PLYMOUTH CENTER & NORTH PLYMOUTH CIRCULATION & MOBILITY STUDY

FINAL || April 2025

TOWN OF PLYMOUTH MASSACHUSETTS

GPI

TABLE OF CONTENTS

01 STUDY BACKGROUND

BACKGROUND + STUDY AREA

The Town of Plymouth is a community of great historical and cultural importance and has experienced significant growth in the past several decades with projections showing further growth into 2030. Its ideal location between Boston and Cape Cod, in addition to its pivotal role in American history, has helped it emerge as the economic and tourism center of the South Shore, attracting a substantial influx of seasonal visitors. The increased activity, through tourists and general population growth, has induced pressure on the town's transportation infrastructure. The increase in congestion has displaced speeding traffic onto neighboring streets where it cannot be safely accommodated. In fears of being struck, residents do not feel comfortable parking on the street and therefore encroach onto sidewalks, presenting a significant challenge to the safety and mobility of pedestrians in a high demand area for both residents and visitors alike.

To help address traffic flow, parking issues, and pedestrian safety and mobility, the town, spearheaded by Precinct 3 and approved by Town voters at Town Meeting in April 2023, initiated this **Plymouth Center + North Plymouth Circulation + Mobility Study.** Previous local initiatives have evaluated traffic flow and safety on certain neighborhood streets to address congestion and accommodate on-street parking without infringing on pedestrian walkways. Rather than addressing complaints on a street-by-street basis over time, this study takes a holistic approach by examining the larger area as a whole. This approach allows for a comprehensive understanding of the area's transportation challenges and opportunities, considering the safety and interconnectivity of streets and neighborhoods for all road users. By looking at the area as a whole, this study identifies systemic issues and develops a toolbox of solutions to address root causes areawide rather than merely addressing isolated areas of concern.

The area defined for this study includes **North Plymouth and Plymouth Center**, bounded by Obery Street, the waterfront, the Kingston town line, and Route 3. The study area includes the historic center of Plymouth and surrounding neighborhoods. The area holds significant interest associated with the Mayflower's landing and Plymouth's downtown, schools and neighborhood centers. Therefore, this planning effort for the larger area was undertaken by focusing on the following concerns:

- **Pedestrian Safety and Mobility** – Specifically looking at sidewalk connectivity/mobility, crosswalks, and pedestrian crash clusters.
- **Safety / Speeding** – Specifically looking to better understand where speeding occurs throughout town, diving deeper into crash trends that indicate speeding as a contributing factor and identifying potential solutions to calm traffic.
- **Traffic Flow** – Specifically looking at traffic flow considerations on narrow roadways as well as assessing the impacts of converting two-way roadways to one-way operations.

The intent of this plan was to work with the public through various engagement activities and analyze existing conditions to identify concerns, develop/evaluate potential projects/policies, and develop a prioritized list of implementation actions, including Short Term, Medium Term, and Long Term actions for the Town to implement over time as funding becomes available.

STUDY PROCESS + GOALS

Process

The following describes the scope of work completed in the development of the Plymouth Center + North Plymouth Circulation + Mobility Study:

- **Site Reconnaissance** – The project team conducted field visits to document and observe the study area.
- **Planning And Data Review** – This step involved assessing the current network to identify areas falling short of the project's objectives. It also included a review of past planning efforts to understand the goals of North Plymouth and Plymouth Center's future.
- **Existing Conditions Analysis** – The project team examined transportation network characteristics, parking supply and utilization trends, traffic counts, traffic speeds, crash data, historic properties, and public spaces to identify specific challenges within the study area.
- **Public Outreach** – Throughout the development of the plan, the project team hosted public events and deployed online surveys to gather input and gauge public satisfaction with the plan.
- **Identification of Preliminary Projects and Prioritization** – Based on public feedback and an analysis of the existing conditions, the team identified potential projects and developed a preliminary prioritization plan.
- **Plan Refinement and Implementation Plan** – With input from the Town and the community, the project team finalized the prioritization plan.

Goals

Goals for the study were derived from previous planning efforts, as well as from the community engagement process, by categorizing stakeholder and community comments collected during the Preliminary Informational Session, the Open House, and from the online surveys. The goals of the project are as follows:

- Create safe and accessible streets for all ages, abilities, and modes of travel.
- Expand travel options for people traveling to, through and around Plymouth Center + North Plymouth
- Support growth and quality of life for residents and visitors in Plymouth Center + North Plymouth through improved public space and walkability.
- Provide predictable and reliable travel for all modes.

POLICY & PLAN REVIEW

Prior planning initiatives, both by the Town of Plymouth and other stakeholders, have identified policies and recommendations regarding the North Plymouth and Plymouth Center areas. Applicable plans, policies, and recommendations are summarized below:

Complete Streets Policy and Prioritization Plan (2013, 2017)

The Town of Plymouth initially adopted a Complete Streets Policy in 2013 illustrating the Town's commitment to accommodate all users by creating a road network that meets the needs of individuals utilizing a variety of transportation modes, including pedestrians and bicyclists. The Policy states that all transportation infrastructure and street design projects requiring funding or approval by the Town of Plymouth, as well as projects funded by the State and Federal Government, such as Chapter 90 funds, Transportation Improvement Program (TIP), MassWorks Infrastructure Program, Community Development Block Grants (CDBG), and other state and federal funds for street and infrastructure design shall adhere to the Town of Plymouth's Complete Streets Policy.

In 2017, the Town of Plymouth developed a Complete Streets Prioritization Plan that identified and ranked a series of projects aimed towards making streets more accessible, safe, and convenient for all users, including pedestrians, bicyclists, public transit users, motorists, and individuals with disabilities. The plan identified several projects that specifically pertain to the study area of this document. These areas include:

- ***Route 3A (Kingston Town Line to Warren Avenue)*** - Replace existing poor crosswalks, signs, wheelchair ramps, and sidewalk panels. Mark shared lanes as well as upgrade traffic signals and install bike signs from Kingston Town Line to Warren Ave. This roadway segment has been identified as a high bicycle traffic route by OCPC.

The Plymouth Center/ Waterfront Area Master Plan Update (2019)

The Plymouth Center/ Waterfront Area Master Plan, updated in 2019, is a comprehensive and long-term planning document that outlines the visions and goals for land use, development, and infrastructure within Plymouth's Center/Waterfront Areas. The Plymouth Center Steering Committee identified infrastructure improvements & safety as a key strategy moving forward. Specifically, the plan identified the following action items that specifically pertain to the study area of this document:

- ***Improve and upgrade existing sidewalk and crosswalk conditions for safe access and mobility.*** Pedestrian safety is a priority, and a few on-street parking spots may need to be lost in order to provide visibility at some of the existing crosswalks. Specifically, the plan calls to assess and prioritize sidewalks and crosswalks for improvements within the Plymouth Center / Waterfront Area, appropriate funds for further infrastructure improvements at future Town Meetings, and add enhanced lighting, pavement markings, bump outs, raised crosswalks, additional reflective signage, Rapid Flashing Beacons and/or Flashing Blinker Signs where needed. [Getting Around & Infrastructure; Goal 2; Action Item 3].

Old Colony Congestion Management Process (2020)

The OCPC developed the Old Colony Congestion Management Process (CMP) document to identify congested locations, determine the causes of congestion, develop alternative strategies to mitigate congestion, evaluate the potential of different mitigation strategies, propose alternative strategies that best address the causes and impacts of congestion, and track/ evaluate the impact of previously implemented congestion management strategies.

- ***Route 3A (Cherry Street to South Street)*** - The CMP identified Route 3A between Cherry Street and South Street as a congested roadway facility due to demand surge. Recommended congestion management strategies included the promotion of non-motorized travel, the use of Intelligent Transportation Systems (ITS), and the advancement of public transportation.
- ***Sandwich Street at Main St. Ext. and Sandwich Street at Water Street*** - In addition, the CMP identified the intersections of Route 3A at Sandwich Street and Water Street as congested intersections.

The recommendations herein aim to promote non-motorized transportation via enhanced pedestrian safety and mobility. In addition, this plan aims to address operational issues occurring at the intersection of Route 3A at Sandwich Street / Water Street.

Route 3A Corridor Study (2007)

The Route 3A Corridor Study was a planning level study developed by the Old Colony Planning Council (OCPC) in 2007 to conduct a comprehensive assessment of infrastructure, traffic flow, and safety conditions along the Route 3A corridor through Plymouth and Kingston. The study identified deficiencies and potential alternatives for several areas that specifically pertain to the study area of this document. These areas include:

- ***Sandwich Street at Main St. Ext. and Sandwich Street at Water Street*** – These two intersections, while separate, were treated as a single unit when identifying deficiencies and potential enhancements within the 2007 Corridor Study. Both a level-of-service analysis and on-site assessments revealed that these intersections experience significant congestion, experiencing LOS D and F during peak periods, particularly in the summer season. Traffic signal warrant analyses confirmed the need for traffic control measures at both locations. Roundabouts were also considered. Conversations with the Town of Plymouth indicated that, at the time, there were considerable constraints related to available right-of-way, which could pose significant challenges for implementing traffic signals or reconstructing these intersections with roundabouts. As outlined in the Route 3A Corridor Study, the preferred solution for this location involved implementing a downtown traffic management system that combined traffic flow adjustments and signage. For instance, the use of directional signage on Water Street to guide Route 3A-bound drivers toward signal-controlled Leyden Street could help alleviate congestion at the Water Street intersection.
- ***Downtown Plymouth Traffic Circulation*** – At the time of study (2007), the Town of Plymouth was exploring the idea of implementing a one-way traffic circulation pattern in the Downtown and Waterfront area in which Route 3A would become one-way southbound through the Downtown and Water Street would become one-way northbound from the intersection of Sandwich Street at Water Street to the intersection of S. Park Avenue at Town Wharf. The proposed traffic pattern change was envisioned to potentially increase on-street parking availability and alleviate congestion. While the 2007 study recognized the significance of these potential advantages, it was determined that further investigation was required.

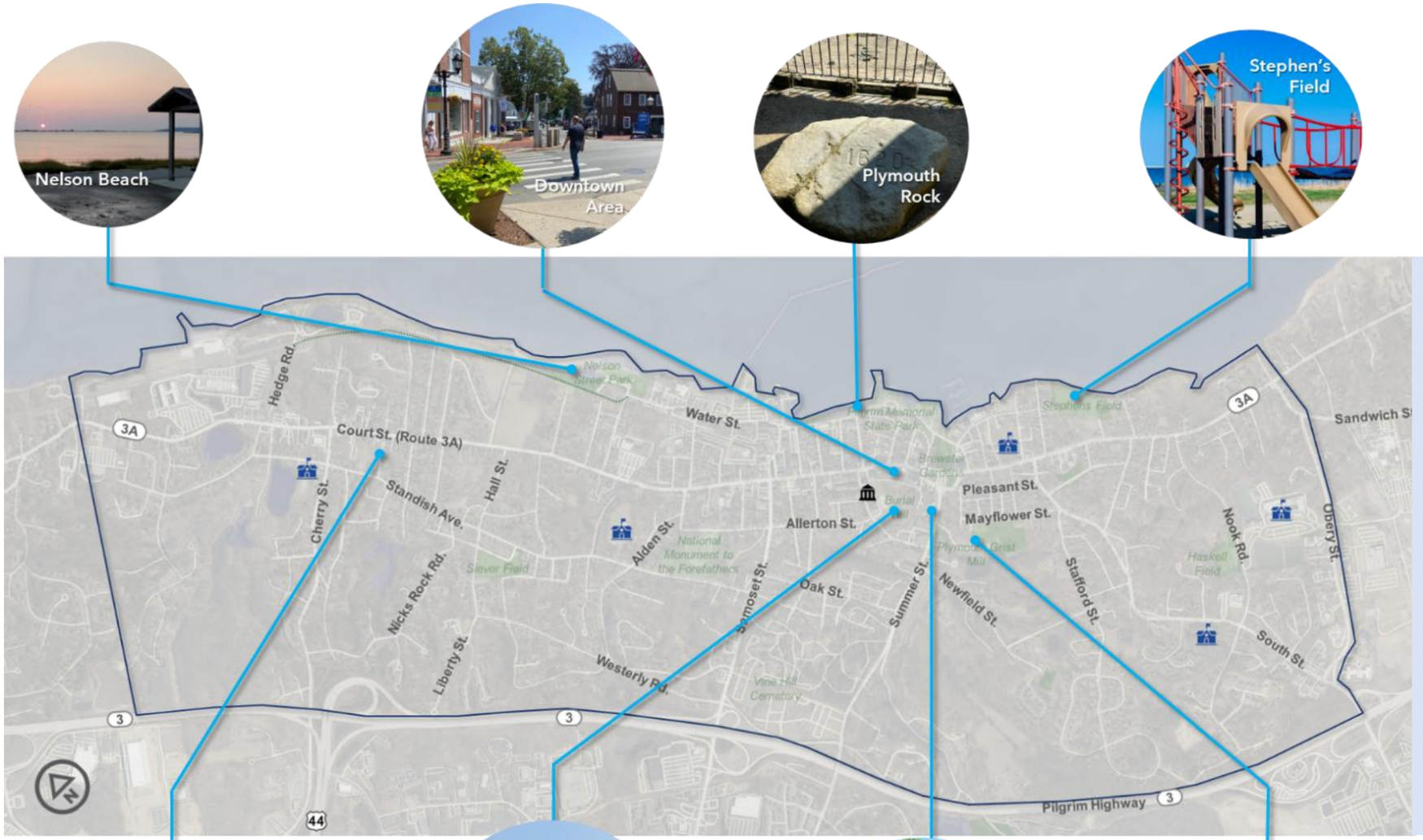
As part of this study, the project team investigated the one-way concept further and preliminary findings indicated that the one-way configuration does not yield the desired additional parking on Route 3A and creates pedestrian safety concerns (see Chapter 5). In addition, Plymouth Police & Fire are opposed to such a traffic circulation pattern and therefore, it is not recommended.

Plymouth Public Space Action Plan (2007)

The Plymouth Public Space Action Plan was a planning level study initiated by the Plymouth Department of Public Works with the goal to better connect and enhance the existing social, environmental, historic, and economic fabrics of the community that, when implemented, will benefit all. The study was focused on the Downtown/Harbor District. Several of the recommendations within the Public Space Action Plan specifically relate to the focus of this study area. These recommendations include:

- Significantly upgrade key town center open spaces and strengthen the pedestrian and bicycle linkages between all public spaces.
- Develop stronger and more attractive pedestrian connector streets to better unite downtown with the heavily visited harbor. Specifically, the following streets were identified as strong connector streets: North Street, Leyden Street, Brewster Street, Chilton Street and Memorial Drive.

The recommendations herein reflect the goals and build upon the action items stated within the Public Space Action Plan by improving pedestrian safety and mobility throughout the corridor.



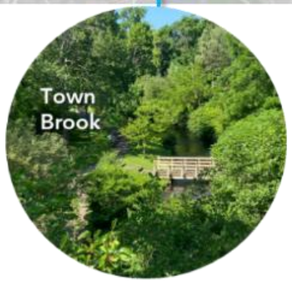


Figure 1. The area defined for this study includes **North Plymouth and Plymouth Center**, generally bounded by Obery Street, the waterfront, the Kingston town line, and Route 3. The study area includes the historic center of Plymouth and surrounding neighborhoods and is home to significant interest associated with the Mayflower's landing and Plymouth's downtown, schools and neighborhood centers.

02 PLAN CONTEXT

Plymouth is an evolving place, and its transportation system must also change to meet the needs of its residents and visitors. Understanding the existing challenges and opportunities within the project area is critical in developing safe and effective transportation solutions. To better identify the challenges and issues that should be addressed, an existing conditions and needs assessment was completed based on a review of previous plans and studies, demographic data, land use information, multimodal demand and facilities, crash statistics, commuting patterns, and roadway congestion/delays.

A GROWING PLYMOUTH

As a regional destination and an evolving urban center, Plymouth attracts a broad range of activity year-round and has experienced significant growth over the past 20 years. Population and employment in Plymouth rose approximately 20% and 18%, respectively, from 2010 to 2020. According to the Massachusetts Regional Household and Labor Force projections, household population and employment are anticipated to keep growing approximately 12% and 7%, respectively, from 2020 to 2040.

It is also important to note that the population of Plymouth is aging, a trend that is being experienced throughout the country. This trend is expected to continue through 2050, at a faster pace than previously seen. As the population ages, there will be a change in the region's mobility needs as older adults often experience barriers to transportation.

The population growth and its aging trend have resulted in a need for more rental apartments and age-restricted housing. This, along with a desire to live in the downtown area close to amenities and facilities, has created an influx of multi-family residential developments within the village boundaries, resulting in higher parking demands.

In addition, the study area experiences significant seasonal tourism given its rich history. This influx of visitors adds further pressure on the town's infrastructure and transportation system.

These demographic changes and growth trends have significantly impacted Plymouth's transportation system and will continue to do so without action. With more residents, workers and visitors, the roads have experienced higher traffic volumes, leading to congestion and speedy cut-through traffic on neighborhood streets as drivers seek to avoid main road congestion. This growth has also led to competition for convenient parking, especially on residential streets close to downtown where the demand for on-street parking is high.

These issues highlight the need for traffic calming measures, improved parking management, enhanced pedestrian safety, and improved traffic flow to ensure the transportation system can accommodate the growing population and maintain the quality of life for residents.

ROADWAY NETWORK

Plymouth lies along the "Pilgrims Highway" portion of Route 3, which is the major route between Cape Cod and Boston. The study area can be accessed via two exits on the highway (Samoset Street and South Street) which provide direct access to Route 3A. Court Street / Main Street / Sandwich Street (Route 3A) was the original north-south highway connecting Plymouth and Boston and runs parallel to the waterfront and Route 3. The local street system includes a grid with variable width rights of way. There are many narrow streets in the older area of the Town, which were established before automobile use. The area experiences congestion at peak periods which causes frustration for local users and concerns for police and fire services. There is a desire for more on-street parking in neighborhoods where feasible. On some narrow residential streets, vehicles park on the sidewalk to leave adequate space for traffic flow which creates pedestrian safety and accessibility concerns. Speeding problems have been identified on several streets.

Parking on Residential Streets

Parking is a sought-after commodity in Plymouth, with field observations revealing high utilization on residential streets, particularly in proximity to the downtown area, several of which present widths on the narrower side. On-street parking on narrow roadways can be perceived as problematic due to limited space, safety concerns, and accessibility issues. With less room available due to parking, congestion can occur, hindering traffic flow and increasing the potential for sideswipe collisions. On the other hand, it serves as an essential parking supply for residents and creates "friction" along the road, promoting calmer, slower speeds as vehicles must yield to one another. This naturally reduces the likelihood of speeding and enhances overall road safety by encouraging a more cautious driving approach.

Additionally, collector streets with a high residential density, such as Standish Avenue, Oak Street, and Nelson Street, often experience parking extending onto sidewalks, presenting a significant challenge. Sidewalk parking poses serious safety concerns, especially for individuals with mobility or visual impairment, as well as families with young children. When further investigating the reason behind this behavior, particularly on roadways with ample roadway width, it became evident that speeding along these routes prompted residents to park on sidewalks to avoid potential collisions. This underscores the importance of addressing speeding issues.

Standish Avenue - Parking on Sidewalk & Blocking view of Crosswalk

Oak Street - Parking on Sidewalk

Street Classification

Figure 2 represents the street classification system within the study area. These roadway classifications function together to serve the needs of the traveling public. The functional classification of a roadway is one consideration that influences appropriate design options regarding signage, striping, and traffic calming elements. For example, principal arterials typically serve as the primary connection between cities and regions, are important for emergency services, often support transit routes, and are meant to serve higher volumes of traffic. Therefore, design elements which would deter from that function (i.e., some traffic calming elements) would not be appropriate on those roadways. It is important that pedestrian related and traffic calming design elements be implemented in ways which foster sustainable safety.

Figure 2. Street Classification

Traffic Volumes

Annual Average Daily Traffic (AADT) volumes were obtained by Replica databases and represent volumes from a typical fall day in 2022 as depicted in Figure 3. As expected, roadways with arterial classifications (Route 3A, Cherry Street, Samoset Street, and Summer Street) carry a higher volume of vehicles while collectors (Standish Avenue, Westerly Road, Oak Street, South Street) and local roadways carry lower volumes. Comparing volumes to street classification may allow planners to pinpoint areas with significant cut-thru traffic (i.e., a collector or local road with high volumes). Traffic volumes are also particularly important in understanding sustainable solutions.

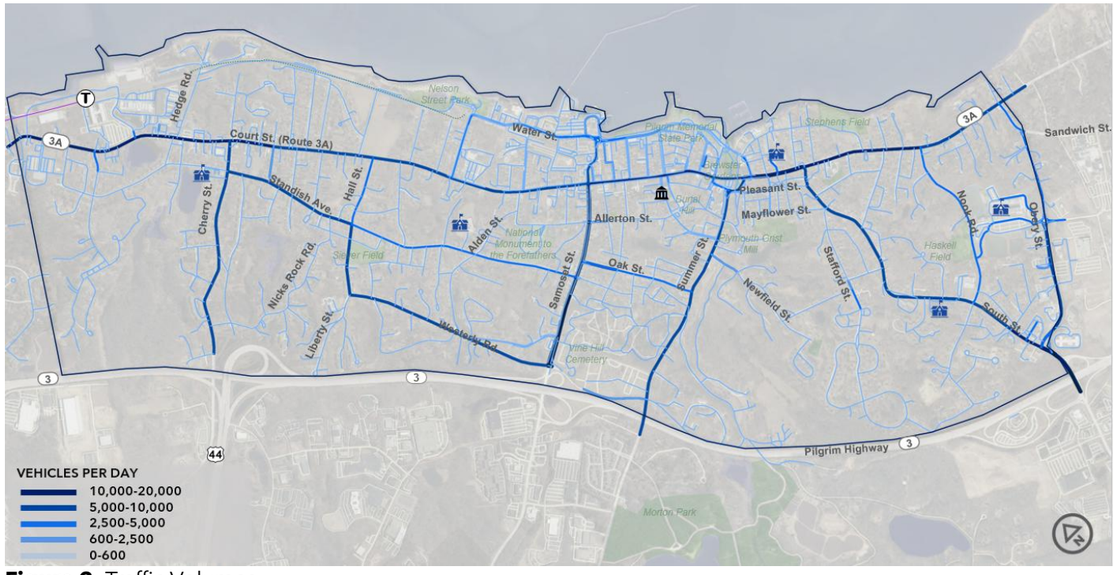


Figure 3. Traffic Volumes

THE MULTIMODAL NETWORK

The GPI Team visited the project area several times throughout the summer of 2023 to gather data and make general observations regarding the multimodal network. In addition, a comprehensive desktop review of the town's pedestrian, bicycle, and transit networks was conducted in July 2023. The inventory included the review of the existing networks as provided in the MassDOT Roadway Inventory File, the MassDOT Bike Inventory File and MassDOT/GATRA Bus Routes and Stops GIS Data.

Pedestrian Network

Plymouth Center is a walkable district with a pedestrian-scale street system, and numerous destinations including downtown historic attractions, parks, schools, and neighborhood commercial centers that generate significant foot traffic.

In examining the pedestrian network within the greater study area, it was found that most streets have sidewalks on at least one side of the roadway, resulting in an overall, well-connected network. That being said, there are some notable gaps in the sidewalk network, such as along Hedge Road and Robbins Road, both of which provide a direct connection from Court Street (Route 3A) to the Seaside Rail Trail (also known as the North Plymouth Rail Trail). This lack of connectivity limits safe access to this alternate, off-road route to downtown. In addition, the lack of sidewalks along neighborhood roads, such as Ocean View Avenue, Birch Avenue and South Cherry Street, for example, creates barriers between residential neighborhoods and key amenities like nearby schools and parks.

Figure 4. Pedestrian Network Deficiencies

In certain instances, although sidewalks are present on one side of the street, they may be absent on the side with significant pedestrian activity or where a clear desire for walking exists. Union Street is a great example. Sidewalk is provided on the western side but not on the eastern side along the waterfront where people want to walk and are observed walking.

Further, in some cases where sidewalks exist, they do not comply with ADA requirements and/or have uneven and cracked surfaces, posing challenges for pedestrians, particularly those with mobility impairments. For example, Sever Street exhibits sidewalks in poor condition due to cracking, sloping, and obstruction from vegetation and parked vehicles. The pervasive issue of parking on sidewalks throughout the study area presents a significant safety hazard, compromising pedestrian connectivity and accessibility. The existing sidewalk conditions hinder the pedestrian experience along this roadway, and others, which are critical connectors from neighborhoods to the downtown corridor.

Pedestrian crossings also raise a safety concern within the study area. Many crossings within the study area, especially midblock crossings, lack sufficient visibility. This is often exacerbated by the obstruction caused by vehicles parked too close to the crosswalk, blocking critical sightlines. This is especially prevalent along Main Street/ Court Street (Route 3A) within the downtown area. Additionally, poorly located crosswalks (observed throughout the study area) lead to compromised sight lines, necessitating double-stage crossings or failing to cater adequately to the surrounding land uses.

While the pedestrian network offers a degree of connectivity, there are issues of conditionality, accessibility and safety that must be addressed.

Bicycle Network

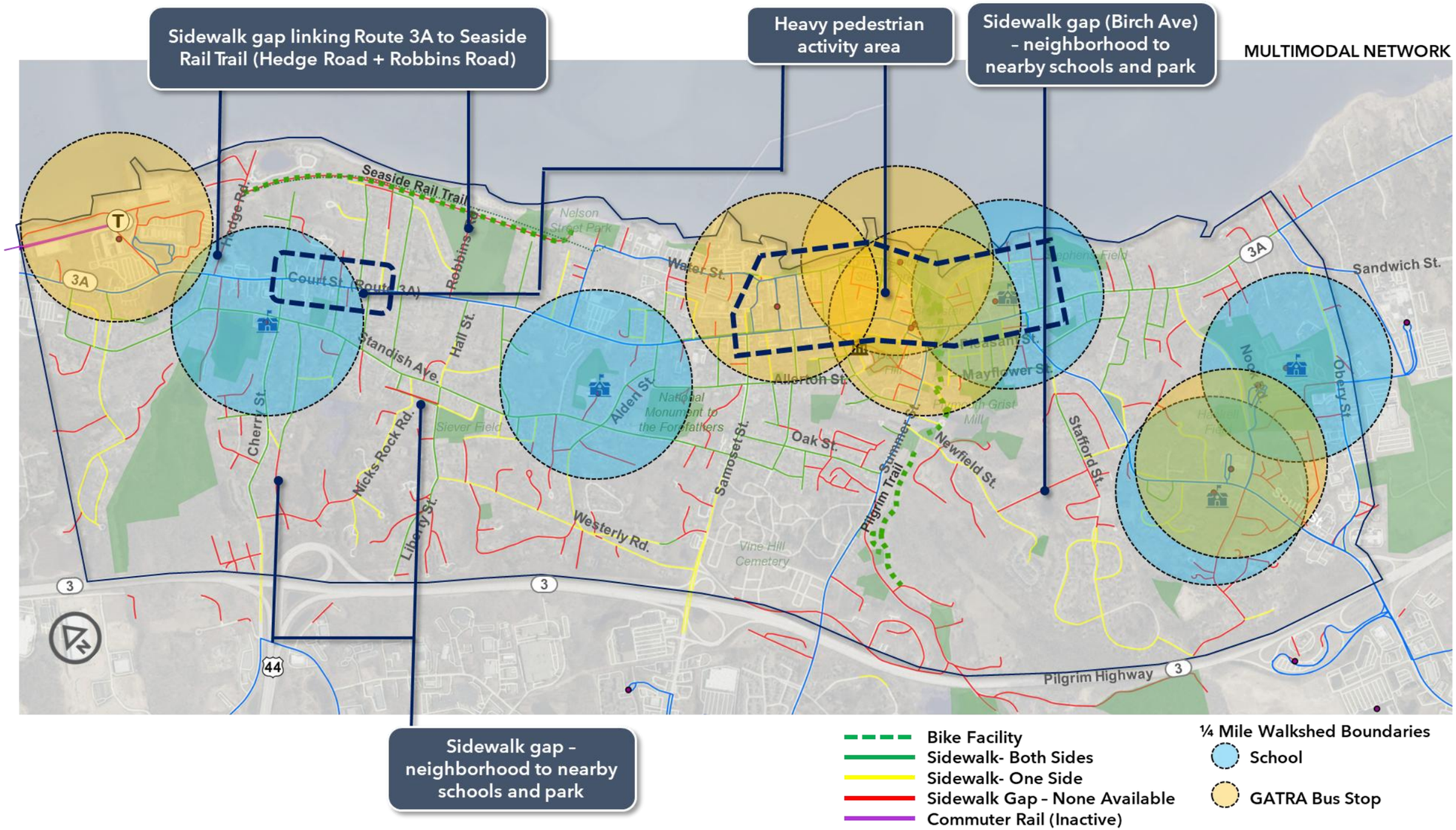
The existing bike network within the study area is very limited. In fact, the only street within the project area with dedicated bike lanes, or any bike infrastructure for that matter, is Water Street (Brewster Street northerly to Nelson Street). The on-road bike facilities on Water Street provide a critical connection to the Seaside Rail Trail (with access provided on Nelson Street). The Seaside Rail Trail, also known as the North Plymouth Rail Trail, follows the older section of rail lines of the Old Colony Railroad that continued on from Cordage Park to Plymouth Center. While it is only about 1.5 miles, it is a gateway to other recreational areas, such as Nelson Beach (via Nelson Street) and Holmes Reservation (via Robbins Road) as well as the downtown area (via Water Street). This dedicated off-road facility provides a critical safe alternative for multimodal traffic to access the downtown area as opposed to Main Street/ Court Street (Route 3A) which experiences heavy volumes and a lack of bicycle infrastructure.

Transit Network

There is a range of public and private transportation services in Plymouth. There is an MBTA commuter rail station located in the Cordage Park complex in North Plymouth that once served the Plymouth/Kingston Line providing service to Boston's South Station and Kingston. However, the Plymouth Station was indefinitely terminated in April 2021 due to limited ridership and service. No dates for resumption of service have been announced as of June 2024.

GATRA (Greater Attleboro and Taunton Regional Transit Authority) provides public transit bus service in Plymouth. Three bus routes in the area run primarily along Main Street/ Court Street (Route 3A), Water Street, Summer Street, South Street, and Obery Street. There are also tourist-oriented shuttles throughout the Town and a ferry service to Provincetown. Providing safe pedestrian routes to and from transit stops and hubs are essential considerations for the pedestrian network and overall multimodal network.

Figure 5. Multimodal Network



SAFETY ANALYSIS

Overview

Crash data have been researched for the latest available five-year period (2018-2022) on file with MassDOT via means of the MassDOT Crash Portal. Within the complete five-year study period, approximately 1,415 crashes were reported within the study limits. Approximately 68% of these crashes resulted in property damage only, while 31% resulted in non-fatal injury. The remaining 1% of crashes had unknown or unreported severity. The most common crash types were rear-end (30%), single-vehicle crashes (24%), angle (19%), and sideswipe (same direction) (10%). Approximately 4% of crashes involved a pedestrian or bicyclist.

Notably, the severity levels and number of single-vehicle crashes stood out. To identify any anomalies or clear trends, the project team utilized the MassDOT Test of Proportions tool which is built into its crash database and compares crash diagnostics between several areas or characteristics. Plymouth crashes were thus compared to statewide crashes using the most recent years available for the tool's analysis (2018-2020). The tool reported several interesting findings:

- **Speeding Related Crashes** – Crashes involving contributing codes related to speeding represent 8.01% of crashes in Plymouth compared to 4.95% statewide. This data clearly indicates that speeding is a significant issue on Plymouth's roads.
- **Injury Crashes** – Approximately 31% of crashes in Plymouth resulted in some degree of injury, compared to 24% of crashes statewide. This supports the need for investment in traffic calming initiatives to improve safety.
- **Crashes Involving Parked Cars** – There is a significant number of crashes involving parked cars, further highlighting the dangers posed by speeding and the need for effective parking management and traffic calming measures.

Problematic Intersections

A heat map was developed with all crashes to identify areas where safety issues may persist (Figure 6). Bright yellow areas indicate locations with a higher number of crashes. Ultimately, areas with a higher concentration of crashes should be prioritized for safety improvements. Most notably, the map suggests that there are a significant number of collisions at the following intersections:

Cherry Street at Standish Avenue

Standish Avenue intersects Cherry Street from the north and south to form a signalized four-way intersection. The intersection has a crash rate higher than the statewide and district wide averages for signalized intersections. Nearly half of the reported crashes were attributed to disregard for traffic control, indicating a prevalent issue with red light running. This is exacerbated by outdated signal equipment, which is post-mounted rather than overhead mounted, making it far less visible to drivers. The intersection's proximity to the Hedge Elementary School (located in the northwest corner) further elevates the risk, especially since pedestrian signal equipment is also outdated and lacks modern features like countdown timers. The very tight layout of the intersection reduces maneuvering space for vehicles which leads to a very uncomfortable experience for pedestrians waiting at curb ramps.

Court Street (Route 3A) at Samoset Street / North Park Avenue

Samoset Street (Route 44) and North Park Avenue intersect Court Street (Route 3A) from the west and east, respectively, to form a four-way signalized intersection. The northbound Court Street (Route 3A) approach provides a dedicated left turn lane and a shared thru/right turn lane while the southbound approach provides a shared left turn/thru lane and a dedicated right turn lane. Northbound lefts are permissive/protective and are indicated via a flashing yellow arrow. Southbound lefts, on the other hand, are permissive only, with no signage indicating as such. Permissive left turns rely on drivers to interpret gaps in traffic, which can be challenging when signals are not clearly indicating protected versus permissive turns, leading to potential errors and confusion. Additionally, vehicles in the shared left/thru lane may stop suddenly to wait for a gap in oncoming traffic to make a left turn, surprising drivers behind them who expect thru traffic to continue moving, heightening the risk for rear-end crashes. In reviewing the crash data, this intersection experienced a significant amount of angle and rear-end collisions.

