

# NMCOG Greater Lowell Bicycle and Pedestrian Plan

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Existing Conditions



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# Vision and Goals

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## *Vision*

The Northern Middlesex region is a cohesive region where people walking, rolling, bicycling, wheeling, and taking transit feel **safe** and **comfortable** across its nine municipalities. People using **active modes** of transportation **for travel and for recreation** is the norm, and more people choose active modes.

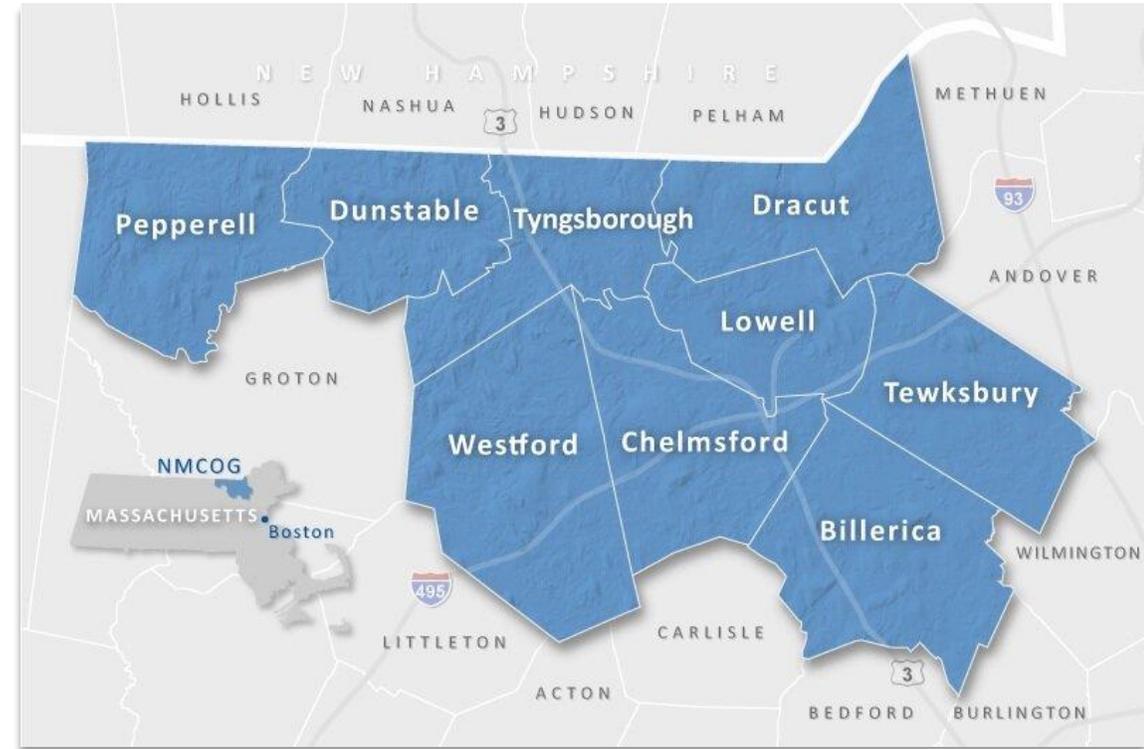
## *Goals*

1. Develop a cohesive and connected network
2. Promote safe and comfortable facilities
3. Increase walking and bicycling for both recreational and utility purposes
4. Ensure equitable and accessible access to active transportation and transit facilities
5. Educate the region on safety practices for walking and bicycling
6. Support and enhance housing and economic development in town/city centers

# Existing Conditions Assessment

This report sets the baseline for existing walking and bicycling conditions across the greater Lowell region. It covers the following sections:

1. Existing Plans and Studies
2. Infrastructure Inventory
3. Safety Analysis
4. Demographics
5. Destinations
6. Active Transportation Demand
7. Summary



# Existing Plans and Studies

# Existing Plans and Studies in the NMCOCG Region

This section details past plans and studies related to transportation in the Greater Lowell region, including regional and municipal plans. Plan reviews aim to extract areas of alignment between the vision and goals of this plan and past plans, and recommendations that would help further those goals. Municipal plans were selected based on their relevance and recency – for some municipalities this means including a bicycle and pedestrian focused plan, and for others it means including an Open Space and Recreation Plan (OSRP).

## Regional Plans

- Envision 2050: Long-Range Transportation Plan (2023)
- Greater Lowell Vision Zero Plan (2024)

## Municipal Plans

- Billerica Master Plan (2018)
- Billerica OSRP (2024)
- Chelmsford Bicycle and Pedestrian Plan (2021)
- Dracut Master Plan (2020)
- Dunstable Master Plan (2018)
- Lowell Forward Comprehensive Plan (2024)
- Go Lowell Plan: Lowell Multimodal Complete Streets Plan (2021)
- Pepperell Master Plan (2020)
- Tewksbury Pedestrian Mobility Master Plan (2017)
- Tyngsborough Master Plan (2004)
- Tyngsborough OSRP (2018)
- Westford Comprehensive Master Plan (2009)
- Westford OSRP (2018)



Each plan summary includes (1) Vision and Goals, (2) Purpose and Need, and (3) Related Recommendations, with an accompanying map, if provided. Note that not all goals, recommendations, etc. from each plan are summarized here, only those that pertain to walking and bicycling.

# Existing Plans and Studies: Regional

# Envision 2050: Long-Range Transportation Plan (2023)

## Vision and Goals

- Improve the safety of the transportation system for all users
- Ensure that the transportation network supports economic development and accommodates future economic growth
- Efficiently manage existing transportation assets and infrastructure
- Minimize and mitigate the impacts of the transportation system on the environment, including air quality, water quality, wildlife, and climate change
- Provide fair and equitable transportation access and service quality for all communities

## Purpose and Need

- Identifies and analyzes transportation infrastructure and improvement for the region's transportation system
- Serves as the policy framework for future investment in bicycle and pedestrian network

## Related Recommendations

- Bicycle and pedestrian improvement projects make up 4% of the programming in the FFY 2024-2028 TIP
- Both FFY 2034-2038 and FFY 2039-2043 will have 20% of the programming for active transportation improvement projects
- Lowell's Upper Pawtucket Canalway Construction project
- Billerica's Yankee Doodle Bike Path Construction (Phase I)
- Dracut's Improvements at George Englesby Elementary School Safe Routes to School

# Greater Lowell Vision Zero Plan (2024)

## Vision and Goals

- Value the safety of all people using the transportation network and apply an equitable approach to inform and eliminate deaths and serious injuries in the region by the year 2050
- Maintain and build safe transportation infrastructure that enhances safety, accessibility, and efficiency for all road users

## Purpose and Need

- Position NMCOG communities to pursue federal funding through USDOT Safe Streets and Roads for All (SS4A) discretionary grant program
- Encourage NMCOG communities to rethink their approach to safety and ensuring zero fatal and serious injuries occur on their roadways

## Related Recommendations

- Prioritize local and regional transportation projects and plans that address the Priority Network
- Improve access and connectivity to multiple transportation modes
- Host a regional Safety Summit to raise awareness of Complete Streets Programs, successes, and strategies, and to advance understanding of mobility and vulnerable road users
- Partner with non-profits, schools, universities, and other partners to support vulnerable roadway users
- Improve snow clearance procedures on roads, sidewalks, and bike/multi-use facilities across the Greater Lowell region to ensure safety for all roadway users
- Research, identify, and inform regional stakeholders of innovative transportation safety resources and changes to best practices for transportation safety

# Greater Lowell Vision Zero Plan (2024)

## Prioritized Project List

- The plan identified top priority locations for safety improvement projects, including at least one project in each municipality
- Tables in the plan detail which safety countermeasures are proposed as part of each project
- Maps in the Safety Analysis chapter show the full High Injury Network this list is based on

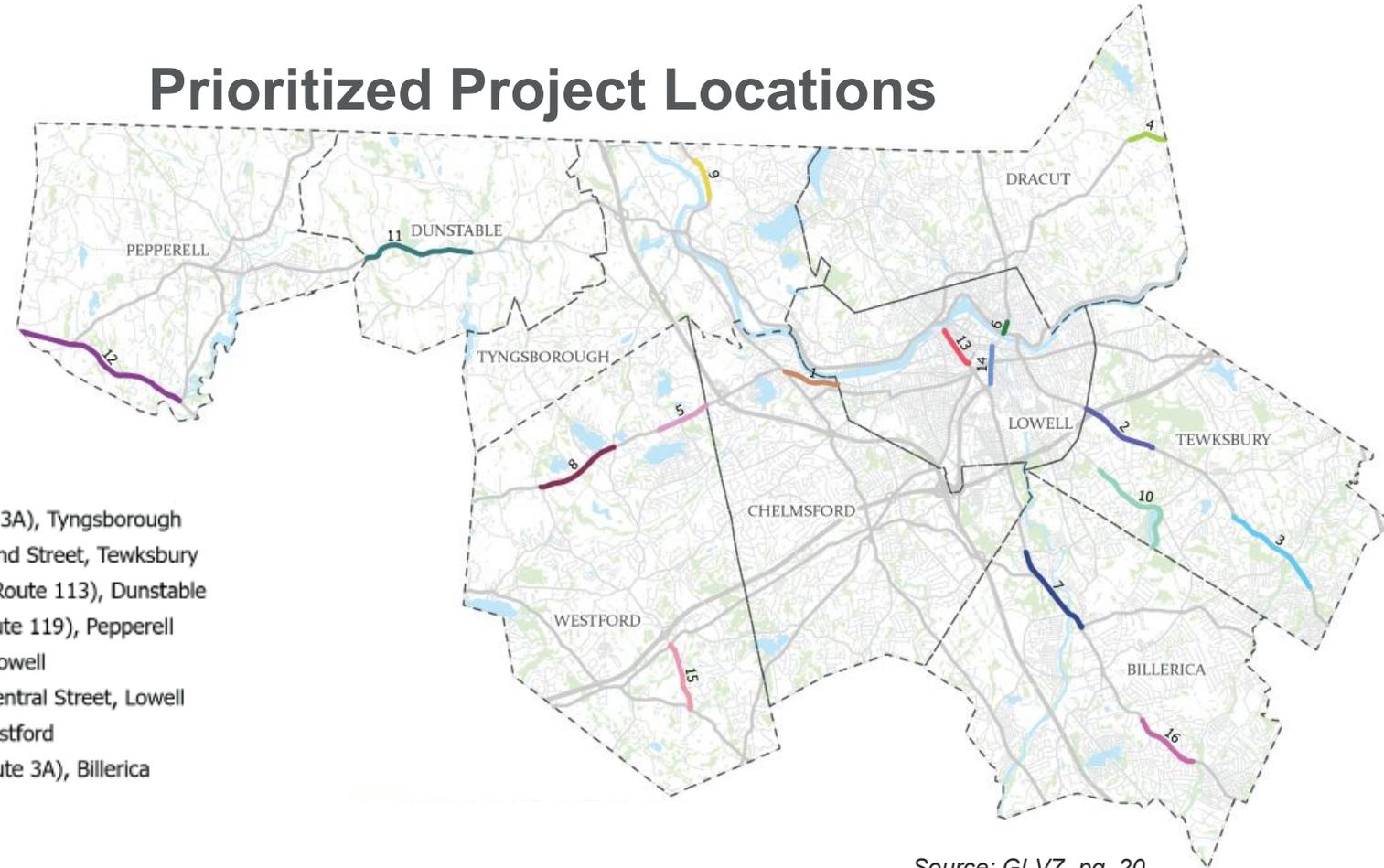
### Projects

- 1. Middlesex Street, Chelmsford
- 2. Main Street (Route 38), Tewksbury
- 3. Main Street (Route 38), Tewksbury
- 4. Broadway Road (Route 113), Dracut
- 5. Groton Road (Route 40), Westford
- 6. Bridge Street (Route 38), Lowell
- 7. Boston Road (Route 3A), Billerica
- 8. Groton Road (Route 40), Westford

- 9. Frost Road (Route 3A), Tyngsborough
- 10. Whipple Road/Pond Street, Tewksbury
- 11. Pleasant Street (Route 113), Dunstable
- 12. South Street (Route 119), Pepperell
- 13. Fletcher Street, Lowell
- 14. Gorham Street/Central Street, Lowell
- 15. Carlisle Road, Westford
- 16. Boston Road (Route 3A), Billerica

Source: GLVZ, pg. 20

### Prioritized Project Locations



Source: GLVZ, pg. 20



# Greater Lowell Vision Zero Plan (2024)

## Road Safety Audit Locations

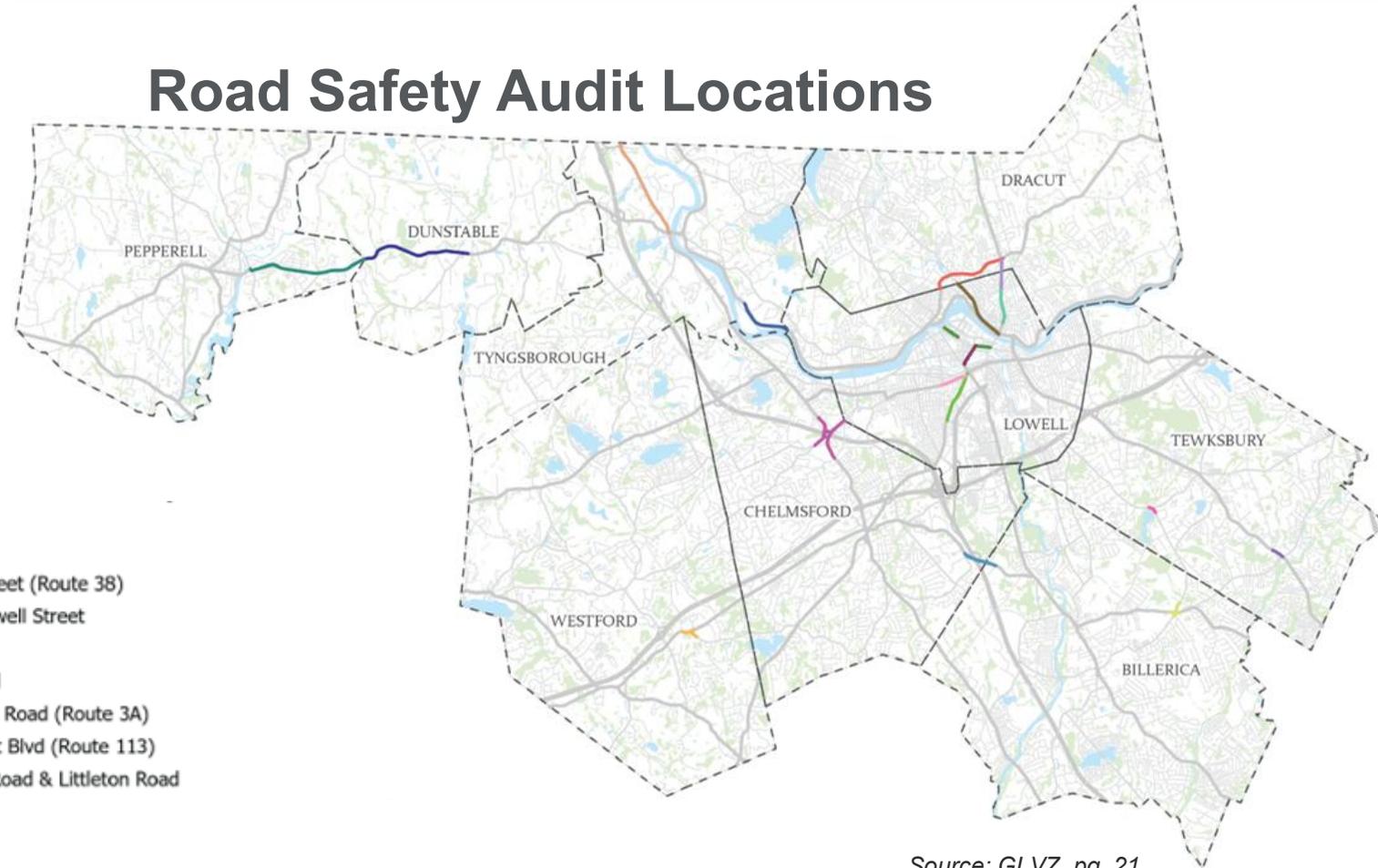
- The plan also included locations noted as municipal priorities, but which could not be readily advanced to a sufficient level in the plan, were identified for Road Safety Audits (RSAs)
- These deeper dives into crash patterns and behaviors will help develop a shared understanding of safety issues and potential solutions, which will then inform future projects

### Road Safety Audit Locations

- |  |  |
|--|--|
|  Billerica, Salem Road & Grey Street      |  Lowell, Merrimack Street                       |
|  Chelmsford, Drum Hill Rotary             |  Lowell, Westford Street                        |
|  Billerica/Chelmsford, Route 129          |  Lowell/Dracut, Bridge Street (Route 38)        |
|  Dracut, Pleasant Street (Route 113)     |  Pepperell, Tarbell and Lowell Street           |
|  Dunstable, Pleasant Street (Route 113) |  Tewksbury, Main Street                         |
|  Lowell, Bridge Street (Route 38)       |  Tewksbury, Whipple Road                      |
|  Lowell, Chelmsford Street (Route 110)  |  Tyngsborough, Middlesex Road (Route 3A)      |
|  Lowell, Dutton Street                  |  Tyngsborough, Pawtucket Blvd (Route 113)     |
|  Lowell, Lakeview Avenue                |  Westford, S Chelmsford Road & Littleton Road |

Source: GLVZ, pg. 21

### Road Safety Audit Locations



Source: GLVZ, pg. 21

# Existing Plans and Studies: Municipal

# Billerica Master Plan (2018)

## Vision and Goals

- Provide a more complete transportation system that will better serve the Town's population
- Become a bicycle and pedestrian friendly community by expanding existing bicycle and pedestrian facilities

## Purpose and Need

- A commitment to preserving the social, economic and natural heritages while embracing changes that will allow the Town to be a more desirable place to live, work, and play for all generations
- Develop a strategy on how to enhance the existing infrastructure to provide a more cohesive community that serves the needs of all of its residents

## Related Recommendations

- Seek funds to advance design and construction of the Yankee Doodle Bike Path
- Develop a townwide pedestrian and bicycle inventory and construction/maintenance plan
- New sidewalk construction in areas with gaps in the network and near schools and trip generators
- Upgrade existing pedestrian facilities to conform to current ADA standards
- Use signage and pavement markings for on-street bicycle network
- Educate community on bicycle safety and rules of the road
- Explore developing and adopting a Complete Streets policy
- Improve wayfinding signage
- Develop gateways at Town entrance points and land use transition points

# Billerica Open Space and Recreation Plan (2024)

## Vision and Goals

- Provide safe, connected, and enjoyable walking and bicycle access throughout Town, and beyond

## Purpose and Need

- Focus on priorities that are most likely to improve the quality of life for present and future residents and safeguard the environment
- Bicycle and pedestrian facilities are minimal throughout most of the Town

## Related Recommendations

- Adopt a bike/pedestrian committee
- Ensure completion of planned Yankee Doodle Bike Path from the southern Town line of Billerica to North Billerica and beyond
- Develop a townwide sidewalk and bike network plan
- Improve the sidewalk network around Nutting Lake
- Investigate the potential for a trail or multi-use path within utility easements

- Install bike racks at all publicly accessible Town-owned lands including municipal buildings and conservation/recreation areas
- Complete the Bay Circuit Trail through Billerica
- Add a bike path through Town Center
- Look for opportunities to connect existing open space and recreation areas with walking and bicycle routes
- Specific connections:
  1. Connect Cider Mill Land and Fox Hill by adding a sidewalk/crosswalk across Andover Road (Bay Circuit Gap related)
  2. Work with the Town of Chelmsford and NMCOG to connect the Yankee Doodle Bike Path with the Bruce Freeman Rail-Trail by utilizing the Middlesex Canal Towpath
  3. Improve bike safety on the portion of Lowell Street identified as a Bike/Ped Priority Roadway by MassDOT
  4. Identify a viable connection and create a trail or walking path between Fox Hill and the Middlesex Canal Tow Path (Bay Circuit Gap related)

# Chelmsford Bicycle and Pedestrian Plan Update (2021)

## Vision and Goals

- A community where people can travel throughout the Town safely without using motorized transportation
- Create a comprehensive view of bicycle and pedestrian related activities with the goal of making the Town a more bicycle and pedestrian friendly community

## Purpose and Need

- The 2010 Master Plan called for the creation of a comprehensive Bicycle and Pedestrian Plan for the Town, which was created in 2015
- This plan serves as the five-year update to the 2015 Bicycle and Pedestrian Plan

## Related Recommendations

- Adopt a public process for prioritizing bicycle and pedestrian infrastructure projects
- Expand bike and pedestrian educational activities such as expanding the Safe Routes to School Program for middle school and developing bicycle classes for learning to repair and ride bikes.
- Complete gaps in sidewalk connections along Old Westford Road, Concord Road, Groton Road, School Street, Main Street, Route 4, Westford Street, Tyngsboro Road, Mill Road, Riverneck Road, Brick Kiln Road, Alpine Lane, Carlisle Street, and Center Village
- Install crosswalks at Oak Street near Woodland Square, Richardson Road/Graniteville Road, Lakeside Avenue, and at 9 Acton Road
- Add crosswalk signage at Kate's Corner, Steadman Street/Smith Street, at the middle schools
- Rebuild sidewalks on Fletcher Street
- Develop a bike and pedestrian route between Vinal Square and Chelmsford Center
- Add bike lanes to Littleton Road, Princeton Street
- Add sharrow markings on selected streets

# Dracut Master Plan (2020)

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## Vision and Goals

- Incorporate bicycle and pedestrian accommodations in future transportation
- Address the transportation needs of all residents, including seniors and those with disabilities
- Ensure that the Town's transportation system is as safe as possible

## Purpose and Need

- Understand and manage future growth in the Town
- Shape the future of the Town that does not detract from its quality of life and character

## Related Recommendations

- Develop a plan to expand the Town's sidewalk network to close gaps and improve connectivity and safety
- Expand sidewalk network near Lakeview Avenue school complex, the Campbell and Greenmont schools, and the area around the Senior Housing
- Prioritize pedestrian connections between the Town Center and Loon Hill Road
- Identify opportunities to design and construct off-road multi-use trails
- Update the townwide Trail Map and make available publicly on the website
- Establish a sidewalk fund through developer contributions
- Participate in Safe Routes to School and Complete Streets Programs
- Implement a bike and pedestrian safety education program for school children
- Update Subdivision Regulations to include pedestrian and bicycle accommodations

# Dunstable Master Plan (2018)

## Vision and Goals

- An excellent and fully interconnected transportation system for pedestrians, bicyclists, and motor vehicles
- Implement traffic calming measures to manage vehicle speeds and “pass through” traffic in the Town Center and neighborhoods

## Purpose and Need

- The transportation chapter of the Master Plan outlined bicycle and pedestrian existing conditions and policies and recommendations for moving forward
- Dunstable has an aging population that uses public transportation and walking as their main forms of transportation

## Related Recommendations

- Develop an asset management program for the Town’s transportation infrastructure
- Work with NMCOCG and MassDOT to study potential traffic calming measures along Route 113 within the Town Center and neighborhoods
- Incorporate bicycle and pedestrian accommodations in future transportation improvement projects, whenever possible
- Amend the Zoning Bylaw and Subdivision regulations to require developers to add bicycle and pedestrian infrastructure and facilities, as well as consider active transportation needs within the site plan
- Reduce the minimum ROW for new roadways
- Consider establishing a sidewalk fund, which would collect fees through developer contributions
- Improve pedestrian and bicycle connections and fill gaps in existing networks
- Establish a snow removal bylaw
- Develop a connectivity plan for the Town’s trails and sidewalks
- Implement bicycle and pedestrian safety educational programs
- Improve transportation services for seniors

# GoLowell Plan: Lowell Multimodal Complete Streets Plan (2021)

## Vision and Goals

- Increase mobility and meet access needs of residents, commuters, visitors, and area schools' faculty, staff, and students
- Reduce vehicle miles traveled (VMT), delay and congestion, and improve travel time on the local roadway network
- Ensure the full and fair participation of the environmental justice communities throughout the transportation decision-making process

## Purpose and Need

- Reduce the vehicular traffic within downtown by creating a framework to enhance the multimodal transportation network, providing safer nonmotorized and public transit transportation alternatives

## Related Recommendations

- Establish pedestrian priority zones
- Encourage snow clearing by property owners
- Establish a sidewalk maintenance program

- Publish a signal policy that addresses signal modifications that favor pedestrians and bicyclists
- Construct a two-way protected bike lane on the east curb Chelmsford Street connecting the Bruce Freeman Rail Trail to the Gallagher Terminal.
- Conduct pedestrian-focused Road Safety Audits (RSAs) and walk audits (allocate funding for 3 ped-focused RSAs each year)
- Establish a dedicated line item in the yearly Capital Budget for implementation projects identified in walk audits
- Create a funding plan for near-term projects
- Leverage multimodal paths for economic development
- Install wayfinding signage for trails and commercial areas
- Support school walking and biking education and programming
- Create an ADA transition plan
- Support a bike culture through educational programming and incentive programs
- Create a dedicated fund for crosswalk installation and evaluation
- Conduct a bus stop audit to understand accessibility and maintenance needs

# GoLowell Plan: Lowell Multimodal Complete Streets Plan (2021)

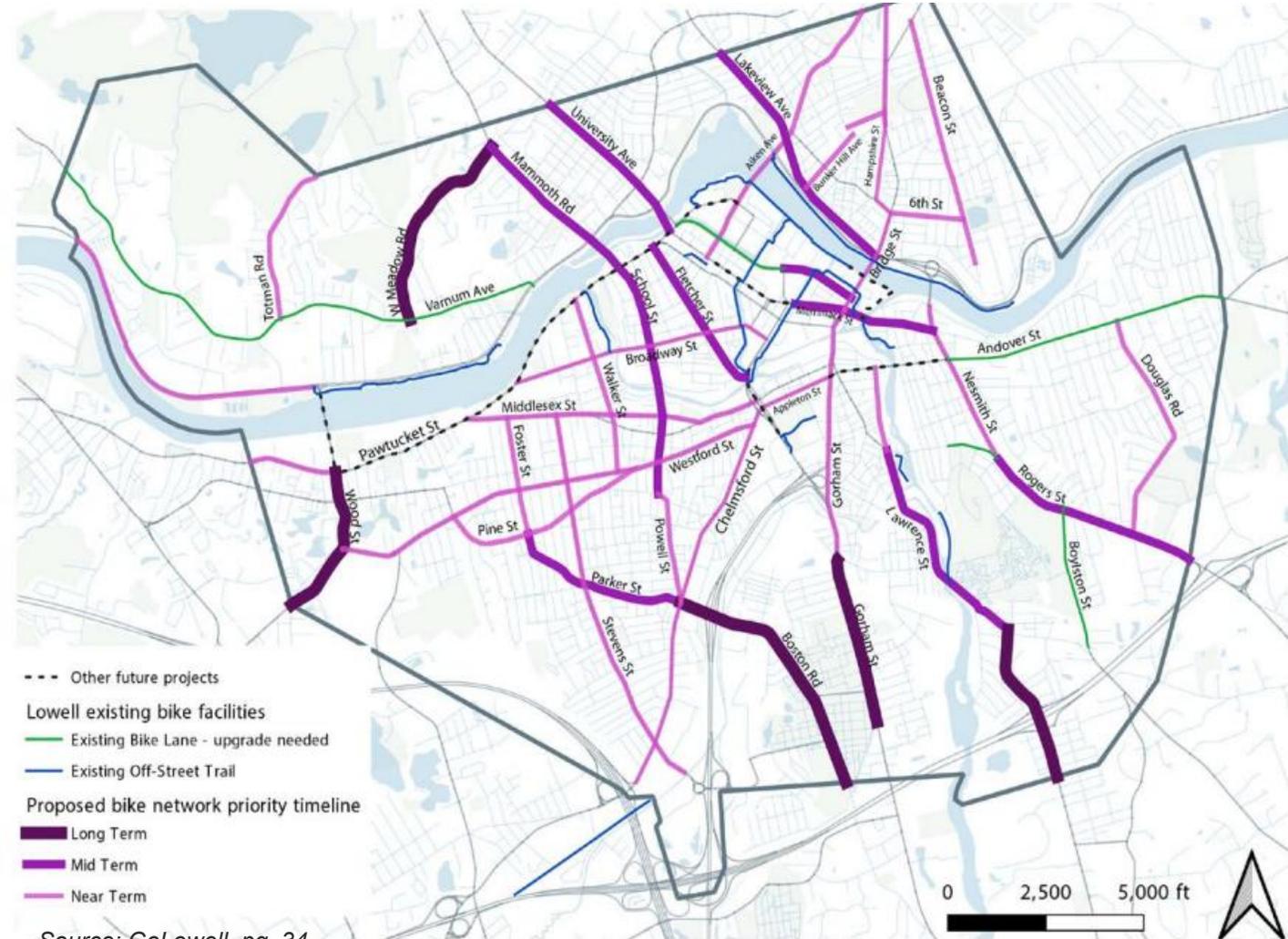
## Proposed Bike Network Priority Timeline

### High Need Streets to Identify Improvements:

1. Bridge St from Merrimack St to Bridge St
2. Riverwalk from Bridge St to Aiken Ave
3. Merrimack St from Aiken Ave to Nesmith St
4. Chelmsford St from Northwest Expressway to Plain St
5. Dutton St from Merrimack St to Lords Overpass
6. Plain St from Chelmsford St to Main Street
7. Rogers St from Nesmith St to Route 495 Interchange
8. Middlesex St from School St to Gorham St
9. Andover St from Nesmith St to Clark Rd
10. Drum Hill Rd from Westford to Northwest Expressway

### Near Term Bike (B) and Pedestrian (P) Projects:

1. Aiken Ave (B)
2. Appleton St (B,P)
3. Bridge St/Hampshire St (B,P)
4. Broadway St (B,P)
5. Gorham St (B,P)
6. Merrimack St (B,P)
7. Westford St (B)
8. Middlesex St
9. Stevens St
10. Chelmsford St



Source: GoLowell, pg. 34



# Lowell Forward Comprehensive Plan (2024)

## Vision and Goals

- A safe, equitable, and connected mobility network that accommodates all users including walkers, riders, drivers, bikers, and rollers
- Provide convenient access to, and navigation toward, transportation options

## Purpose and Need

- Capture the City's 20-year road map for supporting growth and investment in the communities, open and natural spaces, and infrastructure networks
- Integrate all aspects of city planning, including transportation around the city's values

## Related Recommendations

- Build 36 linear miles of on-street bicycle infrastructure by 2040
- Repair, replace, or construct 65 miles of sidewalks throughout the city by 2040
- Prioritize improving sidewalk quality and pedestrian facilities along high pedestrian routes
- Implement GoLowell's 2021 bike network
- Extend the Bruce Freeman Rail Trail into Lowell
- Improve trails wayfinding signage to and from activity centers

# Pepperell Master Plan (2020)

## Vision and Goals

- The Town's transportation system is safe and efficient, incorporating the needs of all residents through roadway improvements, transit service, and bicycle and pedestrian facilities
- Incorporate bicycle and pedestrian accommodations in future transportation improvement projects, whenever possible
- Address the transportation needs of all residents, including the needs of older adults and those with disabilities
- Ensure that the Town's transportation system is as safe as possible for all users

## Purpose and Need

- Ensure smart, effective planning that protects and leverages the Town's assets for the benefit of the community

## Related Recommendations

- Establish a committee to focus on pedestrian and bicycle planning and improve connectivity and safety
- Repair/replace existing sidewalks in poor condition or not compliant with ADA requirements
- Add pedestrian amenities such as benches, pedestrian scale lighting, and water stations
- Continue implementation of Complete Streets Prioritization Plan
- Participate in the Safe Routes to School Program
- Consider establishing a bikeshare program
- Update the Town's subdivision regulations to include sidewalk requirements
- Establish a sidewalk fund
- Develop bicycle and pedestrian safety programs for school children
- Add bicycle racks at priority locations (Town Hall, Library, Community Center, Albert Harris Center, Rail Trail, and Covered Bridge)
- Add crosswalks in Railroad Square and at other locations on Main Street
- Install RRFBs

# Tewksbury Pedestrian Mobility Master Plan (2017)

## Vision and Goals

- Increase connectivity: Connect fragmented segments of existing sidewalk for better usability
- Access to destinations: Provide walkable routes to popular municipal and commercial destinations
- Promote outdoor exercise
- Reduce the potential for accidents with motorized vehicles

