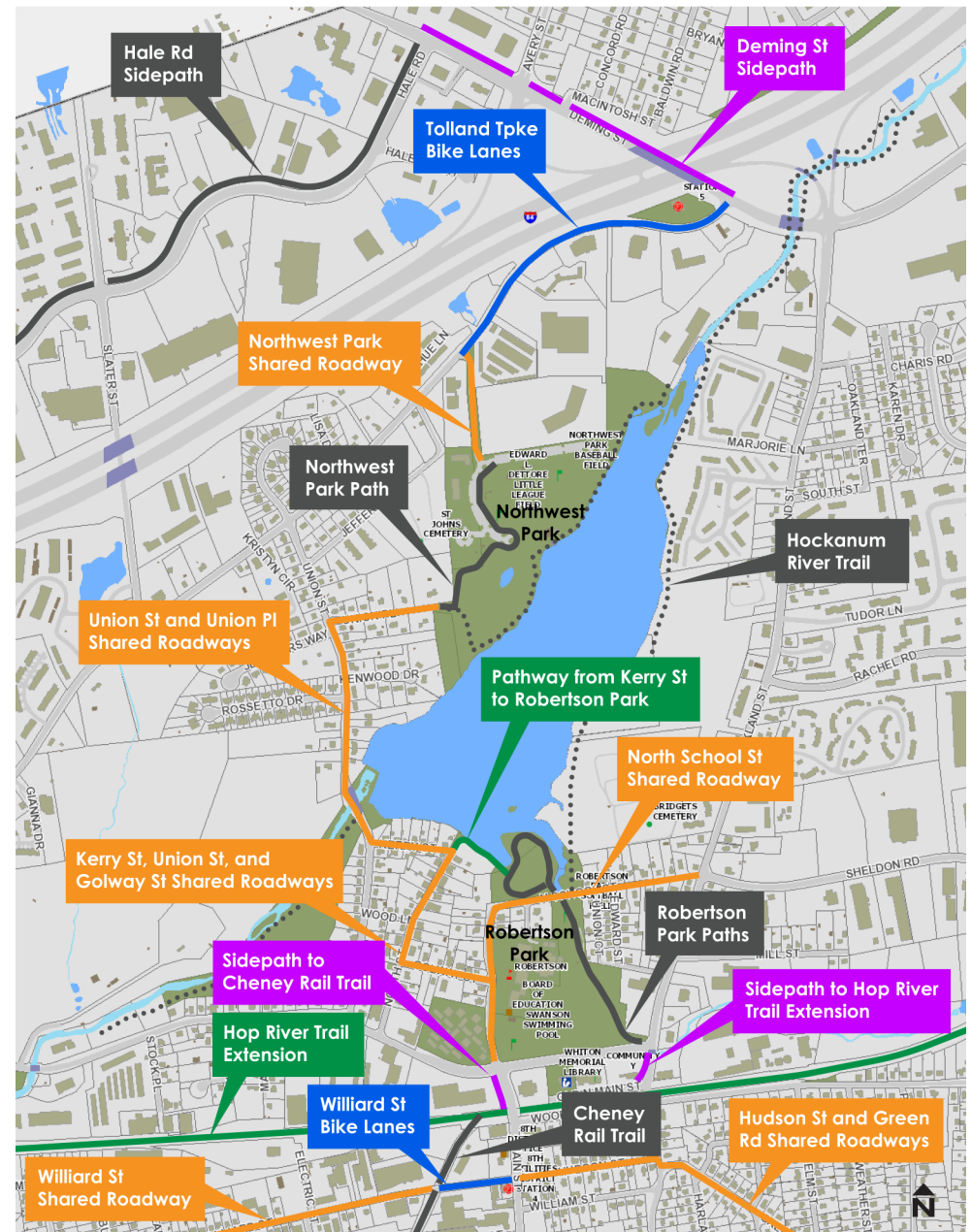
The connection between Northwest Park and Robertson Park would be provided using existing pathways in Northwest Park and shared roadways on Union Place, Union Street, Kerry Street, Golway Street, and North School Street. A potential shortcut in this route would be the installation of a pathway between Kerry Street and Robertson Park; however, property in this area is not owned by the Town and would require an easement and access agreement or purchase of a sliver of land along the pond to accommodate the pathway.



Focus Area 3

### Focus Area 3 (cont'd)

Connections to the Cheney Rail Trail would be provided using a short segment of sidepath on the west side of Main Street between Robertson Park and the rail line where the Cheney Rail Trail terminates. Extension of the Hop River Trail along the rail line is also recommended as a means of providing east/west connections across town. Because the Town does not control the rail line and this could be a long-term improvement if it does occur, shared roadways are recommended on Williard Street, Hudson Street, and Green Road. A short segment of bike lanes would be provided on Williard Street between the Cheney Rail Trail and Main Street where there is adequate shoulder space to accommodate the bike lanes. All roadway crossings in this area would use existing pedestrian crossing infrastructure.



Focus Area 3



## Focus Area 4

Focus Area 4 includes Downtown Manchester, Manchester High School, Illing Middle School, Bagshaw Field, Center Springs Park, Center Park, the Cheney Rail Trail, and the East Side and Mahoney Recreation Centers. The recommended improvements seek to provide accessible bicycle and pedestrian connections between all these destinations and facilities. While sidewalks are present in most areas, bicycle facilities are lacking, and streets such as Middle Turnpike and Main Street are not conducive to bicycling. A combination of pathways, sidepaths, bike lanes, and shared roadways would provide access across the area for all users.



Focus Area 4

## Focus Area 4 (cont'd)

Specific improvements include an extension of the Cheney Rail Trail to the southwest connecting to a shared roadway leading to the Mahoney Recreation Center. A pathway along the Bigelow Brook would connect through the Parkade property to a sidepath on Green Manor Boulevard. Short segments of sidepath on Broad Street and a mid-block crossing in this location would connect the Bigelow Brook Pathway to Center Springs Park. Similarly, sidepaths along Main Street and Center Street would connect Center Park to Center Springs Park. Shared roadways would be located on low volume local roadways and would connect to destinations such as the Mahoney and East Side Recreation Centers and Manchester High School and Iling Middle School. Sidepaths along the Middle Turnpike East frontage of both of those schools would provide bicycle access between the schools.



