Technical Memorandum

City Sidewalk Snow Clearing: High Priority Streets

Prepared by the Syracuse Metropolitan Transportation Council For the City of Syracuse September 18, 2018





MEMORANDUM

TO: Corey Driscoll Dunham, Director of Operations, City of Syracuse

FROM: Aaron McKeon, Sr. Transportation Planner, Syracuse Metropolitan Transportation Council

DATE: September 18, 2018

RE: City Sidewalk Snow Clearing – High Priority Streets

CC: James D'Agostino, Director, Syracuse Metropolitan Transportation Council Adria Finch, Chief Innovation Officer, City of Syracuse i-Team Sam Edelstein, Chief Data Officer, City of Syracuse i-Team Neil Milcarek-Burke, Transportation Planner, City of Syracuse

Background

In July 2018, staff of the Syracuse Metropolitan Transportation Council (SMTC) met with City of Syracuse staff to discuss steps the City could take in order to launch a sidewalk snow clearing effort during the winter of 2018/2019. SMTC staff offered to assist the City with the process of prioritizing routes to be cleared, recognizing that a budget for this effort had not yet been developed and many of the logistics were unknown, but funding constraints would severely limit the number of miles of sidewalk that would be cleared. Tools at the SMTC's disposal include the GIS-based sidewalk inventory, the pedestrian demand model, GIS-based locations of schools, grocery stores, and other destinations, and data on traffic volumes.

In subsequent discussions with City staff, the following parameters were defined for this task:

- Access to schools should be prioritized.
- Pedestrian safety is the primary consideration.
- Access to grocery stores and other neighborhood destinations (such as pharmacies and convenience stores) should be weighted heavily.

- The benefits of such a program should be distributed throughout the city: splitting mileage up evenly among the city's five Common Council Districts would be an acceptable approach.
- Given budget constraints, it may be necessary to limit sidewalk snow clearing to one side of the street only.

Budgetary considerations

At this time, neither the exact per-mile cost of implementing a sidewalk snow clearing program in Syracuse nor the total budget available for such a program are known with certainty. However, the City clearly indicated that they do not expect to have funding available in the near future to implement snow clearing on all sidewalks in the City and, therefore, some method is necessary to prioritize locations for inclusion in the initial program.

Discussions with City staff in summer 2018 suggested that funding in the range of \$25,000 to \$100,000 would be a reasonable expectation for the first year of a sidewalk snow clearing program.

For planning purposes, a conservative cost estimate of \$4,000 per mile of sidewalk per season was assumed. The City of Rochester's cost is \$1,400 per mile per season (according to e-mail correspondence from 2014). The University Hill Partnership's sidewalk snow clearing pilot project cost roughly \$2,100 per mile during the winter of 2009/2010. Given the unprecedented nature of the City of Syracuse's undertaking and the unpredictability of equipment, snowfall, and other variables, it seemed prudent at the planning stage to assume a worst-case cost that was roughly double the University Hill Partnership's estimate. In practice, the per-mile fee will be determined in cooperation with the City's selected vendor(s).

Based on a \$4,000 per mile estimate and the anticipated initial budget of approximately \$25,000 to \$100,000, the centerline¹ roadway mileage to be cleared could range from a low of six miles to a high of 25 miles. This memo identifies 20 miles of high-priority centerline mileage as a starting point. Once an initial framework is decided upon, sidewalk mileage can be added by linking major

¹ Unless otherwise noted, mileage in this memorandum refers to centerline mileage: the length of a roadway segment as measured down the road's center, as opposed to the length of the sidewalks along the roadway segment. Most city streets have sidewalks on both sides of the street, but it is not necessarily the case that a sidewalk snow clearing program would clear snow from the sidewalks on both sides of a given street.

routes to one another, connecting to major destinations, including other major corridors, and/or clearing sidewalks on both sides of selected streets.