Main Street Ext. (Route 3A) at Sandwich Street / Sandwich Street (Route 3A) at Water Street

The intersections of Main Street Ext. (Route 3A) at Sandwich Street and Sandwich Street (Route 3A) at Water Street act as a critical gateway point to the downtown and waterfront areas, providing access to downtown shopping, historic sites, and parking areas. Sandwich Street also provides a connection to western Plymouth and regional access to Route 3. As such, a significant movement involves vehicles flowing from Water Street to Sandwich Street, and vice versa, the former of which may be used to bypass downtown congestion to access Route 3. This heavy movement is intersected by the long pedestrian crossing of Sandwich Street (Route 3A). The crosswalk's current location leads to operational inefficiencies as motorists must wait for pedestrians to cross the wide street while also waiting for gaps in Main Street Ext. (Route 3A) traffic to execute a left turn. This occurrence results in numerous conflict points and poses safety issues as well as operational concerns as left turning vehicles block through traffic. Modifications should address pedestrian safety and mobility well as improve intersection operations.

Samoset Street (Route 44) at Oak Street

Stop-controlled Oak Street intersects free-flowing Samoset Street (Route 44) from the south to form a three-way unsignalized intersection located along a slight horizontal and vertical curve. The constrained space, influenced by the built environment, exacerbates these issues. Sight distance is heavily restricted by a retaining wall and vegetation in the southwest corner, making it difficult for Samoset Street eastbound and Oak Street northbound vehicles to see each other. This lack of visibility is supported by the crash data, which shows a significant amount of angle crashes involving northbound left-turning vehicles and eastbound through vehicles.

Samoset Street at Standish Avenue / Chestnut Street

Standish Avenue and Chestnut Street intersect Samoset Street (Route 44) from the north and south, respectively, to form a four-way signalized intersection. All four approaches provide a single travel lane and therefore, left-turning vehicles must wait for gaps in oncoming traffic to execute their turns. This can lead to angle type collisions as well as rear-end collision, both of which are prevalent at the intersection. Chestnut Street intersects Samoset Street at a significant downgrade which can cause vehicles to approach the intersection at higher speeds, reducing their ability to stop in time. Similarly, the Samoset Street eastbound approach approaches the intersection at a slight downgrade, heightening the risk for speeding vehicles and rear-end crashes. These grades, in combination with buildings located in all four corners of the intersection, restrict sight lines. This limited visibility heightens the risk of angle type crashes, especially because right turns on red are permitted at the intersection.

Standish Avenue at Hall Street / Liberty Street

Liberty Street and Hall Street intersect Standish Avenue from the west and east, respectively, to form a four-way unsignalized intersection. Liberty Street and Hall Street operate under STOP sign control while Standish Avenue operates under free-flowing conditions. This intersection has a crash rate higher than the statewide and district wide averages for unsignalized intersections, and in reviewing the crash data, approximately 71% of the reported crashes resulted in personal injury which is far greater than the state average of 24%. A considerable amount of crashes either involved an eastbound vehicle and a northbound vehicle colliding or a westbound

vehicle and southbound vehicle colliding. This indicates that sight distance may be obstructed due to adjacent buildings and vegetation at the intersection as well as the approaching grades of Liberty Street (approaches at a downgrade – eastbound vehicles may be not as visible to northbound vehicles due to a retaining wall) and Hall Street (approaches at an upgrade – westbound vehicles may be not as visible to southbound vehicles due to retaining wall and vegetation). Obstructed visibility may be exacerbated by excessive speeding on Standish Avenue, which may be responsible for the high frequency of more severe crashes at this location. It is also important to note that this intersection carries significant cut-thru traffic as previously mentioned. The cut-thru nature of the route may lead to more aggressive driving behavior.

Summer Street at Russell Street

Russell Street intersects Summer Street from the north to form a three-way unsignalized intersection with Russell Street under STOP control and Summer Street operating under free-flowing conditions. On-street parallel parking on Summer Street blocks the view of oncoming traffic from the west, while overgrown vegetation significantly restricts sight distance to the west. This causes Russell Street vehicles approaching the intersection to inch out in order to see oncoming traffic, heightening the risk of angle type collisions which the crash data indicates are very prevalent at this intersection. In addition, the intersection has wide sweeping curves, promoting high turning speeds and putting pedestrians at risk, especially given the long length of the crosswalk.

Problematic Corridors

The map also suggests several roadway segments experiencing a significant number of collisions:

Allerton Street

Allerton Street did not experience as many crashes as some other roadways. However, in relation to the volume of traffic it services and its relatively short length, it stood out. There were seven reported crashes, five of which indicated contributing factors related to speeding. In addition, three of the total seven crashes involved collisions with parked vehicles.

Cherry Street

Cherry Street is fairly narrow in some sections and includes several horizontal curves. Utility poles and trees are located very close to the roadway for much of the corridor. The segment of Cherry Street from Route 3 to Standish Avenue experienced 16 crashes within the study period, seven of which resulted in some degree of injury. Eleven of the total 16 crashes were single vehicle crashes including collisions with curbs, trees, and utility poles situated closely to the roadway. Approximately 38% of crashes (6 crashes) were attributed to speeding.

Oak Street

Similar to Allerton Street, Oak Street did not experience a significant number of crashes, but in relation to the amount of traffic it serves and its relatively short length, it stood out as a problematic corridor. Oak Street (between Samoset Street and Summer Street) experienced nine crashes within the study period, five of which resulted in some degree of injury. A third of the crashes on this roadway involved collisions with parked vehicles, two of which were contributed to speeding.

(Court Street/ Main Street/ Main Street Ext./ Sandwich Street) Route 3A

There were several areas along Route 3A that experienced a high concentration of segment crashes. Particularly, these were located within the northern retail area (Prince Street to Atlantic Street), the downtown area (Samoset Street to Water Street), and the southern gateway area (around Nook Road). Rear-end and sideswipe crashes were prevalent within the northern retail area and downtown area, likely due to their high pedestrian activity and highly utilized on-street parking. Frequent stops for pedestrians and distractions from the busy urban environment increase the potential for rear-end crashes. In addition, vehicles maneuvering in and out of highly utilized on-street parking spaces can cause sudden stops leading to rear-end crashes as well as sideswipe collisions. Most crashes within the northern retail area and downtown area resulted in property damage only due to the relatively low speeds that come with a congested downtown area. The majority of the injury related crashes involved vulnerable road users (pedestrians or bicyclists), which are further discussed in the following section. The segment of Sandwich Street (Route 3A) in the vicinity of Nook Road presents different crash trends due to this segment's less constrained nature and lack of on-street parking. Approximately 50% of crashes were rear-end crashes in the vicinity of Nook Road where an uncontrolled crosswalk is located along Sandwich Street (Route 3A). It is possible that pedestrian crossings are causing sudden stops, resulting in rear-end crashes in either direction of the crosswalk. In addition, there were several single vehicle crashes located within the segment. It is important to note that this segment is located along a slight horizontal curve, and the speed limit drops from 40 mph to 30 mph at the intersection with Obery Street. Therefore, vehicles may be carrying some speed as they enter the southern gateway to the downtown area, resulting in transition zone crashes.

Standish Avenue

Standish Avenue immediately stood out as a problematic corridor due to a number of intersections and segments exhibiting crash rates higher than the statewide and districtwide averages. An in-depth safety review was conducted for the Standish Avenue corridor and is included in the Appendix of this report. The following summarizes the key findings of that analysis:

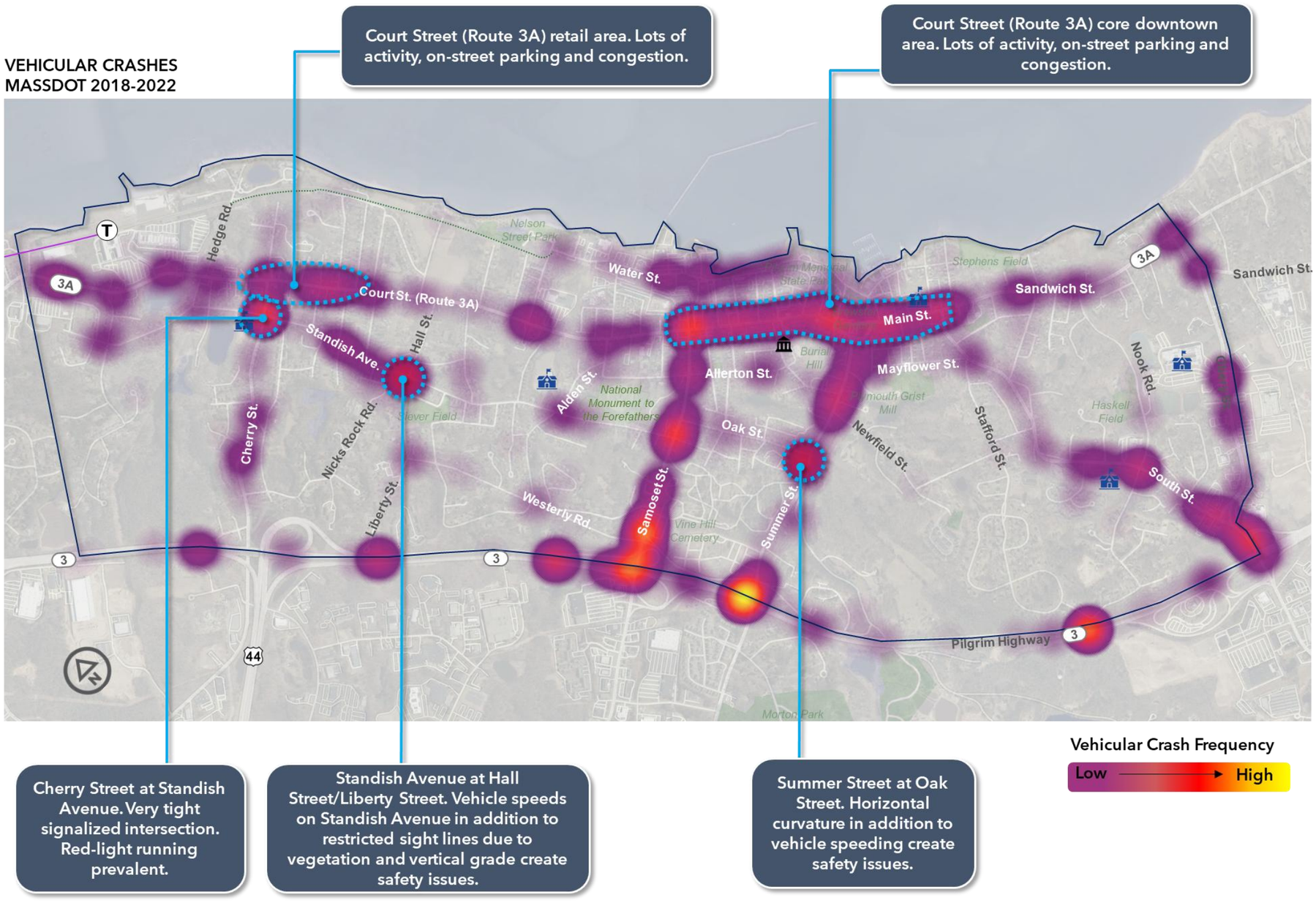
- Non-fatal injuries accounted for 40% of all crashes, which is far above the statewide average of 24%. There were no reported fatalities within the study period. The high percentage of injury related crashes may indicate that the corridor experiences higher speeds, which typically result in more severe crashes.
- During the five-year period, there were four crashes involving vulnerable road users (i.e., bicyclists and pedestrians). Two of these crashes involved youths (ages 6-15).
- There are a significant number of crashes, 14%, involving parked cars. When broken down by segment crashes, this represents 44% of segment related crashes, which is far higher than the statewide segment average of 15.89% over the same five-year study period. These crashes are clustered between Savery Avenue and Centennial Street and south of Alden Street.
- Based on the Town's crash reports for the intersection of Standish at Liberty/Hall Streets, residences along Standish Avenue have been hit and damaged by vehicles. This also points to excessive speeding and the need for changes to the street design that moderates speed.

The in-depth analysis confirmed the prevalence of cut-thru traffic and the impacts of speeding along Standish Avenue, corroborating many residents' reports and observations. This wide roadway has become a hotspot for speeding incidents, resulting in numerous instances of vehicles striking parked cars and prompting residents to resort to parking on the sidewalk as a safety precaution. Additionally, our analysis revealed a concerning pattern of collisions involving vulnerable road users in close proximity to schools and parks, emphasizing the critical need to implement measures to slow down vehicles and create a safer, more pedestrian friendly environment along Standish Avenue.

Summer Street

There were 27 segment-related crashes along Summer Street during the study period. A majority of the segment crashes occurred between Newfield Street and Pleasant Street, approximately 25% of which involved collisions with a parked vehicle. This segment of Summer Street has high parking utilization and high pedestrian crossing activity which can explain the sideswipe collisions and rear-end collisions that were reported. Of the total 27 crashes, 5 were single vehicle crashes, 4 of which were attributed to speeding and the majority of which were located along the horizontal and vertical curve near Oak Street.

Figure 6. Vehicular Crash Density Map



Pedestrian Crashes

Within the 2018-2022 study period, there were 39 reported crashes which involved pedestrians within the study area. Compared with vehicle crashes, of which 31% resulted in injury, 79% of the pedestrian related crashes resulted in injury. This statistic illustrates that crashes involving vulnerable users such as pedestrians and bicyclists result in disproportionately higher injury risks than motor vehicle crashes and the importance of slowing down vehicles.

Figure 7 represents a heat map depicting pedestrian crashes occurring within the study area. Bright yellow areas indicate locations with higher numbers of crashes. Most notably, the map suggests that there are a significant number of pedestrian crashes at the following locations:

Downtown Area (Route 3A from Samoset Street (Route 44) to South Green Street and Market Street)

This segment of Route 3A comprises the walkable downtown core as well as a MassDOT identified Highway Safety Improvement Program (HSIP)-eligible pedestrian high-crash cluster (Main Street/ Main Street Extension/Court Street (Route 3A) between Memorial Drive and Summer Street). This segment also includes several intersections with elevated risks of pedestrian-vehicle conflicts due to geometry and existing crossings, most notably Route 3A at Sandwich Street / Water Street, Sandwich Street at Pleasant Street, Market Street at Town Square, and Sandwich Street at Market Street. The combination of high pedestrian activity, known safety issues, and a potential funding source positions this area as an ideal candidate for substantial safety enhancements and the promotion of improved pedestrian mobility along the corridor. As such, the project team conducted an in-depth analysis into the safety and mobility within this area which is included within the Appendix of this report.

In examining the area, the following deficiencies were observed in regard to pedestrian safety and mobility:

- Curb ramps along the corridor may not meet current accessibility standards, posing challenges for individuals with disabilities.
- Some side street intersections, as well as locations along Route 3A, are excessively wide resulting in longer pedestrian crossing distances.
- The corner radii of several intersecting streets favor higher speed vehicle turns which create safety concerns for vulnerable users.
- There are several crosswalks within the study area that are inadequately located (they are offset from intersections resulting in poor visibility or located within multiple conflict points) resulting in inconvenient paths for pedestrians or potentially leading to unsafe crossing behavior.
- On-street parking may obstruct the visibility of pedestrians and drivers, increasing the risk of crashes.
- Some midblock crossings lack clear and consistent signage.
- There is a need for safe and efficient crossings to facilitate pedestrian movements from the downtown area to the waterfront area.

Summer Street at Oak Street

Oak Street intersects Summer Street from the north to form a three-way unsignalized intersection. Oak Street is STOP-controlled while Summer Street is free flowing. The intersection is fairly tight and constrained due to adjacent houses and is located along both a horizontal and vertical curve. Crosswalks are provided along the southbound approach of Oak Street and the eastbound approach of Summer Street. Visibility of the Summer Street crosswalk is poor, especially for motorists approaching from the east due to the curvature of the roadway. Signage is present but is static and faded. In addition, the straightaway and natural downgrade of Summer Street as one approaches the intersection from the west encourages speeding, which has been observed and reported in this area. Speeding, combined with the tight feeling of the intersection, may make pedestrians feel intimidated and deter people from walking in the area.

Water Street – Brewster Street to South Park Avenue

Water Street provides access to the waterfront, historic landmarks, and retail. The section of Water Street from Brewster Street to the South Park Avenue roundabout is extremely wide, featuring parallel on-street parking on the retail side and head-in parking on the water side. Bike lanes are provided in each direction, and sidewalks are narrow considering the amount of foot traffic in the area. Due to the extremely wide curb to curb width, pedestrians face significant challenges, including long crossing distances, blocked sight lines due to parked vehicles, and the risk of speeding. In addition, bike and pedestrian conflicts are present due to the poorly marked bike lanes, especially on the water side.

Bicyclist Crashes

Crashes within the study area were filtered to highlight crashes involving bicyclists. Within the 2018-2022 study period, there were 21 reported crashes involving bicyclists, 67% of which resulted in injury. The heat map in Figure 8 depicts bicycle crashes occurring within the study area. Bright yellow areas indicate locations with higher numbers of crashes.

Most notably, the map suggests that there are a significant number of collisions at the following locations:

Route 3A

Several bicyclist-related crashes were experienced along Route 3A particularly in the downtown area as well as from Hedge Road to Robbins Road, both of which provide access to the Seaside Rail Trail. There are no bicycle accommodations along Route 3A to provide safe connections to this off-street facility.

Summer Street

Summer Street experienced a few bicyclist-related crashes which is frequently used to access the Town Brook Trail as well as Holmes Park. There are no dedicated bicycle facilities provided along Summer Street. Bicyclists were observed utilizing the sidewalks, which presents a significant safety hazard for both bikes and pedestrians.

Water Street

There are bike lanes provided along Water Street from Brewster Street to Nelson Street which provides access to the Seaside Rail Trail. The section of Water Street from Brewster Street to the North Park Avenue roundabout poses some significant safety issues for bicyclists regardless of the dedicated facility present. Head-in parking on one side results in vehicles backing out into the bike lane, while parallel parking on the other side of the street can lead to dooring incidents when car doors open into the bike lane. In addition, the wide nature of the roadway may lead to speeding and the higher pedestrian activity, especially during the peak summer months, presents bike/pedestrian conflicts at crosswalks.

As stated, there are very limited bicycle accommodations within the study area. Providing bicycle facilities may help reduce the number and severity of bicycle related collisions.

Figure 7. Pedestrian Crash Density Map

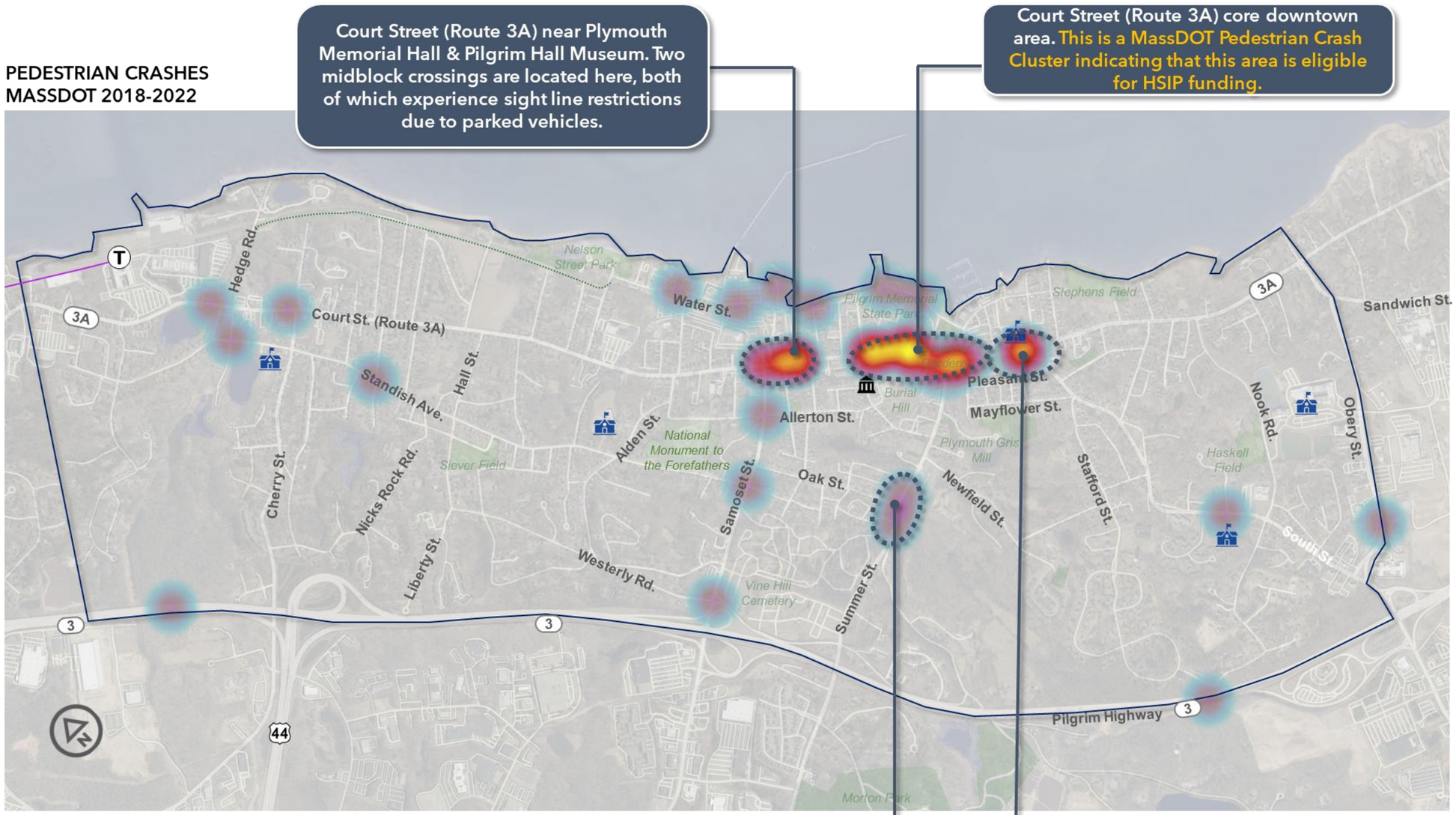
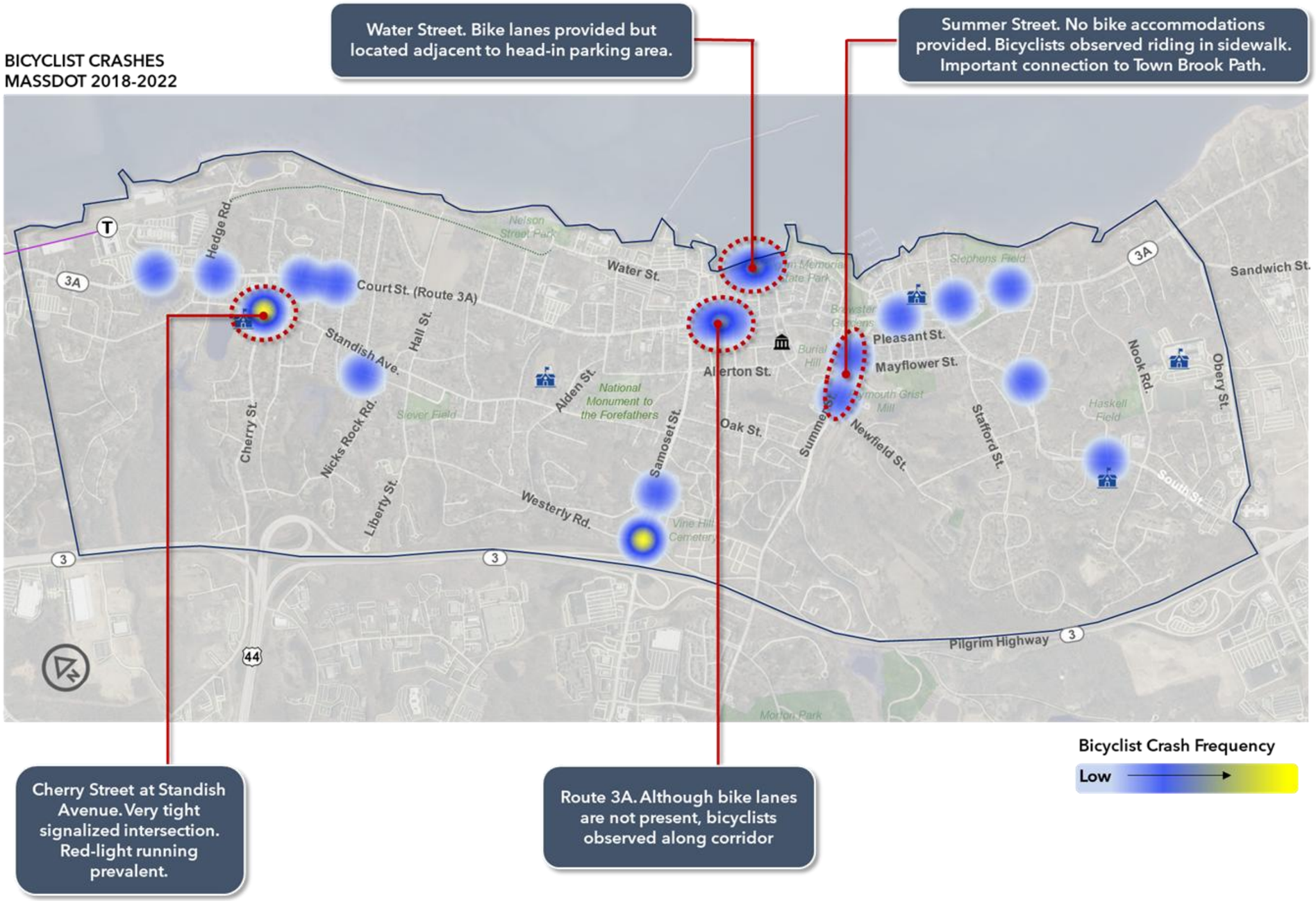


Figure 8. Bicyclist Crash Density Map



03 PUBLIC FEEDBACK

OUTREACH PROCESS AND SUMMARY OF INPUT

The project team conducted community engagement activities between August 2023 and April 2024 to gain public input on the project's vision, initial improvement projects, and prioritization results. Activities included online surveys, listening sessions with public officials, and two public open house events. A dedicated website was also created to keep the public engaged throughout the planning process.

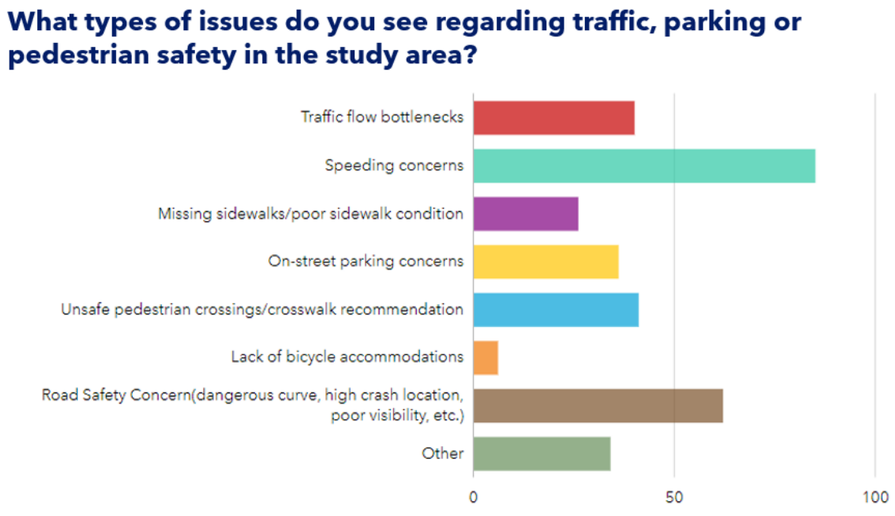
Phase 1: Existing Conditions, Issues & Opportunities

The project kicked off with an in-person open house listening session on August 3, 2023, during which the project team provided an update on the work to date which had focused on collecting public input, existing conditions information and field observations. Public feedback received could be generalized as identifying certain streets and intersections experiencing challenges related to speeding, pedestrian safety, traffic flow, and parking.

During this phase, representatives from GPI's design team engaged town and emergency response officials to discuss concerns within the project area and assess their receptiveness to potential traffic solutions, such as converting two-way streets to one-way and implementing traffic calming measures.

A study website was launched at the onset of the project which included a study overview, findings from the initial project research, and information regarding future public outreach events. Additionally, to better understand the community's needs and desires for improvements, an online survey was developed to gather the community's thoughts regarding mobility/safety challenges and opportunities within the study area. The survey was distributed to key stakeholders, business groups, and the larger Plymouth community and asked a number of questions to understand how people move around Plymouth and what mobility issues they experience. Over 225 participants completed the survey.

Figure 9. Public Outreach Summary



The project team heard a lot about the challenges of driving in and around the study area, as well as the needs of people walking and biking. Survey respondents marked over 250 challenging spots on an interactive Wiki map. Figure 10 represents the locations of these spots. The colors reflect the density of the markers from yellow at the high end to blue at the low end.

The public outreach led to three prominent trends: speeding, pedestrian safety and mobility, and traffic flow/circulation issues, all of which are closely interconnected.

Speeding. Residents are greatly concerned about speeding throughout town. Congestion driven by population growth and seasonal tourism, leads to frustration among drivers, prompting them to resort to cutting through neighboring streets at high speeds. Consequently, residents park their vehicles on sidewalks to avoid potential collisions, resulting in compromised pedestrian safety and mobility.

Key Areas: Nelson Street, Standish Avenue, Oak Street, Summer Street, Cherry Street

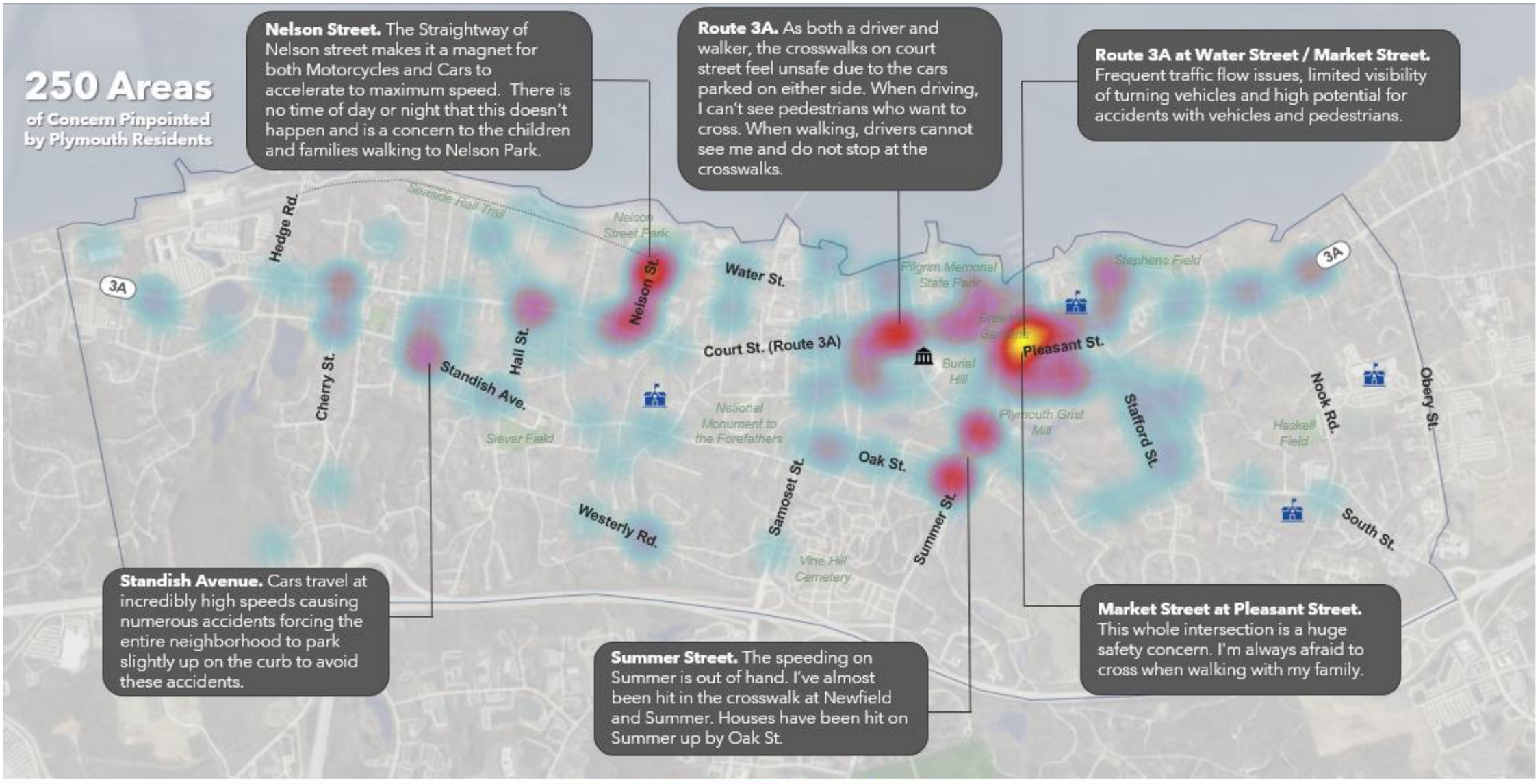
Pedestrian Mobility + Safety. Residents feel unsafe to cross, even at marked crosswalks due to speed and blocked sight lines due to parked vehicles. Not to mention, vehicles parked on sidewalks, as to avoid being hit by a speeding vehicle, compromise pedestrian safety and mobility. In addition, residents pointed out poor sidewalk conditions and connectivity issues due to gaps in the network (lack of sidewalk in some areas).

Key Areas: Route 3A, Leyden Street, Pleasant Street, Ocean View Avenue, Birch Avenue, Nelson Street, Standish Avenue, Summer Street, Sever Street, Union Street, Hedge Road

Traffic Flow/ Circulation Issues. As the Town experiences growth, there is a heightened demand for on-street parking, particularly in denser residential areas. This increased demand often leads to congestion on narrower roadways, impacting residents who must yield to accommodate two-way traffic on their residential streets. In addition, there has been past interest to convert the downtown area into a one-way couplet**,** with the aim of alleviating congestion and increasing the parking supply.

