City of Syracuse Sidewalk Study Technical Memorandum

OCTOBER 2024

DRAFT

Syracuse Metropolitan Transportation Council

DRAFT
TECHNICAL MEMORANDUM

SMTC

EXECUTIVE SUMMARY

As a part of the 2020-2021 Unified Planning Work Program (UPWP), the Syracuse Metropolitan Transportation Council (SMTC) agreed to complete the City of Syracuse Sidewalk Planning Study. This study developed out of a desire by City staff to pursue a municipal sidewalk program. The City successfully passed this ordinance in 2021. Prior to the development of this program, the cost of sidewalk repairs fell on the homeowner, and sidewalks were cited and condemned on a reactive rather than a proactive basis.

Under the new municipal sidewalk program, property owners pay a set fee, and maintenance has been transferred to the City. In order to adopt a strategic maintenance program, City staff indicated a desire to know the current conditions of the sidewalks. The SMTC developed an inventory plan for the sidewalk system complete with several variables about both the sidewalks and the surrounding land uses. Over the course of the last five years, SMTC utilized interns to collect this data, and the inventory was completed in July 2024.

This memo serves as an overview of the program, the SMTC's role, and suggestions for ensuring the program continues.

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Introduction and Background

SMTC and City of Syracuse staff have worked closely on several initiatives, with the SMTC providing technical assistance to the City on a variety of transportation planning-related projects. The SMTC maintains both a GIS – Member Agency Assistance and a City of Syracuse On-Call Planning support line item on its UPWP. Before the start of the sidewalk project, SMTC staff had recently assisted the City in developing routes for its Snow Removal Pilot Program.

In 2019, City of Syracuse staff approached SMTC staff to discuss the possibility that the City would assume maintenance responsibility for all public sidewalks on city streets. City staff requested the SMTC's assistance in developing an approach to prioritizing sidewalk repair, replacement, and construction.

SMTC staff agreed to take on the task but recognized the limitations in developing a prioritization plan. Most importantly, little-to-no data was available for sidewalks. The SMTC maintained a GIS file which documented the presence or absence of sidewalks in the city, along with an approximation of the sidewalk's condition. This file was maintained at the block level and was completed using aerial photography. If the City desired a prioritization analysis, the sidewalk data would need to be much more granular – at the parcel level.

As there was not a parcel-level inventory available, SMTC delivered a prioritization analysis based on three factors:

1.) The existing Snow Removal Pilot corridors, which represent the outcome of both analysis and public input, and the maintenance of which, assuming this pilot continues, will significantly benefit snow removal operations.

2.) Pedestrian demand, as measured in the SMTC's pedestrian demand model (PDM). This model combines data from 19 inputs to estimate which parts of the city are most likely to have high pedestrian activity.

3.) Pedestrian safety, as measured (inversely) by traffic volume. Studies show that as traffic volume increases, risks to pedestrians walking along a street also increase.

At the time this effort was completed, it was anticipated that the City of Syracuse would complete a sidewalk condition inventory in the summer of 2020. When this data was collected, these priority rankings could be combined or otherwise cross-referenced with the new quality data to generate a plan for improving and installing sidewalks over a timeframe of the City's choosing.

SMTC Data Collection

Initially, the SMTC planned on serving an advisory role in the process of sidewalk data collection. To ensure the greatest benefit possible, it was determined that the inventory file should be spatially referenced and stored in a geographic information system. SMTC staff would develop the inventory schema and provide technical expertise and could train City staff and/or interns. However, with the onset of the COVID-19 pandemic in 2020, the SMTC took the lead in the inventory.

Fix Sidewalk File

SMTC staff determined that the existing sidewalk file held value as a starting point from which to build the new inventory. This file already contained lines drawn on each city block which approximated the location of sidewalks. These lines needed to be split at each parcel for the City's inventory purposes. Utilizing a GIS geoprocessing model, SMTC staff iteratively split the lines and assigned each sidewalk parcel line a unique identifier. This identifier is largely made up of the street name and the parcel's print key.

Develop schema

Once the SMTC had a GIS file prepared, work began on developing the attributes to be included in the inventory. Since each parcel in the city would be visited, staff were interested in making this data collection effort as useful as possible. Striking a balance between collecting useful information for the sidewalk program and ensuring a quickly-moving collection time at each parcel would be key.

For the sidewalk condition rating, SMTC staff turned to NYSDOT's ADA Transition Plan, which included a rating scale of 1-5 for sidewalk condition. Staff utilized this rating scale as the basis for the ratings used in the Syracuse sidewalk inventory, with some changes to better fit this project. That scale is simplified as:

Rating 1 - Not Applicable: A facility not considered to require accessibility, for example, limited-access highways. *Note: this rating was used in a very limited fashion on the SMTC scale and was mostly for large stretches of pavement abutting parking lots or similar uses.*

Rating 2 - Not Accessible: Significant discontinuity such as steps, no ramps, more than 100 feet of unpaved walkway, heaving, vertical displacement, other severe distress, flooding.

Rating 3 - Partially Accessible: Not designed to current standards, for example, problems with the geometry of sidewalks, ramps and landings, absence of detectable warnings, lack of handrails.

Rating 4 - Accessible: May need additional improvements, such as no detectable warnings at curb ramp locations, insufficient width.

Rating 5 - Fully Accessible: Visual appearance suggests facility is designed to current standards, presence of detectable warnings at curb ramp locations.

