

2021 Bicycle and Pedestrian Plan Chelmsford, Massachusetts

Prepared by

The Chelmsford Bicycle and Pedestrian Advisory Committee (BPAC)

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Table of Contents

<i>Executive Summary</i>	3
1 Introduction	4
1.1 Benefits of Improving Bicycle and Pedestrian Access in Chelmsford	4
1.1.1 Massachusetts Complete Streets Initiative	4
1.1.2 Economic Benefits of Bicycling and Walking	5
1.1.3 The Environmental Benefits of a Bike and Pedestrian Friendly Community	5
1.1.4 The Health and Social Benefits of Promoting Walking and Bicycling.....	6
1.2 BPAC Mission Statement	6
1.3 Existing Conditions	7
1.3.1 Roadways	7
1.3.2 Pedestrian	7
1.3.3 Bicycle.....	10
1.3.4 Bruce Freeman Rail Trail	11
1.3.5 Community Policies and Education	12
1.3.6 Public Transportation	13
1.3.7 Bylaws	14
2 Recommendations	16
2.1 Pedestrian	16
2.2 Bicycle	16
2.3 Safety and Education	17
3 Action Plan / Implementation	19
4 Contributors / Acknowledgements	20
<i>Appendix 1: Improvements</i>	21
<i>Appendix 2: Existing Rights of Way</i>	27
<i>Appendix 3 - State Controlled Roads in the Town of Chelmsford</i>	29
<i>Appendix 4: Chelmsford Road Paving Plan</i>	30
<i>Appendix 5: Chelmsford Sidewalk Implementation Plan</i>	31
<i>Appendix 6: Chelmsford Capital Expenditures</i>	32

Executive Summary

The Chelmsford Bicycle and Pedestrian Advisory Committee (BPAC) formed in 2008 as part of the Chelmsford Master Plan to analyze and address pedestrian and bicycle traffic issues. In the USA, there is a growing awareness of the importance of infrastructure supporting walking and bicycling. Many studies show towns accommodating pedestrians and bicyclists benefit from an enhanced sense of community, a higher level of physical fitness of its citizens, and better air quality. There are also economic benefits, including increased real estate values and more visits to local businesses.

Many people who grew up in Chelmsford in the '60s, '70s, and even '80s remember a town where children roamed freely, walking and riding their bicycles alone or in groups to get where they needed to go. But changes over the decades, such as increased car ownership and increases in southbound commuters living north of Chelmsford, have increased traffic on local roads. Without a network of sidewalks and accommodations to allow bicycles to use the streets safely, foot and bicycle traffic fell precipitously. It is the goal of BPAC to make Chelmsford a town where all people can travel safely without using motorized transportation.

BPAC also works to educate the public about pedestrian and bicycle safety and popularize Chelmsford's beautiful amenities, such as the Bruce Freeman Rail Trail. This document details the plans.

This document includes pedestrian and bicycle improvements that BPAC is recommending for the next ten years. These recommendations follow the Complete Streets initiative described in Section 1.1.1 to make Chelmsford a vibrant pedestrian and bicycling community.

1 Introduction

1.1 Benefits of Improving Bicycle and Pedestrian Access in Chelmsford

Our Town's rural past led to several small villages rather than one central commercial district. A burst of residential and corporate construction in the 1960s and 1970s filled the farmers' fields with homes and businesses. Spread out over 22 square miles, distances between homes, schools, and businesses are often not within easy walking distance from each other. Consequently, cars are the primary form of personal transportation in Chelmsford.

Chelmsford is also uniquely situated at the intersection of two major highways, US Route 3 and Interstate 495, and several busy regional routes, making the Town a cut-through for drivers avoiding traffic delays. Although Chelmsford's population has remained relatively stable over the past two decades, the number of cars on the road has continued to rise. For example, a recent count of motorized traffic on Golden Cove Road increased by 4000 vehicles per day over a similar count in the 1980s.

Recently, an interest in walking and biking for pleasure and transportation has begun to blossom, especially since the opening of the Bruce Freeman Rail Trail and the building of many new sidewalks around Town. As of October 2020, Chelmsford has approximately 230 miles of public roads and 54 miles of publicly owned sidewalks. Providing a safe and pleasurable means for pedestrians and bicyclists to use these roadways alongside cars, trucks, and buses is challenging but necessary. Working towards a more bicycle and pedestrian-friendly community will yield economic, environmental, health, and social benefits for Chelmsford's future.

1.1.1 Massachusetts Complete Streets Initiative

A guiding principle for the Chelmsford Bicycle and Pedestrian Plan is to conform with Complete Streets policies' goals. A Complete Street¹ is one that provides safe and accessible options for all travel modes -- walking, biking, transit, and vehicles -- for people of all ages and abilities. The Complete Streets Initiative represents a shift from motor vehicle traffic to find the proper balance for all transportation modes. Properly applied, Complete Streets will result in friendlier and safer roadways for bicyclists, pedestrians, and others, creating more livable communities.

The State of Massachusetts was an early innovator in this concept when it released the Project Development & Design Guide (MassDOT, 2006) before the term "Complete Streets" was even coined. In that guide book, the following principle is to be applied for multimodal consideration and reflected in both the Chelmsford Master Plan (2010) and the Chelmsford Bicycle and Pedestrian Plan:

to ensure that the safety and mobility of all users of the transportation system (pedestrians, bicyclists, and drivers) are considered equally through all phases of a project so that even the most vulnerable (e.g., children and the elderly)

1. <https://www.mass.gov/complete-streets-funding-program>

can feel and be safe within the public right of way. This includes a commitment to full compliance with state and federal accessibility standards for people with disabilities.

The Town adopted the Complete Streets concept in 2016 for incorporation into designing new projects or reconditioning existing streets and sidewalks. On behalf of the Town of Chelmsford, a Complete Street Prioritization Plan conducted by Howard Stein Hudson was completed in April 2017. It can be found at <http://www.townofchelmsford.us/DocumentCenter/View/11690/Chelmsford-Complete-Streets-Prioritization-Plan-Report> . This extensive document details many areas in the Town where bicycle, pedestrian, and sidewalk improvements can be made to enhance the use and safety of non-motorized modes of transportation. Some of the recommendations have been undertaken, and others are part of longer-term project plans that are being drafted.