## Purpose and Need

- Build more sidewalks along the Town's streets to expand the Town's sidewalk network and to improve the walkability of the Town

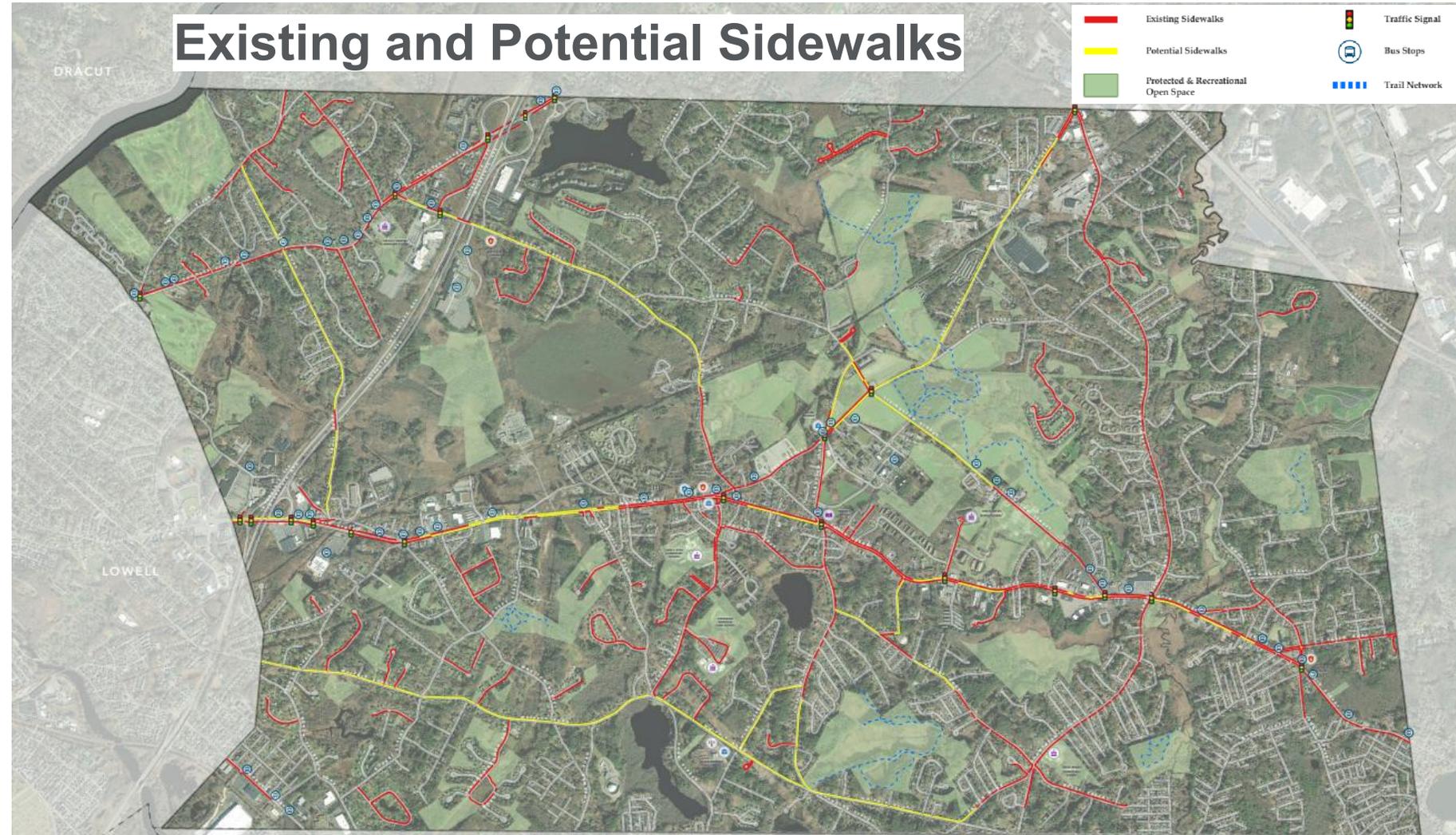
## Related Recommendations

- Install sidewalks to fill gaps within the existing network and along major corridors
- Install sidewalks between points of interest such as schools, recreational facilities, municipal buildings, and commercial areas
- Install sidewalks that include design features to enhance the safety of pedestrians
- Install a 3-foot wide vegetated buffer between pedestrians and the travel way
- Install curbing with a vertical profile where a vegetated buffer is not possible
- Install accessible, compliant ramps and sidewalks (consistent with Americans with Disabilities Act (ADA) and the Massachusetts Architectural Access Board (AAB))
- Implement traffic calming (road diets)

# Tewksbury Sidewalk Inventory (May 2024)

Potential sidewalks include  
57 Segments on 13  
Roadways:

1. Chandler St
2. Colonial Dr
3. East St
4. Fiske St
5. Foster Rd
6. Livingston St
7. Main St
8. North St
9. Pine St
10. Pleasant St
11. Shawsheen St
12. Trull Rd
13. Whipple Rd



Source: Tewksbury Sidewalk Inventory (May 2024)



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# Tyngsborough Master Plan (2004)

## Vision and Goals

- Improve access among locations within the Town and enhance access and connections to surrounding communities
- Provide additional cross-river access
- Provide appropriate pedestrian and bicycle facilities
- Improve traffic safety

## Purpose and Need

- Desire to retain the Town's rural and village character and to preserve and enhance its natural and historic resources

## Related Recommendations

- Develop an open space corridor/trail system
- New bicycle and pedestrian paths
- Construct sidewalks along arterial roadways
- Construct bike lanes on arterial roadways undergoing improvements
- Establish a multi-use trail around Town Center and along the roadways serving schools and shopping centers
- Develop a townwide Trail Plan
- Negotiate easements for a townwide trail system
- All new subdivision and development projects should require sidewalks be constructed
- Establish a Department of Public Works to manage, plan, and oversee sidewalk improvements

# Tyngsborough Open Space and Recreation Plan Update (2018)

## Vision and Goals

- Establish regional greenways
- Expand the recreational trail system
- Implement Complete Streets policies and recommendations;
- Implement projects that foster and enhance bicycle and pedestrian accommodations
- Develop and expand bike routes throughout the Town

## Purpose and Need

- There are limited existing bicycle lanes and sidewalks in the Town
- The public has identified the lack of pedestrian and bicycle facilities in the Town as an area of concern

## Related Recommendations

- Work with surrounding Towns to develop regional trail linkages
- Prioritize parcels needed to expand regional trail system, as recommended in the Master Plan
- Seek funding opportunities to continued development of the regional trail network
- Develop a townwide trail plan
- Work with the developers to include bicycle and pedestrian accommodations within project designs
- Create designated bike routes throughout Town on appropriate roadways
- Construct bicycle and pedestrian facilities and amenities as outlined in the Complete Streets plan
- Obtain funding for Safe Routes to School programming for improving pedestrian facilities and safety near Town schools
- Work with public safety officials to address pedestrian and bicycle safety concerns and issues

# Westford Comprehensive Plan (2009)

## Vision and Goals

- Promote a safe and efficient transportation system
- Provide sidewalks, trails and bicycle-safe routes that connect neighborhoods with villages, public facilities and schools, community institutions and open space

## Purpose and Need

- Town continues to struggle with a lack of pedestrian and bicycle facilities
- Minimal number of amenities for bicyclists and pedestrians is a public safety concern and promotes the use of automobiles
- Lack of pedestrian and bicycle amenities, especially around schools and trip generators, is a critical concern – today, sidewalks are mostly present on a few roadways in the Town Center and in recently constructed residential subdivisions

## Related Recommendations

- Develop and implement a Pedestrian and Bicycle Circulation Plan
- Form a sidewalk committee to develop and implement the sidewalk plan
- Develop a funding mechanism for sidewalk construction
- Prioritize sidewalk construction based on a to-be-developed criteria matrix
- Improve existing sidewalks within the villages and construct new sidewalks to connect the villages to adjacent neighborhoods
- Adopt the MA Safe Routes to Schools Program
- Enhance and publicize the Town's existing pedestrian trail network
- Add wayfinding signage along the trail networks
- Adopt a policy for on-road bicycle accommodation on major arterials
- Implement Travel Demand Management (TDM) measures
- Provide pedestrian connections between office and retail areas
- Implement the sidewalk recommendations in the Route 110 Master Plan

# Westford Open Space and Recreation Plan (2018-2025)

## Vision and Goals

- Meet active recreation needs
- Create new needed recreational facilities
- Make necessary improvements to existing recreational facilities

## Purpose and Need

- As a farming community, historically shared the roadway with cars and wagons. However, the Town did not develop a plan for pedestrian infrastructure with the creation of vehicle-based roadways
- Most of the Town does not have pedestrian and bicycle facilities, leading to high vehicle use
- The increase in future employment opportunities and multifamily housing developments is a consideration for improving pedestrian and bicycle facilities

## Related Recommendations

- Create new trails and greenway connections
- Continue coordinating trail planning among Town departments
- Bridge gaps in the trail networks
- Create trails/bicycle paths suitable for cycling by people of all ages and abilities
- Coordinate with abutting Towns to create trail linkages and communicate opportunities to Planning Board and Conservation Commission
- Maintain and improve trails/pedestrian connections
- Look for opportunities to make existing trails ADA accessible to the greatest extent feasible
- Create a Safe Routes to School program
- Create parking for the Bruce Freeman Rail Trail to allow for greater access

# Existing Plans Takeaways

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- NMCOCG roadways are designed with vehicles as the primary mode of transportation. However, municipalities are making concerted efforts to build safer streets to encourage residents to walk or bicycle to their destinations, especially for shorter trips.
- Plans include policy and educational initiatives in addition to recommendations for physical infrastructure and design treatments.
- Five of the municipal master/comprehensive plans recommend that the municipality develops a pedestrian and bicycle plan, and three other municipalities already have such a plan.
- Many plans prioritize building out a connected bicycle and pedestrian network.
- Many of the plans do not include Massachusetts' environmental justice criteria for determining priority locations for bicycle and pedestrian infrastructure.

# Summary of Recommendations from Existing Plans and Studies

	Plan	Expand the bicycle and pedestrian network	Improve connectivity	Add crossings and crosswalks	Implement educational campaigns	Develop a dedicated fund for bike/ped facilities and maintenance	Amend subdivision regs/ bylaws to include bike/ped facilities	Add or improve wayfinding	Develop a bike/ped plan, prioritization plan, or connectivity plan
MMCOG	Envision 2050	X		X					
	Greater Lowell Vision Zero Plan	X	X	X	X				
Municipal	Billerica Master Plan	X	X	X	X			X	X
	Billerica OSRP	X	X	X				X	X
	Chelmsford Bicycle and Pedestrian Plan	X	X	X	X			X	
	Dracut Master Plan	X	X		X	X	X		X
	Dunstable Master Plan	X	X	X	X	X	X		X
	GoLowell			X	X	X		X	
	Lowell Forward	X	X	X				X	
	Pepperell Master Plan	X	X	X	X	X	X		
	Tewksbury Ped Mobility Plan	X	X						
	Tyngsborough Master Plan	X					X		
	Tyngsborough OSRP	X	X					X	
	Westford Comprehensive Plan	X	X		X	X	X	X	X
	Westford OSRP	X	X					X	
	<b>TOTAL</b>		<b>14</b>	<b>12</b>	<b>9</b>	<b>8</b>	<b>5</b>	<b>5</b>	<b>8</b>



# Existing Plans and Studies: Complete Streets



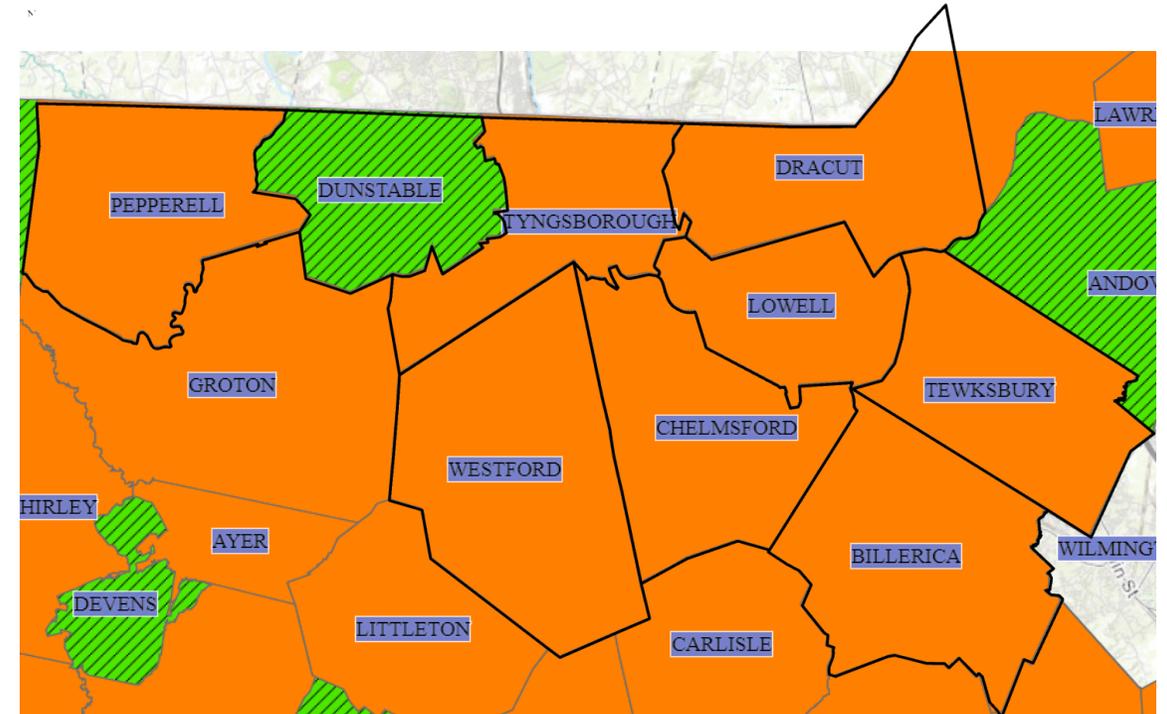
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# MassDOT Complete Streets Program

Mass DOT has a three-tiered program that offers funds to municipalities for implementing Complete Streets.

- Complete Streets are streets that accommodate people traveling by all modes of transportation – including people walking and bicycling
- The program begins with the municipality adopting a policy that commits to designing any new streets according to these principals
- *All communities in the Greater Lowell region participate in this program and are at least tier 2 communities, demonstrating a shared understanding of and commitment to Complete Streets. Most communities reached the final tier and received project funding.*



- Approved Policies
- Approved Prioritization Plan
- Approved Projects

# Complete Streets

Municipality	Policy Adopted	Goals/Priorities
Billerica	2017	<ul style="list-style-type: none"> <li>Accommodate all road users to meet the needs of a variety of transportation modes</li> <li>Focus on developing a connected integrated network</li> </ul>
Chelmsford	2017	<ul style="list-style-type: none"> <li>Use transportation modes to create a linked network of roads, walkways, trails, and other transit systems for all users</li> <li>Transportation projects apply the design principles of Complete Streets, whenever possible, including new, general maintenance or reconstruction projects</li> </ul>
Dracut	2019	<i>Document not received</i>
Dunstable	2016	<i>Document not received</i>
Lowell	2015	<ul style="list-style-type: none"> <li>Create a multimodal transportation system designed to provide improved mobility and accessibility opportunities for all users</li> <li>Maintain a Transportation Infrastructure Inventory</li> <li>Incorporate Complete Streets Elements into Transportation Projects</li> <li>Incorporate Complete Streets Policy into Development Review Process</li> </ul>
Pepperell	2019	<ul style="list-style-type: none"> <li>Accommodate as many modes of travel as practical within the transportation network which includes many miles of narrow, two-lane roads</li> <li>Preserve and enhance scenic, aesthetic, historical, and environmental resources while improving or maintaining health, safety, mobility, and infrastructure conditions</li> <li>Accommodate all users by creating a transportation network that attempts to meet the needs of individuals using a variety of transportation modes</li> <li>Encourage healthy opportunities for Pepperell residents such as walking and bicycling instead of driving</li> <li>Balance the needs of motorists and public safety vehicles with the environmental impacts of the transportation networks</li> <li>Reduce reliance on motor vehicles</li> </ul>
Tewksbury	2017	<ul style="list-style-type: none"> <li>Accommodate all users by creating a transportation network that meets the needs of visitors and residents using a variety of modes</li> <li>Develop and implement projects that is context sensitive to Tewksbury and the community's values and enhances the aesthetic, historical, and environmental resources while improving and maintaining safety and mobility</li> </ul>
Tyngsborough	2016	<i>Document not received</i>
Westford	2016	<ul style="list-style-type: none"> <li>Accommodate all road users by creating transportation networks that meet the needs of people using a variety of modes</li> <li>Accommodate as many modes of travel as practical within the transportation network which includes many miles of narrow, two-lane roads</li> <li>Encourage healthy opportunities for Westford residents such as walking and biking instead of driving</li> <li>Balance the needs of motorists and public safety vehicles with the environmental impacts of the transportation network</li> <li>Reduce reliance on motor vehicles and thereby reducing greenhouse gas emissions</li> </ul>

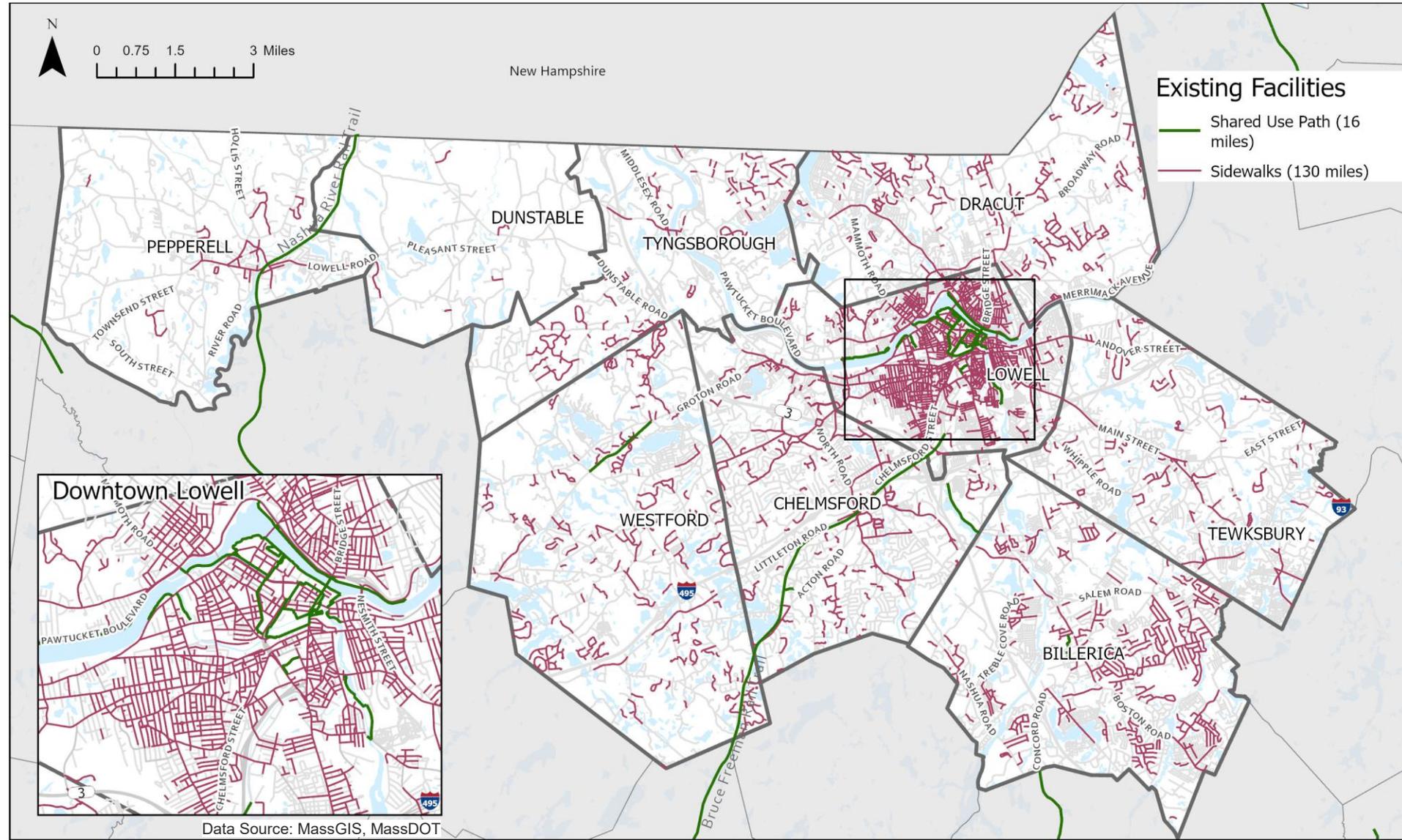
# Infrastructure Inventory



# Existing Pedestrian Infrastructure

- There are 130 miles of sidewalks and 16 miles of Shared Use Paths in the Greater Lowell region, covering only 8% of all roadway miles<sup>1</sup>
- Lowell has the most connected and complete sidewalk network, followed by Billerica's connected network on the eastern side of the municipality
- Majority of municipalities have disconnected or disjointed sidewalk networks
- Dunstable has the most limited sidewalk network

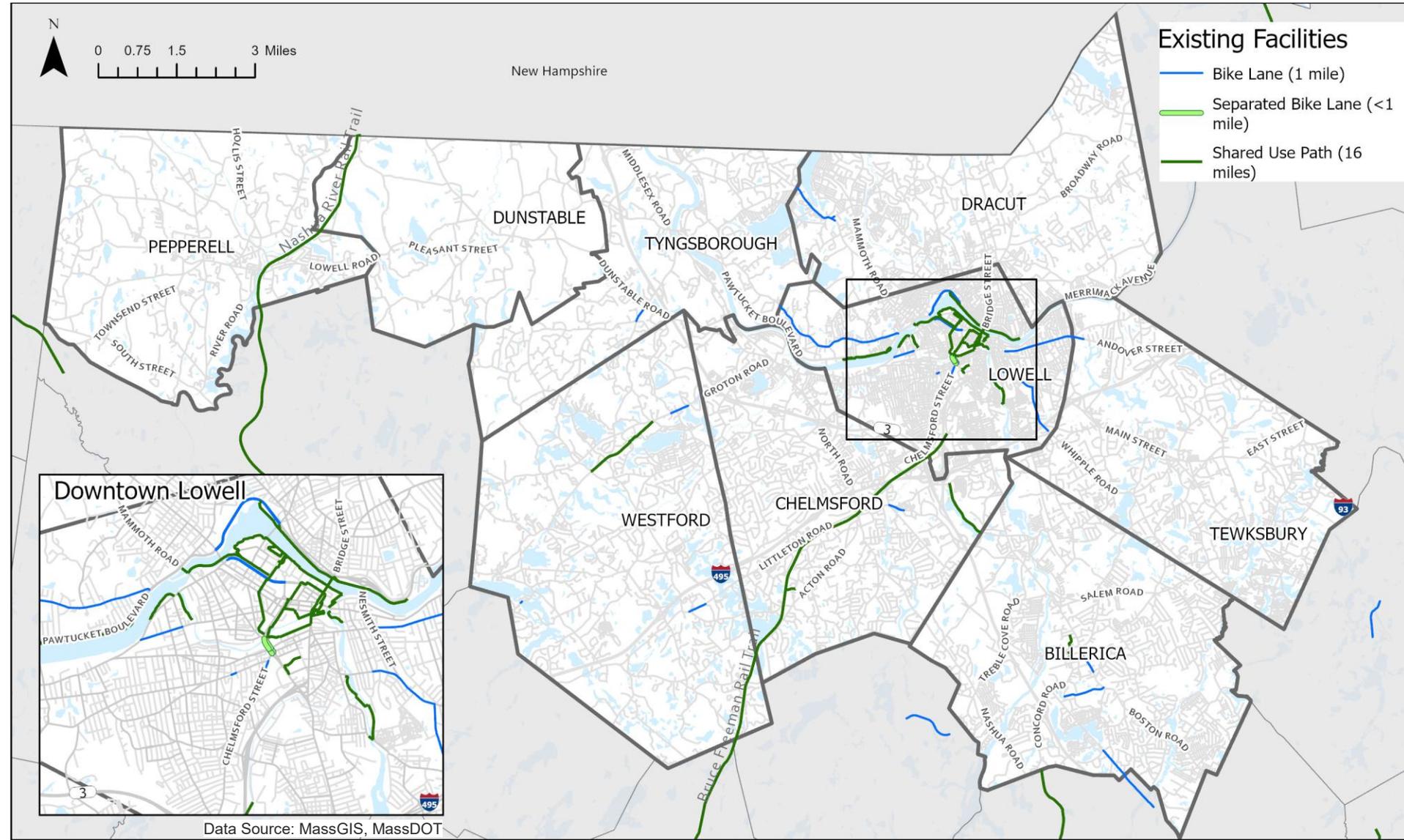
<sup>1</sup>The 8% includes the total miles of sidewalks and shared use paths (130 and 16, respectively), which is divided by total road miles of 1,762





# Existing Bicycle Infrastructure

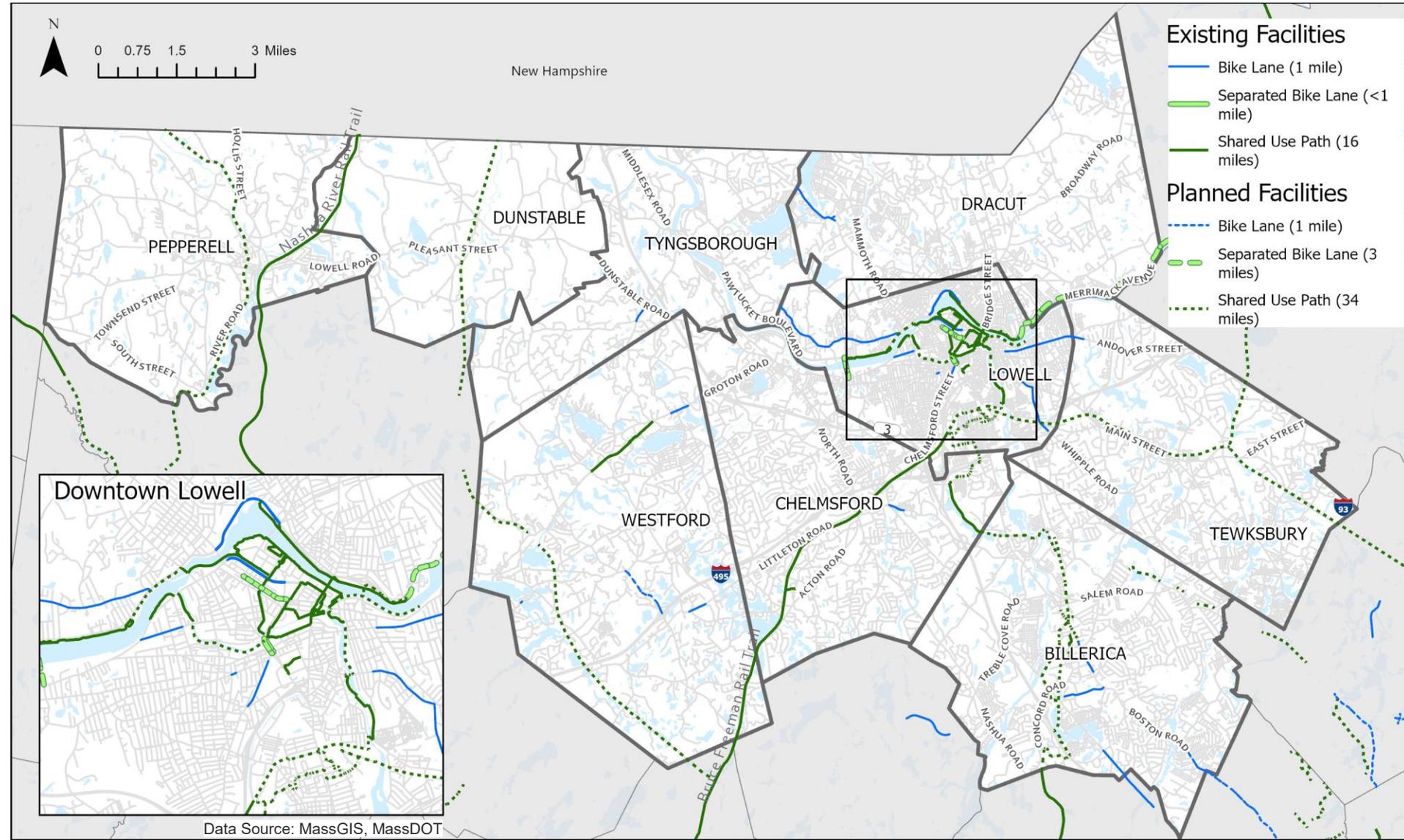
- The 16 miles of shared use paths form the backbone of Greater Lowell's bicycle network
- Beyond these paths, there are only a few miles of on-street bicycle facilities
- Lowell is the only municipality with a separated bike lane and some elements of a connected network
- Dracut, Tyngsborough, Chelmsford, Tewksbury, and Billerica each have 1 to 2 segments of bike lane
- Dunstable and Pepperell have no bicycle facilities, except the Nashua River Rail Trail





# Planned Bicycle Infrastructure

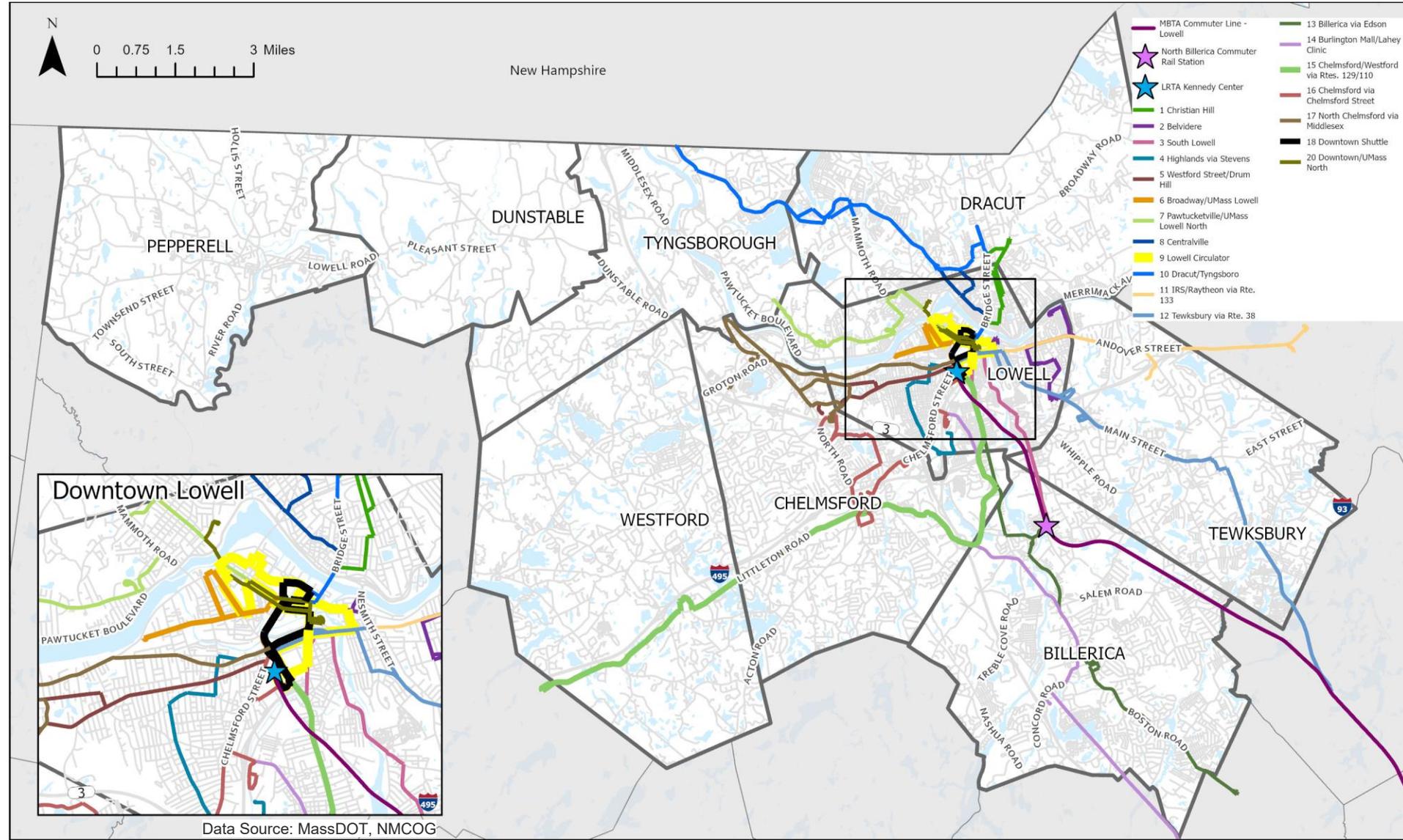
- Shared Use Path extensions are planned in all communities except Chelmsford, Tyngsborough, and Dracut – these connections would go a long way toward regional connectivity
- There are plans to install a separated bike lane along Merrimack Avenue from Lowell through Dracut to Methuen
- The plans do not, however, include connections to these Share Use Paths from neighborhoods or downtowns



# Transit Service

Walking and bicycling are part of taking transit. Typically, at least one side of a transit trip involves walking or bicycling.