SMTC staff also added an additional rating of 0 – which was no sidewalk present. This scale is included as Appendix A at the end of this memo.

SMTC staff consulted with City of Syracuse staff to create a list of variables to be included in the data collection effort in addition to the sidewalk rating. SMTC staff also planned to utilize a domain in GIS so that only certain answers could be selected to questions. This is to prevent misspellings or two different data collectors using different words to indicate the same thing. The sidewalk schema is included as Appendix B at the end of this memo.

Data Collection

As this dataset needed to be both spatial and electronic, SMTC staff sought to collect the data in a way compatible with these needs. Staff elected to use the ArcGIS Collector app, which allows users to edit data directly in a map in the field offline and sync the data back to the main database upon returning to the office. This app was installed on Apple iPads, and the SMTC also purchased mobile GPS units to pair with the devices. A few technological changes occurred during the course of the project: ArcGIS Collector was replaced with ArcGIS Field Maps, an app with similar functionality; and SMTC purchased cellular-enabled iPads to allow live editing of the data and continual monitoring of progress.

SMTC utilized a combination of staff and intern labor to complete the inventory. Interns were hired in late May of each year and worked through mid-August. Interns arrived at the SMTC office early each day (approximately 7:00 AM) to begin the inventory and complete as much as possible before higher temperatures set in. Interns worked in pairs, with each traditionally working on either side of a single street. Interns were directed to stick together at all times and wore yellow high visibility vests. They carried SMTC cards and multiple copies of a notice on City letterhead which were handed out to any residents with questions.

Interns approached each parcel separately and worked through the data collection schema. At times, they were joined by the Sidewalk Planner for the City of Syracuse. Over the course of the five years, a combination of SMTC interns, SMTC staff, and City staff completed approximately 1,000 miles of inventory. This inventory is stored in the SMTC's ArcGIS Online account and on SMTC servers.
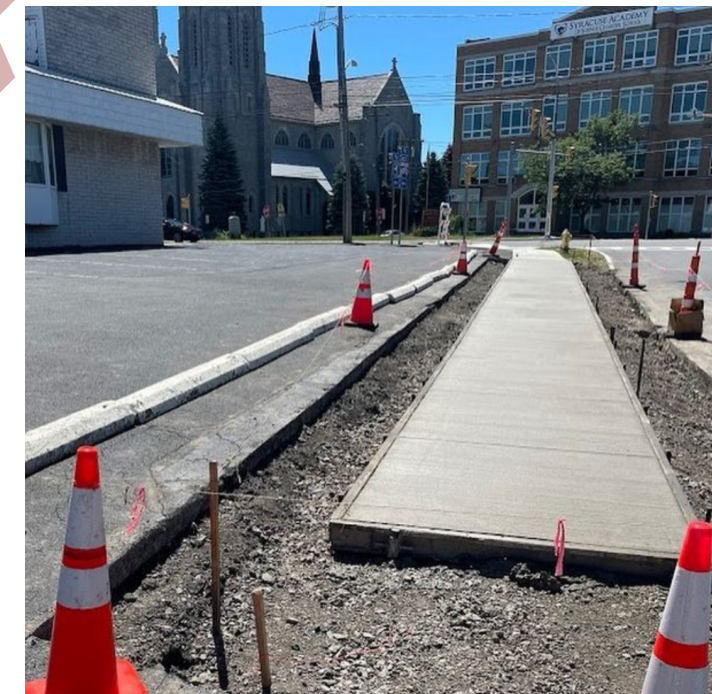
Results