1.1.2 Economic Benefits of Bicycling and Walking

Chelmsford's economic future benefits from promoting biking and walking. "Walkability" has now become an essential consideration for most people today. Real-estate sites such as [zillow.com](http://www.zillow.com) now include walkability scores measuring the distance to amenities. According to Forbes Magazine, attention is now being given by developers and realtors to the accessibility and proximity of a property to cycling routes and multi-use trails.² Proximity to bike paths and trails tends to increase property values.³

Businesses and communities thrive with vibrant, convenient, and safe commercial areas and walkable neighborhoods. Several studies have shown that pedestrians and bicyclists may spend less per visit to a business district than their car-driving counterparts. However, they make more frequent visits and spend more money over a month.⁴

1.1.3 The Environmental Benefits of a Bike and Pedestrian Friendly Community

Today, in the United States, motor vehicles are responsible for nearly one-half of the smog-forming volatile organic compounds (VOCs), more than half of the nitrogen oxide (NOx) emissions, and about half of the toxic air pollutant emissions. Motor vehicles, including off-road vehicles, now account for 75 percent of carbon monoxide emissions nationwide.⁵

The World Watch Institute reports, "For each mile of car travel reduced by bicycling or walking, one pound of pollutants is kept out of the air." There are also environmental health aspects to consider. With a car-centric transportation system, polluted air leads to higher asthma levels, lung cancer, heart disease, respiratory illness, and premature death (Bell and Cohen, 2009). Since the emission of most harmful pollutants occurs within minutes of starting a car, short trips

² <https://www.forbes.com/sites/jeffsteele/2019/08/23/wheeling-and-dealing-bicycle-oriented-development-shifts-into-higher-gear/#3d8b8d6a10ba>

³ <https://www.railstotrails.org/resourcehandler.ashx?id=4482>

⁴ https://bikeleague.org/sites/default/files/Benchmarking_Report-Sept_03_2019_Web.pdf

⁵ <https://www.epa.gov/sites/production/files/2015-08/documents/peg.pdf>

pollute more per mile and significantly impact our overall health than longer trips (FHWA, 2012). The most recent national health data report that 9% of adults in the US live with asthma (BRFSS, 2010)." The benefits of reducing the number of vehicles would significantly improve Chelmsford's air quality.

1.1.4 The Health and Social Benefits of Promoting Walking and Bicycling

Many studies have shown that moderate exercise, such as a 2-mile walk or a 4-mile bike ride several times per week, improves an individual's health and well-being. A few short walks in the sunshine per week can also help with Vitamin D absorption and promote overall good health. For the many people who do not drive due to age, desire, finances, or physical disability, having pedestrian and bicycle-friendly streets and commercial areas can be the difference between isolation and being an integral part of the community.

Walking and biking with friends and family is fun and relaxing, adding a sense of community to peoples' lives. The many psychological benefits of physical exercise include greater self-esteem, reduced stress, and pride of accomplishment. Physical activity has also been linked to a reduction in both mild and severe depression. Recent studies have shown that outdoor exercise has benefits that far outweigh those of exercising inside.

Babies in strollers, running children, couples of all ages, and groups of laughing friends are a regular sight on the Bruce Freeman Rail Trail today. There are many economic, health, and social reasons for Chelmsford to work hard to make the rest of our community as pedestrian and bicyclist friendly as possible.

1.2 BPAC Mission Statement

The BPAC mission was defined to improve bicycling and pedestrian conditions in the Town by developing a comprehensive view of bicycle and pedestrian-related activities to make Chelmsford a more bicycle and pedestrian-friendly community. This includes:

- Facilitating coordination of activities that involve or affect non-motorized transportation in Chelmsford.
- Working with various Town boards and committees, including but not limited to the Commission on Disabilities, Community Development, Conservation Commission, the Police, Fire Departments, the Board of Selectmen, and the Historical District Commission.
- Consulting with the Town Engineer and the Department of Public Works to address short- and long-term needs for maintenance and improvements to bicycle and pedestrian facilities in the Town.
- Providing specific recommendations to the Planning Board (PB) regarding Bicycle and Pedestrian amenities for on-site plans under review by the Board.
- Coordinating the maintenance, policing, and enhancements to the Bruce Freeman Rail Trail consistent with the Memorandum of Agreement among the Department of Conservation and Recreation, the Massachusetts Highway Department (now Mass DOT), and the Municipalities of Lowell, Chelmsford, and Westford.

With the Northern Middlesex Council of Governments (NMCOG) assistance, the Town of Chelmsford developed the 2010 Master Plan. The 2010 Master Plan outlined many issues for roads, intersections, parking, and recreational facilities affecting motorized and non-motorized transportation in the Town. The 2010 Master Plan called for the creation of a comprehensive Bicycle and Pedestrian Plan for the Town. This document would be explicitly focused on bicycle and pedestrian issues and updated on a five-year basis. The Plan should consider on-road and off-road facilities, recreational facilities, the Bruce Freeman Rail Trail, and increasing safety for these users at intersections and crosswalks, installing bicycle racks, pedestrian crossing signals, and installing pavement markings and signage at key locations. However, the Bicycle and Pedestrian Plan is now updated concurrently with the Master Plan.

1.3 Existing Conditions

1.3.1 Roadways

The Town of Chelmsford has over 230 miles of public roadway. Of these, 68% are local streets servicing local neighborhoods, 28% are arterial or collector roadways and 4% are highways.

1.3.2 Pedestrian

The Town of Chelmsford has been addressing sidewalk needs in key locations since the late 1970s. The Town had a Traffic and Safety Committee looking into pedestrian safety issues during this timeframe. In 1981, a Pedestrian Safety Study prepared by Edward McCann Associates emphasized increasing the number of sidewalks near the schools because school Department budget cuts resulted in the loss of some school buses. More students needed to find alternative methods of transportation, including walking to their school.

In 1996, the Traffic and Safety Committee submitted to the Capital Planning Committee a document named *"Sidewalk Construction: An Update."* This document subsequently became a default "Sidewalk Plan" for the Town. It focused primarily on the building of sidewalks outward from the schools. The goal was to allow students to safely walk to school from a distance of one-half to one mile from surrounding residential areas. Since that point, funds were budgeted for constructing additional sidewalks, and this effort has continued to the current time. The 1996 Plan has been nearly completed concerning sidewalks though some further construction remains, notably near the Byam School. Even though the sidewalk building effort has continued every year, no record exists that the original plan document has been formally updated.

During public input sessions for the 2010 update of the Town's Master Plan, there was the sentiment that additional sidewalks be constructed. There was also recognition that it would not be possible to provide sidewalks in every neighborhood. Due to pedestrians' higher concentrations, efforts to construct and maintain them are in critical areas such as business districts and near schools. The Master Plan also documents the issues related to snow removal on sidewalks so that they can be used safely during the winter.

The Town has continued to allocate funds for sidewalk construction in its capital budget. In recent years the funding has been increased to \$325,000 per year through FY2020. However, for FY2021, these funds were eliminated from the budget due to the 2020 COVID-19 pandemic constraints. These funds for FY 2021 were restored at the 2020 Fall Town Meeting. Program efforts focused on building sidewalks further into neighborhoods surrounding the schools and creating loops of sidewalks to make them usable from neighborhoods around Chelmsford Center and Vinal Square. The current practice includes the construction of new sidewalks and repairing older sidewalks that have deteriorated and become unsafe. In the past several years, sidewalks were added to:

- Richardson Road (Edgelawn St. to Princeton St.),
- Warren Ave. between Turnpike Road and Boston Rd.),
- A portion of Drum Hill Road,
- Rivermeadow Road (Warren to Tollcross),
- Boston Road (South Row School to Wildes Road),
- Smith Street (Parkhurst Road to Belair Road),
- Parkhurst Road (Rt. 3 to Walmart).

