

# PAVEMENT MANAGEMENT PROGRAM

City of Worcester, MA

January 2025



## INTRODUCTION

The Pavement Management Plan (PMP) provides a framework for prioritizing projects based on the needs and long-term transportation network goals of the Worcester community.

This document will continue to evolve and will be the basis for the City to make informed decisions when prioritizing transportation infrastructure improvements with the goal of better serving the needs of all users.

The plan's primary goals are to:

- Document and track the conditions of the City's transportation infrastructure clearly
- Establish benchmarks and coordinate transportation infrastructure improvements to leverage available funding in an efficient manner that will benefit all users
- Define the process by which roadway network improvements are identified and prioritized
- Educate the community regarding the importance of pavement maintenance strategies and how they can be properly utilized
- Create realistic budget scenarios to meet the City's desired level of service for all roadway infrastructure

The document is designed to provide consumers with key takeaways, such as the plan's synergies with pre-existing policies and programs, an overview of current-day transportation infrastructure conditions, and an understanding of how infrastructure projects are being prioritized now and how prioritization may be considered in the future.

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## SECTION 1: OVERVIEW

Pavement management is an important factor in shaping the quality of life for Worcester residents.

The Worcester community shares a collective goal of improving access for all network users while promoting safe, equitable, and sustainable transportation options, such as walking, biking, and public transportation. As the community continues to evolve, the City will align this program to broader community goals, such as the Complete Streets Policy, the Green Worcester Plan, the Now/Next Plan, and Mobility Action Plan Transportation Goals.

This Pavement Management Plan (PMP) provides a framework for prioritizing transportation projects based on the needs of the community and will enable the City to make informed decisions when prioritizing transportation infrastructure improvements with the goal of better serving the needs of all users.

The primary goals of this plan are to:

- Document the conditions of the City's transportation infrastructure
- Define the process by which roadway network improvements are identified and prioritized
- Establish benchmarks and coordinate transportation infrastructure improvements to leverage available funding in an efficient manner that will benefit users
- Educate the community regarding the importance of pavement maintenance strategies and how they can be properly utilized
- Create realistic budget scenarios to meet the City's desired level of service for all roadway infrastructure

### Data References & Notes

- Data reflected within this document includes pedestrian curb ramps, sidewalks, and City-maintained pavement
- Roadway scans and existing conditions data referenced throughout the document were collected in October 2023
- Cost estimates are planning level based on recently completed City and MassDOT projects in nearby communities

## SECTION 2 PROGRAMS & POLICIES

The PMP has synergies with other City initiatives.

These policies and programs and the ideas guiding them will be integrated into the PMP to serve all users of the transportation network.

### Complete Streets Policy

In 2017, Worcester City Council adopted a Complete Streets Policy, which set a new course regarding how the City approaches transportation projects. The overall goal of the policy is to facilitate the development of an integrated, multimodal transportation system that provides safe, convenient, and efficient accommodations for all modes of transportation, including walking, bicycling, driving, and transit.

The policy committed the City to incorporate Complete Streets principles into the planning, design, construction, maintenance, and operation of its streets, transportation infrastructure, and transportation services, as well as related municipal functions, including land use planning, zoning, development, and public health. Where feasible and appropriate for the context, the policy calls for the incorporation of the following features:

- Wider sidewalks, street trees, attractive streetscape, pedestrian-scale lighting, curb extensions, ADA-compliant curb ramps, crosswalks, and protected midblock crossings
- Bicycle lanes, shared lane markings, separated bicycle paths, cycle tracks, bicycle parking, and bicycle treatments at intersections
- Traffic calming, left turn lanes, safety improvements, operational improvements, on-street parking, loading zones, and traffic signal upgrades
- Bus shelters, more frequent transit services, transit fare vending, transit rider information systems, transit priority
- Access management, buildings oriented to the fronting street, pedestrian/bicycle/transit supportive urban design, and parking requirements fitting the urban context

Per the policy, these projects will prioritize the needs and safety of the City's most vulnerable users by virtue of their modes of transportation, such as walking or cycling, or because of their age or ability, such as small children, senior citizens, and people with disabilities.

The PMP envisions that City staff will make strides through pavement marking changes and signage as part of pavement preservation projects and include more permanent Complete Streets elements in roadway construction projects to provide safer, more equitable, and more sustainable transportation options for all users.

## Green Worcester Plan

In 2021, the City and its community members developed a comprehensive and holistic Green Worcester Sustainability and Resilience Strategic Plan (GWP), which charts a roadmap to bring sustainability values to all aspects of city life. The City heard from its diverse community to make sure that this plan reflects its ideas and priorities. The Plan draws on the City's unique strengths and challenges, identifies environmental and sustainability priorities, and includes short and longer-term actions. This plan works in conjunction with the Complete Streets Policy by encouraging the roadway network to provide safe, convenient, and comfortable pedestrian, bicycle, and transit networks so that the City can meet its climate goals via mode shift and by transitioning to vehicles powered by renewable electricity.

## Worcester Now/Next Plan

Following a two-year community engagement and plan development process, in 2024, the City released its long-range city-wide plan. Now/Next captures the vision and values of the community and provides a framework to guide the way that the City invests to help shape the City in the next 10 years, especially in terms of development and infrastructure. One of the main goals of the plan is “a more connected and accessible city for all” that acknowledges Worcester’s existing auto-dominated transportation network and a lack of investment in other infrastructure, facilities, and services for other travel modes have resulted in inequities in access and exacerbate public health and Environmental Justice concerns. The plan includes seven objectives that are all centered around implementing a coordinated, multi-modal approach to transportation that prioritizes safety, equity, and sustainability for all.

## Mobility Action Plan

In 2024, the City released its Mobility Action Plan for Safe, Equitable, and Sustainable Transportation (MAP). A spin-off the Now/Next Plan, MAP is a long-range transportation plan that will guide the Worcester Department of Transportation & Mobility (DTM) in the execution of identified policies, programs, strategies, and projects to improve the City's transportation system. MAP is based on the guiding vision that the City of Worcester’s transportation network should support people of all ages and abilities with safe, equitable, and sustainable mobility choices. The plan identifies challenges and opportunities within Worcester’s existing transportation system and includes 46 recommended strategies to improve and advance mobility for Worcester’s community through the conversion of roadways to Complete Streets, elimination of traffic-related fatalities and serious injuries, removal of inequitable transportation barriers, and collaborative work across City departments.

## Vision Zero Safety Action Plan

In December 2024, the City released its draft Vision Zero Safety Action Plan. The Vision Zero Safety Action Plan is a guide for how the City will eliminate fatalities and severe injuries from crashes on our roadways by 2035. Adopting the U.S. DOT’s Safe System Approach, the City places safety as a high priority — even one fatality from crashes is too many. Knowing that humans make mistakes and that we are vulnerable, the plan recommends proactive changes that create a stronger

redundant transportation system to prevent further deaths and serious injuries. Based on data analysis and public input, the plan recommendations and actions are broken down into the categories of design, systemic, policy and continued education. Through this community effort, Worcester will create a culture of safety and ensure our collective safety and well-being.

## ADA/PROWAG & MAAB Compliance

Worcester will incorporate Americans with Disabilities Act (ADA), Public Right-of-Way Accessibility Guidelines (PROWAG), and Massachusetts Architectural Access Board (MAAB) compliance issues that have been discovered in the recent survey of all sidewalks and curb ramps into the PMP and, as part 2 of this project, will undergo a further assessment to bring the City into compliance by adopting a Transition Plan for the public right of way.

## Traffic Signal Inventory

City staff, in conjunction with Tighe & Bond, conducted an assessment of the City's traffic signal systems to inventory equipment, assess its compliance with state and federal regulations, and identify short-term improvements, such as re-timing and longer-term replacement projects. A traffic signal does not need to be completely upgraded in order to make such improvements as signal timing, inclusion of accessible pedestrian signal (APS) push buttons, and countdown timers to bring them into compliance with ADA and improve the walkability of the community, or potentially interacting with buses and giving bus priority.

## SECTION 3 INFRASTRUCTURE CONDITIONS

The City's transportation network is comprised of a variety of assets that work together to provide mobility for all users.

This collection of assets is key to connecting people to destinations within Worcester and the overall region, spurring economic development, and supporting small business owners throughout the community.