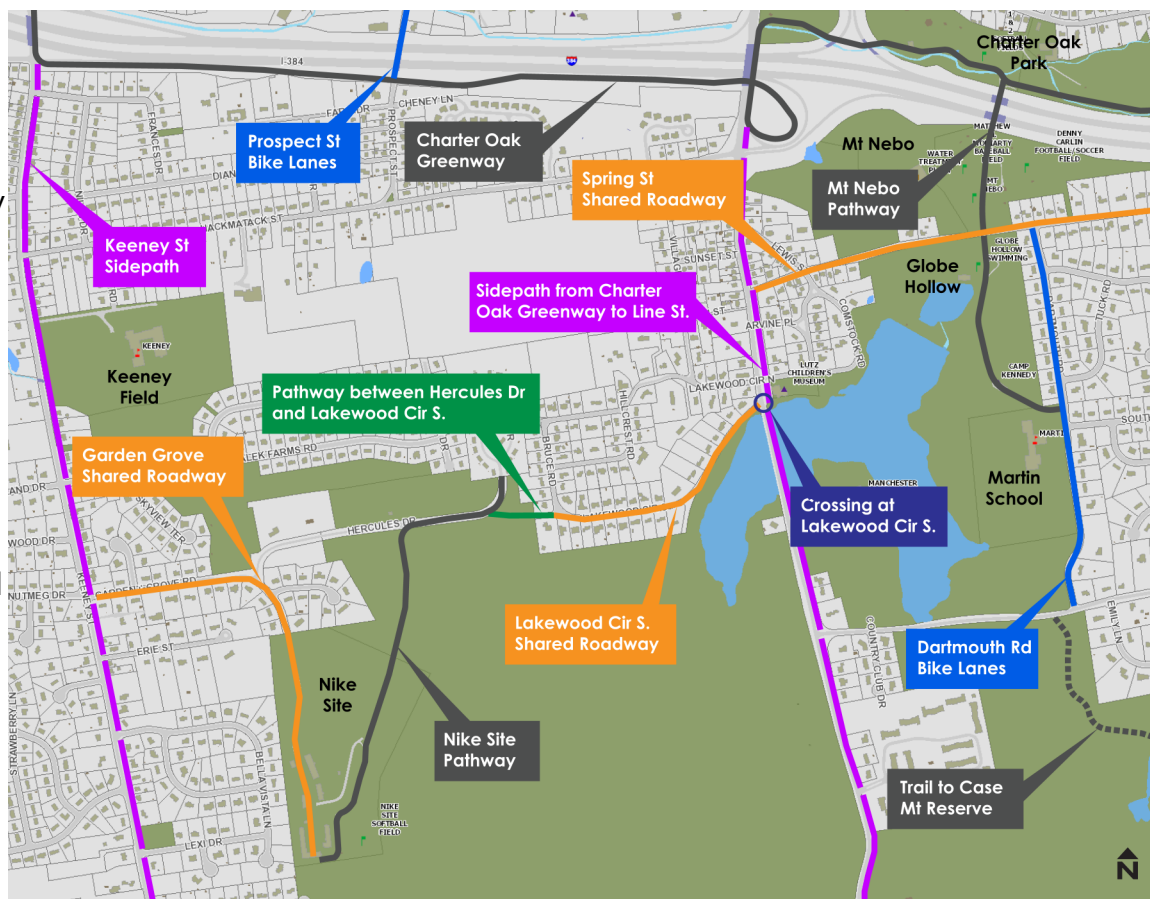
Focus Area 4

In addition to the Broad Street crossing, crossing improvements are needed at Strant Street at Main Street and Spruce Street at East Center Street to connect shared roadways to sidepaths in those areas.



## Focus Area 5

Focus Area 5 includes Charter Oak Park, Mt. Nebo, Globe Hollow, Martin School, Keeney Field, and the Nike Site. Existing bicycle and pedestrian infrastructure is limited to the Charter Oak Greenway and a limited sidewalk network. The Nike Site has many trails, most being narrow hiking or mountain biking trails blazed by local residents and visitors. The site does have a pathway and roadway that connects to Hercules Drive and holds potential for use as an accessible route. The construction of a short segment of pathway between Hercules Drive and Lakewood Circle South would facilitate a connection between the Nike Site and Mt. Nebo and Globe Hollow. That connection would be completed by providing a shared roadway on Lakewood Circle South and a sidepath on the east side of South Main Street between Lakewood Circle South and Spring Street. A shared roadway on Spring Street would connect to Mt. Nebo, Globe Hollow, and the Charter Oak Greenway, and it would continue east to the Case Mountain Reserve.



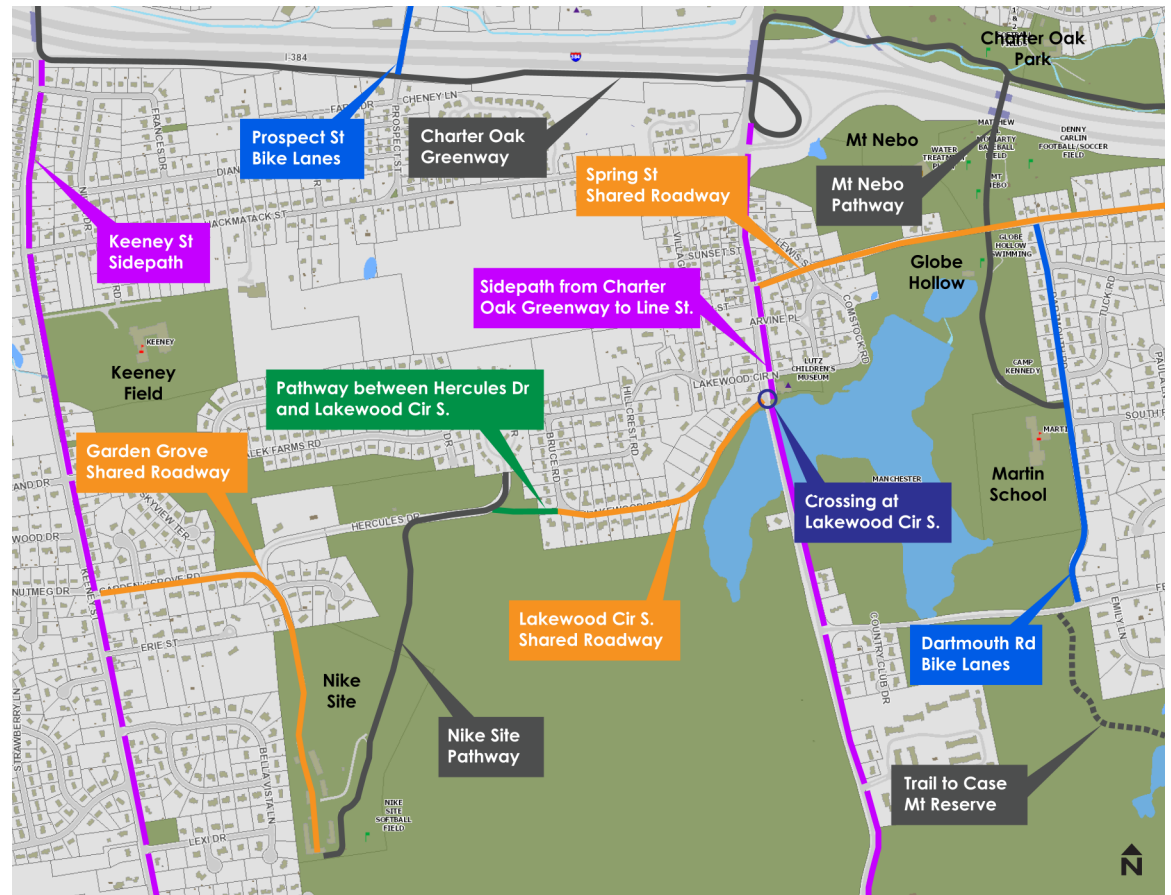
Focus Area 5



## Focus Area 5 (cont'd)

Additional recommendations include the installation of bike lanes on Dartmouth Road that would connect to the Spring Street, the Mt. Nebo pathway, Martin School, and the Case Mountain Reserve trail system. The installation of bike lanes on Prospect Street would provide a connection over I-384 toward the Mahoney Recreation Center. Toward the west, a sidepath on Keeney Street would provide a north/south connection through the area and would connect to a shared roadway at Garden Grove Road and the Nike Site.

