

City of Burlington

Vermont



Department Of Public Works

SIDEWALK PROGRAM

March 2016

SIDEWALK REPAIR PROGRAM

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1.0 PURPOSE

The Sidewalk Management Program (SMP) is a multimodal system of managing and maintaining the existing sidewalk network within the Right-of-Way in the City of Burlington. This program focuses on continuous preventative maintenance while taking into consideration resident feedback and outstanding safety concerns.

2.0 BACKGROUND

Burlington has an extensive transportation network containing over 130 miles of sidewalks. These sidewalks range in age from brand new to 60 years old or older. The design life for a segment of concrete sidewalk is estimated to be 40 years which means that a significant portion of City sidewalk has exceeded its design life expectancy. To meet this 40 year target design life, alternative repair methods and consistent maintenance will be required.

In 2014 the City of Burlington contracted Sally Swanson Architects to perform data collection on the entire sidewalk network. Working closely with staff, the consultant provided a GIS database that would allow the City to continuously track the conditions and needs of the sidewalk network.

3.0 OBJECTIVES

The objectives of this program are to:

1. Manage the total sidewalk network in a way that ensures safe and hazard free routes for pedestrian traffic.
2. Ensure that sidewalks within the right of way meet ADA standards and PROWAG guidelines.
3. Maintain a complete record of Burlington Sidewalks and their condition evaluated on a 5-10 year rotating schedule.
4. Determine a predictive work plan for long run replacement of sidewalks.
5. Use various methods of evaluation and repair to ensure the most economical use of sidewalk funding.
6. Address additional safety hazards that may occur within the sidewalk network.

4.0 INVENTORY MANAGEMENT

4.1 PURPOSE

In order to maintain and manage the sidewalk network a complete inventory of all existing sections of sidewalk had to be created. This was done **empirically** using GPS technology and data collector to create a GIS database. This database allows for a graphical representation of the sidewalk network and condition.

When repairs are made to a given section of sidewalk, the inventory will be updated to reflect these repairs, otherwise sidewalk sections are only evaluated every 5-10 years.

4.2 BARRIER SCORE

The barrier score is used to determine the level of deterioration of a given section of sidewalk. A number of factors were taken into consideration: running slope, cross slope, vertical offset, and puddling.

Table 1: Barrier Score Factors

Barrier Type	Weight	Quantity	Value	Score
Minor Heaving	10	1-2 incidents	30%	3
		3-5 incidents	60%	6
		6 + incidents	100%	10
Major Heaving	20	1-2 incidents	30%	6
		3-5 incidents	60%	12
		6 + incidents	100%	20
Cross Slope Low	5	10' or less	50%	2.5
		> 10'	100%	5
Cross Slope Medium	10	10' or less	50%	5
		> 10'	100%	10
Cross Slope High	15	10' or less	50%	7.5
		> 10'	100%	15
Running Slope Low	2.5	10' or less	50%	1.25
		> 10'	100%	2.5
Running Slope Medium	5	10' or less	50%	2.5
		> 10'	100%	5
Running Slope High	7.5	10' or less	50%	3.75
		> 10'	100%	7.5
Puddling	25	1 incident	50%	12.5
		3+ incidents	100%	25

Notes: Sidewalk puddles are evaluated during the year when the ground is not frozen, to determine where year-round drainage issues occur. Under full-funding, puddles will begin to be evaluated during winter months to address maintenance as well as drainage issues.

4.3 ACTIVITY SCORE

The activity score is used to estimate the level of activity that a given section of sidewalk might see. This is the equivalent of the Pedestrian Propensity (Potential) Index. The following table shows what factors are considered and how they are weighted to compute an activity score.

Table 2: Activity Score Factors

CRITERIA LAYER	SUB CATERGORY	WEIGHT	CATEGORY	VALUE	ADUSTED SCORE
STREETS	ARTERIAL	10	ADJACENT ARTERIAL STREET	100%	10
	COLLECTOR		ADJACENT COLLECTOR STREET	50%	5
	LOCAL		ADJACENT LOCAL STREET	25%	2.5
TRANSIT STOPS		5	WITHIN 1/4 MILE OF TRANSIT STOP	100%	5
SCHOOLS	ELEMENTARY SCHOOL	12	WITHIN 1/4 MILE OF ELEMENTARY SCHOOL	100%	12
	MIDDLE OR HIGH SCHOOL		WITHIN 1/2 MILE OF MIDDLE OR HIGH SCHOOL	67%	8
	COLLEGE		WITHIN 1 MILE OF COLLEGE	42%	5
PARKS/PATH	LARGE	10	WITHIN 1/2 MILE OF PARK	100%	10
	MEDIUM		WITHIN 1/2 MILE OF PARK	50%	5
	SMALL		WITHIN 1/4 MILE OF PARK	50%	5
CITY ATTRACTORS	DOWNTOWN DESIGNATION	12	WITHIN 1/4 MILE OF DOWNTOWN AREA	100%	12
	NEIGHBORHOOD ACTIVITY CENTER		WITHIN 1/4 MILE OF NEIGHBORHOOD ACTIVITY CENTER	67%	8
PEDESTRIAN GENERATORS	SENIOR CENTER	12	WITHIN 1/4 MILE OF SENIOR CENTER	100%	12
	COMMUNITY CENTER		WITHIN 1/4 MILE OF COMMUNITY CENTER	67%	8
	EMPLOYMENT CENTER		WITHIN 1/2 MILE OF LARGE EMPLOYER	42%	5
	MEDICAL OR SOCIAL SERVICES		WITHIN 1/4 MILE OF MEDICAL OR SOCIAL SERVICES	100%	12
POPULATION DENSITY		12	CATEGORIES LOOSELY BASED ON "NATURAL BREAKS" CLASSIFICATIONS	0%	0
				30%	4
				60%	7
				100%	12
ELDERLY POPULATION DENSITY		12	CATEGORIES LOOSELY BASED ON "NATURAL BREAKS" CLASSIFICATIONS	0%	0
				30%	4
				60%	7
				100%	12