Key Areas: Route 3A, Downtown Streets, Mayflower/ Presidential Streets Neighborhood

Figure 10. Public Feedback Density Map



Phase 2: Recommendations & Evaluation Findings

An in-person public open house was held on the evening of April 25, 2024, at the Plymouth Public Schools Central Office to present and obtain feedback on the recommended action plan (traffic calming and pedestrian safety toolbox, project identification, and project prioritization). Following the presentation, community members were invited to provide feedback and comment on programs, specific projects and their subsequent prioritization.

A second online survey was deployed following the meeting to gauge the community's satisfaction with the proposed action plan. Key findings from the meeting and online survey include:

Speed Management

Approximately 75% of respondents are Very Satisfied (50%) or Somewhat Satisfied (25%) with recommendations regarding speed management, including the establishment of a traffic calming policy & program, as well as the identification of priority corridors to advance to project development. Overall, residents expressed a desire for more speed limit signs, speed feedback signs, and traffic calming. In addition, residents voiced their concern regarding school zones throughout the study area. As such, the recommendations have been altered to include further study of all school zones to ensure these areas are up to date with current regulations and advances in technology.

Pedestrian Safety + Mobility

Approximately 75% of respondents are Very Satisfied (37.5%) or Somewhat Satisfied (37.5%) with the improvements regarding pedestrian safety and mobility. Residents expressed their desire for public education regarding overgrown vegetation townwide which encroaches on sidewalks and restricts sight lines at many intersections throughout the study area. In addition, residents voiced concern regarding parking on sidewalks. This raises a conflicting debate as this requires enforcement on resident parking in an area where demand is high.

Traffic Flow

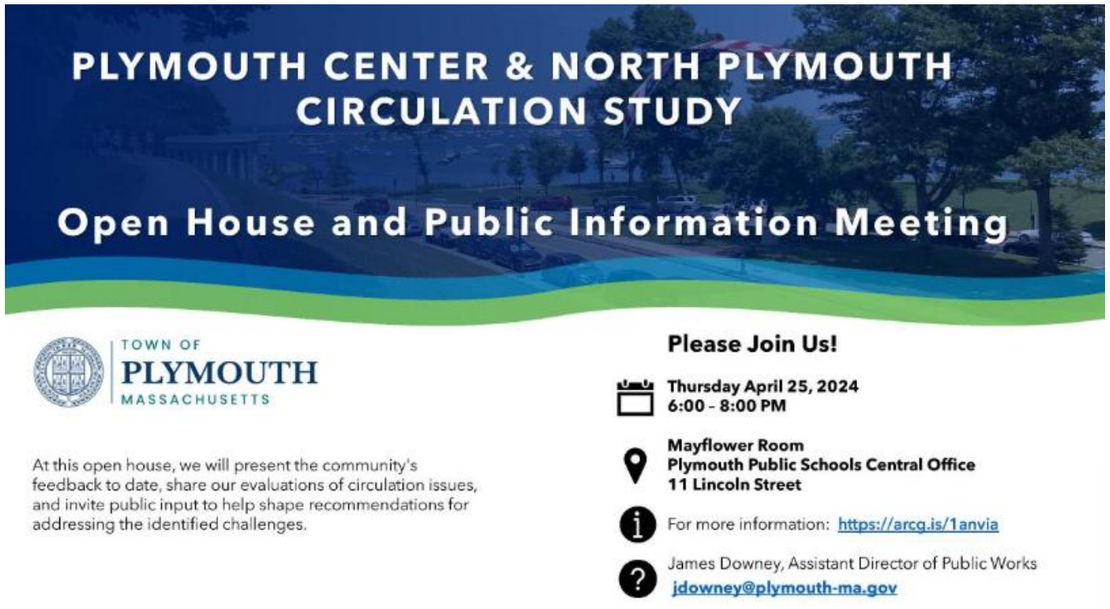
Approximately 75% of respondents were Very Satisfied (37.5%) or Somewhat Satisfied (37.5%) with the recommendations regarding traffic flow, which initially did not include further study of two-way to one-way conversions. At the open house meeting, there seemed to be conflicting opinions regarding this topic. Therefore, the study was altered to include further analysis to determine the feasibility of two-way to one-way conversions on public identified roadways. Given the conflicting opinions, it is also recommended that the Town establish a workflow to progress these potential conversions which may include majority abutter approval to even be considered.

Prioritization Metrics & Rankings

Approximately 87.5% of respondents are Very Satisfied (50%) or Somewhat Satisfied (37.5%) with prioritization metrics and rankings. Overall, residents would like to see the downtown and waterfront areas prioritized.

Overall, there was a generally positive response to the recommended action plan. Several additions and modifications were made to the project list as well as adjustments to the prioritization rankings based on community feedback. In particular, the action plan has been revised to include traffic flow (two-way to one-way conversion) policy and program and recommends several streets for future study in which such a conversion has been deemed feasible.

Figure 11. Outreach Outreach Event Flyer



04 NEEDS & CHALLENGES

IMPROVING SAFETY FOR ALL

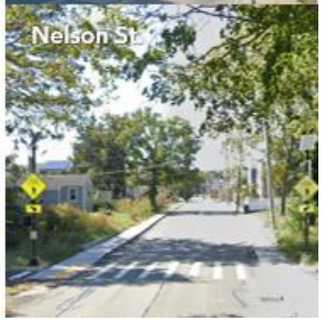
Within the study area, speeding presents a multifaceted challenge with significant implications for safety, livability, and community well-being. Across various roadways, the prevalence of speeding is notable, particularly on stretches of roadway characterized by long, straight alignments and wide travel lanes. Speeding, likely caused by vehicles bypassing downtown congestion, has compelled residents to park on sidewalks to avoid potential collisions, thereby jeopardizing pedestrian safety and mobility, especially for vulnerable populations. Heightened community concerns reflect the growing recognition of the dangers associated with speeding vehicles, especially in residential areas and near pedestrian-heavy generators like schools and parks.

Speed can have a detrimental effect on pedestrian safety. As speed increases, people driving lose the ability to properly observe their immediate surroundings as their field of vision narrows, and drivers require longer distances to come to a stop. The faster a vehicle strikes a pedestrian, the more likely the pedestrian will sustain a severe injury, or the collision will result in fatality. Statistics highlighted in "Impact Speed and a Pedestrian's Risk of Severe Injury or Death", published by Brian Tefft with the AAA Foundation for Traffic Safety, indicates that if a vehicle were to strike a pedestrian at 40 mph, there is a 77% likelihood that the pedestrian will suffer from a severe injury or death. Conversely, if a vehicle were to strike a pedestrian traveling at 25 mph, there would be an 18% likelihood that the pedestrian would suffer from a severe injury or death. These statistics depict the importance of slowing motor vehicles down, specifically in neighborhood environments where multi-modal transportation is more likely to occur.

The following streets were identified by the community and/or observed as having speeding concerns. These roadways represent prime candidates for further investigation and potential implementation of speed management measures aimed at reducing speeds and enhancing safety for all users:

- Allerton Street
- Birch Avenue
- Bradford Street
- Cherry Street
- Hall Street
- Hamilton Street
- Leyden Street
- Mayflower Street
- Muster Field Road
- Nelson Street
- Oak Street
- Ocean View Avenue
- Pleasant Street
- Russell Street
- Spooner Street
- Stafford Street
- Standish Avenue
- Summer Street
- Water Street
- Westerly Road

Figure 12. Roadways with Observed/Reported Speeding



IMPROVING WALKABILITY & CLOSING THE GAPS

Pedestrian safety and mobility go hand in hand with speeding. Speeding prompts residents to park on sidewalks to avoid being hit, resulting in accessibility and safety concerns for pedestrians. In addition, speeding in combination with visibility issues compounds the challenge of crossing roadways within Plymouth, as highlighted by feedback from numerous residents during the public outreach phase. Challenges faced by pedestrians in Plymouth can be summarized by the following:

Crossing in Plymouth

Many crossings within the study area, especially midblock crossings, lack sufficient visibility. This is often exacerbated by the obstruction caused by vehicles parked too close to the crosswalk, blocking critical sightlines. This is especially prevalent along Route 3A within the downtown area. Additionally, poorly located crosswalks (observed throughout the study area) lead to compromised sight lines, necessitating double-stage crossings or failing to cater adequately to the surrounding land uses.

Some Sidewalks are in Rough Shape

In some cases, where sidewalks exist, they do not comply with ADA requirements and/or have uneven and cracked surfaces, posing challenges for pedestrians, particularly those with mobility impairments. Overgrown vegetation was observed overtaking the sidewalks in many areas, causing obstruction. The pervasive issue of parking on sidewalks throughout the study area presents a significant safety hazard, compromising pedestrian connectivity and accessibility.

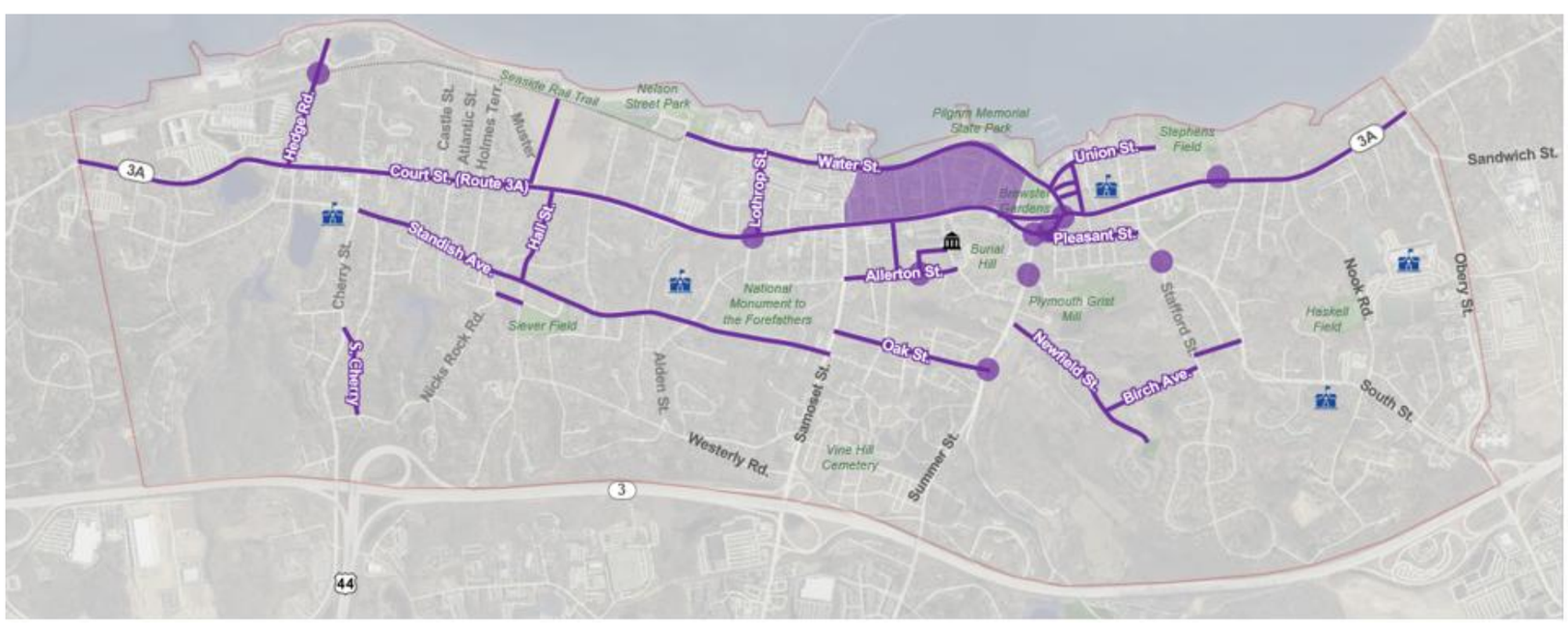
Network Gaps

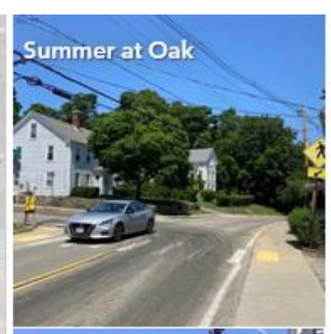
In examining the pedestrian network within the greater study area, it was found that most streets provide sidewalks on at least one side of road- resulting in an overall, well-connected network. That being said, there are some notable gaps in the sidewalk network, such as along Hedge Road and Robbins Road, both of which provide a direct connection from Route 3A to the Seaside Rail Trail (also known as the North Plymouth Rail Trail). This lack of connectivity limits safe access to this alternate, off-road route to downtown. In addition, the lack of sidewalks along neighborhood roads, such as Ocean View Avenue, Birch Avenue and South Cherry Street, for example, creates barriers between residential neighborhoods and key amenities like nearby schools and parks.

The following areas were identified by the community and/or observed as experiencing pedestrian safety and mobility concerns. These areas represent prime candidates for further investigation and potential implementation of sustainable pedestrian safety and mobility enhancements:

- Allerton Street
- Birch Street
- Bradford Street
- Clyfton Street
- Hall Street
- Hedge Road
- Howland Street
- Leyden Street
- Lothrop Street
- Market Street
- Memorial Drive
- Middle Street
- Newfield Street
- North Street
- Oak Street
- Ocean View Avenue
- Pleasant Street
- Robbins Road
- Route 3A
- Sever Street
- South Cherry Street
- Standish Avenue
- Town Square
- Towns Street
- Union Street
- Water Street

Figure 13. Roadways/Areas with Observed/Reported Pedestrian Safety Concerns





BALANCING CROSS SECTIONAL NEEDS

An increasingly difficult key challenge within the Town of Plymouth is balancing the cross-sectional needs of the roadway network to accommodate residents, workers, and visitors. Conflicting public feedback indicates there is a desire for one-way flow on some narrow roadways to alleviate bottlenecks caused by high on-street parking utilization and cut-thru traffic. While two-way traffic and on-street parking create friction that helps slow down vehicles in a town struggling with speeding issues, residents also seek the convenience of seamless travel and ample parking without the risk of collisions.

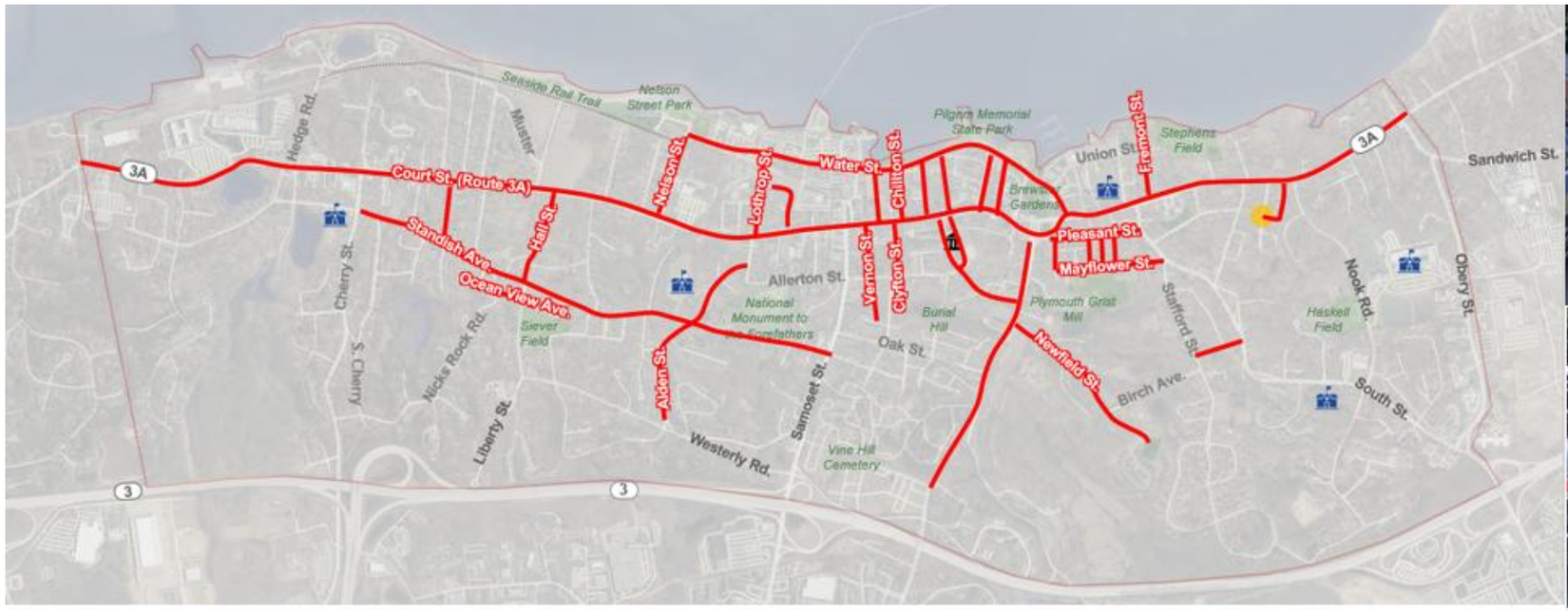
This balance requires exploring ways to maximize parking and curb congestion along Route 3A which is the source of much of the cut-through traffic in surrounding neighborhoods, particularly during the peak season.

Balancing these needs network wide requires careful consideration, often meaning not all desires are met. For example, converting a two-way street to one-way may encourage speeding due to the wider travel width available and thus jeopardizing pedestrian safety and creating a different kind of problem. Another example is keeping two-way flow but reducing parking to one side only, which enhances safety but removes valuable parking supply where demand is high. Alternatively, keeping traffic two-way and removing parking entirely could facilitate vehicle movement and ensure cars aren't parked on sidewalks but at the cost of eliminating needed parking spaces. Thus, balancing safety, parking, and seamless traffic flow often involves compromises and prioritizing certain needs over others to achieve the best overall safe outcome for the community.

The following streets were identified by the community as experiencing traffic flow issues. They represent individual streets that were further investigated for their feasibility of conversion to one-way operations.

- Alden Street
- Brookside Avenue
- Chilton Street
- Clyfton Street
- Franklin Street
- Freemont Street
- Hall Street
- Hamilton Street
- Jefferson Street
- Lothrop Street
- Mayflower Street
- Murray Street
- Nelson Street
- Newfield Street
- Ocean View Avenue
- Robinson Street
- Route 3A
- Summer Street
- Towns Street
- Vernon Street
- Washington Street
- Water Street

Figure 14. Roadways with Observed/Reported Traffic Flow Issues



05 OPTIONS TO ACHIEVE THE VISION

SLOW DOWN VEHICLES!

Speeding is a complex and situation-specific issue. As such, a comprehensive approach to managing speed is often recommended for communities. Traditionally, speed limits have been set utilizing the 85th percentile speed which aligns with the natural speed of most drivers. However, this approach has limitations when it comes to protecting vulnerable road users, such as pedestrians and bicyclists. Lowering speed limits below what is considered 'credible' by drivers can lead to driver non-compliance and may not address specific safety needs. Newer speed management strategies require a more integrated approach, considering road characteristics, adjacent land uses, and safety goals to set contextual speed limits. Implementing traffic calming measures and road design changes, along with educational campaigns and technology solutions such as driver feedback signs, can help strike a balance between road user safety and compliance.

Speed management is a vital component of this plan, as it aims to address speeding and related concerns, thus lowering the likelihood of severe injuries and fatalities by reducing the frequency and severity of crashes. It is essential for creating streets that support safe, comfortable, and convenient travel for everyone, whether driving, walking, biking, or rolling. This section outlines the benefits of speed management and describes tools available to manage speeds.

Benefits of Speed Management

Effective speed management and traffic calming measures often offer numerous benefits that can contribute to the overall safety, livability, and economic vitality to the Town of Plymouth.

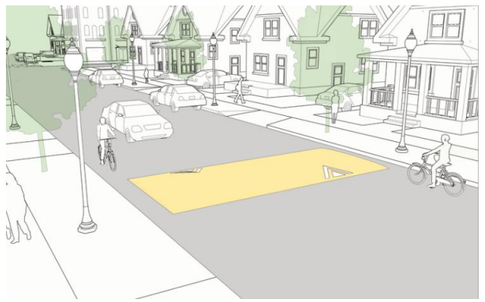
- **Enhanced Safety** – Speed management and traffic calming are critical for reducing the frequency and severity of crashes. By reducing vehicle speeds, these measures help decrease the likelihood of crashes and significantly reduce the risk of severe injuries and fatalities for all road users, including drivers, pedestrians, and cyclists.
- **Improved Pedestrian and Cyclist Comfort** – Speed management countermeasures often create safer and more inviting environments for pedestrians and cyclists. Features such as widened sidewalks, dedicated bike lanes, raised crosswalks, and curb extensions, make walking and biking more comfortable and secure. These improvements encourage more people to choose active transportation modes, promoting healthier lifestyles and reducing reliance on motor vehicles.
- **Enhanced Neighborhood Livability** – Implementing speed management and traffic calming strategies can transform neighborhoods by creating quieter, safer and more pleasant streets. Reduced traffic noise and slower vehicle speeds enhance the quality of life for residents, making outdoor activities, and interactions more enjoyable. These changes can foster a stronger sense of community and increase residents' overall satisfaction with their living environment.
- **Economic Benefits** – Calmer traffic and safer streets can boost the economic vitality of downtown areas and business districts. Attractive, pedestrian-friendly environments encourage more foot traffic, which benefits local businesses by increasing customer visits and sales. Additionally, improved safety and accessibility can make downtown areas more appealing to tourists and potential investors, further stimulating economic growth,
- **Environmental Benefits**- Lastly, traffic calming measures can contribute to environmental sustainability by promoting the use of active transportation modes. When streets are safer and more comfortable for walking and biking, people may choose these modes over driving. This shift can lead to reduced traffic congestion, lower vehicle emissions, and improved air quality, helping to create a healthier and more sustainable urban environment.

Tools for Speed Management

Speed management involves a variety of tools that can be categorized into enforcement, education, and engineering measures. While education and enforcement are valuable tools for managing speeds, these resources are not always readily available, nor are they practical long-term. Therefore, it is crucial to design self-enforcing roads through physical changes and engineering-related roadway treatments.

Vertical Deflection Countermeasures

Vertical deflection countermeasures are raised areas in the road that are designed to both slow down vehicle speed and enhance safety for pedestrians by physically and/or visually marking crosswalks. These measures can also offer additional safety benefits, such as improved access for people with disabilities, without impacting on-street parking or adjacent properties.



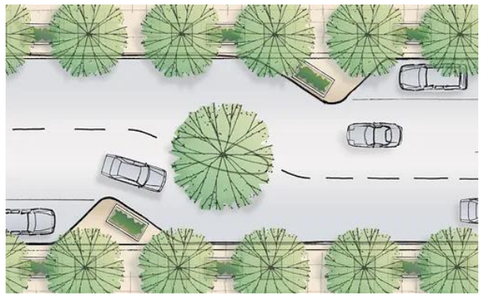
Speed Bump/Hump/Cushions
By deflecting both the wheels and frame of a traveling vehicle, these features encourage drivers to travel at a slow speed in both directions, as well as over the speed bump itself. These features typically cost around $2,000, depending on drainage conditions and materials. Typically, these features yield a 14-34% reduction in speed.

Raised Crosswalks
These features provide a designated safe route for pedestrians across vehicular roadways where the pedestrian walking surface is raised to the same level—or close to the same level—as the sidewalks that access the pedestrian crossing. Costs range from $5,000 - $7,000 and yield speed reduction in the range of 12-29%

Raised Intersections
These raised areas act as speed tables, covering an entire intersection with ramps on all vehicular approaches to slow vehicle traffic through the intersection and improve safety for pedestrians. Costs range from $25,000 - $70,000 depending on drainage, materials, and size of the intersection. Speed reduction varies considerably depending on the types of roadways.

Horizontal Deflection Countermeasures

Horizontal deflection measures, such as median islands, chicanes, and curb extensions, alter the roadway's horizontal cross-section to slow traffic and enable safe roadway access. These measures can reduce cut-through traffic and shorten pedestrian crossing distances without significantly impacting emergency vehicle access, unlike some vertical countermeasures such as speed humps.

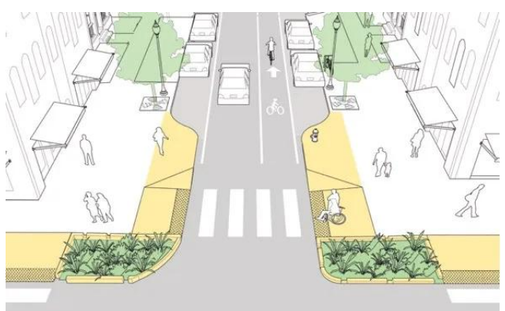


Chicanes & Lateral Shifts

These features include a series of curb extensions that alternate from one side of the street to the other, forming S-shaped curves that essentially narrow the roadway width and create an effect that slows down traffic. Costs range from $10,000 - $16,000 depending on landscaping and pavement type and typically yield speed reductions in the range of 10-29%.

Median Islands

These roadway elements provide physical separation between opposing vehicle lanes, and narrow roadway widths to reduce vehicle speed. Median islands are typically landscaped to improve their aesthetic. They can provide a "gateway" appearance when placed at the entrance to a neighborhood and are often combined with textured pavements. They can also be used to provide a pedestrian refuge area in the center of the roadway by providing a gap in the island. They typically cost approximately $8,000 to $15,000 to construct, depending on materials, length, and amount of landscaping. Their implementation often results in a decrease in travel speeds by approximately 7%.



Curb extensions / Bulb-outs

Curb extensions, also known as bulb-outs or neckdowns, extend the sidewalk or curb line which reduces the effective street width. By narrowing the width of the roadway at crosswalk locations, curb extensions significantly improve pedestrian safety by reducing the pedestrian crossing distance and thus the time that pedestrians are in the street. In addition, curb extensions improve the ability of pedestrians and motorists to see each other, which is especially important in areas with on-street parking. Curb extensions, whether paved or landscaped, contribute to traffic calming by slowing vehicles. The improved safety, coupled with the potential for landscaping, creates a more attractive and pedestrian friendly environment. Costs range from $2,000 - $20,000 per corner, depending on design /site considerations and typically yield speed reductions in the range of 3-12%.

Road Diets and Visual Cues

Roadway configuration, along with visual cues for drivers, plays in maintaining safe speeds and promoting traffic safety.

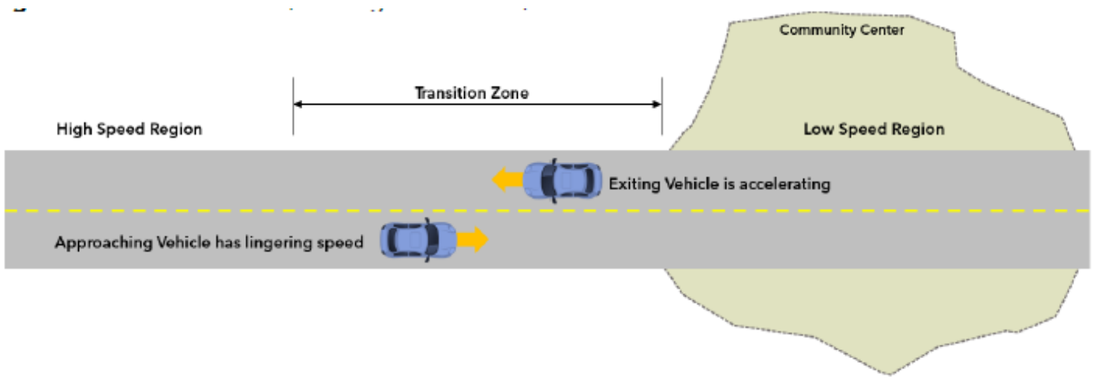
- **Road Diets** – Narrowing or eliminating travel lanes on roadways by installing road diets can help to calm traffic. Road diet restriping costs vary greatly depending on geometrics features on the roadway but can reduce speed by 4-9%.
- **Optical Measures** – Visual cues can help focus a driver's attention on their speed and draw their attention to the need to reduce speed for safety. This can include speed limit pavement markings and optical bar pavement markings. These features are generally low-cost and easy to install. They can reduce speeds anywhere from 0-27% depending on the application used.

Speed Transition Zones, Advisory, and Feedback Signage

A speed transition zone comprises a series of measures placed over a distance to help drivers recognize changes in the roadway environment – such as transition from a high speed to low speed area. This gives drivers sufficient time to reduce speed before entering the new zone. The goal of transition zone features such as advisory and feedback speed signage, along with other countermeasures like curb extensions, raised crosswalk/intersection, raised medians, landscaping, and gateway treatments, is to incrementally reduce vehicle speeds.

- **Signage** – Common transition signs include reduced speeds ahead, regulatory or advisory speed limit signs, and speed feedback signs in strategic locations that alert drivers to their speed. In regard to speed feedback signage, it is recommended that these signs be used in conjunction with a regulatory or statutory speed limit sign to give context and show drivers their speed in relation to the legal speed limit. Dynamic speed feedback signs can vary from $2,000 to $12,000 per display (depending on design, power, and duration). These features often yield speed reductions in the range of 2-17%.

Figure 15. Example Transition Zone



Street Friction

On-street friction, created by two-way traffic flow and on-street parking, can also be an effective method for calming traffic. The presence of parked vehicles narrows the roadway, causing drivers to slow down and navigate more carefully as to avoid collisions This reduced lane width naturally encourages lower speeds and heightens driver attention. Similarly, two-way traffic flow, especially on more narrow residential roadways, introduces additional complexity, requiring drivers to be more cautious and reducing the likelihood of speeding.

Speed Limits

As data shows, speed can have a detrimental effect on pedestrian safety and therefore, it is imperative to slow down vehicles in areas with high pedestrian activity. The following are tools to lower speed limits that work well when combined with roadway design changes, communication, and enforcement.

- **Townwide 25 MPH** – In 2016, new legislation enabled municipalities to opt into Section 17C of Chapter 90 of the Massachusetts General Laws (MGL), allowing them to reduce the statutory speed limit from 30 mph to 25 mph on city- or town-owned roadways within densely populated or business districts. It is recommended that the Town of Plymouth work towards opting into the program.
- **Safety Zones**- Legislation also states that municipalities are allowed to establish regulatory 20 mph safety zones. Per Massachusetts State Law, Safety Zones are regulatory speed limits set at 20 mph intended to be used in areas (such as parks, playgrounds, senior housing, hospitals, and childcare centers) where vulnerable users may be present. Vulnerable road users include pedestrians and bicyclists, especially children, people with disabilities and older adults. It should be noted that Safety Zones shall not be used in lieu of school zones. These are the only regulatory speed limits municipalities can implement on their roads without MassDOT consent. However, signage may have a limited effect and therefore, additional road treatments are recommended to further encourage drivers to reduce their speed in these high-risk areas.
- **School Zones** - It is recommended that the Town enhance school zones to ensure the safety of children walking or biking to and from school. School zones in Massachusetts are applicable to public, private, charter, or vocational technical schools serving grades K-12

Figure 16. Example Townwide 25 MPH MassDOT Speed Sign

Figure 17. Example Enhanced School Zone Speed Sign with Dynamic Speed Feedback Sign

MAKE WALKING SAFE, ACCESSIBLE AND ATTRACTIVE

Improving walkability is essential for creating a vibrant, accessible, and healthy Plymouth. Walkable areas encourage more foot traffic, which boosts local businesses, enhances community engagement, and promotes a healthier lifestyle.

Benefits of a Walkable Community

- **Safety** – Enhancing walkability reduces pedestrian crashes by making streets safer and more accessible. Features such as well-marked crosswalks, traffic calming measures, adequate lighting, and pedestrian friendly infrastructure like sidewalks and pedestrian islands create a safer environment for walkers of all ages and abilities. Reduced vehicle speeds and improved visibility contribute to fewer crashes and decreased severity of injuries when crashes do occur.
- **Connectivity** – Improved walkability fosters better connectivity within neighborhoods and between key destinations such as schools, parks, shopping areas, and public transit. Well-connected pedestrian pathways encourage more people to walk for daily trips, commuting, and recreation, reducing dependency on cars and easing traffic congestion. This connectivity aspect not only promotes physical activity but also enhances social interactions and community cohesion by making it easier for residents to meet, interact, and engage with each other.
- **Equity and Accessibility** – Improving walkability ensures equitable access to essential services and amenities for all residents, including those with disabilities and mobility challenges. Accessible sidewalks, curb ramps, and pedestrian crossings enhance inclusivity and support independent mobility for everyone, regardless of age, income, or physical ability.
- **Health and Well-being** – Walkable communities support active lifestyles, promoting physical health and mental well-being among residents. Accessible sidewalks, pedestrian friendly streetscapes and opportunities for outdoor activities encourage walking and biking as viable means of transportation.
- **Economic Vitality**- Walkable communities often see increased economic activity and local business vitality. Pedestrian-friendly environments attract shoppers, tourists and investors, boosting retail sales and property values.
- **Environmental Sustainability** – Encouraging walking and biking as alternative modes of transportation reduces greenhouse gas emissions and air pollution associated with car travel. By promoting sustainable transportation options, walkable communities contribute to environmental conservation efforts, improving air quality and mitigating the negative impacts of urban sprawl.

Tools to Improve Walkability

Enhancing walkability involves various tools and measures aimed at improving pedestrian infrastructure, safety, and comfort.

Sidewalks/Walkways

Sidewalks or walkways are designated areas for pedestrians and individuals using wheelchairs. These include sidewalks, side paths, and shared-use paths. Ensuring accessibility is an essential aspect of effective sidewalk planning and design.

Lighting

Street lighting, when implemented properly, improves safety for all road users by illuminating otherwise dark locations on both streets and sidewalk areas. Illuminance design standards for street lighting are typically based on street classification and the level of pedestrian activity. For example, high volume roadways with high pedestrian activity require more lighting in terms of quantity and intensity than low volume roads with little to no pedestrian activity. Street lighting can be used to highlight areas of particular concern such as crosswalks, school zones, and intersections with high pedestrian and bicyclist activity.