An important step in developing a prioritization strategy for future infrastructure projects is to understand current infrastructure conditions. The City is in the process of developing an inventory and assessment process for roadways, sidewalks, and traffic signals that allows for an understanding of what the assets' current conditions are and where improvements need to be made.

### 3.1 Roadways

#### Pavement Management

Pavement management involves strategically planning pavement preservation and maintenance to optimize the lifespan of a road network. This methodical approach determines a schedule for the maintenance and rehabilitation of roadways, ensuring the pavement maintains a desired condition throughout its lifecycle. By employing pavement management practices, the City can preserve and maintain its roadways, improving their lifespan and ensuring a sustainable and resilient transportation network.

In New England, most roadways are constructed with bituminous concrete, commonly known as asphalt. Asphalt pavement can expect to remain serviceable for many years depending on a variety of factors, including traffic volumes, construction quality, and weather. Throughout the pavement lifecycle, the surface begins to deteriorate and shows signs of cracking, rutting, potholes, and raveling. These distresses appear and will gradually increase in size and quantity over time as the surface continues to deteriorate. Throughout the pavement lifecycle, maintenance and preservation treatments can be performed to extend the useful life of the asphalt pavement. In general, these treatments are less costly and less intrusive than minor or major rehabilitation, which involves replacing the pavement surface or rebuilding the pavement structure completely.

The goal of a pavement management program is to provide decision-makers with the tools and data to make effective and timely decisions on maintenance and rehabilitation. The pavement management approach will vary greatly based on the starting point (or Pavement Condition Index, PCI) of the overall network. With adequate funding and the right approach, pavement managers can extend the useful life of roads in adequate condition while reserving rehabilitation for roadways in a state of disrepair.

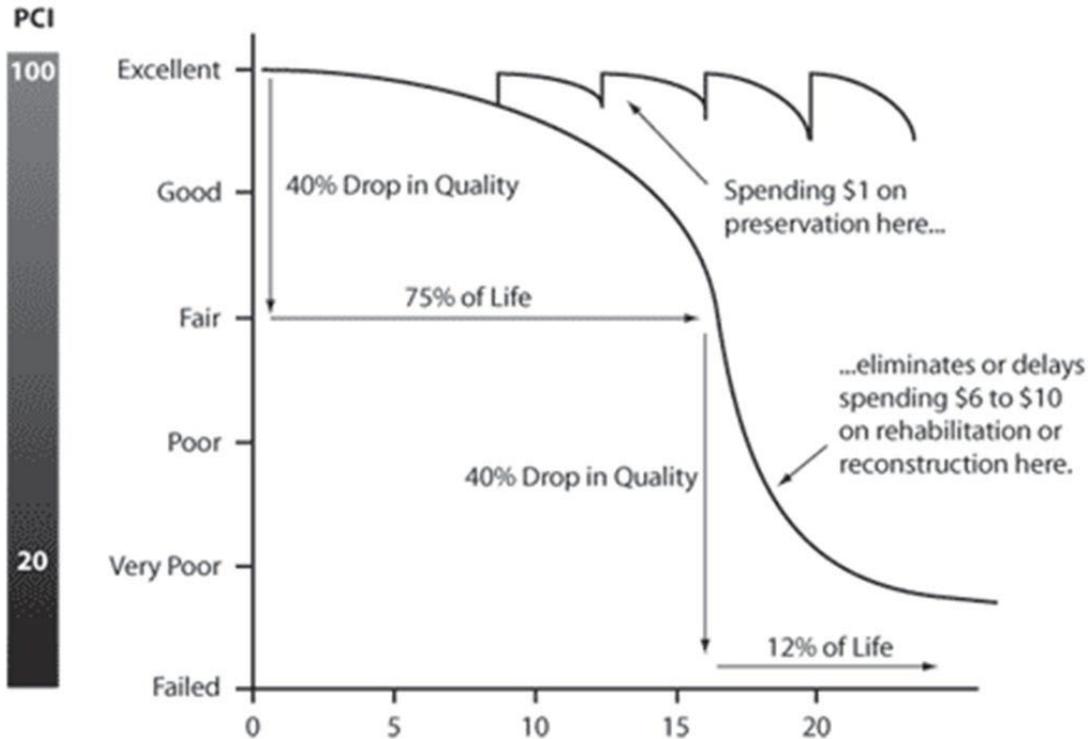


Image Source: U.S. Department of Transportation Federal Highway Administration

Figure 1: PCI Curve

To obtain data that could be used to better understand the City's roadway network, an outside consultant was retained to conduct an inventory and analysis of the road network.

The City's pavement management process followed a three-step approach:

1. Roadway Network Inventory & Data Collection
2. Analysis & Reporting
3. Capital Planning & Action Planning

The costs associated with the maintenance required includes sidewalk improvements and minor complete streets improvements, such as curb extensions or spot changes, for minor and major rehabilitation projects. However, it does not include the costs associated with any necessary drainage improvements, significant changes to the roadway alignment, or any outside consulting that may be required to complete the work. The proposed improvements and costs provided in this plan are planning level only; further engineering may be required.

PCI scores are to the hundredth degree and are a function of the equation that is applied to the data to reflect the deterioration of the pavement from the time of inspection. Actual pavement conditions may vary slightly from the score shown.

## Roadway Network Inventory

First, a database of the City's accepted road network was established in the City's Geographic Information System (GIS) platform.

Accepted roadways are those roadways that are accepted by the City through City Council, designed to meet the City's standards, and maintained by the City's Department of Public Works & Parks (DPW&P).

Roads that have not undergone the acceptance process are referred to as unaccepted or private roads. A private way is a road owned or controlled by a private person, persons, or corporation. In Worcester, unaccepted roads typically service residential properties. Until a roadway is accepted by City Council, it is considered a private way, with all associated maintenance costs borne by the owner(s). The City does have a limited program, in accordance with MGL Chapter 40 Section 6N, for making temporary repairs on private ways.

Once the roadway database was established, the roads were broken into segments, with a given segment typically spanning from one intersection to the next. The database allows the lengths of each roadway segment to be easily recorded. Then, aerial photography was used to determine the roadway widths for each roadway segment, allowing the surface areas to be established. The functional classification of each roadway was also coded into the database using MassDOT's latest Road Inventory dataset.

The functional classifications of the inventoried roadways are below.

Classification	Miles
Arterial	108.581
Collector	33.524
Local	287.411
Local – Low Volume	36.484
Total Miles*	467.000

\*Inventory includes City-accepted roadways only

Table 1: Worcester's Roadway Network

This information provides a high-level understanding of the type of roadways in Worcester, which provides insight into the traffic volumes that can be expected on each.