- The Lowell Regional Transit Authority (LRTA) serves this region with 19 bus routes – providing circulation within and radiating out of Lowell
- In the towns surrounding Lowell, neighborhoods closest to the city have more service
- The MBTA Commuter Rail also serves the Lowell (LRTA Kennedy Center) and North Billerica stations, connecting to Boston North Station

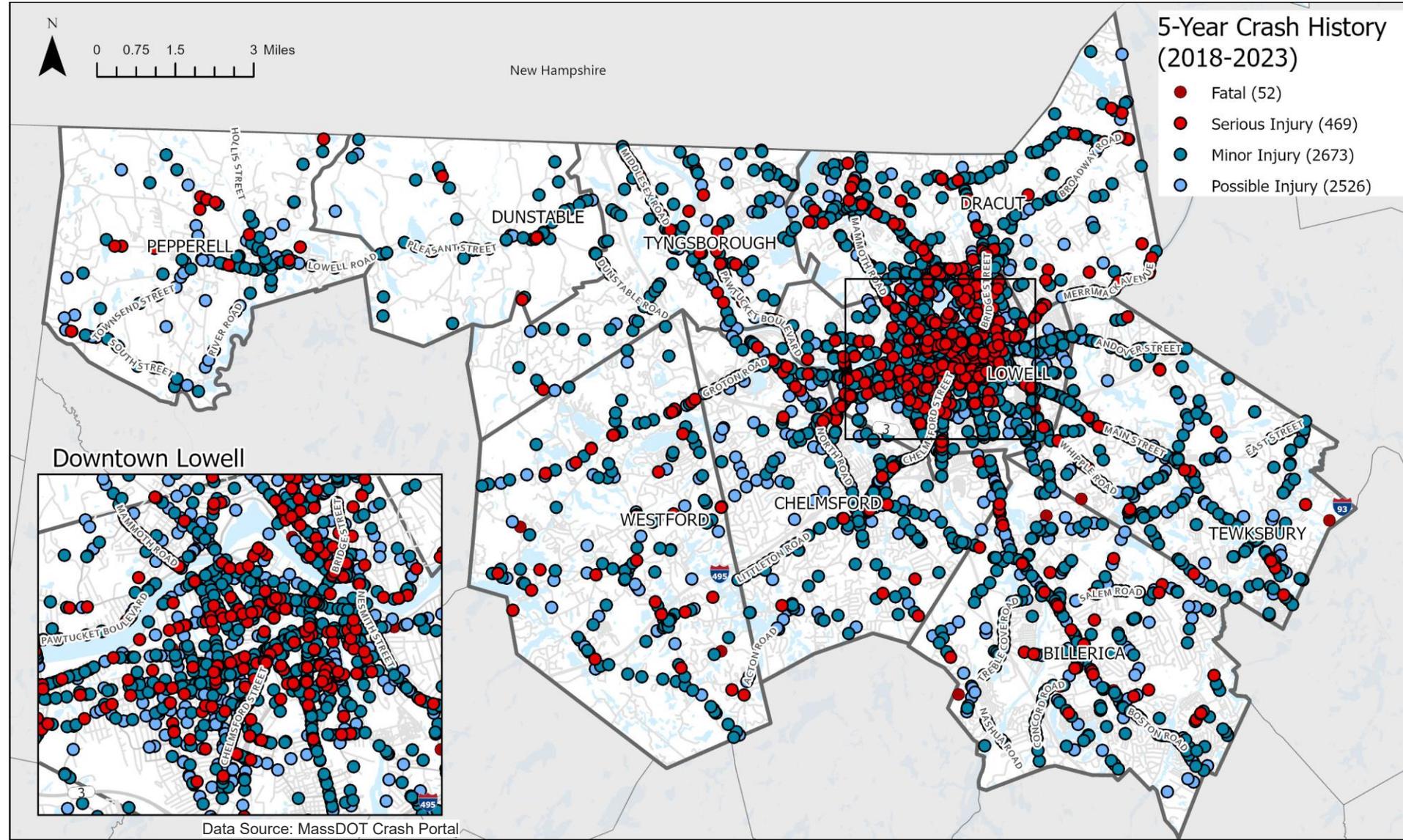


Data Source: MassDOT, NMCOG

# Safety Analysis

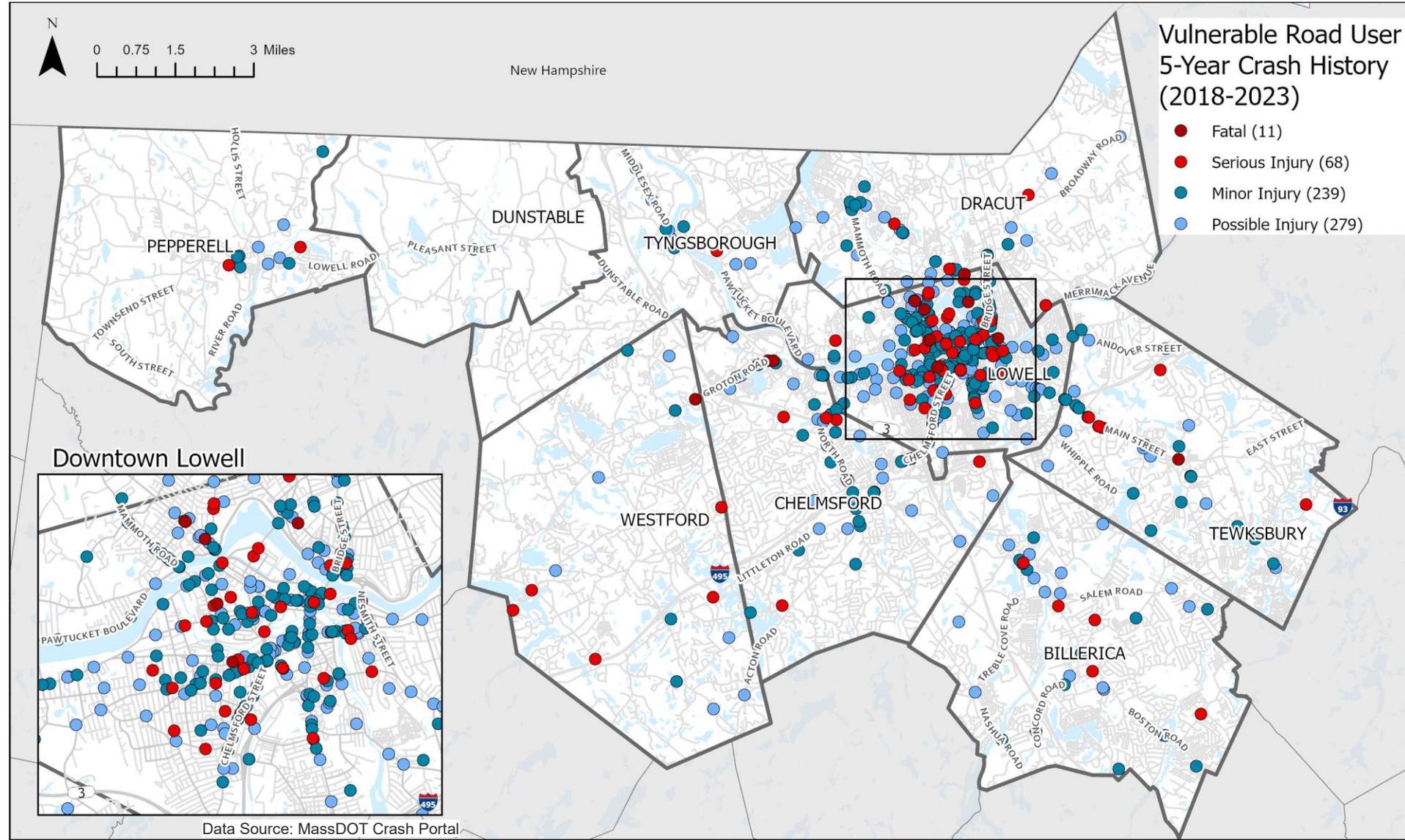
# All Injury Crashes by Most Severe Injury (2018-2023)

- NMCOG recently completed the Greater Lowell Vision Zero Plan (2024), which includes a detailed analysis of all injury crashes
- Between 2018 to 2023, 52 people were killed on roadways in the region; 469 individuals were seriously injured
- This map shows injury crashes, by level of severity; crashes where no one was injured are excluded
- At a high level, this map shows that injury crashes are concentrated in Lowell, other town centers, and along the major arterial roadways that connect the region



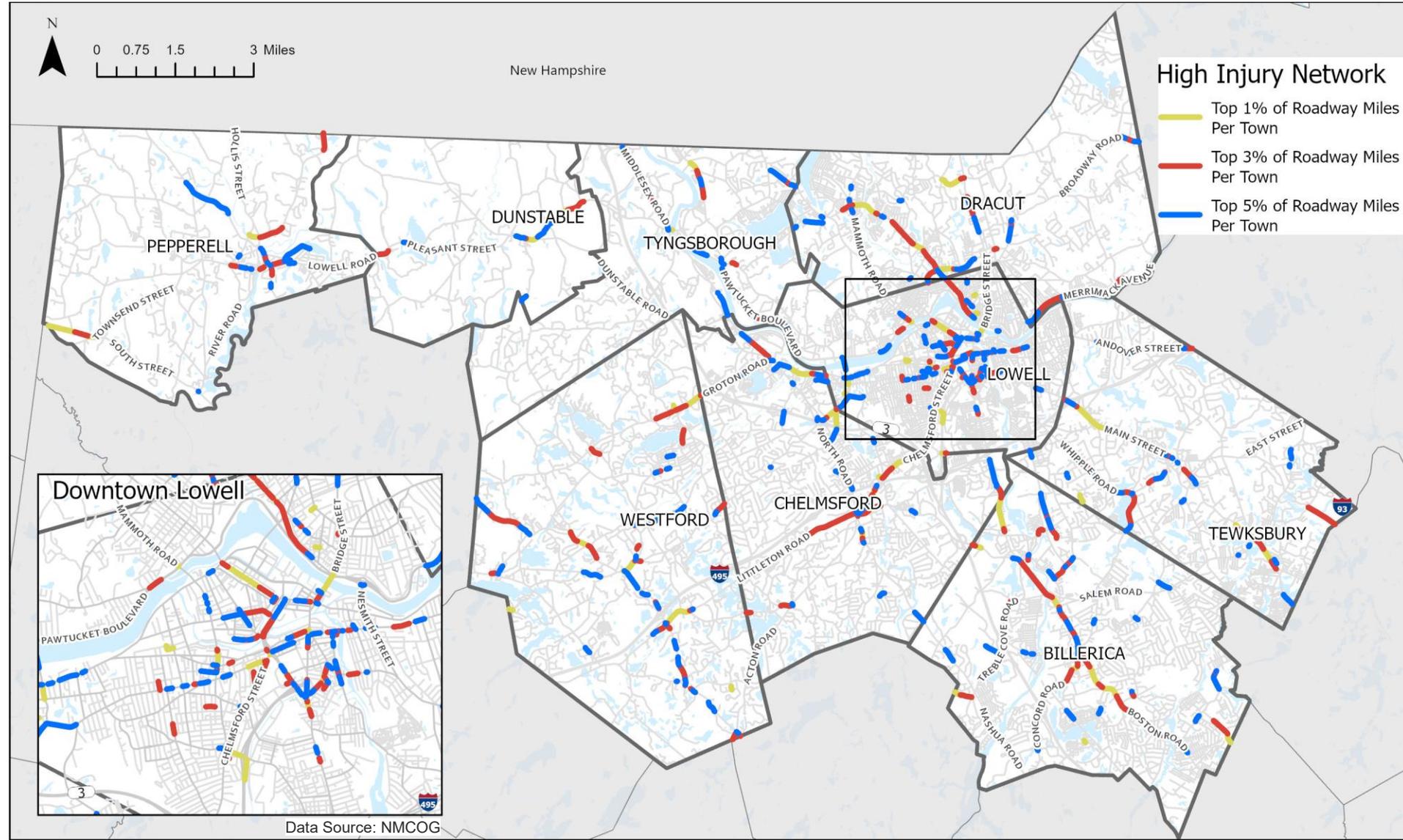
# All Vulnerable Road User Injury Crashes (2018-2023)

- This map focuses on injury crashes with Vulnerable Road Users (VRUs) or people travelling outside of a vehicle, typically walking or bicycling
- Between 2018 and 2023, 11 people were killed in the region; 68 individuals were seriously injured
- People walking and bicycling are at a higher risk of death or severe injury in a crash – from 2018 to 2023, 21% (11 of the 52) fatal crashes involved a VRU, whereas VRUs made up only 10% of all injury crashes – safe and accessible infrastructure for VRUs improve safety for not only these individuals but everyone



# High Injury Network

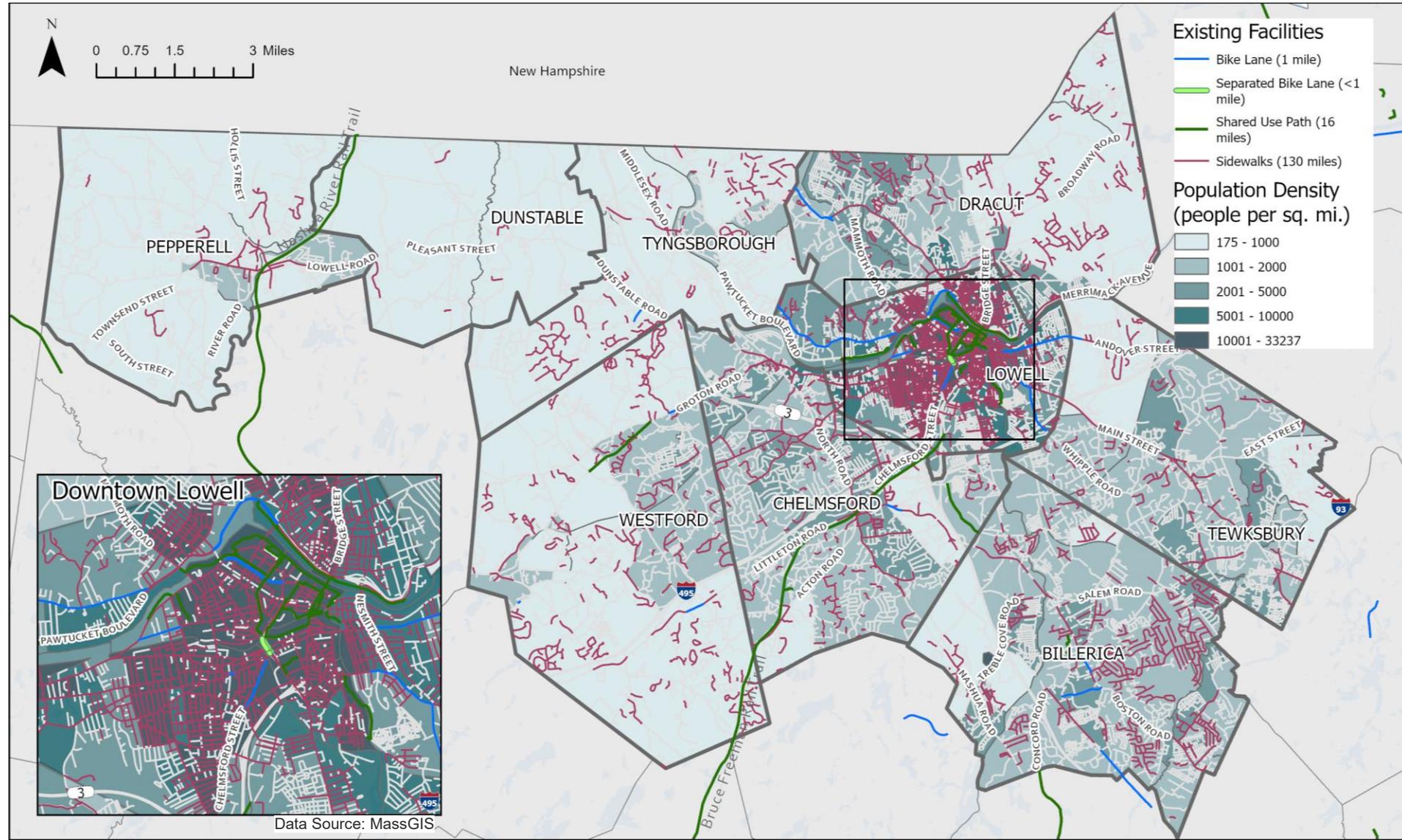
- The Greater Lowell Vision Zero Plan developed a High Injury Network (HIN), based on a score that accounts for number and severity of crashes, to focus investment on where it is needed most
- The HIN includes the top 5% of roadways per municipality – accounting for 97% of all fatal crashes and 73% of all fatal and serious injury crashes
- 30% of the roadways in the HIN are owned by MassDOT; according to the national [Dangerous by Design Report \(2024\)](#), state-owned roads are the most dangerous, accounting for 66% of all traffic deaths nationwide



# Demographics

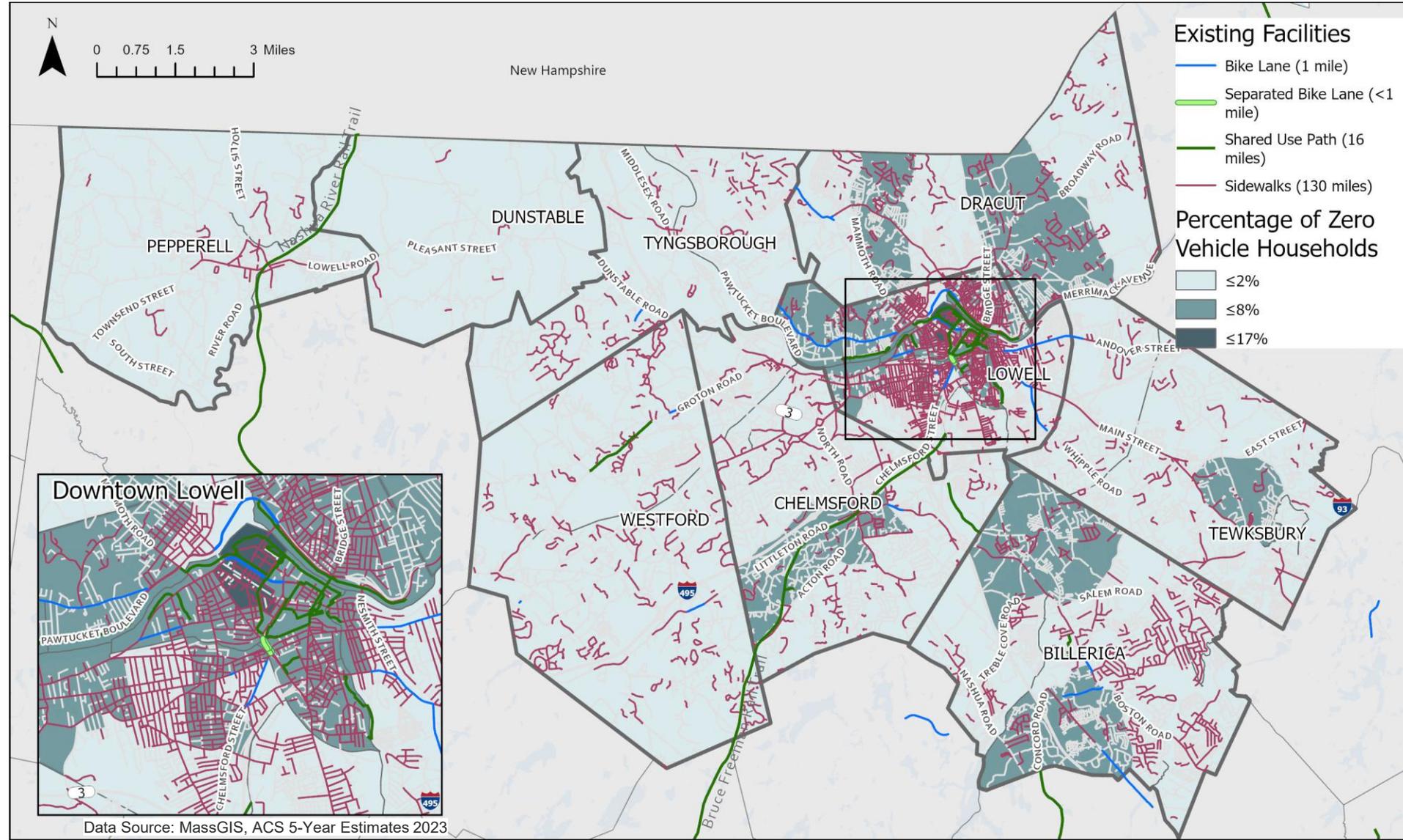
# Population

- The region's most dense community is Lowell
- Communities surrounding Lowell – Dracut, Chelmsford, Billerica, and Tewksbury – have higher population densities throughout
- Communities to the northeast that are further from Lowell and from Commuter Rail access to Boston – Pepperell, Dunstable, Tyngsborough, and Westford – have lower population densities throughout



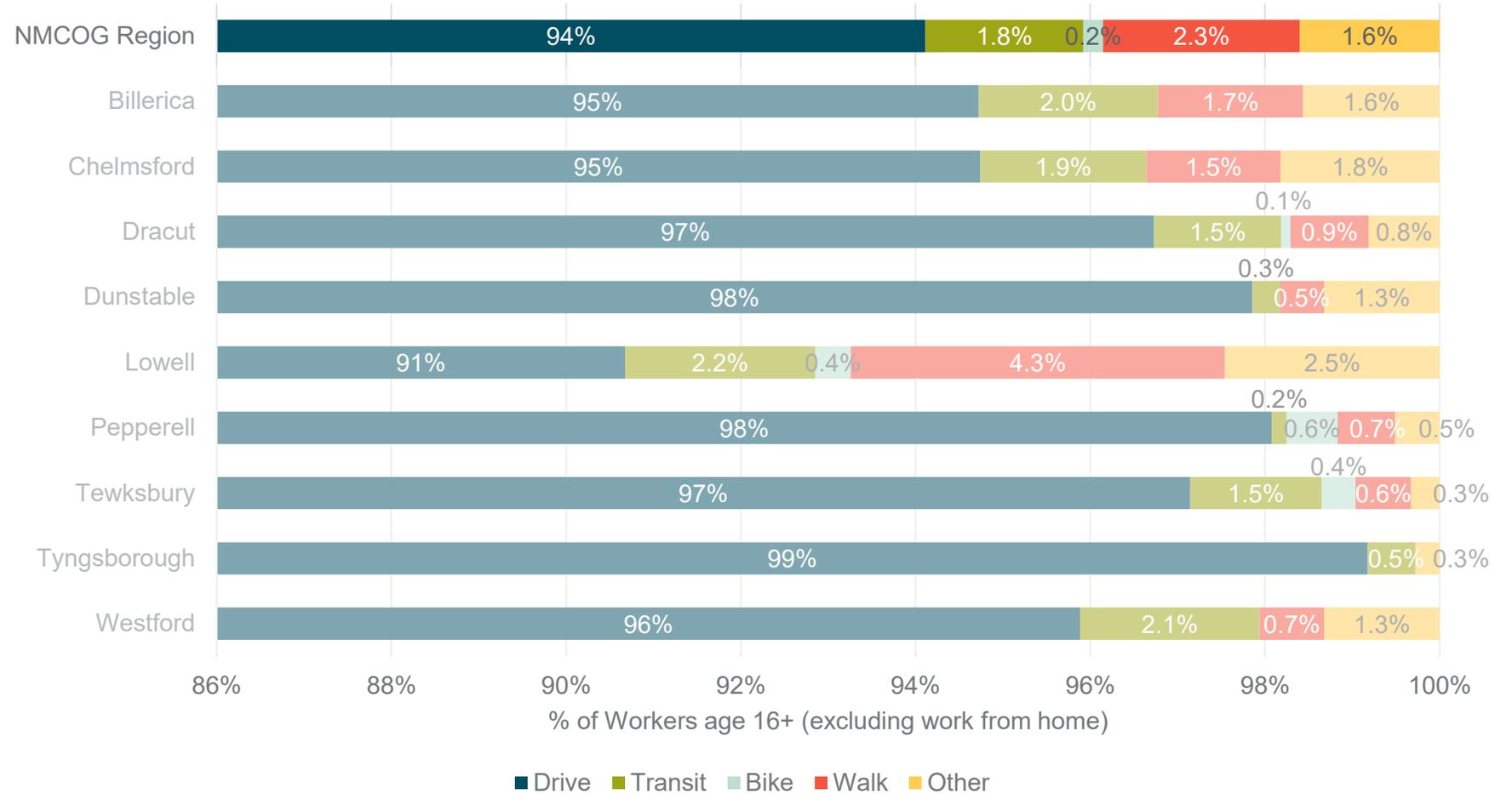
# Zero Vehicle Car Households

- 7% of households in the region do not have vehicles (either by choice or out of necessity), these people must rely on walking, bicycling, taking transit, or getting rides from others – these individuals deserve safe facilities to access work, school, and other critical destinations
- The highest concentration of zero-vehicle households is in Lowell, where 14% of households have zero cars
- Dracut, Chelmsford, Billerica, and Tewksbury have higher concentrations of zero-vehicle households, despite limited walking and bicycling options



# Mode Share of Commuters by Municipality

- Overall, about 3,400 people in the Greater Lowell region walk or bicycle to work, 2,400 of whom live in Lowell
- Across the region, the most common mode of commuting is driving (94%), with 1.8% of people taking transit and 2.5% walking or bicycling
- Outside of Lowell, Billerica and Chelmsford have the highest walking percentages
- Outside of Lowell, Pepperell and Tewksbury have the highest bicycling percentages

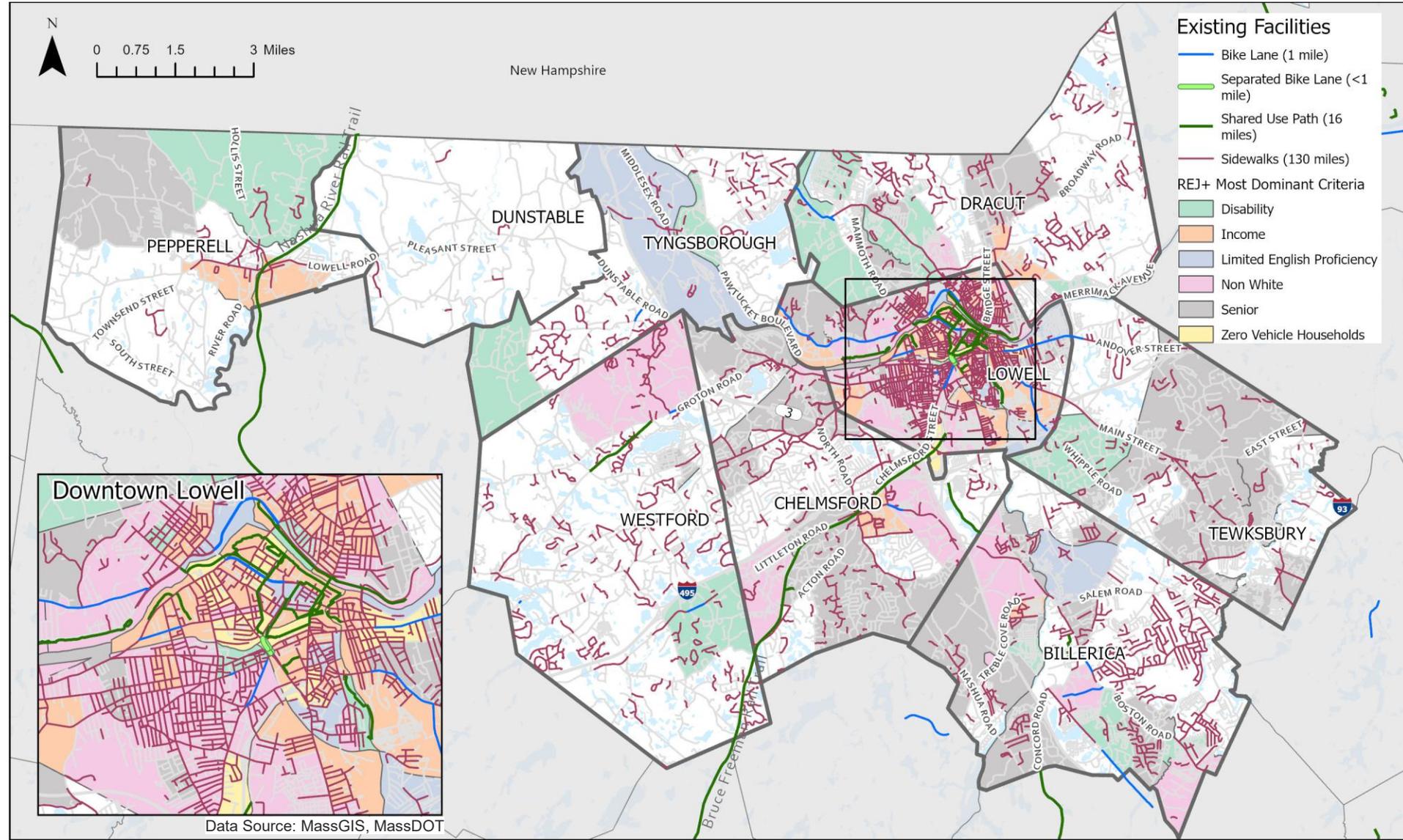


Source: U.S. Census ACS 5-Year Estimates 2023  
 Note: This summary excludes people who work from home

# Regional Environmental Justice Plus (REJ+) Index

MassDOT's REJ+ index looks at socioeconomic factors associated with transportation needs, normalized across the nine municipalities in the Greater Lowell region.

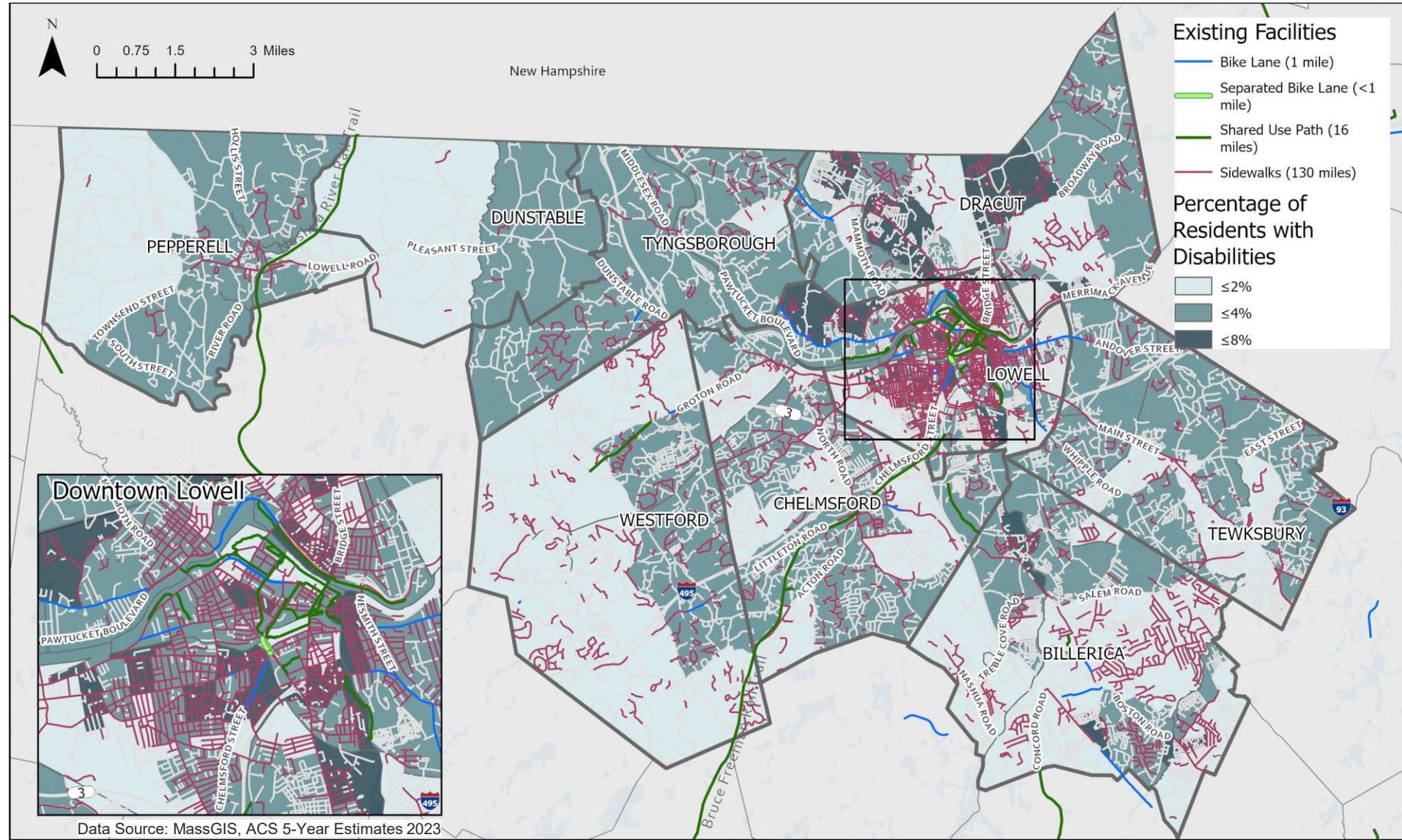
- The Greater Lowell Vision Zero Plan found that fatal or serious injury crashes are 7.6x higher on roadways in REJ+ communities
- The most dominant criteria is senior, encompassing 20% of the region, followed by disability accounting for 10%
- Outside of Lowell, there are neighborhoods in each town, other than Dunstable, where REJ+ communities need better walking and bicycling options



# People with Disabilities

People with Disabilities is one of the criteria used in MassDOT's REJ+ index and is prominent in the region.