Crosswalk Enhancements

A critical component of pedestrian safety is implementing crossing treatments that foster sustainable safety and are appropriate for a location given the roadway context and surrounding land use. Poor crosswalk location and visibility heighten the risk of pedestrian-vehicle crashes. Factors such as inadequate lighting, faded or absent markings, a lack of clear warning signage, and sight obstructions such as parked vehicles or vegetation can obscure pedestrians from drivers. Addressing these inadequacies via means of improved lighting, high visibility crosswalk markings, at and in advance pedestrian warning signage, and daylighting is crucial in enhancing crosswalk visibility and overall pedestrian safety. Appropriate countermeasures depend on various factors such as traffic control, volumes, and speeds.

The FHWA STEP (Safe Transportation for Every Pedestrian) guide (Figure 18) is a comprehensive resource developed by the Federal Highway Administration to improve pedestrian safety at uncontrolled crossings. The STEP promotes the following six effective and lower-cost countermeasures that communities can deploy based on their specific needs:

- **Crosswalk Visibility Enhancements** – Crosswalk visibility enhancements include high-visibility crosswalk markings, parking restriction on crosswalk approaches, improved lighting, advanced Yield Here To [Stop Here For] Pedestrians sign and yield [stop] line, In-Street Pedestrian Crossing signs, and curb extensions. These features are relatively low-cost treatments, often achieved via pavement markings and static signage and have been shown to reduce pedestrian crashes by 25 – 30%.
- **Raised Crosswalks** – Raised crosswalks, as previously described, are elevated sections of the roadway at pedestrian crossings, designed to slow vehicle speeds and increase visibility of pedestrians. Costs generally depend on the length and design complexity (drainage). Typically, costs range from $5,000 - $7,000. Raised crosswalks can reduce pedestrian crashes by approximately 45% through speed reduction and improved visibility.
- **Pedestrian Refuge Islands** – Refuge islands are raised or elevated areas in the center of a roadway where pedestrians can safely wait between traffic lanes before completing their crossing. They improve safety by allowing pedestrians to cross one direction of traffic at a time. Costs can vary based on island size, materials, and landscaping, but are generally in the range of $8,000 to $15,000. Refuge islands have been shown to reduce pedestrian crashes by approximately 32%.
- **Pedestrian Hybrid Beacon (PHB) / High-Intensity Activated Crosswalk (HAWK)**– PHBs, also known as HAWK signals, are traffic control devices designed to help pedestrians safely cross busy or high-speed roads at midblock locations or at intersections where full traffic signals are not warranted. They are pedestrian activated. Cost of installing these features can range from $100,000 to $200,000 depending on site conditions and infrastructure requirements. They have been shown to reduce pedestrian crashes by up to 55%.
- **Road Diets** – Road diets involve reducing the number of travel lanes on a roadway to improve safety and accommodate other users such as bike lanes, pedestrian facilities, or on-street parking. This can include converting a four-lane road to a three-lane road (one lane in each direction plus a center turn lane), for example. Associated costs vary widely depending on the scope and specific changes. However, road diets have been shown to reduce pedestrian related crashes by approximately 19% in urban areas and 47% in suburban areas due to their ability to reduce speeds and crossing distances.
- **Rectangular Rapid Flashing Beacons (RRFB)** – RRFBs are traffic control devices designed to increase driver awareness of pedestrians crossing roadways at marked midblock crossings or uncontrolled intersections. RRFBs can be activated manually by pedestrians by pushing a button or passively by a pedestrian detection system. When activated, they emit an irregular flash pattern that is similar to emergency flashers on emergency vehicles. The activated lights significantly increase visibility,

especially in low-light conditions, encouraging drivers to yield to pedestrians. RRFBs should be strategically placed to avoid over proliferation, ensuring that their benefits, such as enhanced pedestrian safety and driver awareness, are effectively realized at key crosswalk locations. Installation costs for RRFBs range from $10,000-$30,000 per crossing and have been shown to reduce pedestrian-related crashes upward of 47%.

When selecting appropriate crosswalk treatments, it is important to consider the specific conditions of the roadways, such as the roadway configuration (number of lanes and degree of separation), posted speed limit and typical traffic volumes. Generally, higher speed and higher volume roads require more advanced and robust treatments (such as PHBs and RRFBs), while lower speed and lower volume roads can be effectively managed with simpler, more cost-effective solutions (such as signage and high-visibility crosswalks). (Figure 19)

Figure 18. FHWA Step Guide

Roadway Configuration	Posted Speed Limit and AADT								
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
2 lanes (1 lane in each direction)	● 2 4 5 6	● 5 6 7 9	○ 5 6 ● 9	● 4 5 6	5 6 7 9	○ 5 6 ● 9	● 4 5 6 7 9	○ 5 6 7 9	○ 5 6 ● 9
3 lanes with raised median (1 lane in each direction)	● 2 3 4 5	● 3 5 7 9	○ 3 5 ● 9	○ 3 4 5 7 9	○ 3 5 ● 9	○ 3 5 ● 9	○ 3 4 5 7 9	○ 3 5 ● 9	○ 3 5 ● 9
3 lanes w/o raised median (1 lane in each direction with a two-way left-turn lane)	● 2 3 4 5 6 7 9	● 3 5 6 7 9	○ 3 5 6 ● 9	○ 3 4 5 6 7 9	○ 3 5 6 ● 9	○ 3 5 6 ● 9	○ 3 4 5 6 7 9	○ 3 5 6 ● 9	○ 3 5 6 ● 9
4+ lanes with raised median (2 or more lanes in each direction)	● 3 5 7 8 9	● 3 5 7 8 9	○ 3 5 ● 8 9	○ 3 5 7 8 9	○ 3 5 ● 8 9	○ 3 5 ● 8 9	○ 3 5 7 8 9	○ 3 5 ● 8 9	○ 3 5 ● 8 9
4+ lanes w/o raised median (2 or more lanes in each direction)	● 3 5 6 7 8 9	○ 3 5 6 7 8 9	○ 3 5 6 ● 8 9	○ 3 5 6 7 8 9	○ 3 5 6 ● 8 9	○ 3 5 6 ● 8 9	○ 3 5 6 7 8 9	○ 3 5 6 ● 8 9	○ 3 5 6 ● 8 9

Given the set of conditions in a cell,

- # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
- ● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- ○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
2 Raised crosswalk
3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
4 In-Street Pedestrian Crossing sign
5 Curb extension
6 Pedestrian refuge island
7 Rectangular Rapid-Flashing Beacon (RRFB)**
8 Road Diet
9 Pedestrian Hybrid Beacon (PHB)**

*Refer to Chapter 4, 'Using Table 1 and Table 2 to Select Countermeasures,' for more information about using multiple countermeasures.

**It should be noted that the PHB and RRFB are not both installed at the same crossing location.

This table was developed using information from: Zegeer, C.V., J.R. Stewart, H.H. Huang, P.A. Lagerwey, J. Feaganes, and B.J. Campbell. (2005). Safety effects of marked versus unmarked crosswalks at uncontrolled locations: Final report and recommended guidelines. FHWA, No. FHWA-HRT-04-100, Washington, D.C.; FHWA. Manual on Uniform Traffic Control Devices, 2009 Edition. (revised 2012). Chapter 4F, Pedestrian Hybrid Beacons. FHWA, Washington, D.C.; FHWA. Crash Modification Factors (CMF) Clearinghouse, http://www.cmfclearinghouse.org/; FHWA. Pedestrian Safety Guide and Countermeasure Selection System (PEDSAFE). http://www.pedbikesafe.org/PEDSAFE/; Zegeer, C., R. Srinivasan, B. Lan, D. Carter, S. Smith, C. Sundstrom, N.J. Thirsk, J. Zegeer, C. Lyon, E. Ferguson, and R. Van Houten. (2017). NCHRP Report 841: Development of Crash Modification Factors for Uncontrolled Pedestrian Crossing Treatments. Transportation Research Board, Washington, D.C.; Thomas, Thirsk, and Zegeer. (2016). NCHRP Synthesis 498: Application of Pedestrian Crossing Treatments for Streets and Highways. Transportation Research Board, Washington, D.C.; and personal interviews with selected pedestrian safety practitioners.

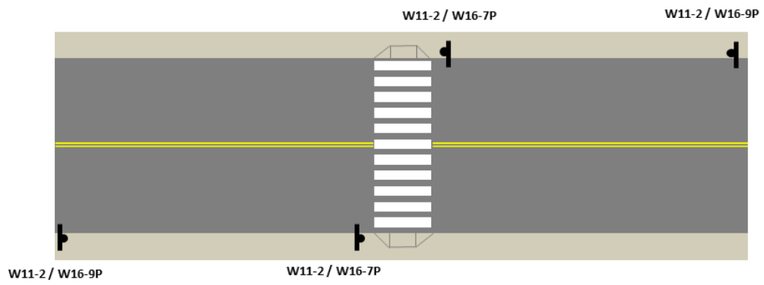
Figure 19. Examples of Crossing Treatments

TRAFFIC VOLUME + SPEED

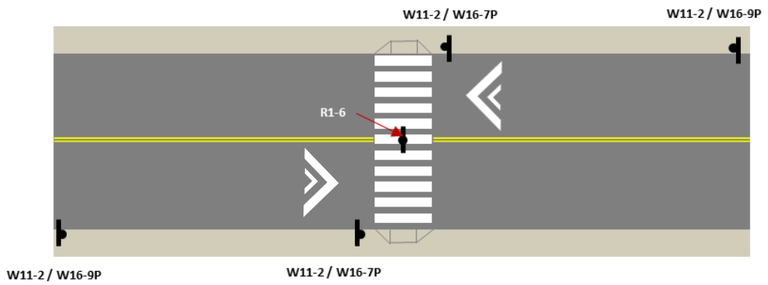
LOW

HIGH

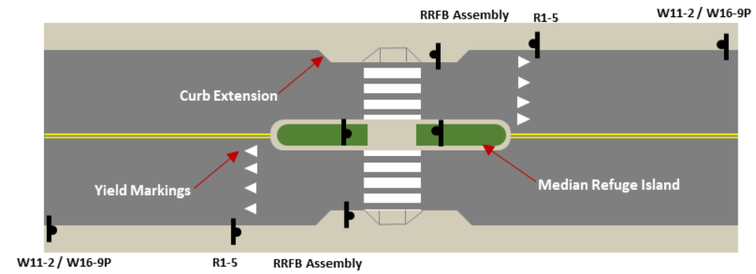
High visibility crosswalk with pedestrian warning signage both at and in advance of crosswalk.



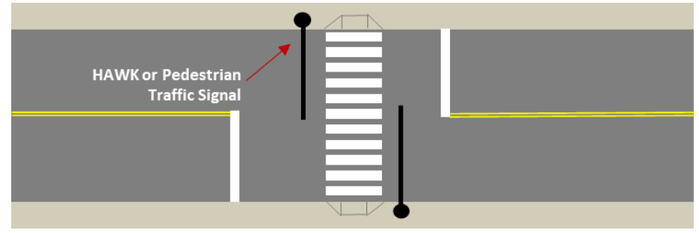
Raised, high visibility crosswalk with pedestrian warning signage both at and in advance of crosswalk.



High visibility crosswalk with pedestrian refuge island, curb extensions, and RRFB.



High visibility crosswalk with HAWK installation.

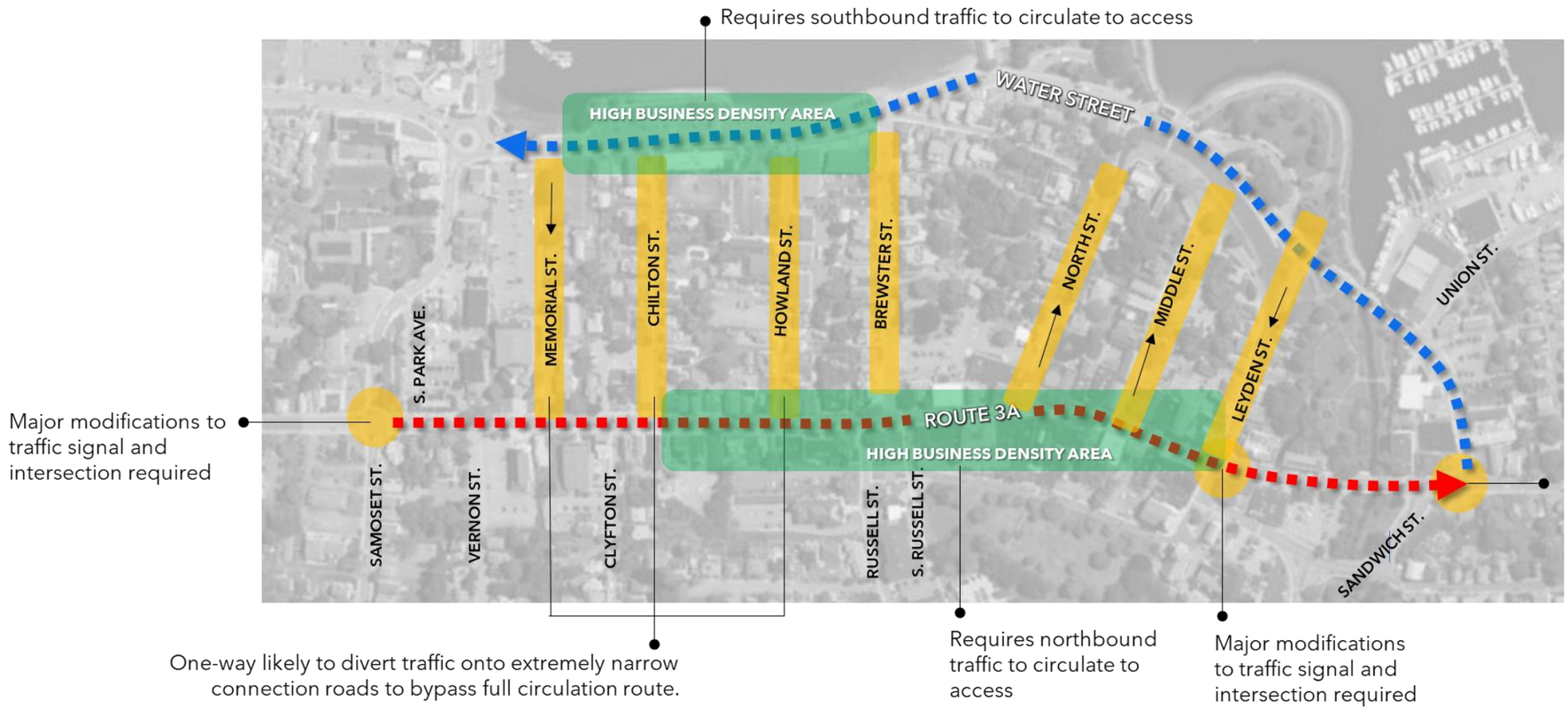


DETERMINE THE FEASIBILITY OF A ROUTE 3A / WATER STREET ONE-WAY PAIR

As part of the North Plymouth / Plymouth Center Circulation and Mobility Study, the project team was tasked with analyzing the feasibility of converting a portion of Main Street/Main Street Extension/Court Streets (Route 3A) and Water Street from two-way traffic flow into a one-way pair between Sandwich Street and Samoset Street/North Park Avenue. Main Street/Main Street Extension/Court Street (Route 3A) would be converted to southbound operation and Water Street would be converted to northbound operation as depicted in Figure 20.

This idea has been circulating for years with the perception that converting to a one-way pair would increase the parking supply and reduce congestion, and thus, this study took a comprehensive look to assess its viability. The following provides a summary of the analysis. A full technical memorandum is included in the Appendix of this report.

Figure 20. Potential One-Way Operations



Existing And Proposed Typical Street Sections

Court Street / Main Street / Main Street Extension (Route 3A)

In the existing condition, Court Street typically consists of two 12-foot travel lanes (one in each direction) and two 8-foot parallel parking bays for a total curb to curb width of 60-feet. For one-way traffic flow, the street could be reconfigured to one 20-foot travel lane and one 20-foot parking lane for angled parking. The 20-foot space outside of the parking lane is needed for emergency vehicle access and back-out space for angled parking. A five-foot bike lane could be accommodated in this configuration (i.e., a 15-foot travel lane/back out space and a 5-foot bike lane would maintain the 20-foot space necessary for emergency vehicle access (EVA)). The existing two-way cross section and potential one-way cross section is depicted in Figures 21 and 22, respectively.

Figure 21. Route 3A Existing Two-Way Cross Section

Figure 22. Route 3A Potential One-Way Cross Section

Water Street

Water Street is more variable in width. South of Brewster Street, Water Street generally consists of two 11-foot travel lanes (22-feet curb to curb). For one-way traffic flow, the existing 22-foot section would be converted from two 11-foot travel lanes to a 22-foot travel lane. This space could be allocated as a 12-foot travel lane and two-5-foot bike lanes, but additional parking could not be accommodated due to the need to maintain 20-feet of 'lane space' for EVA. The existing two-way cross section and potential one-way cross section is depicted in Figures 23 and 24, respectively.

Figure 23. Water Street (South of Brewster Street) Existing Two-Way Cross Section

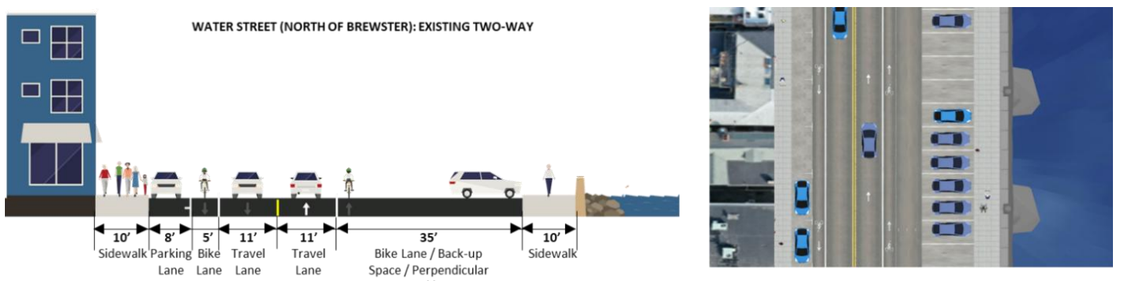
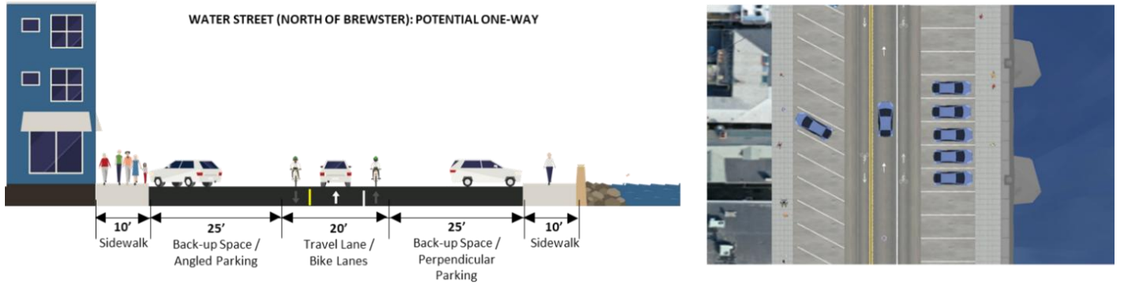


Figure 24. Water Street (South of Brewster Street) Potential One-Way Cross Section



North of Brewster Street, Water Street consists of two 11-foot travel lanes, an 8-foot parallel parking lane, 5-foot bike lane and a 35-foot parking lane (90-degree parking)/ bike lane for a total curb to curb street dimension of 70-feet. In the area north of Brewster Street, the street would be reconfigured to include a 20-foot lane (or a 10-foot travel lane and two 5-foot bike lanes) and two 25-foot parking zones that would accommodate 90-degree and angled parking. The existing two-way cross section and potential one-way cross section is depicted in Figures 25 and 26, respectively.

Figure 25. Water Street (North of Brewster Street) Existing Two-Way Cross Section

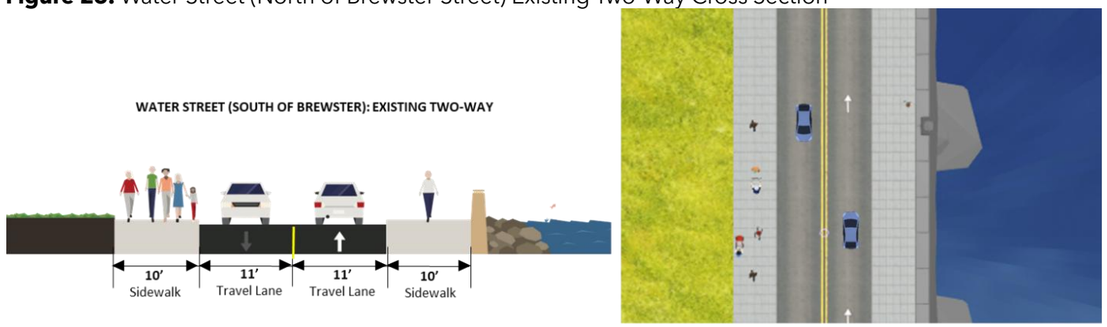
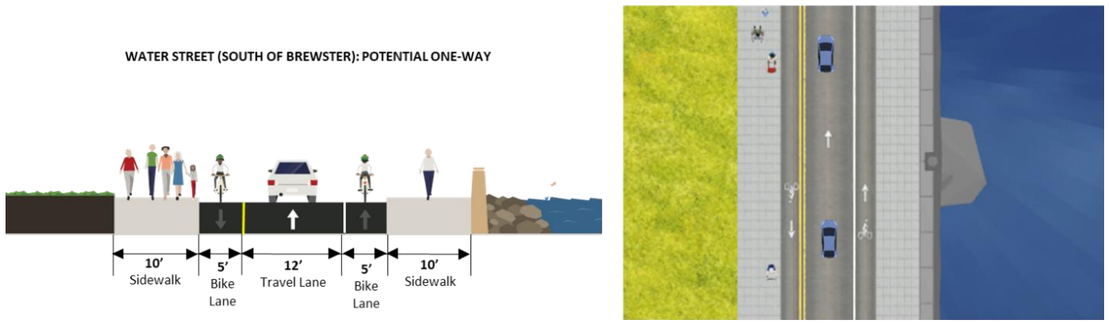


Figure 26. Water Street (North of Brewster Street) Potential One-Way Cross Section



Evaluation Criteria

In assessing the feasibility of converting the existing two-way traffic pattern into a one-way pair. The following factors were evaluated from both an engineering and holistic approach:

- Parking Supply
- Emergency Response
- Pedestrian +Bike Mobility/Safety
- Downtown Economic Vitality
- Access and Network Considerations
- Travel Time
- Cost to Implement

Parking Yield Analysis In Comparison To Existing Utilization

Converting Main/Court Streets and Water Street to a one-way couplet would result in a loss of 18 parking spaces on Court Street and a gain of 23 spaces on Water Street. Collectively, this results in a total gain of 5 parking spaces along the couplet, inclusive of loading zones for improved curbside management, but exclusive of on-street dining considerations. The greatest gain of spaces occurs at the northerly end of Water Street where parallel spaces can be converted to angled spaces. The parking space changes by block are summarized in **Table 1.**

Court Street	Existing	Potential	Change
S. Park to Vernon	3	11	8
Vernon to Memorial	9	7	-2
Memorial to Clyfton	8	4	-4
Clyfton to Chilton	5	2	-3
Chilton to Russell	43	33	-10
Russell to S. Russell	2	3	1
S. Russell to North	10	10	0
North to Middle	15	19	4
Middle to Leyden	19	9	-10
Leyden to Water	32	30	-2
Court Street Total	**146**	**128**	**-18**

Water Street	Existing	Potential	Change
S. Park to Memorial	10	10	0
Memorial to Chilton	9	11	2
Chilton to Howland	11	10	-1
Howland to Brewster	10	12	2
Brewster to Pilgrim Memorial Park	9	29	20
Middle to Leyden	12	12	0
Waterfront Parking	84	84	0
Water Street Total	**145**	**168**	**23**

Total	**291**	**296**	5

The project team conducted a parking utilization survey on September 27, 2023, at 12:00 PM and 2:00 PM, to understand the on-street parking usage along the two streets. As depicted in Table 2, the utilization of parking at these times hovered around 80% along both streets. An 85% to 90% utilization rate is generally considered the highest acceptable target utilization. Beyond 85-90%, drivers will not find a space easily and will circulate through the area looking for parking spaces. We note that parking utilization is likely to be higher during the peak summer months than in September. It is important to note that a total of 16 spaces along Route 3A are currently utilized by on-street dining. As part of the utilization study, these spaces were marked as utilized (as if a car were parked in these segments). Figures 27 and 28 depict existing parking utilization along the corridors during 12:00 PM and 2:00 PM, respectively.

Table 2. On-Street Parking Utilization – Main /Court Streets and Water Street (September 27, 2023)

Street	Total Supply	12:00 PM		2:00 PM	
		Occupied Spaces	Utilization Rate	Occupied Spaces	Utilization Rate
Route 3A	146	115	79%	120	82%
Water Street	145	114	79%	110	76%

Looking at existing utilization in comparison to the potential parking yields, most of the added spaces (per block) are near the Samoset Street intersection which currently has the lowest utilization within the corridor. Current utilization is highest within the core downtown area which sees a reduction in spaces per block with the one-way configuration. This will be further exacerbated if outdoor dining spaces are maintained which typically take up more spaces in an angled parking layout than a parallel layout.

Figure 27. On-Street Parking Utilization, Route 3A and Water Street, 12:00 PM

Figure 28. On-Street Parking Utilization, Route 3A and Water Stret, 2:00 PM

Safety

When contemplating the conversion of an existing two-way street to a one-way configuration, it is paramount to emphasize safety concerns, particularly regarding impacts on vulnerable users such as pedestrians and bicyclists. The wider travel lanes inherent in one-way streets can inadvertently encourage higher vehicle speeds thus posing a danger to pedestrians along the corridor. In addition, one-way streets often lead to drivers paying less attention, as there is no conflicting traffic flow. This reduced need to watch for oncoming vehicles can result in a false sense of security and lower attentiveness, which can be detrimental to pedestrians and cyclists trying to navigate these streets.

Head-in angled parking on a major downtown street can also create safety concerns as motorists must back out into traffic with poor visibility of oncoming traffic. On low volume/low speed streets it is less of a concern for motorist safety but is always a concern for bicyclists. This has been addressed in some places by introducing reverse angle or 'head-out' parking, which is safer, but public acceptance of a novel parking pattern can be challenging.

One-way street systems also create circuitous routes which are frustrating and disorienting for some drivers who may respond with road rage.

Downtown Economic Vitality

While this evaluation analysis predominantly focused on traffic engineering-related considerations, there are other factors that need to be weighed when changing traffic flow to a one-way pattern in a downtown area. Conversion into a one-way pattern would have economic impacts on businesses established on Court Street (Route 3A) and Water Street and may negatively impact property values as well. Diverting nearly half of the vehicle volume from Court Street (Route 3A) creates a bypass of the downtown businesses, and creates a circuitous travel pattern, which would be expected to negatively impact patronage. Visitors are an important component of the downtown businesses, and visitors, by definition, are unfamiliar with an area and often visit shops and restaurants on impulse as they are passing through rather than having a destination in mind ahead of time. If they are diverted away, or find it difficult to navigate downtown, they may take their business elsewhere.

Many one-way pairs in downtown areas across the country have been reversed for this reason. In fact, local neighbors, Barnstable and Hyannis, are taking steps to convert their existing one-way pairs back to two-way flow for this reason.

Cost To Implement

Implementing a one-way street system involves significant reconfiguration of the current road layout. This includes changes to signage, pavement markings, modifying intersection, and updating signal timing. These changes can be costly and time-consuming, making the conversion to a one-way pair the more expensive option as compared to maintaining the current two-way system.

Access To Key Destinations And The Impact On The Surrounding Roadway Network

Existing Two-Way Circulation

Currently, Court Street / Main Street (Main/Court Streets (Route 3A) and Water Street are both two-way streets that are connected by several one-way and two-way streets. Both streets provide access to popular destinations, including the Plymouth Town Hall, Plymouth Rock, and various parking areas. Under existing conditions, Town Hall can be accessed via Main/Court Streets (Route 3A) from the northbound and southbound direction. Similarly, Plymouth Rock and the waterfront parking area can be accessed via Water Street from the northbound and southbound direction. In addition, in the event that drivers either miss their destination or are unable to find a parking spot along Water Street while traveling northbound, the roundabout at the intersection of Water Street and South Park Avenue allows drivers to reverse direction on Water Street without the need to circle back via Main/Court Streets (Route 3A).

One-Way Circulation

This study assumes that Water Street would be one-way northbound, Court Street / Main Street would be one-way southbound, and all side streets connecting the two roadways would remain as is in terms of traffic flow direction. Under this vehicular circulation pattern, drivers attempting to access Town Hall heading southbound on Main/Court Streets (Route 3A) would have similar access to that provided under existing conditions. Drivers attempting to access Town Hall from the south, however, would have to proceed northbound onto Water Street and access Main/Court Streets (Route 3A) via South Park Avenue. Given the length of that route, drivers would likely opt to utilize side streets such as Memorial Drive and Chilton Street as 'cut throughs' to gain access to Route 3A destinations, likely increasing traffic volumes on these typically narrow roadways.

Access to Plymouth Rock and the waterfront parking area would remain similar to access provided under existing conditions for those traveling northbound on Main/Court Streets (Route 3A), south of Water Street. Drivers attempting to access Plymouth Rock and the waterfront from the north, however, would have to continue southbound through the intersection of Court Street at Samoset Street/South Park Avenue and proceed to the intersection of Main Street and Water Street to gain access or would likely opt to utilize side streets such as North Street, Brewster Street, Howland Street, or Chilton Street as cut throughs to gain access to Water Street destinations more efficiently, likely increasing traffic volumes on these narrow roadways.

Furthermore, transit routes and tourism buses will require rerouting under a one-way couplet scenario, which may complicate access to downtown attractions.

Travel Time Considerations

Another consideration with respect to a one-way couplet involves travel time through the area and to key destinations within the area. Existing travel times were collected during the morning (7:00 AM to 9:00 AM) and evening (4:00 to 6:00 PM) peak periods on September 27, 2023, to understand existing conditions. These travel times were used to provide an assessment of how a potential conversion of Main/Court Streets and Water Street would affect travel time circulating through and to specific destinations in the downtown.

Existing AM Peak Travel Times

During the morning peak period (7:00 to 9:00 AM) the average travel time on Court Street / Main Street (Route 3A) in the northbound direction was approximately one (1) minute and seventeen (17) seconds (1:17). In the southbound direction, the average travel time observed was one (1) minute and twenty-seven (27) seconds (1:27). Very few interruptions were present on Court Street / Main Street during this time period, such as turning vehicles, crossing pedestrians, vehicles entering and exiting parking spots, etc.

During the morning peak period the average observed travel time on Water Street between Sandwich Street and Court Street in the northbound direction was approximately two (2) minutes and twenty-eight (28) seconds (2:28). In the southbound direction, the average travel time was two (2) minutes and six (6) seconds (2:06). Very few interruptions were present on Water Street during this time, such as turning vehicles, crossing pedestrians, vehicles entering and exiting parking spots, etc. Existing AM peak hour observed travel times are depicted in Figure 29.

Existing PM Peak Travel Times

During the afternoon peak period (4:00 to 6:00 PM), the average travel time on Court Street / Main Street (Route 3A) in the northbound direction was approximately two (2) minutes and forty-four (44) seconds (2:44).

In the southbound direction, the average travel time observed was three (3) minutes and twenty-five (25) seconds (3:25). Several interruptions to flow were present on Court Street / Main Street, including pedestrians crossing to access restaurants and shops as well as vehicles entering and exiting parallel parking spots. In addition, during approximately half of the southbound trips, it took at least two cycles to clear the traffic signal at Main Street and Leyden Street / Town Square due to the vehicle queue building in the southbound direction on Main Street.

During the afternoon peak period, the average travel time on Water Street in the northbound direction was approximately three (3) minutes and twenty-four (24) seconds (3:24). In the southbound direction, the average travel time observed was two (2) minutes and forty (40) seconds (2:40). Several interruptions to flow were present on Water Street during this time period, including pedestrians crossing to access Plymouth Rock, the waterfront park and parking area, as well as restaurants and shops. In addition, several vehicles were entering and exiting parking spots along Water Street.

Existing PM peak hour travel times are depicted in Figure 30.

Potential Travel Times to Key Destinations

Based on the travel times collected, travel times to popular destinations in the study area were approximated to provide a better understanding of the effects the conversion to one-way streets would have.

- *Main/Court Streets Through Traffic* – Travel time for drivers traveling northbound on Main/Court Streets (Route 3A) in the AM peak would increase by an average of one (1) minute and eleven (11) seconds due to the diversion to Water Street. This represents almost a doubling of the travel time or a 92% increase. In the PM peak period, the travel time difference is modest, at an average of 40 seconds in period due to evening congestion on Court Street (Route 3A).

- *Town Hall* - For drivers traveling northbound on Main/Court Streets (Route 3A) approaching the study area, it was estimated that it would take an additional two (2) minutes and fifty-four (54) seconds to reach the Town Hall without utilizing cut-throughs or one (1) minute and forty-six (46) seconds longer utilizing Chilton Street, the most direct route. This equates to an approximate doubling of the travel time or an increase of 104%. Travel time to Town Hall is summarized graphically in Figure 31.