Items to be Analyzed Elsewhere

The SMTC's role in this activity was to identify key routes for a limited sidewalk snow clearing program. In the course of this analysis, several ancillary issues were raised that were ultimately set aside as not critical to the task at hand. These program elements are not discussed in this memo, but are cataloged for future reference. They include:

- Type of equipment to be used to clear sidewalks including its size, acquisition, storage, and maintenance;
- Whether salt and/or sand will be used on sidewalks;
- How snow clearing equipment and/or personnel will be transported throughout the city;
- The benefits of walking the selected routes prior to the first snowfall to note any issues with existing sidewalks (such as obstructions or narrow sidewalks);
- The possibility of using flexible poles to delineate the edges of sidewalks along routes to be cleared; and
- The snowfall level that would trigger sidewalk snow clearing on these routes (Rochester plows sidewalks when four inches of new snow have accumulated).

Examples from other cities

SMTC staff conducted a review of sidewalk snow clearing practices in other U.S. cities. Rochester, which is often cited as an example for Syracuse, clears all sidewalks within the city limits using a network of individual contractors. The City of Rochester began hiring contractors (with horse drawn plows) to clear selected sidewalks in 1904, expanding to the entire city in subsequent years. Among cities that clear only a portion of public sidewalks, it is common practice to prioritize major routes, such as principal and minor arterials,² supplemented with clearing of sidewalks on local

 $^{^2}$ For planning purposes, streets and roads are classified according to the level of accessibility and mobility they provide. Arterials (principal and minor) provide the greatest mobility – that is, higher speeds, more lanes, and connections from one part of a city or region to another. Local roads provide lower mobility (narrower roads with slower speeds and more stops) but the highest accessibility – it is easy to get to and from individual houses or other

streets adjacent to public schools and in central business districts. In Portland, Maine, city workers clear 100 miles of sidewalk. Portland's approach focuses on the city's arterials, but local streets are included in order to connect to public schools.

Pedestrian Safety Concerns

Several approaches to the task of prioritizing sidewalk clearance in Syracuse were discussed. Because large numbers of public school students must get to school on foot regardless of snowfall, focusing on schools is a logical starting point. And if the alternative to using a cleared sidewalk is walking in or along the road, the question becomes: which road is it preferable for children to walk in – a busy arterial or a relatively low volume local street? (Clearly it is preferable for no child to walk in any road.) Research indicates that arterials are generally more dangerous for pedestrians than local streets. While arterials make up only ten percent of the nation's highway mileage,³ a 2018 insurance industry analysis reported that more than half of all pedestrian fatalities occurred on arterials.⁴

Current Sidewalk Snow Clearing

Syracuse City School District

In many cases, clearing snow from sidewalks on main streets would not provide direct access to nearby schools. The Public Service Leadership Academy at Fowler (PSLA), for example, is located on the portion of South Geddes Street between West Genesee and Delaware Streets, but the main entrance is on Magnolia Street, 1,000 feet from South Geddes Street (a minor arterial). Based on conversations with City staff and the Syracuse City School District (SCSD) Facilities and Operations department, the SMTC understands that SCSD staff currently clear sidewalks adjacent to SCSD properties. This is assumed to include street segments adjacent to athletic fields that may be quite distant from schools' main entrance or parking areas. In the case of the PSLA, if the City were to clear South Geddes' sidewalks, current SCSD sidewalk clearing would create a path from Geddes along Seymour Street to Magnolia Street. In this example, if the City were to

destinations. Collector roads connect arterials to local roads and share aspects of each – typically traffic moves faster on collectors than on local roads and traffic volumes are lower than on arterials.

³ Our Nation's Highways – Selected Facts and Figures, Federal Highway Administration, 1998.

⁴ An Examination of the Increases in Pedestrian Motor Vehicle Crash Fatalities during 2009 – 2016, Wen Hu and Jessica Cicchino, Insurance Institute for Highway Safety, May 2018.

clear the sidewalk on the west side of South Geddes, it would be taking over snow clearing that is, presumably, a current SCSD responsibility. The idea of expanding SCSD sidewalk snow clearing to create connections to routes to be cleared by the City is explored in greater detail below.