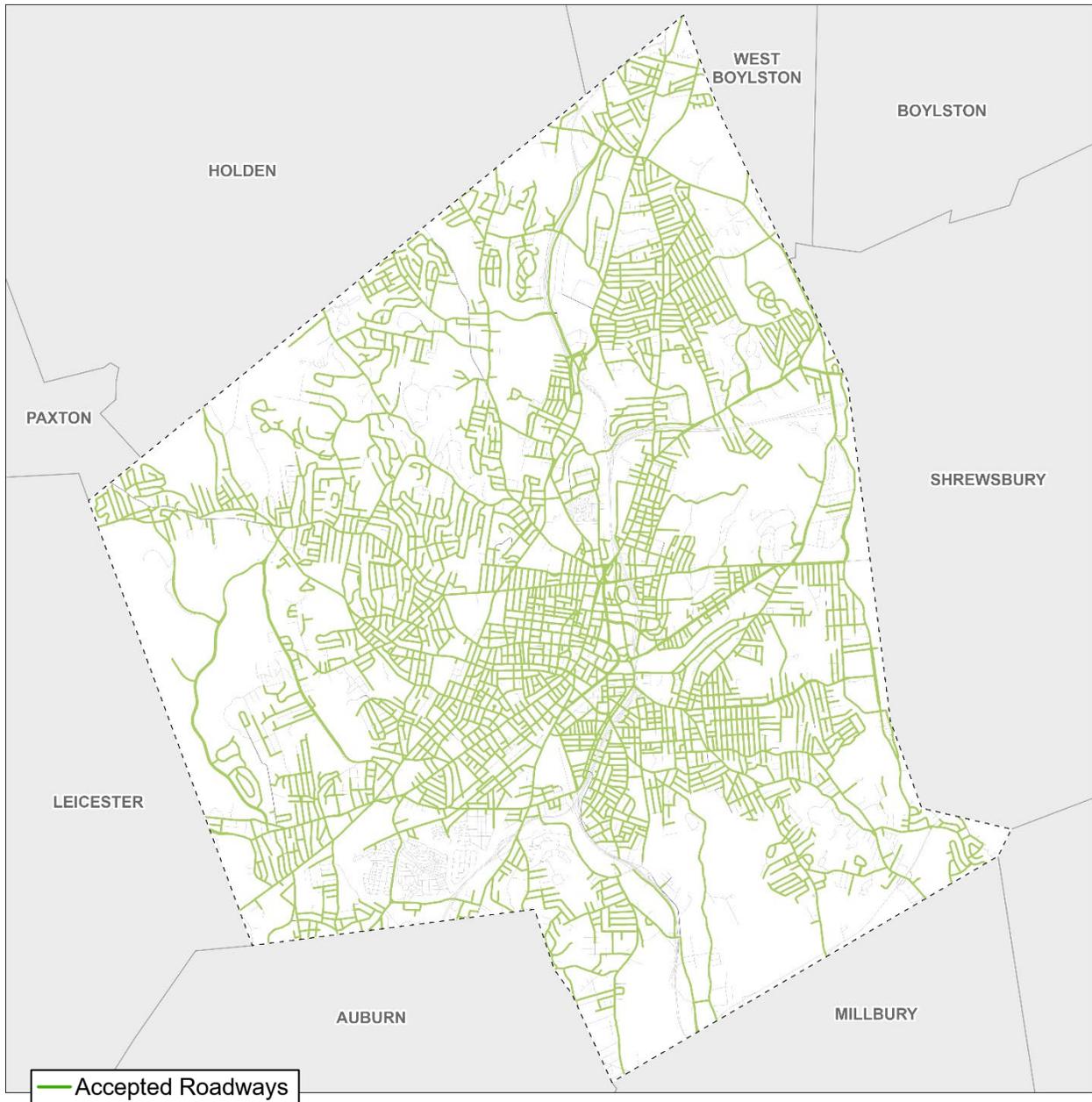


Figure 2: Accepted Roadways

### Data Collection

Data on existing conditions were collected using the latest technology in pavement management data collection. A combination of visual photography, LiDAR technology, and artificial intelligence (AI) was utilized, and the data were analyzed using machine learning. A vehicle equipped with LiDAR, GPS, and high-resolution cameras scans the roads, capturing detailed measurements and images. Tested and calibrated algorithms process the data to identify deficiencies in the pavement, such as cracking, potholes, and roadway oxidation, to assess the overall condition of each roadway and assign a score. The use of AI ensures that the analysis of the roadway network is not biased.

Additionally, high-definition photographs were taken every ten feet along the entirety of the road network. This approach is cost-effective for the City over the long term because the photographs allow right-of-way managers to review the conditions of the roadways at the time of the assessment and compare those to current conditions to confirm that the roadway condition reflects predicted model data.

Additional roadway attribute information, such as length, width, square yardage, segment start and end points, and functional classification, was also included in the database. It is anticipated that the City will recalibrate the pavement management program every few years by re-inspecting the entire road network. This recalibration will confirm that roads are in the condition anticipated as part of the model and provide the City with more current pictures of the condition at the time.

### Analysis & Reporting

The roadway condition data were compiled to establish the PCI for each roadway segment. The PCI rates the surface condition of a roadway on a scale from 0 to 100, with a minimum value of 0 indicating that the roadway has severe distress or requires major rehabilitation and a maximum value of 100 indicating that the roadway has no visible defects and requires no maintenance at the time of the inspection. This scale allows each roadway segment to be assigned a roadway repair category and follows the ASTM D6433 “Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys”, which is the industry standard for determining PCI.

Repair categories include:

- No Maintenance Required: PCI 90-100
- Routine Maintenance: PCI 80-90
- Preventative Maintenance: PCI 65-80
- Minor Rehabilitation: PCI 50-65
- Major Rehabilitation: PCI 0-50



A total of 469.46 miles of roadway were evaluated as part of this project. The overall rating for the road network was 69.64. This overall PCI will be used to measure the performance of the City's pavement management program moving forward.

Roadway repair categories and associated unit costs were defined (as shown below) to develop a planning-level backlog summary of work. In this context, “backlog” refers to the maintenance that is required on each roadway segment at the time of inspection. The costs associated with this maintenance are in present-day dollars if the work were to be performed today.

The planning-level unit costs used to calculate the backlog were based on awarded construction prices from recent City projects. It can be assumed that these costs will increase over time as the roads further deteriorate and as the prices of materials and labor increase due to inflation. These prices will be monitored on a yearly basis so that the City can estimate the costs associated with future projects in a reliable manner.

The backlog summary provides a snapshot of how many miles of roadway fall into each repair category and the approximate cost to complete all outstanding maintenance throughout the roadway network. The current backlog for the City's roadway network is approximately **\$286 million**.

The detailed backlog of roadway repairs allows City decision-makers to develop a strategy regarding how to spend available infrastructure funding and gauge whether additional funding is necessary to improve the roadway network most effectively. The estimated value of Worcester's roadway network is approximately **\$886 million**. This is a planning-level figure representing the total cost associated with fully rebuilding all the accepted roadway pavement structures using current construction costs. This cost reflects the improvement to the pavement structure only (from edge of pavement to edge of pavement) and does not include sidewalk and curb ramp repairs or reconstruction, edge treatment improvements (curbing etc.), safety improvements, engineering design, engineering investigations (pavement cores), stormwater modifications, utility work, traffic signal replacements, and other costs that may be ancillary or necessary during typical construction projects that focus on improving roadways.

## 3.2 Sidewalks & Curb Ramps

### Inventory and Data Collection

In addition to roadways, the first phase of this project began with data collection for sidewalks and curb ramps data along all City-owned roadways using a specialized digital tool created to simplify the inventorying and evaluation of assets. Following the digital data collection, a field inventory of 500 curb ramps suspected of being compliant (i.e., cement concrete, in good condition, has detectable warning panel) will be conducted to confirm their compliance with ADA standards, including opening width, slope, and level landing depth.

The following attributes were collected for each existing sidewalk and curb ramp:

### Existing Sidewalks

#### Physical Condition

- Good - No distresses identified, up to minor surface blemishes and deterioration observed on the sidewalk.
- Fair - Distress is starting to develop but provides minimal to no impedance.
- Poor/Replace - Distresses and obstructions are actively observed, making the sidewalk unsafe in certain areas.

#### Material Type

- Cement Concrete

- Asphalt
- Mixed materials
- Other

#### Width

- Average width of the sidewalk segment (Measured to the nearest foot)

#### Grass Strip Present (Y/N)

- Whether or not a grass strip is present

#### Maintenance Locations

- Maintenance Issues: Quick fixes, such as shrubbery overgrowing the sidewalk, overhanging tree branches
- Structural Issues: Locations of sidewalk deficiencies, such as cracks, depressions, and popped panels, where spot repair is needed.
- Obstruction Issues: Locations along the sidewalk where there is not adequate clearance for a wheelchair due to a vertical obstruction in the sidewalk, such as a fire hydrant or utility pole

## Existing Curb Ramps

#### Material Type

- Cement Concrete
- Asphalt
- Mixed materials
- Other

#### Condition

- Good - No distresses identified, up to minor surface blemishes and deterioration observed on the ramp.
- Fair - Distress is starting to develop but provides minimal to no impedance.
- Poor - Significant signs of failure that could present safety issues observed. Not likely to meet ADA & MAAB guidelines.

#### Ramp Type

- Parallel
- Perpendicular
- Apex

#### Detectable Warning Panel (Y/N)

- Whether a detectable warning panel is present

It should be noted that this project is addressing the physical conditions of our existing sidewalk and curb ramp network and not the buildout of the walkable network with sidewalks do not currently exist. That work is addressed as part of the Mobility Action Plan.

### 3.3 Analysis & Reporting

According to the inventory and assessment results, the City maintains approximately 525 miles of sidewalk infrastructure and 7,003 curb ramps. The City's GIS platform developed as part of this project now allows staff to manage this inventory moving forward. Sidewalk and ramp inventory data can be revised to show improvements as they are completed.