Figure 29. Existing AM Peak Travel Times

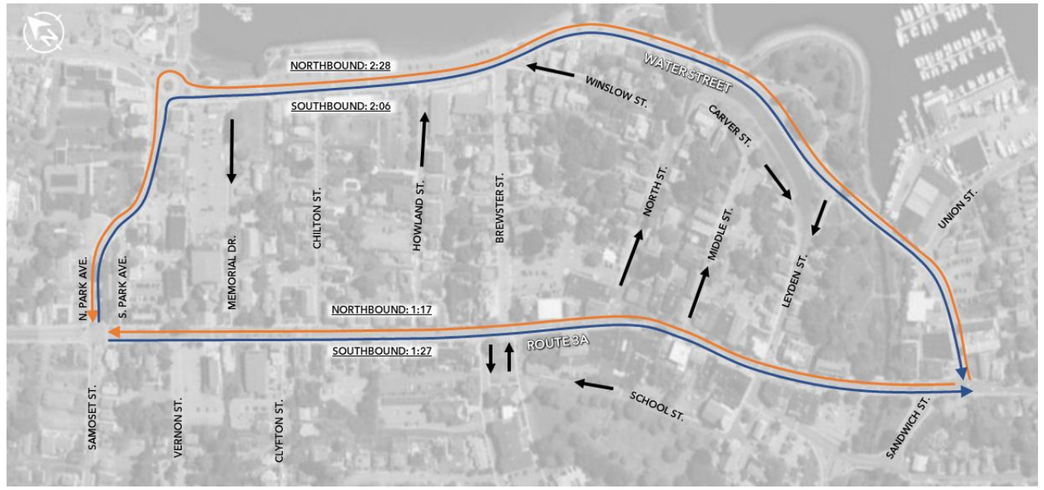
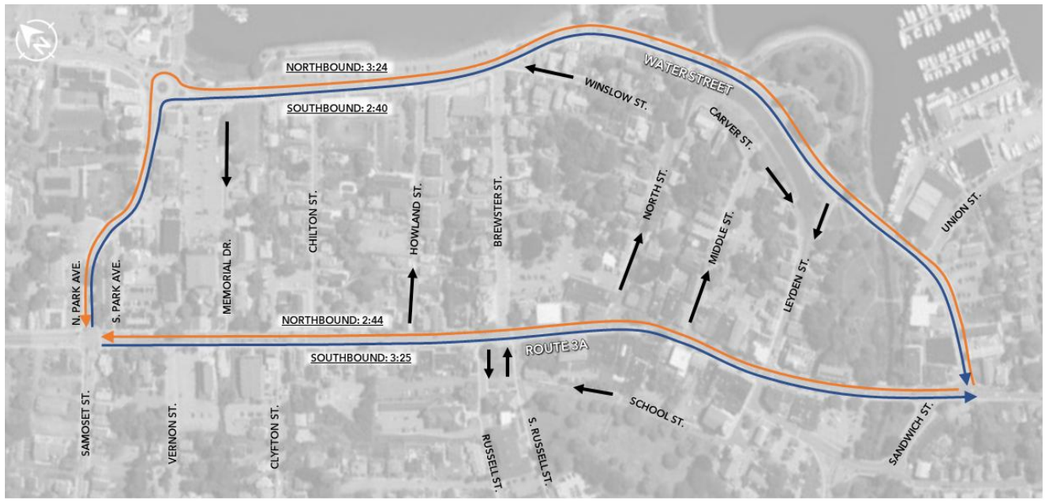


Figure 30. Existing PM Peak Travel Times



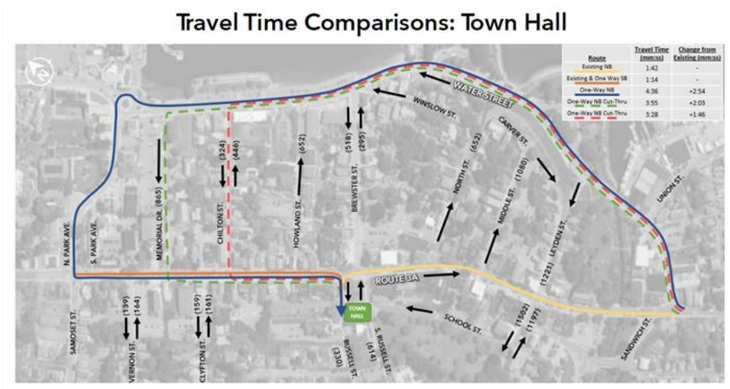
- *Plymouth Visitor Center Parking Lot* - Travel times to the Plymouth Visitor Center parking lot on Memorial Drive were also analyzed. For drivers traveling southbound on Main/Court Streets (Route 3A) approaching the study area, the trip would take an average of five (5) minutes and fifteen (15) seconds without utilizing cut-throughs or an additional fifty-four seconds (0:54) utilizing Brewster Street, the shortest path to the parking area. This represents more than a doubling of travel time or an increase of 130% over existing conditions. Travel time to the Visitor Center Parking Lot is summarized in Figure 32.

- *Water Street Waterfront Parking* - Additionally, travel times to the waterfront parking area on Water Street were also analyzed. For drivers traveling southbound on Court Street (Route 3A) approaching the study area, it was estimated that the trip to the Waterfront parking area on Water Street would be an additional four (4) minutes and twenty-three (23) seconds without utilizing cut-throughs or an additional one (1) minute and seven (7) seconds using Brewster Street. This represents close to triple the existing travel time or an increase of 276%. Travel time to the Waterfront Parking area is summarized in Figure 33.

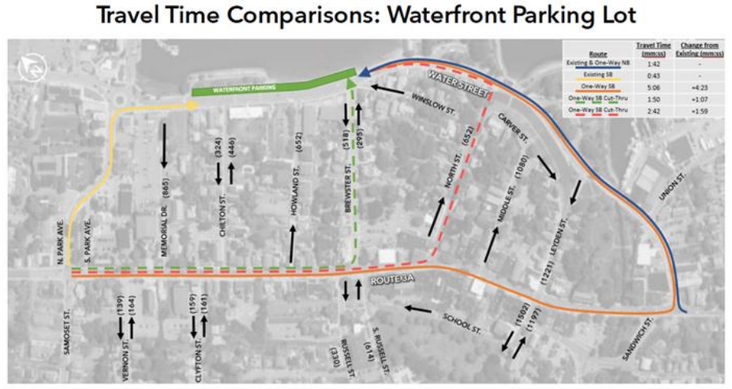
Plymouth Rock - Lastly, travel times to Plymouth Rock on Water Street were also analyzed. For drivers traveling southbound on Court Street (Route 3A) approaching the study area, it was estimated that the trip to Plymouth Rock would be approximately two (2) minutes and forty-seven (47) seconds longer. No cut-throughs exist that could be utilized to directly access Plymouth Rock. This represents more than double the existing condition or an increase of 162%. Travel time to the Plymouth Rock is summarized in Figure 34.

As shown in Figures 31-34, travel to destinations with the study area becomes more circuitous with one-way traffic flow on Main Street/Court Street (Route 3A) and Water Street. Additional volumes would certainly be added to the streets between Court Street (Route 3A) and Water Street due to the significant savings in travel time compared with using only Court Street (Route 3A) and Water Street. Many of these streets are narrow and more residential in character. In addition, these streets have also been identified through master planning efforts as crucial multimodal routes to facilitate walking and biking between the downtown area and the waterfront. The increased vehicle volume on these roads may create concerns for pedestrian and bicycle safety on these streets.

Figure 31.

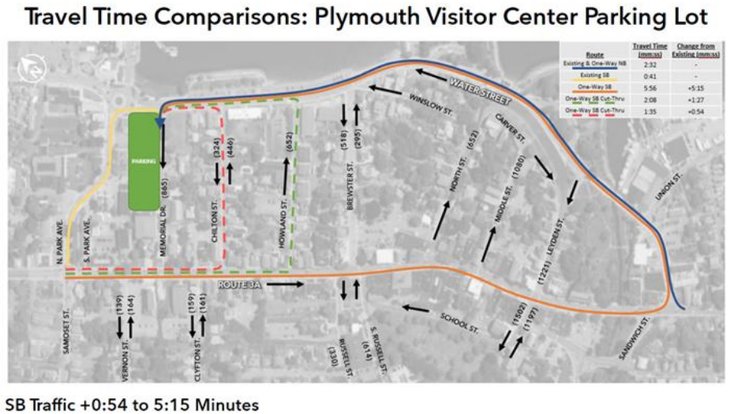


NB Traffic +1:46 to 2:54 Minutes



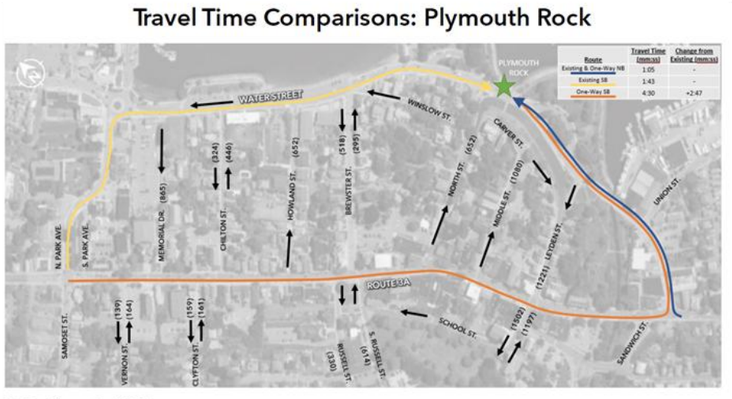
SB Traffic +1:07 to 4:23 Minutes

Figure 32.



SB Traffic +0:54 to 5:15 Minutes

Figure 34.



SB Traffic + 2:47Minutes

Emergency Vehicle Access Considerations

As shown in the above travel time comparisons, a one-way system would be expected to increase emergency response times. GPI met with Plymouth Police and Fire Department representatives in November 2023 to discuss a potential one-way traffic flow pattern on Court and Water Streets. During that discussion, access requirements were confirmed, and emergency response times and primary routes were thoroughly examined. The outcome of this conversation was that emergency responders opposed a one-way flow pattern on Court Street (Route 3A) and Water Street due to compromised public safety response times. They also noted that a crash on Route 3A under one-way flow would likely shut down downtown circulation, exacerbating traffic congestion and potentially hindering emergency access elsewhere throughout the study area.

Recommendation

Balancing these considerations from both an engineering and holistic perspective, it is clear that the potential benefits of converting to a one-way system are outweighed by significant drawbacks. While the one-way option may improve through traffic flow particularly in the southbound direction, it does so at a cost to small businesses, essentially turning the downtown area into more of a bypass than a vibrant hub where people shop, walk, and interact. The slight increase in parking supply does not justify the negative impacts on access, safety, emergency response, economic vitality, and implementation costs.

Ultimately, the opposition from emergency responders was the decisive factor, and therefore, it is not recommended that this idea be further considered. Considerations are summarized in Table 3.

Table 3. Route 3A Two-Way vs. One-Way Operations Summary

	EXISTING TWO-WAY	POTENTIAL ONE-WAY	
Travel Time / Congestion	Longer corridor travel times. Comparatively less Vehicle Miles traveled due to lack of travel restrictions.	Faster corridor travel times. Comparatively more Vehicle Miles traveled due to travel restrictions and necessity for additional turns. Creates confusion for visitors.	**One-Way**
Surrounding Roadway Network	Two-way configuration is less confusing for visitors and the more direct option for residents/businesses. Reduces potential of cut-thru to bypass circuitous route. This allows for greater network flexibility.	One-way configuration is more confusing for visitors. Vehicles may try to bypass circuitous routes and use narrow connector roads that are not well equipped to handle additional volumes. May also require major modifications to several intersections including a roundabout, two traffic signal-controlled intersections, and an existing high crash location.	**Two-Way**
Pedestrian + Bike Mobility / Safety	Generally slower vehicle speeds due to increased turning movements and increased perceived friction along the roadway. Results in fewer, less severe crashes.	Encourages faster vehicle speeds due to less friction. Though two-way streets invite more conflict, drivers on one-way streets tend to be less attentive to their surroundings, and thus more at-risk for collisions, especially with bikes and pedestrians.	**Two-Way**
Transit Routes/ School Bus Routing	Operates as is.	Requires modification in GATRA, public schools, and tourism bus routing.	**Two-Way**
Parking Supply	Existing Route 3A and Water Street Supply = 291	Potential Route 3A and Water Street Supply = 296 (Net 5 Spaces)	**One-Way**
Emergency Response	Provides much faster response times for incidents located on Main Street between Water Street and N. Park Avenue.	Requires emergency vehicles to route around Water Street northbound for incidents located on Main Street between Water Street and N. Park Avenue.	**Two-Way**
Business Exposure / Visibility	Downtown more of a “destination”. Increased visibility. Provides greater opportunity for impulse or pass-by trips	Downtown more of a “pass through”. May move vehicles away from downtown too quickly thus reducing opportunity for impulse or pass-by trips. Reduction in business visibility.	**Two-Way**
Cost to Implement	None	Costly due to intersection reconfigurations, pavement markings, signage, etc.	**Two-Way**

EVALUATE ONE-WAY TRAFFIC FLOW

The project team heard from residents that there is a desire to study the feasibility of converting certain streets from two-way to one-way operations. Plymouth is old and has some narrow streets, which, with growth, have led to increased parking demand and changes in mobility patterns, including more frequent deliveries by large trucks from Amazon, Fed Ex. UPS, and others. As a result, residents often park on sidewalks to avoid being hit by passing vehicles, thus creating pedestrian safety and mobility issues throughout the study area. While converting streets into one-way operations could potentially address these issues, such changes can also have significant impacts.

Evaluation Criteria

To evaluate the feasibility of these potential changes, the following criteria were considered:

Curb to Curb Width – Assessing the physical width of the streets to determine if one-way operation can provide adequate space for vehicles, parking, and pedestrians. If a street is too wide, converting it to one-way traffic may encourage speeding and cut-through traffic due to the increased lane width and lack of opposing traffic, which can reduce friction and the natural calming effect of two-way traffic.

Parking Supply and Demand – Evaluating current parking availability and utilization. Conversions may be more favorable on roadways that currently have parking on both sides of the road where it is highly utilized, as this condition provides friction to help naturally calm traffic. In contrast, if parking is provided but utilization is low, converting to one-way may encourage speeding due to a lack of on-street friction and therefore it may be better suited to remove some parking supply or alternate it from side to side.

Emergency Vehicle Access and Primary Routes – Ensuring that any changes do not hinder access for emergency vehicles and that primary routes for these vehicles are maintained. It is crucial to consider the impact on response time and ensure that emergency routes are not compromised by potential conversions.

Surrounding Land Use – Considering the types of land uses adjacent to the streets, such as residential, commercial, or mixed-use, and how these uses might be affected by a conversion. Local, residential roadways are more favorable than high volume, multi-use roadways.

Surrounding Network Impact (Traffic Volumes) – Analyzing how the conversion would impact traffic patterns and volumes on surrounding streets and the overall network. The goal is to ensure that one-way conversions do not simply displace traffic problems to nearby streets or create new bottlenecks in the network. Therefore, roadways with low volumes are more favorable than arterial or collector roadways that serve a high volume of traffic.

Speed and Safety (All Road Users) – Assessing potential changes in vehicle speeds and the overall safety for all road users, including pedestrians and cyclists. If the roadway already exhibits speeding concerns, converting to one-way operations may further exacerbate those issues, potentially making the street less safe for all users, but especially non-motorized users.

Roadways Deemed Infeasible at This Time

Through this evaluation, the following streets were deemed infeasible for conversion at this time. The table below provides reasoning and the recommended treatment for each roadway in lieu of one-way operations in order to improve flow and safety.

Table 4. Roadways Deemed Infeasible for One-Way Travel

Roadway	Classification	Curb-to-Curb Width	Centerline	Parking Availability	General Parking Utilization	Land Use	Multimodal Demand	Preliminary Recommendation	Potential Treatment(s)
Alden Street	Local	35'	Yes	Both Sides	Medium	Residential	Medium	Not recommended due to existing speeding problems, low parking utilization, and the need to retain full two-way emergency access to Cold Spring School; better suited for traffic calming.	Traffic Calming/ Speed Management Measures / Chicaned Parking
Cherry Street	Minor Arterial	26'	Yes	No Parking	N/A	Commercial / Residential	High	Not recommended due to its status as a major east-west arterial route with significant traffic volumes, lack of viable one-way pair, and negative impacts on the surrounding roadway network.	Traffic Calming/ Speed Management Measures
Franklin Street	Local	20'	No	One-side	Low	Residential	Medium	Not recommended due to very low traffic volume, short length, and the need for one-way pairs throughout the neighborhood which could impact emergency access.	Restrict on street parking / Create strategic parking bays
Hall Street	Local	20'	No	Both Sides	Low	Residential	Medium	Not recommended due to existing speeding problems and low parking utilization; better suited for traffic calming.	Traffic Calming/ Speed Management Measures / Chicaned Parking / Restrict on-street parking to one side

Roadway	Classification	Curb-to-Curb Width	Centerline	Parking Availability	General Parking Utilization	Land Use	Multimodal Demand	Preliminary Recommendation	Potential Treatment(s)
Hamilton Street	Local	28'	No	Both Sides	Low	Residential	Medium	Not recommended due to existing speeding problems and low parking utilization; better suited for traffic calming.	Traffic Calming/ Speed Management Measures / Chicaned Parking
Jefferson Street	Local	14'	No	No Parking	N/A	Residential	Medium	Not recommended due to very low traffic volume, short length, and the need for one-way pairs throughout the neighborhood which could impact emergency access.	Restrict on street parking / Create strategic parking bays
Lothrop Street	Local	24'	Yes	One-side	Low	Commercial / Residential	High	Not recommended due to low parking utilization, potential for increased speeding, and the need for a good one-way pair which is unavailable without Nelson.	Traffic Calming/ Speed Management Measures / Chicaned Parking
Massasoit Street	Local	20'	No	One-side	Low	Residential	Medium	Not recommended due to very low traffic volume, short length, and the need for one-way pairs throughout the neighborhood which could impact emergency access.	Restrict on street parking / Create strategic parking bays
Mayflower Street	Local	20'	No	One-side	Medium	Residential	Medium	Not recommended due to existing speeding problems, low parking utilization, and potential cut-through traffic on side streets if paired with Pleasant; better suited for traffic calming.	Traffic Calming/ Chicaned Parking
Nelson Street	Minor Arterial	28'	Yes	Both Sides	Low	Recreation / Residential	High	Not recommended due to substantial traffic volumes, existing speeding problems, and the need for emergency access to Rail Trail and Nelson Beach Park; better suited for traffic calming.	Traffic Calming/ Speed Management Measures / Chicaned Parking
Newfield Street	Local	20'	No	One-side north of Birch	Medium	Residential	Medium	Not recommended due to the need to retain full two-way emergency access to Rolling Hill retirement community, with one-way flow causing long detours due to Birch Ave restriction.	Traffic Calming/ Speed Management Measures / Restrict parking south of Birch Avenue
Oak Street	Collector	24'	Yes	One-side	Medium	Residential	Medium	Not recommended due to its status as a significant north-south arterial route with significant traffic volumes, lack of viable one-way pair, and negative impacts on the surrounding roadway network.	Traffic Calming/ Speed Management Measures / Chicaned Parking
Robinson Street	Local	18'	No	No Parking	N/A	Residential	Medium	Not recommended due to very low traffic volume, short length, and the need for one-way pairs throughout the neighborhood which could impact emergency access.	Traffic Calming/ Chicaned Parking
Sagamore Street	Local	14'	No	No Parking	N/A	Residential	Medium	Not recommended due to very low traffic volume, short length, and the need for one-way pairs throughout the neighborhood which could impact emergency access.	Restrict on street parking / Create strategic parking bays
Stafford Street	Local	24'	No	Both Sides	Low	Residential	Medium	Not recommended due to the need to retain full two-way emergency access to Stafford Hill Assisted Living community, with one-way flow causing long detours due to Birch Ave restriction.	Traffic Calming/ Chicaned Parking
Summer Street	Minor Arterial	22'	Yes	No Parking	N/A	Commercial / Recreation / Residential	Medium	Not recommended due to its status as a major east-west arterial route with significant traffic volumes, lack of viable one-way pair, and negative impacts on the surrounding roadway network.	Traffic Calming/ Speed Management Measures
Towns Street	Local	22'	No	Both Sides	Low	Residential	Medium	Not recommended due to low parking utilization and potential for increased speeding on the straightaway; better suited for traffic calming.	Traffic Calming / Restrict parking to one-side
Washington Street	Local	20'	No	One-side	Low	Residential	Medium	Not recommended due to very low traffic volume, short length, and the need for one-way pairs throughout the neighborhood which could impact emergency access.	Restrict on street parking / Create strategic parking bays

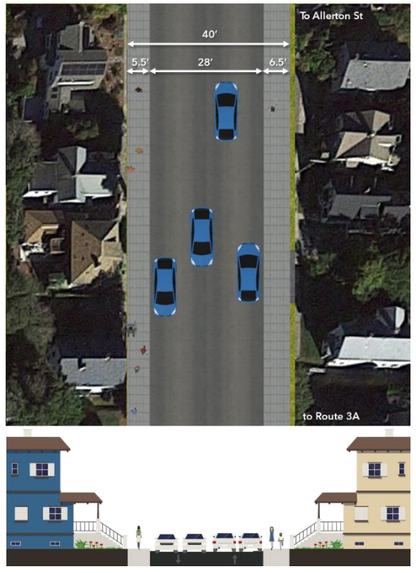
Roadways Deemed Feasible at This Time

Through this evaluation, the following streets were deemed feasible for conversion at this time. The table below provides reasoning and the recommended treatment for each roadway.

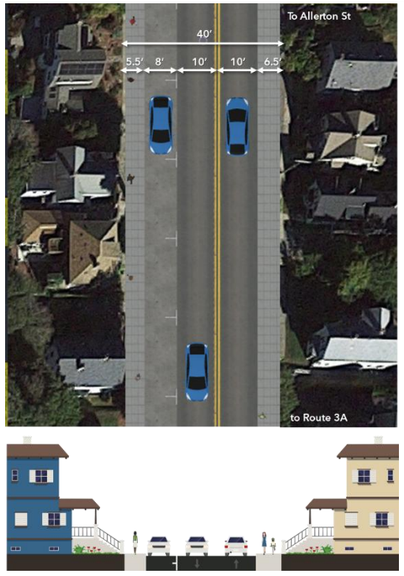
Table 5. Roadways Deemed Feasible for One-Way Travel

Roadway	Classification	Curb-to-Curb Width	Centerline	Parking Availability	General Parking Utilization	Land Use	Multimodal Demand	Preliminary Recommendation	Potential Treatment(s)
Brookside Avenue	Local	14'	No	No Parking	N/A	Residential	Low	Recommended for further study.	Formalize traffic flow one-way towards Bay View Avenue.
Chilton Street	Local	24'	No	One-side	High	Residential	High	Recommended for further study.	Formalize traffic flow one-way towards Water Street (to be paired with Memorial Drive) -or- Maintain two-way flow and alternate parking for chicane effect.
Clyfton Street	Local	28'	No	Both Sides	High	Residential	High	Recommended for further study.	Formalize traffic flow one-way away from Route 3A (to be paired with Vernon Street) -or- Maintain two-way flow and alternate parking for chicane effect.
Freemont Street	Local	20'	No	One-side	High	Residential	High	Recommended for further study.	Formalize traffic flow one-way away from Route 3A.
Murray Street	Local	20'	No	One-side	High	Residential	Medium	Recommended for further study.	Formalize traffic flow one-way away from Route 3A.
Ocean View Avenue	Local	25'	No	One-side	Low	Residential	Medium	Recommended for further study.	Formalize traffic flow one-way away from Liberty Street and construct sidewalk on one side of the road.
Vernon Street	Local	26'	No	Both Sides	High	Residential	High	Recommended for further study.	Formalize traffic flow one-way towards Route 3A (to be paired with Clyfton Street) -or- Maintain two-way flow and alternate parking for chicane effect.

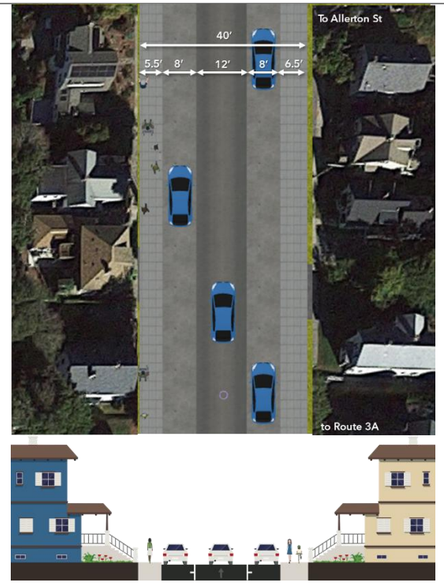
Figure 35. Potential Clyfton Street Cross Sections



Existing Two-Way Flow with High Parking Utilization on Both Sides
This results in a very crowded cross-section.



Maintain Two-Way and Chicane Parking to Create a Yield Street
This would result in a loss of parking but provide ample room for traffic flow.



Convert to One-Way with Parking on Both Sides

06 RECOMMENDATIONS

IDENTIFYING PROJECTS

Developing a list of recommended projects and initiatives is an iterative process. The project team combed through past plans and studies and listed out infrastructure improvements that had been identified previously and not yet implemented. The project team then reviewed the 225+ data points of community input, which resulted in support for previously identified improvements as well as identification of other potential projects. The review of all the materials yielded key themes of desired improvements, and a preliminary list of project recommendations. This list includes new and improved crosswalks, sidewalks, intersection safety upgrades, traffic calming, network connections, traffic flow conversions and citywide initiatives / processes.

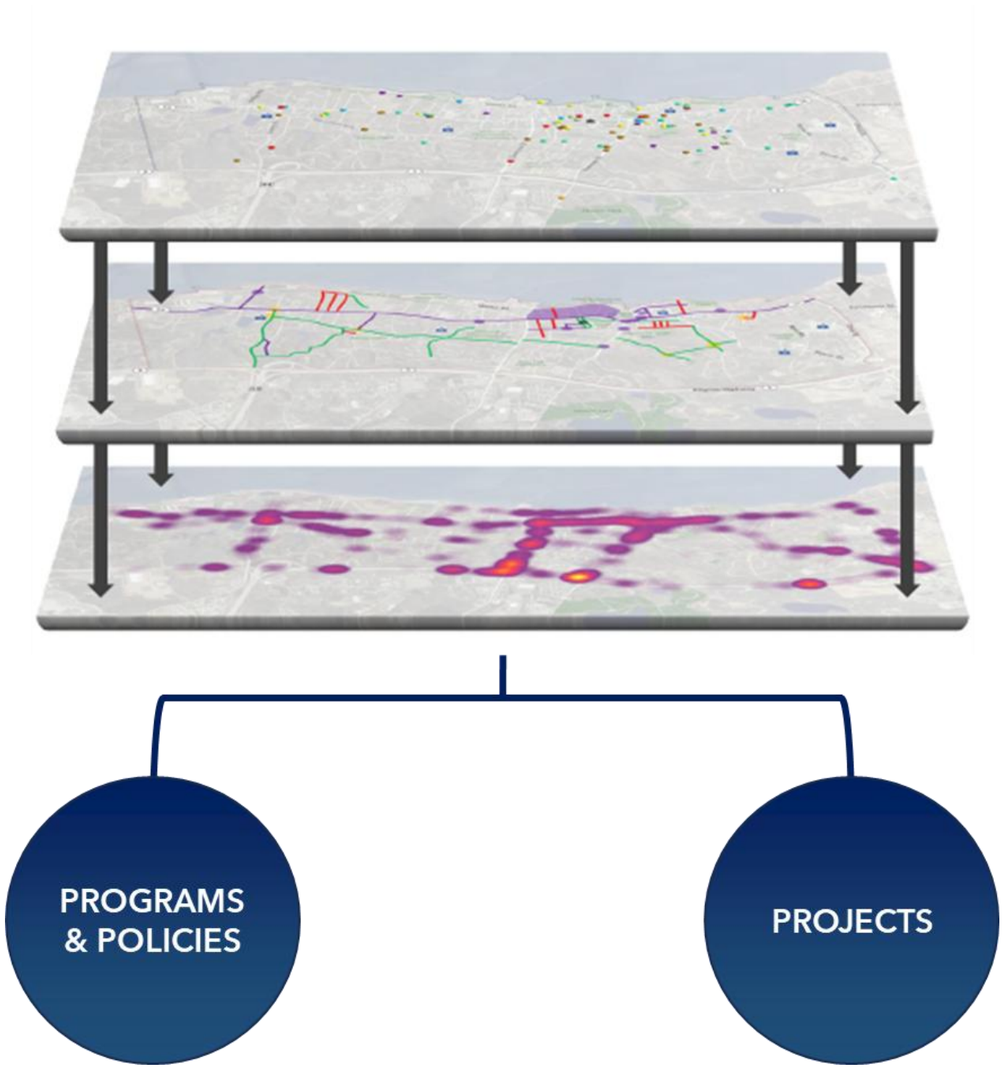
Following the identification of potential projects, it became evident that GIS would be an invaluable tool considering the sheer volume of projects identified. In order to help the Town of Plymouth identify actionable recommendations, the project team looked for areas of overlap within the preliminary project list to synthesize the projects down into an actionable and implementable list of recommendations. To achieve this, projects were mapped and then overlaid onto several analysis layers, including the following:

- **Safety** - Crash density maps and pedestrian/bike related crashes were reviewed in relation to the vicinity of projects. Projects addressing high crash locations or alleviating vulnerable road user crashes received higher scores, while those that did not, received lower scores.
- **Community Input** – Community input concerns were mapped utilizing the wiki map feature of the online survey. Projects addressing multiple community concerns received higher scores.
- **Pedestrian Generators** – Pedestrian generators such as retail areas, historic landmarks, recreational areas, parks, and schools were reviewed in relation to the vicinity of projects.
- **Multimodal Demand** – MassDOT's Potential for Everyday Walking and Biking layers were utilized, both of which display latent demand for active-mode trip making. In the context of everyday walking and biking, the tool assigns each roadway segment a score measuring its underlying potential for more people to choose these modes of transport if more appropriate infrastructure were in place based on surrounding land use, volumes, transportation access and social equity demographics. Projects overlapping areas with a high multimodal demand are prioritized due to their ability to encourage the use of walking and biking as alternative transportation modes and thus enhancing the overall transportation efficiency.
- **Gap Analysis** – Existing pedestrian and bicycle networks were mapped in addition to key bike and pedestrian generators. Projects addressing current gaps in the network should be prioritized.
- **Roadway Features** – Roadway features such as street classification and traffic volumes were mapped, and projects were examined in relation to the types of roadways they addressed. For example, an arterial roadway that carries a significant amount of people and goods can have a greater impact on the overall transportation network compared to an extremely low volume, short in length roadway.

This allowed the project team to visually identify high-priority corridors and group similar projects into townwide initiatives or area focused studies. For instance, several high-priority corridors were identified because they encompassed multiple smaller projects (such as intersection or crosswalk improvements) and were located in areas with high traffic volumes, significant multimodal demand, known safety issues, and substantial community concern. Similarly, projects that addressed specific areas such as school zones, or community concerns such as speed, were identified and grouped into townwide initiatives.

Overall, using GIS in this manner provided a clear and objective way to prioritize projects, ensuring that the most pressing needs are addressed first and that the potential benefits of each project are maximized.

Figure 36. Initially, a total of 140 projects were identified. To help the Town take effective actions, these were condensed into actionable recommendations, resulting in a number of programs, policies, and high-impact projects.



TOWNWIDE PROGRAMS & POLICIES

Establish a Traffic Calming Policy & Program

It is recommended that the Town of Plymouth establish a town-wide Traffic Calming Policy and Program – aimed to provide effective and consistent guidelines for the implementation of traffic calming measures throughout the Town. Implementing sustainable traffic calming can help to decrease vehicle speeds and increase safety and livability for the residents of Plymouth. Ideally, the program will incorporate full resident engagement and opportunity for input into identifying traffic issues and solutions, as well as traffic data collection to confirm traffic issues. An example of a simplified flow chart depicting a potential process is shown below. Once developed, the traffic calming program should prioritize roadways with known safety issues and sensitive receptors such as schools, parks, senior destinations, and any areas with heavy pedestrian volumes.

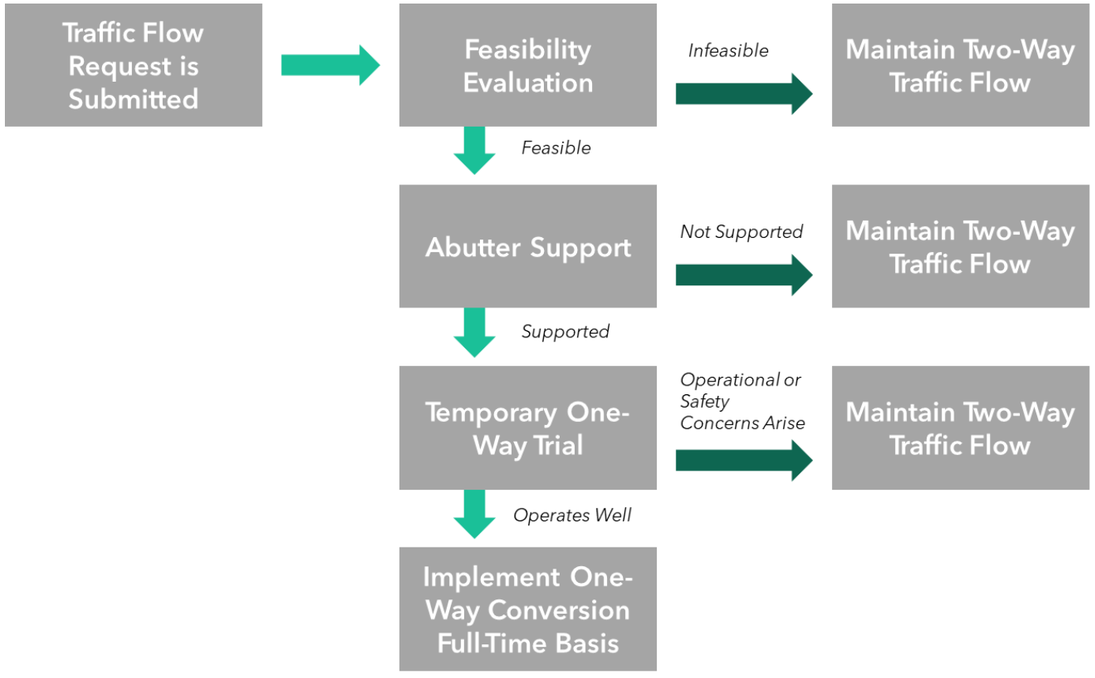
Figure 37. Example Traffic Calming Procedure

Establish a Traffic Flow Request Program

To effectively manage and respond to community requests for traffic flow changes, it is recommended that the town establish a Traffic Flow Request Program. This program would allow community members to submit a request to convert streets from two-way to one-way operations. Each request would be evaluated based on specific criteria to determine feasibility including but not limited to curb-to-curb widths, parking supply and demand, traffic volumes and subsequent impact to surrounding roadway network, and multimodal activity. If deemed feasible, the proposal would move to a community approval phase, requiring signatures from local residents. Successful proposals would then be implemented on a trial basis before potentially becoming permanent solutions, ensuring a thorough and inclusive decision-making process.