Recommended improvements would use existing roadway crossings. Crossing improvements would be needed at South Main Street and Lakewood Circle South to connect the shared roadway on Lakewood Circle South to the sidepath on South Main Street.

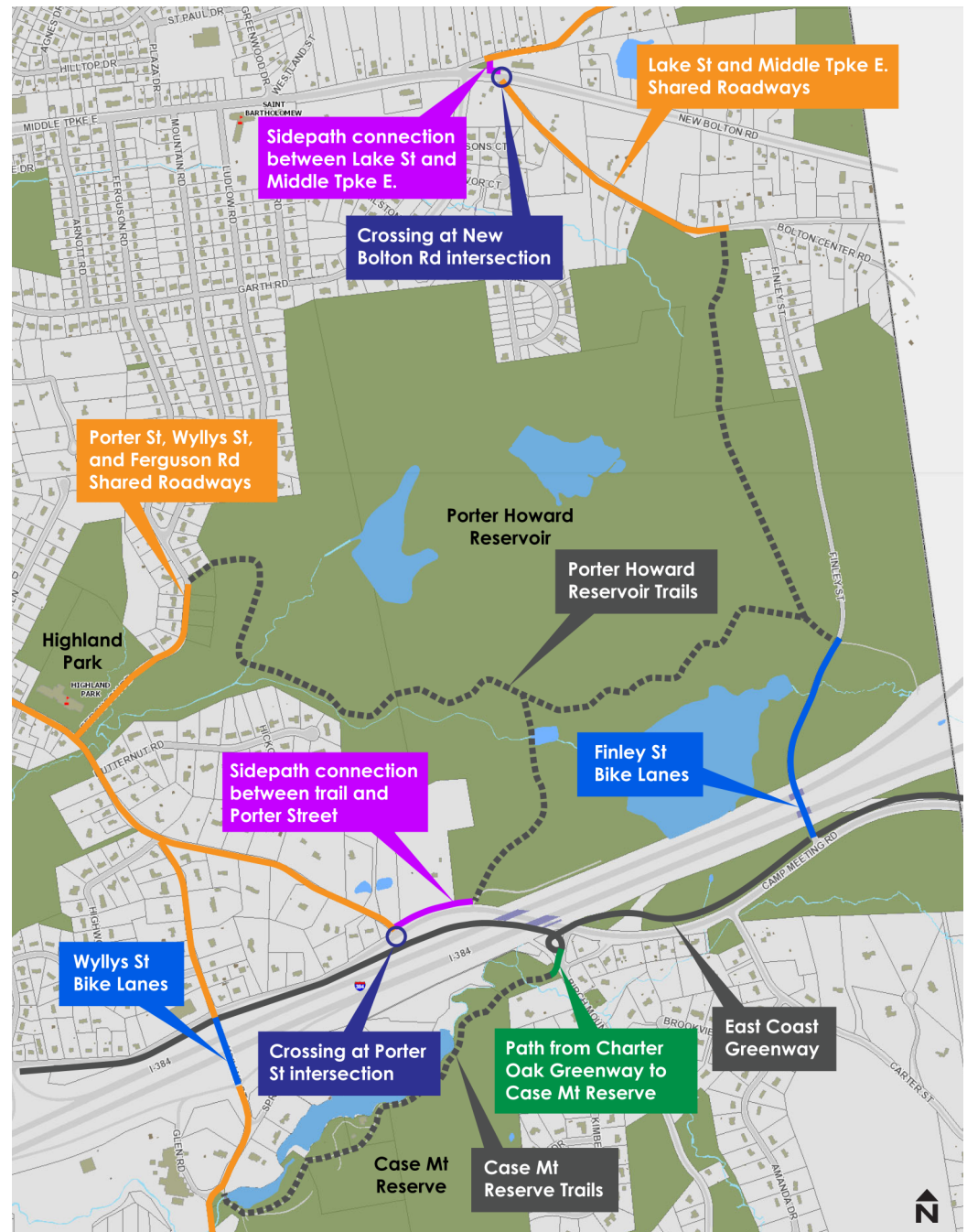


Focus Area 5

## Focus Area 6

Focus Area 6 includes connections on the east side of Town between the Porter Howard Reservoir, Highland Park, the Case Mountain Reserve, and the Charter Oak Greenway. Those connections are provided by a combination of shared roadways, bike lanes, short segments of pathway, and existing or improved pathways and trails.