City of Syracuse – Public Works and Parks Departments

In addition to SCSD snow removal activities, the SMTC's analysis took into account sidewalk snow clearance routinely done by the City's Public Works and Parks Departments. Public Works' sidewalk snow clearing tends to be spot-oriented, for example clearing several short stretches of sidewalk under highway overpasses. In some cases, however, the Public Works Department is currently clearing snow from sidewalks on key corridors, such as West Street, or on strategic connectors, such as Grand Avenue, Velasko Road, and West Onondaga Street near Western Lights Plaza.

Business Improvement Districts and Institutions

The Downtown Committee of Syracuse handles sidewalk snow clearing in Downtown Syracuse: the area bounded by I-690, I-81, Onondaga Creek / West Street, and Adams Street. The Crouse-Marshall Business Improvement District clears snow on sidewalks on several blocks on University Hill. Syracuse University, SUNY ESF, and LeMoyne College clear sidewalks on their respective campuses.

Sidewalk Snow Clearing - Prioritization

SMTC staff and City staff cooperatively determined that, if only a few miles of sidewalk are to be kept clear of snow, it would be logical to focus on high-volume streets that provide access to schools and other destinations, such as grocery stores. City staff requested that the mileage be distributed across the city, with roughly the same mileage in each of the five council districts. Given the budget constraints and cost information previously discussed, this resulted in the following parameters for identifying priority segments for sidewalk snow clearing:

• Priority route mileage should be roughly equal across council districts.

- At the minimum anticipated budget (as indicated by the City) of \$25,000 and an estimated cost of \$4,000 per mile, one mile should be identified in each council district. An additional mile in each district should also be identified for a total budget of up to \$50,000.
- Priority should be given to Arterials, followed by Major Collectors (according to the SMTC Functional Classification map).
- Higher traffic volume roads should be given priority (generally over 5,000 vehicles per day).
- Priority routes should have a concentration of pedestrian destinations and, ideally, provide access to schools and grocery stores.
- A "secondary" set of segments should be identified that connect to the "top priority" routes and result in a total of about 20 centerline miles of roads (under \$100,000 total budget).

Table 1 identifies the "top priority" segments and the destinations to which they provide access.

The secondary segments were identified as valuable, logical, and practical extensions to top priority segments. Some of these segments simply connect two one-mile segments separated by the artificial boundary of Common Council Districts – such as the half-mile of James Street between Lincoln Middle School and Grant Boulevard. Other segments are comparable in value to the "top priority" segments. For example, clearing sidewalks on the portion of West Genesee Street west of Erie Boulevard to the city's edge would not only help students reach Porter Elementary School, it would make it safer to walk between several city neighborhoods and Westvale Plaza, and make it easier to reach the Rite Aid on Avery Avenue – one of the few pharmacies on the city's west side. The secondary segments are listed in Table 2.

The attached map 'Potential Sidewalk Clearing Routes – Priority Routes' shows the entire network of priority segments together (both top priority and secondary segments).

District	Street Name	From	То	Centerline Mileage	AADT*	Destinations			
1	James Street	State Street	Lincoln Middle School	1.4	11,380	Lincoln Middle School, Bryant & Stratton, ARISE, Interfaith Works			
1	Butternut Street	Salt Street	Grant Boulevard	1.3	6,400 - 8,000	Save-A-Lot, Rite Aid, Franklin School, White Branch Library, Cathedral Academy at Pompei			
2	West Genesee Street	West Street	Erie Boulevard West	1.2	10,000	Academy of Science High School, Frazer School, Aldi / Dollar Tree / Dunkin Donuts			
2	South Geddes Street	West Genesee Street	Delaware Street	1	8,300 - 13,600	Aldi, PSLA, Delaware School, Save-A- Lot			
3	South Salina Street	Matson Avenue	Clary Middle School	1.2	14,500	Valley Plaza, Clary School, Expeditionary Learning School, Betts Branch Library Academy of Science Elementary			
3	Glenwood Avenue / South Avenue	South Geddes Street	Cortland Avenue	1.4	6,800 - 9,200	Corcoran HS, Roberts School, Community Healthcare South			
4	South Salina Street	MLK Boulevard	Matson Avenue	1.4	10,500 - 14,600	McKinley-Brighton Elementary, McCarthy at Beard, Beauchamp Library			
4	South Avenue	West Onondaga Street	Onondaga Avenue	1	6,000	SW Community Center, Onondaga Park, Price Rite, PEACE Head Start			
5	James Street	Grant Boulevard	City Line	0.9	11,400	Paine Library, Blessed Sacrament School, Kinney Drugs, Rite Aid			
5	East Genesee Street	Almond Street	Salt Springs Road	1.5	6,800	Levy School (swing space), Rite Aid			
	TOTAL 12.3								
*Annual A	*Annual Average Daily Traffic – an estimate of average daily traffic volume on a roadway segment.								