Following the establishment of such a program, the town should further progress the streets deemed feasible for one-way flow to obtain resident approval and implement the flow change on a trial basis.

Figure 38. Example Traffic Flow Request



Establish a Crosswalk Installation Policy and Program

A critical component of pedestrian safety is implementing crossing treatments that foster sustainable safety and are appropriate for a location given the roadway context and surrounding land use. There were several requests for crosswalk installations within the study area including:

- Allerton Street at Davis Street
- Atlantic Avenue at Atlantic Street
- Carver Street at Middle Street
- Leyden Street at Carver Street
- Lothrop Street at Rail Trail Trailhead
- Oak Street at Davis Street
- Route 3A at Howland Street
- Route 3A at Nelson Street
- Route 3A at Holmes Terrace
- Route A at Wellingsley Avenue
- Stafford Street at Wood Street

As such, it is recommended that the Town of Plymouth adopt a crosswalk installation policy to ensure that crosswalks are implemented in locations where it is safe to establish a crossing, and that where installed, they comply with Federal and State standards.

According to the Manual on Uniform Traffic Control Devices (MUTCD), *"Crosswalk lines should not be used indiscriminately. An engineering study should be performed before they are installed at locations away from high traffic signals or STOP signs."* The MUTCD further states, *"New marked crosswalks alone, without other measures designed to reduce traffic speeds, shorten crossing distances, enhance driver awareness of the crossing, and/or provide active warning of pedestrian presence, should not be installed across uncontrolled roadways where the speed limit exceeds 40 mph and either:*

A. The roadway has four or more lanes of travel without a raised median or pedestrian refuge island and an ADT of 12,000 vehicles per day or greater; or

B. The roadway has four or more lanes of travel with a raised median or pedestrian refuge island and an ADT of 15,000 vehicles per day or greater."

Therefore, it is highly recommended that all requested crosswalk locations be evaluated through an engineering study. Typical studies should include collection of traffic and pedestrian volume data at the proposed location, collection of speed data, evaluation of accident history and field measurement of available sight distances. Since a marked crosswalk can sometimes create a "false sense of security" for pedestrians, the engineering study is critical in identifying the actual need and adequacy of a marked crosswalk. Prior to preparation of a full engineering study, the following general guidelines can be reviewed for each proposed crosswalk location. If it is determined that a proposed crosswalk location appears feasible, then a full engineering study should be completed preceding a crosswalk installation.

Enforcement/Public Education Campaigns

Sidewalk and Vegetation Trimming

There are many instances throughout the study area where overgrown vegetation restricts sight distances and impedes on sidewalk widths. It is recommended that the Town conduct a public education campaign regarding the importance of trimming residential vegetation and keeping sidewalks clear.

Speeding & Parking on Sidewalks

More importantly, there is an epidemic of vehicles parked on sidewalks in the Town of Plymouth. It is recommended that in addition to enforcement, the Town conduct a public education campaign regarding the dangers of parking on sidewalks and the negative effects it has on pedestrian safety and mobility.

Parking Management Strategies

To address parking challenges and improve overall traffic flow, it is recommended that the town continue to develop comprehensive parking solutions townwide. These solutions could include implementing resident permit only parking on neighborhood roadways, enforcing restrictions on parking on sidewalks, and establishing policies for off-street parking spots as rental units become more prevalent. Additionally, it is recommended that the town aim to direct visitors to off-street parking facilities to encourage a "park and walk" approach and alleviate the issue of cars circulating the downtown area while searching for parking. The town may also consider altering parking fee structures including demand pricing so that on-street parking spots close to retail are more expensive compared to off-street facilities, making off-street facilities more desirable. Effective wayfinding signage can support this initiative by guiding drivers to less expensive and available off-street parking areas.

Update Complete Streets Prioritization Plan

It is recommended that the town utilize the improvements identified in this plan to help update their Complete Streets Prioritization Plan (CSPP). Following the CSPP update approval, the Town may be eligible for up to $500,000 in construction funding through MassDOT's Complete Streets Funding Program.

Integrate 25 MPH Townwide Speed Limit

It is recommended that the Town opt into Section 17C of Chapter 90 of the Massachusetts General Laws (MGL), allowing them to reduce the statutory speed limit from 30 mph to 25 mph on city- or town-owned roadways within densely populated or business districts. In addition, the Town may also consider implementing Safety Zones of 20 mph in areas such as parks, playgrounds, senior housing, hospitals, and childcare centers where vulnerable users may be present.

Adopt Street Typologies

As the Town of Plymouth continues to evolve, the need to balance mobility, safety and access for all users will become increasingly important. It is recommended that the Town adopt street typologies to achieve this balance by categorizing streets based on their adjacent land uses, existing right-of-way widths, and traffic characteristics. These typologies can serve as flexible guidelines that can adapt to Plymouth's growth, ensuring that streetscapes support a variety of functions including vehicular traffic, multimodal traffic, and parking.

The project team developed preliminary street typologies for North Plymouth and Plymouth Center collectors and local roadways. The typologies consider factors such as curb-to-curb widths, traffic volumes, speed, land use intensity, pedestrian volume, and parking utilization.

Residential Collectors - 26'+ Curb-to Curb

Curb-to-Curb Width: 26' +

Vehicular Volumes: Moderate
Multimodal Volumes: Moderate

Speed: Low/Moderate

Land Uses Served: Residential

Typical Parking Utilization: Low/Moderate

Two cross-sections were developed for 26' C.T.C width residential collectors. Given the relatively low/moderate parking utilization, these roadways are suited for two-way travel with parking dedicated on one side only or chicaned side to side.

Example Streets include Westerly Road, Oak Street, Nelson Street, and Liberty Street.

Residential Collectors - 32'+ Curb-to Curb

Curb-to-Curb Width: 32' +

Vehicular Volumes: Moderate
Multimodal Volumes: Moderate

Speed: Low/Moderate

Land Uses Served: Residential

Typical Parking Utilization: Low/Moderate

Example Streets include Standish Avenue.

Downtown Local Roads - 20+' Curb-to-Curb

Curb-to-Curb Width: 20' +

Vehicular Volumes: Low/Moderate
Multimodal Volumes: High

Speed: Low

Land Uses Served: Multiuse

Typical Parking Utilization: High

Two cross-sections were developed for 20' C.T.C width downtown local roads. Given the narrow nature, these roadways are suited for either one-way travel with parking on one side or two-way travel with no parking.

Example Streets include Freemont Street, Bradford Street, Leyden Street, Middle Street, Howland Street, Pleasant Street, Memorial Drive, Russell Street, Chilton Street, and S. Russell Street.

Downtown Local Roads - 27'+ Curb-to-Curb

Curb-to-Curb Width: 27' +

Vehicular Volumes: Low/Moderate
Multimodal Volumes: High

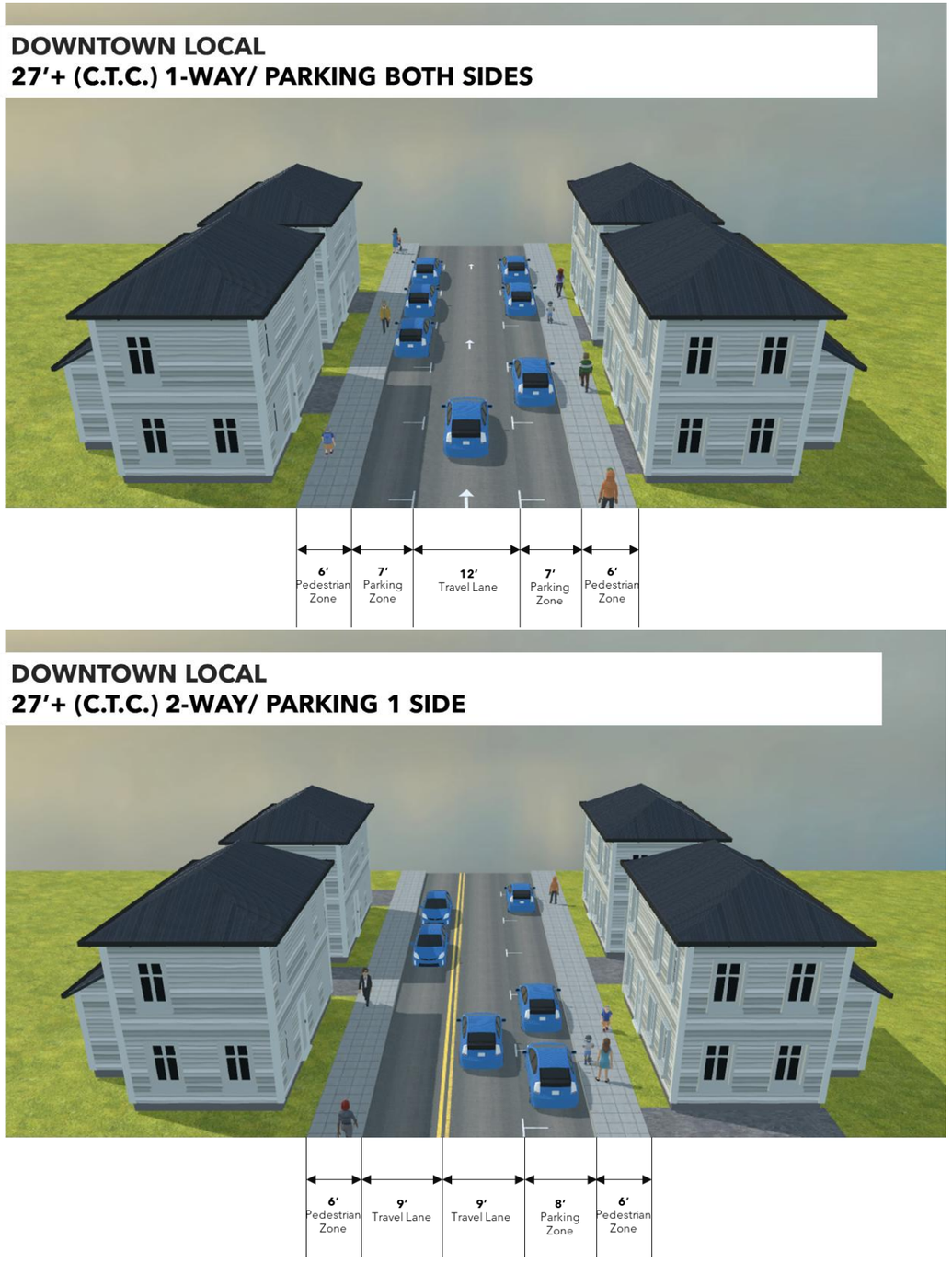
Speed: Low

Land Uses Served: Multiuse

Typical Parking Utilization: High

Two cross-sections were developed for 27' C.T.C width downtown local roads. These roadways are suited for either one-way travel with parking on both sides to maximize parking or two-way travel with parking on one-side (which can be chicaned side to side for a traffic calming effect)

Example Streets include Clyfton Street, Vernon Street, Sever Street, and North Street.



Neighborhood Local Roads - <20' Curb-to Curb

Curb-to-Curb Width: <20'

Vehicular Volumes: Low
Multimodal Volumes: Low/Moderate

Speed: Low

Land Uses Served: Residential

Typical Parking Utilization: Low/Moderate

Given the narrow nature of these roadways, they are best suited for two-way travel with no parking. This allows for a yield condition.

Example Streets include Sagamore Street, Jefferson Street, Robins Street, Washington Street.

Neighborhood Local Roads – 20+' Curb-to Curb

Curb-to-Curb Width: 20' +

Vehicular Volumes: Low
Multimodal Volumes: Low/Moderate

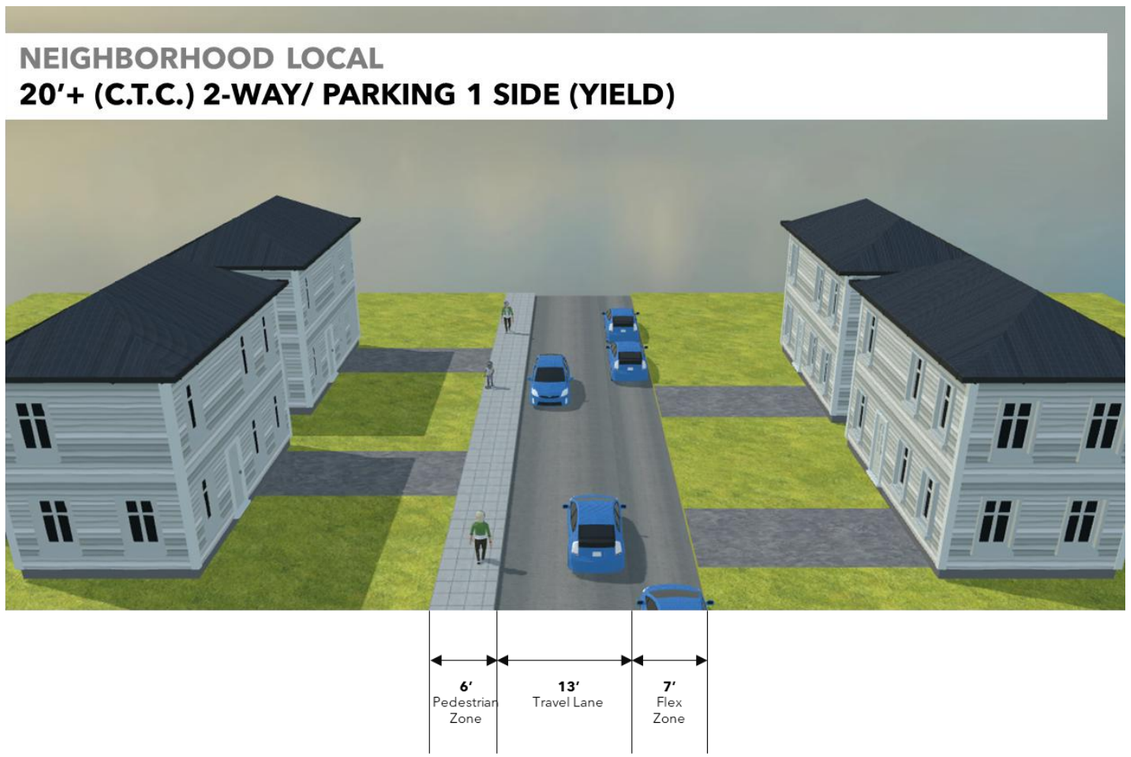
Speed: Low

Land Uses Served: Residential

Typical Parking Utilization: Low/Moderate

Given the relatively narrow nature of these roadways, they are best suited for two-way travel with parking on one side only. This allows for some on-street parking but with a yield condition on these low volume roadways. Yellow centerline should be avoided on these low volume roadways.

Example Streets include Mayflower Street, Franklin Street, Massasoit Street, Hall Street, Murray Street, Newfield Street, Towns Street, Lothrop Street, and Castle Street.



Neighborhood Local Roads – 26+' Curb-to Curb

Curb-to-Curb Width: 26' +

Vehicular Volumes: Low
Multimodal Volumes: Low/Moderate

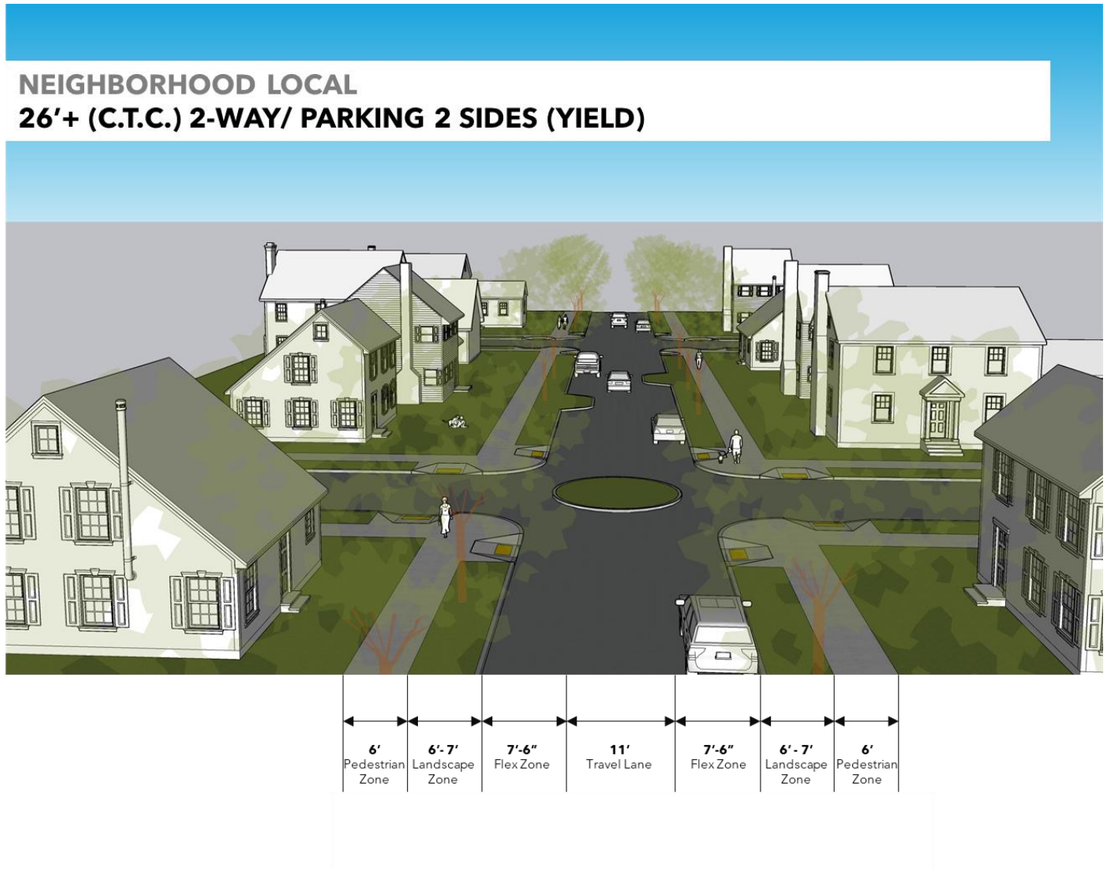
Speed: Low

Land Uses Served: Residential

Typical Parking Utilization: Low/Moderate

Given the relatively low/moderate parking utilization, these roadways are suited for two-way travel with parking dedicated on one side only or chicaned side to side.

Example Streets include Stafford Street, Allerton Street, Hamilton Street, Alden Street, and Spooner Street.



ROUTE 3A CORRIDOR STUDY

Route 3A is a significant regional arterial but also provides access to Plymouth's bustling downtown. The corridor traverses through different contexts; towards the outer extents of the study area, Route 3A is more open, resulting in higher speeds, and then transitions to more condensed, high-pedestrian areas. Despite a clear demand, there are currently no bike facilities along Route 3A within the study area. Numerous intersections and crosswalks along Route 3A have been identified by the public as problematic and corroborated by observations and crash data. As such, the Route 3A corridor presents itself as a high-impact candidate for further study to help plan for a corridor wide project to help transform Plymouth.

This plan recommends that the Town conduct a Route 3A Corridor Scoping Study aimed at developing cross-sectional improvements that will transform the area and balance the needs of all users, including pedestrians, cyclists, and motorists. The scoping study should identify opportunities to connect to off-street bike facilities, such as the Seaside Rail Trail, and enhance pedestrian safety and mobility along the corridor. This may include enhancements to existing crosswalks as well as exploring the feasibility and implementation of new crosswalks to provide better connectivity from residential neighborhoods to the southwest to the waterfront to the northeast. Additionally, the study should consider implementing gateway and transition zone improvements to help slow down vehicles as they move between different vulnerable contexts within the corridor, specifically the area between Stephens Street and Warren Avenue. The study should identify opportunities to improve intersection operations and safety throughout the corridor. Furthermore, the study should explore the integration of Intelligent Transportation Systems (ITS) and adaptive signal equipment to improve traffic flow throughout the corridor. Given the area's congestion, advancements in traffic technology, combined with infrastructure to encourage and accommodate non-motorized travel, are expected to help alleviate traffic issues.

DOWNTOWN AREA MULTIMODAL SAFETY STUDY

Within the confines of the downtown area, there are inconsistent crossing treatments, lack of bike facilities/connections, high traffic volumes, and known safety concerns. Therefore, this Plan is recommending the Town implement a Downtown Area Multimodal Safety Improvement Study. The Study will provide the opportunity to address several problematic intersections (Route 3A at Water Street/Sandwich Street, Sandwich Street at Pleasant Street, Pleasant Street at Robinson Street, Market Street at Summer Street, Market Street at Town Square) as well as improve crossings and enhance the streetscape along the Route 3A corridor from Samoset Street to South Street. This project is aimed at addressing the Pedestrian Crash Cluster within the downtown area, improving walkability/connectivity, improving safety for all users, and improving public spaces. As such, it is a great candidate for HSIP funding and to be implemented as a TIP project.

Figure 39. Route 3A Deficiencies & Context

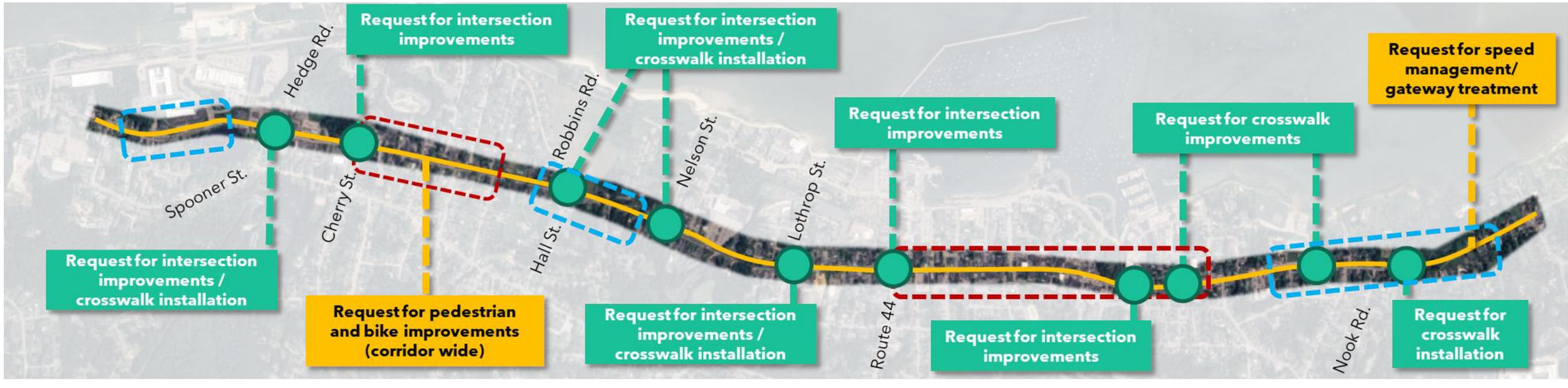


Figure 40. A preliminary concept plan has been developed to enhance pedestrian crossings and address intersections with elevated risks of pedestrian-vehicle conflicts in the downtown area. The proposed improvements include implementing curb extensions and tightening curve radii to reduce crossing distances, improve sight lines near on-street parking, and slow down turning vehicle speeds. Additionally, raised crosswalks are planned for key downtown-waterfront connector streets, including memorial Drive, Chilton Street, Brewster Street, North Street, and Middle Street to facilitate pedestrian movement between the two major "destination" areas. Streetscape enhancements will also be introduced to improve the area's visual appeal and encourage more walking. These measures aim to create a safer and more attractive environment for pedestrians. A full technical memorandum highlighting deficiencies and proposed improvements for the Downtown Area Multimodal Study is included within the Appendix of this report.

PRIORITY CORRIDORS

Throughout this study, safety data, traffic data, public input, and field observations were utilized to identify projects throughout the study area. However, during the project identification and prioritization process, it became clear that there was a need to identify "Priority Corridors" for safety improvements throughout the study area. These corridors have been highlighted due to their high incidence of speeding, frequent traffic accidents, and community concerns about safety. As such, they could greatly benefit from focused safety interventions.

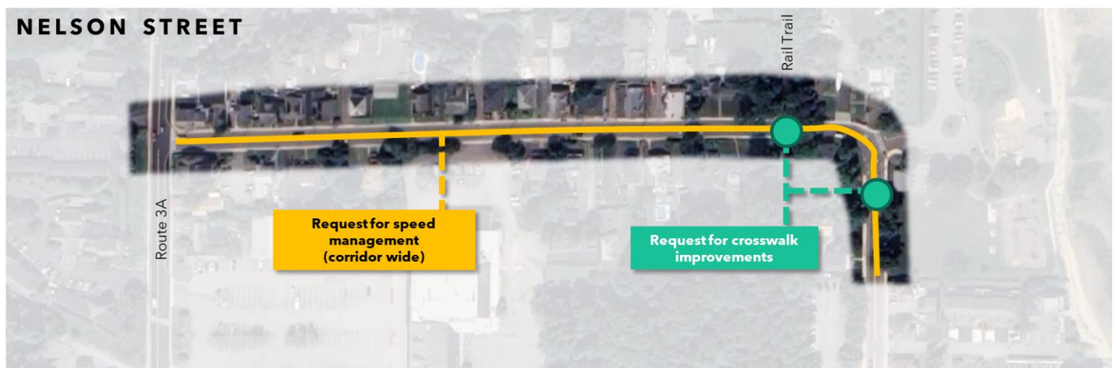
Nelson Street

Nelson Street is highlighted as a priority corridor to receive additional study to provide recommendations based on feedback from the community. Nelson Street received the most public comments regarding speeding, with 17 mentions highlighting it as a priority. Despite being relatively short in length, the frequency and volume of these concerns underscore the urgency for addressing speeding issues on Nelson Street. As such, there is a strong desire for traffic calming measures to be evaluated and implemented.

Several key community resources and destinations are located along Nelson Street including Nelson Beach and access to the Seaside Rail Trail, which generate significant multimodal activity (pedestrians and bicyclists), especially during the summer months. As such, it was expressed that there is a desire for safe pedestrian and bicycle facilities to allow for key connections along this corridor. While there are sidewalk facilities available, utility poles create accessibility issues and vehicles were observed parking on sidewalks. In addition, while a trail crossing with an activated RRFB is present for the Seaside Rail Trail crossing, a sharp horizontal curve drastically reduces sight lines for both pedestrians and motorists. This is further exacerbated by speeding.

This plan recommends a scoping study for all of Nelson Street to further identify and progress high impact improvements that would address safety, access, and connectivity for all users. Preliminary recommendations include installing speed feedback signage and permanent chicanes through raised features. This would maintain on-street parking in a sustainable way while also deterring vehicles from parking on sidewalks. In addition, the chicane effect would aid in slowing down vehicles along the corridor. It is also recommended that the study further progress the concept of raised crosswalks at the Seaside Trail as well as Water Street just south of the intersection of Nelson Street. Additional signage should also be considered as well as lighting and vegetation trimming to improve visibility as much as possible.

Figure 41. Nelson Street Deficiencies/ Requests



Since Nelson Street was the most referenced public concern, the project team took a deeper look at potential treatments.

Figure 42. Existing Condition

Nelson Street currently has two (2) overly wide travel lanes at 14' which are directionally separated via a double yellow centerline. There are no striped parking lanes.

The wide travel lanes in the existing condition encourage speeding. The yellow centerline and lack of striped parking lanes give the perception that there is not enough room for vehicles to park on the roadway and thus parking on sidewalks is observed.

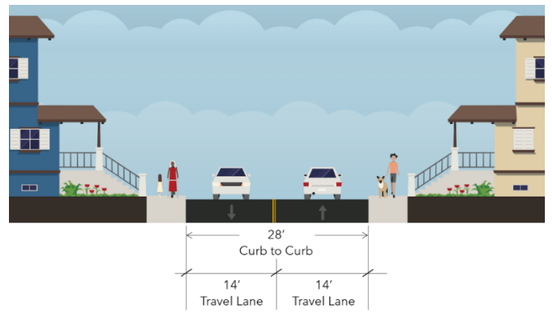


Figure 43. Street Space Reallocation

It is recommended that Nelson Street be reallocated to provide two (2) 10' travel lanes and an 8' parking lane. To help reduce vehicle speeds and provide dedicated parking spaces for residents, it is suggested that the parking alternates from side to side, creating chicanes.

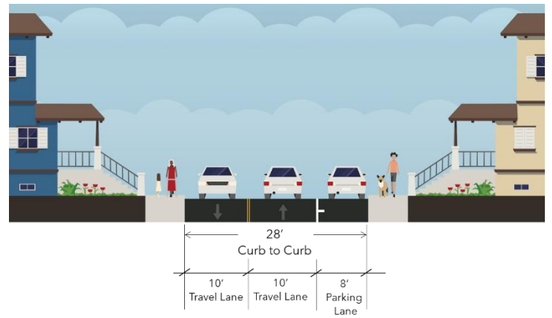


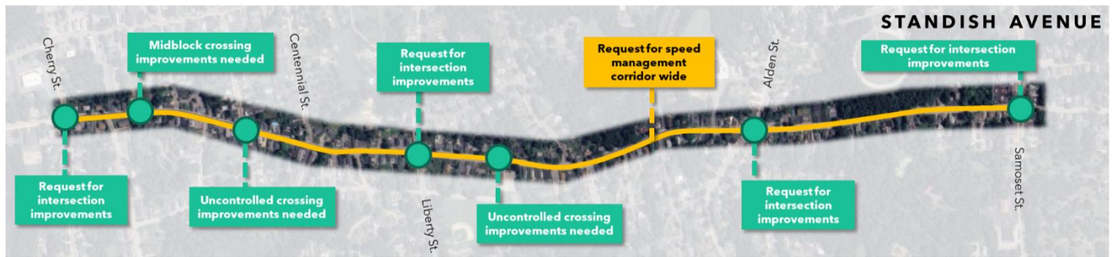
Figure 44. The plan view graphic below illustrates potential chicanes elements, strategically placed to slow down vehicles along the corridor while ensuring movements in/out of driveways.

Standish Avenue

Standish Avenue, a north-south connector running parallel to Route 3A, has raised significant community concerns regarding speeding, likely due to its use as a cut-through to bypass downtown traffic. These concerns are compounded by issues with pedestrian and bicycle safety, as vehicles are often parked on sidewalks to avoid being hit by passing cars. This behavior results in accessibility issues, especially given that on-street parking utilization varies along the street. The straight nature of Standish Avenue further exacerbates speeding issues. A detailed crash analysis indicates several intersections and segments experiencing high crash rates. As such, there is a strong desire from the community for traffic calming measures to be evaluated and implemented.

Standish Avenue, although primarily residential, also provides access to a busy corner store, two schools, and two parks. There are several uncontrolled crosswalks along Standish Avenue that lack visibility enhancements. Given the current condition of existing pedestrian facilities and the number of pedestrian generators, there is also a strong desire from the community for pedestrian safety improvements.

Figure 45. Standish Avenue Deficiencies/ Requests



As such, this plan recommends a scoping study to evaluate the highest impact improvements in terms of traffic calming and multimodal facilities along Standish Avenue. It is recommended that the project address problematic intersections.

- **Standish Avenue at Cherry Street -** The OCPC completed a study that recommended upgrading the antiquated signal equipment to overhead traffic signals for improved visibility. It is recommended that the Town implement the recommendations laid forth by the OCPC.
- **Standish Avenue at Alden Street** – As part of the crash analysis assessment, an all-way stop control was deemed not warranted due to existing volumes. The Town has produced plans to install curb extensions at the Alden Street intersection to reduce turning speeds, reduce crossing distances, and slow down vehicles. It is recommended that the Town move forward with those plans. In addition, the Town may consider the implementation of intersection conflict warning system (ICWS). ICWSs reduce the likelihood of collisions at dangerous two-way stop intersections by providing real-time warning to approaching drivers when cross traffic is present.
- **Standish Avenue at Liberty Street / Hall Street** – As part of the crash analysis assessment, it was recommended that the intersection be converted to all-way stop control. It is recommended that the Town implement this change along with curb extensions to slow down vehicles and help improve sight lines.
- **Standish Street at Hamilton Street** – Similarly to Alden Street, it is recommended that curb extensions be explored and implemented at this intersection.
- **Standish Avenue at Samoset Street**- It is recommended that the Town consider restricting right turns on red due to limited sight lines form the built environment.

As part of the initial crash assessment conducted, the full technical memo of which is included in the Appendix of this report, explored several cross-section options to help balance the needs of all road users along Standish Avenue. This included the following:

Figure 46. Option A
Option A would stripe the roadway to two 10' travel lanes and 8' parking lanes. While this may deter residents from parking on sidewalks, in areas where parking is sparse, this still results in a wide expanse of pavement and therefore speeding may persist.