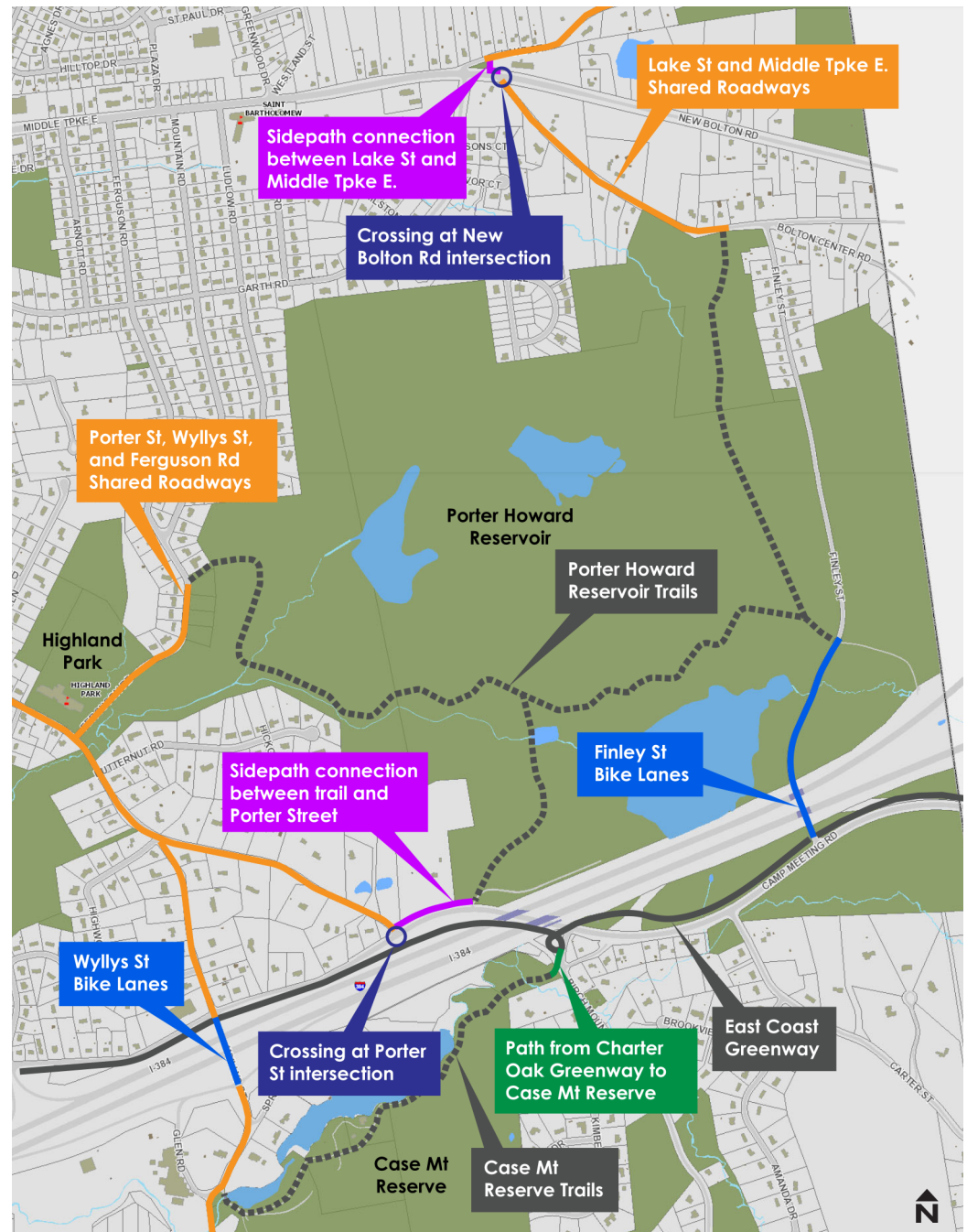
Highland Park and Case Mountain Reserve would be connected by shared roadways on Ferguson Road, Porter Street, and Wyllys Street. These low-volume residential roadways are suitable for bicycling or walking on the roadway. A short segment of bike lane could be accommodated on the Wyllys Street bridge across I-384 where there is sufficient shoulder space for their provision. A north/south connection on the eastern edge of Town would be provided by shared roadways on Lake Street and Middle Turnpike East, connecting to existing trails at the Porter Howard Reservoir and to bike lanes on Finley Street. The trail connection on the Porter Howard Reservoir property along Finley Street may need improvement to accommodate all users. Alternatively, the shared roadway could be continued on Finley Street (traffic speed data would need to be collected and potential traffic calming measures may need to be employed to assure that this stretch of the roadway is suitable for shared use).



Focus Area 6

## Focus Area 6 (cont'd)

Connections to Case Mountain Reserve and its trail system would be provided from a shared roadway at the Spring Street entrance. Connections at Birch Mountain Road would be provided by segment of pathway between the Charter Oak Greenway and Birch Mountain Road entrance of the Reserve. Significant grading would be required to facilitate this connection, but this improvement would provide a valuable connection.



Focus Area 6

## Phasing of Improvements

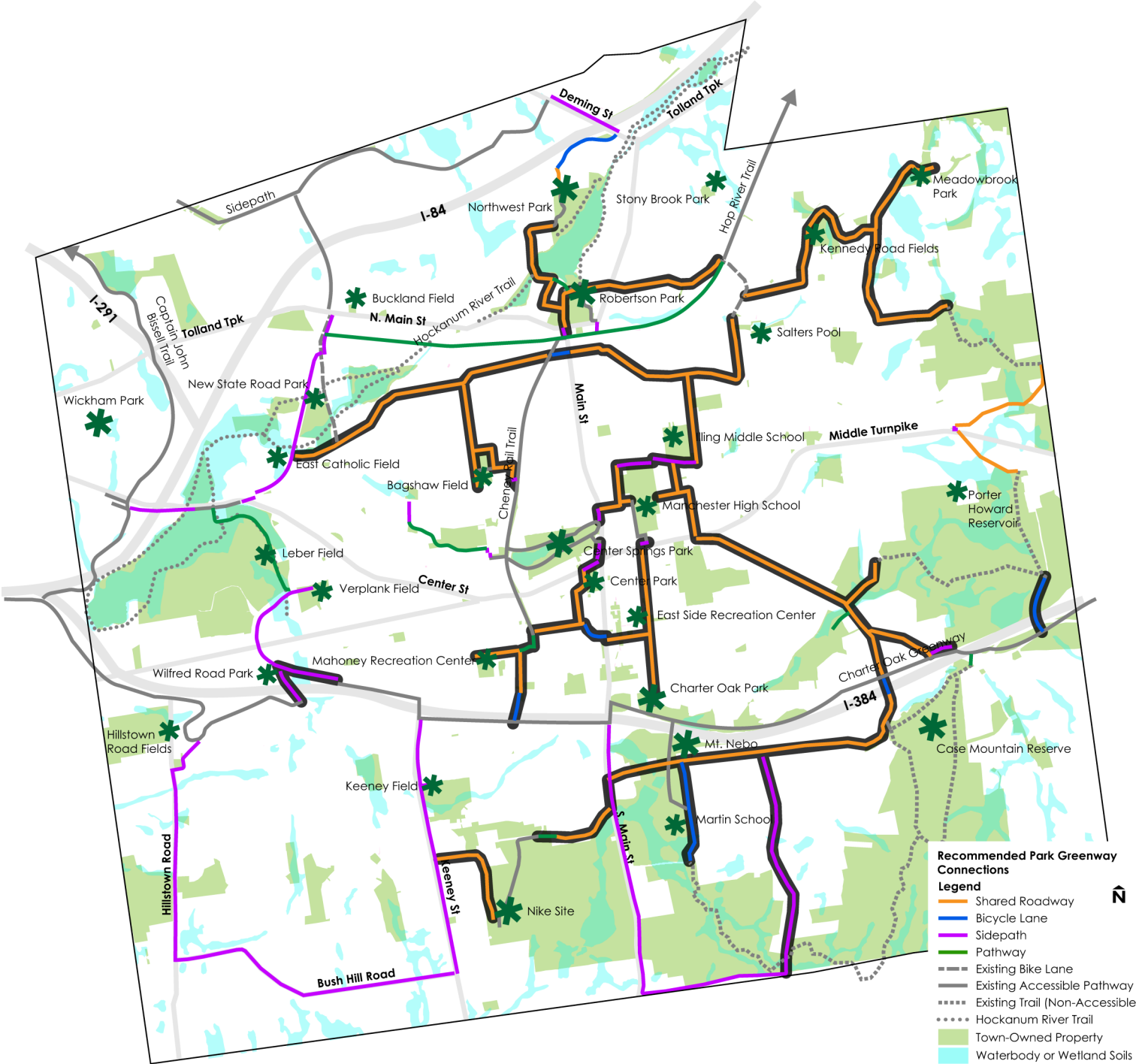
The parks connectivity network will not be constructed or implemented all at once. It will require several years and perhaps a decade or more to build out the recommended network. Many of the recommendations of this plan, such as shared roadways, can be implemented at a relatively low cost and do not require extensive design. Other facilities, such as shared use pathways that are more costly but would provide important links in the network (e.g. extension of the Cheney Rail Trail to Pine Street) should be prioritized.