Phase 2 of this project will include the completion of the sidewalk and curb ramp inventory and development of the federally required ADA Transition Plan to develop a roadmap to make progress on upgrading our public ways to be fully compliant with the Americans with Disabilities Act (ADA) and the Public Rights-of-Way Guidelines (PROWAG) issued by the Architectural Access Board and adopted by the US Department of Transportation.

### 3.4 Traffic Signals

Traffic signals are a critical asset to the transportation and mobility of the City. These devices are designed to guide users through areas of intersecting traffic in a safe and efficient manner.

Because of their role in the transportation network, it is imperative that the City understand where signals are located, the age of the infrastructure, and whether these devices are working properly. Completing an assessment of the signal equipment allows the City to understand the lifecycle and schedule equipment maintenance, upgrades, and replacements. This information provides the foundation for a signal program budget.

A traffic signal inventory was originally conducted in Worcester in 2023 and has been continuously updated by staff, yielding the following information:

- 176 Traffic Signals
- 71 Rectangular Rapid Flashing Beacons (RRFBs)
- 15 Flashing Beacons
- 4 School Zone Flashing Beacons
- 4 Fixed Radar Speed Feedback Display Boards

### 3.5 Bike & Micro-Mobility Network

The MAP included the framework for a bike and micro-mobility network within the City and called for the development of a planned network of safe, pleasant, and connecting bicycle and micro-mobility routes within the City to facilitate the planning and implementation of related safety improvements.

The Plan defines micro-mobility as transport provided by very light vehicles, including bicycles and stand-up scooters of all types, with or without motorists and whether privately owned or shared/rented, as well as motorized wheelchairs and other modes for people with mobility limitations.

Micromobility devices often use the same infrastructure as vehicles, both on the road and for parking and locking. There will also be a need in the future for charging stations to accommodate electric bicycles and scooters.

The network's framework is comprised of routes that traverse the City—roughly north-south and east-west. A second level of connecting streets provides access to and from these major routes, to the City's neighborhoods, and to key destinations, such as schools and parks.

Circuitous routes that discourage cycling should be avoided to the extent feasible in the plan, incorporating routes that minimize traffic stress, avoid hills, are esthetically pleasant, and minimize stops. The MAP incorporates routes that cyclists prefer such that the designated routes are actually utilized by cyclists.

It is expected that the Bike & Micro-Mobility Network Plan will include a list of proposed bike and micro-mobility projects for streets and intersections. Based on the City's Complete Streets Policy, all roadway reconstruction projects are required to include these improvements as part of the project, and when feasible, all pavement preservation projects should include the bike & micro-mobility improvements as well.

### 3.6 Public Transit

Worcester is served by a variety of public transit services. The WRTA provides fixed-route bus service and paratransit throughout the City. The MBTA commuter rail provides service to regional employment centers in the Greater Boston area. A variety of supplementary transit services are also available for seniors and persons with disabilities. As pavement management projects progress along identified WRTA bus routes, bus stop locations will be identified and improved including signage, pavement markings, and compliance with ADA requirements.

## SECTION 4 CAPITAL PLANNING & ACTION PLANNING

This section provides an overview of how capital projects in the PMP are identified and prioritized.

### 4.1 Holistic Approach

In 2019, Worcester adopted a Complete Streets Policy that set a new standard for how the City approaches transportation projects. The policy commits City staff and officials to planning, constructing, and maintaining public ways to enhance the safety, access, inclusion, convenience, and comfort of all users, thereby creating “Complete Streets.” It also requires the City to create a comprehensive transportation network that sufficiently accommodates people of all ages and abilities, whether traveling by foot, bike, micro-mobility, wheelchair, mass transit, or motor vehicle.

As such, the City’s transportation projects will prioritize the needs and safety of the City’s most vulnerable users by virtue of their modes of transportation, such as walking or cycling, or because of their age or ability, such as small children, senior citizens, and people with disabilities.

Historically, a pavement management program prioritizes roadway projects using a cost-benefit value (CBV) analysis. This analysis assigns a value to each roadway segment based on:

- The average daily traffic anticipated on the roadway
- The cost of the maintenance necessary at the time of inspections
- The presumed life extension (in years) of the suggested maintenance
- The condition rating of the roadway segment

As Worcester prioritizes potential projects, additional factors are will now be factored in and considered to determine which roadway corridors are the best candidates for maintenance or repair.

These additional factors typically include:

- **Underground Utility Condition:** This is to ensure that water, sewer, drainage, or gas infrastructure improvement projects are not necessary prior to the rehabilitation of the roadway surface.
- **Constructability & Mobilization Considerations:** Mobilization of equipment is often costly. Projects of similar nature should be grouped when possible. This approach will lead to favorable construction bids and, thus, more infrastructure repairs being completed.
- **Design Process & Considerations:** Worcester will take a holistic approach to transportation projects. As such, the various treatment options that can be used to improve the safety of the roadway and make it more accessible to all users will need to be accounted for. Additional considerations will be included when establishing a plan to ensure that it aligns with this approach.

- Treatment Options: The City strives to use the right treatments on the right roadways at the right time by considering all treatment options available to maximize the effectiveness and cost efficiency of the program.
- The City also aims to incorporate certain areas of the city into its capital planning and action planning program to help to improve accessibility for all modes of transportation, particularly focusing on:
  - School Zones & designated Safe Routes to School walking routes
  - Commercial Areas & Business Districts
  - Areas with a concentrated Senior Population
  - Public Transit
  - Areas surrounding other public facilities or gathering places, including, but not limited to, Libraries, Municipal Buildings, Parks, and Playgrounds
  - Bike & Micro-Mobility projects identified in the Network Plan

## 4.2 Maintenance vs. Rehabilitation

To maintain the highest level of service for the roadway network, the City strives to strike a balance between rehabilitating roadways and maintaining roadways found to be in good condition through the use of cost-effective pavement preservation techniques that extend the life of the roadway surface and maintain its rideability. In order to strike this balance, the PMP requires adequate funding.



Image Source: Indus, Inc.

Figure 3: Benefit of Pavement Preservation

The categories of roadway maintenance include:

### [Routine Maintenance](#)

Routine maintenance typically involves a surface treatment to seal the existing pavement from air and water intrusion and, in the case of fog seal, to protect against oxidation. It can extend the life of the pavement by 2-5 years. One example of routine maintenance treatment that is used in Worcester is crack sealing.

### Crack Seal

Crack seal is when cracks in the pavement are individually sealed, preventing water from getting in and damaging the roadway during the freeze-thaw cycle. Crack seal is best used on individual surface cracks in the pavement.

### Fog Seal

Other examples that will be explored include fog seal, which is a thin coat of diluted asphalt emulsion that is applied to seal the surface of the roadway. Often, a rejuvenator is added, allowing the roadway to stay flexible. A rejuvenator can be thought of as a moisturizer for the pavement. A fog seal treatment is best used prior to the appearance of pavement distresses.

### Full-Depth Patching

Full-depth patching repairs potholes or other damaged areas of pavement by removing the entire depth of asphalt and replacing it with new, fresh asphalt. This treatment is a permanent fix for potholes and other pavement damage. Unlike surface repairs, which only address the top layer of asphalt, full-depth patching removes the entire depth of asphalt and replaces it with new asphalt which ensures that the repair will last longer and be more durable, especially in high-traffic areas.

### [Preventative Maintenance](#)

Preventative maintenance, sometimes referred to as pavement preservation, is typically a curb-to-curb thin seal that is put over the roadway. To the untrained eye, many of the treatments in this category can look as though a new pavement surface was installed, but the existing road remains underneath. These treatments are less costly and less intrusive than roadway rehabilitation, but many do not have the same life expectancy as a new asphalt surface.

In some cases, the treatment is only applied to the travel lanes or shoulder of the roadway; the suitability of such an approach depends on the traffic volumes of the roadway and pavement condition. This is decided on a project-by-project basis.

Preventative maintenance can be used on existing pavement that has minor to moderate surface distresses, such as cracking, raveling, or oxidation.

If the application is sufficiently thick, adjustment of structures in the roadway may be necessary to facilitate a smooth final product. Although roadways treated with preventative maintenance often appear the same as new roadways, the cost and life expectancy of this approach are not as high as those for roadways that have undergone minor or major rehabilitation.