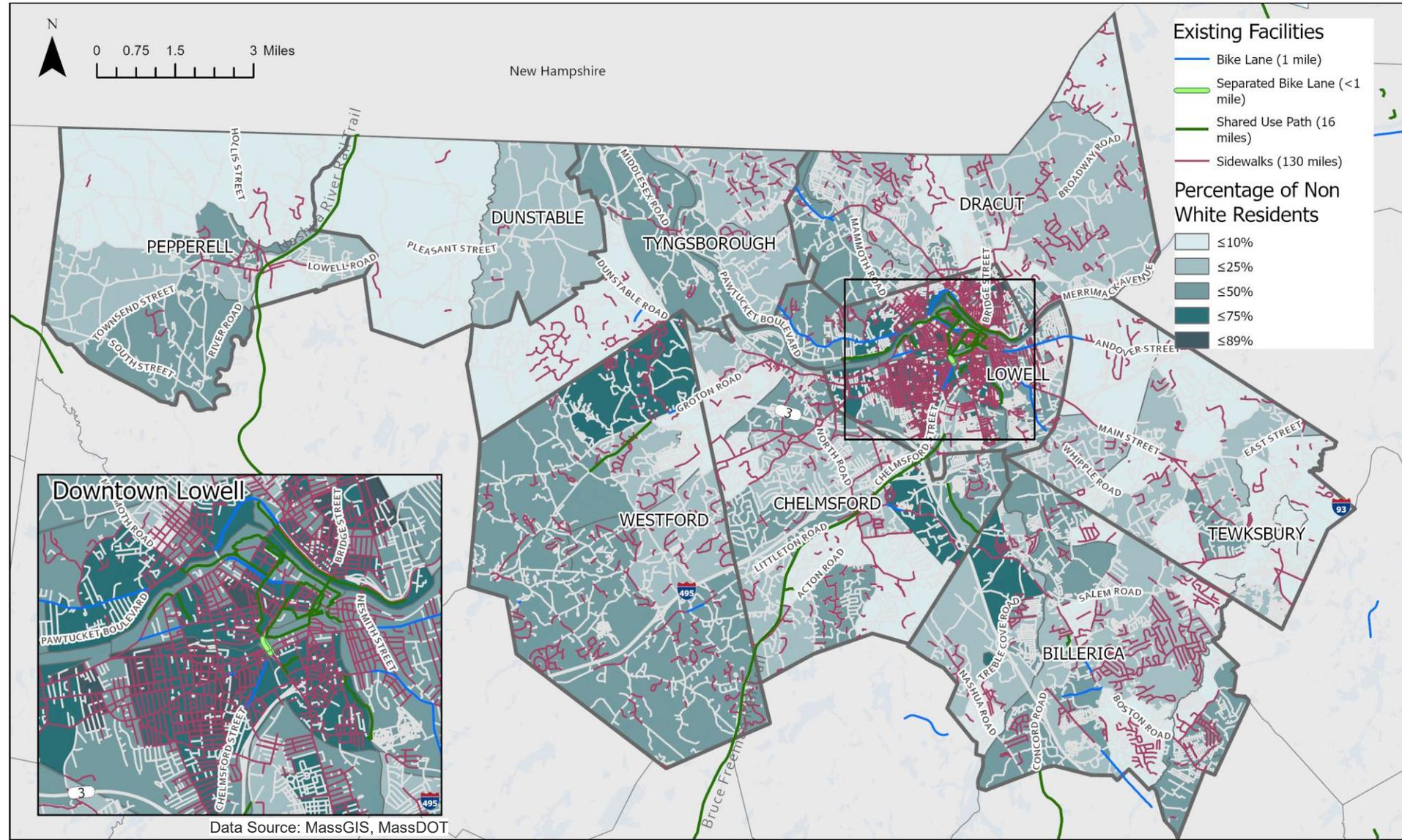
- There are larger shares of people with disabilities living in Lowell, including neighborhoods outside of downtown, where walking and bicycling facilities are more limited
- BillERICA, Tyngsborough, and Dracut also have areas with a higher concentration of people with disabilities, which ought to have better walking and bicycling connections to destinations
- Note that not all disabilities inhibit mobility, but this data does not distinguish type*



# Non-White Residents

Non-White Residents is one of the criteria used in MassDOT's REJ+ index.

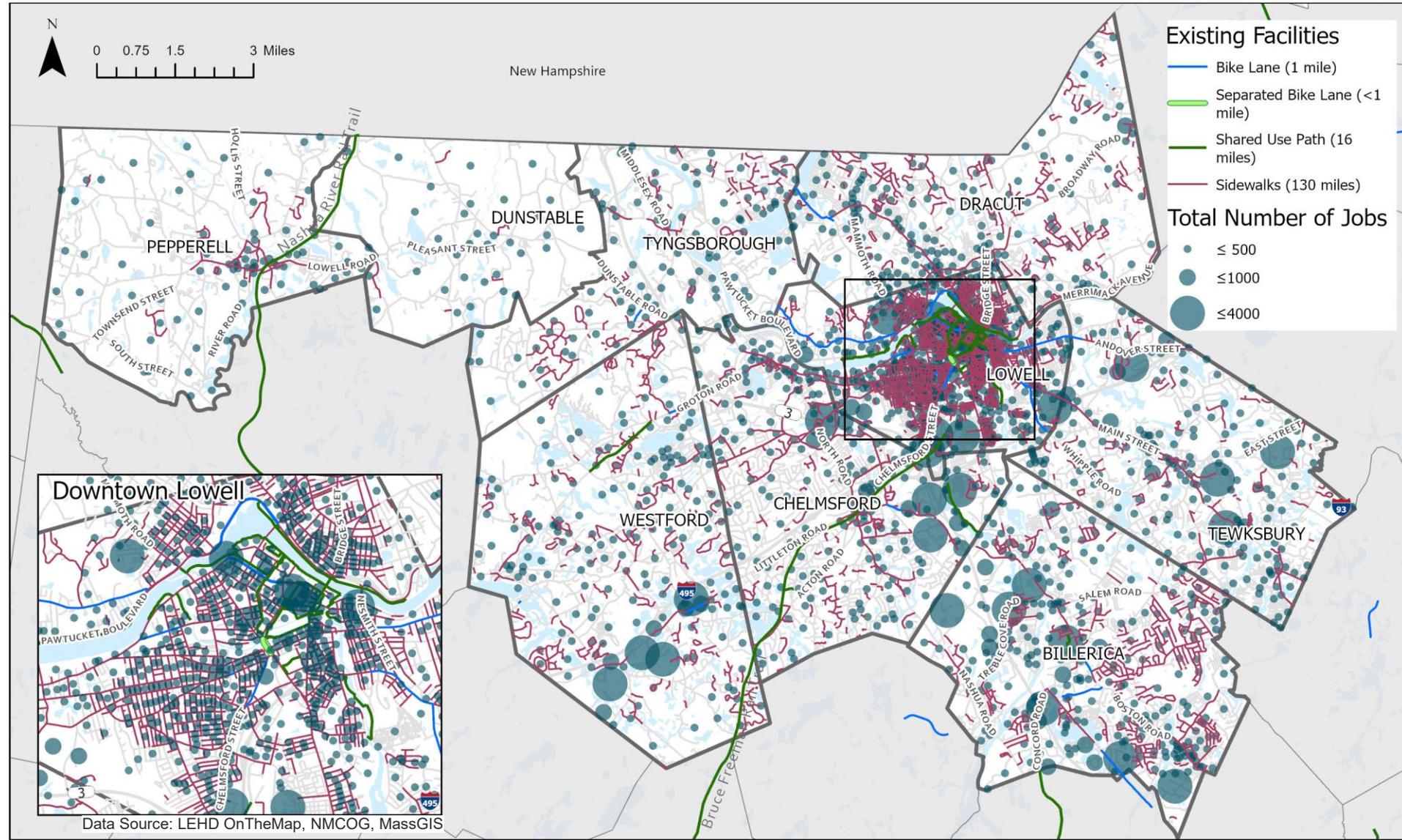
- A higher percentage of non-white residents live in Tyngsborough, Westford, Chelmsford, and Billerica, with a large percentage of non-white residents living in Lowell
- There are limited sidewalk networks serving non-white communities in Chelmsford, Billerica, and Tyngsborough



# Workforce

The flip side of population density is employment density – where people work. This map shows the number of jobs per employment center. Key themes from this map show:

- Top employment centers are in Lowell, Westford, Chelmsford, Billerica, and Tewksbury
- Many of these employment centers are located along the I-495 corridor
- Only 12.9% of jobs are within 100 feet of a sidewalk
- Only 3.4% of jobs are within 100 feet of an existing bicycle facility



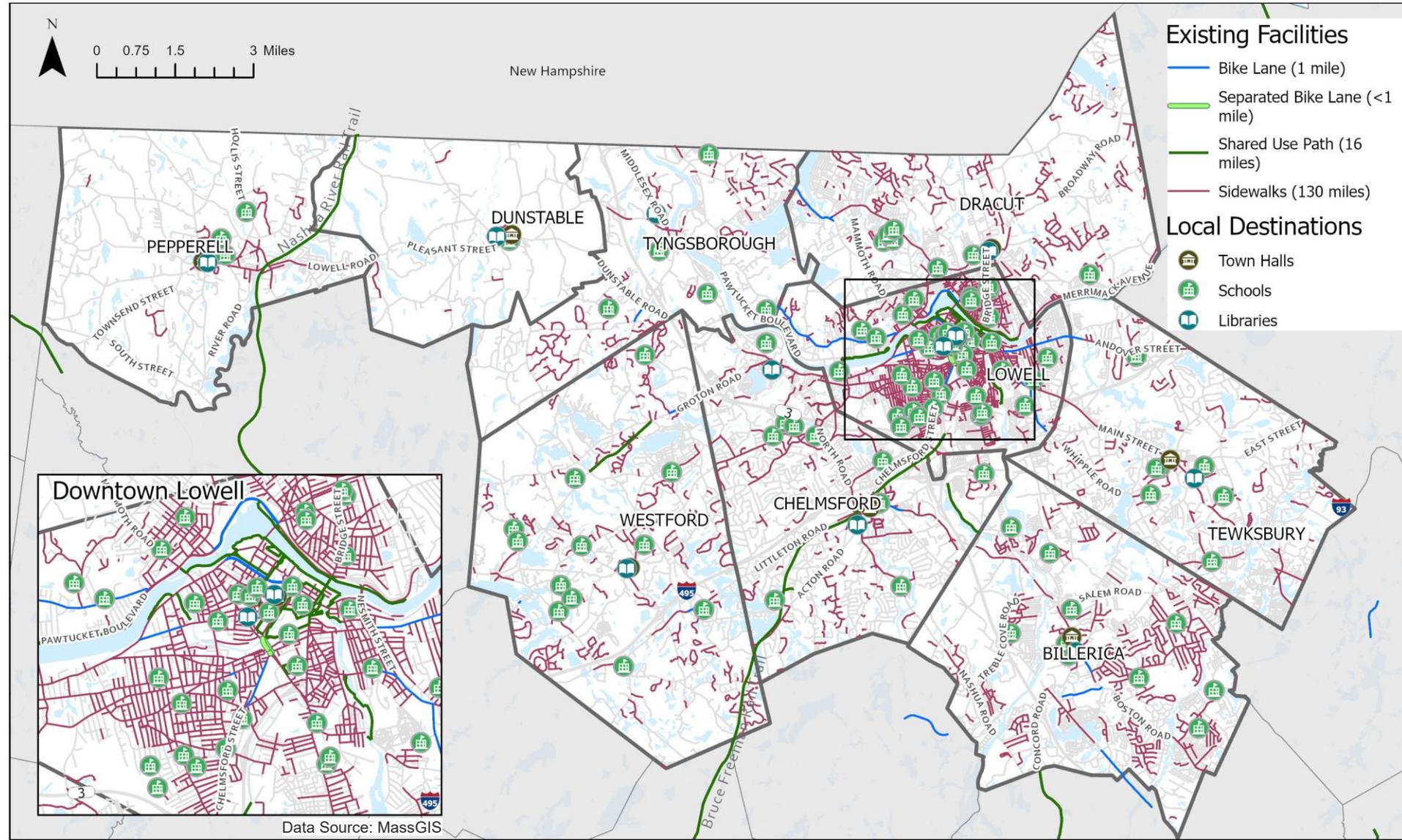
# Destinations

# Local Destinations

This sections aims to define key destinations that people living and working in the region ought to have access to.

*These destinations will be used during the next phase of analysis to identify critical gaps in walking and bicycling access. This list will be augmented with destinations articulated in Phase 1 community engagement.*

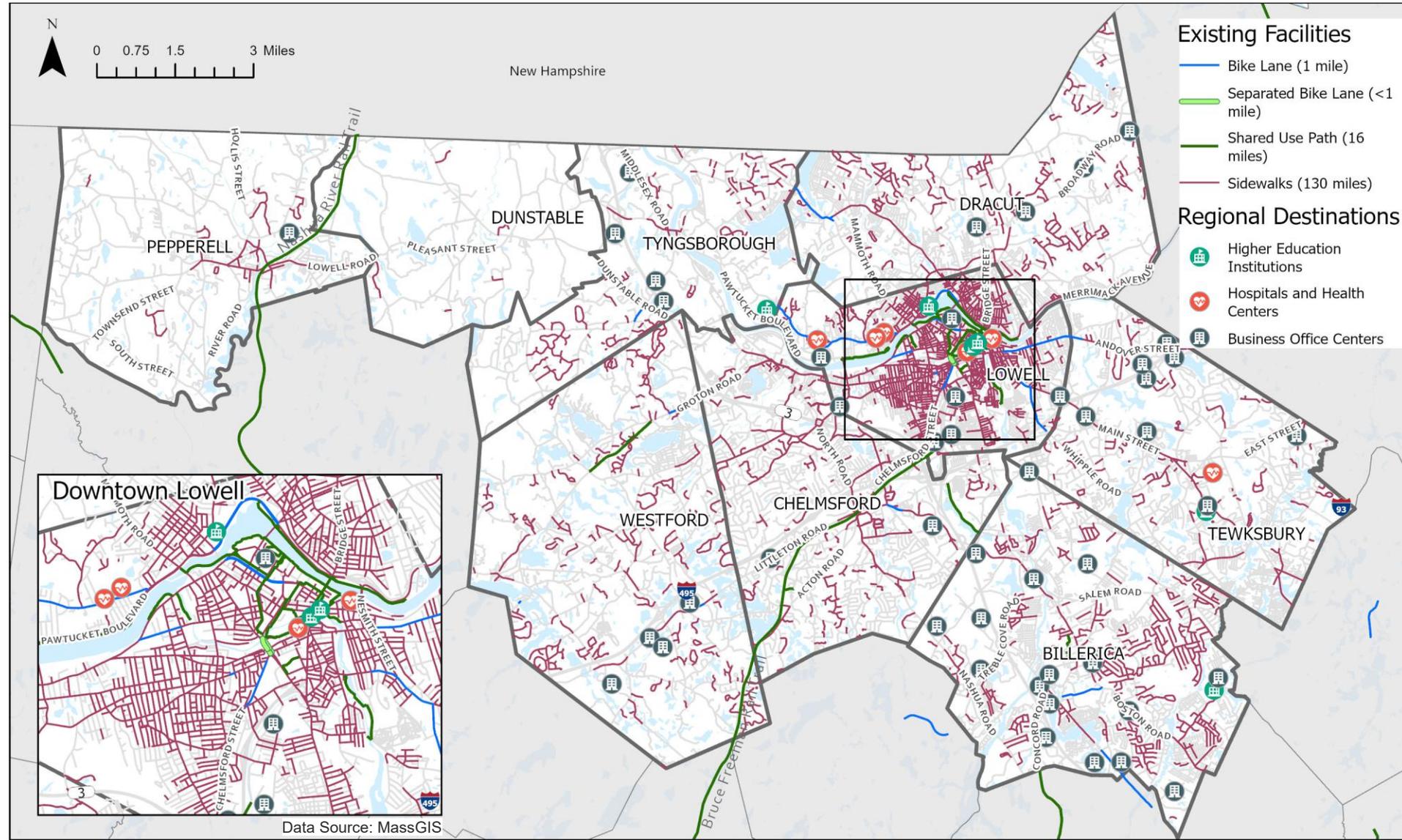
- Critical civic destinations include town halls, schools, and libraries, which are mapped here
- In most communities, these destinations are concentrated in town centers, with additional schools spread through neighborhoods



# Regional Destinations

Some destinations have a regional draw and are likely to be best served by inter-municipality trips.

- Regional civic and institutional destinations include higher education institutions, business centers, and hospitals and health centers
- Regional destinations are concentrated in Lowell, with a few in Tyngsborough, Billerica, and Tewksbury



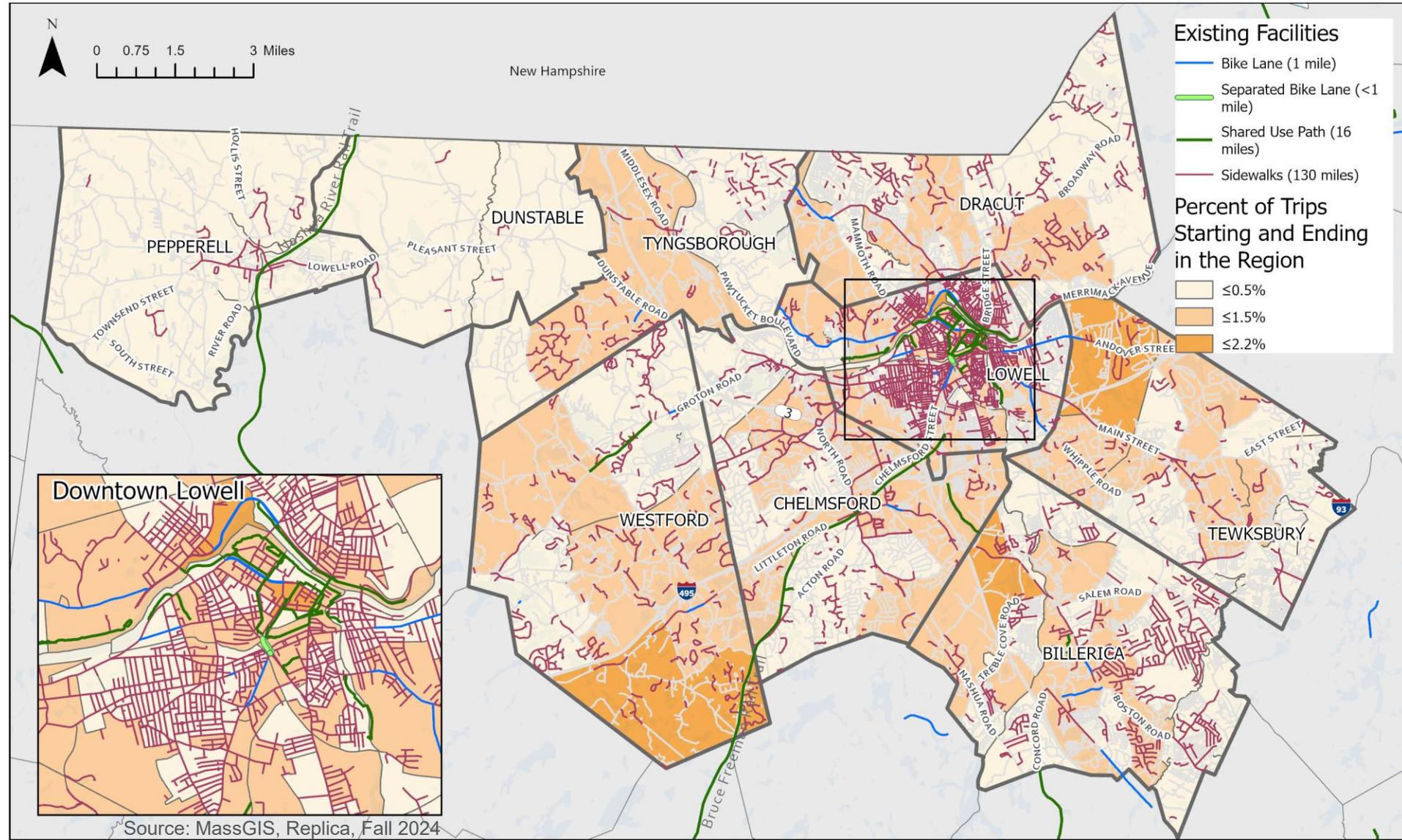
# Active Transportation Demand

# Trip Destinations

Replica is a data platform that provides transportation practitioners with travel patterns and characteristics by running a model that includes inputs from the census data, cell phone travel pattern data, and other sources.

It allows us to look beyond the commute-only focus of census data.

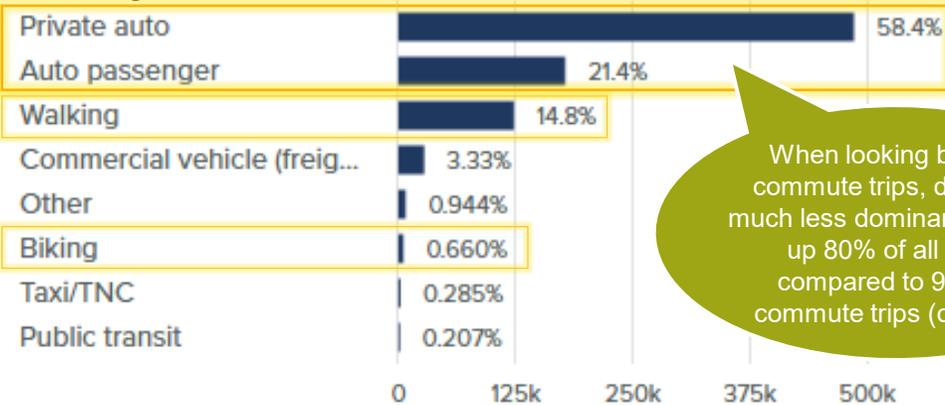
- Of all trips that start and end in the Greater Lowell region, this map shows where they end
- Areas in Lowell and along the I-495 corridor in Westford, Billerica, and Tewksbury are common destinations



# Travel Behavior – Mode and Purpose

Of all trips that start and end in the Greater Lowell region...

## Primary Mode



When looking beyond commute trips, driving is much less dominant! Making up 80% of all trips, compared to 94% of commute trips (census).

## Trip Purpose (by destination)

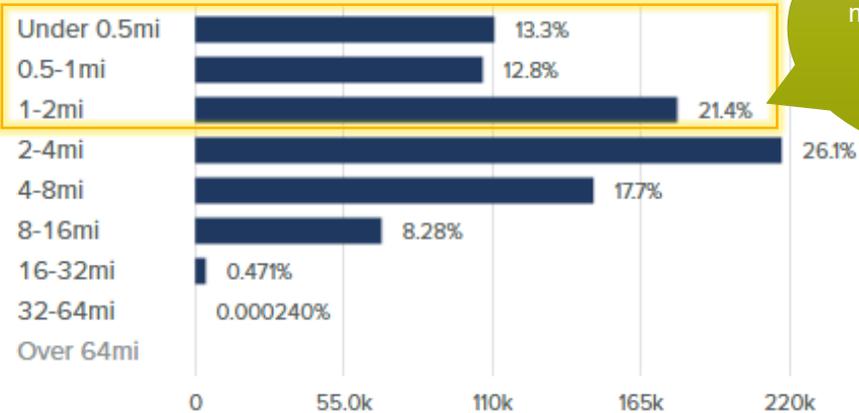


Other than trips that end at home, trips to shopping destinations are the most common.

# Travel Behavior – Distance and Location

Of all trips that start and end in the Greater Lowell region...

## Trip Distance (Miles)



Almost half of trips (48%) are less than 2 miles – trips that can be made by walking and bicycling with the right infrastructure!

## Top Origin-Destination Pairs

**Westford - Westford**  
(Census Tract 3184)

10.8K trips

**Billerica - Billerica**  
(Census Tract 3161.02)

10K trips

**Billerica - Billerica**  
(Census Tract 3165)

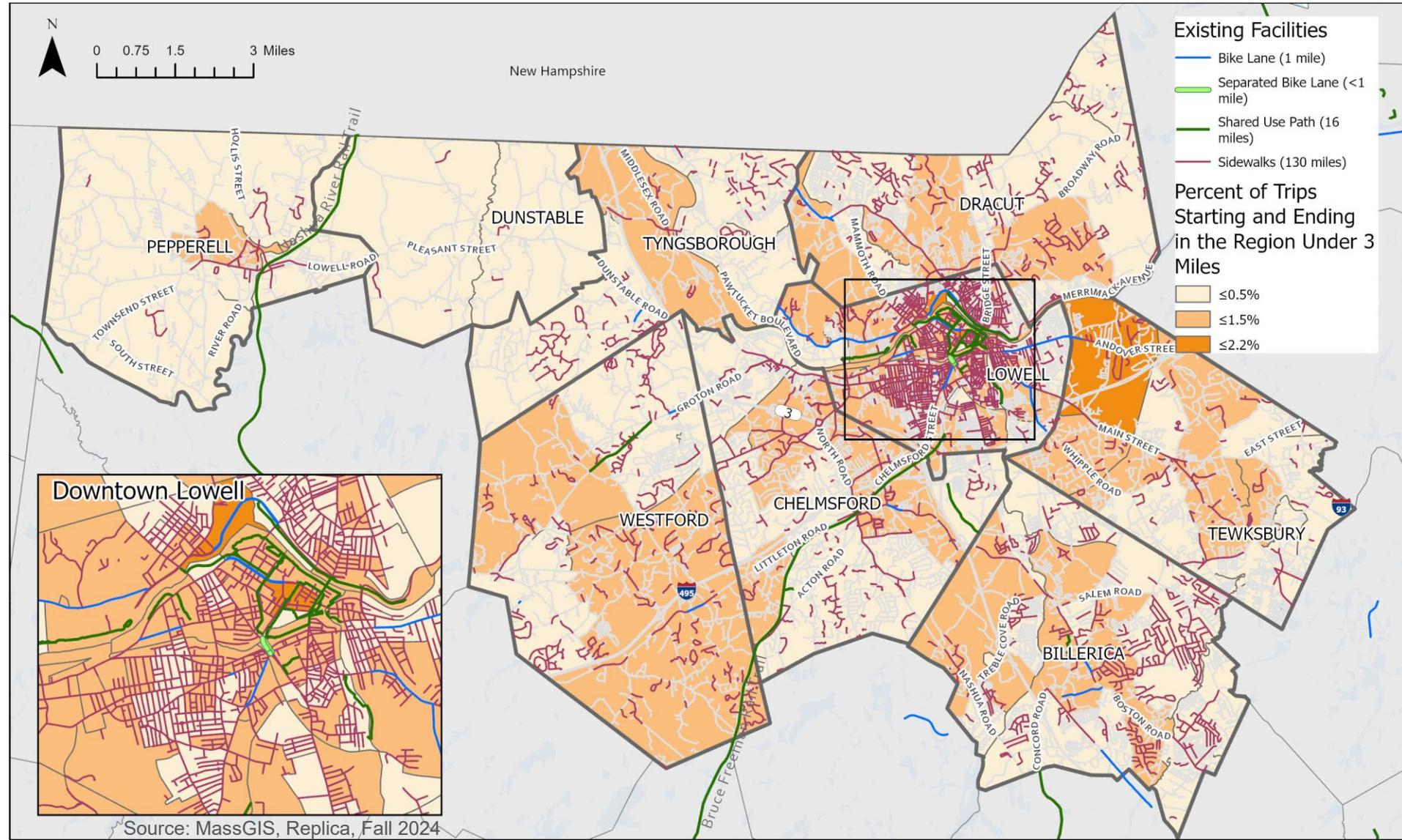
9.6K trips

Most trips are local trips, so they tend to stay within the same census tract.

# Trip Destinations under 3 miles

Trips under three miles are trips that could be made by walking or bicycling if safe and comfortable facilities provided the connections people need.

- Of all short trips that start and end in the Greater Lowell region, this map shows where they end
- Like the previous map showing trips of all lengths, areas in Lowell and along the I-495 corridor in Westford and Tewksbury are common destinations
- Short trips often go to local town centers and municipal commercial areas

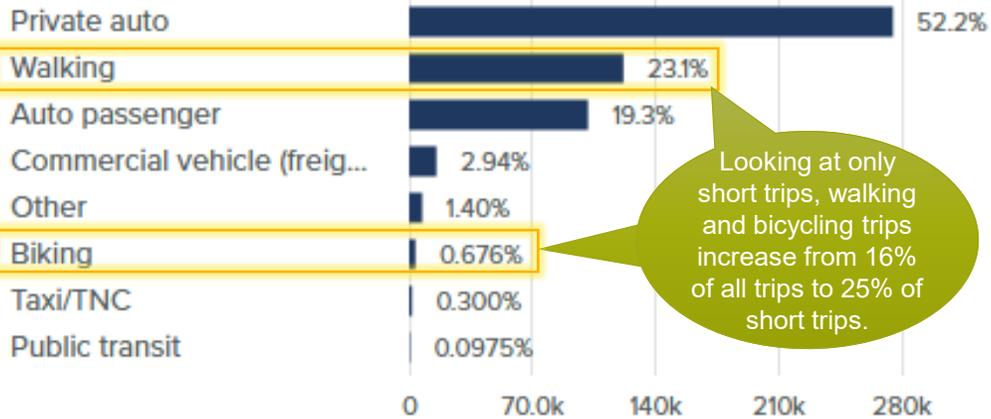


# Travel Behavior – Mode and Purpose

## Trips under 3 miles

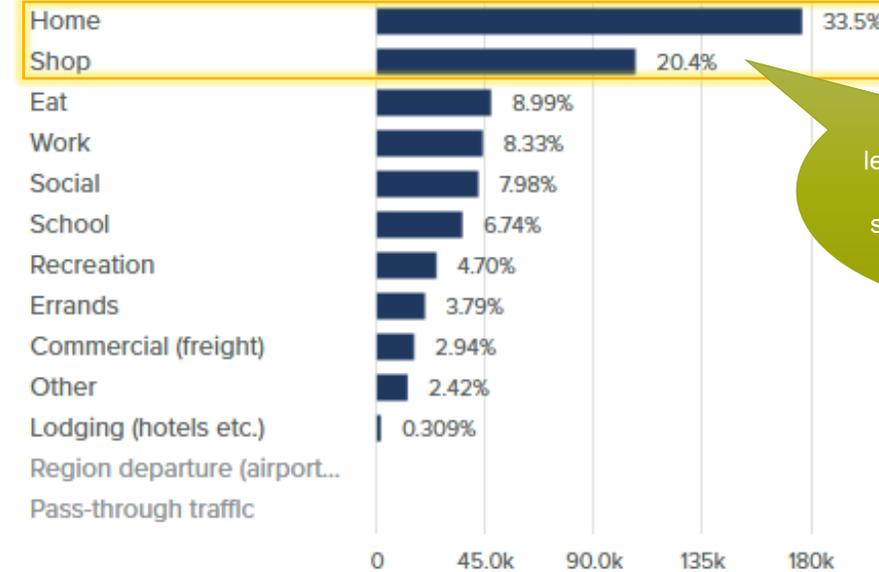
Of all trips that start and end in the Greater Lowell region and are less than 3 miles...