Sidewalks have been rebuilt along:

- North Road (Orchard Lane to Dalton Road),
- Acton Road (Maple Road to Sleigh Road),
- Billerica Road (Central Square to Center School), and others.

In 2017 the fourth crosswalk leg was added at the North Road/Parkhurst Road/Davis Road/ intersection. Of particular note is that a Complete Streets Grant awarded to the Town in September 2017 completed the Billerica Road sidewalk improvement project, the 4th leg crosswalk on North Road, and the Richardson Road sidewalks. The Town also used 53G Funds to fund the Rapid Rectangular Flashing Beacons on Acton Road near the Heart Pond Mobil gas station and sidewalk improvements on Drum Hill Road.

The most recent (2020) Sidewalk Plan for the Town of Chelmsford is documented at <http://www.townofchelmsford.us/DocumentCenter/View/930/sidewalks2020?bidId=>. According to this figure, sidewalks in either good or fair condition are present on all arterial or collector roadways except the following:

- Tyngsboro Road – no sidewalks from Vinal Square to the Tyngsboro line, except for a short stretch near Wellman Avenue.
- Princeton Street – sidewalk in poor condition between North Road and the Lowell line.
- North Road – no sidewalks from Drum Hill rotary to Princeton Street.
- Main Street – no sidewalks along the entire length, except a few short stretches in poor condition.
- School Street – no sidewalks from Graniteville St. to Old Westford Rd.
- Old Westford Road – no sidewalks west of Thomas Drive or between Baldwin Road and Overlook Drive.

- Westford Street – no sidewalks along the entire length.
- Littleton Road – no sidewalks, except close to the Center.
- Billerica Road – some sections of the sidewalk in poor condition (Rivermeadow Brook to #299).
- Riverneck Road – no sidewalk, except the section near the bridge over Route 3.
- Turnpike Road – no sidewalks along the entire length.
- Acton Road – no sidewalks except for close to the Center and the segment between Kate's Corner and Sleigh Road.
- Boston Road – no sidewalks between Mill Road and South Row School, or between Roberts Street and Billerica line.
- Concord Road – no sidewalks along the entire length.
- Mill Road – no sidewalks between Raymond Road and office park located about midway between Elizabeth Drive and Vincent Road.
- Parkerville Road – no sidewalks along the entire length.
- Maple Road – no sidewalks, except segment between Parkerville Road and Acton Road.

As noted in the 2010 Chelmsford Master Plan, the Drum Hill corridor's pedestrian connections are deficient. Among the observations made in that document:

- There is a lack of defined pedestrian pathways between parking areas and businesses.
- During the winter, existing sidewalks are not adequately maintained, and the sidewalk surfaces suffer the effects of frost heaves.
- Sidewalks are not provided along the entire commercial district's length. Some sidewalks that exist do not meet the Americans with Disabilities Act (ADA) requirements.
- There is only one crosswalk on Drum Hill Road, located at the signals for entrance/exit to the Hannaford parking lot across to the Cumberland Farms Filling Station.

The Northern Middlesex Council of Governments (NMCOG), in its Vinal Square Master Plan, documented the generally poor condition of sidewalks surrounding the Square.⁶ The report found that most of the sidewalks in this neighborhood do not meet ADA requirements.

Other pedestrian deficiencies noted in the Chelmsford Master Plan include:

- Inadequate sidewalks, not compliant with ADA, at the intersection of Gorham Street and Brick Kiln Road, and Carlisle Road.
- Lack of sidewalks along Maple Road and Parkerville Road.
- During winter months, snow is not removed from many sidewalks within an acceptable time frame.
- Cycle symbols at controlled intersections are faded and not routinely maintained.

Recent sidewalk upgrades and repairs have incorporated handicap accessibility improvements, including ADA-compliant wheelchair ramps and audible pedestrian tones at traffic signals. Sidewalks and traffic signals that have not been recently upgraded still lack these features for the disabled population.

⁶ <https://www.nmcog.org/master-plans>

At the November 30, 2020 Selectman Board Meeting, the DPW provided a project Sidewalk Improvement Plan where sidewalks may be improved or added during the 2020 to 2025 time frame. It can be found at <http://www.chelmsfordma.gov/AgendaCenter/ViewFile/Item/2737?fileID=4539> and is included in the appendix of this document.

At the same meeting, a Road Paving Plan was provided, which documents the roads repaved in 2019- 2020 and the roads targeted for repaving from 2021 to 2024. This Plan can be found at <http://www.chelmsfordma.gov/AgendaCenter/ViewFile/Item/2737?fileID=4539> and is included in the appendix of this document.

Both plans are subject to change based on needs, priorities, and the availability of funding.

The Capital Improvement Program Summary for FY 2022 – 2026 indicated the intent to fund sidewalk improvement funding at \$350,000 through FY 2025 and increasing to \$375,000 in FY 2026.

1.3.3 Bicycle

Bicycles are permitted to travel on any public roadway other than on limited-access highways (Interstate 495, US Route 3, the Lowell Connector, and any related off-ramp or on-ramp to same). Bicycles are accommodated through one of the following methods:

- Shared Use Path – facilities for non-motorized users, physically separated from roadways intended for motorized vehicles. The Bruce Freeman Rail Trail is the shared use path that exists in Chelmsford.
- Bicycle Lanes – portions of the traveled way, adjacent to (but separated by pavement markings) vehicular lanes, designated for bicycle use exclusively. There are currently no bicycle lanes in Chelmsford.
- Shoulder Use – similar to bicycle lanes in that bicycles may travel in the "breakdown" lane but not explicitly designated as bicycle lanes. Several arterial or collector roadways in Chelmsford have shoulders adequate for bicycle travel (Tyngsboro Road, Groton Road, Middlesex Street, Princeton Street, Chelmsford Street Gorham Street).
- Shared Lanes – use of the regular travel lanes by both motor vehicles and bicycles. Other than those with adequate shoulder widths for bicycle use, Chelmsford's arterial or collector roadways accommodate bicycle travel by this method.
- Sidewalks – outside of business districts (Chelmsford Center, Vinal Square, Drum Hill corridor, Chelmsford Street corridor), bicycles are permitted to travel on Chelmsford's sidewalks.