Examples of preventative maintenance treatments being used in Worcester include hot in-place recycling (2023) and Rubber Chip Seal (2025). Other anticipated treatments to be used as part of the City's Pavement Management Program include micro-surfacing and bonded wearing course.

### Hot In-Place Recycling

Hot in-place recycling (HIR) consists of heating and softening the existing asphalt pavement with one or more preheater units, followed by one or more heater scarification units, which scarify the softened pavement with spring-loaded tines, carbide teeth, augers, or hot rotary mills to the specified depths. Typical treatment depths range from 3/4 to 2 inches (19 to 50 mm), although some equipment can treat up to 3 inches (75 mm) by utilization of sequential heating, milling, and windrowing the heated material. The scarified, augered, or milled pavement is then thoroughly mixed with a rejuvenating agent, and the recycled mix is placed and compacted with conventional asphalt paving equipment. With HIR, 100 percent of the existing asphalt pavement is recycled on-site. As the HIR and related equipment may be spread out over several hundred feet, the combined equipment is often referred to as an HIR "train."

### Rubber Chip Seal

Rubber chip seal is a modernized version of the traditional chip sealing. It involves a hot spray application of asphalt rubber over the existing pavement surface followed by the application of cover aggregate, or "chips," then rolling/compacting and finally sweeping to recover excess chips. The asphalt and aggregate layer form a new waterproof wearing surface.

### Micro Surfacing

Micro surfacing is a slurry seal placed at a thickness between 1/4" (single lift) and 3/8" (double lift). This type of treatment can extend the life of a roadway by 5-9 years. A bonded wearing course is a thin hot mix overlay placed at a thickness of 5/8" to 3/4". It consists of spray-applied polymer-modified asphalt emulsion immediately ahead of gap-graded hot mix asphalt. This type of treatment can extend the life of a roadway by 8-14 years.

### Bonded Wearing Course

Bonded wearing course is a high-performance ultrathin overlay that seals the existing road surface and provides a new, skid-resistant, smooth and thin (5/8" to 3/4") hot mix asphalt (HMA) wearing course in one simultaneous operation. BWC provides a durable, open-graded, drainable wearing surface on existing pavements showing signs of aging, surface oxidation and minor rutting to extend the life of your pavements.

While Worcester's Complete Streets design process is not necessarily triggered by routine and preventative maintenance, in recent years, the City has chosen to use such projects as an opportunity to make desired changes and improvements through pavement markings, bollards, and other non-construction methods to meet the goals of the policy.



Figure 4: Mill Street Preventative Maintenance (completed Fall 2023)

In 2023, Worcester used a HIR treatment on Mill Street and used the project as an opportunity to implement enhanced safety improvements, including a road diet, parking-protected bike lanes, new crosswalks & ADA ramps, RRFBs, and bollards.

#### Minor & Major Rehabilitation

Roadways that fall into the minor and major rehabilitation categories are roadways that show significant signs of wear and tear and require extensive repairs. For each roadway that requires this level of repair, the Complete Streets design process must be followed. This design process is detailed in the following sections.

#### Minor Rehabilitation

Minor rehabilitation is required on roadways with minor to moderate surface distresses, such as cracking, raveling, or oxidation. In Worcester, minor rehabilitation typically consists of milling off the top 1.5-2 inches of existing asphalt surface and replacing it with a new 1.5-2 inches of asphalt. If the pavement beneath the scarified surface is in a state of advanced deterioration, isolated patching may be required before the new asphalt layer is put down. Structure adjustments will also be

necessary to meet the final grade of the roadway. These contracts generally include both curb and sidewalk repair or replacement. Under the recently adopted regulations, the push buttons and pedestrian signal heads at signalized intersections within the project limits will require upgrading to meet PROWAG standards. This treatment can extend the life of a roadway 12-15 years.

Another minor rehabilitation treatment is a structural overlay. An overlay involves applying approximately 1.5-2 inches of asphalt to the existing surface or pavement of the roadway. Repairs to fix cracks and potholes are performed prior to the application of asphalt.

### Major Rehabilitation

Major rehabilitation is used on roadways with moderate to severe pavement distress and/or underlying base issues. The preferred type of major rehabilitation in Worcester is full-depth reclamation.

Full-depth reclamation involves grinding, pulverizing, and mixing the existing pavement material with part of the underlying base gravel to create a new roadway base. Some of the pulverized material is removed so that the elevation of the roadway remains unchanged. Then, the roadway is repaved. The full-depth reclamation process requires roadway structures to be adjusted twice (lowered once so that the pulverizing machine can traverse them and then raised once to meet the grade of the roadway after it is paved). These contracts generally include both curb and sidewalk repair or replacement. Under the recently adopted regulations, the push buttons and pedestrian signal heads at signalized intersections within the project limits will require upgrading to meet PROWAG standards. Full-depth reclamation will yield a like-new roadway with a life expectancy of 12-18 years. However, it is the most expensive and intrusive treatment option. Thus, actions should be taken to prolong the life of existing pavement before reclamation becomes necessary.

## 4.3 Design Process

The City goes through a staff-led design review process for each new roadway. This ensures alignment with City goals set by such policies as Complete Streets, Green Worcester, Mobility Action Plan, Vision Zero Plan, ADA & AAB Compliance, and the City's Urban Forest Master Plan.

### Complete Streets Design Process

Worcester set a new course regarding how the City approached transportation projects when it adopted its Complete Streets Policy. Adopting the policy required the City to fully consider all users' safety, comfort, and convenience.

This required the need for a comprehensive design process that considers the following:

- Roadway Geometry
- Traffic Speed & Volume Counts
- Crash Summaries
- Review of outstanding:
  - City Council Orders or Ordinances
  - Safe Routes to Schools Requests
  - Pedestrian Reports

- Mobility Action Plan Requests
- Sidewalk & Curb Ramp ADA, PROWAG, and MAAB Compliance
- Sidewalk/Pedestrian Enhancements
- Bike & Micro-Mobility Accommodations
- Traffic Calming/Safety Improvements
- Traffic Signal Upgrades
- Curb Management & Parking Considerations - commercial district or residential district

Another example where the Complete Streets process was followed is Stafford Street's minor rehabilitation project, where the following improvements were implemented:

- Safety improvements & traffic calming: A Road diet to reduce speed and increase safety by reducing the number of travel lanes from 4 to 2.
- Pedestrian Safety: New ADA-compliant curb ramps were installed at all existing crosswalks, curb extensions were installed to reduce crossing lengths and improve visibility, new crosswalks were installed throughout the corridor, and new RRFBs were installed to increase the visibility of crossing pedestrians
- Bike/Micro-Mobility Improvements: Buffered bike lanes and high-visibility green intersection markings were added to improve safety and access
- New PROWAG-compliant sidewalks and ramps were installed

Overall, these improvements dramatically improve the travel experience for vulnerable roadway users, including pedestrians and cyclists, and improve safety for all roadway users.



Figure 5: Logan Field Complete Streets Project

#### 4.4 Program Funding

The current overall backlog of work or the cost to complete all the required maintenance on the existing roadway networks is approximately **\$286 million**. This estimate is based on the existing condition of the roadways and does not include allowances for typical sidewalk and curb ramp improvements. This figure is a planning estimate for how much maintenance is required on the roadway network in today's dollars.

Currently, the City allocates approximately an average of \$15 million for the paving projects. The funding is a combination of City-allocated funds and Chapter 90 funding, which is funding that comes directly from the Massachusetts Department of Transportation. It is expected to cover the cost of designing and constructing pavement management projects and associated improvements.

Worcester's Chapter 90 allotment from the Commonwealth in FY2025 was \$4,151,464.81. This figure has been consistent over the past 5 years as the program has commonly been level-funded. The Commonwealth determines this amount based on the City population, the number of City-accepted road miles, and how many people are employed in the City. Governor Healey recently announced a multi-year Chapter 90 budget program that will increase in the funding levels for the overall FY2026

budget by 50%. This extra \$100m in funding will be based solely on the roadway miles, which means Worcester can expect approximately \$1.4 million in additional Chapter 90 funding beginning in FY2026 assuming the legislature approves the Governor’s recommendation.

The next step is to determine how much will be spent on roadways each year to improve the overall roadway network rating. Figures 7 and 8 show two funding scenarios and the resulting overall roadway network scores over a five-year period.