Approximately 200 miles of sidewalk were inventoried each year, with the exception of the first and last years of the program. In 2020, data collectors also inventoried parking signs in selected neighborhoods as a part of a separate SMTC study. In 2024, four SMTC interns were used, which sped up the data collection process and allowed the agency to complete the inventory before the summer ended. Figure 1 below shows the number of miles rated each year in bars, and the total cumulative rated miles in an orange line.
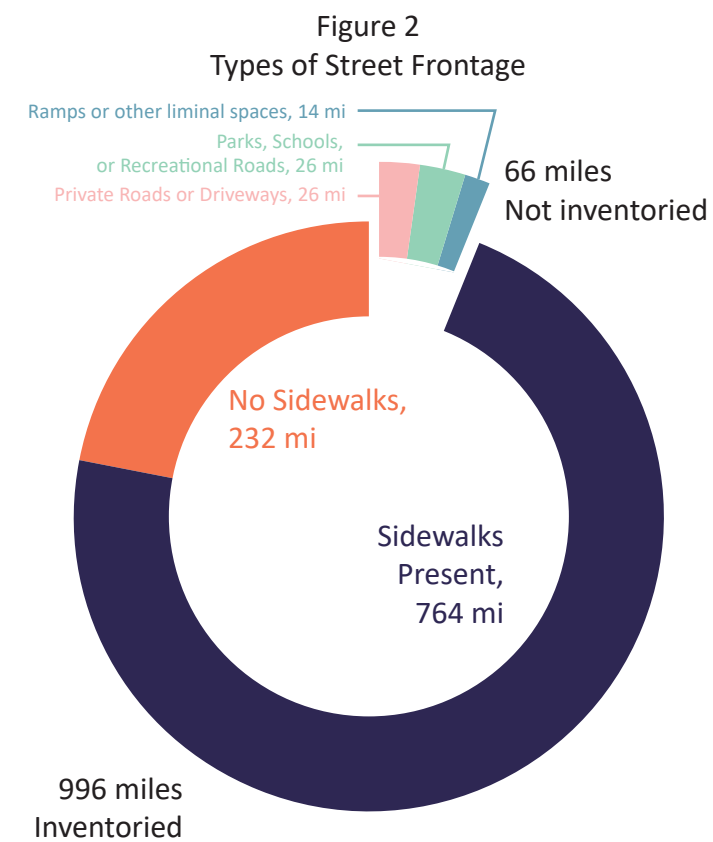
Figure 1
Street Frontage Miles Inventoried by Year
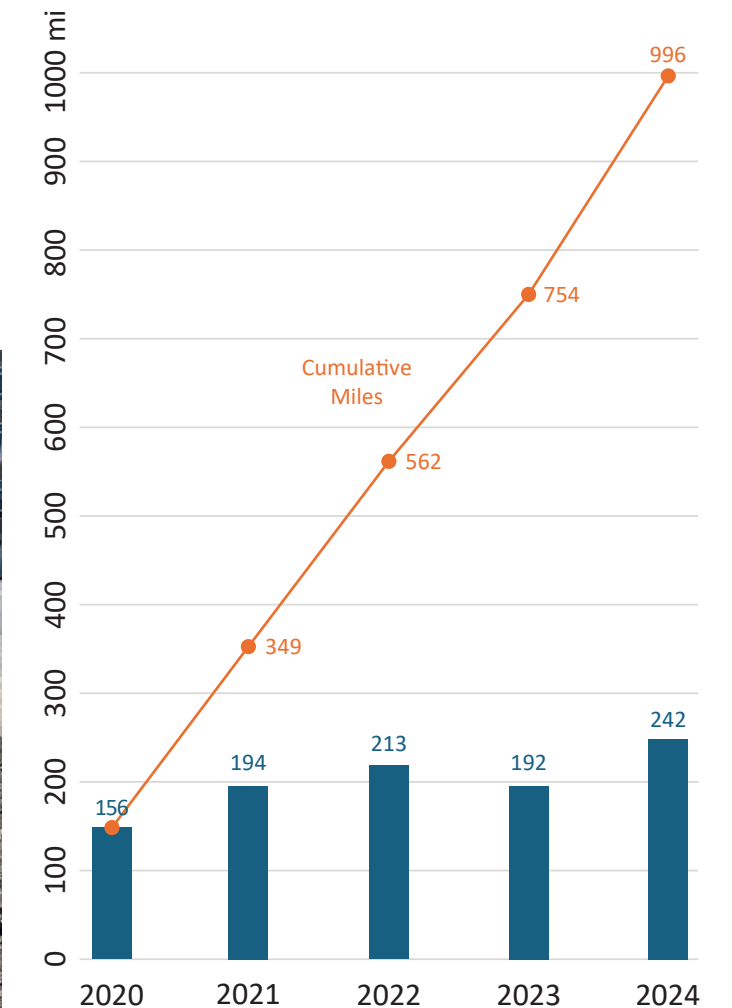
This project is more accurately an inventory of street frontage, rather than just sidewalks. SMTC staff estimate that there are 1,062 miles of street frontage in the city. This number does not include limited access highways, but does include the frontage on roads not used by the traveling public, such as park roads and roads on school properties.

SMTC staff reviewed the overall street frontage and focused only on roads used for travel. This reduced the miles of street frontage to 996 miles, which is what the inventory consists of.

Of those inventoried miles, 232 miles did not have sidewalks. These parcels have no additional data tied them. Figured 2 below shows the different types of street frontage in the city and explains which types were included in the inventory.

Figure 2
Types of Street Frontage

Ramps or other liminal spaces, 14 mi
Parks, Schools, or Recreational Roads, 26 mi
Private Roads or Driveways, 26 mi
66 miles Not inventoried
No Sidewalks, 232 mi
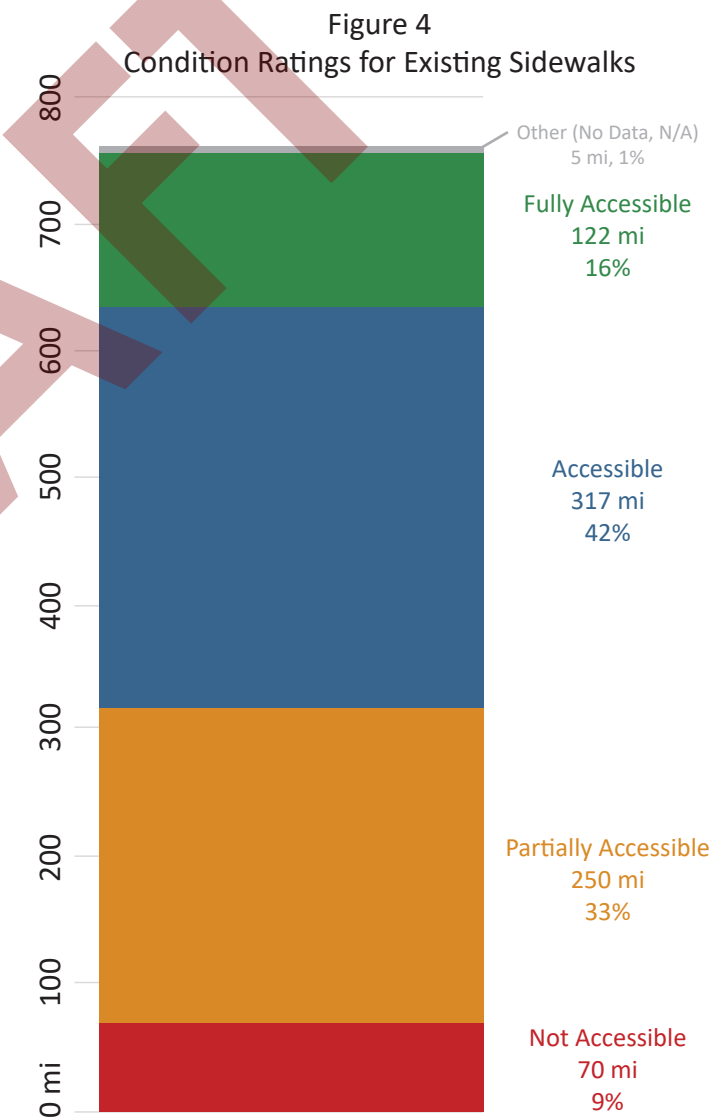Sidewalks Present, 764 mi
996 miles Inventoried

