

CITY OF SOMERVILLE, MASSACHUSETTS
 KATJANA BALLANTYNE
 MAYOR
 DEPARTMENT of INFRASTRUCTURE & ASSET MANAGEMENT



RICHARD E. RAICHE, PE, PMP
 DIRECTOR OF INFRASTRUCTURE & ASSET MANAGEMENT

BRIAN C. POSTLEWAITE, PE
 DIRECTOR OF ENGINEERING

FY2023 PAVEMENT & SIDEWALK MANAGEMENT PROGRAM

Since 2015, the City has utilized a data-driven pavement management program to support objective decisions and develop cost-effective results. Starting in FY2020, the Engineering Division has divided the annual program into three contracts:

- Major corridor complete streets with full-width pavement mill-and-overlay, full sidewalk reconstruction to attain ADA compliance, and targeted safety improvements;
- Targeted sidewalk and intersection reconstruction to improve pedestrian safety and ADA compliance on priority routes, and
- Partial paving of travel lanes only for side streets that are not priority pedestrian routes or major corridors.

The rationale for the creative funding approach was presented to the City Council Finance Committee on 3 December 2019, the video and side presentation of which can be found here:

http://somerillecityma.iqm2.com/Citizens/Detail_LegiFile.aspx?Frame=&MeetingID=3048&MediaPosition=4163.809&ID=22098&CssClass=

FY 2023 Program

The FY2023 program budget totals \$8,000,000, and is derived from three sources:

- \$1,209,520 from the Massachusetts Chapter 90 program for roadway repairs,
- \$4,545,827 from City bond for street resurfacing, sidewalk improvements and ADA ramps and improvements,
- \$500,000 from the Street Reconstruction Stabilization Fund for Street & Sidewalk Repairs and ADA Improvements, and
- \$1,800,000 Funds remaining from previously completed annual street reconstruction projects.

FY 2023 Complete Street Project

Street	From	To	Scope
Washington St	Webster Ave	Line St	Complete Street
Holland St	Broadway	Claremon St	Complete Street
Holland St	Simpson Ave	College Ave	Complete Street
College Ave	Highland Ave	Winslow Ave	Complete Street





FY 2023 Sidewalk and Intersection Project

Street	From	To	Scope
Osgood St	Adjacent to City Park		Sidewalks
Elm St	College Ave	Grove St	Sidewalks
Highland Ave	College Ave	East 160 th	Sidewalks
Grove St	Elm St	Kenney Park	East Sidewalk
Meacham Rd	Dover St	City Line	Sidewalks
Jay St	Holland St	Howard St	Sidewalks
Irving St	Broadway	Holland St	Sidewalks
Oak St	At Houghton St		Intersection
Hanson St	At Skehan St		Intersection
Perry St	At Lincoln Park		Raised Crossing

FY 2023 Roadway Paving Project

Street	From	To	Scope
Meacham Rd	Dover St	City Line	Full Paving

Program Details

Roadway Evaluation & Prioritization

The Engineering Division, with the aid of an outside consultant, maintains a database that defines several characteristics for every street in Somerville:

- Pavement Condition Index (PCI) describes the physical condition of the pavement with 100 being a newly paved road and 0 being a fully deteriorated road.
- Functional Classification Priority (FCP) defines the roadway use with higher scores assigned to major arteries and lower scores to residential side streets.
- Pavement Classification Priority (PCP) provides the ability to score roads with different pavement types such as concrete or cobble stone.
- Average Daily Traffic (ADT) assigns higher scores to roads with more traffic.





That data is used to calculate a Network Priority Ranking (NPR) for each road segment according to the following formula:

$$\text{NPR} = (0.40 \times \text{PCI}) + (0.50 \times \text{FCP}) + (0.30 \times \text{PCP}) + (0.10 \times \text{ADT})$$

The NPR drives the selection of roads for inclusion in the annual improvement contracts. Virtually all Somerville roads are asphalt; therefore, Pavement Classification is generally not a factor in determining prioritization. Functional Class receives the highest weight as it has been the City's policy to prioritize main roads that receive the most use by the greatest number of travelers. The Pavement Management Program includes five Functional Classes ranging from "Arterial" to "Residential Dead End", which is consistent with classifications used by the City for other transportation studies. Figure 1 provides the roadway classification (aka the FCP) for each street in the database. The factors used for Average Daily Traffic are also consistent with those used by the City for other transportation studies and are generally associated with the FCP categories. Unlike the other factors, which are relatively fixed for our roadway network, the Pavement Condition Index is constantly degrading as roads experience wear over time. Consequently, the roads are surveyed, and the PCI is updated every year.