Figure 47. Option B
Option B would chicane the parking along the corridor (i.e., periodically switching the side parking is located on and providing physical neckdowns on the other side to horizontally deflect travel and reduce speeds). In some scenarios, this may cause residents to park on the other side of their residence and have to cross the street. Therefore, parking locations should be thoughtfully considered regarding current parking patterns and ensure that crossings are enhanced along the corridor. In areas with neckdowns, the curb-to-curb width would narrow, reducing speeds along the corridor

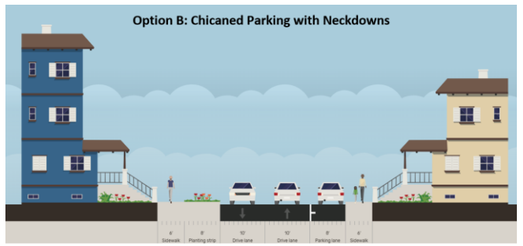


Figure 48. Option C
Option C would restrict parking to one side of the roadway and provide a SUP on the other side to accommodate the school traffic along the corridor. This would deter vehicles from parking on sidewalks as well as reduce the curb-to-curb width- reducing vehicle speeds along the corridor.

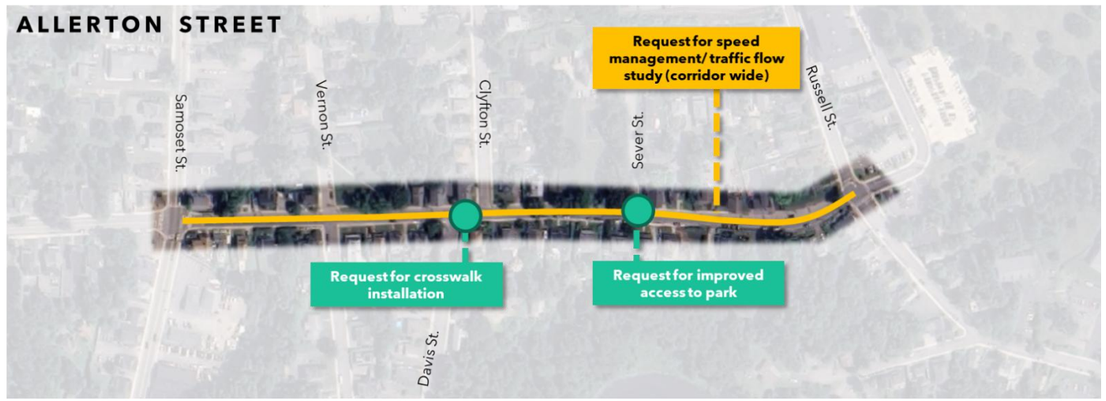
It is recommended that the scoping study build on these efforts to select measures that appropriately balances all users, residents and visitors alike.

Allerton Street

Allerton Street, a local north-south route running parallel to Route 3A, serves primarily residential areas but also provides access to Bates Park and Sever Park. Community members noted that there is a clear and present need for better accommodations for walkers and bikers along Allerton Street. In particular, there were requests to install a crosswalk at Davis Street/Clyfton Street to improve pedestrian safety and connectivity to/from neighborhoods to the west and the parks and downtown area to the east. Similarly, there is also a strong desire for traffic calming measures to be evaluated and implemented along Allerton Street. While the roadway is lower volume, residents note that there is regular speeding, likely by drivers utilizing Allerton to bypass downtown congestion. In addition to these considerations, there is a need to maintain on-street parking for residential and park usage. Crash data reveals crashes related to speeding and involving parked cars.

As such, this plan recommends that Allerton Street be revisited as a multimodal/slow street corridor through a scoping study effort. Recommendations may include implementing traffic calming measures such as chicanes via alternating on-street parking. On-street parking bays can be striped to deter driveway blocking and ensure adequate sight lines at crosswalks and intersections. Additionally, it is recommended that the centerline be removed to make the street operate more like a yield street to further enhance safety and accessibility. Where space permits, bump-outs may be installed to reduce crossing distances and further slowdown vehicles.

Figure 49. Allerton Street Deficiencies/ Requests

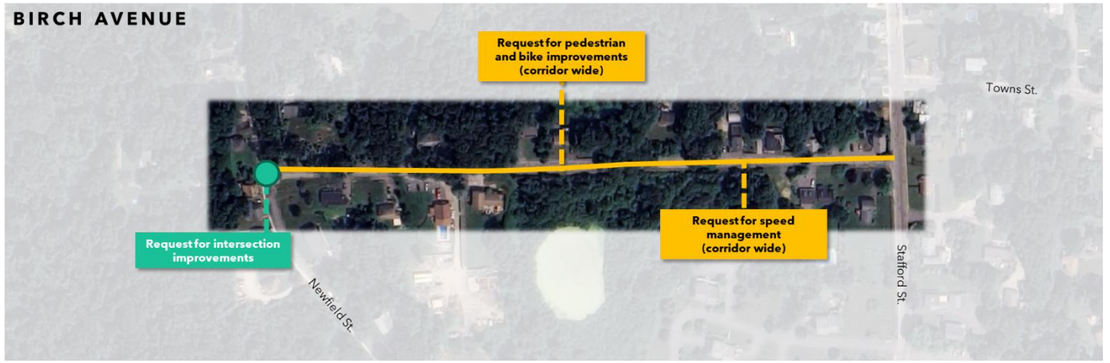


Birch Avenue

Birch Avenue is a local roadway with one-way northwest traffic flow and no dedicated pedestrian facilities. The street is wide for one-way operations and functions like a straightaway, exacerbating speeding issues. The public have identified Birch Avenue as experiencing speeding issues as well as pedestrian and bicycle safety concerns given the lack of dedicated facilities for multimodal users. In addition, the poorly marked intersection of Birch Avenue at Newfield Street leads to frequent wrong-way driving. Poor sightlines are also an issue at this intersection due to grading and vegetation in the northeast corner.

Given its potential to connect neighborhoods, parks and downtown and fill a gap in the sidewalk network, it is recommended that the Town further study the feasibility of installing sidewalks and speed management measures on Birch Avenue. Appropriate speed management measures may include speed feedback signage and neckdowns where space permits. Intersection improvements at Birch Avenue and Newfield Street are recommended including advanced signage informing of the one-way operations of Birch Avenue as well as tightening the Birch Avenue approach to deter wrong way driving and improve sight lines.

Figure 50. Birch Avenue Deficiencies/ Requests



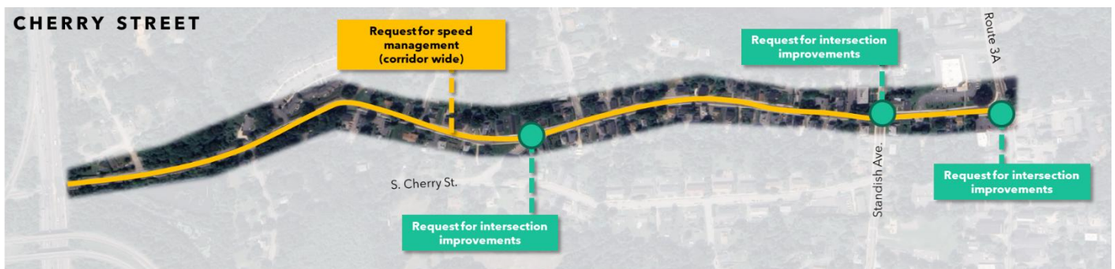
Cherry Street

Cherry Street, a major east-west route providing access from Route 3 to Route 3A, has been publicly identified as experiencing speeding issues. The roadway is narrow in several segments with multiple horizonal curves. Utility poles and trees are located close to the roadways and create accessibility issues for pedestrians. Several intersections along Cherry Street (Cherry Street at South Cherry Street, Cherry Street at Standish Avenue, and Cherry Street at Route 3A) have been identified as experiencing safety and/or operational issues.

It is recommended that a full study to evaluate the highest impact improvements in terms of traffic calming and multimodal facilities be undertaken for Cherry Street. In addition, it is recommended that the project address problematic intersections.

- **Cherry Street at Route 3A:** The intersection of Cherry Street at Route 3A is currently under construction to enhance safety and operations.
- **Cherry Steet at Standish Avenue:** The OCPC completed a study that recommended upgrading the antiquated signal equipment to overhead traffic signals for improved visibility. It is recommended that the Town implement the recommendations laid forth by the OCPC.
- **Cherry Street at South Cherry Street:** It is recommended that this intersection be tightened to reduce crossing distances and improve sight lines exiting South Cherry Street.

Figure 51. Cherry Street Deficiencies/ Requests

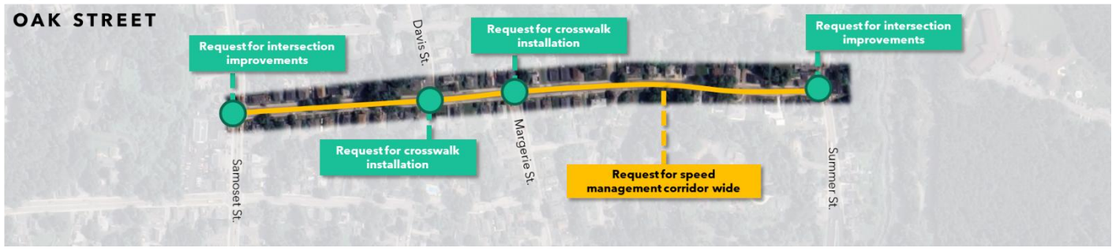


Oak Street

Oak Street, a north-south connector running parallel to Route 3A, has raised significant community concerns regarding speeding, likely due to its use as a cut-through to bypass downtown traffic from Route 3 via Samoset Street to the southern study area. These concerns are compounded by issues with pedestrian and bicycle safety, as vehicles are often parked on sidewalks to avoid being hit by passing cars. This behavior results in accessibility issues, especially given that on-street parking utilization varies along the street. The straight nature of Oak Street further exacerbates speeding issues. As such, there is a strong desire from the community for traffic calming measures to be evaluated and implemented. In addition, there were requests for a crosswalk to be installed along Oak Street just south of Davis Street. Curb ramps are present, but no crosswalk is actually marked giving pedestrians a false sense of security.

This plan recommends a scoping study for the Oak Street corridor to further identify and progress high impact improvements that would address safety, access and connectivity for all users. Preliminary recommendations include installing speed feedback signage to replace the non-functioning equipment present today and permanent chicanes through raised features. This would maintain on-street parking in a sustainable way while also deterring vehicles from parking on sidewalks. In addition, the chicane effect would aid in slowing down vehicles along the corridor. It is also recommended that the study further progress the feasibility of installing a marked crosswalk at the Davis Street intersection. This may be a good opportunity to implement a raised crosswalk to introduce a gradual vertical element along the corridor to further reduce speeds.

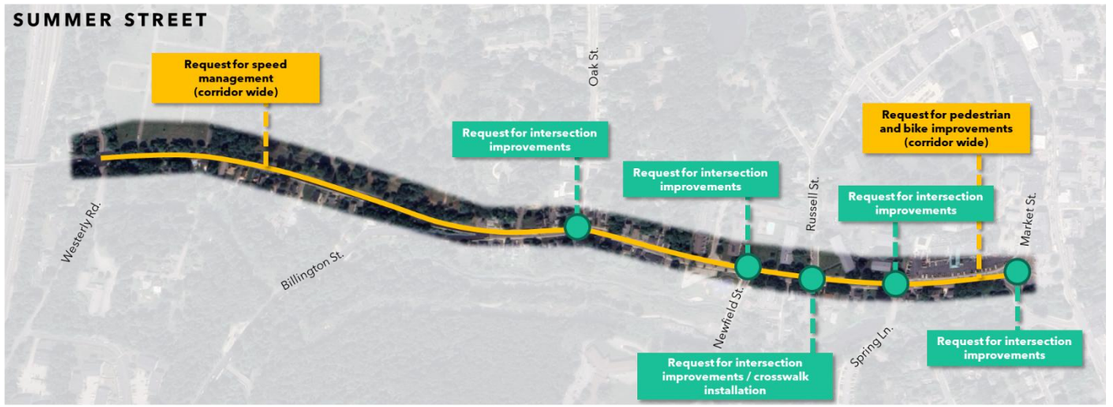
Figure 52. Oak Street Deficiencies/ Requests



Summer Street

Summer Street, a major east-west corridor, experiences speeding concerns and pedestrian safety issues. It serves as an access route to residential neighborhoods, historic landmarks, parks, and downtown areas. The street varies in context. The western segment from Route 3 to Oak Street is narrow with winding sections lacking on-street parking and utilities close to the roadway, causing accessibility issues. In addition, the narrowness and observed speeding result in an uncomfortable experience for pedestrians. East of Oak Street, Summer Street becomes more congested with on-street parking and frequent crossings. Crossings in this area are uncontrolled and often have poor sight lines due to parked vehicles and exhibit inconsistent signage. Summer Street experienced a few bicycle related crashes in this area as well, which is frequently used to access the Town Brook Trail as well as Holmes Park. There are no dedicated bicycle facilities provided along Summer Street and bikes were observed utilizing the sidewalks- which presents a significant safety hazard for both bikes and pedestrians. Given the varying context of the road, this plan recommends further study of Summer Street to provide an opportunity for targeted traffic calming measures and the development of a cohesive approach to accommodating walk and biking along the corridor. In addition, the plan should prioritize safety improvements at the intersection of Summer Street at Oak Street and the uncontrolled crosswalk just west of Oak Street which received numerous public mentions. Intersections at Russell Street, Spring Lane, and Newfield Street should be improved via tightening curve radii for reduced crossing distances, improved sight lines, and slower turning speeds.

Figure 53. Summer Street Deficiencies/ Requests



Water Street

Water Street provides access to the waterfront, historic landmarks, and retail. As such, the corridor experiences significant pedestrian and bicyclist activity along the waterfront, but the current prioritization of vehicles creates safety concerns. The section of Water Street from Brewster Street to the South Park Avenue roundabout is extremely wide, featuring parallel on-street parking on the retail side and head-in parking on the water side. Bike lanes are provided in each direction (providing access to the Seaside Rail Trail off of Nelson Street) and sidewalks are narrow considering the amount of foot traffic in the area. Due to the extremely wide curb to curb width, pedestrians face significant challenges, including long crossing distances, blocked sight lines due to parked vehicles, and the risk of speeding. In addition, bike and pedestrian conflicts are present due to the poorly marked bike lanes, especially on the water side. Head-in parking on onside results in vehicles backing out into the bike lanes, while parallel parking on the other side of the street can lead to dooring incidents when car doors open into the bike lane. It is recommended that the Town explore cross-section alternatives that prioritize walking and biking safety.

Figure 54. Water Street Deficiencies/ Requests

IMPLEMENT INTERSECTION IMPROVEMENTS

There were several intersections located outside of priority corridors and the potential Route 3A downtown project that were identified by the community as experiencing safety and/or operational issues.

Carver Street at Leyden Street

Carver Street intersects Leyden Street from the northwest. Both roads are one-way towards Route 3A and Carver Street approaches from an elevated grade. Carver Street is STOP controlled. The intersection is complex but could benefit from striping, enhanced signage, and a mirror to help Carver Street vehicles see approaching Leyden Street motorists.

Carver Street at Middle Street

Middle Street intersects Carver Street from the west. Middle Street is one-way towards Carver Street and is STOP sign controlled while Craver Street is free flowing in a southbound direction. Vegetation in the northwest corner in conjunction with the slight horizontal curve along Carver Street, restricts sight distance. In addition, the existing signage informing motorists of the one-way operations on both streets is lackluster and blocked by various obstructions, potentially resulting in wrong way driving on both streets. It is recommended that the Town initiate a project aimed at tightening curve radii where possible to improve sight lines, replace one-way signage and install advanced warning signage indicating prohibited turns.

Rodman Lane at West Street

It was reported that motorists traveling northbound on West Street infrequently stop at the intersection with Rodman Lane. West Street is under stop control but neither a STOP sign nor STOP bar is present. It is recommended that the Town install a STOP bar and STOP sign for the West Street approach.

South Street at Mount Pleasant Street

The current intersection is a "K" type intersection where South Street runs free-flowing in a north-south direction, while Mount Pleasant Street and South Street intersect from the northeast and southeast, respectively. This configuration results in inherent confusion regarding which side street has the right-of-way, as well as an extremely long crosswalk along the two side streets which provides access to the park in the southeast corner. It is recommended that the Town explore potential reconfigurations of the intersection. A potential treatment would involve "T-ing" up both side street intersections with South Street. This would involve introducing a center island which would help facilitate turning movements and reduce crossing distances.

South Stret at Nook Road/Bradley Lane

Nook Road and Bradley Lane intersect South Street from the east and west, respectively, to form a four-way intersection. Nook Road and Bradley Slane are STOP controlled while South Street is free-flowing. The intersection itself presents wide sweeping turns. As a result, the crosswalks along the east and west approaches are excessively long. It is recommended that the Town consider tightening the curve radii where feasible to reduce crossing distances and slow down turning vehicle speeds. This may be done with striping, if necessary, to ensure trucks can still maneuver throughout the intersection.

South Street at Stafford Street/Mayflower Street

The Intersection of South Street at Stafford Street and Mayflower Street is another "K" type intersection. South Street operates free-flowing in a north-south direction while Stafford Street and Mayflower Street intersect from the southwest and northwest, respectively, both of which are under STOP control. The "K' type configuration results in an inherent confusion as to who has the right-of-way and several unnecessary conflict points. The Town is recommended to explore reconfiguration options to streamline operations, improve safety, and reduce crossing distances for pedestrians. Potential reconfiguration options are presented in Figure 55.

Westerly Road at Alden Street

Alden Street intersects Westerly Road from the northeast. Directional travel on Alden Street at the intersection is separated via a raised center median, which essentially creates two intersections of Westerly Road at Alden Street and a Y intersection for the Alden Stret traffic. This results in several conflict points (merging and lack of defined traffic control). It is recommended that the Town initiate a project to reconfiguration the geometry at the intersection. This may include removing the center island median and Ting up the intersection. This would likely require relocation of a utility pole (currently located in the median island) and coordination to facilitate two driveways on Alden Street close to the intersection. Reconfiguration has the potential to remove conflict points and improve the flow of the pedestrian network.

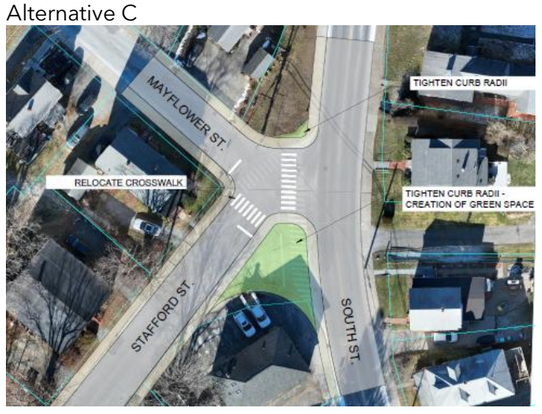
To enhance safety and functionality, it is recommended that each identified intersection be progressed towards project development. Potential improvements include tightening curve radii to slow down turning vehicles and reduce pedestrian crossings where feasible to still facilitate heavy truck turning radii. Traffic calming measures, such as curb extensions and raised intersections, may also be introduced to slow down traffic and enhance safety for all users. Each intersection should be further evaluated to determine the most effective combination of modifications to address its unique challenges and needs.

Figure 55. Potential Intersection Improvement Concepts – South Street at Mayflower Street /Stafford Street

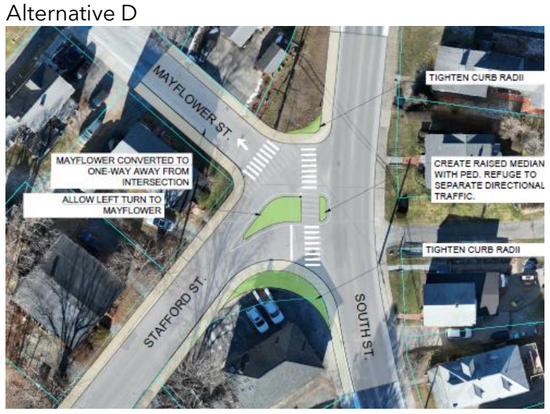
Alternative A

Alternative B

Alternative C



Alternative D



ENHANCE PEDESTRIAN CROSSWALKS

Outside of the priority corridors, there were several pedestrian crossings that were identified by the community as experiencing safety issues. They are as follows:

- Alden Street north of Allerton Street
- Allerton Stret at National Monument
- Carver Street north of North Street
- Pleasant Street east of Franklin Street
- Spooner Street south of Forest Avenue
- Spooner Street north of Park Road

All of these crosswalks are uncontrolled. In the short term, it is recommended that high visibility crosswalks (new pavement markings, signage at and in advance of the crosswalk in both directions) be implemented.

Figure 56. Example of Crosswalk Enhancement at Pleasant Street at Training Green

IMPLEMENT SPEED MANAGEMENT MEASURES

Outside of the priority corridors, several lower-volume local roadways have been identified by community feedback as experiencing significant speeding issues. They are as follows:

- Leyden Street
- Mayflower Street
- Muster Field Road
- Newfield Street
- Spooner Street
- Stafford Street
- Towns Street
- Westerly Road

It is recommended that the Town consider installing appropriate speed management measures on each of these roadways, some of which could be implemented on a trial basis. The town is recommended to refer to the speed management tools presented in Chapter 4 to select the most effective solutions for each specific roadway.

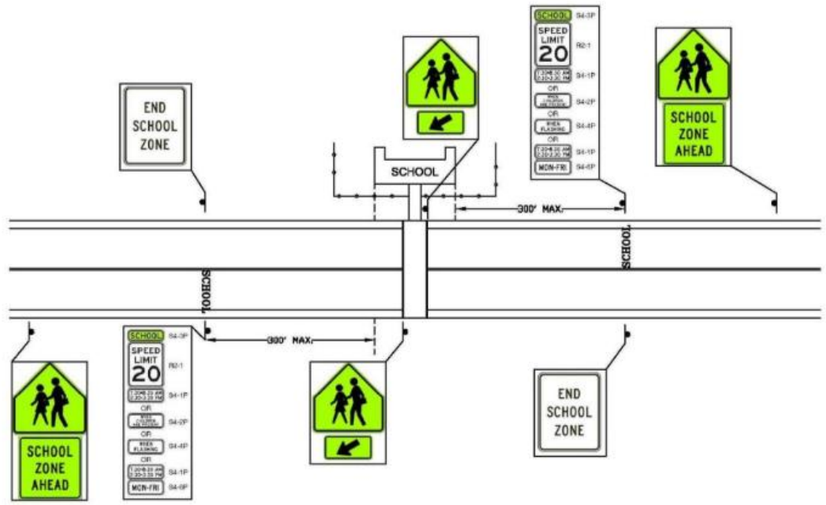
UPGRADE/ESTABLISH SCHOOL ZONES

It Is recommended that the Town implement a project to upgrade or establish school zones where warranted. The study area includes the following school zones:

- Hedge Elementary School – Standish Avenue/Cherry Street
- Cold Spring School – Alden Street / Standish Avenue
- Nathaniel Morton Elementary School – Bradford Street / Lincoln Street / Sandwich/ Union
- Plymouth North High Schools – Nook Road

MassDOT provides guidelines through the Safe Routes to School (SRTS) program regarding school zone related signs and striping. An example school zone is depicted graphically below. In addition to the 20 MPH speed signage, the Town is recommended to install speed feedback signage.

Figure 57. MassDOT School Zone



TRAIL IMPROVEMENTS/EXTENSION

There is public desire to improve trail conditions and accessibility along Brewster Garden Trail and Town Brook Trail. In addition, there is a desire to explore further extension of the Seaside Rail Trail given that MBTA service has been suspended at the Plymouth station. It is recommended that the Town consider initiatives to maintain and improve existing trails as well as work with the MBTA to conduct a feasibility study aimed at further extending the Seaside Rail Trail.

PROGRESS FEASIBLE ONE-WAY STREET CONVERSIONS

It is recommended that streets deemed feasible for one-way conversions be further explored to gain support from abutters. Public feedback on one-way operations has been very mixed. Therefore, it is suggested that the town establish a process to set a standard percentage of abutters in favor of the change before implementing a traffic flow alteration. Additionally, it is recommended that any changes be made on a trial basis before permanent implementation.

To temporarily convert two-way traffic to one-way, the Town is recommended to install temporary infrastructure such as signage, cones, and barriers to guide traffic and prevent wrong-way entry. Changes should be communicated clearly to the public through various channels. Following temporary installation, the Town is recommended to monitor traffic flow closely, paying special attention to safety and access concerns, and collect feedback from residents to evaluate the impact. Based on these observations and feedback, the Town is recommended to make adjustments as necessary before making one-way traffic flow permanent.

FILL THE GAPS

In examining the existing multimodal network, several key corridors were identified as lacking facilities that could help connect residents and visitors to important destinations including schools, parks, rail trails, and retail areas. Introducing or improving key multimodal connections can help alleviate traffic congestion, improve safety, and encourage more walking and biking thus creating a more sustainable community. They are as follows:

- **Atlantic Avenue** – There is sidewalk along the southern side of Atlantic Avenue but abruptly stops approximately 250 feet west of Atlantic Street which provides connection to the Seaside Rail Trail. It is recommended that the Town further investigate the feasibility of extending the sidewalk to complete the network.
- **Atlantic Street** – Similarly, there is sidewalk along the western side of Atlantic Street, but it abruptly ends approximately 100 feet south of Atlantic Avenue, it is recommended that the Town evaluate the feasibility of connecting the network for better access to the Seaside Rail Trail.
- **Hedge Road** – There are currently no sidewalks or bicycle facilities along Hedge Road which is a key connection from Route 3A to the start of the Seaside Rail Trail. It is recommended that the Town initiate a project to install pedestrian and bicycle facilities on the road. This may be sidewalks and on-street bike facilities or possibly the installation of a shared use path.
- **Lothrop Street** – While there is sidewalk along both sides for most of its length, Lothrop Street lacks bike facilities. Lothrop Street is a critical connector to the Seaside Rail Trail at its terminus from Water Street and Route 3A. The Town is recommended to consider bicycle connection facilities.
- **Ocean View Avenue** - Ocean View Avenue currently has no sidewalk yet provides direct access from residential neighborhoods to Siever Field. It is recommended that the Town reevaluate the cross section from Nicks Rock Road to Liberty Street to provide dedicated space for pedestrians on at least one side of the street.
- **Robbins Road** – There is no sidewalk or bike facilities provided along Robbins Road which provides a connection to the Seaside Rail Trail at its eastern terminus and Holmes Reservation to the south. It is recommended that the Town initiate a project to install pedestrian and bicycle facilities on the road. This may be sidewalks and on-street bike facilities or possibly the installation of a shared use path.
- **Sever Street** – There is currently dispersed sidewalk in poor condition along Sever Street which provides access from downtown to the Sever Street Park/Playground. It is recommended that the Town consider reconstructing sidewalk in a uniform and consistent manner to improve connectivity to the park.
- **South Cherry Street** – There is no sidewalk along South Cherry Street south of Cordage Terrace Extension. South Cherry Street provides access to Holy Ghost Field, which hosts several events throughout the year. The is recommended to study the feasibility of installing sidewalk on South Cherry Street at least from Cordage Terrace Extension to the field for better connectivity from residential neighborhoods and downtown.
- **Union Street** – Sidewalk is provided along the southern side of Union Street but its major attractions (the harbor and yacht club, are located on the northern side. This represents a key missing link in the pedestrian network. It is recommended that the Town initiate a project to implement sidewalk along the northern side of Union Street, where people are observed walking today, regardless of the lack of facilities.

While there are additional local, very low volume roadways that also lack sidewalks, it is recommended that the Town put focus first on high pedestrian activity areas and place emphasize on creating connections to existing off-street facilities such as the Seaside Rail Trail.

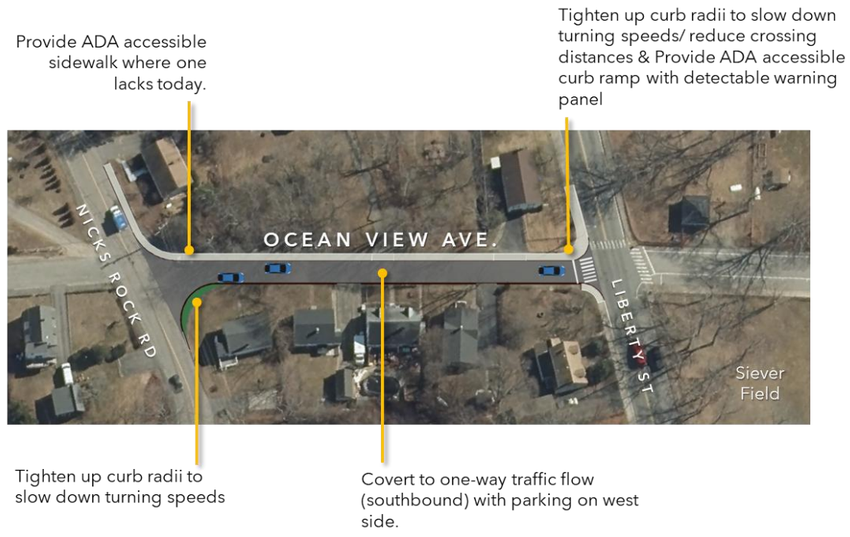


Figure 58. Example of One-Way Conversion/Sidewalk Installation on Ocean View Avenue

07 IMPLEMENTATION PLAN

The Plymouth Center & North Plymouth Circulation and Mobility Study provides a set of recommendations intended to create safe and accessible streets for all users, expand travel options, support growth and quality of life through improved public spaces and walkability, and provide predictable, safe and reliable travel for all modes. Implementing these recommendations will require coordination and persistence among the town, its residents, and key stakeholders.

IMPLEMENTATION STEPS

Project Development Process

The recommendations within this plan vary significantly in terms of scale, cost, and general ease of implementation. Overall, the successful execution of the recommendations hinges on a well-defined strategy. Below are the general steps for implementation:

- Identify Project Need
  - Assess and prioritize the most critical areas requiring improvement.
  - Engage with community members and stakeholders to validate needs and gather input.
- Initiative Project Scoping
  - Define project objectives, scope, and deliverables.
  - Conduct preliminary studies and gather necessary data.
- Seek Funding
  - Identify potential funding sources.
  - Prepare and submit funding applications and proposal as necessary.
- Permitting and Design
  - Develop detailed design plans, estimates, and specifications.
- Construction
  - Implement the construction phase.
  - Monitor progress and make adjustments as needed.

Some of the smaller scale recommendations may be undertaken by Town staff and resources such as simple pedestrian accessibility improvements, signing and striping, and traffic calming improvements. However, the implementation of large-scale infrastructure projects such as a Route 3A Corridor Revitalization project and similar Priority Corridors would occur in phases.

Timeframes & Planning Level Cost Estimates

The plan identifies three general timeframes for project implementation:

- Short Term – 0 to 5 Years
- Medium-Term – 6 to 10 Years
- Long Term – 10+ Years

Planning level cost estimates were developed for each project and include typical planning phase contingencies and account for inflation assuming 4% over a five year period. The planning level cost estimates are broken down in three categories:

- Low-Cost – Less than $100,000
- Medium-Cost - $100,000 - $500,000
- High-Cost - $500,000+

It is important to note that timeframes and planning level cost estimates are subject to change.

PRIORITIZATION PROCESS

Developing an actionable and implementable plan for the Town of Plymouth requires a holistic approach inclusive of data review and analysis, a synthesis of input from the community, and a review of past plans and studies. A successful plan merges what was learned from these efforts into a public input and data-backed list of plan recommendations, evaluated and prioritized from a set of criteria built from these same ideas.

Developing Evaluation Criteria

Evaluation criteria for prioritization were derived from comprehensive community engagement and a thorough review of past plans and studies. Residents provided valuable input on the future of the study are through multiple touchpoints and tools, which are summarized in Chapter 3. The use of targeted questions and map-based input strategies facilitated a broad range of feedback from the public. While this input varied widely, extensive review revealed common themes, such as the importance of safety, the need for a well-connected and safe pedestrian network, and strategies to address traffic flow. Revisiting past studies and efforts was also necessary to ensure this plan aligns and builds off of the Town's previous goals and recommendations.

Synthesizing these key takeaways from community engagement and the review of past town plans and studies led to the development of the following evaluation criteria to assess the extensive list of desired projects and initiatives:

Safety - Assessing the potential of each project to reduce crashes and enhance the safety of all road users, including pedestrians, cyclists, and motorists.

Gap Analysis - Assessing the potential of each project to address gaps in the existing transportation network, particularly where connectivity and accessibility are lacking.

Community Hot Spot - Incorporating feedback from community members and stakeholders to ensure the projects address local concerns and needs.

Cost/Timeframe - Considering financial feasibility and the time required to complete each project.

Multimodal Demand - Evaluating a project's ability to serve demand for various modes of transportation, including walking, cycling, public transit, and driving.

Key Roadways – Focusing on projects that impact major roadways with high traffic volumes, as improvements here can significantly enhance overall mobility and safety.

Equity – Ensuring projects promote equitable access to transportation options for all community members, including vulnerable populations.

Supporting Documents – Aligning project selection with existing plans, studies, and policy documents that outline long-term transportation goals.

Prioritization of Recommendations

The following table represents the application of the evaluation criteria to the final list of identified projects. The results of this process are not intended to represent the order in which these recommendations should be completed or implemented, but rather to help inform project funding and future implementation of the recommendations. Community needs and support, feasibility, permitting, engineering complexity, and funding source availability are all equally, if not more, important than the prioritization represented below. Please note that project descriptions are visions without any engineering or technical analyses performed, meaning that cost estimates, timelines, and overall feasibility may change depending on the finalization of project scopes and further engineering.