### Primary Mode



Looking at only short trips, walking and bicycling trips increase from 16% of all trips to 25% of short trips.

### Trip Purpose (by destination)



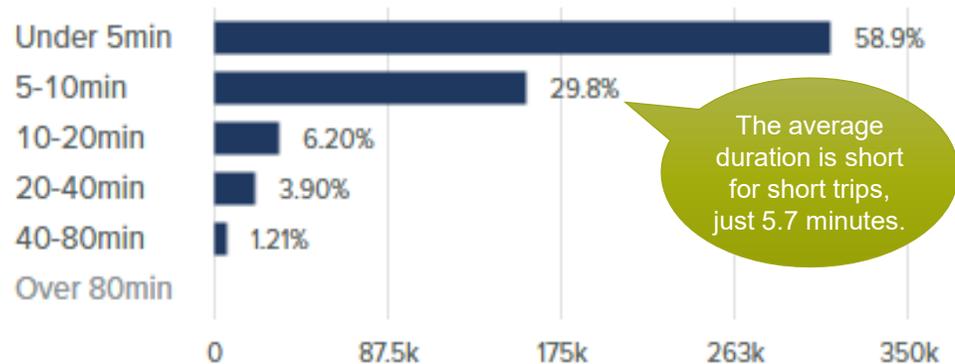
Just as with trips of any length, other than trips that end at home, trips to shopping destinations are the most common.

# Travel Behavior – Distance and Location

## Trips under 3 miles

Of all trips that start and end in the Greater Lowell region and are less than 3 miles...

### Trip Duration (Minutes)



The average duration is short for short trips, just 5.7 minutes.

### Top Origin-Destination Pairs

**Westford - Westford**  
(Census Tract 3184)

10.2K trips

**Billerica - Billerica**  
(Census Tract 3161.02)

9.9K trips

**Billerica - Billerica**  
(Census Tract 3165)

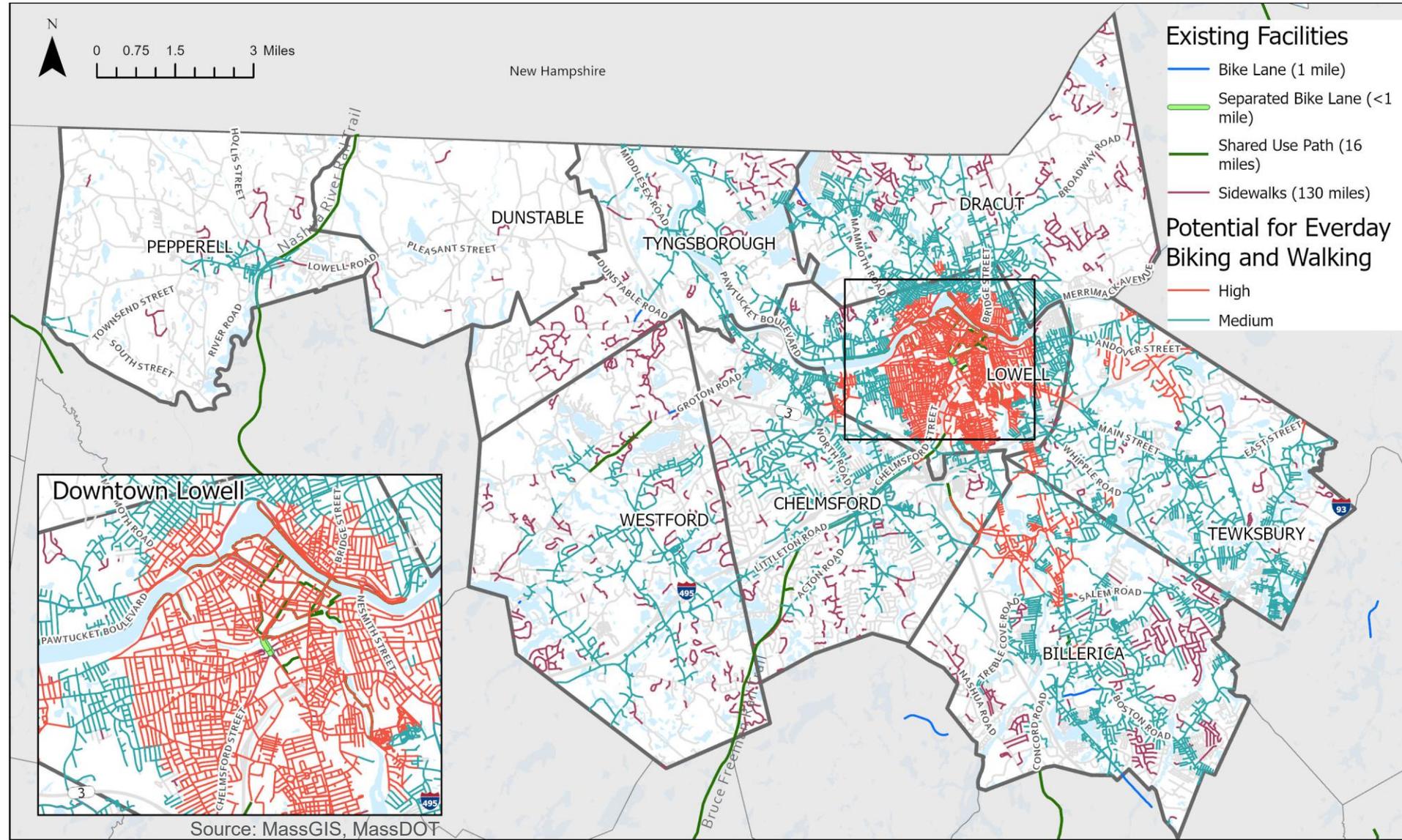
9.4K trips

Just as with trips of any length, most short trips are local trips, so they tend to stay within the same census tract.

# MassDOT Potential for Everyday Biking and Walking

MassDOT used Streetlight trip volumes (a data vendor that summarizes travel patterns based on information from cell phones and connected vehicles) to model demand and access for walking and biking.

- High = top 10% of potential road segments
- Medium = top 60% of potential road segments
- Communities with some high segments:
  - Lowell
  - Billerica
  - Tewksbury
  - Dracut
  - Chelmsford

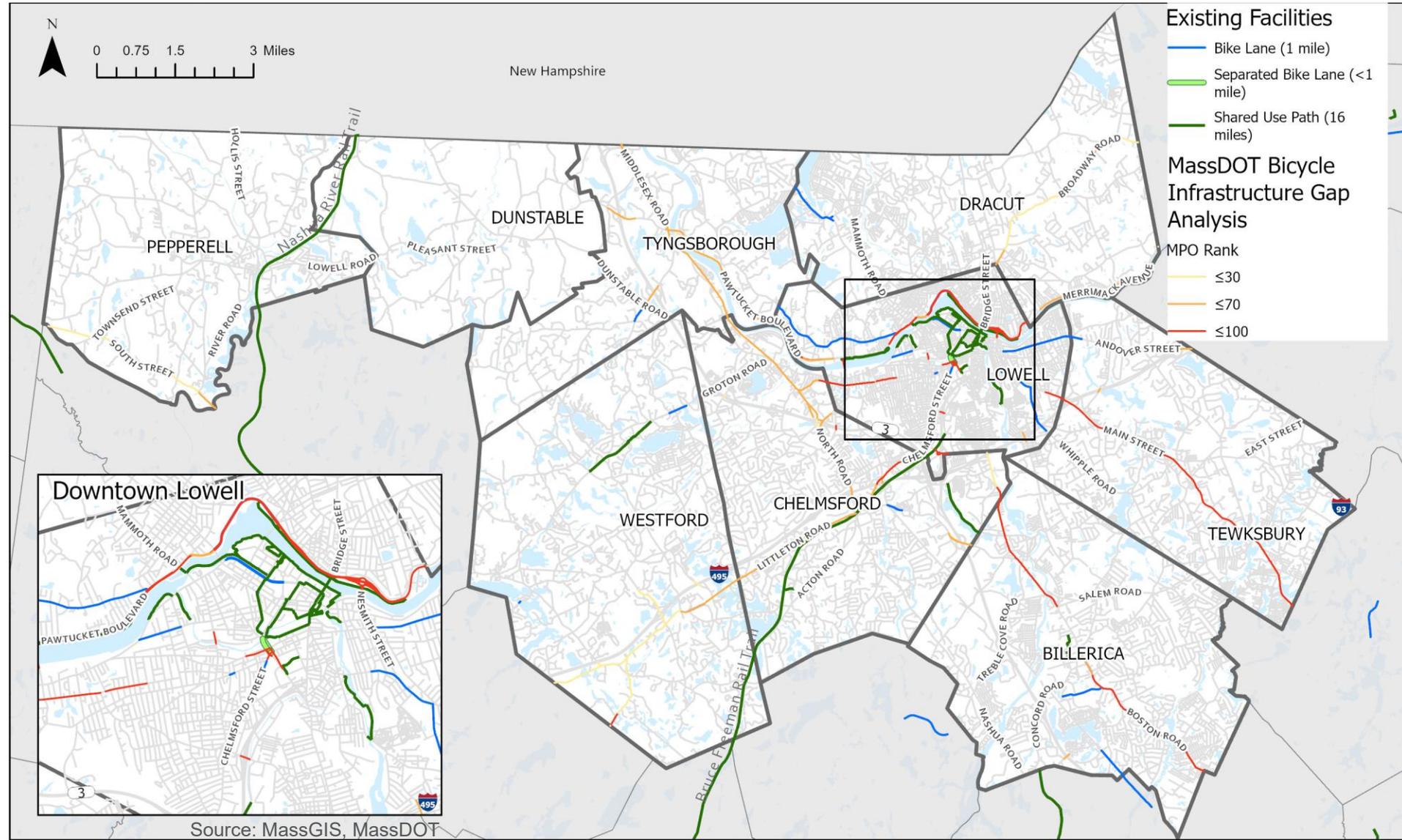




# MassDOT Bicycle Infrastructure Gap

MassDOT completed a statewide effort to identify infrastructure improvements needed to achieve high comfort facilities for people bicycling on all MassDOT-owned roadways. This assessment was based on vehicle speeds and volumes. Each segment is ranked within a region, in this case the nine municipalities in the Greater Lowell region.

- Communities with some high segments:
  - Lowell
  - Billerica
  - Tewksbury
  - Chelmsford

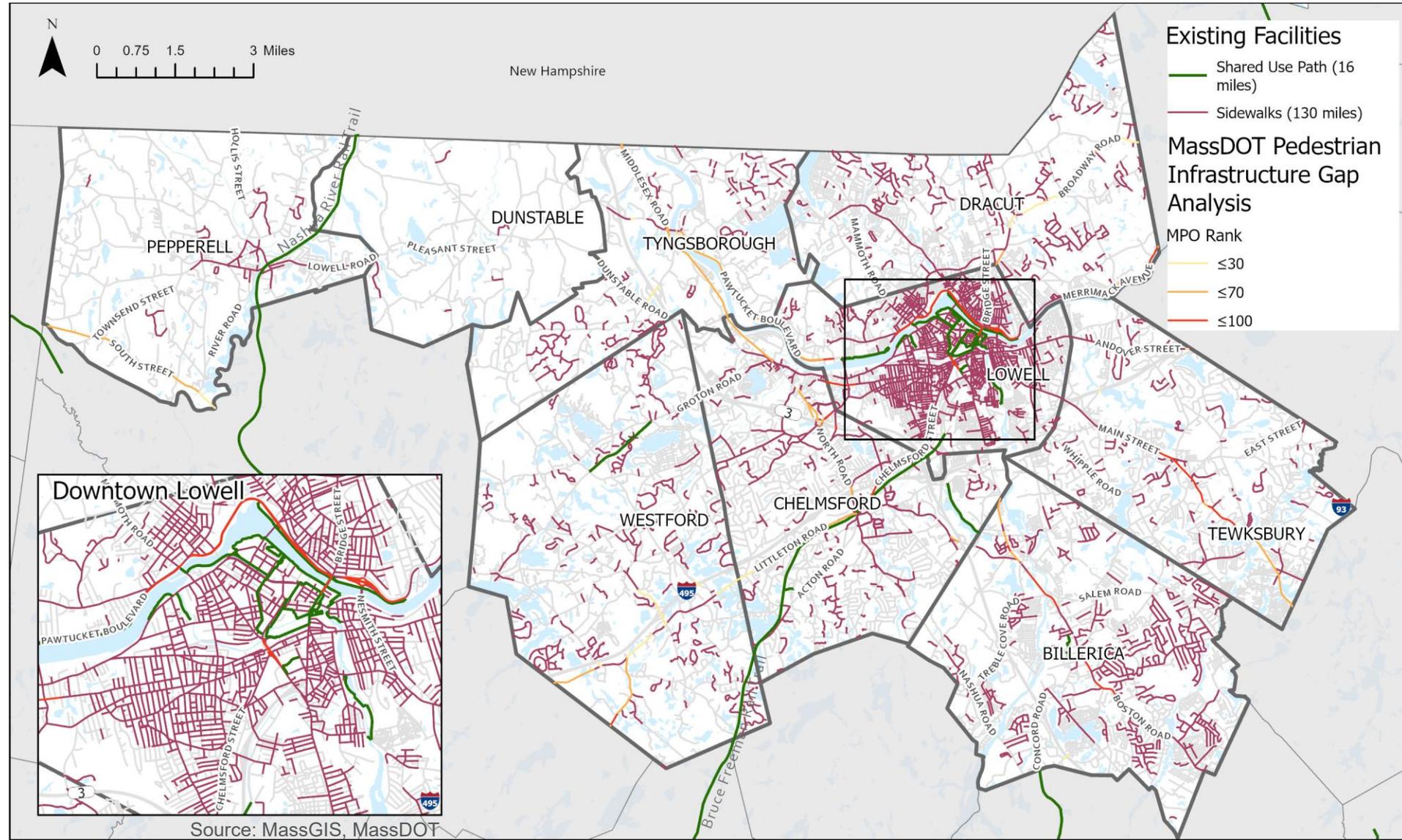




# MassDOT Pedestrian Infrastructure Gap

MassDOT also completed a statewide assessment of pedestrian infrastructure improvements needed to achieve high comfort facilities for people walking on all MassDOT-owned roadways. This assessment was based on sidewalk gaps and widths. Each segment is ranked within a region, in this case the Greater Lowell region.

- Communities with some high segments (75+):
  - Lowell
  - Chelmsford
  - Billerica
  - Tewksbury
  - Dracut



**NORTHERN MIDDLESEX COUNCIL OF GOVERNMENTS**  
SERVING THE REGION SINCE 1963

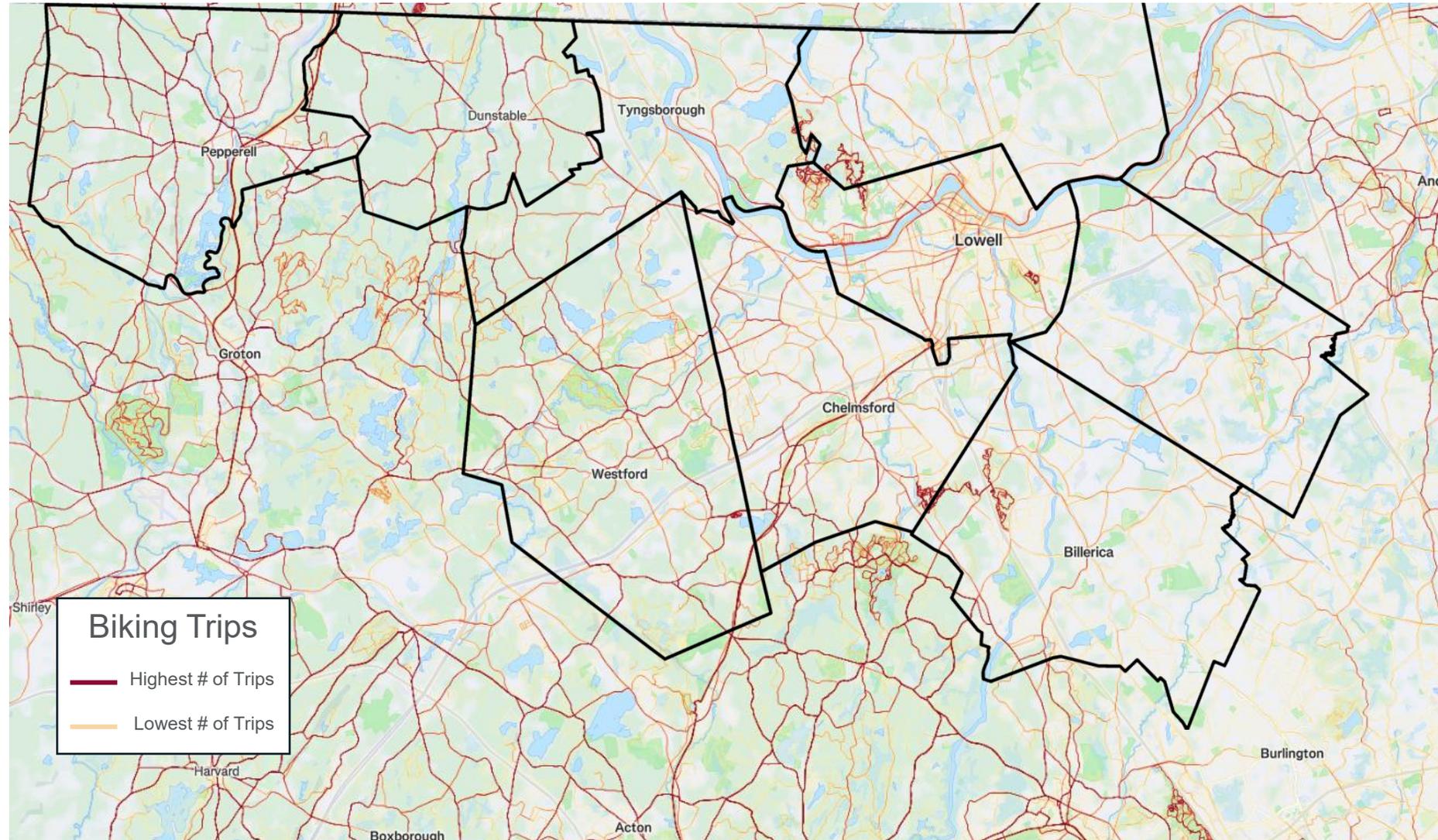
**TOOLE DESIGN**



# Strava – Heatmap of Bicycle Trips

Strava is a cell phone app people use to track their walking and bicycling trips. It is a biased source because it tends toward enthusiastic people who opt-into tracking and sharing their trips. Nonetheless, it provides a snapshot of the roadways people use for active transportation trips today.

- The existing regional shared use paths are the highest used segments in the region
- In addition to trails, bicyclists in the region tend to favor roadways that offer connections across and between towns



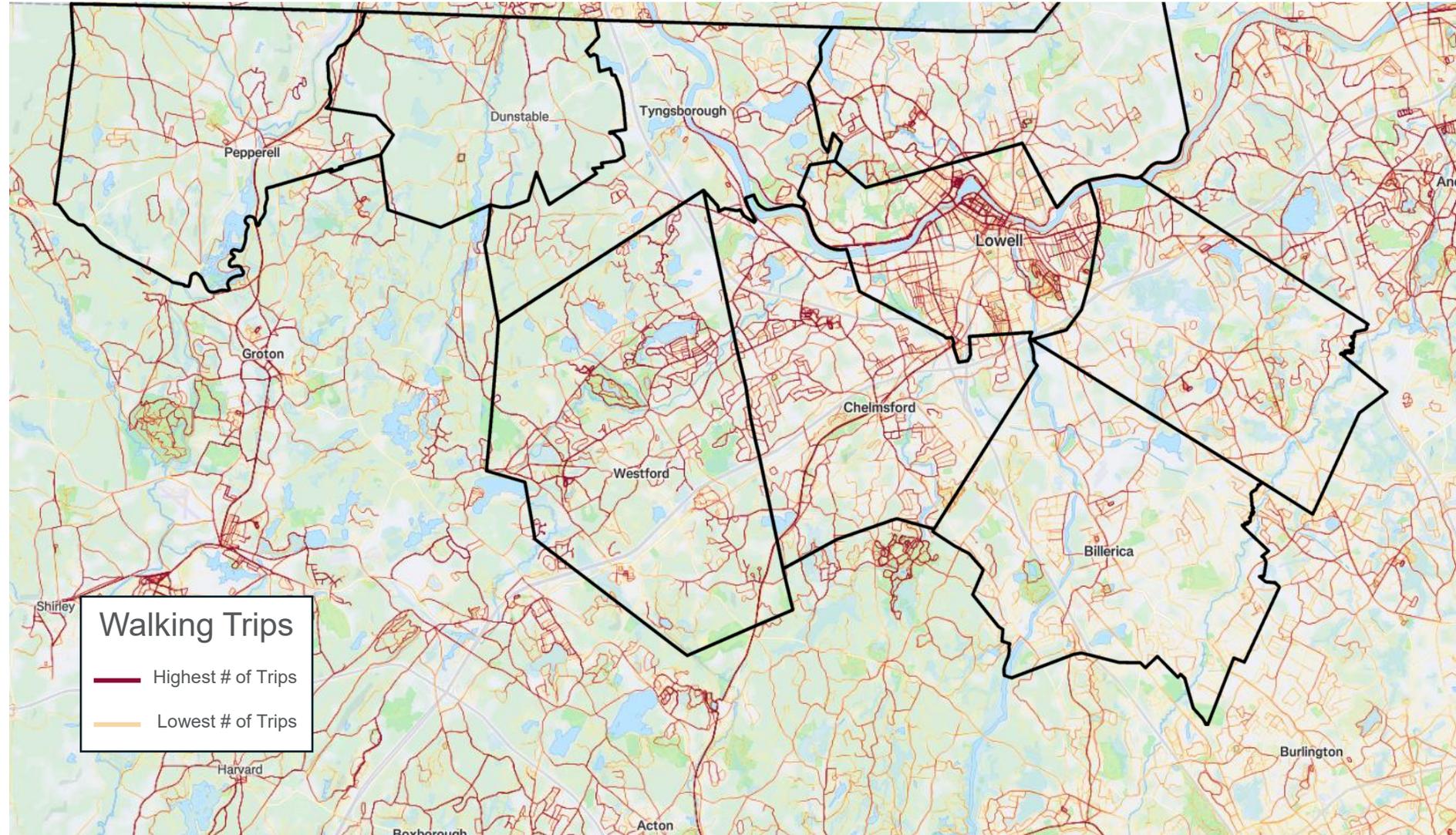
Source: Strava



# Strava – Heatmap of Pedestrian Trips

Strava also allows users to track walking trips.

- The existing regional shared use paths are among the highest used segments in the region for walking, as well as bicycling
- Unlike bicycling, denser less regionally connected streets in town centers are also among the highest used roadway in the region
- In addition, neighborhood streets are common as people tend to make walking trips, either for recreation or utility, close to their homes



Source: Strava

# Active Transportation Survey Results

NMCOG received data from previous active transportation related surveys administered by municipalities.

*Billerica, Chelmsford, Tyngsborough, Westford did not have relevant survey data available for review.*

## Dracut

- 75% of respondents favor increasing available accommodations for nonmotorized transportation
- 88% of respondents favor adding sidewalks or trails
- Respondents generally indicate that bicycle facilities are lacking
- Respondents mentioned lack of sidewalks/walkability and pedestrian safety concerns

## Dunstable

- 77% of respondents favor increasing accommodations for pedestrians and bicyclists
- 45% of respondents indicated bicycle facilities/accommodations are poor
- 56% of respondents indicated pedestrian accommodations are poor
- 71% of respondents favor adding sidewalks/pathways

## Lowell

- Lacks cohesive bike lane network that connects to key areas
- Andover Street, Westford Street, and Route 38 are dangerous for bicyclists
- Sidewalks are in poor condition and are unsafe
- Extend Bruce Freeman Rail Trail to Lowell

## Pepperell

- Address issues of pedestrian safety through improved crosswalks and signage
- Address conditions of sidewalks and develop a plan to improve maintenance

## Tewksbury

- 96% of respondents favor adding new sidewalks over rehabilitating existing sidewalks
- 39% of respondents favor requiring developers to construct a sidewalk on at least one side of the street
- 81% of respondents want increase in funding for sidewalks

# Summary

# Existing Conditions Summary Takeaways

<p><b>1. Existing Plans and Studies</b></p>	<p>All municipalities have embraced Complete Streets and through local plans they have called for expanded and improved the bicycle and pedestrian networks. Bicycle and pedestrian infrastructure and plans vary among the 9 municipalities, with some further along than others. Regional plans set the foundation for a focus on safety and making regional connections.</p>
<p><b>2. Infrastructure Inventory</b></p>	<p>Greater Lowell’s 16 miles of shared use paths form the backbone of a future transportation network. A dedicated and protected network is critical for supporting safety for people of all ages and abilities. On-street bicycle facilities are limited and only 7% of the roadway network has sidewalks (including double counting where there is a sidewalk on both sides).</p>
<p><b>3. Safety Analysis</b></p>	<p>Between 2018 and 2023, there were 11 fatalities and 68 serious injuries in crashes involving someone walking or bicycling, most of these concentrated in Lowell and on arterial roadways.</p>
<p><b>4. Demographics</b></p>	<p>Across the region, 8,000 households (7%) do not have any vehicles. Transportation vulnerability indicators, predominantly concentrations of seniors and people with disabilities, point to areas of the region in need of improved walking and bicycling connections.</p>
<p><b>5. Equitable Distribution</b></p>	<p>Greater Lowell has off-street shared use paths and trails that support recreational usage and exercise. However, the region lacks proper pedestrian and bicycle facilities for utility and short trips, especially in locations with a high number of environmental justice (REJ+) populations.</p>
<p><b>6. Destinations</b></p>	<p>Local and regional destinations will provide a window into gaps in the next phase of analysis.</p>
<p><b>7. Active Transportation Demand</b></p>	<p>About one quarter of trips in the region are less than 2 miles – trips that can be made by walking and bicycling with the right infrastructure. MassDOT’s Potential for Everyday Biking and Walking analysis shows core areas in almost every municipality where this could be achieved.</p>

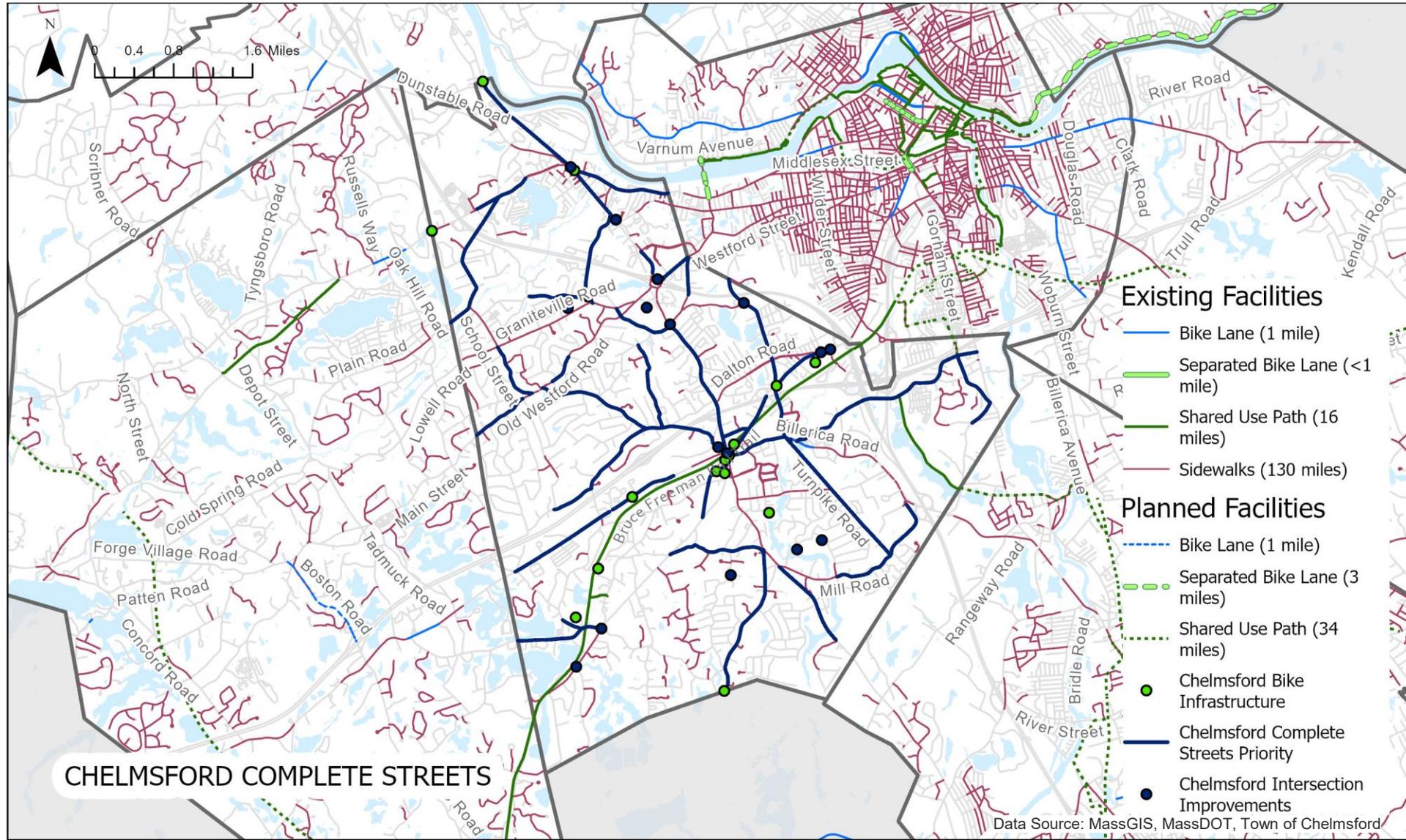
# Municipality Maps Appendix

# Complete Streets Prioritization



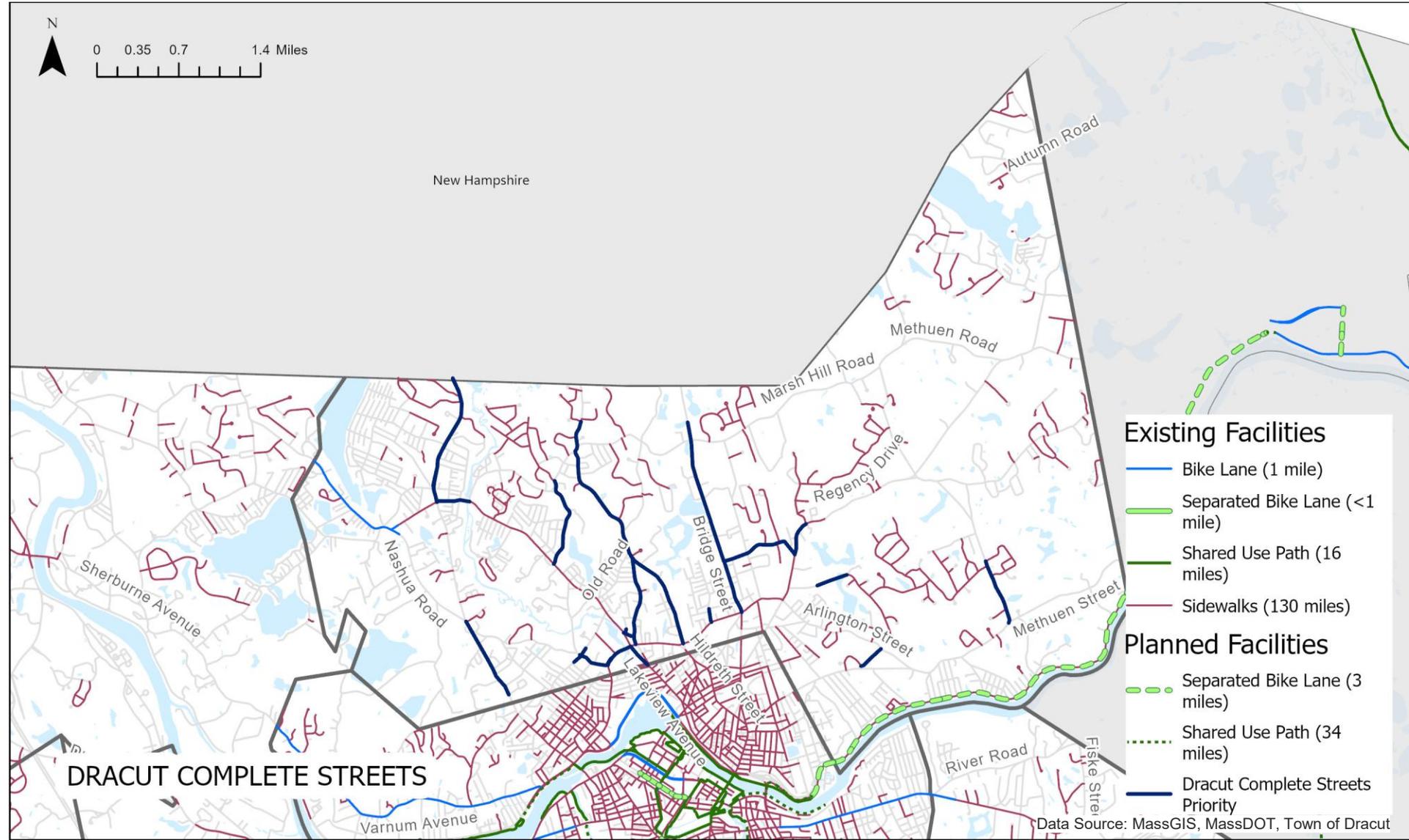
# Chelmsford

Priority at Bruce Freeman Rail Trail crossings, on low stress roadways, and near the Town Common