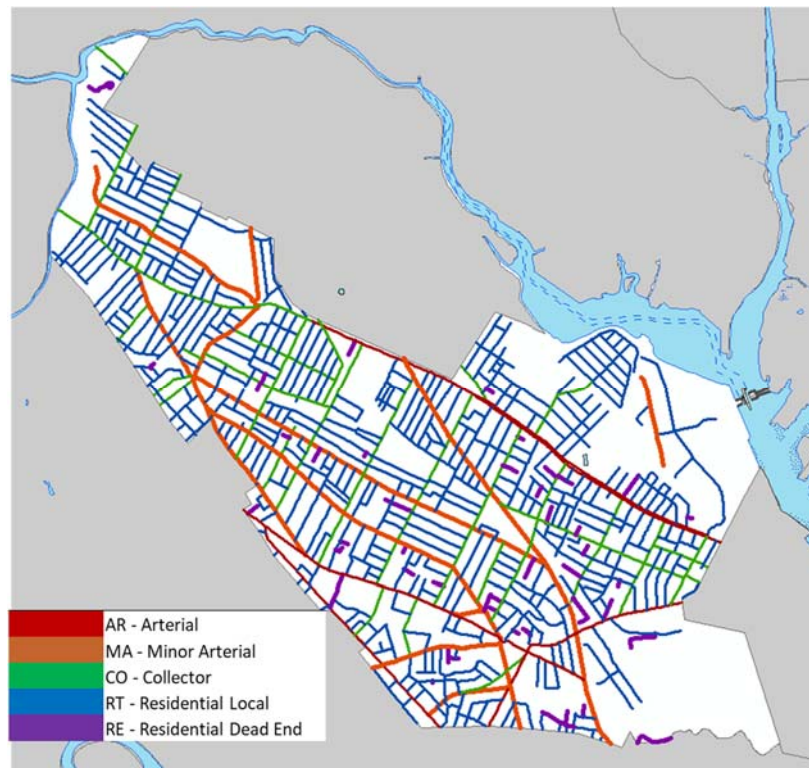


Figure 1 - Functional Classification Map

Sidewalk Prioritization

Historically, the street prioritization was the sole driver for sidewalk improvements as full-width pavement also includes reconstruction of sidewalks for ADA compliance. Experience with the program





through 2019, however, indicated that addressing sidewalks based on pavement priority does not adequately address the needs of pedestrians. When the Pavement Management Program development was initiated in 2012, data was also collected regarding sidewalk condition, which is also updated annually. To improve the City's progress toward ADA compliance and improving the pedestrian experience in general, in FY2020, the City initiated a separate sidewalk construction package in addition to the mill & overlay contract. To select sidewalks for inclusion in the contract, the Engineering Division in collaboration with a wide range of other City Departments developed a data-driven process that mirrors the paving prioritization.

- Sidewalk Condition Index (SCI) describes the physical condition of the sidewalk with 100 being a new sidewalk and 0 being fully deteriorated.
- Route Classification Priority (RCP) defines a priority routes throughout the City for pedestrians with 4 being the highest priority sidewalk routes and 0 being the lowest.

To determine the RCP multiple City Departments develop and update a list of priority locations throughout the City, including:

- Transit stations & bus stops,
- Civic buildings,
- Medical facilities,
- Religious centers,
- Day care centers,
- Adult housing,
- Neighborhood markets,
- Schools, and
- Open space & parks.