For a sidewalk to be considered fully accessible, it must be constructed of concrete. Of existing sidewalks in Syracuse, the majority are concrete. There are some asphalt sidewalks and a very small number of other surfaces, like brick or crushed stone. Figure 3 below illustrates existing sidewalks by material.

Figure 3
Sidewalks by Material Type

Asphalt 107 mi, 14%
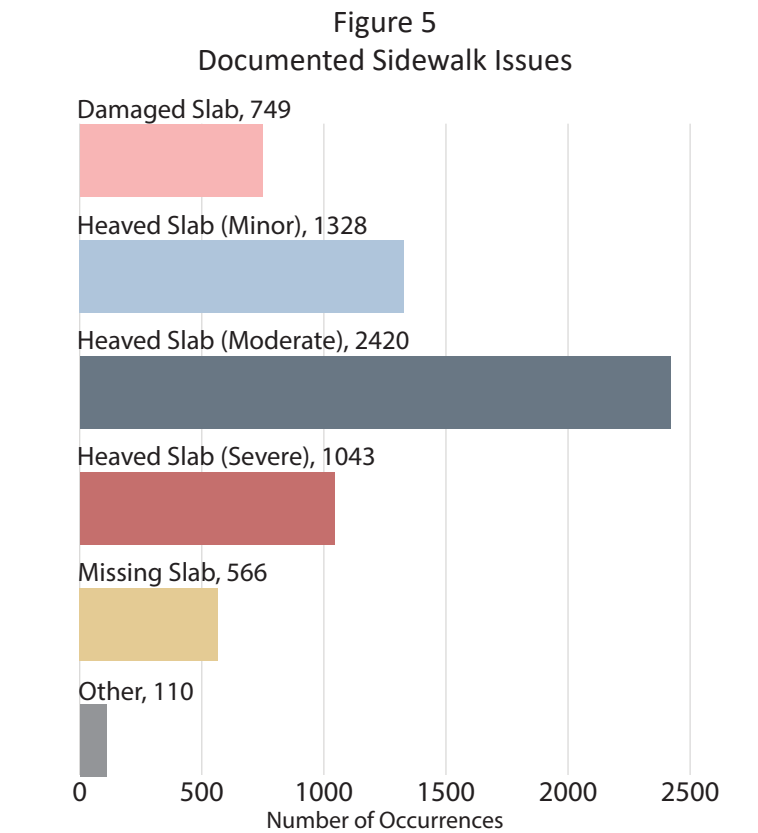Other 11 mi, 1%
Concrete 646 mi 85%
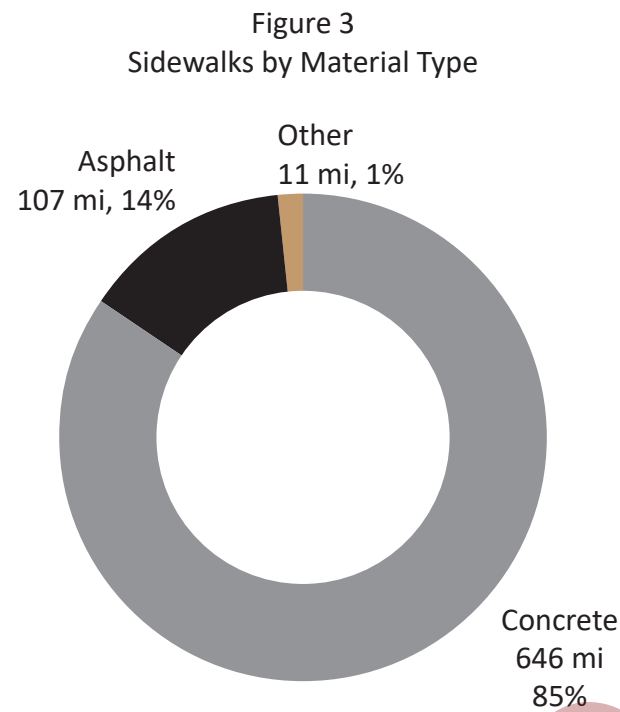
The condition rating will allow the City to proactively plan sidewalk maintenance as a part of a larger prioritization model. The City already utilizes a prioritization model to pave roads, and a similar model could be created for sidewalks.

Of the sidewalks that currently exist in the city, the majority have conditions that are considered Accessible (4) or Fully Accessible to Current Standards (5). Parcels currently without sidewalks could be targeted for installation if conditions allow. Figure 4 below illustrates condition ratings in the sidewalk database.