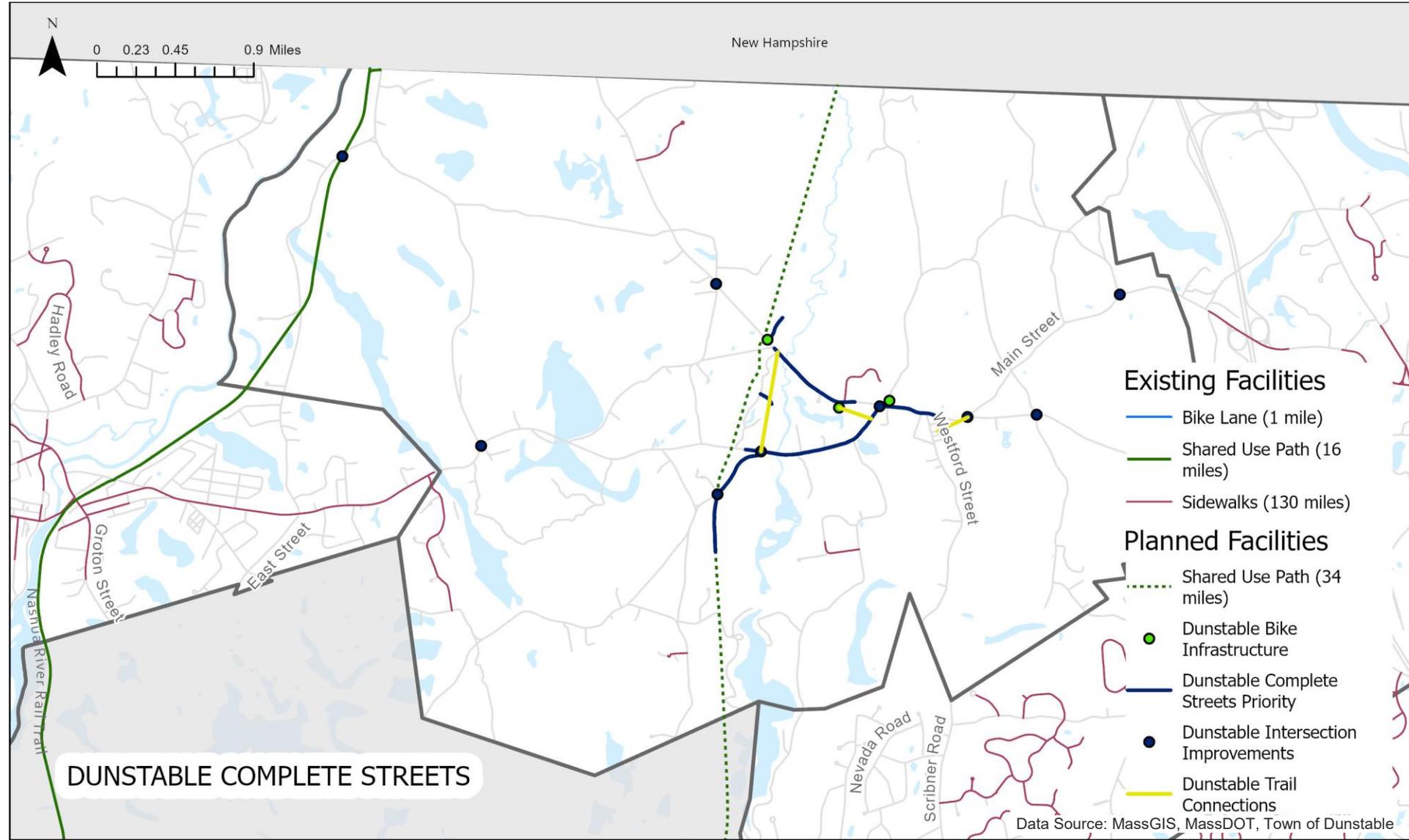
# Dracut

Priority along Mammoth Rd, Bridge St, and streets accessing local businesses



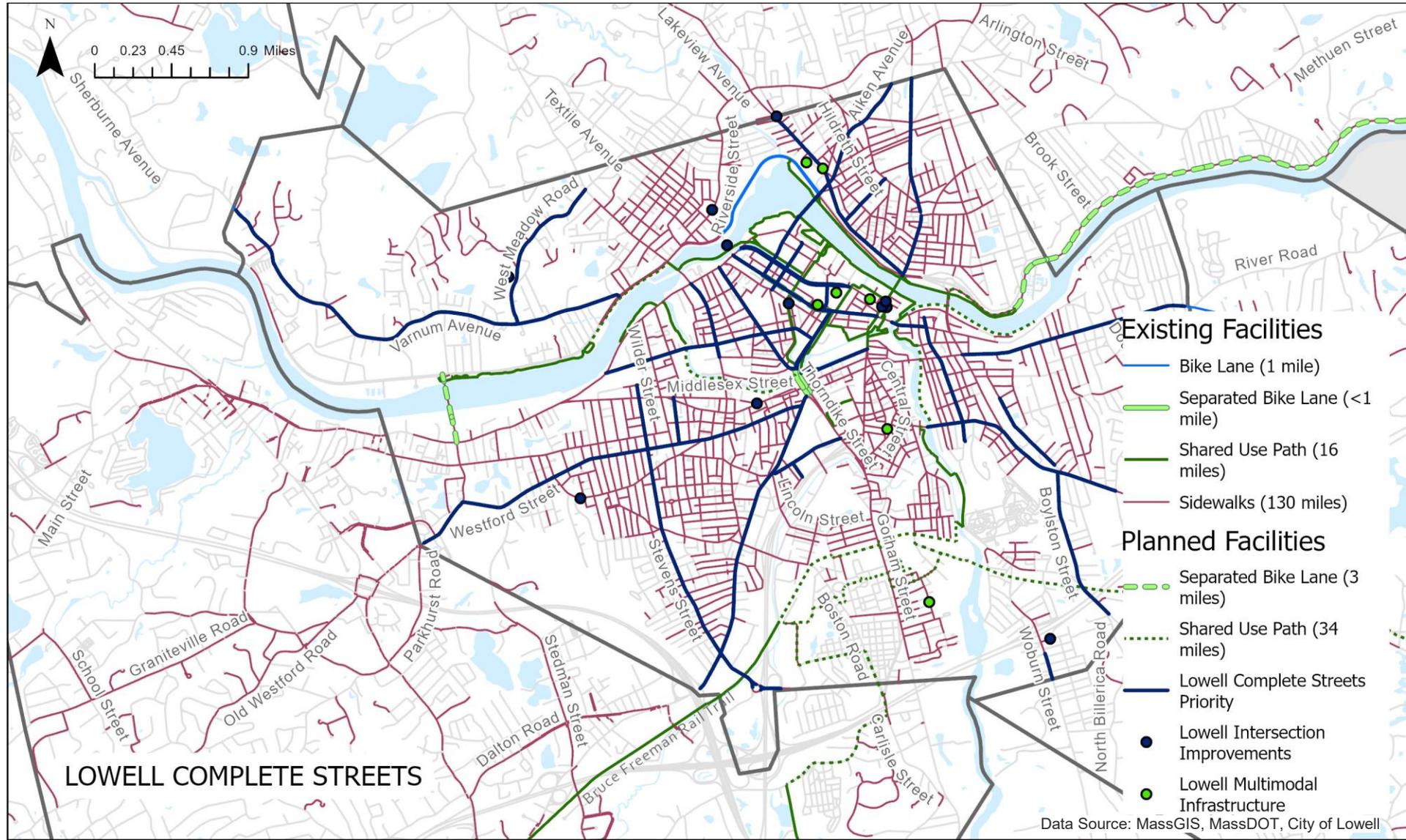
# Dunstable

Priority along Main St (Rt 113) and Pleasant St



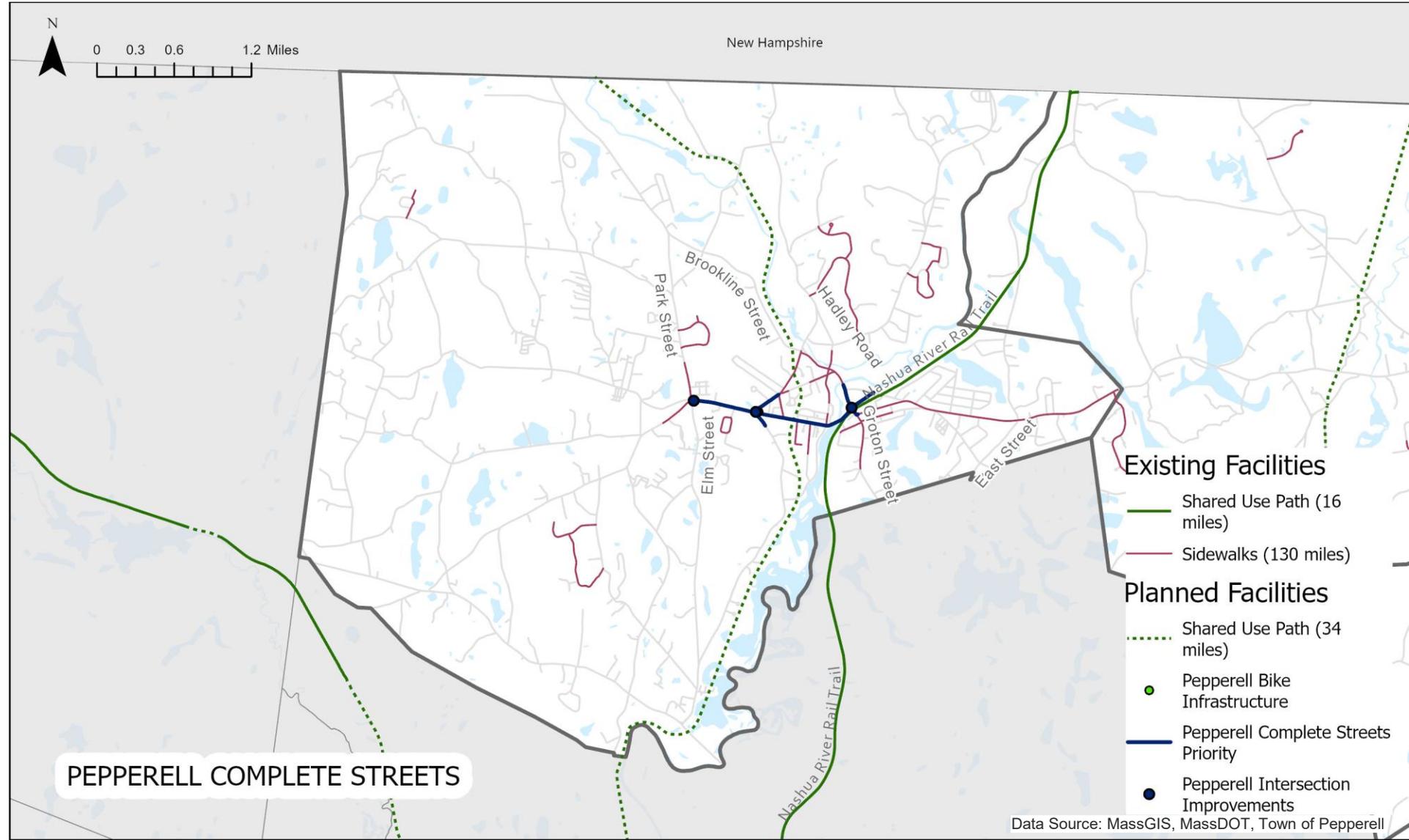
# Lowell

Priority to improve east/west and north/south connections and intersections in downtown Lowell



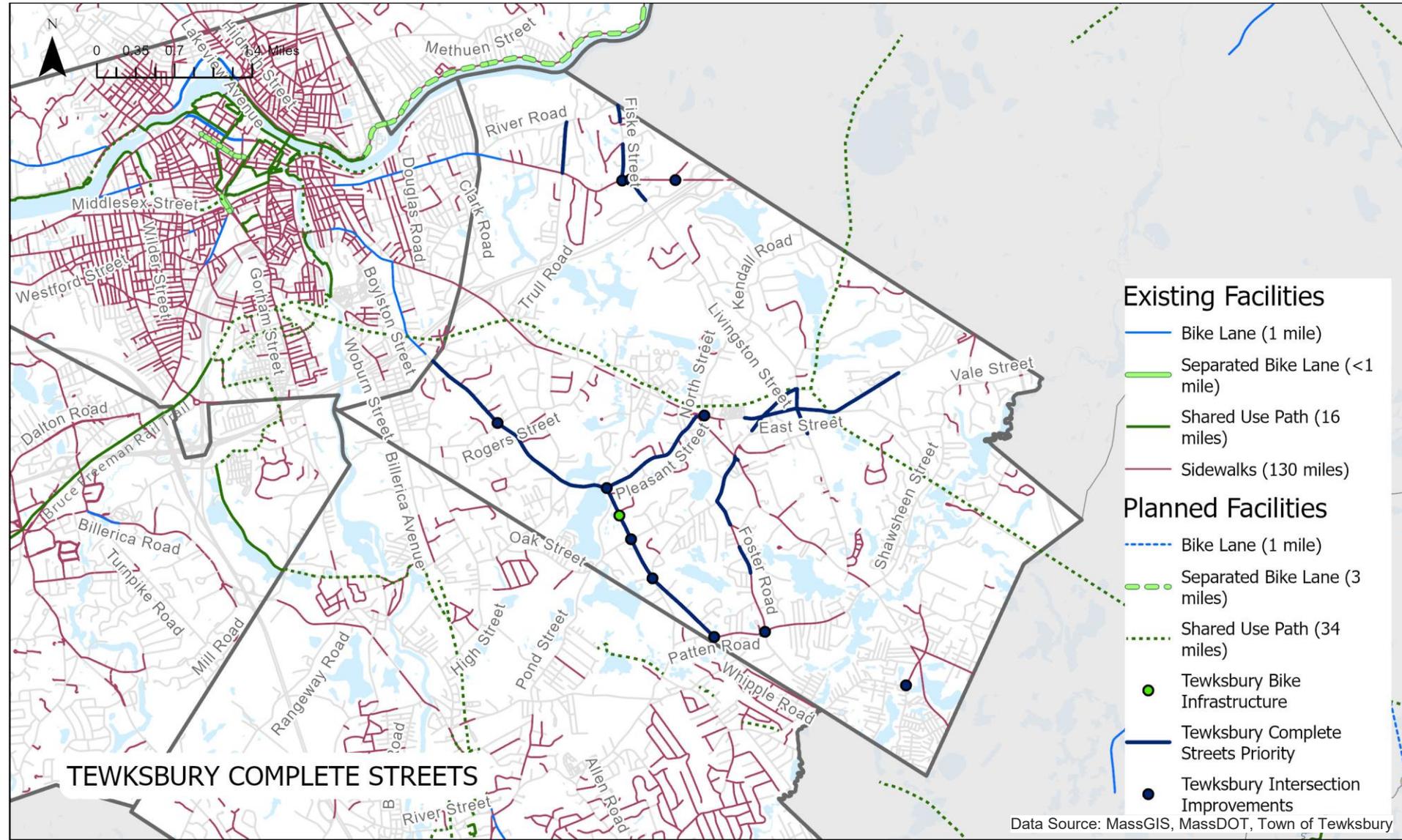
# Pepperell

Priority along Main St (Rt 113) and Park St



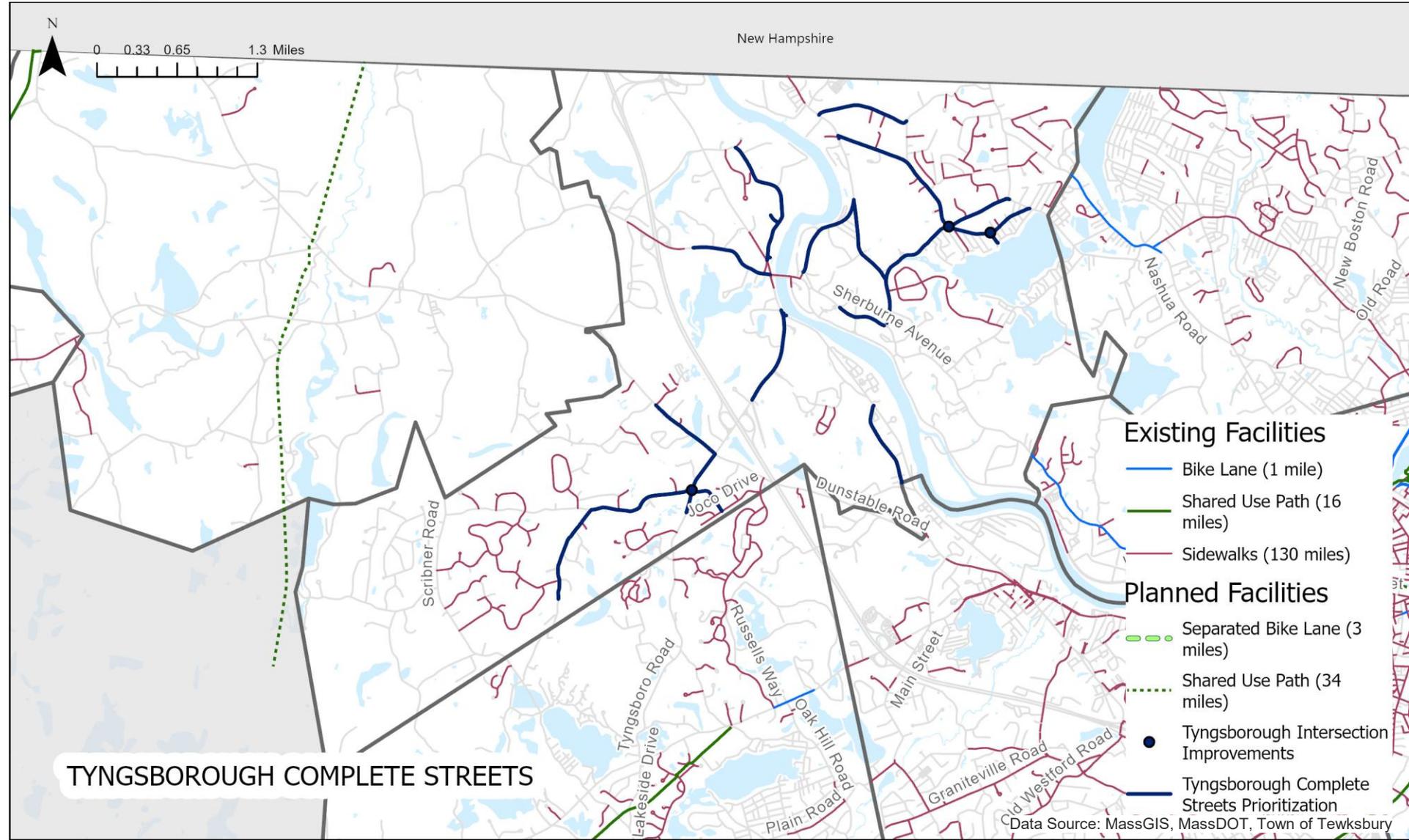
# Tewksbury

Priority along Whipple Rd and Pleasant St



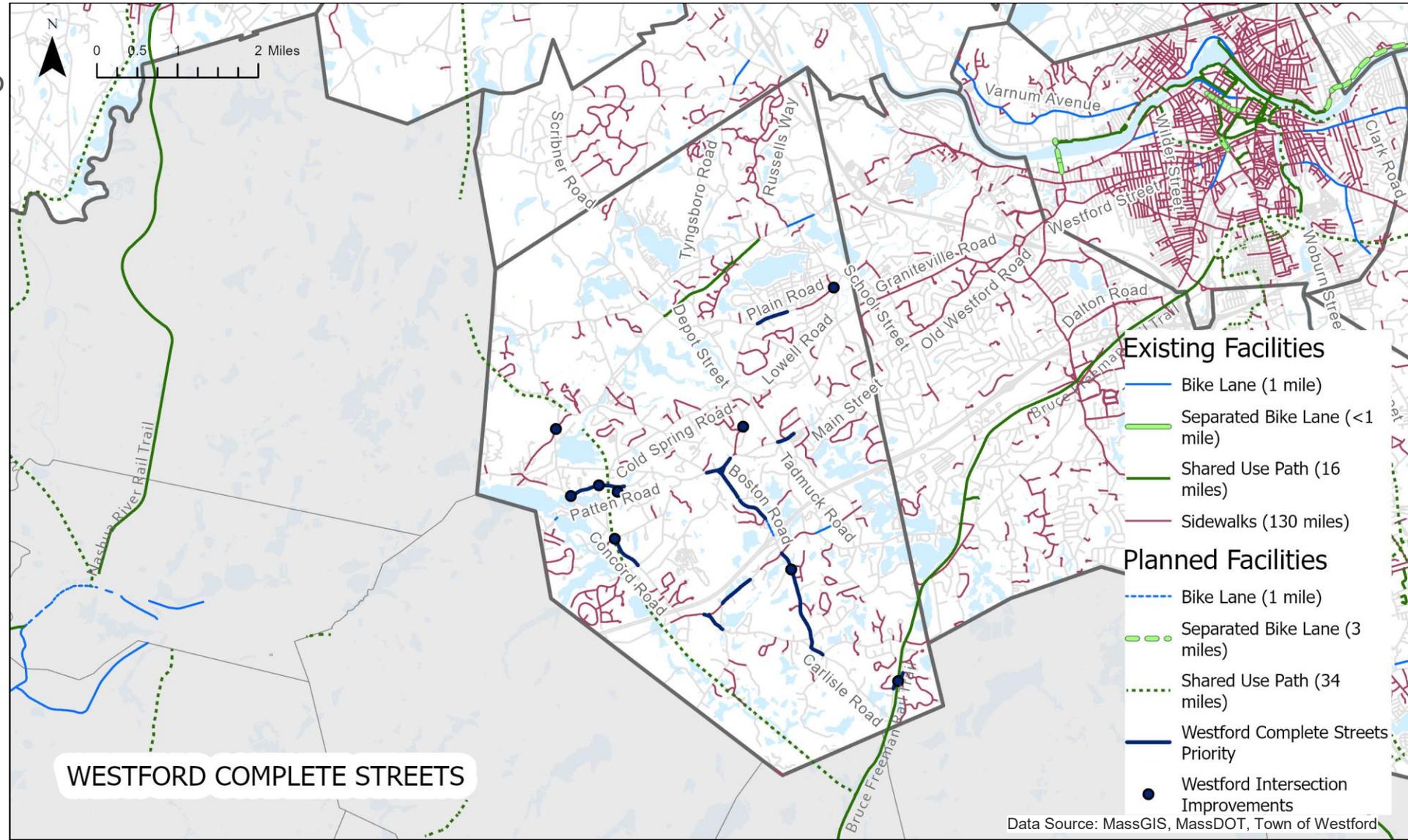
# Tyngsborough

Priority along Lakeview Ave, Norris Rd, and Coburn Rd



# Westford

Priority along Boston Rd to Town Center and near Westford schools



Data Source: MassGIS, MassDOT, Town of Westford



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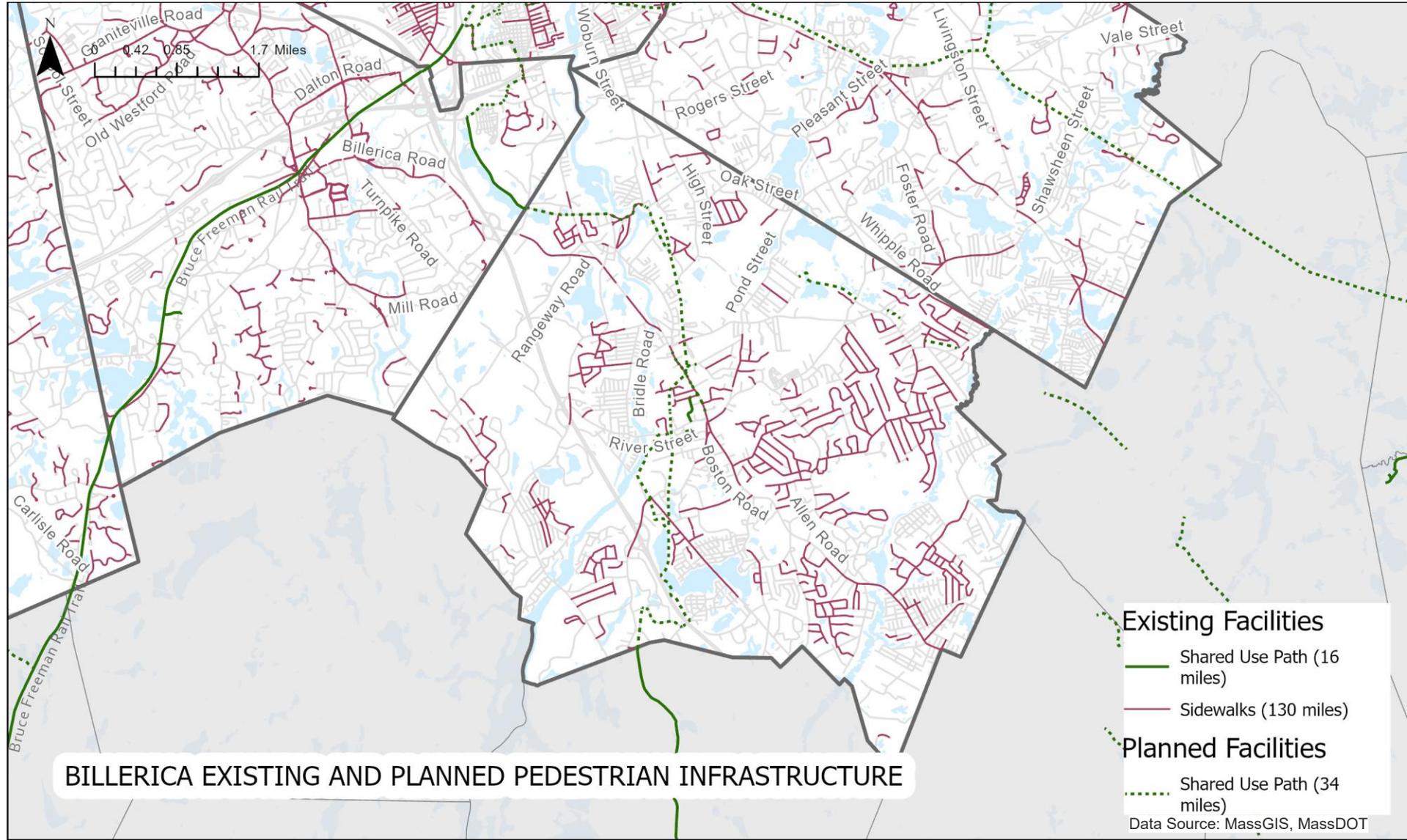
**TOOLE  
DESIGN**