The City's geospatial team performs routing and proximity analyses between these priority locations, and combines this with topographical data to develop a Route Classification Priority (RCP) for each sidewalk in the City, divided into five classifications:

0. Calm Streets
1. Side Streets
2. Dense Neighborhoods
3. Transit Corridors
4. Business Districts

The Sidewalk Condition Index (SCI) and Route Classification Priorities (RCP) are combined for each street in the City to develop a ranked priority of sidewalk reconstruction; this is the Network Priority Ranking (NPR):

$$\text{NPR} = (0.40 \times \text{SCI}) + (0.60 \times \text{RCP})$$



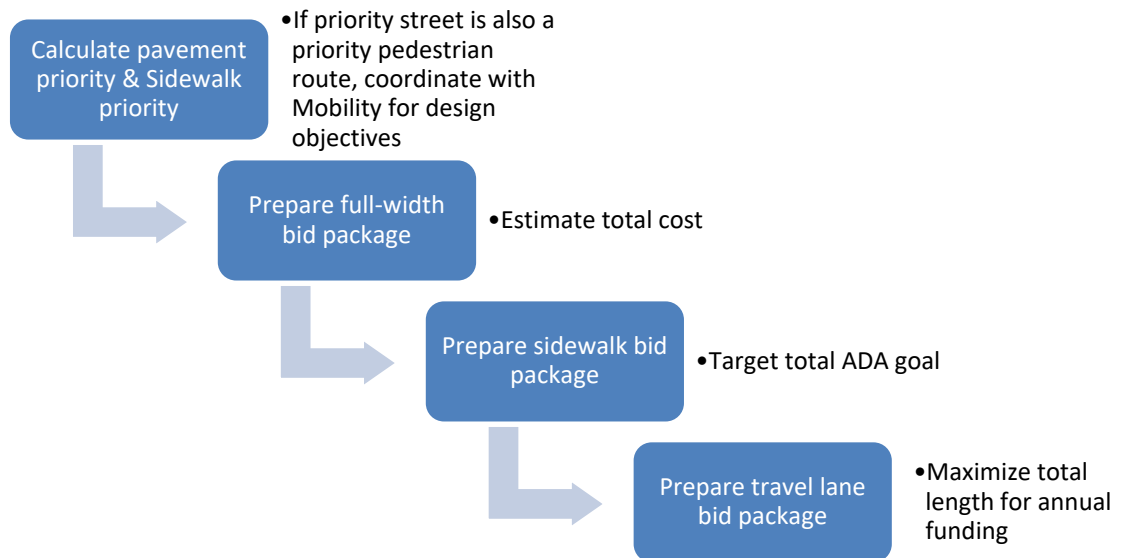


The NPR drives the selection of sidewalks for inclusion in the annual reconstruction contracts. All sidewalks are reconstructed in cement concrete pavement and made ADA/MAAB compliant. The reconstruction includes upgraded accessible curb ramps, driveway aprons and tree wells. Existing tree wells often include new rubberized porous pavement material to minimize root impacts on the sidewalk surface.

The NPR is averaged over entire street lengths of sidewalk. As such isolated sidewalk failures in otherwise acceptable sidewalks could be missed. The City assesses 311 notifications, ADA complaints and the annual sidewalk condition surveys for specific repairs. The City will self-perform these repairs where possible and include them in the sidewalk contract where these repairs are more complicated.

Program Workflow

Given the prioritization approach for roadways and sidewalks described above, and in coordination with other City departments, primarily Mobility, the Engineering Division ranks locations and develops cohesive bid packages for construction contracts as follows:





Planning Future Program Contracts

Sorted by their respective NPRs and planning level construction costs, a list of complete street and sidewalk reconstruction projects are developed that the City can reasonably expect to construct over the next five years. A similar list of residential side streets, sorted by their PCI, is also developed for travel lane only partial paving.

The annual construction project is assembled through consultation with the Mobility, Planning and PSUF divisions of OSPCD, OSE, the School Department, and various City Committees and Commissions to accomplish the following goals:

- Develop a cohesive construction project to receive favorable construction bids.
- Advance the City’s Vision Zero action plan goals.
- Advance the City’s ADA Title II Transition Plan.
- Coordinate with planned City utility upgrades.
- Coordinate with private utility trench repair projects.
- Leverage private development street reconstruction opportunities.