Safer and practical routes for walking and cycling, connecting Vinal Square to the Drum Hill and Vinal Square to Central Square, require approximately 9.5 miles to be rebuilt. Refer to the Appendix for proposed routes. Assuming curbs and sidewalks on one side and a slightly widened roadway within the right of way, the DPW estimated \$150 per linear foot. The total

cost projection is \$7.5 million at current prices. Suppose these roads were widened to add full bicycle lanes and sidewalks on both sides. In that case, the cost could potentially double since work would involve drainage improvements, additional pavement, land takings (easements or eminent domain), and utility pole relocations.

Since Tyngsboro Road, Princeton Street, and North Road from the Drum Hill Rotary to Princeton Street, are MassDOT controlled, bicycle and pedestrian accommodations require petitioning MassDOT or the Transportation Improvement Program (TIP) through the Northern Middlesex Council of Governments (NMCOG). One limiting factor on Princeton Street is the bridge's width over the railroad tracks at the Mills as there is no current way to widen that bridge.

1.3.4 Bruce Freeman Rail Trail

Phase 1 of the Bruce Freeman Rail Trail (BFRT), opened in 2009, is a shared-use path that originates at the CrossPoint Towers in Lowell, bisects Chelmsford (roughly parallel to Chelmsford Street, Littleton Road, and Acton Road), and continues into Westford for a total of 6.8 miles. Phase 2A from Westford to Acton opened in 2018, adding approximately 4.9 miles of trail. Phase 2C in West Concord opened in 2019, adding 2.5 miles of trail. The total open trail length is now at 14.2 miles.

Phase 2B is currently an approximate one-mile gap in the trail due to the requirements of building a bridge over Route 2. Phase 2B went out to bid in the autumn of 2019 and is currently under construction with a target opening date of Fall 2021/Spring 2022.

Since Phase 1 of the BFRT in Chelmsford was opened over ten years ago, it has suffered from tree root incursions and pavement cracking in numerous sections. It was creating a hazardous situation for trail users. The Town of Chelmsford applied for and received a grant of \$90,000 from the MassTrails Grant program. This money plus \$10,000 in cash and approximately \$18,000 of in-kind funds from the Town will be used to repair the trail's affected sections. Work on the trail repairs is expected to commence in late 2020 with the section between the Rt. 3 Tunnel/Lowell Line and Golden Cove Road are closed until spring 2021. Work on other sections of the trail under the Grant is expected to be completed in 2021.

The BFRT has been very popular with bicyclists since its opening. A trail count held on a Saturday in September 2020 in Chelmsford indicated over 2000 trail users (cyclists, walkers, runners, etc.). Note that this was a count for a single day. Trail use varies from day to day.

The BFRT crosses several roadways within Chelmsford. The crossing control at most of these intersections involves warning signs on the trail approaches, stop signs at the crossing, and bicycle crossing warning signs on the roadway approaches. Additional controls consist of the following:

- Golden Cove Road crossing – yellow flashing warning lights are provided on both approaches on Golden Cove Road. These lights flash 24 hours per day, without any detection or activation by trail users. In the fall of 2015, "Rectangular Rapid Flash Beacons" (RRFB's) were installed at this location to provide additional warning to

approaching motorists and enhance cyclist and pedestrian safety. Trail users activate the sensors. The addition of automatic sensors to this set of beacons is being evaluated.

- Chelmsford Street/Fletcher Street crossings – trail users use the existing pushbuttons to activate the Walk signals at the intersection of Chelmsford Street and Fletcher Street.
- Central Square – trail users use the existing pushbuttons to activate the Walk signals at the intersection of North Road and Littleton Road.
- Maple Road - "Rectangular Rapid Flash Beacons" (RRFB's) with automatic sensors were installed in October 2019
- High Street - Town Meeting allocated funding to install automatic RRFB's at this crossing. The signals were installed in March of 2020.

Another aspect of bicycle accommodation is the provision of bike racks. Currently, bike racks are provided at several town-owned properties (Town Hall, schools, library, parks). However, numerous Town-owned properties do not offer bike racks, including:

- The municipal parking lot at Vinal Square
- Community Education Building (former Westlands School)
- Varney Park
- Southwell Field
- Murphy Field (soccer fields off of Mill Road)
- Highland Field
- Chelmsford Country Club/Golf Course
- North Town Hall
- Chelmsford Forum
- Friendship Park

Bicycle racks should adhere to the [Guidelines for Bike Rack Styles](#) document found on the Town of Chelmsford website. It is disappointing that many developers have installed racks that do not conform to the Guidelines Document. While bicycle racks are in many development plans, there is a lack of enforcement by the Planning Board to require following these guidelines specifically.

Bicycle detection sensors exist at many traffic signals in Chelmsford. This feature detects the presence of a bicycle when stopped at a traffic signal. The signal controller is alerted that a bicycle is waiting on one approach and will assign the green light accordingly. The detector is typically located near the lane's Center before the stop line at a signaled intersection. The bicycle symbols on the pavement are frequently or entirely eroded. They should be repainted as needed or when the intersection is re-striped.

1.3.5 Community Policies and Education

Community education is an essential element of the master plan to provide an effective and safe bicycle and pedestrian transportation network in the Town. All community members need to be involved: bicyclists, pedestrians, and motorists.

- In the past, the BPAC has periodically published a column "Steps and Spokes" in the then Chelmsford Independent, now the Eagle Independent, which covers Chelmsford and includes Westford and Littleton. The paper ceased to accept and publish the submitted column in early 2019.
- BPAC will be working on new avenues for publishing informative and timely articles relative to bicycle and pedestrian issues.
- BPAC promotes the Safe Routes to School (SRTS) program. This program is led by the state organization MassRIDES, which promotes transportation methods to reduce automotive traffic. SRTS supports and encourages towns to get more children walking and riding their bicycles to school. It includes classroom visits, safety training, presentations to parents, organizing themed walk days, and infrastructure improvements. In the past, all of the elementary schools had been interested in the program, with South Row School having the most significant involvement. Interest in that program has waned, and there are no current active efforts by any of the schools. However, the Town has been addressing safety improvements near the schools involving crosswalks and Rectangular Rapid Flashing Beacons installation.
- BPAC educates and informs town officials about pedestrian and bicyclist needs or problems, relays public input on these topics, and prepares this master plan for the Town.
- BPAC Advises town officials and boards as needed to include bicycle and pedestrian considerations in town planning and development projects. For example, BPAC engaged with the Center Village Master Plan Committee about bicycle and pedestrian accommodations changes.

1.3.6 Public Transportation

A key component in having a successful pedestrian and bicycle network in a town or city is public transportation. There is a need to travel farther than is practical by walking or bicycling. That is where public transportation can fill in the gap. The transportation network should allow a commuter to easily transfer from one travel mode to another (i.e., walking to a bus station or biking to a commuter rail station).

There are several possibilities for connecting cycling with public transportation. Lowell Regional Transit buses have been fitted with bicycle racks in front, accommodating two bikes per bus. The Kennedy Transportation Center in Lowell and the North Billerica Train Station both have bicycle parking. By transferring at the Kennedy Transportation Center, travel can extend to Littleton, Burlington, Lawrence, Tyngsboro, and Dracut. However, some routes don't extend as far on Saturdays, and the buses don't run on Sundays.