# Existing and Planned Pedestrian Infrastructure

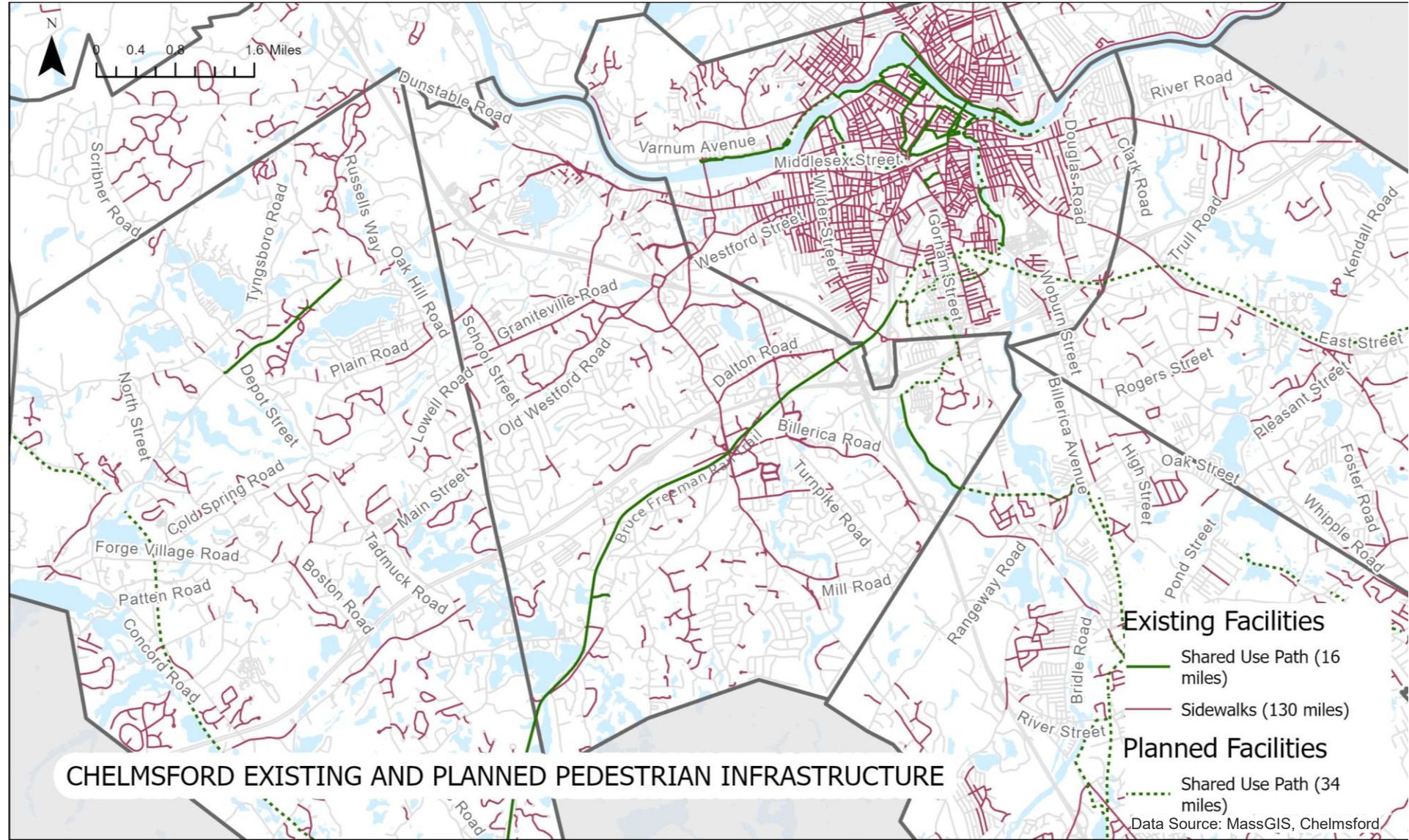


# Billerica





# Chelmsford

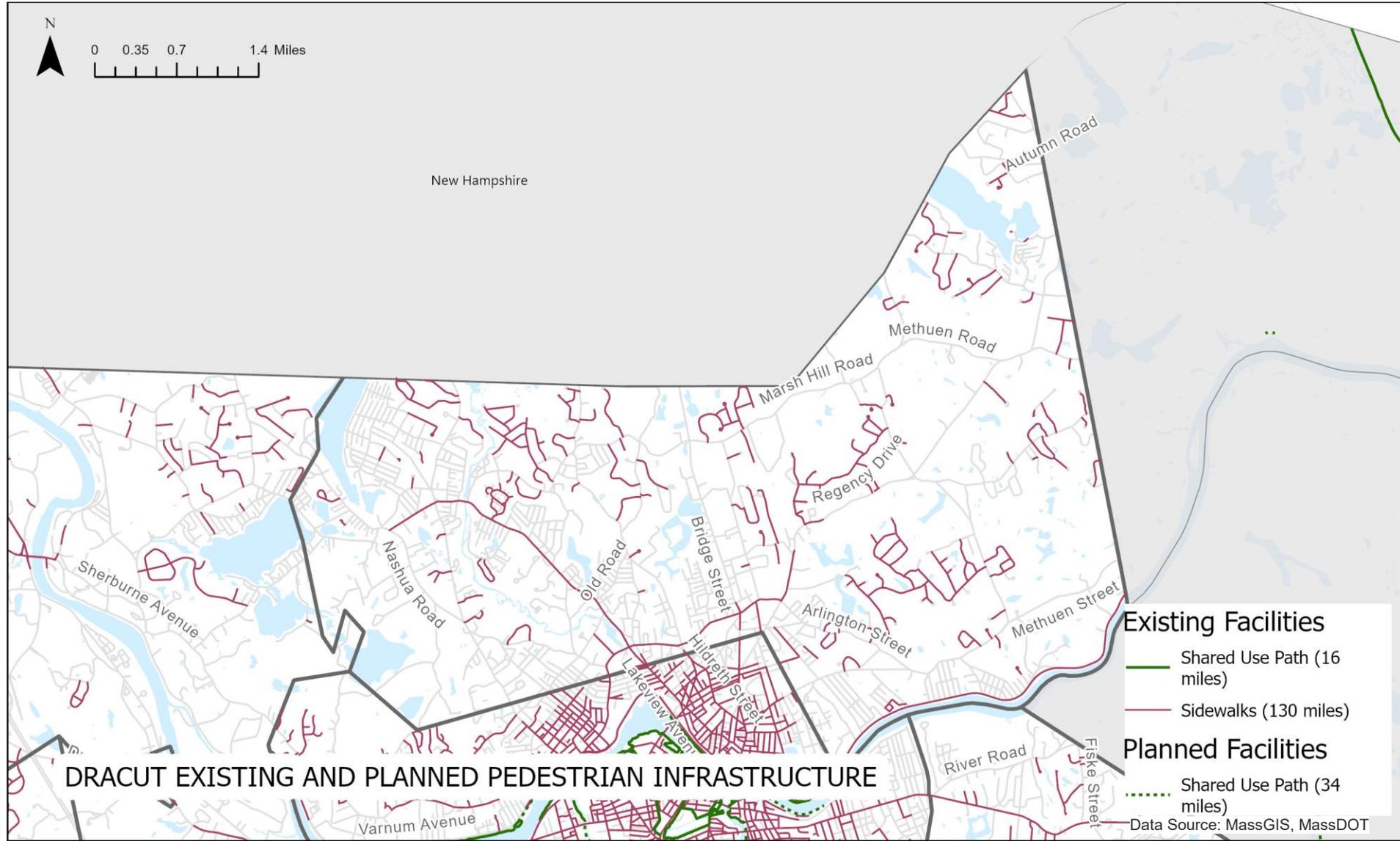


CHELMSFORD EXISTING AND PLANNED PEDESTRIAN INFRASTRUCTURE





# Dracut

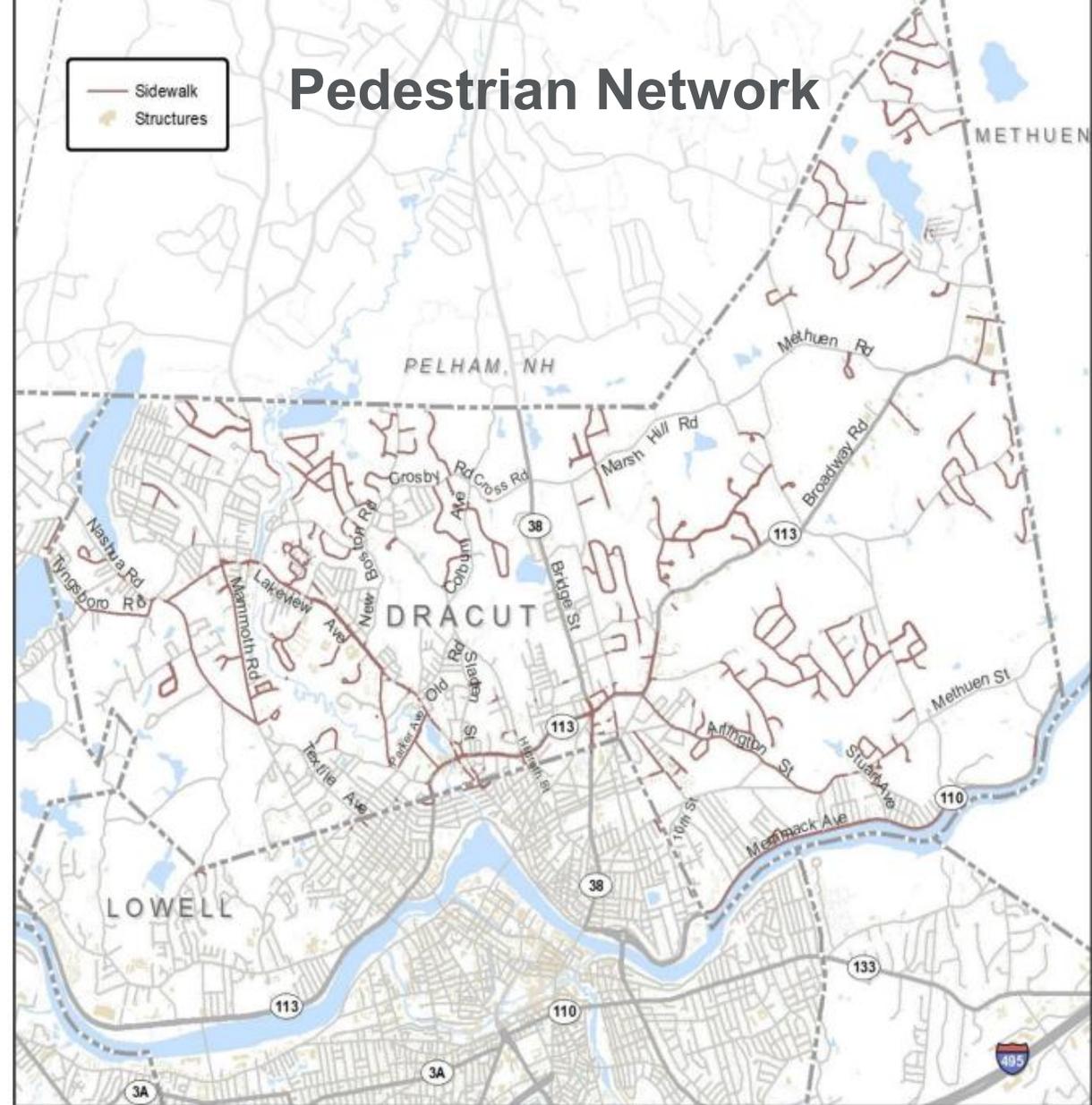


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DESIGN**

# Dracut Master Plan (2020)

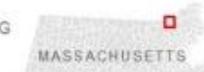
- Existing Pedestrian Network



**Sources:**  
Town of Dracut (sidewalks); MassDOT/NMCOG (roads);  
MassGIS (town boundaries, structures); MassDEP/NMCOG  
(hydrography); NH GRANIT (roads, political boundaries)

Data provided on this map is not sufficient for either boundary  
determination or regulatory interpretation.

Produced by NMCOG: 4/16/2019



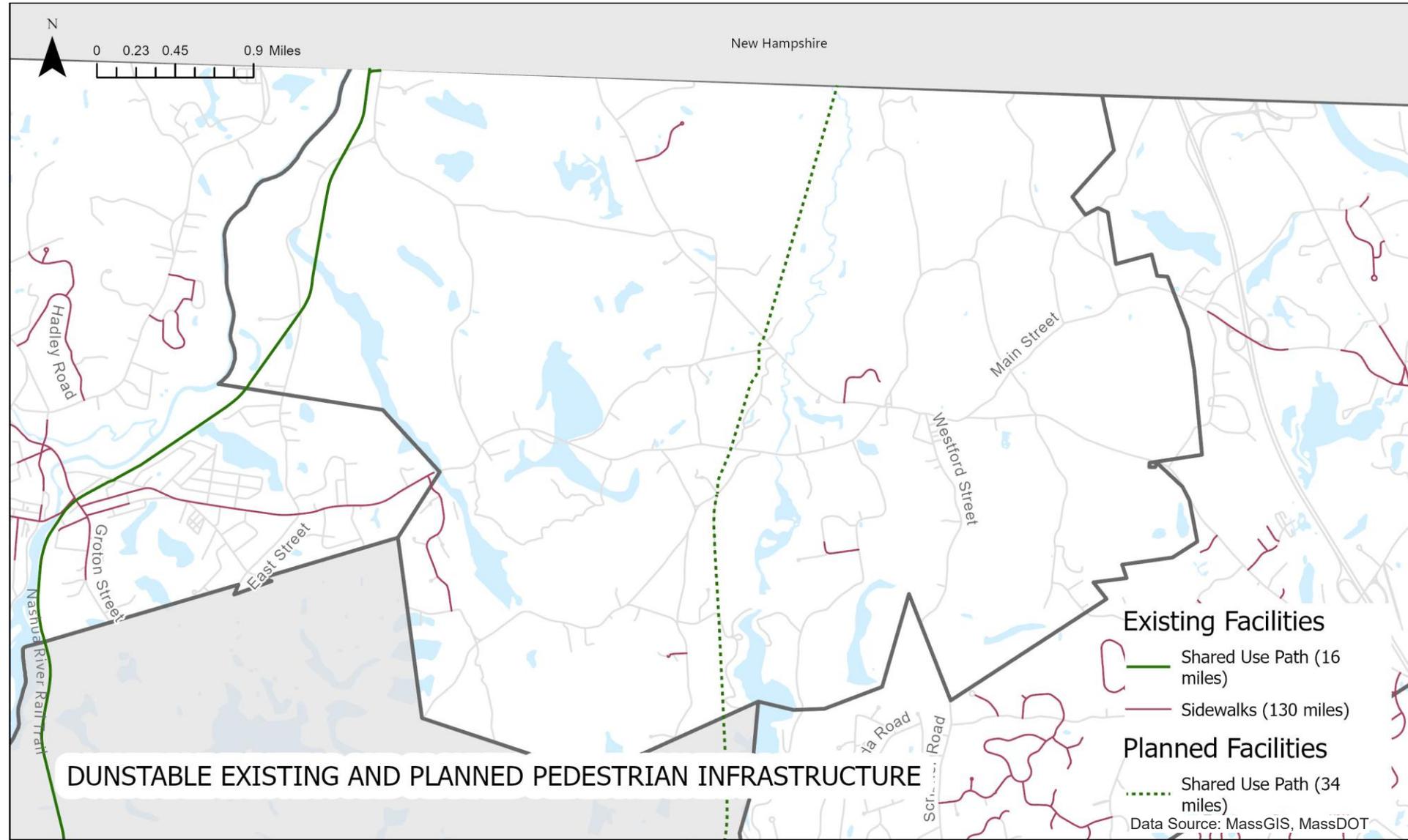
0 2,000 Feet



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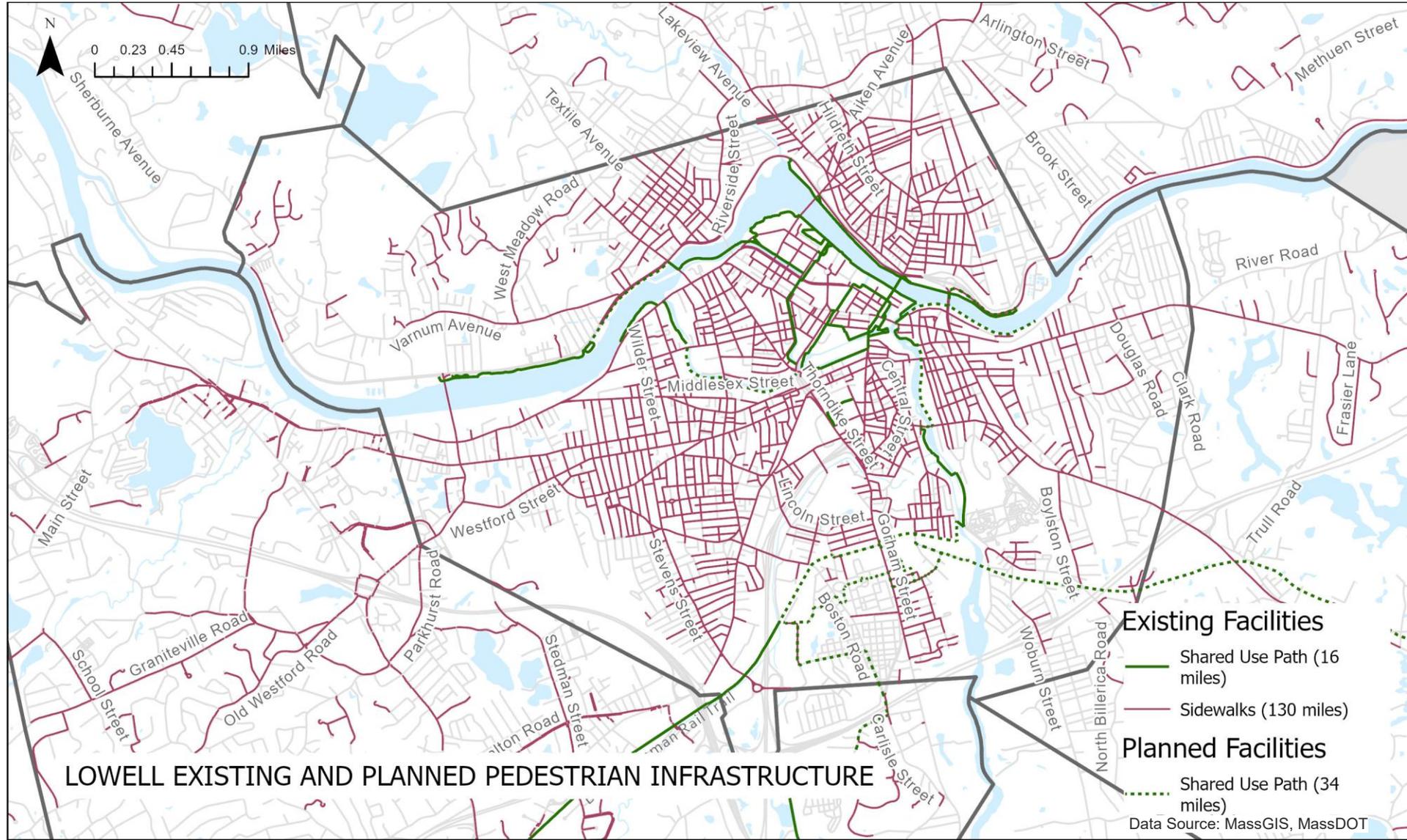


# Dunstable





# Lowell

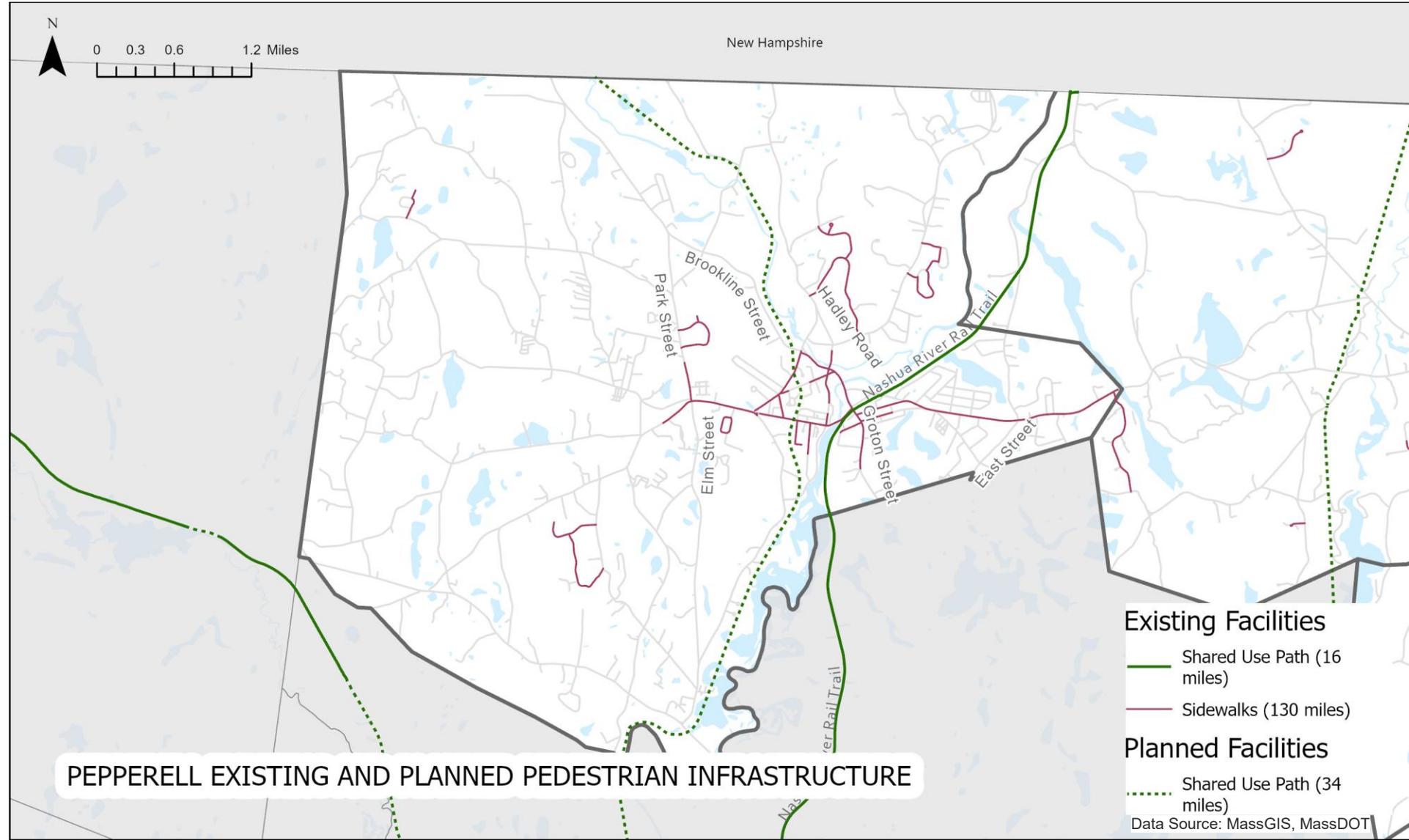


LOWELL EXISTING AND PLANNED PEDESTRIAN INFRASTRUCTURE



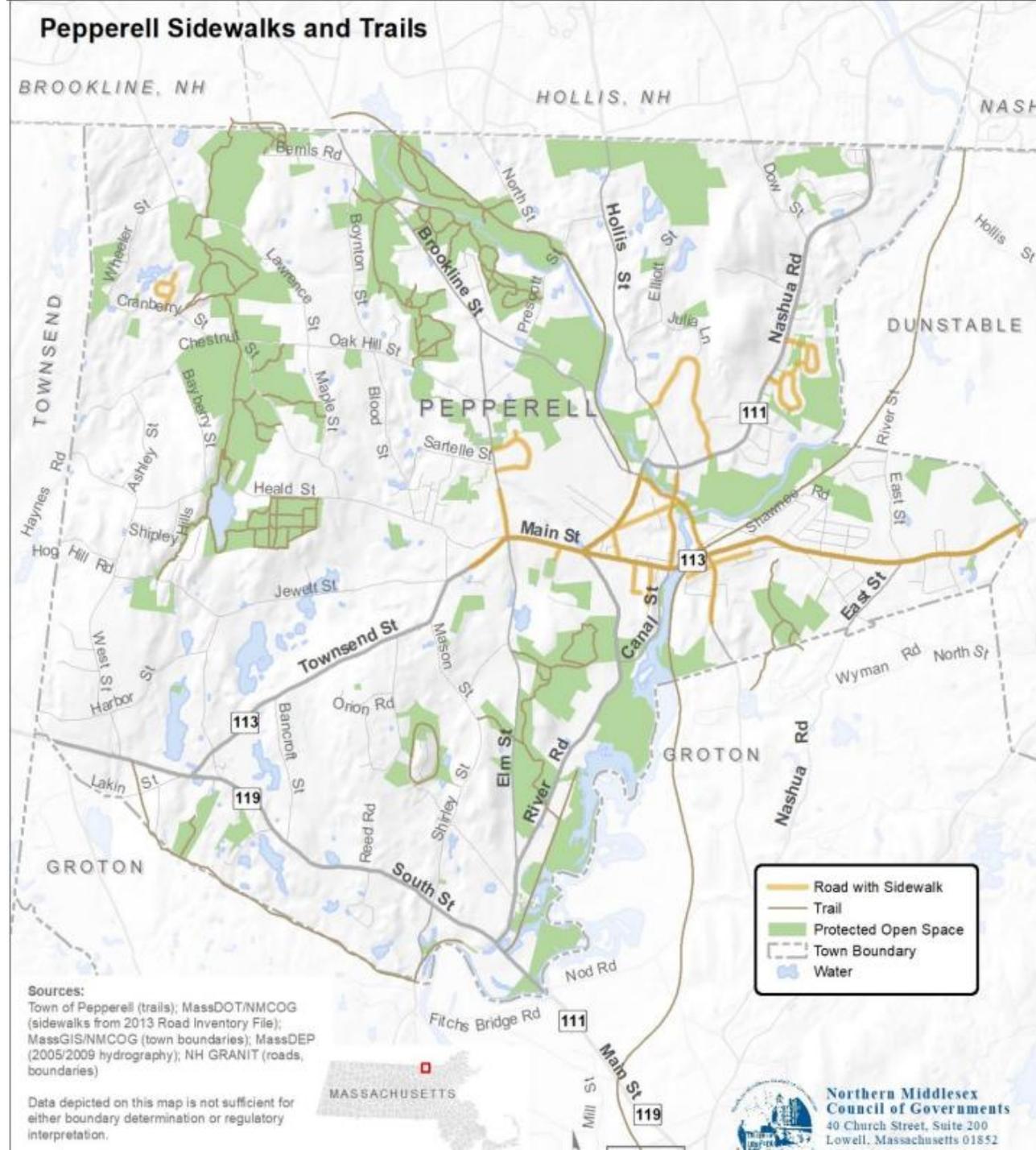


# Pepperell



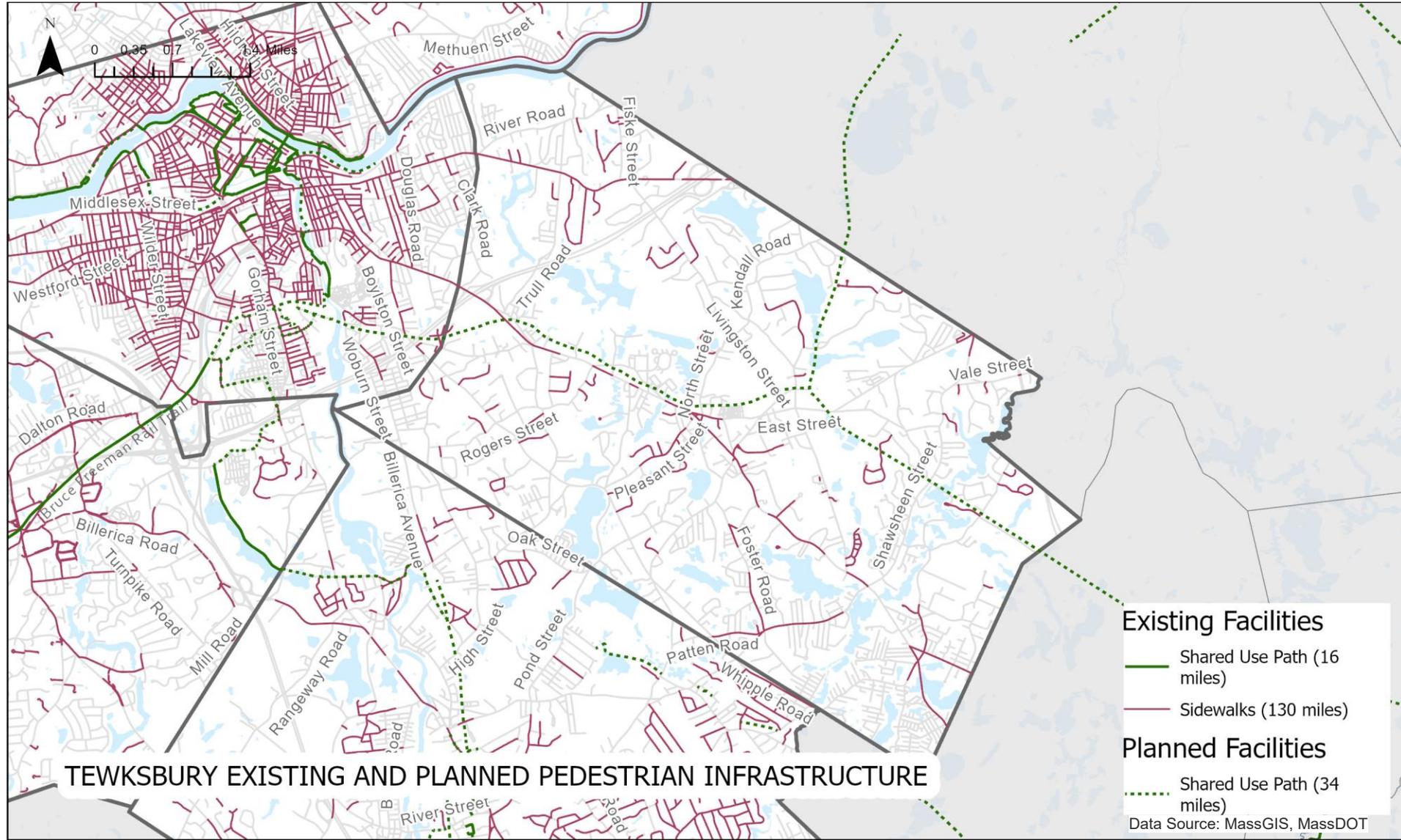
# Pepperell Master Plan (2020)