The NPR-sorted complete street and sidewalk lists, and the PCI-sorted partial paving list are provided below:

Complete Streets

Street	From	To
Broadway (E)	Central St	School St
Broadway (E)	Montgomery Ave	McGrath Hwy
Broadway	Glenwood Rd	Central St
Broadway	Josephine	Wilson
Broadway (E)	Sargent Ave	Montgomery Ave
Broadway	205' E of Medford St	Glenwood Rd
Broadway (W)	McGrath Hwy	130' E of Marshall St
Broadway (W)	Bond St	Central St
Broadway (E)	School St	Sargent Ave
Middlesex Ave	Mystic Ave	Foley St
Middlesex Ave	Foley St	Fellsway West
Washington	Hawkings St	Cambridge City Line
Webster Ave	Prospect St	Cambridge City Line
College Ave	Broadway	Medford City Line





Street	From	To
Broadway (W)	School St	Bond St
Broadway	Wilson Ave	Charles E Ryan Rd
Elm St	Somerville Ave	Russell St
Pearl St	Skilton Ave	McGrath
North St	Broadway	Medford City Line
Elm St	Russell St	Day St
Broadway	Westminster St	Wallace St
Broadway	Arlington Town Line	Westminster St
Cameron	Holland Ave	Cambridge City Line
Broadway	Wallace St	College Ave
Mt Vernon	Pearl St	Washington St
Broadway	College Ave	Josephine St
Broadway (W)	130' E of Marshall St	School St
East Albion St	Mt Verson St	Moreland St
Broadway	Charles E Ryan Rd	205' E of Medford St
East Albion St	Moreland St	Fremont St
Tufts St	Washington St	Cross St

* (E) and (W) respectively refer to the Eastbound and Westbound sides of Broadway where separated by a median.

Sidewalks

Street	Street (cont'd)	Street (cont'd)	Street (cont'd)
Chester Ave	Dana St	Fountain Ave	Wesley St
Wheatland St	Arlington St	Lexington Ave	Everett Ave
Rush St (S)	Franklin Ave	Belknap St	Hathorn St
Russell Rd	Grandview Ave	Winslow Ave	Clark St
Bond St	Lincoln Pkwy	Warner St	Otis St (E)
Thorpe St	James St	Rush St (N)	Ellsworth St
Windsor St	Cross St East	Holyoke Rd	Barton St





Partial Paving

Street	From	To
Douglas Ave*	Edgar Ave	Dead End
Thorpe St*	Highland Ave	Dead End
Harold St*	Dimick St	Marion St
Dearborn Rd	Medford City Line	College Ave
Laurel Terr	Laurel St	Dead End
Murdock St	Cedar St	Clyde St
Giles Park*	Walnut St	Dead End
Thurston St*	Medford St	Broadway (E)
Windom St*	Elm St	Summer St
Whipple St*	Highland Ave	Willow Ave
Weston Ave*	Broadway	Clarendon Ave
Crown St	Lowell St	Porter St
Sawyer Ave	Curtis St	Packard Ace
Lewis St*	Magnus Ave	Dead End
Wade Ct	Cedar St	Dead End
Atherton St*	Central St	Spring St
Third Ave	Inner Belt Rd	Inner Belt Rd
Oak St	Prospect St	550' N of Cambridge City Line
Hill St	Broadway (E)	Fairmount Ave
Packard Ave	Broadway (E)	Professors Row
Chester Ave	Cross St	Mcgrath Hwy
Lake St	Hawkins St	Church St
Hudson St	Central St	Cedar St
Latin Way	Professors Row	Talbot Ave
Mondamin Ct*	Ivaloo St	Harrison St
Chandler St*	Park Ave	Broadway (E)
Oak St*	550' N of Cambridge City Line	Cambridge City Line
Billingham St	William St	Broadway (E)
Springhill Terr	Highland Ave	Belmont St





Street	From	To
Whitfield Rd*	Packard Ave	Curtis St
Pearl St Pl	Pearl St	Dead End
Acadia Park	Somerville Ave	Dead End
Cross St East	Broadway (W)	Dead End
First Ave	Inner Belt Rd	Dead End
Benedict St	Austin St	Dead End
South St	Harding St	Windsor St
Teele St*	Packard Ave	Curtis St
Prentis St*	Beacon St	City Line

Note: Streets* will be paved in spring 2023 utilizing the \$949,338 FY 2023 Supplemental Funding.