Figure 4
Condition Ratings for Existing Sidewalks

Other (No Data, N/A) 5 mi, 1%
Fully Accessible 122 mi 16%
Accessible 317 mi 42%
Partially Accessible 250 mi 33%
Not Accessible 70 mi 9%

The SMTC also tracked noticeable sidewalk issues where they occurred. City staff could utilize this information to replace smaller sidewalk sections across the city if desired. Data collectors noted minor, moderate, and severe heaves of concrete slabs, as well as missing or damaged slabs. The number of each of these documented issues is shown below in Figure 5.

Figure 5
Documented Sidewalk Issues

Damaged Slab, 749
Heaved Slab (Minor), 1328
Heaved Slab (Moderate), 2420
Heaved Slab (Severe), 1043
Missing Slab, 566
Other, 110

Number of Occurrences

Recommendations

With the completion of the data collection effort, SMTC staff developed a series of recommendations for the City of Syracuse to consider as it continues to build out its Municipal Sidewalk Program.

Recommendation 1: Revisit the Sidewalk Maintenance Prioritization Memo.

When the SMTC initially completed the sidewalk prioritization analysis, staff indicated that the report was of limited utility without widespread, parcel-level condition data. This inventory adds that missing component. City staff should review the SMTC's recommendations in the Sidewalk Maintenance Prioritization Memo and add sidewalk condition as a weighted variable in the analysis.

Recommendation 2: Maintain the sidewalk inventory digitally.

SMTC staff do not have the capacity to regularly inventory the city's street frontage. This sidewalk inventory was built from the ground up and contains the efforts of countless hours of data collection over the course of five years. It would be in the City's best interest to ensure that this dataset is kept up to date as new sidewalks are installed and old sidewalks are repaired. To accomplish this, field visits to the installation locations should occur each year and data should be collected in the same way as it was in this inventory. Without proper investment into this dataset, it will quickly age into uselessness and obscurity.

At the time of this memo, SMTC still currently maintains possession of the sidewalk database. Until a plan for data maintenance is determined with City staff, SMTC will maintain ownership of the file with the ability for DPW staff to view the file and its contents.

Recommendation 3: Use the sidewalk inventory as the basis for a larger asset management system.

The City now has access to a digital asset which can be updated yearly and utilized in transportation planning efforts. The sidewalk inventory can serve as an example of digital asset management which could expand to other city-owned infrastructure. The SMTC already maintains a large amount of City infrastructure data which could be folded into a new asset management system as a valuable source of information across departments.
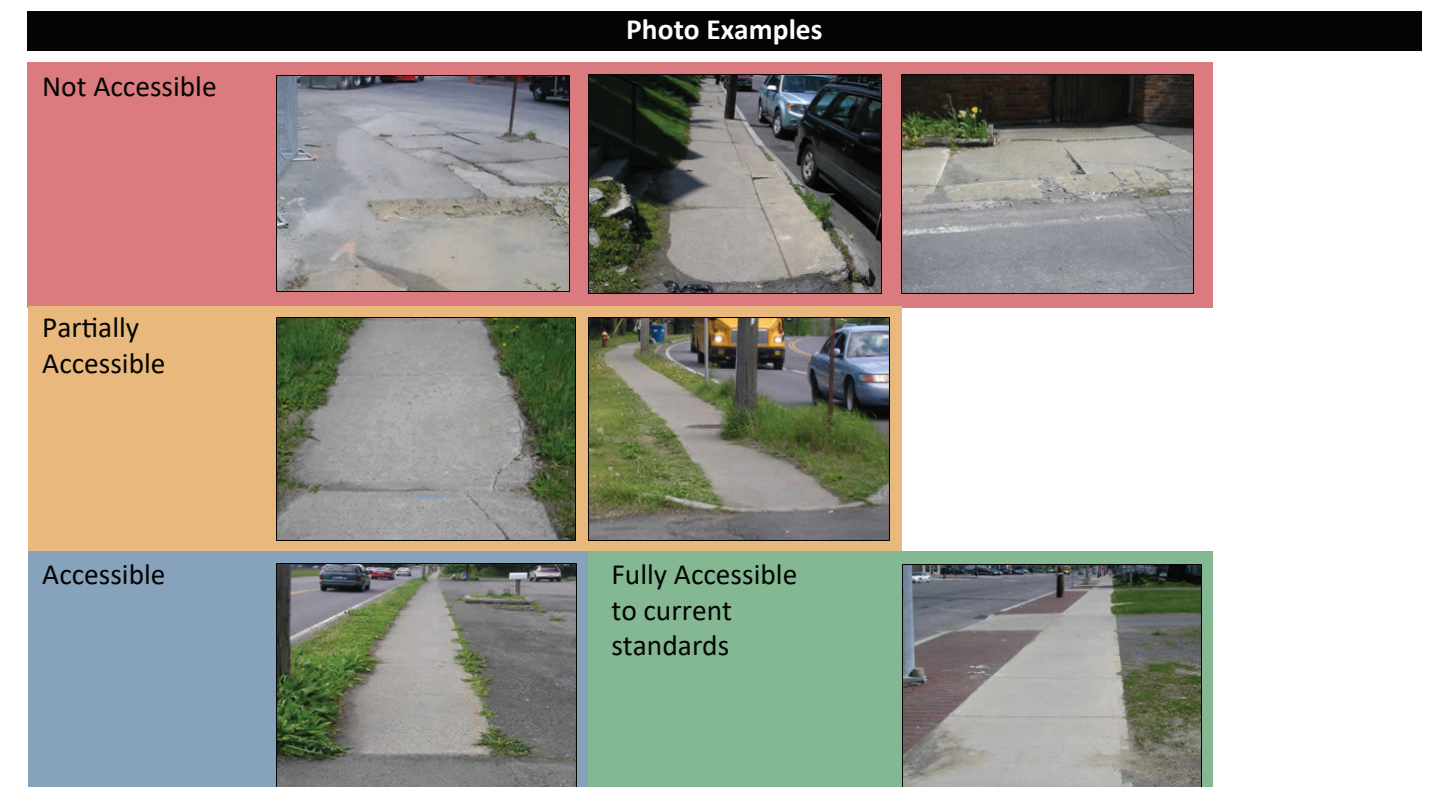
Conclusion