4.4 PRIORITY SCORE:

The priority score or SCI (Sidewalk Condition Index) is the final score that determines the order in which whole segments of sidewalks come up for replacement. This score combines the barrier and activity score to give us an objective idea of how important replacing each segment of sidewalk is. Higher scores mean segments in greater need of repair, lower scores mean less need of repair. The equation for the priority score is as follows:

a = Activity Score

b = Barrier Score

p = Priority Score

$$\begin{aligned} \text{If } a \leq 2b; & \quad p = b + a \\ \text{If } a > 2b; & \quad p = b + 2b \end{aligned}$$

5.0 REPAIR METHODOLOGY

5.1 LONG RUN REPAIRS

- a. Based on the Sidewalk Condition Index (SCI)
- b. Repaired in order of score (highest to lowest)

5.2 LOCALIZED REPAIRS

- c. Localized repairs occur where the entire segment of a sidewalk doesn't qualify for replacement in the near future, but a smaller section within that segment may warrant some repair.
- d. Identification of Localized Repairs
 - i. Coordinated work with other departments
 - ii. Project related work
 - iii. To improve conditions on a low scoring sidewalk segment
 - iv. Requested
 1. RFS (Request for Service)
 2. SCF (See-Click-Fix)
 3. DPW customer service
 4. Other

5.3 SAFETY HAZARD REPAIRS

- e. A sidewalk safety hazard is an extant condition in a sidewalk that causes it to be difficult to traverse for a pedestrian.
- f. Sidewalks deemed to be a safety hazard are eligible for repair outside the normal work plan for sidewalk improvements through an expedited system.
- g. Identification of Safety Issues
 - i. After safety incident

- ii. Requested
 - 1. RFS (Request for Service)
 - 2. SCF (See-Click-Fix)
 - 3. DPW customer service
 - 4. Other
- iii. Identified via inventory

5.4 ALTERNATIVE REPAIRS

- h. Sidewalks that do not qualify as safety hazards or localized repairs and are not planned to be repaired within the current fiscal year may qualify.
- i. Alternative repairs include sidewalk sawcutting, asphalt patching, mudjacking, tree root trimming, sidewalk bridging, etc.

6.0 SAFETY HAZARD CRITERIA

6.1 DEFINITION OF SAFETY HAZARD

A safety hazard within the sidewalk program is a physical feature of a sidewalk that causes it to be hazardous to traverse for an average person.

6.2 QUALIFICATION OF SAFETY HAZARD

For a sidewalk to be considered a safety hazard it must meet at least one of the following conditions:

- A sidewalk panel rocks when walked across.
- The sidewalk contains an instance of 2” or greater vertical displacement
- More than half of a sidewalk panel is missing and there is at least a 1 inch vertical displacement
- The panel is producing granular material in such quantity and size that it is causing a tripping hazard. (>1” diameter pieces)
- Large unstable broken chunks of sidewalk
- There is a gap between panels 2” or greater with some amount of vertical displacement

Conditions that do not, in themselves, constitute a sidewalk safety hazard:

- A panel surface has started to deteriorate or appears to be “down to dirt”, but appears in decent condition after loose material has been removed.
- Two sidewalk panels have grass growing between them.
- The sidewalk is severely cracked, but has no vertical displacements.
- The sidewalk is being lifted by tree roots.

- Spalling along the edges of a panel that does not create a vertical change of greater than 2 inches.

NOTE: Sidewalks showing these conditions will be evaluated for inclusion in the localized replacement list.

7.0 BUDGET

7.1 PROGRAM LEVEL BUDGET

Budgetary considerations and outline to adequately support the City of Burlington’s Sidewalk Program.

Definition of a fully-funded program: $\geq \$750,000.00$
 Definition of an under-funded program: $< \$750,000.00$

Under a fully funded program, work sufficient to cover annual ROW department budget will be assigned to ROW department. All other sidewalk work will be contracted out.

7.2 PROJECT LEVEL BUDGET

The percentage of funds allocated to various types of repairs will vary based on the funding level of the program.

Under a fully-funded program, the project funding breakdown is as follows:

Type of Repair	% of Funds Allocated
Long Runs	$\geq 75\%$
Short Runs (non-safety)	$\leq 10\%$
Short Runs (Safety)	$\leq 15\%$

Under an under-funded program, the project funding breakdown is as follows:

Type of Repair	% of Funds Allocated
Long Runs	$\geq 40\%$
Short Runs (non-safety)	$\leq 15\%$
Short Runs (Safety)	$\leq 45\%$

The budget for the Sidewalk Sawcutting Program will consist of no more than 10% of the budget allocated to Long Run repairs in a given fiscal year.

8.0 SIDEWALK ENHANCEMENTS

8.1 Identification

Sidewalk enhancements constitute construction of new pedestrian facilities within the right-of-way.

8.2 Prioritization

1. Activity Score
2. Walk/Bike plan recommendations
3. Visual inspection for signs of pedestrian usage.