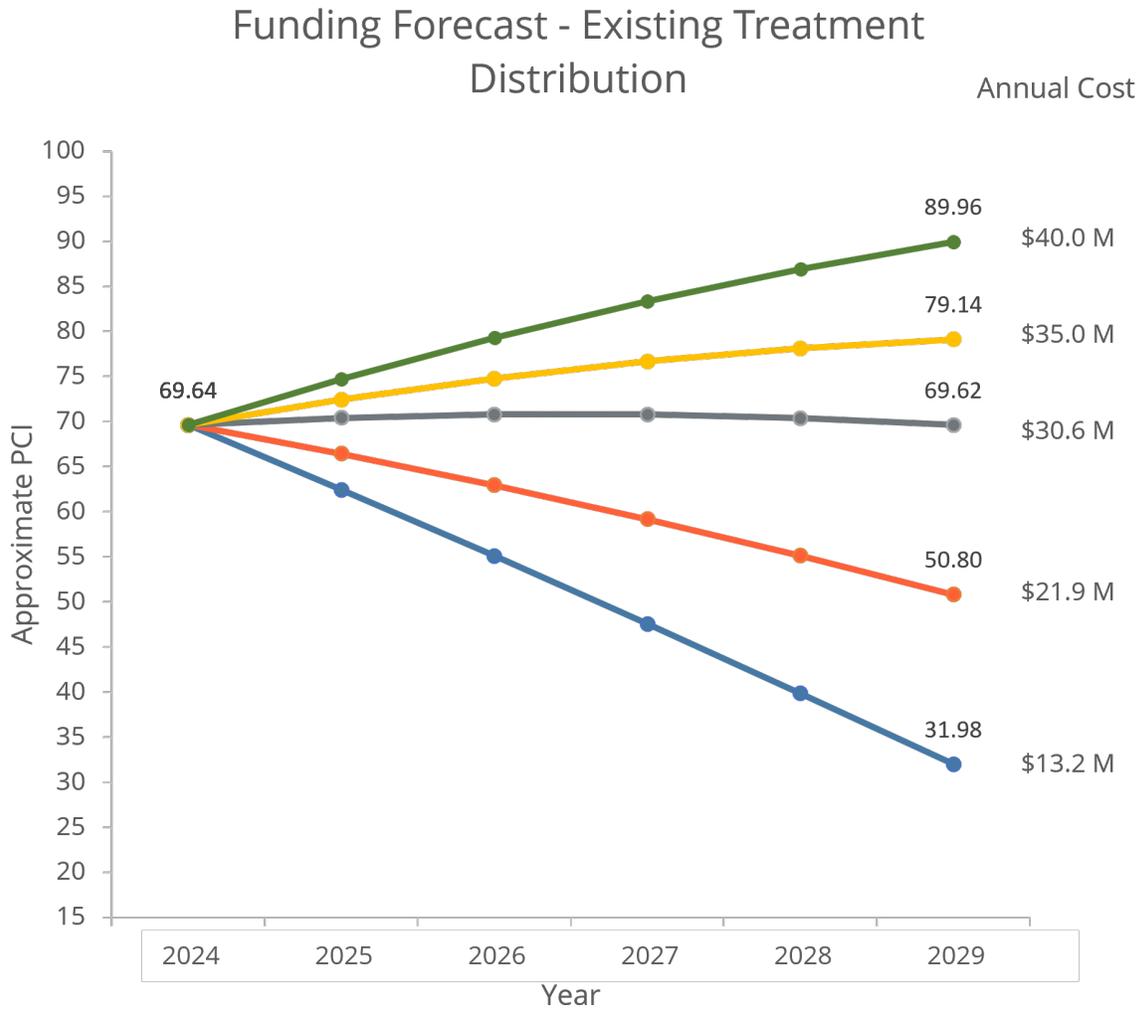


Figure 6: Projected PCI per Year based on Existing Treatment Distribution

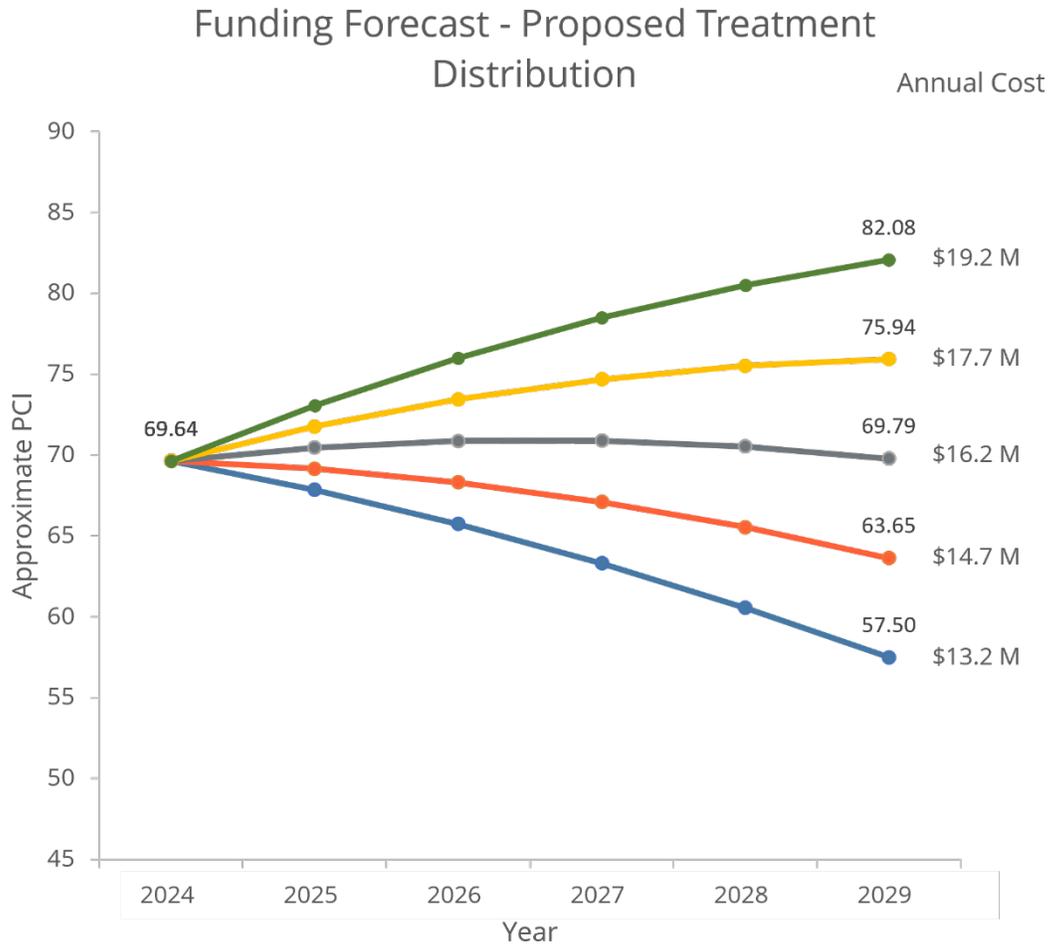


Figure 7: Projected PCI per Year based on Proposed Treatment Distribution

These two funding scenarios take into account the types of treatments each roadway would require and how much that treatment would extend the life of the roadway as a function of the percent of the roadway budget that the City wants to allocate to each category of treatment per year (i.e., routine maintenance, preventative maintenance, minor rehabilitation, major rehabilitation).

The two funding scenarios (Figure 7: Projected PCI per Year based on Existing Treatment Distribution and Figure 8: Projected PCI per Year based on Proposed Treatment Distribution) are based on the following criteria:

Repair Category	Cost per SY	Life Extension (Years)	Budget Distribution (Existing)	Budget Distribution (Proposed)
Routine Maintenance	\$1.00	3	2%	5%
Preventative Maintenance	\$20.00	8	0%	55%
Minor Rehabilitation	\$60.00*	12	56%	30%
Major Rehabilitation	\$100.00*	15	42%	10%

\*Includes sidewalk repairs as part of project

These models account for a 3% inflation rate for construction cost increases and anticipate minor sidewalk repairs. If substantial design changes are necessary for a particular project, construction, engineering, and construction administration costs would rise, leading to less roadway work being completed in a particular construction season.