The City of Syracuse Sidewalk Study is another example of collaborative efforts between the SMTC and its member agencies. The City leveraged the SMTC's technical expertise to obtain an inventory of an asset that it is now responsible for. The City should now be able to utilize that inventory as a tool in developing a sidewalk maintenance program, ensuring that sidewalk maintenance is a data-driven process.

MUNICIPAL SIDEWALK PROGRAM
#SIDEWALKTUESDAY

DEPARTMENT OF PUBLIC WORKS
SIDEWALK REPAIR IN PROGRESS
MUNICIPAL SIDEWALK PROGRAM
CITY OF SYRACUSE | MAYOR BEN WALSH

- Sidewalk work is taking place on Park St as part of the Municipal Sidewalk Program (MSP)
- MSP work can include new or repair of concrete sidewalks, American Disability Act (ADA) compliant corner ramps, curbing, asphalt removal, driveway adjustment, new grass areas and other related items.

APPENDIX A — Sidewalk Condition Rating Scale

Rating	Title	Description	Notes
0	NO SIDEWALK	No sidewalk present.	
1	Not Applicable	A facility or feature is not required to be accessible. If a feature is part of an accessible route, it is required to be accessible.	Generally not going to be used.
2	Not Accessible	Accessibility for Persons with Disabilities is impossible or very difficult. Think "Poor."	>50' unpaved walkway / Significant heaving or vertical displacement / Significant flooding / Vegetation growing over walkway / Steps within walkway / Less than 3' of width around obstacles (5' generally overall)
3	Partially Accessible	Not to current standards. Accessibility is possible, but there are problems. Think "Fair."	Small heaving or vertical displacement / No handrails on walkway ramps (not generally applicable) / Major maintenance issues (gravel accumulation)
4	Accessible	May need additional improvements. Think "Good."	Generally minor maintenance problems / Minor insufficient width
5	Fully Accessible to current standards	No improvements needed. Think "Excellent."	No or very minor maintenance problems / Appropriate width (5' residential, 8' commercial)