The recommendations of this plan are organized into three phases. Phase 1 segments of the network are recommended for near-term improvements. Phase 2 segments should follow completion of Phase 1 improvements, and Phase 3 segments are measures that are likely to take several years to fund, design, and construct. The recommended phases of this plan do not preclude a Phase 2 or Phase 3 segment from moving forward in the near term or prior to Phase 1 segments being completed.



# Phase 1 Improvements

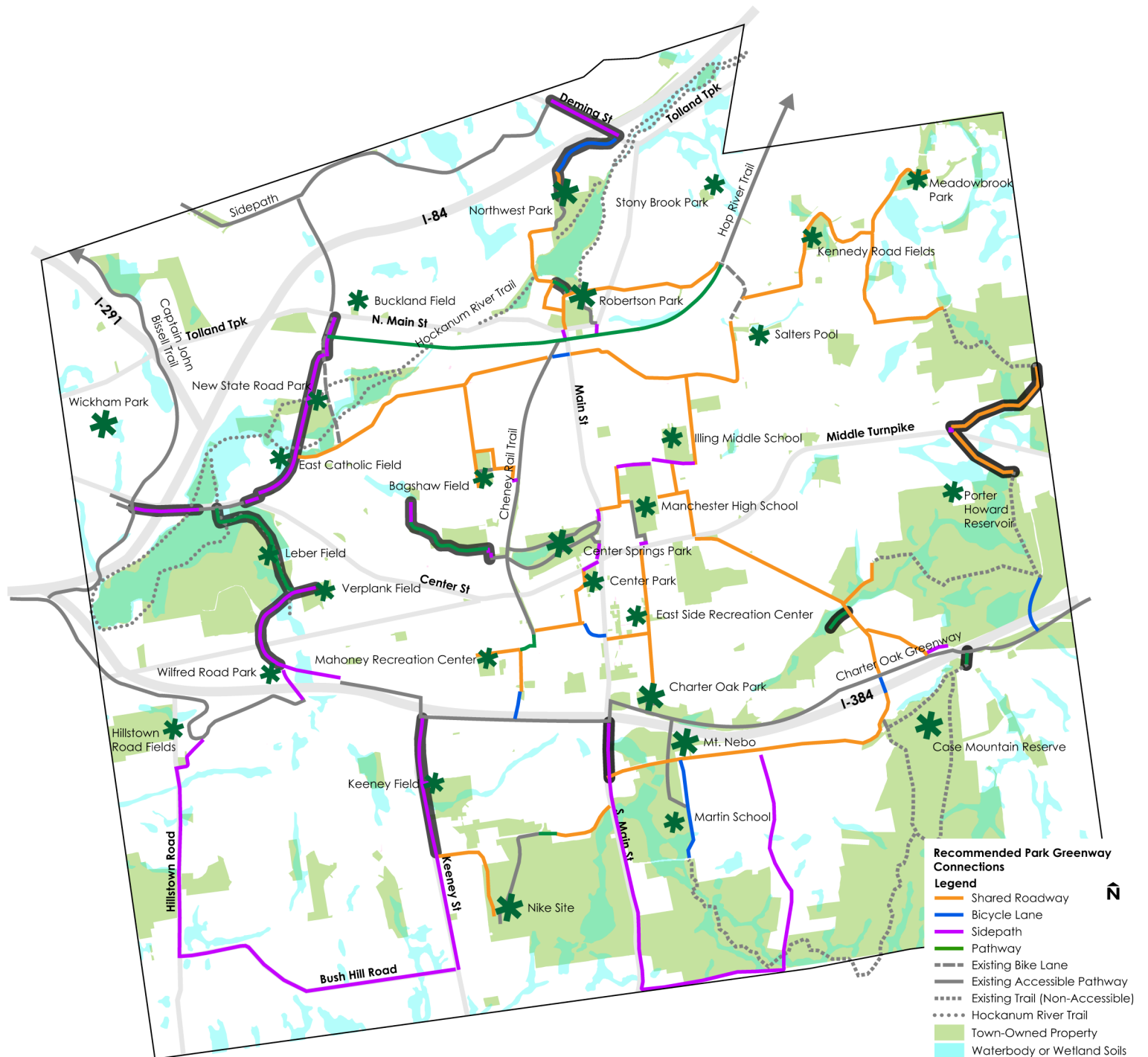
The Phase 1 improvements include 21.7 miles of facilities and two roadway crossings. Improvements are outlined in black on the map to the right.