Table 1 – Sidewalk Snow Clearing – Top Priority Segments by Common Council District

District	Street Name	From	То	Centerline Mileage	AADT*	Destinations		
1	Teall Avenue	James Street	Erie Boulevard East	1.1	17,400	Henninger HS, Price Rite		
1	James Street	Lincoln Middle School	Grant Boulevard	0.5	11,380	Downtown - Eastwood connection		
1	Grant Boulevard	Butternut Street	Pond Street	0.2	5,600	Tops, Grant School		
1	Pond Street	Grant Boulevard	First North Street	0.3	3,700	Tops, Grant School		
1	Park Street	Butternut Street	Hiawatha Boulevard	1.5	1,700 - 3,500	Franklin School, Ihsan School of Excellence , Destiny USA		
2	West Genesee Street	Erie Boulevard West	City Line	0.85	21,800	Westvale Plaza		
2	West Onondaga Street	West Adams Street	South Avenue	0.3	7,700	Seymour School, Boys & Girls Club		
2	South Geddes Street	Delaware Street	West Onondaga Street	0.4	7,500	Mundy Library		
2	West Onondaga Street	South Geddes Street	Kandace Street	0.4	5,400	Providence House senior housing, Catholic Charities, Western Lights		
3	West Brighton Avenue	South Avenue	Onondaga Creek	0.3	9,100	Danforth School		
3	South Salina Street	Clary Middle School	City Line	0.8	10,400	Meachem School		
4	West Brighton Avenue	Onondaga Creek	South Salina Street	0.6	9,200	Danforth School, Cannon Street Community Center		
5	Columbus Avenue	Erie Boulevard East	East Genesee Street	0.22	5,500	North-south connection		
5	East Genesee Street	Salt Springs Road	Hurlburt Road	0.7	6,800	Nottingham HS		
TOTAL 8.2								
*Annual Average Daily Traffic – an estimate of average daily traffic volume on a roadway segment.								

Table 2 – Sidewalk Snow Clearing – Secondary Segments by Common Council District

Connecting to Schools

The segments listed in Tables 1 and 2 would not connect students to schools on low volume, neighborhood streets. In some cases, it would be extremely beneficial to students if SCSD sidewalk snow clearing was extended beyond school grounds, to connect to a route being cleared by the City.

The City requested that the SMTC identify potential snow clearing routes to connect to schools that are within one-third mile of a sidewalk that is already being cleared or is proposed to be cleared in this analysis. The attached map "Additional School District Clearing" identifies a total of an additional 5.5 miles of sidewalk that would connect students either to sidewalks that are currently cleared (for example, by the City Parks Department) or that would be cleared under the program proposed in this memo that meet this distance criteria. This would be in addition to the SCSD's current snow clearing, which (as stated above) the SMTC understands to include all sidewalks adjacent to a given school. Table 3 below provides an estimate of additional sidewalk snow clearing for each school are also attached. Additional clearing is not proposed for all schools in the city since some schools are located over one-third mile from existing or proposed school clearance routes.

This additional clearing is divided into two tiers:

- Tier 1: segments that connect a school to another street segment, whose sidewalks are either currently being cleared or proposed for clearance (in Table 1 or Table 2 in this memo).
- Tier 2: segments that connect to a sidewalk adjacent to a park that is already being cleared by the City Parks Department.