Photo Examples

Not Accessible

Partially Accessible

Accessible

Fully Accessible to current standards

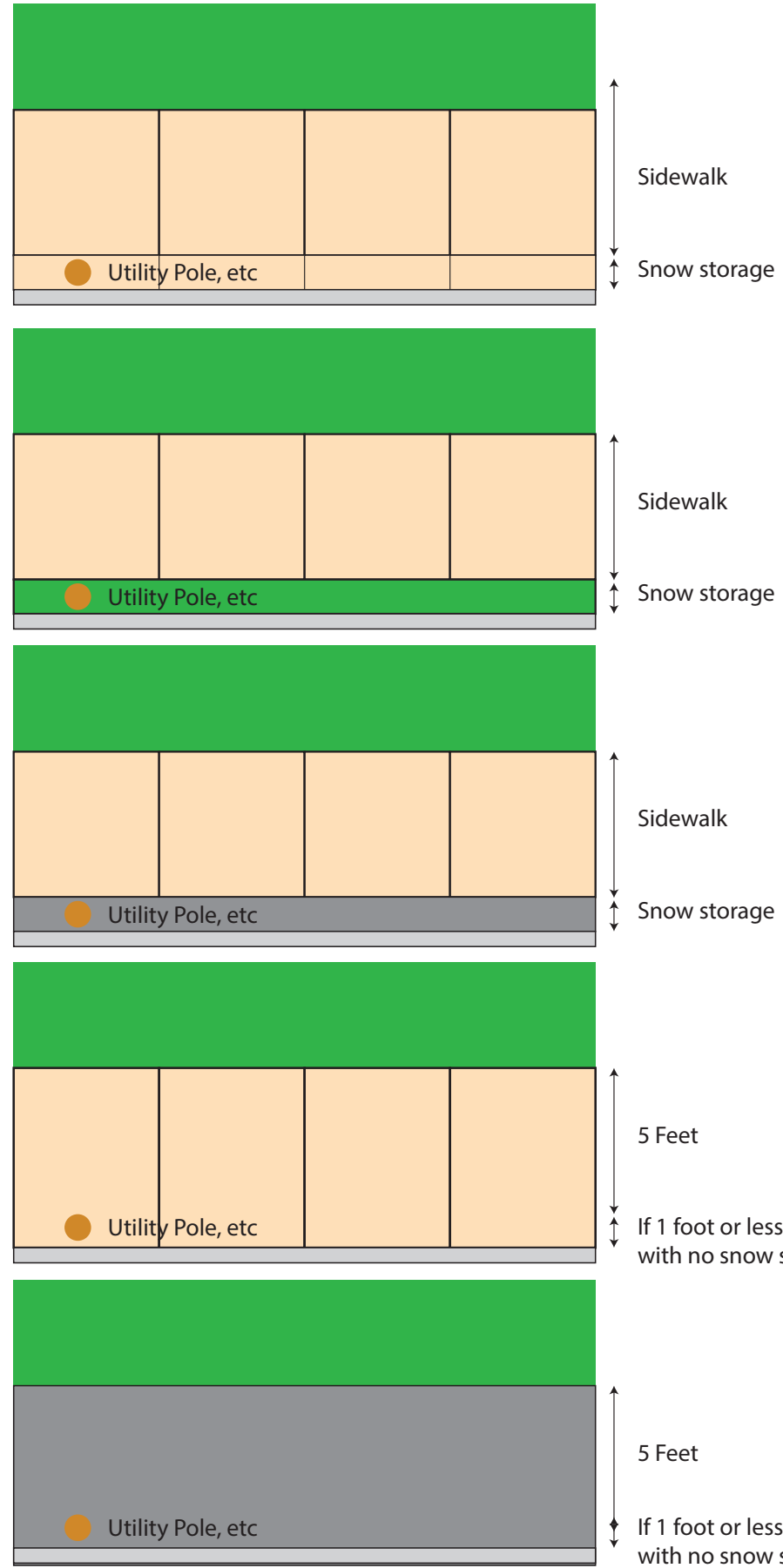| Field	Options	Description	Additional Info
Street_Parcel_ID	None	ID used to tie sidewalk geometry to parcel data	Keeps track of inventory
GlobalID	None	Unique ID for sidewalk segment (auto-generated)	
Neighborhood	None	City Neighborhood (for reference)	
Assumed Street Frontage	None	Type of street (for reference)	
Rating Completed	Yes/No	Has a sidewalk assessment been completed yet?	
Inventory Date	Date	Enter "Today" for when you are collecting	
Sidewalk Material	Concrete Asphalt Crushed Stone Other		Only possible 5. Highest asphalt can be is 4. Highest crushed stone can be is 4. Highest other can be is 4.
Material (if other)	ANY	Other material	
Concrete through driveway?	Yes/No/NA		If there is not concrete through the driveway, even if the rest is brand new and perfect, it immediately goes down to 4. Poor concrete slabs over driveway can also drop rating.
Other item in sidewalk?	None Manhole Utility cover Clean cut Grate Multiple items from above list Other		These are items that should be flush (or nearly flush) with the sidewalk surface.
Other item in sidewalk?	ANY		
Condition Rating	(0) No Sidewalk (1) Not Applicable (2) Not Accessible (3) Partially Accessible (4) Accessible (5) Fully accessible to current standards		
Specific condition defect	None Spalling Pocked Cracking Spalling and Pocked Spalling and Cracking Pocked and Cracking Spalling, Pocked, and Cracking		Chunks anywhere but largely near joints Holes that sand could fill
Joint condition	No issues Expansion in joints Vegetation in joints Expansion and vegetation in joints		Also would include vegetation in general slab cracks. Does not include vegetation on sides. Needs fairly substantial growth
Appropriate width	Yes/No	5' residential, 8' commercial	Less than 8' commercial sidewalks will be dropped to 4. 4.5 human feet is good enough for 5' residential

Field	Options	Description	Additional Info
Snow Storage width	0 Feet (non existent) Up to 3 feet 3-5 feet Over 5 feet		For bits of asphalt sidewalk that expand past where a sidewalk "should" be, use the width of where the rest of the sidewalks on the block to determine snow storage. See graphic.
Snow Storage material	Grass Concrete Brick Asphalt Other		
Street Tree	Yes/No		
Adjacent Feature	None Fence Retaining wall Other		Must abut sidewalk (within 1 foot or so)
Adjacent Feature (if other)	ANY	Other adjacent feature	
Unbuffered parking area	No Yes - Interior/Building side Yes - Exterior/Street side		
Encroaching feature	None Utility pole Sign pole Guy wire Traffic pole Grass creep Hedge/other vegetation Parking/striping Tree root Other		Takes up more than 1 foot total
Encroaching feature (if other)	ANY	Other encroaching feature	
Noticeable Slope Issues	No issues Cross slope issues Running slope issues Running and Cross Slope issues		Slab only
Parcel Slope Issues	No issues Cross slope issues Running slope issues Running and Cross Slope issues		Parcel
Construction date stamp	Date	If collectors see a concrete stamp with date indicated	
Other notes	ANY	Any other notes	

How to Handle Snow Storage versus sidewalk: some examples

Sidewalk

Snow storage

Sidewalk

Snow storage

Utility Pole, etc

Sidewalk

Snow storage

Utility Pole, etc

Parking   Parking

5 Feet

Utility Pole, etc

If 1 foot or less - count whole as sidewalk with no snow storage. If more than 1 foot, count as SS.

5 Feet

Utility Pole, etc

If 1 foot or less - count whole as sidewalk with no snow storage. If more than 1 foot, count as SS.

Dealing with commercial areas

Situation 1 - Clearly demarcated areas. Measure obvious sidewalk as sidewalk.