As of this writing, several bus routes serve various areas of Chelmsford:

- Bus 5 runs a short route from Lowell to points in the Drum Hill area.
- Bus 15 travels down Littleton Road through Westford, ending at IBM in Littleton.
- Bus 17 serves North Chelmsford, including the Senior Center and Drum Hill.
- Bus 16 travels down Chelmsford St. and turns to Drum Hill.

- Bus 14 runs Brick Kiln Rd. and on to the North Billerica Train Station and Lahey Hospital and Medical Center in Burlington.
- Bus 13 travels to the North Billerica MBTA train station and continues down Boston Road.

There is a route that travels through Vinal Square to shopping centers in Nashua, New Hampshire, during the holiday season. In June 2019, the LRTA began a nine-month pilot program offering Sunday service with Bus 15 and 16 in a combined route to determine if it is viable to be made permanent.

The Bruce Freeman Rail Trail reaches within two miles of the Kennedy Transportation Terminal in Lowell, connecting with both buses and the commuter train to Boston. A study is underway in Lowell to determine the issues in routing the trail from Industrial Avenue to the Target Plaza at Plain Street. The study is to be completed by the summer of 2021.

There is also an effort to find a more direct path across the CrossPoint parking lots to Industrial Avenue.

Standard bicycles are allowed on the commuter trains on weekends and designated non-peak hours on weekdays, though not on Christmas and Independence Day. Folding bicycles, if folded, are permitted on all trains at all times. Information can be found on MBTA.com for both the commuter rail and connecting buses and subway lines. The most up-to-date information on buses can be found online at LRTA.com, on trains, and on MBTA.com.

1.3.7 Bylaws

The vast majority of subdivision road development in Chelmsford occurred when sidewalks were not required on either side of the street. Fortunately, in most cases, vehicular traffic is low enough on the Town's subdivision roads such that bicycle and pedestrian safety is satisfactory.

The Town of Chelmsford currently has bylaws addressing the addition of pedestrian and bicycle facilities in the Town. A parking reduction zoning bylaw (195-18.d) considers reducing parking spaces in trade for bicycle parking. In the case of new development, sidewalks are required on one side of streets and minor roads in all but Residential C districts where they are required on both sides.

Most new commercial development in Chelmsford comes in the form of reuse of existing developed land. BPAC recommends the addition of either Zoning Bylaw or Subdivision Rules and Regulations that benefit Chelmsford's pedestrians and bicyclists.

Examples of such bylaw changes would be the following:

- Bicycle racks would be required for all new business development or redevelopment of existing properties or when a substantial addition of parking spaces to existing parking is made. One bicycle rack per 20 automotive spaces would be recommended.

- On properties with multiple commercial tenants, bicycle racks should be distributed appropriately across the property.
- 53G mitigation funds are based upon a Planning Board policy, adopted in 2000, that requires a developer to contribute \$100 for every new parking space created. The Town then uses these funds for various traffic and pedestrian improvements.

2 Recommendations

BPAC recommends that the Town adopt a formal public process to prioritize road, sidewalk, and bicycle infrastructure projects. This process should be transparent and seek public input while valuing expert recommendations from the Town Engineer and the Director of the DPW. Transportation Improvement Projects should be included in this process.

2.1 Pedestrian

Pedestrians need a safe and convenient network of sidewalks, trails, connectors, and crosswalks to be able to travel throughout Town, whether it be out of necessity, exercise, or leisure. Unlike the driver of a car or a bicyclist, the Town's pedestrians include every age group and physical ability. Therefore, building and maintaining a suitable network of sidewalks is vital to the community's well-being.

BPAC has identified and ranked items and areas for improvement to significantly help meet the Town's pedestrians' needs. The committee will consult with the DPW on an annual basis to indicate which committee's projects would be most beneficial. The sidewalk recommendations are not intended to circumvent any existing plans of the DPW. Existing sidewalks that have been identified as not compliant with ADA standards should be made a top priority. BPAC's recommendations are meant to augment the DPW's sidewalk plan by recognizing other opportunities for improvement.

BPAC also encourages the Town to improve its communication of planned improvements so the residents can know how work is being done throughout the Town. For example, a South Chelmsford resident may be unaware that sidewalks are being installed in North Chelmsford or vice versa. A little outreach can go a long way in residents' contentment when they may be wondering, "Why isn't anything being done in my neighborhood?"

See Appendix 1 for specific pedestrian improvement recommendations.

2.2 Bicycle

Bicyclists require a safe and convenient network of bicycle accessible road shoulders, bicycle lanes, and shared-use paths to enable more bicycle use in Chelmsford. As shown in Section 1.3 Existing Conditions, there is no formally planned bicycle infrastructure (other than the Bruce Freeman Rail Trail) currently in Chelmsford. BPAC has and will continue to consult with town entities on providing more bicycle-friendly roads. When roads are repaved, enhanced, or reconstructed, the appropriate entity will be consulted to provide better bicycles' access. BPAC has provided input to the DPW on where to install several donated bicycle racks. BPAC will promote bicycle racks at businesses, town properties, and all new development projects. BPAC is also working with the Town to provide better maintenance for the Bruce Freeman Rail Trail (BFRT) and plan for more substantial repairs in the future. BPAC will also work with the Town to make rail-trail crossings of major streets as safe as possible. The Friends of the BFRT continue to provide funding for temporary restrooms placed strategically along the trail. The

Friends of the BFRT also offer financial support for maintaining the bicycle fixit station and kiosk at Cushing Place.

BPAC has developed a bicycle map of the safest and most common routes throughout the Town to reach popular destinations. BPAC will also advise on signage specific for cyclists to help navigate throughout the Town, particularly to points of interest. Some key destinations are:

- Bruce Freeman Rail Trail
- Drum Hill Business District
- Great Brook Farm State Park
- Town Center (Chelmsford)
- Carol Cleven Park
- Vinal Square

Additional points of interest are:

- Cranberry Bog Reservation (Elm Street Trailhead)
- Crooked Spring Reservation
- Deep Brook Reservation
- East School Field
- Heart Pond Beach
- Lime Quarry Reservation
- Red Wing Farm
- Roberts Field
- Russell Mill Town Forest
- Southwell Field
- Walter F. Lewis Community Garden at Sunny Meadow Farm
- Thanksgiving Ground Forest
- Varney Park
- Wright Reservation

The BPAC has identified roadways in Chelmsford for improvement, emphasizing safe bicycle access to the above destinations and points of interest. Addressing these needs will be crucial in providing convenient bicycle access throughout the Town. These needs have been broken down into categories to be able to better address and track them. The categories were determined by the existing road width and conditions.