Table 3 – Proposed Off-Campus SCSD Sidewalk Clearing, by School

School Name	School		Street Name	Block(s)	Feet
	Total (ft.)	Tier			
McCarthy @ Beard	2,467	1	West Kennedy	100	627
Miccartiny & Beard		1	West Kennedy	200 & 300	1,840
Bellevue Elementary	2,019	1	South Geddes Street	1400 & 1500	779
believue Liementai y		2	Roberts Avenue	300, 400 & 500	1,240
Westside Academy at Blodgett	1,310	1	Otisco Street	600 & 700	1,310
Corcoran High School	191	1	Glenwood Avenue	900	191
Dr. King Elementary	2,400	1	MLK Boulevard (East Castle Street)	100 & 200	1,010
		2	South McBride Street	500, 1400 & 1500	1,390
Dr. Weeks Elementary	2,730	1	Oak Street	200, 300 & 400	1,540
Dr. Weeks Liementary	2,750	2	Hawley Avenue	700, 800 & 900	1,190
Ed Smith Pre-K-8	1,050	2	Broad Street	300, 400 & 500	1,050
Franklin Elementary	264	1	South Alvord Street	400	264
Frazer Pre-K-8	1,126	1	Park Avenue	700	620
Flazer Pre-N-0		1	Park Avenue	900	506
Grant Middle School	349	1	Grant Boulevard	2300	349
Honninger High School	1,121	1	Robinson Street	400	325
Henninger High School		2	Robinson Street	200 & 300	796
(Hughes) Syracuse Latin	1,704	2	Jamesville Avenue	400	524
(Hughes) Sylacuse Latin		2	Vincent Street	200 & 300	1,180
	1,535	2	Sunnycrest Road	300	185
Huntington Pre-K-8 School		2	Stafford Avenue	400	986
		2	Caleb Avenue	200	364
Levy (Swing Space)	753	1	Fellows Avenue	000 & 100	753
Lincoln Middle School	1,180	1	Durston Avenue	100	1,180
	3,149	1	West Pleasant Avenue	100	316
McKinley-Brighton Elementary		1	West Newell Street	100	313
		1	Cannon Street	600,700 & 800	1,130
		2	West Newell Street	200 & 300	1,390
Meachem Elementary	507 1		Spaulding Avenue	100	507
Nottingham High School	515	1	Meadowbrook Drive	none	179
Nottingham High School		1	Hurlburt Road	100	336
Porter Elementary	333	1	Emerson Avenue	500	333
PSLA @ Fowler	915	2	South Wilbur Avenue	500 & 600	915

School Name	School Total (ft.)	Route Tier	Street Name	Block(s)	Feet
Salem Hyde Elementary	1402	1	Durston Avenue	200, 300 & 400	1,140
Salem Hyde Elementary	1402	2	Gray Avenue	200	262
Seymour Dual Language Academy	154	1	Shonnard Street	100	154
Webster Elementary	1 926	1	Wadsworth Street	300 & 400	845
webster Elementary	1,836	1	Grant Boulevard	1700 & 1800	991

Table 3 Continued – Proposed Off-Campus SCSD Sidewalk Clearing, by School

Some schools are geographically isolated from other snow clearing efforts (either ongoing or proposed) such that there is no logical place to which to extend SCSD snow clearing. No additional clearing is recommended for the following schools, due to their distance (over one-third mile) from existing or proposed routes:

- HW Smith Pre-K-8 School;
- LeMoyne Elementary; and
- Van Duyn Elementary.

No additional sidewalk snow clearing is recommended for the following schools because existing and/or proposed clearing efforts are deemed sufficient to provide access:

- Clary Middle School;
- CORE K-8 @ Elmwood School;
- Danforth Middle School;
- Delaware Elementary School;
- ITC High School; and
- Roberts Pre-K-8 School.

Erie Boulevard East

Erie Boulevard East is a notable omission in this memo's listings. Erie Boulevard is a critical eastwest connector and a known hazard for pedestrians, as documented in the SMTC's *Erie Boulevard East Pedestrian Study*. However, unlike the other street segments identified in this document, Erie

Boulevard is not a "neighborhood" street: there are no schools on or adjacent to this route and it is a third of a mile from Erie Boulevard to the next residential area to the north. Additionally, sidewalks are inconsistent along Erie Boulevard – particularly on the southern side (eastbound lanes). A continuous cleared sidewalk on the three-mile segment between Downtown Syracuse and Thompson Road may be possible along the northern side (westbound lanes) of the road. As funding becomes available, the City of Syracuse should consider clearing this route.