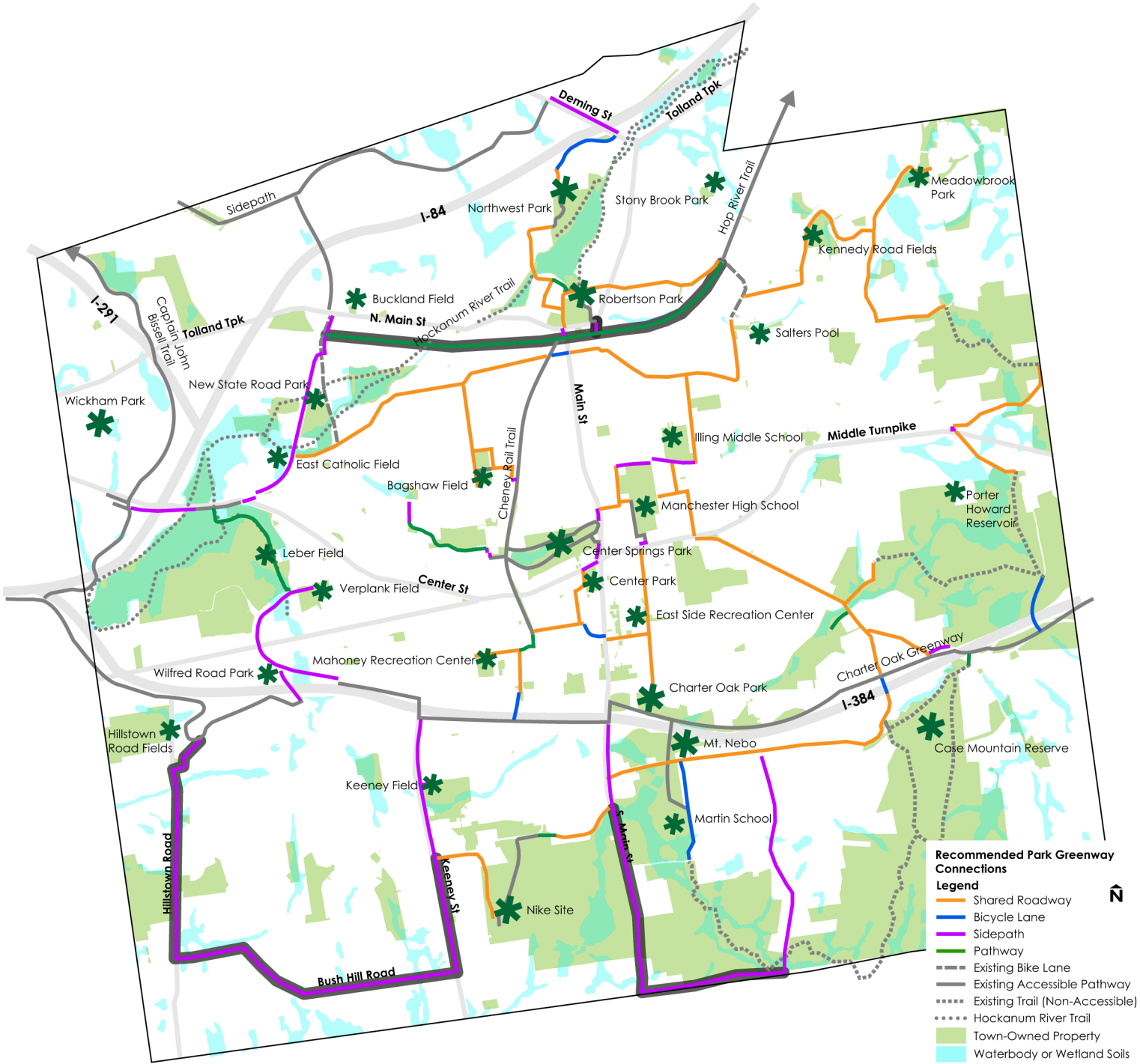
## Phase 2 Improvements

The Phase 2 improvements include 5.6 miles of facilities and two roadway crossings. Improvements are outlined in black on the map to the right.



### Phase 3 Improvements

The Phase 3 improvements include 6.3 miles of facilities and one roadway crossing. This includes extension of the Hop River Trail and the construction of sidepaths on Keeney Street, Bush Hill Road, and Hillstown Road. Improvements are outlined in black on the map to the right.



## Maintenance of the Parks Network

The Town should maintain Town-owned facilities to a level that protects public safety and supports the longevity of its parks network infrastructure. Best practices for maintenance of pedestrian and bicycle facilities should be employed while balancing department budgets and public expectations.

Maintenance policies and practices are intended to:

- Improve safety by reducing or eliminating hazards
- Deter nuisances such as vandalism, littering, trespassing, and unauthorized uses
- Encourage the use of facilities for transportation and recreational use
- Support positive relations between the Town and adjacent landowners
- Prolong the life of the facilities

Practices and frequencies for various maintenance activities (e.g., sweeping, surface repairs, pavement marking, landscaping, etc.) should be established by the responsible Town department and in consultation with other affected departments and volunteer organizations. For example, the Department of Public Works, responsible for roadway and parks maintenance, should lead the effort to establish practices and frequencies for the activities related to road sweeping and surface repairs. In addition, the Town should meet with representatives of volunteer organizations that maintain segments of pathways on an annual basis, preferably in the winter or early spring, to discuss planned maintenance and maintenance needs for the year.



Figure 3.28: Faded crosswalk markings at I-384 ramp crossing of the Charter Oak Greenway. Pavement markings on the pathway, installed at the same time, remain in good condition. *Image credit: Google Earth*

## Maintenance of the Parks Network (cont'd)

Specific maintenance recommendations include the following:

### Shared Use Pathways and Sidepaths

- Repair pavement to be in good-to-excellent condition with occasional cracks, but no bumps or potholes
- Maintain stone dust surfaces sufficiently to minimize puddling and erosion
- Mow adjacent lawn areas weekly
- Remove leaves in the fall
- Sweep pathways in the spring, summer, and fall
- Maintain pathways on and adjacent to Town properties with snow removed to a minimum of three feet of passage immediately following snow events, and complete clearing of snow as the Department of Public Works' capacity and schedule allows. Removal of snow from pathways will improve the life span of the pavement.
- Maintain drainage and water crossing infrastructure as needed
- Repair and replace deteriorated, failing, and damaged railings and fencing on an annual basis
- Restore pavement markings as needed with epoxy pavement markings. The typical life span of epoxy pavement markings on pathways is 5 to 6 years but pavement markings for road crossings exposed to motor vehicle traffic may be less.

### Bike Lanes and Shared Roadways

- Maintain on the same schedule as the roadway on which they are located
- Sweep in the spring, summer, and fall – the roadways with bike lanes and shared roadways should be the priority
- Restore pavement markings as needed with epoxy pavement markings. The typical life span of epoxy pavement markings is four years but may be less in highly trafficked areas.

## Cost Estimates

The total cost of implementing the proposed improvements is approximately \$10 million. That cost is spread across three phases as follows:

Phase 1:	\$1,244,500
Phase 2:	\$3,798,250
<u>Phase 3:</u>	<u>\$4,980,000</u>
<b>Total:</b>	<b>\$10,022,750</b>

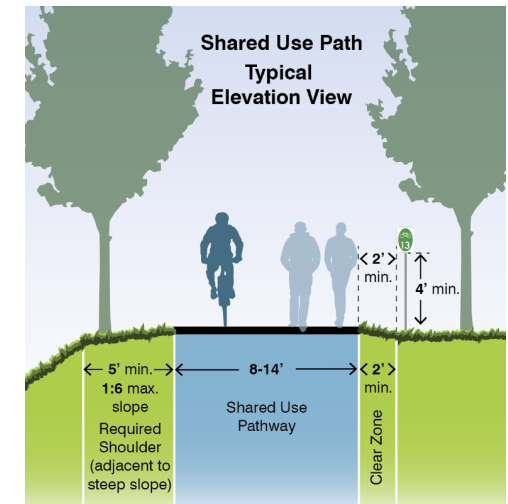
The most costly facilities to construct are shared use pathways, which often require extensive site work including grading, drainage improvements, bridges or culverts, and fences or railings. These facilities have a typical unit cost of \$200 per linear foot compared to \$100 per linear foot for sidepaths, \$10 per linear foot for bike lanes, and \$2.50 per linear foot for shared roadways.

The actual cost of improvements is likely to vary from this estimate due to conditions that are unique to each of the proposed facilities, variations in material costs, construction bids received, and other unknown factors. This cost estimate is intended for use in budgeting for improvements and for the procurement of grants that would assist in financing the proposed improvements.