See Appendix 1 for specific bicycle improvement recommendations.

2.3 Safety and Education

Improved educational efforts can increase bicyclists' and pedestrians' safety and raise public awareness about the possibilities of using bicycles and walking as alternative modes of transportation and recreation. Education also includes highlighting the health benefits of bicycling and walking, the reduction in traffic congestion, and that bicycle and pedestrian-friendly communities are desirable places to live and visit.

The committee is considering ways to improve pedestrian and bicycle education, including:

- Expanding the Safe Routes to School Program to include middle schools.
- Developing interactive events, such as a bicycle repair workshop or helmet fitting event.
- Organizing a bicycle course event for children in a parking lot. Adults would run this, but the Police Department and groups such as the Boy Scouts or Girl Scouts could help the organization. Children would be able to practice using hand signals and negotiating turns and right of way and learn bicycle trail etiquette.
- Communication of existing laws and regulations concerning pedestrian and bicycle safety and helmet use.

3 Action Plan / Implementation

Below is a list describing measures that BPAC follows and will continue to do so to implement this Plan. By following these points, we hope to monitor progress towards the Plan's goals and augment the Plan as new situations develop throughout the Town.

- Meet yearly with Chelmsford DPW to monitor and implement Pedestrian and Bicycle recommendations. This meeting will take place before the beginning of the construction season.
- Meet yearly with the Town Manager to report on progress and address concerns.
- Maintain an active list of bicycle and pedestrian projects and progress.
- Have an internal yearly progress review and update the Plan accordingly.
- Work with MassDOT where applicable (State-owned roads or property).
- The Plan is a living document that will be continuously reviewed by BPAC and amended as required.
- We will be working with the town engineer to produce an overlay of bicycle routes on the town road map and post it to the Town of Chelmsford website.

4 Contributors / Acknowledgements

BPAC would like to thank the people below (many who were/are BPAC members) for developing this Plan. Much effort has gone into this Plan, and it would not have been as complete without their help.

Mike Garvin
Tom Gazda
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Cynthia McLain
Randall Peterman
Karen Taylor
Heather Blanchette
Shaun Berry
Jennifer Bristol
Ken Van Tassell
Janice Ruell
Jim Kelsey
Melinda Goodick
Carol Grueneich
Bob Schneider
Bob Morse
Steve Pustell
Robert Schneider
Robert Klinkhammer
Michael Carignan
Dave Antonelli

Brunswick Maine Bicycle and Pedestrian Advisory Committee (for inspiration)

Appendix 1: Improvements

The committee has identified the following four locations as a priority for sidewalk additions:

- Rt. 40 to Main Street
- Main Street
- Turnpike Road
- Westford Street to Chelmsford Center

Table 1: Pedestrian Improvements

Improvement	Comment
Continue sidewalk along Old Westford Road from Arbutus Avenue to Baldwin Road towards Roberts Field/ Friendship Park	
Need additional connecting sidewalks from corners of Route 4/ Parkhurst Road intersection to Manwell Road.	
Sidewalk along Concord Road	
Sidewalk along Groton Road north of the American Legion	Connect to Main Street
Continue sidewalk along School Street between Old Westford Road and Graniteville Road	Access to Friendship Park
Sidewalks on Main Street from School Street to Route 40.	Large number of walkers on this route
Add sidewalks on the east side of Route 4 to Manwell Road.	Large number of students come from this neighborhood to the McCarthy School
Continue sidewalk along School Street between Old Westford Road and Graniteville	
Sidewalks on Westford Street from Old Westford Road into Center	
Sidewalks on Concord Road from Parker Road to Sonora Drive	
Sidewalks on Tyngsboro Road from Williamsburg Condominiums to Vinal Square	This is a state-controlled road and has to be addressed with the state.
Carlisle Street	

Westford Street	
Center Village	Reference Center Village Master Plan
Add a crosswalk at 9 Acton Road to Bartlett Park.	<ul style="list-style-type: none"> • Reference Center Village Master Plan • Raised crosswalks and RRFBs at Acton Road and Bartlett Street provide a suitable link
Route 4-North of Drum Hill Rotary-need sidewalks continued along this stretch to the town-controlled section.	This is a state-controlled road and has to be addressed with the state.
Add sidewalks on Route 110 from Chelmsford Center to Westford Line.	This is a state-controlled road. Some developments have added sidewalks on their properties but many gaps exist.
State installed crosswalks at Oak Street and near the Woodland Square condominiums.	Striping has not been maintained by the state however.
Add sidewalks on Route 4/Boston Road from South Row School to Cambridge Street.	
Add sidewalks on Mill Road from Raymond Road connecting to at least Turnpike Road but preferably to Elizabeth Drive.	
Add sidewalks on Riverneck Road from Billerica Road to Gorham Street.	
Add sidewalks on Brick Kiln Road from Moore Street to Carlisle Street.	
Add sidewalks from Alpine Lane towards Walgreens.	Coordinate with Center Village Master Plan.
Maple Road/ Parkerville Road	
Drum Hill needs sidewalks on both sides of the road along the stretch of roadway from the rotary to the Lowell line	
Add a crosswalk at Richardson Road and Graniteville Road between Parker School Field and Sully's	Needs redesign to Square off the intersection to Graniteville to shorten the length of a crosswalk
Add a crosswalk at Alpine Lane across Route 110	Chelmsford street Gateway project

Add crosswalk warning signs at Kate's Corner.	There are advanced warning signs however this intersection/ crosswalk needs more visible signage at the actual crosswalk
Add crosswalk signage at Steadman Street and Smith Streets in both directions.	
Add crosswalk signage at both middle schools as well as high school for all crosswalks at or near the schools	RRFB's installed at McCarthy School Crosswalk.
Request School Crosswalk Signs leading up to and at all school crosswalks in Town	
Add a crosswalk from Lakeside Avenue to sidewalk on Route 27 near Elm Street.	Sight lines/ distance needs to be reviewed.
Improve School Zone Signage at Parker and McCarthy Schools.	RRFB's installed at McCarthy School Crosswalk. Signage installed.
Rebuild sidewalks on Fletcher Street	

Table 2: Bicycle Improvement Recommendations

Improvement	Comment
Bike and Pedestrian Route between Vinal Square and Chelmsford Center.	There are two possible routes from Vinal Square to Chelmsford Center, shown below. Each route is approximately 5 miles and will require extensive rework for bike lanes and/or sidewalks. These routes overlap with other standalone recommendations.
Add bike lanes to Littleton Road	State Highway
Add bike lanes to Princeton Street	State Highway
Widen shoulder on Turnpike Road	
Widen shoulder on Westford Street	
Add Sharrow marking on Boston Road	
Add Sharrow marking on Golden Cove Road	
Add Sharrow marking on Parkhurst Road	