Table 6. Projects Prioritized

Priority	Score	Project Name	Project Description	Next Step	Timeframe	Planning Level Cost Estimate
1	**25.5**	Route 3A Corridor Scoping Study	Route 3A varies in context throughout the study area, playing more of a gateway role at the study area outer extents and traversing through the downtown area in the heart of the study area. Some areas have known safety issues and crossing treatments are inconsistent throughout. Route 3A runs parallel to the Seaside Rail Trail and Water Street bike lanes but no bike facilities or connections are provided along Route 3A. As such, a corridor scoping study is recommended to target engagement and conduct a thorough alternatives evaluation regarding cross sectional changes to help balance all road users.	Scoping	Scoping: Medium Design & Construction - Long	High ~ $24,540,000
2	**23.5**	Downtown Area Multimodal Safety Improvements	Inconsistent crossing treatments, lack of bike facilities/connections, high traffic volumes, and known safety concerns throughout the area are among several reasons this Plan is recommending the Town implement a Downtown Area Multimodal Safety Improvement Study. The Study will provide the opportunity to address several problematic intersections (Route 3A at Water Street/Sandwich Street, Sandwich Street at Pleasant Street, Pleasant Street at Robinson Street, Market Street at Summer Street, Market Street at Town Square) as well as improve crossings and enhance the streetscape along the Route 3A corridor from Samoset Street to South Street. This project is aimed to address the Pedestrian Crash Cluster within the downtown area, improve walkability/connectivity, improve safety for all users, and improve public spaces.	Scoping	Design & Construction – Short to Medium	High ~ $6,820,000 Roadway Construction Included ~ $1,690,000 Short Term Improvements
3	**23.5**	Water Street Corridor Scoping Study	Water Street provides access to the waterfront, historic landmarks, and retail. As such, the corridor experiences significant pedestrian and bicyclist activity along the waterfront, but the current prioritization of vehicles creates safety concerns. It is recommended that the Town conduct a scoping study that will allow for targeted community engagement and a thorough alternatives evaluation aimed at prioritizing walking and biking safety and mobility.	Scoping	Scoping: Short Design & Construction – Medium to Long	High ~ $4,650,000
4	**22**	Summer Street Corridor Scoping Study	Summer Street, a major east-west corridor, experiences speeding concerns and pedestrian safety issues. It serves as an access route to residential neighborhoods, historic landmarks, parks, and downtown areas. The street varies in context. Given the varying context of the road, this plan recommends further study of Summer Street to provide an opportunity for targeted traffic calming measures and the development of a cohesive approach to accommodate walking and biking along the corridor. It is recommended that the study prioritize safety improvements at the intersection of Summer Street at Oak Street and the uncontrolled crosswalk just west of Oak Street which received numerous public mentions. In addition, it's recommended that the study provide opportunities to address other problematic intersections and crossings along the corridor.	Scoping	Scoping: Medium Design & Construction - Long	High ~ $5,220,000 Roadway Construction ~ $410,000 Short Term Improvements
5	**20.5**	Standish Avenue Corridor Scoping Study	Standish Avenue, a north-south connector running parallel to Route 3A, has raised significant community concerns regarding speeding, likely due to its use as a cut-through to bypass downtown traffic. These concerns are compounded by issues with pedestrian and bicycle safety, as vehicles are often parked on sidewalks to avoid being hit by speeding cars. This plan recommends a scoping study to evaluate the highest impact improvements in terms of traffic calming and multimodal facilities along Standish Avenue. It is recommended that the project address problematic intersections (Standish Avenue at Cherry Street, Standish Avenue at Alden Street, Standish Avenue at Liberty/Hall Street, Standish Avenue at Hamilton Street, Standish Avenue at Samoset Street) as well as enhance crosswalks along the corridor. The study is recommended to explore cross sectional options to help balance the needs of all road users and help calm traffic through traffic calming and speed management measures.	Scoping	Scoping: Short Design & Construction - Medium	High ~ $9,120,000 Roadway Construction ~ $180,000 Short Term Improvements

Priority	Score	Project Name	Project Description	Next Step	Timeframe	Planning Level Cost Estimate
6	20	Nelson Street Corridor Scoping Study	Nelson Street is highlighted as a priority corridor to receive additional study to provide recommendations based on feedback from the community. Nelson Street received the most public comments regarding speeding, with 17 mentions highlighting it as a priority. This plan recommends a scoping study for all of Nelson Street to further identify and progress high impact improvements that would address safety, access, and connectivity for all users. Preliminary recommendations include installing speed feedback signage and permanent chicanes through raised features. This would maintain on-street parking in a sustainable way while also deterring vehicles from parking on sidewalks. In addition, the chicane effect would aid in slowing down vehicles along the corridor. It is also recommended that the study further progress the concept of raised crosswalks at the Seaside Trail as well as Water Street just south of the intersection of Nelson Street. Additional signage should also be considered as well as lighting and vegetation trimming to improve visibility as much as possible.	Scoping	Scoping: Short Design & Construction - Medium	High ~ $1,450,000 Roadway Construction ~ $180,000 Short Term Improvements
7	19	Cherry Street Corridor Scoping Study	The Cherry Street corridor is recommended for a scoping study. Such a study will allow for targeted community engagement and an alternatives evaluation process to improve multimodal safety and mobility along the corridor. In addition to addressing problematic intersections, the plan should also evaluate the highest impact improvements in terms of traffic calming and multimodal facilities (pedestrian and bike facilities) to address known accessibility issues.	Scoping	Scoping: Medium Design & Construction - Long	High ~ $4,690,000 Roadway Construction ~ $600,000 Short Term Improvements
8	18	Implement Traffic Calming/Speed Management Measures - Leyden Street	It is recommended that the Town consider and implement traffic calming/speed management measures on Leyden Street.	Design & Construction	Design & Construction - Short	Low ~ $40,000
9	16.5	Implement Intersection Improvements - Carver Street at Leyden Street	This plan recommends that the Town consider and implement intersection improvements at the intersection of Carver Street at Leyden Street. Improvements may include striping, enhanced intersection ahead signage, and a mirror to help Carver Street vehicles see approaching Leyden Street vehicles.	Design & Construction	Design & Construction - Short	Low ~ $10,000
10	16.5	Implement Intersection Improvements - Carver Street at Middle Street	This plan recommends that the Town consider and implement intersection improvements at the intersection of Carver Street at Middle Street such as tightened curve radii where possible to improve sight lines, replacement of one-way signage and installation of advanced warning signage indicating prohibited turns.	Design & Construction	Design & Construction - Short	Low ~ $100,000
11	16.5	Oak Street Corridor Scoping Study	Oak Street, a north-south connector running parallel to Route 3A, has raised significant community concerns regarding speeding, likely due to its use as a cut-through to bypass downtown traffic from Route 3 via Samoset Street to the southern study area. These concerns are compounded by issues with pedestrian and bicycle safety, as vehicles are often parked on sidewalks to avoid being hit by passing cars. This plan recommends a scoping study for the Oak Street corridor to further identify and progress high impact improvements that would address safety, access and connectivity for all users. Preliminary recommendations include installing speed feedback signage (to replace the existing non-functioning equipment) and permanent chicanes through raised features. This would maintain on-street parking in a sustainable way while also deterring vehicles from parking on sidewalks. In addition, the chicane effect would aid in slowing down vehicles along the corridor. It is also recommended that the study further progress the feasibility of installing a marked crosswalk at the Davis Street intersection. This may be a good opportunity to implement a raised crosswalk to introduce a gradual vertical element along the corridor to further reduce speeds.	Scoping	Scoping: Short Design & Construction - Medium	High ~ $2,480,000 Roadway Construction ~ $280,000 Short Term Improvements
12	15.5	Implement Pedestrian / Bicycle Infrastructure (Seaside Rail Trail Connection) - Lothrop Street	It is recommended that the Town consider and install sidewalk along the southern side of Lothrop Street (Murray Street to Water Street) for improved access to public parking and the Seaside Rail Trail. In addition, it is recommended that the Town consider the feasibility of installing a crosswalk along Lothrop Street at the Seaside Rail Trailhead to connect to the public parking lot opposite of the Seaside Rail Trailhead.	Design & Construction	Design & Construction - Short	High~ $1,010,000 Roadway Construction

Priority	Score	Project Name	Project Description	Next Step	Timeframe	Planning Level Cost Estimate
13	15.5	Implement Intersection Improvements - Samoset Street at Allerton Street	This plan recommends that the Town consider and implement intersection improvements at the intersection of Samoset Street at Allerton Street such as tightened curve radii where possible to improve sight lines and potential installation of an overhead blinking yellow/red light to enhance visibility of the intersection.	Design & Construction	Design & Construction - Short	High ~ $580,000
14	15	Implement Intersection Improvements - South Street at Mount Pleasant Street	This plan recommends that the Town consider and implement intersection improvements at the intersection of South Street at Mount Pleasant Street. It is recommended that the Town explore potential reconfigurations of the intersection. A potential treatment would involve "T-ing" up both side street intersections with South Street. This would involve introducing a center island which would help facilitate turning movements and reduce crossing distances.	Design & Construction	Design & Construction - Short	High ~ $1,080,000
15	14.5	Downtown Connector Sidewalk Reconstruction	It is recommended that the Town prioritize sidewalk reconstruction along its downtown connector streets where conditional and accessibility issues are of concern. This includes Memorial Drive, Chilton Street, Howland Street, Brewster Street, North Street, Carver Street, Leyden Street, and Bradford Street.	Design & Construction	Design & Construction – Short/Medium	High ~ $4,770,000
16	14	Improve Pedestrian Crossing and Accessibility at Carver Street north of North Street	It is recommended that the Town enhance the crossing across Alden Street north of Allerton Street. This may include curb extensions to reduce the crossing distance, potential relocation, and high visibility signage and markings.	Design & Construction	Design & Construction - Short	Low ~$50,000
17	13.5	Progress Conversion to One-way Traffic Flow and Install Sidewalk - Ocean View Avenue	There is a desire for a safe and separate walking connection between residential neighborhoods and Siever Park. This plan recommends that the Town work to install a sidewalk on one side of Ocean View Avenue. In addition, it is recommended that the Town further engage the residents of Ocean View Avenue to move forward with converting the road from two-way operations to one-way operations. Should residents be in agreement, the Town may implement the change on a trial basis before committing to a permanent change in traffic flow.	Design & Construction	Design & Construction - Short	High ~ $550,000
18	13.5	Implement Traffic Calming/ Speed Management Measures along South Street	It is recommended that traffic calming/speed management measures be considered and implemented along South Street.	Design & Construction	Design & Construction - Short	Medium ~$260,000
19	13.5	Implement Intersection Improvements - South Street at Nook Road	This plan recommends that the Town consider and implement intersection improvements at the intersection of South Street at Nook Road. It is recommended that the Town consider tightening the curve radii where feasible to reduce crossing distances and slow down turning vehicle speeds. This may be done with striping, if necessary, to ensure trucks can still maneuver throughout the intersection.	Design & Construction	Design & Construction - Short	Low ~$90,000
20	13	Implement Low Cost Parking Chicanes and Consider Additional Traffic Calming/Speed Management Measures - Hall Street	While one-way operations on Hall Street are not recommended at this time, it is recommended that the Town consider installing chicaned parking (stripping parking alternating from one side to the other) to create a chicane like effect and help calm traffic. In addition, the town may also consider the implementation of additional traffic calming/speed management measures such as dynamic speed feedback signage.	Design & Construction	Design & Construction - Short	Medium ~$170,000
21	13	Implement Low Cost Parking Chicanes and Consider Additional Traffic Calming/Speed Management Measures - Olmstead Terrace	It is recommended that the Town consider removing the centerline on Olmstead Terrace and installing chicaned parking (stripping parking alternating from one side to the other) to create a chicane like effect and help calm traffic. In addition, the town may also consider the implementation of additional traffic calming/speed management measures such as dynamic speed feedback signage.	Design & Construction	Design & Construction - Short	Medium ~$170,000
22	13	Implement Pedestrian / Bicycle Infrastructure (Seaside Rail Trail Connection) - Robbins Road	It is recommended that the Town consider the feasibility of installing pedestrian and bicycle facilities along Robbins Road to provide connections to the Seaside Rail Trail.	Design & Construction	Design & Construction - Short	High ~$1,220,000

Priority	Score	Project Name	Project Description	Next Step	Timeframe	Planning Level Cost Estimate
23	13	Implement Intersection Improvements - Westerly Road at Alden Street	This plan recommends that the Town consider and implement intersection improvements at the intersection of Westerly Road at Alden Street. It is recommended that the Town initiate a project to reconfigure geometry at the intersection. This may include removing the center island median and Ting up the intersection. This would likely require relocation of a utility pole (currently located in the median island) and coordination to facilitate two driveways on Alden Street close to the intersection. Reconfiguration has the potential to remove conflict points and improve the flow of the pedestrian network.	Design & Construction	Design & Construction - Short	High ~$850,000
24	12.5	Implement Low Cost Intersection Improvements - Freemont Street at Union Street	It is recommended that the Town implement low-cost intersection improvements such as advanced stop sign ahead signage to reduce stop sign running.	Design & Construction	Design & Construction - Short	Low ~$10,000
25	12.5	Implement Traffic Calming/ Speed Management Measures along Spooner Street	It is recommended that traffic calming/speed management measures be considered and implemented along Spooner Street.	Design & Construction	Design & Construction - Short	Low ~$70,000
26	12	Birch Street Corridor Scoping Study	The Birch Street corridor is recommended for further project scoping. Given its potential to connect neighborhoods, parks and downtown and fill a gap in the sidewalk network, it is recommended that the Town further study the feasibility of installing sidewalks and speed management measures on Birch Avenue. Appropriate speed management measures may include speed feedback signage and neckdowns where space permits. Intersection improvements at Birch Avenue and Newfield Street are recommended including advanced signage informing of the one-way operations of Birch Avenue as well as tightening the Birch Avenue approach to deter wrong way driving and improve sight lines.	Scoping	Scoping: Short Design & Construction - Medium	High ~$1,190,000
27	12	Implement Pedestrian / Bicycle Infrastructure (Seaside Rail Trail Connection) - Hedge Road	There are currently no sidewalks or bicycle facilities along Hedge Road, which is a key connection from Route 3A to the start of the Seaside Rail Trail. It is recommended that the Town initiate a project to install pedestrian and bicycle facilities on the road. This may be sidewalks and on-street bike facilities or possibly the installation of a shared use path.	Design & Construction	Design & Construction - Short	High ~$1,390,000
28	12	School Zone Enhancements	It is recommended that the Town implement School Zone enhancements surrounding schools in the study area and in particular add school zone signage, equipped with feedback signage, to help slow speeds on adjacent roads. In addition, the Town may consider additional pedestrian crossing improvements at crosswalks servicing the schools.	Design & Construction	Design & Construction - Short	High ~$540,000
29	12	Improve Pedestrian Crossing and Accessibility at Pleasant Street / Training Green Crosswalk	It is recommended that the Town enhance the crossing across Pleasant Street at the Training Green. This may include curb extensions to reduce the crossing distance and help slow down vehicles in addition to an RRFB.	Design & Construction	Design & Construction - Short	Medium ~$140,000
30	12	Implement Intersection Improvements - South Street at Stafford Street / Pleasant Street	This plan recommends that the Town consider and implement intersection improvements at the intersection of South Street at Stafford Street / Pleasant Street. The Town is recommended to explore reconfiguration options to streamline operations, improve safety, and reduce crossing distances for pedestrians.	Design & Construction	Design & Construction - Short	High ~$1,150,000
31	11.5	Implement Low Cost Parking Chicanes and Consider Additional Traffic Calming/Speed Management Measures – Mayflower Street	While one-way operations on Mayflower Street are not recommended at this time, it is recommended that the Town consider installing chicaned parking (stripping parking alternating from one side to the other) to create a chicane like effect and help calm traffic. In addition, the town may also consider the implementation of additional traffic calming/speed management measures such as dynamic speed feedback signage.	Design & Construction	Design & Construction - Short	Medium ~$140,000
32	11.5	Improve Pedestrian Crossing and Accessibility at Alden Street north of Allerton Street	It is recommended that the Town enhance the crossing across Alden Street north of Allerton Street. This may include curb extensions to reduce the crossing distance and high visibility signage and markings.	Design & Construction	Design & Construction - Short	Low ~$90,000

Priority	Score	Project Name	Project Description	Next Step	Timeframe	Planning Level Cost Estimate
33	11.5	Seaside Rail Trail Improvements and Future Extension	There is a desire to further extend the Seaside Rail Trail given that MBTA service has been suspended. It is recommended that the Town work with MassTrails and the MBTA to consider the feasibility of a future extension of the facility.	Scoping	Scoping: Short Design & Construction – Medium/Long	High ~$7,680,000
34	11.5	Sidewalk Installation - South Cherry Street	There is no sidewalk along South Cherry Street south of Cordage Terrace Extension. South Cherry Street provides access to Holy Ghost Field, which hosts several events throughout the year. The town is recommended to study the feasibility of installing sidewalks on South Cherry Street at least from Cordage Terrace Extension to the field for better connectivity from residential neighborhoods and downtown.	Design & Construction	Design & Construction - Short	High ~$670,000
35	11.5	Sidewalk Installation - Union Street	Sidewalk is provided along the southern side of Union Street but its major attractions (the harbor and yacht club), are located on the northern side. This represents a key missing link in the pedestrian network. It is recommended that the Town initiate a project to implement sidewalk along the northern side of Union Street, where people are observed walking today, regardless of the lack of facility.	Design & Construction	Design & Construction - Short	High ~$720,000
36	11.5	Implement Traffic Calming/ Speed Management Measures along Westerly Road	It is recommended that traffic calming/speed management measures be considered and implemented along Westerly Road. This includes improvements at the intersection of Westerly Road at Liberty Street in which speeding is often carried into the intersection posing significant safety risks.	Design & Construction	Design & Construction - Short	Medium $170,000
37	11	Allerton Street Corridor Scoping Study	Allerton Street is being recommended for a Scoping Study which would allow for targeted community engagement and an alternatives evaluation process. Recommendations may include implementing traffic calming measures such as chicanes via alternating on-street parking. On-street parking bays can be striped to deter driveway blocking and ensure adequate sight lines at crosswalks and intersections. Additionally, it is recommended that the centerline be removed to make the street operate more like a yield street to further enhance safety and accessibility. Where space permits, bump-outs may be installed to reduce crossing distances and further slow down vehicles.	Scoping	Scoping: Short Design & Construction – Medium/Long	High ~ $1,650,000 Roadway Construction ~ $410,000 Short Term Improvements
38	11	Brewster Garden Trail Improvements	There is a desire to improve the Brewster Garden Trail for accessibility. It is recommended that the Town implement a trail improvement project to improve access to beloved public spaces.	Design & Construction	Design & Construction - Short	Medium ~$460,000
39	11	Implement Low-Cost Parking Chicanes and Consider Additional Traffic Calming/Speed Management Measures - Hamilton Street	While one-way operations on Hamilton Street are not recommended at this time, it is recommended that the Town consider installing chicaned parking (stripping parking alternating from one side to the other) to create a chicane like effect and help calm traffic. In addition, the town may also consider the implementation of additional traffic calming/speed management measures such as dynamic speed feedback signage.	Design & Construction	Design & Construction - Short	Low ~$90,000
40	11	Implement Traffic Calming/ Speed Management Measures along Centennial Street	It is recommended that traffic calming/speed management measures be considered and implemented along Centennial Street.	Design & Construction	Design & Construction - Short	Low ~$90,000
41	11	Town Brook Trail Improvements	There is a desire to improve the Town Brook Trail for accessibility. It is recommended that the Town implement a trail improvement project to improve access to beloved public spaces.	Design & Construction	Design & Construction - Short	High ~$590,000
42	11	Consider Crosswalk Installation - Stafford Street at Wood Street	It is recommended that the Town consider the feasibility of installing a crosswalk along Stafford Street at Wood Street given as it is a community desire.	Design & Construction	Scoping – Short Design & Construction - Short	Low ~$90,000
43	10.5	Implement Traffic Calming/ Speed Management Measures along Pleasant Street	It is recommended that traffic calming/speed management measures be considered and implemented along Pleasant Street.	Design & Construction	Design & Construction - Short	Medium ~$160,000
44	10.5	Sidewalk Reconstruction - Sever Street	There is currently poor conditioned dispersed sidewalk along Sever Street which provides access from downtown to the Sever Street Park/Playground. It is recommended that the Town consider reconstructing sidewalk in a uniform and consistent manner to improve connectivity to the park.	Design & Construction	Design & Construction - Short	High ~$530,000

Priority	Score	Project Name	Project Description	Next Step	Timeframe	Planning Level Cost Estimate
45	10.5	Implement Intersection Improvements - Stafford Street at Towns Street	This plan recommends that the Town consider and implement intersection improvements at the intersection of Stafford Street at Towns Street.	Design & Construction	Design & Construction - Short	Low ~$80,000
46	9.5	Implement Traffic Calming/ Speed Management Measures along Newfield Street	It is recommended that traffic calming/speed management measures be considered and implemented along Newfield Street.	Design & Construction	Design & Construction - Short	Medium ~$130,000
47	9	Improve Pedestrian Crossing and Accessibility at Spooner Street north of Park Road	It is recommended that the Town enhance the crossing across Spooner Street north of Park Road. This may include curb extensions to reduce the crossing distance and high visibility signage and markings.	Design & Construction	Design & Construction - Short	Low ~$90,000
48	9	Improve Pedestrian Crossing and Accessibility at Spooner Street south of Forest Avenue	It is recommended that the Town enhance the crossing across Spooner Street south of Forest Avenue. This may include curb extensions to reduce the crossing distance and high visibility signage and markings.	Design & Construction	Design & Construction - Short	Low ~$90,000
49	8.5	Implement Low-Cost Intersection Improvements - Rodman Lane at West Street	It is recommended that the town implement low-cost intersection improvements at Rodman Lane/West Street via STOP sign and STOP bar installation on the northbound West Street approach. It currently exists as an assumed STOP, but reports suggest motorists roll through the intersection.	Design & Construction	Design & Construction - Short	Low ~$10,000
50	8.5	Progress Conversion to One-way Traffic Flow - Clyfton Street	It is recommended that the Town further engage the residents of Clyfton Street to move forward with converting the road from two-way operations to one-way operations. Should residents be in agreement, the Town may implement the change on a trial basis before committing to a permanent change in traffic flow.	Engagement, Design & Construction	Engagement – Short Design & Construction - Short	Low ~$20,000
51	8.5	Progress Conversion to One-way Traffic Flow - Freemont Street	It is recommended that the Town further engage the residents of Freemont Street to move forward with converting the road from two-way operations to one-way operations. Should residents be in agreement, the Town may implement the change on a trial basis before committing to a permanent change in traffic flow.	Engagement, Design & Construction	Engagement – Short Design & Construction - Short	Low ~$20,000
52	8.5	Progress Conversion to One-way Traffic Flow – Murray Street	It is recommended that the Town further engage the residents of Murray Street to move forward with converting the road from two-way operations to one-way operations. Should residents be in agreement, the Town may implement the change on a trial basis before committing to a permanent change in traffic flow.	Engagement, Design & Construction	Engagement – Short Design & Construction - Short	Low ~$20,000
53	8.5	Revisit Potential One-Way as Necessary – Sagamore Street	It is recommended that the Town maintain existing conditions. Should safety issues arise, the Town may consider conducting a feasibility study in the future regarding potential conversion of two-way operations to one-way operations.	No Action	N/A	N/A
54	8.5	Implement Low-Cost Parking Chicanes and Consider Additional Traffic Calming/Speed Management Measures - Towns Street	While one-way operations on Towns Street are not recommended at this time, it is recommended that the Town consider installing chicaned parking (stripping parking alternating from one side to the other) to create a chicane like effect and help calm traffic. In addition, the town may also consider the implementation of additional traffic calming/speed management measures such as dynamic speed feedback signage.	Design & Construction	Design & Construction - Short	Low ~$70,000
55	8	Improve Seaside Rail Trail Connections - Atlantic Avenue/Street	There is a small sidewalk gap along Atlantic Avenue and Atlantic Street in the vicinity of the Seaside Rail Trail. This plan recommends that the Town work to install sidewalk to complete the network and provide connections to the Seaside Rail Trail.	Design & Construction	Design & Construction - Short	Medium ~$120,000
56	7.5	Progress Conversion to One-way Traffic Flow - Chilton Street	It is recommended that the Town further engage the residents of Chilton Street to move forward with converting the road from two-way operations to one-way operations. Should residents be in agreement, the Town may implement the change on a trial basis before committing to a permanent change in traffic flow.	Engagement, Design & Construction	Engagement – Short Design & Construction - Short	Low ~$20,000
57	7	Formalize Brookside Avenue Connection	It is recommended that the Town implement a project to pave and formalize Brookside Avenue as a formal one way street towards Bay View Avenue.	Design & Construction	Design & Construction - Short	Medium ~$190,000

Priority	Score	Project Name	Project Description	Next Step	Timeframe	Planning Level Cost Estimate
58	7	Implement Traffic Calming/ Speed Management Measures along Muster Field Road	It is recommended that traffic calming/speed management measures be considered and implemented along Muster Field Road.	Design & Construction	Design & Construction - Short	Low ~$30,000
59	7	Progress Conversion to One-way Traffic Flow - Vernon Street	It is recommended that the Town further engage the residents of Vernon Street to move forward with converting the road from two-way operations to one-way operations. Should residents be in agreement, the Town may implement the change on a trial basis before committing to a permanent change in traffic flow.	Engagement, Design & Construction	Engagement – Short Design & Construction - Short	Low ~$20,000
60	5.5	Revisit Potential One-Way as Necessary - Franklin Street	It is recommended that the Town maintain existing two-way traffic flow operations. Should safety issues arise, the Town may consider conducting a feasibility study in the future regarding potential conversion of two-way operations to one-way operations.	No Action	N/A	N/A
61	5.5	Revisit Potential One-Way as Necessary - Jefferson Street	It is recommended that the Town maintain existing two-way traffic flow operations. Should safety issues arise, the Town may consider conducting a feasibility study in the future regarding potential conversion of two-way operations to one-way operations.	No Action	N/A	N/A
62	5.5	Revisit Potential One-Way as Necessary Robinson Street	It is recommended that the Town maintain existing two-way traffic flow operations. Should safety issues arise, the Town may consider conducting a feasibility study in the future regarding potential conversion of two-way operations to one-way operations.	No Action	N/A	N/A
63	5.5	Revisit Potential One-Way as Necessary - Washington Street	It is recommended that the Town maintain existing two-way traffic flow operations. Should safety issues arise, the Town may consider conducting a feasibility study in the future regarding potential conversion of two-way operations to one-way operations.	No Action	N/A	N/A
64	5.5	Implement Traffic Calming/ Speed Management Measures along Stafford Street	It is recommended that traffic calming/speed management measures be considered and implemented along Stafford Street.	Design & Construction	Design & Construction - Short	Low ~$90,000

Figure 59. Project Prioritization Map

POTENTIAL FUNDING SOURCES

Many federal, regional, state, and local funding sources are available to assist with implementing the recommendations identified in this plan. The following highlight several of these grant funding opportunities targeted towards planning, infrastructure, connectivity, and economic development enhancements:

Federal Funding Programs

Rebuilding America's Infrastructure with Sustainability and Equity (RAISE)

RAISE grants support muti-modal surface transportation projects of local and/or regional significance that are difficult to support through traditional DOT programs. RAISE grants can provide capital funding directly to any public entity, including municipalities, counties, port authorities, tribal governments, MPOs, or others. In the last funding cycle, 70% of the grants were allocated to projects in regions defined as an Area of Persistent Poverty or a Historically Disadvantaged Community.

The Highway Safety Improvement Program (HSIP)

The Highway Safety Improvement Program (HSIP) funds safety improvement projects to reduce the number and severity of crashes at hazardous locations (90 percent federal / 10 percent non-federal). The HSIP is guided by a data-driven state Strategic Highway Safety Plan that defines state safety goals, ranks dangerous locations, and includes a list of projects. Under MAP-21, the safety plan is required to improve data collection on crashes and updates to identify dangerous locations more accurately. Any project on a public road, trail or path that is included in a state's Strategic Highway Safety Plan and corrects a safety problem (such as an unsafe roadway element or a hazardous location) is eligible for HSIP funding. Eligible projects include but are not limited to the following: intersection improvements, construction of shoulders, high risk rural roads improvements, traffic calming, data collection, and improvements for bicyclists, pedestrians, and individuals with disabilities.

As stated, a segment of Route 3A comprises the walkable downtown core as well as a MassDOT identified Highway Safety Improvement Program (HSIP)-eligible pedestrian high-crash cluster (Main Street/ Main Street Extension/Court Street (Route 3A) between Memorial Drive and Summer Street).

State Funding Programs

Massachusetts Complete Streets Funding Program

The MassDOT Complete Streets Funding Program helps municipalities address critical gaps in transportation networks via tools and funding to advance Complete Streets in their community. Complete Streets are ones that provide safe and accessible options for all travel modes - walking, biking, transit and vehicles - for people of all ages and abilities. Plymouth has adopted a Complete Street Policy and Plan and therefore, is eligible for Tier 3 Funding for capital improvements. In 2022, MassDOT increased the maximum amount of grant awards to $500,000 in construction funding to implement a project identified in their Prioritization Plan. It's important to note that municipalities are eligible to receive up to $500,000 in any four-fiscal-year period. In other words, a municipality may only receive one full $500,000 grant, or several small grants, during any four-fiscal year timeline. As such, it is recommended that the Town utilize this plan to update their Complete Streets prioritization plan to apply for Complete Streets funding.

Safe Routes to School

The Massachusetts Safe Routes to School (SRTS) Program is a federally funded initiative of the Massachusetts Department of Transportation (MassDOT). The SRTS Program works with schools, communities, students, and families to increase active transportation among public elementary, middle school, and high school students in the Commonwealth. There are two types of grants available with the Massachusetts SRTS program. The first is the Signs and Lines Grant which is reimbursement based and now provides up to $10,000 to improve signage and pavement markings within a half mile of a partner school. These are typically quick build projects, with a completion deadline to be eligible for reimbursement. The Infrastructure Grant is for much larger projects and spans from around $300,000 to over $2 million. They typically have a longer timeline as they go through the complete project initiation process with MassDOT. These are infrastructure projects such as transportation construction and capital improvement projects that will improve safety and/or increase the number of children walking AND biking to school and are located within two miles of a school serving children in any grades between kindergarten and twelfth grade such as sidewalk improvements, traffic calming and speed reduction improvements, pedestrian and bicycle crossing improvements, on-street bicycle facilities, off-street pd and bike facilities, secure bicycle parking facilities, and traffic diversion improvements.

Given Standish Avenue's proximity to two schools, the high observance of experience, and crash history involving vulnerable road users, this may be a great candidate for SRTS funding.

Shared Street & Spaces Program Funding

The MassDOT administered Shared Streets and Spaces grant program supports quick-launch/quick-build improvements in support of public health, safe mobility, and renewed commerce. This program was COVID related but just recently had an application process for the FY24 period. It is unclear if this funding program will persist. Past grant programs have emphasized speed management and safety related improvements, bicycle and pedestrian infrastructure, main street improvements and transit supportive infrastructure. Many of the identified projects would appear to be a good fit if there is another round of this funding.

Safe Streets and Roads for All (SS4A)

The SS4A Grant Program was established through the Bipartisan Infrastructure Law (BIL) and funds initiatives through grants to prevent roadway deaths and serious injuries. Many of the pedestrian safety related identified projects may be great candidates for an Implementation Grant.

MassTrails Grant Program

MassTrails provides matching grants to communities, public entities, and non-profit organizations to design, create, and maintain the diverse network of trails, trail systems, and trail experiences used and enjoyed by Massachusetts residents and visitors. Eligible grant activities include project development, design, engineering, permitting, construction, and maintenance of recreational trails, shared-use pathways, and the amenities that support trails. Applications are accepted annually for a variety of well-planned trail projects benefiting communities across the state. The award maximum depends on the project type and needs and is generally $60,000 for "local" projects and up to $500,000 for projects demonstrating critical network connections of regional or statewide significance. The Town may consider improvements or extensions of the Seaside Rail Trail.

MassWorks Infrastructure Program

The MassWorks Infrastructure Program provides a one-stop shop for municipalities and other eligible public entities seeking public infrastructure funding to support economic development, job creation/ retention, housing development, and transportation improvements to enhance safety. The MassWorks Infrastructure Program is administered by the Executive Office of Economic Development, in cooperation with the Department of Transportation and Executive Office for Administration & Finance.

State Transportation Improvement Program (TIP)

The TIP is the five-year capital funding program for transportation projects. Needham and Newton are part of the Boston Region MPO (Metropolitan Planning Organization) which is responsible for developing a list of projects which will receive federal funding including for surface transportation projects including bicycle and

pedestrian facilities (including shared-use paths), complete streets, intersection improvements, roadway construction, and transit improvements.

Multi-modal improvements to Route 3A would be a project of regional significance and may be eligible for funding through the Transportation Improvement Program (TIP) for the Boston Region Metropolitan Planning Organization (MPO).

Local Funding Programs

Town General Funds

The Town of Plymouth could utilize funds allocated in their general budget to fund projects (project development and design) or could provide the local matches for state or federal grant programs.

Chapter 90

The Chapter 90 program entitles municipalities to reimbursement for capital improvement projects for highway construction, preservation, and improvement that create or extend the life of capital facilities. The funds can be used for maintaining, repairing, improving, or constructing town and county ways and bridges that qualify under the State Aid Highway Guidelines issued by the Public Works Commission. Items eligible for Chapter 90 funding include roadways, sidewalks, right-of-way acquisition, shoulders, landscaping and tree planting, roadside drainage, street lighting, and traffic control devices. A municipality seeking Chapter 90 reimbursement for a project must complete a Chapter 90 Project Request Form and an Environmental Punch List for each proposed project and submit it to the appropriate MassDOT District Office. Each municipality in Massachusetts is granted an annual allocation of Chapter 90 reimbursement funding that it is eligible for, and the municipality can choose among any eligible infrastructure investments. Therefore, the Chapter 90 program provides municipalities with a high level of local control over infrastructure spending.

Community Preservation Act Funds

The Community Preservation Act provides communities an opportunity to create a Community Preservation Fund for open space protection, historic preservation, affordable housing, and outdoor recreation. Plymouth is a CPA community – meaning the community has voted to adopt a surcharge on property taxes to generate the fund. The Community Preservation Act requires that at least 10% of each year's Community Preservation revenues be spent or set aside for each of the three Community Preservation categories. The remaining 70% is available for spending on any one or more of the categories as the Committee and Town Meeting see fit.