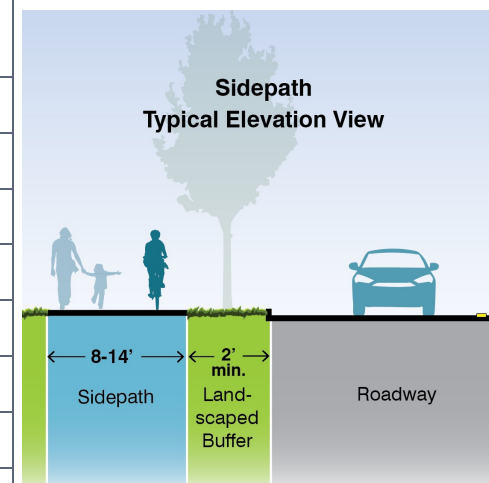


## Shared Use Pathways

Facility Name	Length (lf)	Unit Cost (per lf)	Cost	Phase
Cheney Rail Trail Extension	600	\$200	\$120,000	1
Nike Site	500	\$200	\$100,000	1
Bigelow Brook Trail	2,400	\$200	\$480,000	2
Case Mt./C.O.G. Link	200	\$500	\$100,000	2
Highland Park	400	\$200	\$80,000	2
Robertson Park	400	\$200	\$80,000	2
Verplank Trail	4,400	\$200	\$880,000	2
Hop River Rail Corridor	13,000	\$150	\$1,950,000	3
<b>Total</b>	<b>21,900</b>		<b>\$3,790,000</b>	

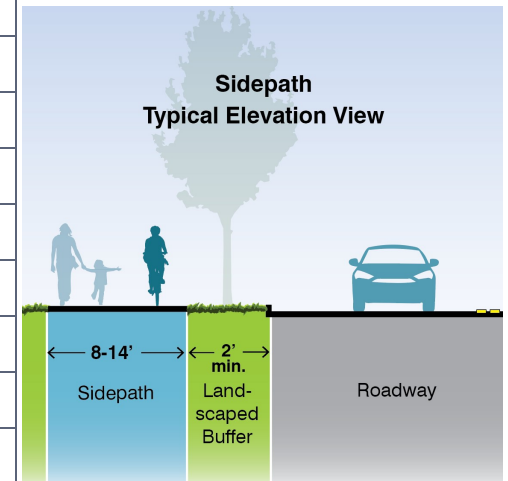


Sidepaths					
Street Name	Length (lf)	Unit Cost (per lf)	Cost	Phase	Notes
Bidwell Street	1,100	-	\$0	1	Funded
Gardner Street	6,800	-	\$0	1	Funded
Greenbrook Manor	500	\$100	\$50,000	1	
Harford Road (Bidwell to C.O.G.)	1,800	-	\$0	1	Funded
Middle Turnpike East	2,000	\$100	\$200,000	1	
Middle Turnpike West	2,900	\$100	\$290,000	1	
Main Street	250	\$100	\$25,000	1	
South Main Street	1,250	\$100	\$125,000	1	
South Main Street	1,300	\$100	\$130,000	2	
South Main Street	5,700	\$100	\$570,000	3	
Adams Street	1,300	\$100	\$130,000	2	
Broad Street	400	\$100	\$40,000	2	
Camp Meeting Road	600	\$100	\$60,000	2	
Center Street	400	\$100	\$40,000	2	
Deming Street	2,300	\$100	\$230,000	2	
E. Center Street	100	\$100	\$10,000	2	
(sidepath total cont'd on next page)					



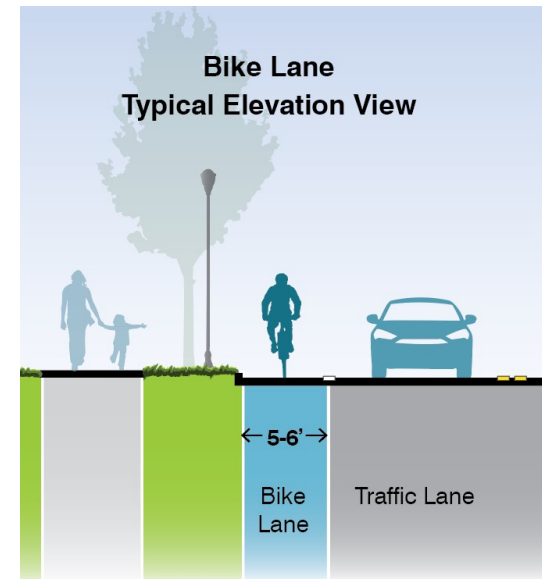
## Sidepaths (cont'd)

Street Name	Length (lf)	Unit Cost (per lf)	Cost	Phase	Notes
Hartford Road (Bidwell to Spencer St.)	1,000	\$100	\$100,000	2	
Keeney Street (north of Garden Grove)	4,300	\$100	\$430,000	2	
Line Street	4,500	\$100	\$450,000	3	
New Bolton Road	200	\$100	\$20,000	2	
New State Road	4,900	\$100	\$490,000	2	
Olcott Street	3,000	\$100	\$300,000	2	
Oakland Street	200	\$100	\$20,000	3	
Bush Hill Road	9,000	\$100	\$900,000	3	
Founders Drive	900	\$100	\$90,000	3	
Hillstown Road	5,700	\$100	\$570,000	3	
Keeney Street (south of Garden Grove)	3,500	\$100	\$350,000	3	
Wetherell Street	700	\$100	\$70,000	3	
<b>Total</b>	<b>66,600</b>		<b>\$ 5,690,000</b>		



## Bike Lanes

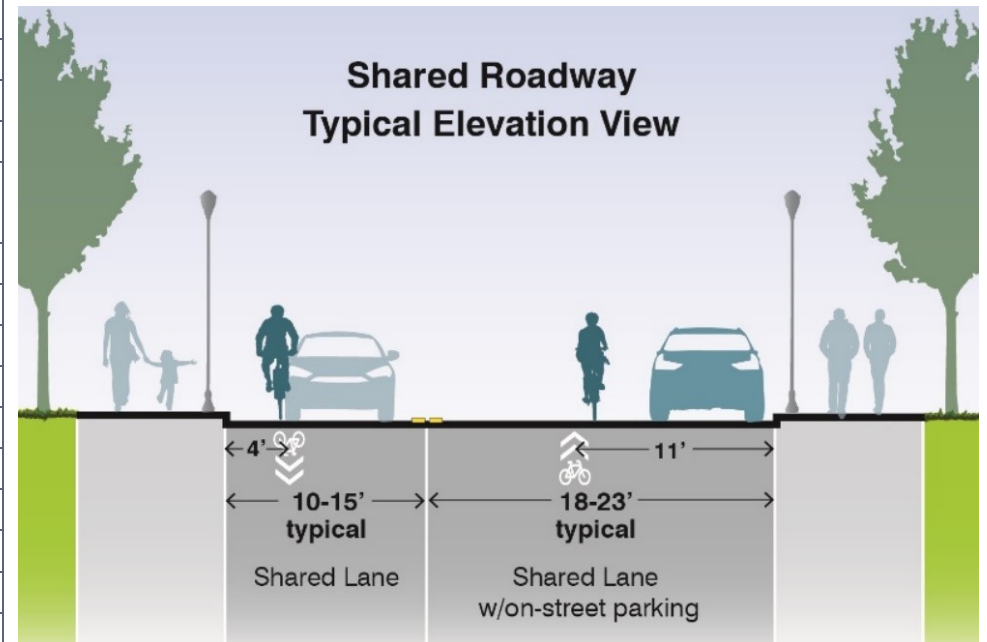
Street Name	Length (lf)	Unit Cost (per lf)	Cost	Phase
Hilliard Street	500	\$10	\$ 5,000	1
St. James Place	800	\$10	\$ 8,000	1
Prospect Street	1,100	\$10	\$ 11,000	1
Dartmouth Road	3,100	\$10	\$ 31,000	1
Wyllys Street	500	\$10	\$ 5,000	1
Finley Street	1,500	\$10	\$15,000	1
Tolland Turnpike	2,200	\$10	\$ 22,000	2
<b>Total</b>	<b>9,700</b>		<b>\$ 97,000</b>	