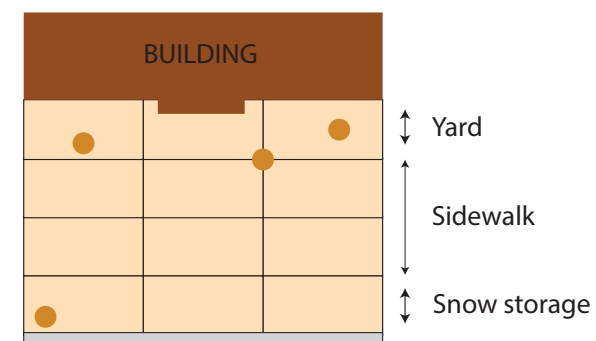Utility Pole, etc   Utility Pole, etc   BUILDING   Utility Pole, etc
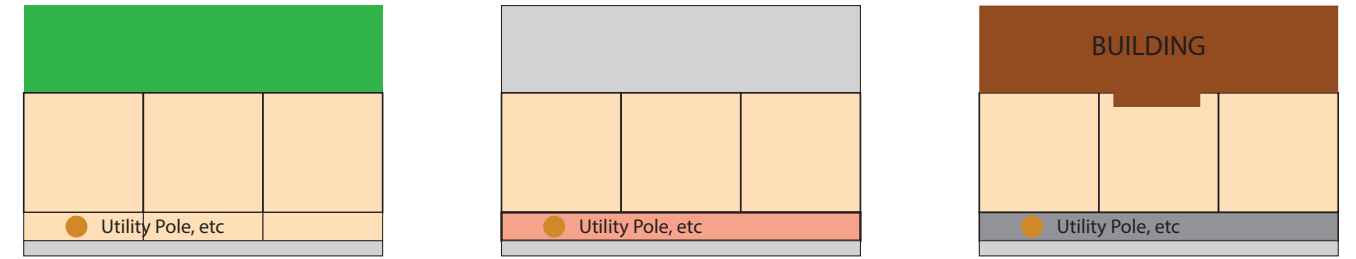
Situation 2 - Ambiguous "sidewalk" area not defined.

Measure at least 5, but up to 8, feet away from the last permanent building-related structure, OR parking stripe.

If you are over 5 feet, then you need at least 1 foot of snow storage left over before you can stop counting.

This has to be PARCEL-specific, not the rest of the way the block operates.

This 5-8 feet area is considered the sidewalk, and the rest of the available area is snow storage.

Then, note "obstructions" in the sidewalk (patio furniture, light poles, etc).

6' Sidewalk

Utility Pole, etc

2' Snow storage

BUILDING

5' Sidewalk

1' Snow storage

8' Sidewalk

5' Snow storage

Parking   Parking

5' Sidewalk

No Snow storage

BUILDING

Yard

Sidewalk
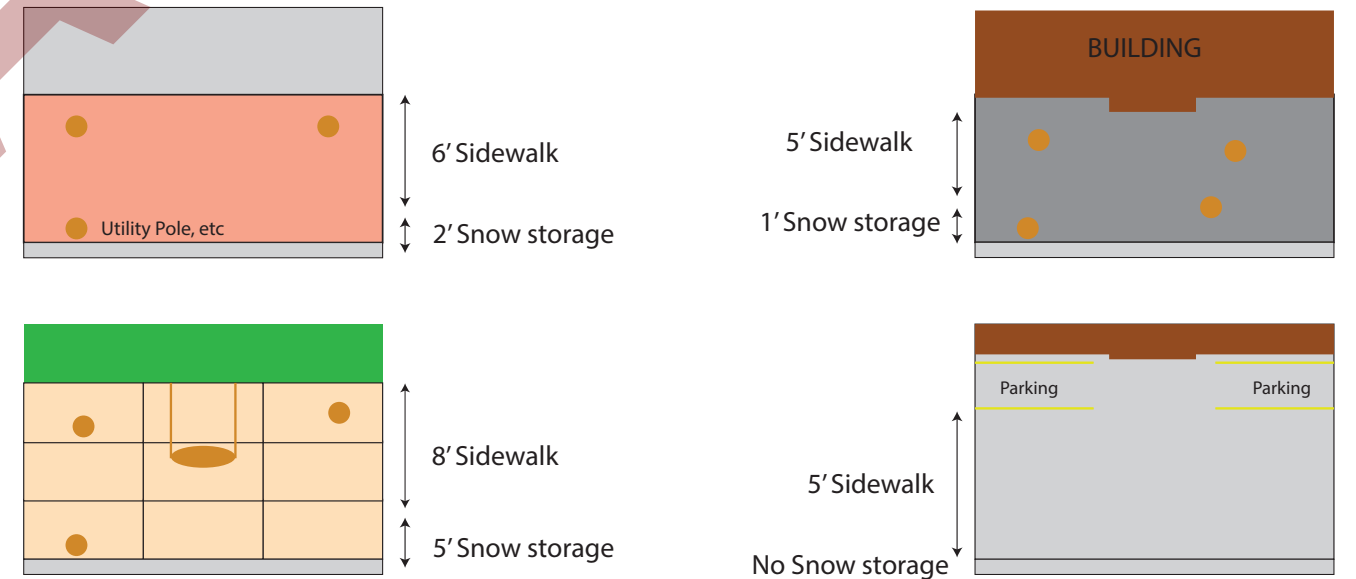
Snow storage

Situation 3 - Ambiguous "sidewalk" area not defined.

If there are 4 or more slabs between the road and building, the middle two are "sidewalk" and the other two are "front lawn" and "snow storage."