Program Gaps

Sidewalk snow clearing on the roadway segments identified previously would make the walk to school substantially safer for many students. Most of the schools located on or adjacent to roads with more than 5,000 vehicles a day would see improved access as a result of the program outlined in this memo.

Access to four schools located on busy roads (more than 5,000 vehicles daily, for the purposes of this analysis⁵) would not be improved by the program outlined in this memo. As funding becomes available, the City should consider adding street segments to its sidewalk snow clearing program to improve access to the following schools:

- ITC High School, between South Salina Street / Warren Street and State Street,
- Van Duyn Elementary School, near Valley Drive,
- Southside Academy Charter School, near Valley Drive, and
- LeMoyne Elementary School, near Wadsworth Street.

ITC High School, located on East Adams Street, currently benefits from the Downtown Committee's sidewalk snow clearing activities. Discussions with students who walk to school may indicate other routes that should be cleared for pedestrians near this school.

⁵ There is no single definition of a "busy" road and a volume of 5,000 vehicles per day on a given road does not mean a road is congested. In terms of students walking to school, New York State's Child Safety Zone regulations (17 CRR-NY 191.3) define a "high volume" road as having 100 or more vehicles per 15-minute period (400 vehicles per hour) during times of day when children are walking to or from school. Most of the roads in our region with more than 5,000 cars a day meet this definition of a "high volume" road.

The segments identified in Tables 1 and 2 would provide access to (or as near as possible to) all of the supermarkets in and adjacent to the city, other than two on Erie Boulevard East (Price Chopper and Aldi). Similarly, most of the city's nearly 20 freestanding pharmacies would be covered under this program, including three on James Street and two on Butternut Street. Only two pharmacies in the city would not see improved access: the Rite Aid at Valley Drive and Seneca Turnpike and the Kinney Drugs at East Seneca Turnpike and Lafayette Road.

Title VI and Environmental Justice

The SMTC is committed to ensuring that no person is excluded from participation in, or denied the benefits of, its metropolitan transportation planning process on the basis of race, color, national origin, gender, age, disability or economic status as provided by Title VI of the Civil Rights Act of 1964 and related statutes.

The SMTC's 2012 *Environmental Justice Analysis* provides a detailed methodology for identifying high-priority target areas, medium-priority target areas, and low-priority target areas, based on the demographic characteristics of these areas' residents. Residents of high-priority and medium-priority target areas have higher than average proportions of low-income, minority, and/or elderly residents. Applying this methodology to 2015 American Community Survey data, many of the Census tracts in the City of Syracuse are identified as either medium-priority or high-priority target areas. Of the 20.5 miles of roadway identified for clearing, 20 miles are in or adjacent to medium-priority or high-priority target areas. The sidewalk snow clearing program outlined in this memo would not exclude low-income, minority, or elderly residents.

Conclusion

At the request of the City of Syracuse, SMTC staff have identified a total of 20 miles of roadway segments that should be considered for a sidewalk snow clearing program in the City of Syracuse. Based on an anticipated cost of \$4,000 per mile, this results in a snow clearing program that would total under \$100,000 as requested by the City. The identification of priority routes was based on roadway functional class, traffic volume, and access to destinations, particularly schools and grocery stores. Given that the city has acknowledged the current budget will not allow for the

clearing of the entire sidewalk system in the city, this memo presents a prioritized network of sidewalks to be cleared of snow within the limits of reasonably expected resources.

The question of how to maintain pedestrian access on city streets through the winter months has confounded City leaders for decades. There is no inexpensive or easy way to move the two to three tons of snow that can fall on the average home's sidewalk each winter. A City administered snow clearance program can leverage economies of scale and benefit from partnerships with other large institutions, such as the SCSD. In the event that a successful pilot program is implemented in the winter of 2018/2019, the strategy outlined in this memorandum (focus on busy roads that link destinations) can be expanded to include more city streets.