An important benchmark in both figures is the gray scenario in the middle, which shows that **\$30.6 million** would be required annually in roadway maintenance alone to maintain the roadway network in its current overall condition utilizing the historic budget distribution that utilizes almost no preventive maintenance treatments, whereas only **\$16.2 million** would be required annually if a treatment distribution that included more preventative maintenance was adopted. This does not include the design costs and associated safety improvements with these projects.

Based on this, the City plans to deploy a more balanced approach to pavement management, which has become an industry wide best practice, to target 90% of our funding over the next 5 years on the 72% of the roads needing Routine, Preventive, or Minor Rehabilitation treatments to ensure they do not fall off into more expensive repair categories. The goal of this strategy is to improve the overall PCI of our network and restore the rideability of our roadways. With respect to the major rehabilitation roadways, these will receive 10% of funding over the next 5 years as well as any additional outside funding such as the Transportation Improvement Project (TIP) funding managed by the Central Massachusetts Metropolitan Planning Organization.

#### Recommended Funding Scenario

Based on a historic funding amount of \$15 million and the recently announced increase in Chapter 90 funding announced by the Governor, the City identified two funding scenarios including a **\$19.2 million** preferred proposal and a \$17.75 million alternative proposal that will meet the City's policy initiatives and better manage the various levels of efforts to improve the overall pavement condition index of the roadways. This new program will be managed by DTM including street selection, design, and data management. Construction bidding and oversight will be done by the DPW&P. However, the two departments are expected to work together in partnership throughout all aspects of the program. Though it may shift each year, the proposed planning level annual funding breakdowns are below:

### \$19.2 million budget distribution

<b>Allocation Description</b>	<b>Amount</b>
Annual Permanent Patch	\$500,000
Annual Crack Seal	\$250,000
Annual Pavement Preservation	\$3,000,000
District Councilor Local Roadway Pick	\$4,000,000
District Councilor Sidewalk Pick	\$750,000
Arterial/Collector Minor & Major Rehabilitation	\$8,095,000
Private Roadway Temporary Maintenance Material	\$5,000
Standalone Complete Streets Safety Improvements	\$1,200,000
Sidewalk Maintenance	\$700,000
Survey & Design for Arterial Roadways	\$500,000
Data Management & Support	\$200,000

### \$17.75 million budget distribution\*

<b>Allocation Description</b>	<b>Amount</b>
Annual Permanent Patch	\$400,000
Annual Crack Seal	\$250,000
Annual Pavement Preservation	\$2,500,000
District Councilor Local Roadway Pick	\$4,000,000
District Councilor Sidewalk Pick	\$750,000
Arterial/Collector Minor & Major Rehabilitation	\$7,745,000
Private Roadway Temporary Maintenance Material	\$5,000
Standalone Complete Streets Safety Improvements	\$1,200,000
Sidewalk Maintenance	\$700,000
Data Management & Support	\$200,000

*\*\$500,000 arterial survey & design costs funded separately*

The District Councilor Local Roadway Picks will be selected every two years (on the even years) for a total of \$1,600,000 for local roadways within each district requiring Preventative Maintenance, Minor, or Major Rehabilitation based on the latest management database. Because the City has an obligation to maintain its infrastructure in a safe and accessible manner, streets will be considered for selection based on their PCI regardless of whether they have been petitioned. The work will include the roadway as well as pavement markings and sidewalk rehabilitation based on condition, ADA, PROWAG, & MAAB compliance, and City specifications. It is expected that the councilor will pick more streets than can be constructed to account for streets being delayed due to utility work.

Separately, the District Councilor Local Sidewalk Picks will be selected every two years (on the even years) for a total of \$300,000 for sidewalks on local roadways within their district based on the latest management database. Because the City has an obligation to maintain its infrastructure in a safe and accessible manner, sidewalks will be considered based on their condition regardless of whether they have been petitioned. The work will include sidewalk rehabilitation based on condition, ADA compliance, and City specifications.

Standalone Complete Streets safety improvement projects are those pedestrian and cyclist safety projects that typically, though not necessarily, are the result of requests petitioned through the City Council process. These projects have typically included traffic calming measures and new pedestrian crosswalks. The City has also established separate spending allowances for miscellaneous traffic signal maintenance & construction and speed hump installations that are not part of this program.

One time funding sources, such as federal & state grants or municipal free cash allotments for pavement management purposes will be utilized in the most cost-effective manner using the above methodology. Ultimately, however, the City recognizes that a funding strategy of \$19.2 million annually may not be a viable option with current City finances. The City remains committed to using available funds in the most cost-effective manner possible. The City will continue to advocate for future funding increases that is critical to protect and improve these vital assets in the community.

## 4.5 Next Steps

As a follow-up to this project, the City plans to take the necessary steps to become fully compliant with ADA by finalizing the compliance review of the 7,010 curb ramps within the City and developing an ADA Self-Assessment and Transition Plan for the Public Right of Way. This plan will inform the standalone sidewalk maintenance line item as well as the sidewalk work as part of minor and major rehabilitation projects included in both funding scenarios above.

## SECTION 5 CONCLUSION

In conclusion, the intent of this document is to demonstrate that the City of Worcester recognizes the importance of protecting and improving one of its most important and valuable collections of assets – its roads, sidewalks, and curb ramps. These assets connect the community, and the City's goal is to protect and improve them based on a framework that is both transparent and predictable. The methodology highlighted as part of this plan aligns with the overall goals and objectives identified by the City: complete streets, traffic calming & safety improvements, and a commitment to accessibility for all.

The City recognizes that the recommendations in this plan come with a cost, as well as that the City of Worcester has limited funds. The City's goal is to spend those funds in the most efficient manner possible, with a commitment to improving this process whenever needed.

## YEAR 0 – FISCAL YEAR 2025 FUNDING

APRIL to DECEMBER 2025:

- DPW&P oversee construction of outstanding contracts already bid by the Department of Public Works & Parks
- DTM & DPW&P review list of remaining work plan for FY2025 funding for remaining outstanding District Councilor Local streets and sidewalks not previously bid
- DTM & DPW&P review list of candidate streets for rubber chip seal treatment for the onetime \$1.2m free cash allotment
- DTM provide to DPW&P identified improvements on selected Local streets for safety & access enhancements
- DPW&P conduct survey and initial investigation of changes needed to implement identified improvements
- DPW&P put out to bid and oversee construction of agreed upon projects planned for FY2025 funding

## YEAR 1 – FISCAL YEAR 2026 FUNDING

FEBRUARY to MAY 2025:

- DTM work with consultant and DPW&P to select Arterial/Collector Minor and Major Rehabilitation Street segments for construction in Years 2 thru 5.
- DTM work with consultant and DPW&P to select street segments and treatment types for Pavement Preservation with extra funding front loaded in Year 1
- DTM work with the DPW&P to identify locations for Annual Permanent Patch with extra funding front loaded in Year 1
- DTM work with the DPW&P to identify streets for Annual Crack Seal including those locations where pavement preservation treatments will be implemented in Year 2
- DTM work with the DPW&P to identify sidewalk segments and ADA ramps for Annual Sidewalk Maintenance contract
- DTM work with District Councilors & DPW&P to make sidewalk selections with extra funding allocated in Year 1 for prior years catch up

MAY 2025:

- DTM & DPW&P work with Utility Companies to identify potential conflicts
- DTM DPW&P prepare final FY2026 Pavement Management Program Street and Sidewalk selections to the City Council

JUNE to AUGUST 2025:

- DTM initiate design process for Arterial/Collector Minor and Major Rehabilitation Street segments for construction in Year 2
- DPW&P prepare and release bid for selected Annual Crack Sealing Program once funding becomes available
- DPW&P prepare and release bid for selected Annual Permanent Patch Program once funding becomes available
- DTM provide to DPW&P identified improvements on selected Local streets for safety & access enhancements
- DPW&P conduct survey and initial investigation of changes needed to implement identified improvements

#### SEPTEMBER TO NOVEMBER 2025:

- DPW&P develop contracts, plans, and preliminary cost estimates for street and sidewalk projects

#### DECEMBER 2025:

- DPW&P review with DTM the contracts, plans, and preliminary cost estimates for street and sidewalk projects and finalize
- DPW&P prepare and release final contracts for next construction season