## Shared Roadways

Street Name	Length (lf)	Unit Cost (per lf)	Cost	Phase
Branford Street	900	\$2.50	\$2,250	1
Broad Street	3,200	\$2.50	\$8,000	1
Chestnut Street	300	\$2.50	\$750	1
Church Street	1,000	\$2.50	\$2,500	1
Durkin Street	900	\$2.50	\$2,250	1
Eldridge Street	1,300	\$2.50	\$3,250	1
Ferguson Street	1,600	\$2.50	\$4,000	1
Garden Grove Road	2,900	\$2.50	\$7,250	1
Golway Street	600	\$2.50	\$1,500	1
Green Road	4,400	\$2.50	\$11,000	1
Hilliard Street	9,300	\$2.50	\$23,250	1
Homestead Street	300	\$2.50	\$750	1
Hudson Street	900	\$2.50	\$2,250	1
Hunniford Street	300	\$2.50	\$750	1
Irving Street	1,100	\$2.50	\$2,750	1
Kennedy Drive	4,600	\$2.50	\$11,500	1
Kerry Street	500	\$2.50	\$1,250	1
Lakewood Circle South	2,000	\$2.50	\$5,000	1
Lenox Street	1,400	\$2.50	\$3,500	1
Linden Street	500	\$2.50	\$1,250	1
Lydall Street	2,300	\$2.50	\$5,750	1
Meadowbrook Drive	500	\$2.50	\$1,250	1
N. School Street	2,500	\$2.50	\$6,250	1
North Street	800	\$2.50	\$2,000	1

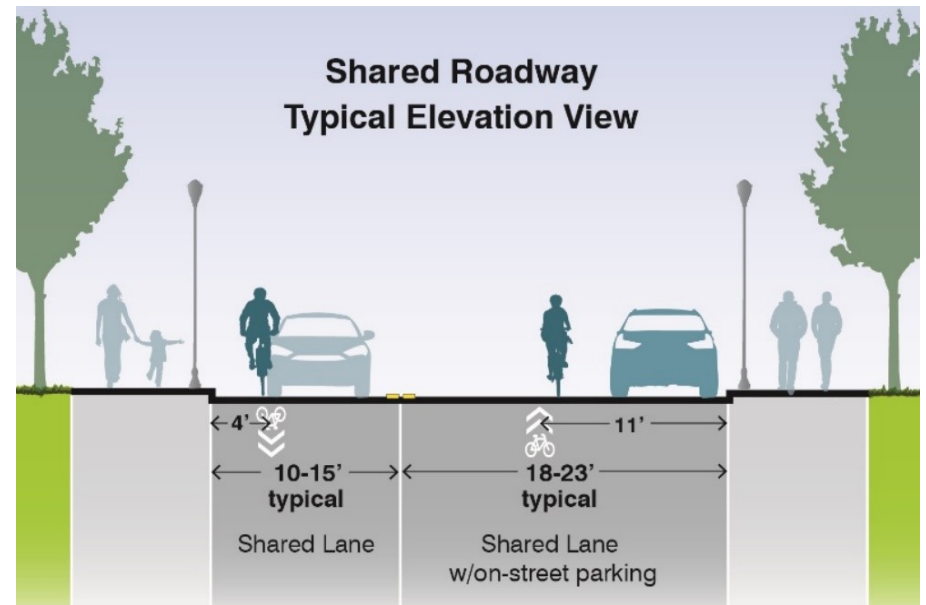
(shared roadway total cont'd on next page)





## Shared Roadways

Street Name	Length (lf)	Unit Cost (per lf)	Cost	Phase
Park Street	1,400	\$2.50	\$3,500	1
Parker Street	1,900	\$2.50	\$4,750	1
Pine Street	1,200	\$2.50	\$3,000	1
Pleasant Street	1,400	\$2.50	\$3,500	1
Porter Street	8,200	\$2.50	\$20,500	1
Princeton Street	2,700	\$2.50	\$6,750	1
Scott Drive	1,900	\$2.50	\$4,750	1
Sheldon Street	3,600	\$2.50	\$9,000	1
Spring Street	9,900	\$2.50	\$24,750	1
Spruce Street	4,500	\$2.50	\$11,250	1
Strant Street	600	\$2.50	\$1,500	1
Summit Street	1,200	\$2.50	\$3,000	1
Union Place	500	\$2.50	\$1,250	1
Union Street	1,500	\$2.50	\$3,750	1
Vernon Street	5,100	\$2.50	\$12,750	1
Windemere Street	600	\$2.50	\$1,500	1
Wyllys Street	1,500	\$2.50	\$3,750	1
Lake Street	3,500	\$2.50	\$8,750	2
Middle Turnpike East	2,200	\$2.50	\$5,500	2
Northwest Park Driveway	800	\$2.50	\$2,000	2
<b>Total</b>	<b>98,300</b>		<b>\$245,750</b>	



## Road Crossings

Location	Facility Type	Cost	Description	Phase
Lakewood Cir. South at S. Main St	Mid-block crosswalk	\$10,000	Curb ramps, crosswalk, and crosswalk signage needed to accommodate road crossing of proposed sidepath/ shared roadway	1
Charter Oak Greenway at Porter St	Crosswalk at non-signalized intersection	\$20,000	Curb ramps, path segment, crosswalk, and crosswalk signage needed to accommodate road crossing between Greenway and proposed Howard Reservoir sidepath and shared roadway at Porter Street	1
New State Rd at Adams St	Crosswalk at existing signalized intersection	\$60,000	Crosswalk, Curb Ramps, Pedestrian Signal Heads and Actuator needed at existing signalized intersection to accommodate road crossing of proposed sidepath	2
Middle Turnpike East and New Bolton Rd	Mid-block crosswalk	\$100,000	Mid-block crosswalk needed to accommodate shared roadway crossing of New Bolton Road connecting Middle Turnpike East to Lake Street. May require pedestrian actuated signal and pedestrian refuge island	2
Bush Hill Rd at Keeney St	Mid-block crosswalk	\$10,000	Curb ramps, crosswalk, and crosswalk signage needed to accommodate road crossing of proposed sidepath	3
<b>Total Cost</b>		<b>\$200,000</b>		