Add Sharrow marking on Steadman Street	
Widen shoulder on Parkerville Road	
Widen shoulder on Main Street	
Add bike route signage on Brentwood Road	
Add bike route signage on Carlisle Street	
Add bike route signage on Davis Road	
Add bike route signage on Dunstable Road	
Add bike route signage on Elm Street	
Add bike route signage on Graniteville Road	
Add bike route signage on Parker Road	
Add bike route signage on Proctor Road	
Add bike route signage on Smith Street	
Add bike route signage on Warren Ave	
Widen shoulder on School Street	
Widen shoulder on Concord Road	
Widen shoulder on Mill Road	
Widen shoulder on Riverneck Road	
Widen shoulder on North Road	State Highway (from Rotary to Princeton Street)

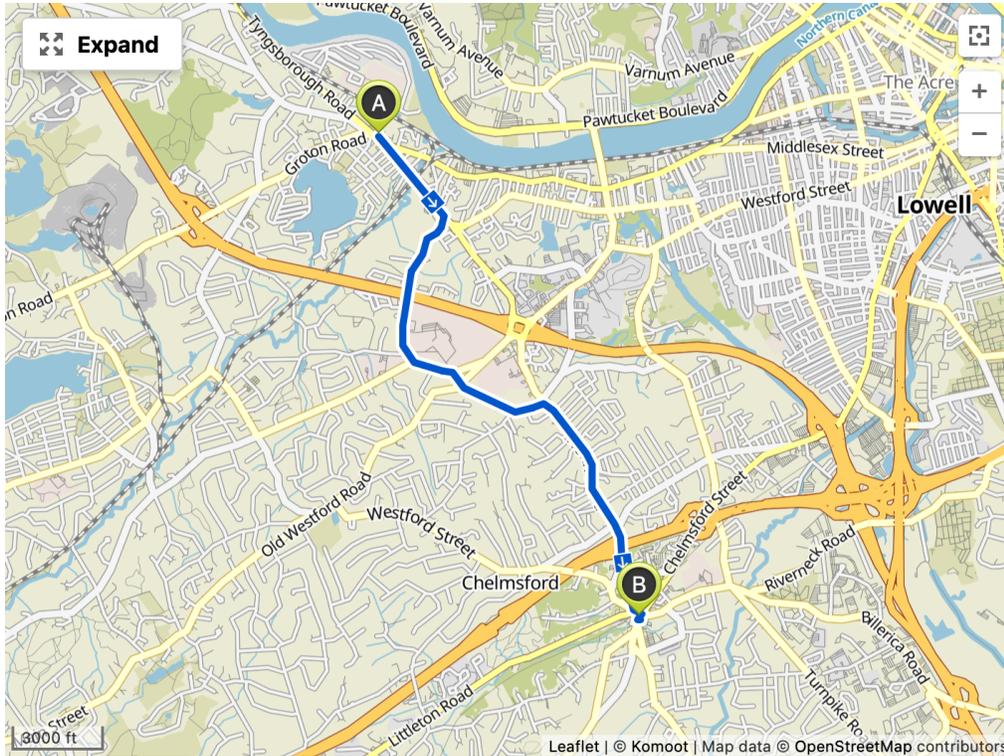


Figure 1: Vinal Square to Chelmsford Center via 3a, Richardson Road, and North Road

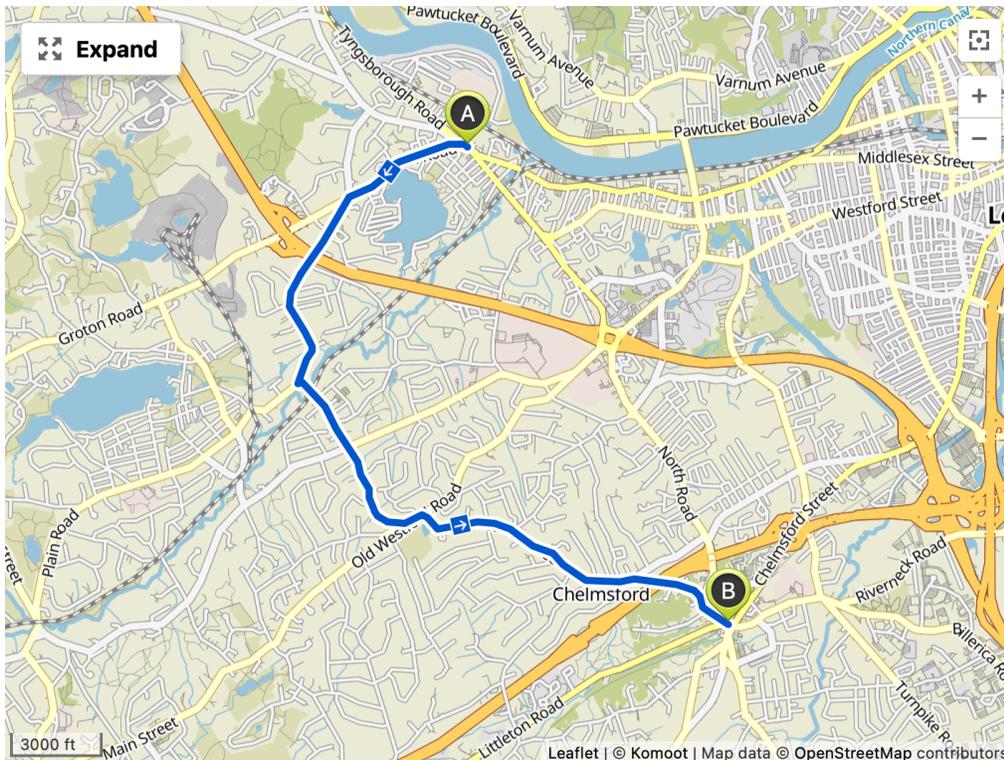


Figure 2: Vinal Square to Chelmsford Center via Route 40, Main Street, School Street, and Westford Street