#### JANUARY TO DECEMBER 2026:

- DPW&P oversee construction and complete projects

## YEAR 2 – FISCAL YEAR 2027 FUNDING

#### JANUARY to MAY 2026:

- DTM work with consultant and DPW&P to review selected Arterial/Collector Minor and Major Rehabilitation Street segments for construction in Years 3 thru 5 to ensure applicability
- DTM work with consultant and DPW&P to select street segments and treatment types of for Pavement Preservation
- DTM work with the DPW&P to identify locations for Annual Permanent Patch
- DTM work with the DPW&P to identify streets for Annual Crack Seal including those locations where pavement preservation treatments will be implemented in Year 3
- DTM work with District Councilors & DPW&P to make Local Street selections for next 2 fiscal years (FY2027 & FY2028)
- DTM work with the DPW&P to identify sidewalk segments and ADA ramps for Annual Sidewalk Maintenance contract
- DTM work with District Councilors & DPW&P to make sidewalk selections for next 2 fiscal years (FY2027 & FY2028)

#### MAY 2026:

- DTM & DPW&P work with Utility Companies to identify potential conflicts
- DTM DPW&P prepare final FY2027 Pavement Management Program Street and Sidewalk selections to the City Council

#### JUNE to AUGUST 2026:

- DTM initiate design process for Arterial/Collector Minor and Major Rehabilitation Street segments for construction in Year 3 fiscal year funding cycle
- DPW&P prepare and release bid for selected Annual Crack Sealing Program once funding becomes available
- DPW&P prepare and release bid for selected Annual Permanent Patch Program once funding becomes available
- DTM provide to DPW&P identified improvements on selected Local streets for safety & access enhancements
- DPW&P conduct survey and initial investigation of changes needed to implement identified improvements

#### SEPTEMBER TO NOVEMBER 2026:

- DPW&P develop contracts, plans, and preliminary cost estimates for street and sidewalk projects

#### DECEMBER 2026:

- DPW&P review with DTM the contracts, plans, and preliminary cost estimates for street and sidewalk projects and finalize
- DTM provide DPW&P 100% design and specification for Arterial/Collector Minor and Major Rehabilitation Streets prepared by consultant
- DPW&P prepare and release final contracts for next construction season

#### JANUARY TO DECEMBER 2027:

- DPW&P oversee construction and complete projects

## YEAR 3 – FISCAL YEAR 2028 FUNDING

#### JANUARY to MAY 2027:

- DTM work with consultant and DPW&P to review selected Arterial/Collector Minor and Major Rehabilitation Street segments for construction in Years 4 and 5 to ensure applicability
- DTM work with consultant and DPW&P to select street segments and treatment types of for Pavement Preservation
- DTM work with the DPW&P to identify locations for Annual Permanent Patch
- DTM work with the DPW&P to identify streets for Annual Crack Seal including those locations where pavement preservation treatments will be implemented in Year 4

- DTM work with the DPW&P to identify sidewalk segments and ADA ramps for Annual Sidewalk Maintenance contract

#### MAY 2027:

- DTM & DPW&P work with Utility Companies to identify potential conflicts
- DTM DPW&P prepare final FY2028 Pavement Management Program Street and Sidewalk selections to the City Council

#### JUNE to AUGUST 2027:

- DTM initiate design process for Arterial/Collector Minor and Major Rehabilitation Street segments for construction in Year 4 fiscal year funding cycle
- DPW&P prepare and release bid for selected Annual Crack Sealing Program once funding becomes available
- DPW&P prepare and release bid for selected Annual Permanent Patch Program once funding becomes available
- DTM provide to DPW&P identified improvements on selected Local streets for safety & access enhancements
- DPW&P conduct survey and initial investigation of changes needed to implement identified improvements

#### SEPTEMBER TO NOVEMBER 2027:

- DPW&P develop contracts, plans, and preliminary cost estimates for street and sidewalk projects

#### DECEMBER 2027:

- DPW&P review with DTM the contracts, plans, and preliminary cost estimates for street and sidewalk projects and finalize
- DTM provide DPW&P 100% design and specification for Arterial/Collector Minor and Major Rehabilitation Streets prepared by consultant
- DPW&P prepare and release final contracts for next construction season

#### JANUARY TO DECEMBER 2028:

- DPW&P oversee construction and complete projects

## YEAR 4 – FISCAL YEAR 2029 FUNDING

#### JANUARY to MAY 2028:

- DTM work with consultant and DPW&P to review selected Arterial/Collector Minor and Major Rehabilitation Street segments for construction in Year 5 to ensure applicability
- DTM work with consultant and DPW&P to select street segments and treatment types of for Pavement Preservation
- DTM work with the DPW&P to identify locations for Annual Permanent Patch

- DTM work with the DPW&P to identify streets for Annual Crack Seal including those locations where pavement preservation treatments will be implemented in Year 5
- DTM work with District Councilors & DPW&P to make Local Street selections for next 2 fiscal years (FY2029 & FY2030)
- DTM work with the DPW&P to identify sidewalk segments and ADA ramps for Annual Sidewalk Maintenance contract
- DTM work with District Councilors & DPW&P to make sidewalk selections for next 2 fiscal years (FY2029 & FY2030)

#### MAY 2028:

- DTM & DPW&P work with Utility Companies to identify potential conflicts
- DTM DPW&P prepare final FY2029 Pavement Management Program Street and Sidewalk selections to the City Council

#### JUNE to AUGUST 2028:

- DTM initiate design process for Arterial/Collector Minor and Major Rehabilitation Street segments for construction in Year 5 fiscal year funding cycle
- DPW&P prepare and release bid for selected Annual Crack Sealing Program once funding becomes available
- DPW&P prepare and release bid for selected Annual Permanent Patch Program once funding becomes available
- DTM provide to DPW&P identified improvements on selected Local streets for safety & access enhancements
- DPW&P conduct survey and initial investigation of changes needed to implement identified improvements

#### SEPTEMBER TO NOVEMBER 2028:

- DPW&P develop contracts, plans, and preliminary cost estimates for street and sidewalk projects

#### DECEMBER 2028:

- DPW&P review with DTM the contracts, plans, and preliminary cost estimates for street and sidewalk projects and finalize
- DTM provide DPW&P 100% design and specification for Arterial/Collector Minor and Major Rehabilitation Streets prepared by consultant
- DPW&P prepare and release final contracts for next construction season

#### JANUARY TO DECEMBER 2029:

- DPW&P oversee construction and complete projects

## YEAR 5 – FISCAL YEAR 2030 FUNDING

### JANUARY to MAY 2029:

- DTM work with consultant and DPW&P to select Arterial/Collector Minor and Major Rehabilitation Street segments for construction in Years 6 thru 10
- DTM work with consultant and DPW&P to select street segments and treatment types of for Pavement Preservation
- DTM work with the DPW&P to identify locations for Annual Permanent Patch
- DTM work with the DPW&P to identify streets for Annual Crack Seal including those locations where pavement preservation treatments will be implemented in Year 6
- DTM work with the DPW&P to identify sidewalk segments and ADA ramps for Annual Sidewalk Maintenance contract
- DTM work with District Councilors & DPW&P to make sidewalk selections for prior years catch up

### MAY 2029:

- DTM & DPW&P work with Utility Companies to identify potential conflicts
- DTM DPW&P prepare final FY2030 Pavement Management Program Street and Sidewalk selections to the City Council

### JUNE to AUGUST 2029:

- DTM initiate design process for Arterial/Collector Minor and Major Rehabilitation Street segments for construction in Year 6 fiscal year funding cycle
- DPW&P prepare and release bid for selected Annual Crack Sealing Program once funding becomes available
- DPW&P prepare and release bid for selected Annual Permanent Patch Program once funding becomes available
- DTM provide to DPW&P identified improvements on selected Local streets for safety & access enhancements
- DPW&P conduct survey and initial investigation of changes needed to implement identified improvements

### SEPTEMBER TO NOVEMBER 2029:

- DPW&P develop contracts, plans, and preliminary cost estimates for street and sidewalk projects

### DECEMBER 2029:

- DPW&P review with DTM the contracts, plans, and preliminary cost estimates for street and sidewalk projects and finalize
- DTM provide DPW&P 100% design and specification for Arterial/Collector Minor and Major Rehabilitation Streets prepared by consultant
- DPW&P prepare and release final contracts for next construction season

JANUARY TO DECEMBER 2030:

- DPW&P oversee construction and complete projects