- Existing Pedestrian Network





# Tewksbury

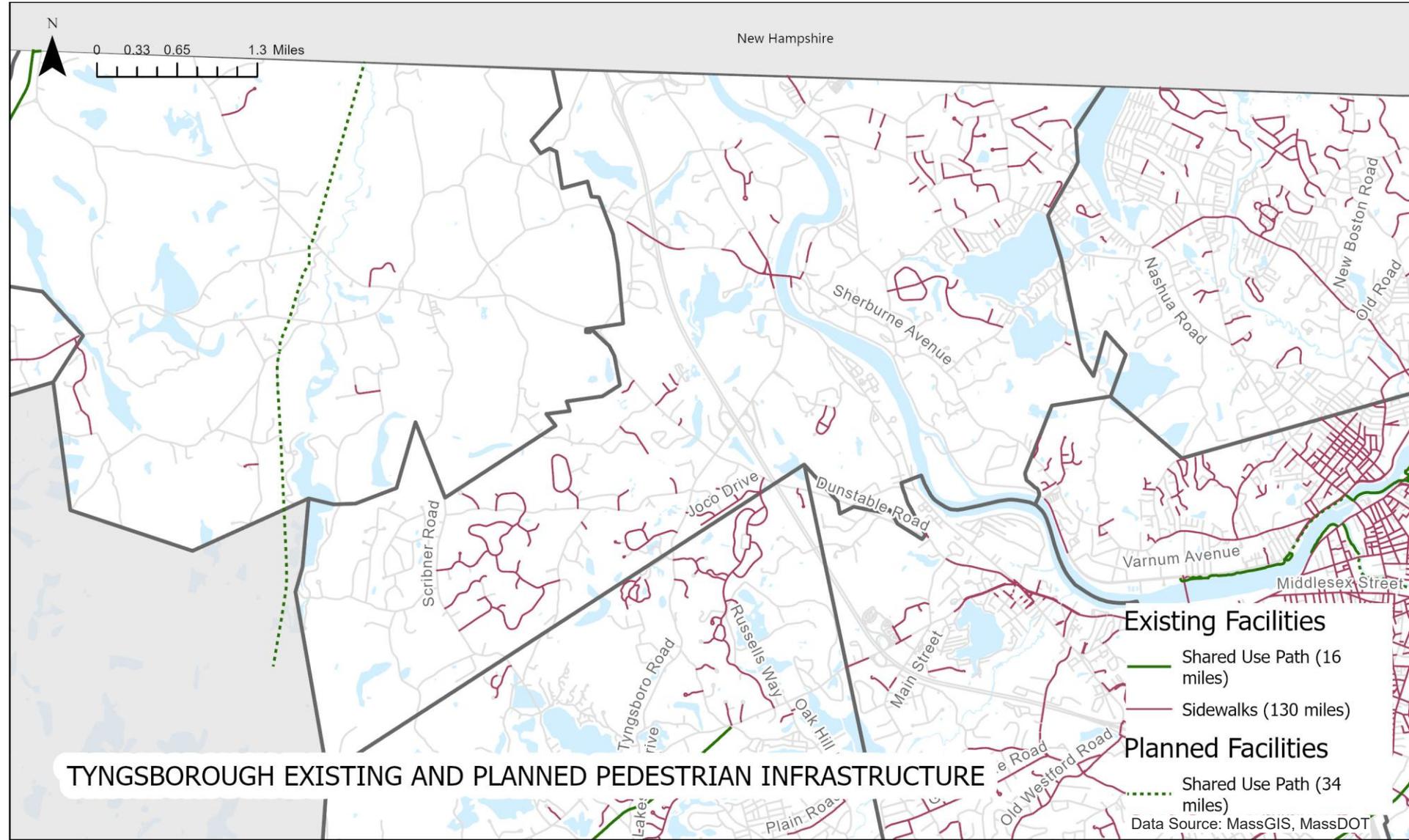


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DESIGN**



# Tyngsborough



TYNGSBOROUGH EXISTING AND PLANNED PEDESTRIAN INFRASTRUCTURE

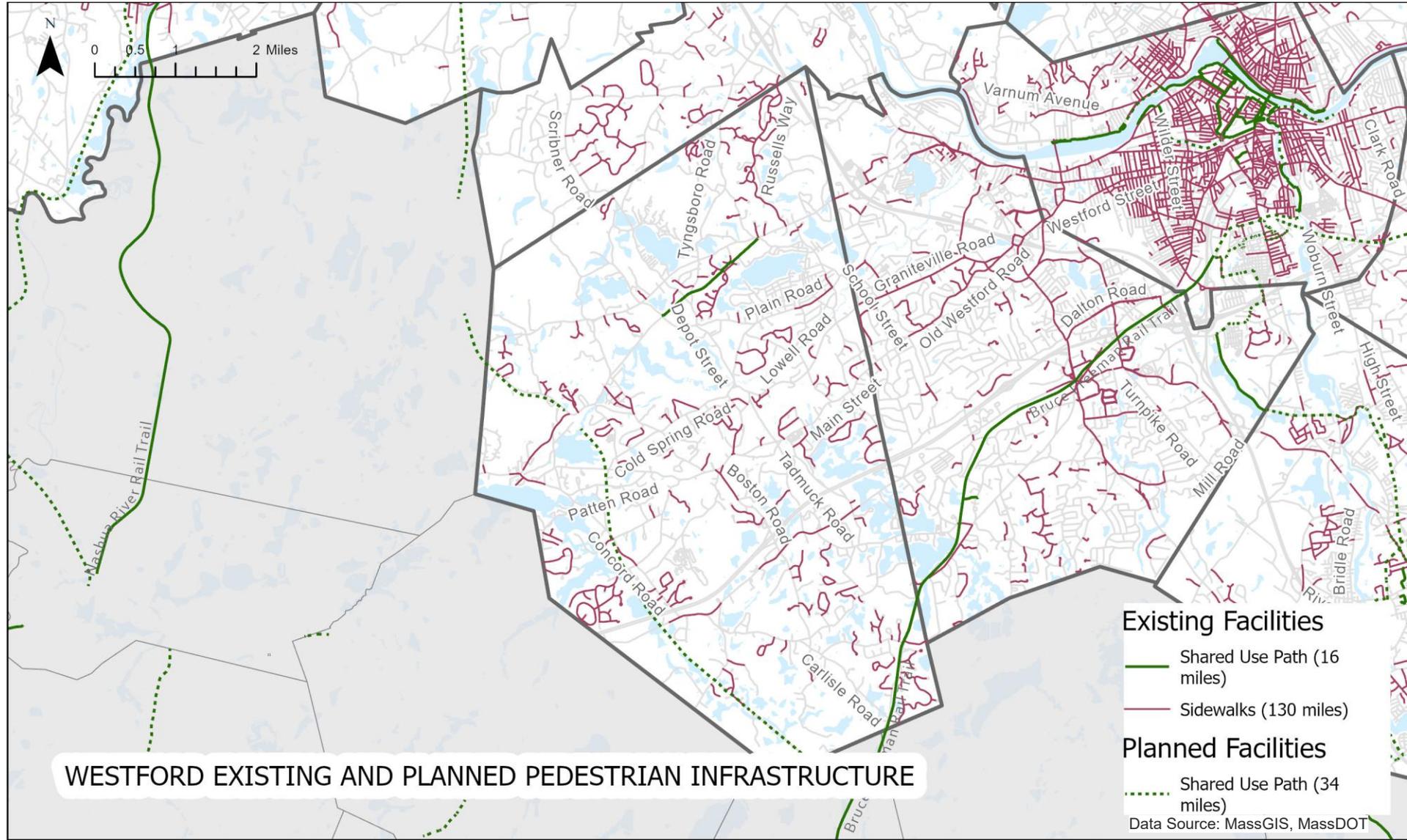


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**TOOLE  
DESIGN**



# Westford

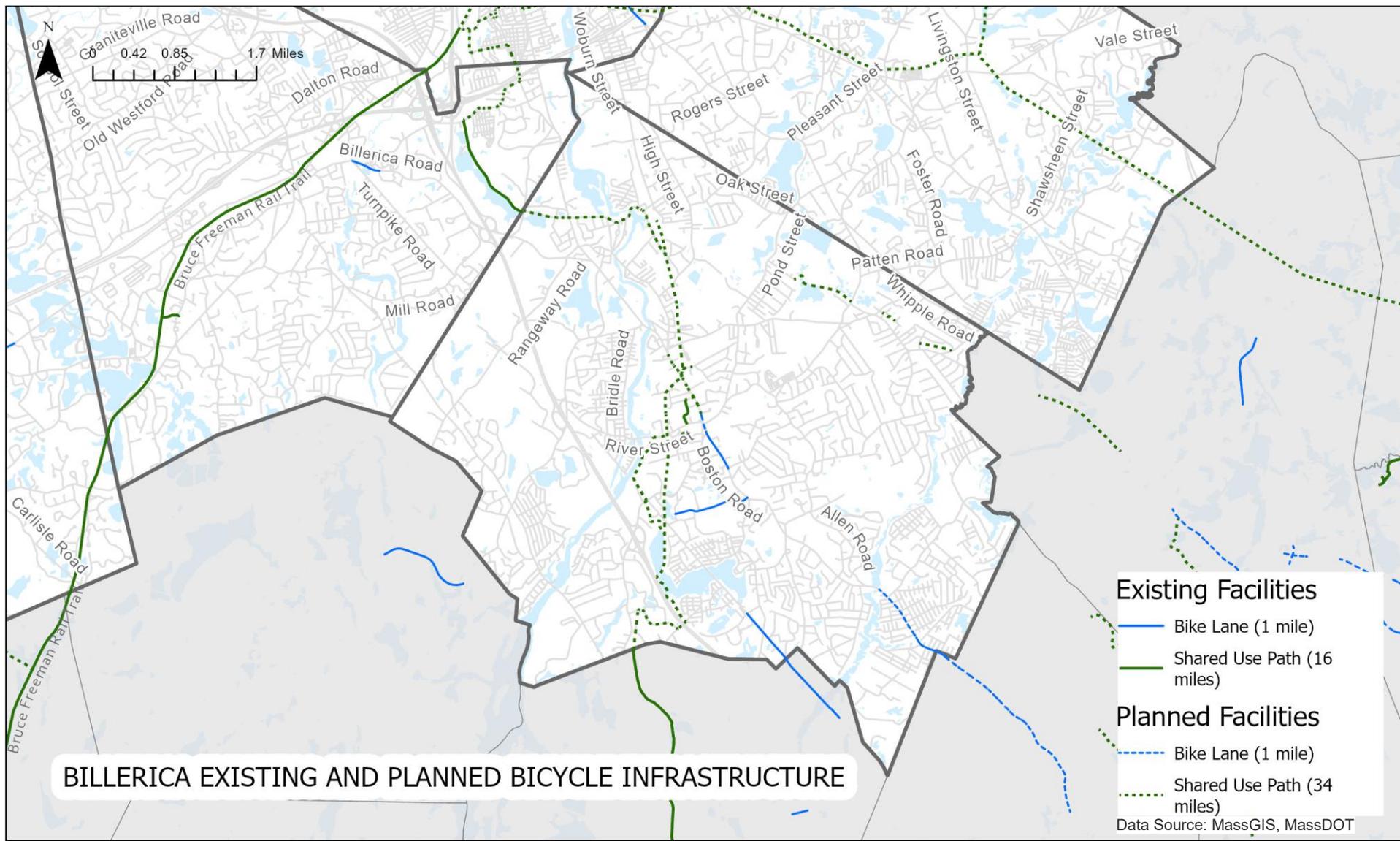




# Existing and Planned Bicycle Infrastructure



# Billerica

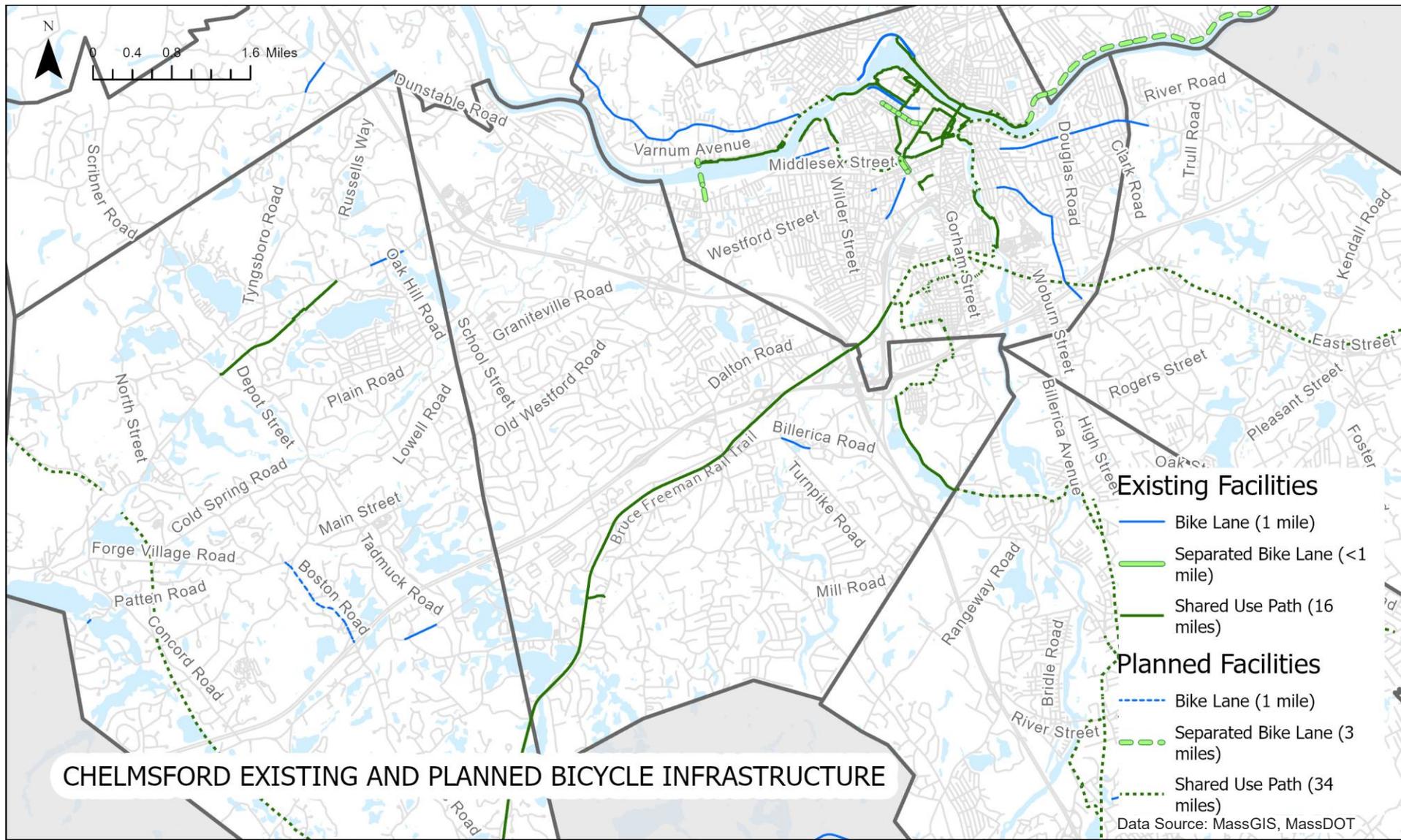


BILLERICA EXISTING AND PLANNED BICYCLE INFRASTRUCTURE





# Chelmsford

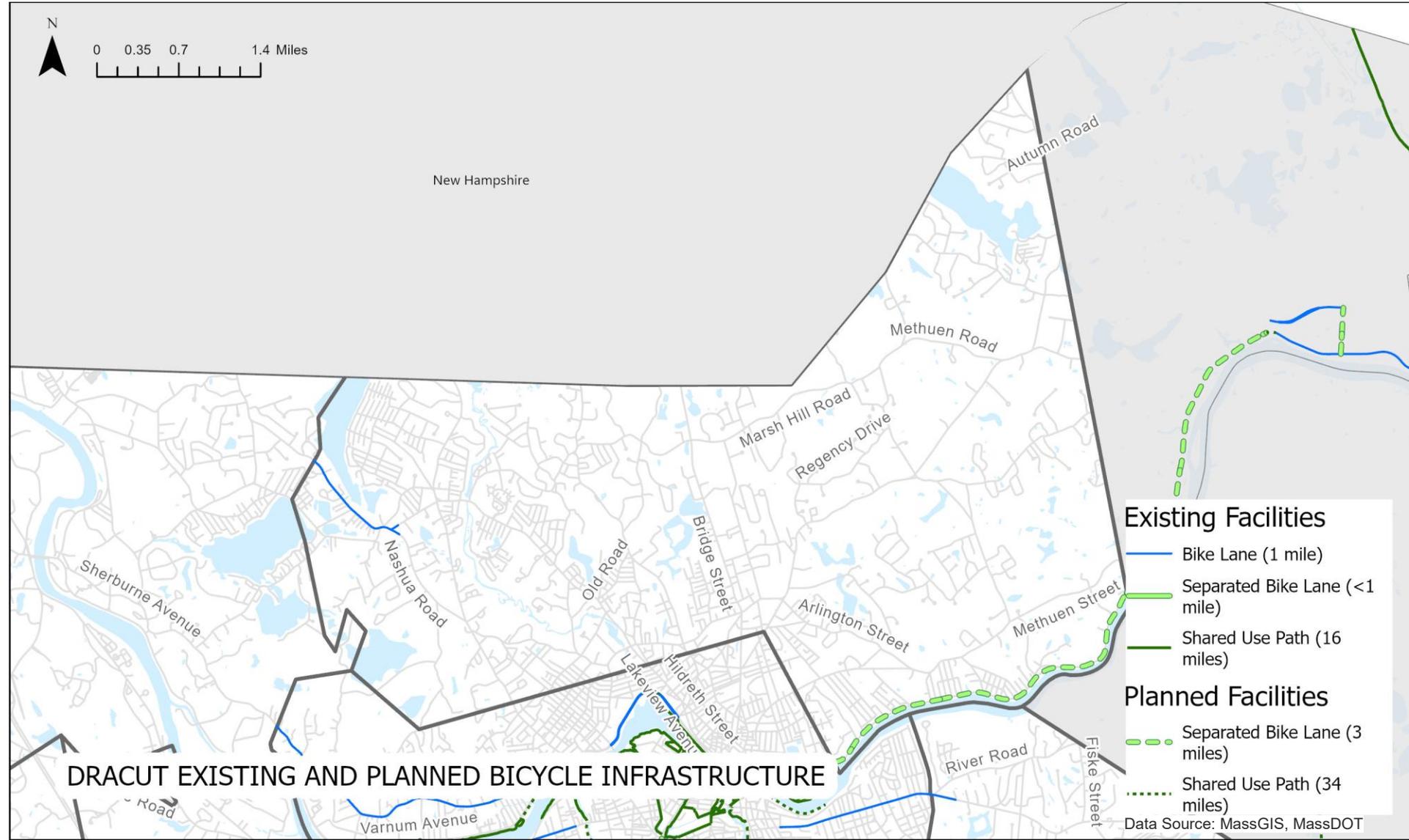


CHELMSFORD EXISTING AND PLANNED BICYCLE INFRASTRUCTURE





# Dracut

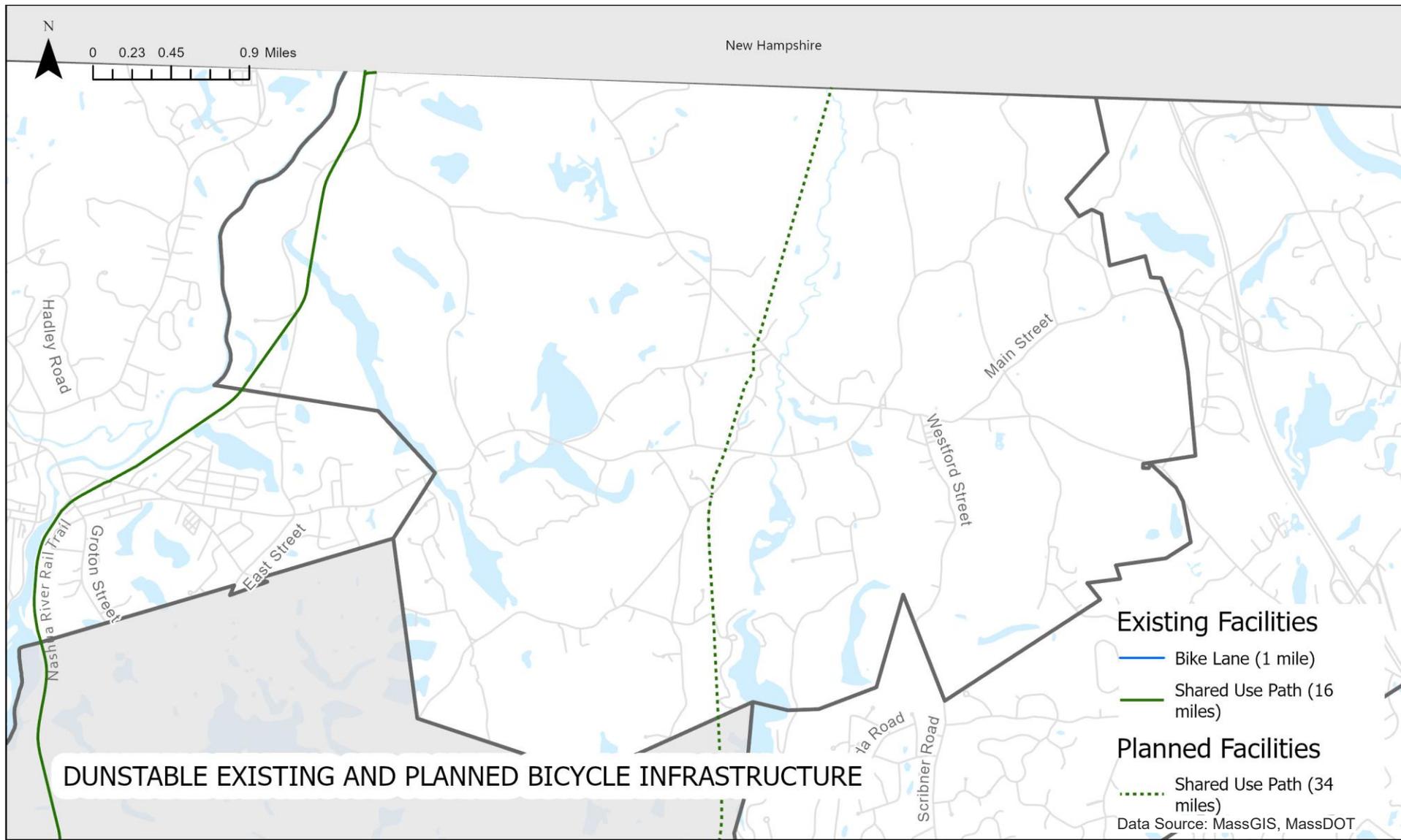


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**TOOLE DESIGN**



# Dunstable



DUNSTABLE EXISTING AND PLANNED BICYCLE INFRASTRUCTURE

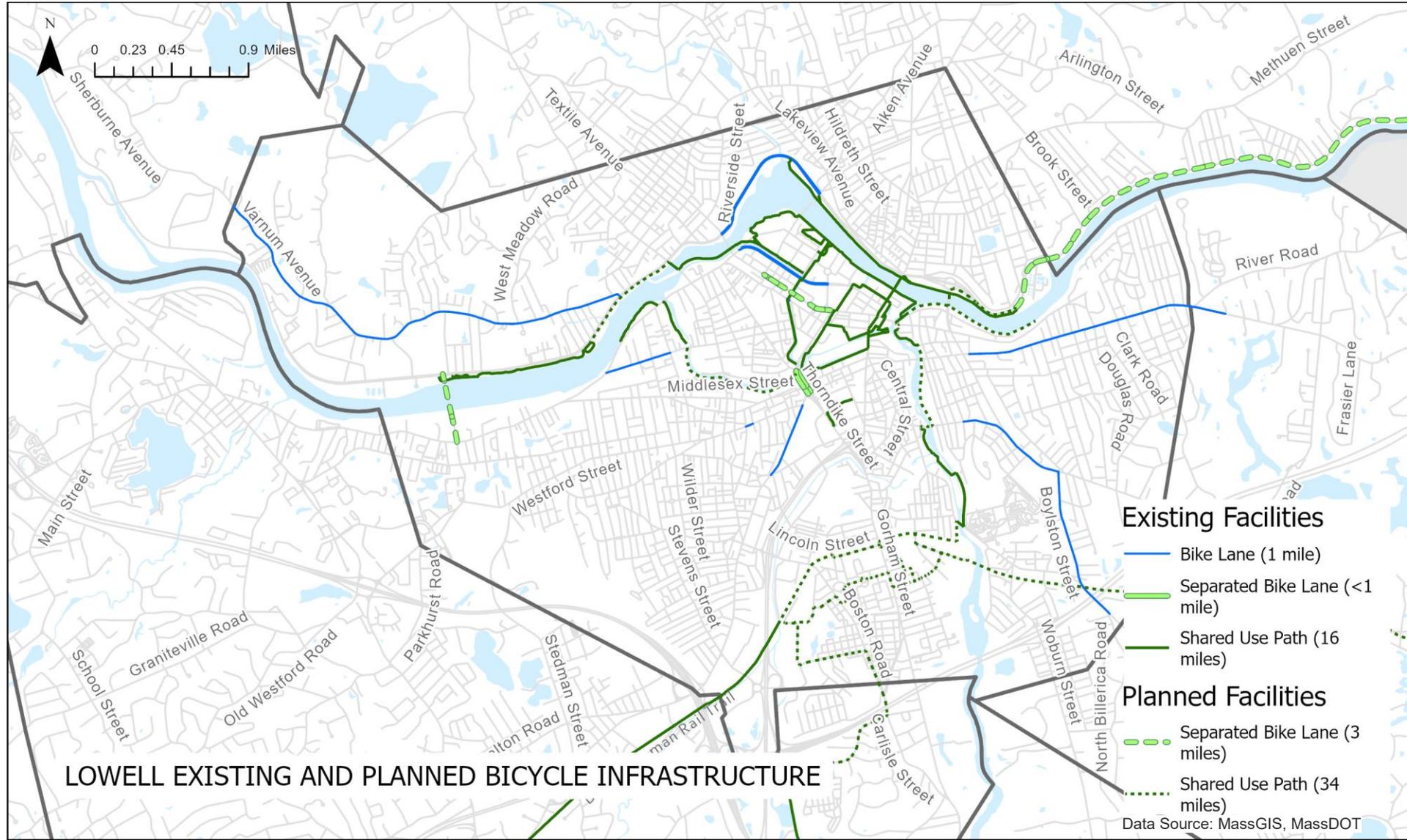


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**TOOLE DESIGN**



# Lowell

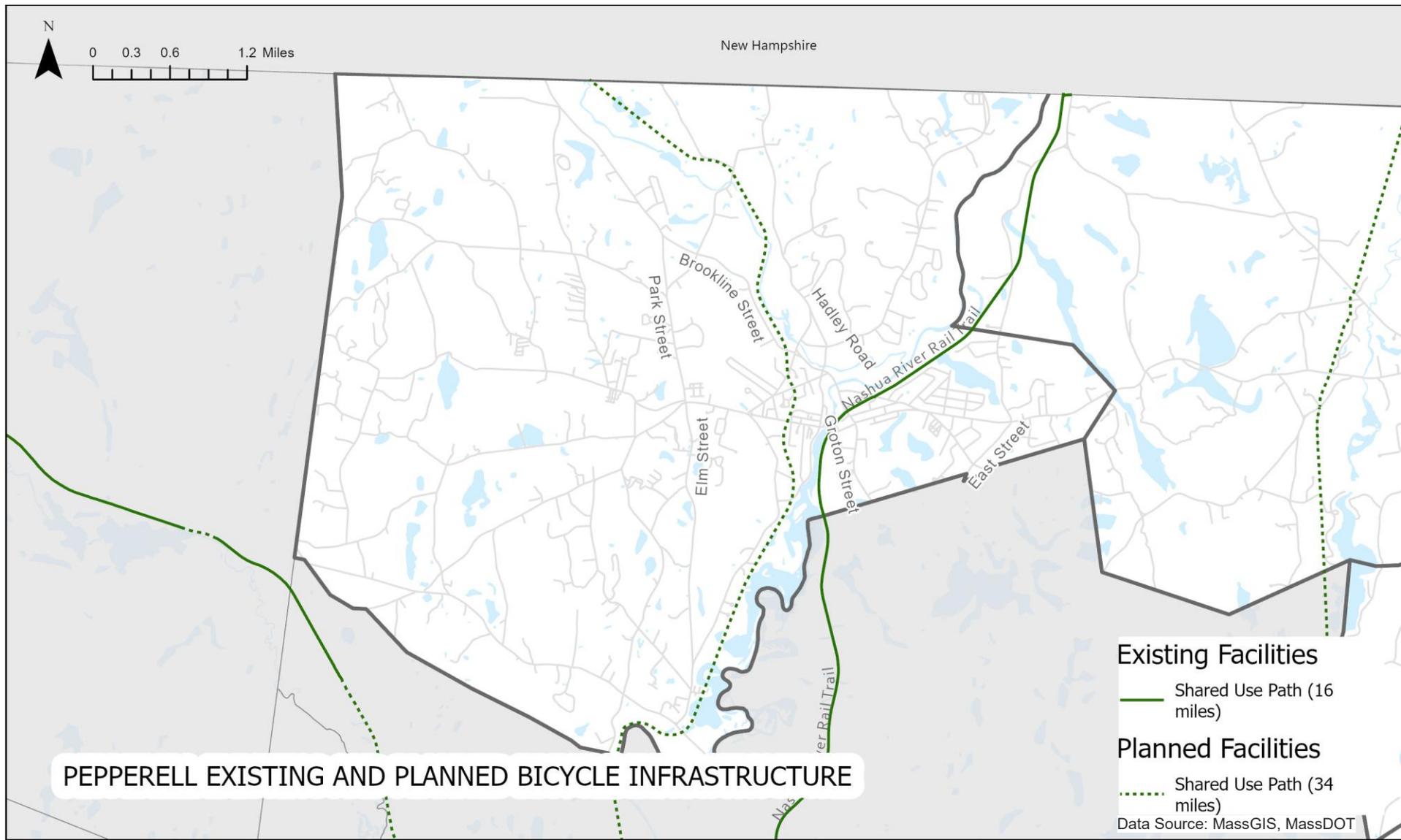


LOWELL EXISTING AND PLANNED BICYCLE INFRASTRUCTURE





# Pepperell



PEPPERELL EXISTING AND PLANNED BICYCLE INFRASTRUCTURE

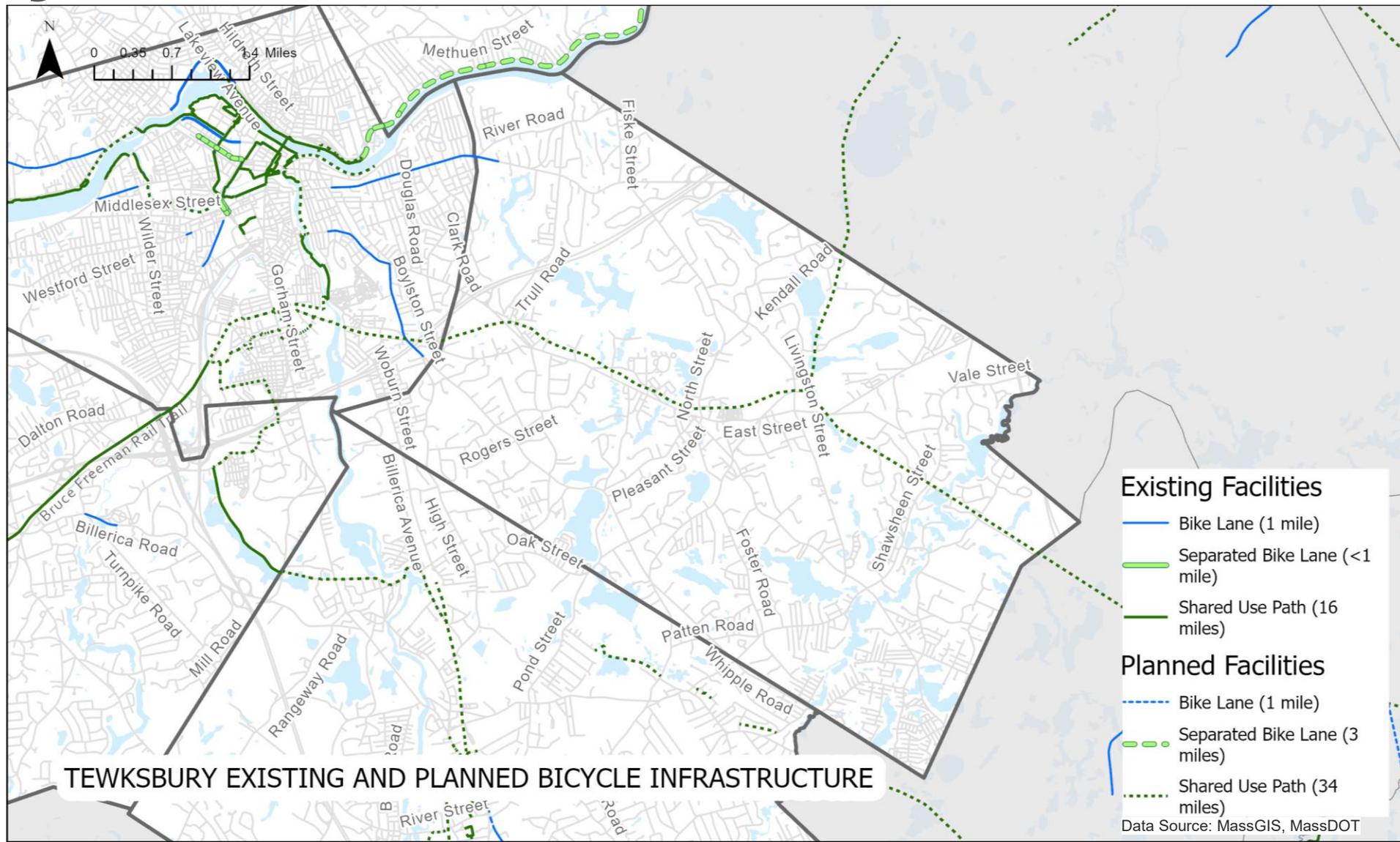


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**TOOLE  
DESIGN**

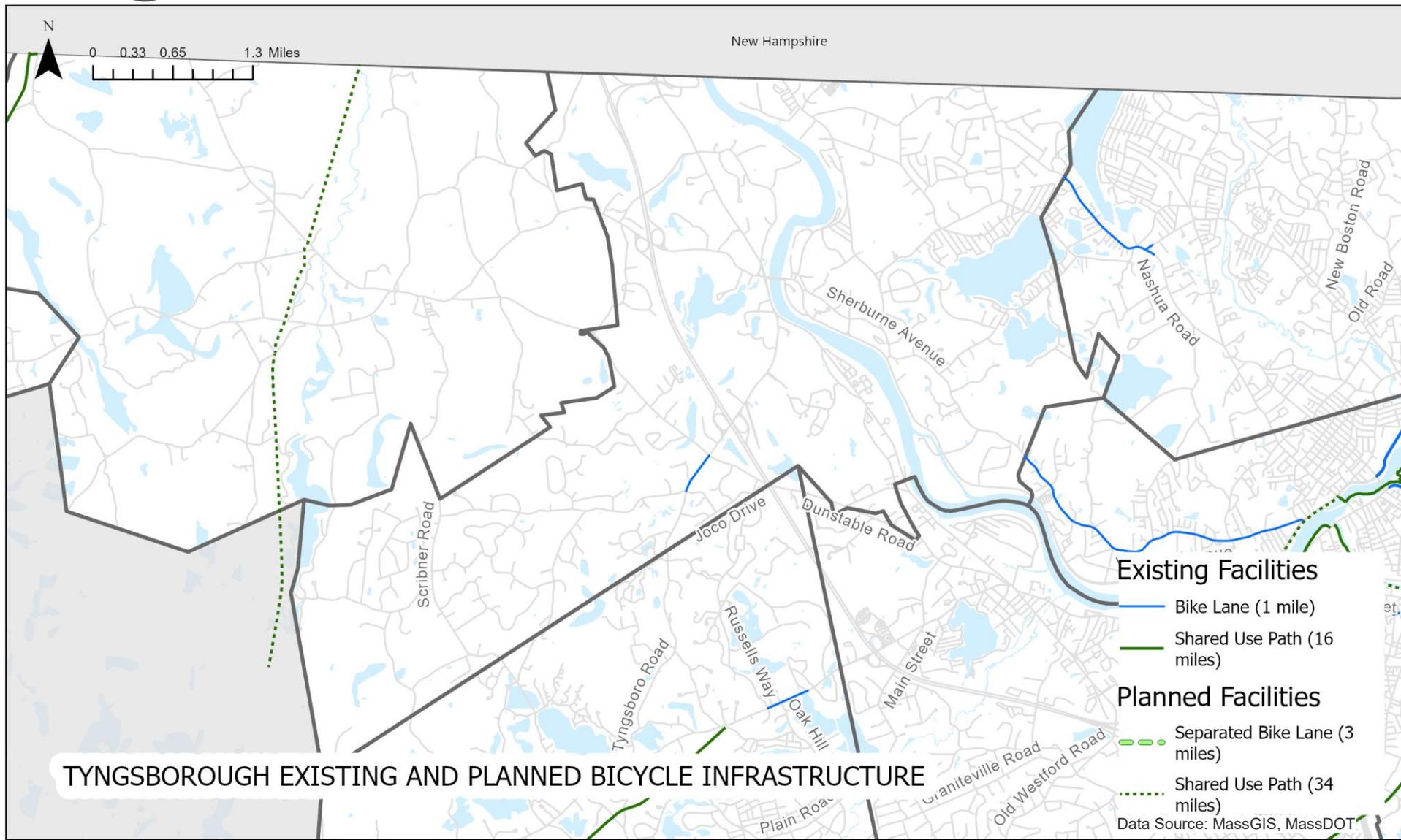


# Tewksbury





# Tyngsborough



TYNGSBOROUGH EXISTING AND PLANNED BICYCLE INFRASTRUCTURE





# Westford