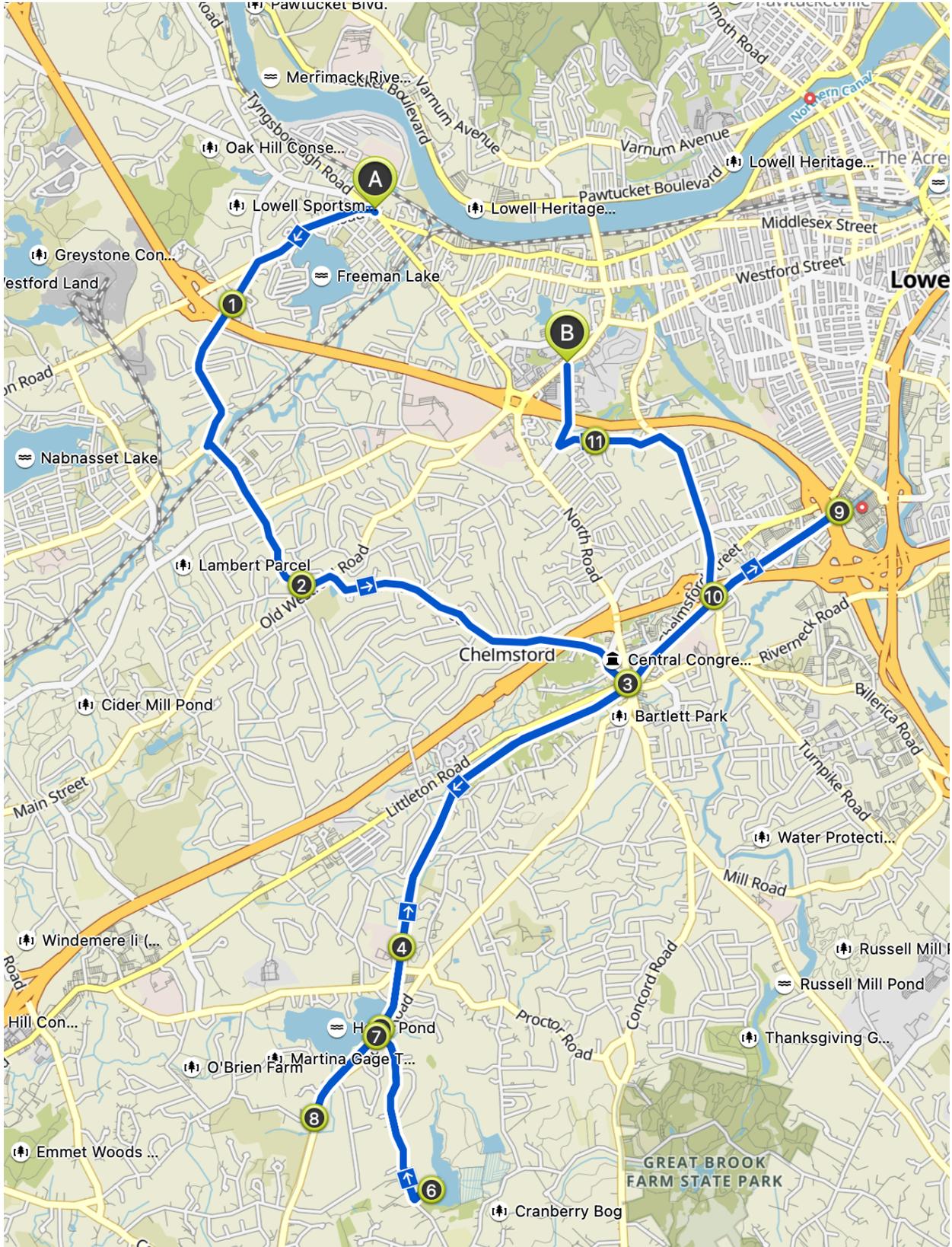


Figure 3: Bike routes connecting various points of interest

Appendix 2: Existing Rights of Way

The following table lists the existing Rights of Way (R-O-W) for each arterial or collector roadway in Chelmsford.

Street	Right of Way
Tyngsborough Road	50'
Groton Road	50'
Middlesex Street	50' – 60'
Princeton Street	50'
North Road	50' (Drum Hill – Littleton Road)
North Road	100' (Drum Hill Rotary – Princeton St)
Main Street	50'
School Street	50'
Graniteville Road	50'
Old Westford road	45' – 50'
Drum Hill Road	50'
Steadman Street	50'
Westford Street	40'
Golden Cove Road	40'
Chelmsford Street	50'
Littleton Road	47.5' – 50'
Billerica Road	Variable
Riverneck Road	40'
Gorham Street	50'
Turnpike Road	40'

Acton Road	45'
Boston Road	40'
Concord Road	40' – 46'
Mill Road	38' – 44'
Parkerville Road	40'
Maple Road	40'
Proctor Road	30'
Tuttle Road	36'

Appendix 3 - State Controlled Roads in the Town of Chelmsford

The following are the list of state-controlled roads.

- Chelmsford Street – partial (from the Mobil gas station to the Lowell Line)
- Gorham Street
- Littleton Road – partial (from the Ginger Ale Plaza to the Westford Line)
- Princeton Street
- Tyngsboro Road
- North Road - partial (from rotary to Princeton Street)

Appendix 4: Chelmsford Road Paving Plan

ROAD PAVING PLAN

Spring 2019		2021	
Richardson	\$265,158		Dakota
Tollcross	\$57,851		Rio Grande
Moncastle	\$56,784		San Mateo
Hildreth	\$49,713		Eldorado
Berkeley	\$208,422		Chydsedale
Parker	\$134,905		Windsor
			Lafayette
			Dobson
			Hart
			Meehan
			Purcell
			Thorton
			Sleigh
			Freeman
			Hall
			2022
			Summer
			Carlisle (SW)
			Graniteville
			Fletcher
			Newfield
			Mansur
			Westland
			Old Westford (Cberry to WTL+SW)
			High
			Manning
			2023
			Ranch
			Prairie
			Laredo
			Indian
			Sheppard
			East Sheppard
			Erlin
			Montview
			Boardwalk
			Pennsylvania
			Main (SW)
			2024
			Rack
			Kristin
			Howard
			Hebert
			Fischer
			Gary
			Drum Hill
			Stedman

Original located at

<http://www.chelmsfordma.gov/AgendaCenter/ViewFile/Item/2737?fileID=4538>

Appendix 5: Chelmsford Sidewalk Implementation Plan

Sidewalk Improvement Plan

2020	
Central Square brick Golden Cove ADA	
2021	
North RD (Fletcher to center brick and ADA) Center Common walkway Turnpike (Warren to Billerica) Billerica Road reconstruction(Industrial to Progress)	
2022	
Old Westford RD (Arbutis to Essex +Thomas to Sarah) Carlisle (495 to Gorham)	with road paving with road paving
2023	
Main Street reconstruction (Westford TL to School St) Main Street (School St to Groton)	with road paving with road paving (may need 2 construction seasons 1.4 miles)
2024	
Westford Street (Worthen to Abbott) Westford Street (Abbott to Old Westford)	with road paving (2 phases - 2.1 miles and UP relocations will need 2 construction seasons)
2025	
Davis Road reconstruction	

Original located at:

<http://www.chelmsfordma.gov/AgendaCenter/ViewFile/Item/2737?fileID=4539>

Appendix 6: Chelmsford Capital Expenditures

The following document links are included for information purposes

- Memo from Town Manager
<http://www.chelmsfordma.gov/AgendaCenter/ViewFile/Item/2737?fileID=4535>
- Capital Improvement Summary 2022 – 2026
<http://www.chelmsfordma.gov/AgendaCenter/ViewFile/Item/2737?fileID=4536>
- Ten Year Capital Plan
<http://www.chelmsfordma.gov/AgendaCenter/ViewFile/Item/2737?fileID=4537>