

1. INTRODUCTION

Sidewalks improve pedestrian safety, encourage otherwise sedentary people to walk and are not extremely expensive to construct. In areas developed after the 1940s, however, sidewalks are not the norm, even in neighborhoods that are otherwise “walkable,” in the sense of having clusters of homes, businesses and other destinations within walking distance of one another. Retrofitting these areas with sidewalks presents funding, planning and maintenance issues. New development, site redevelopment or roadway reconstruction can provide more opportunities for adding sidewalks and pedestrian amenities, but these amenities add to the overall cost of the project, and may mean that the scope of the project is decreased, or that the final cost of a new home or commercial space is higher.

This guide is intended to make the process of adapting infrastructure to pedestrian needs easier by identifying the areas where pedestrian demand is likely to be highest and where the long-term benefits of adding sidewalks are most likely to outweigh the costs. It is also intended to provide a source of information and a catalog of references for anyone confronting the complexities of sidewalk planning, funding, construction or maintenance. There are thousands of pieces of research, plans, studies, guidebooks, ordinances and other documents related to sidewalks available online; the hyperlinks in this document will reduce the time it takes for users to do their own research.

1.1. Scope

The subject of this research is the individual traveling by foot, stroller, walker or wheelchair along a street or on a walkway within a community, rather than a hiker in the woods. On a per capita basis, Americans walked about a third of a mile every day in 2009. About three-fourths of walking trips are “for utilitarian purposes such as getting to work, school, shopping, visiting friends, and accessing public transport.” (Pucher, 2011) This guidance is oriented around these trips, rather than on developing recreational trails or intercommunity pedestrian connections.

This is also not a guidebook on intersection design: intersection facilities *are* critical to pedestrian movement, but intersections are planned, designed, financed, constructed and maintained by highway departments. As a result, there is plentiful guidance available on how

Walking Speeds

Federal standards require that traffic signals be timed for a walking speed of **3.5 feet per second** (f/s). This translates to a walking speed of 2.4 miles per hour (about 25 minutes per mile).

Walking speed by age

Average “comfortable” walking speed

40-year-old: **4.8 f/s**
(3.3 mph or 18.3 minutes/mile)

70-year-old: **4.2 f/s**
(2.9 mph or 21 minutes/mile)

Source: “Comfortable and maximum walking speeds of adults aged 20 – 79 years;” Richard Bohannon, *Age and Ageing*, 1997.

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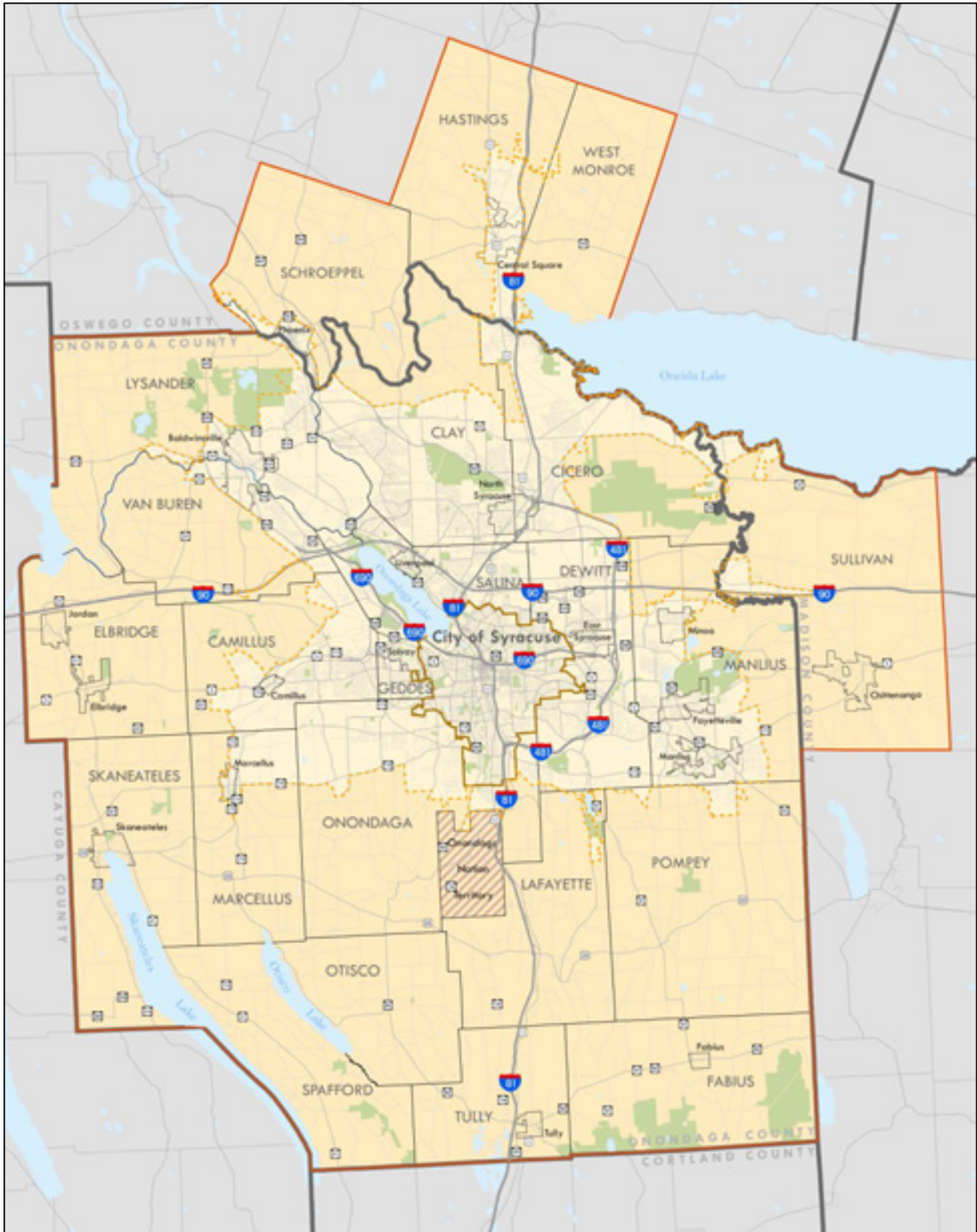


Figure 1-1 - SMTC Planning Area

best to design, build and maintain these facilities for pedestrian safety (see the Design Standards section, below).

Sidewalks, on the other hand, are built by many different entities, both public and private, and are typically maintained by individual property owners. There are several permutations on how a given sidewalk slab got to be, or failed to be, constructed and/or maintained.

Geographically, this research is focused on Onondaga County and Central New York. Examples and data are drawn from cities and counties in other states and in other countries, but the frame of reference is the SMTC's Metropolitan Planning Area. This includes 43 individual governments, primarily in Onondaga County but also including the Villages of Phoenix and Central Square in Oswego County and the Village of Chittenango in Madison County. (See Figure 1-1 – SMTC Planning Area)

1.2. Purpose

The purpose of this document is to collect information on a wide variety of subjects related to sidewalks, from the legal framework in which decisions are made, to suggestions for how to plan for and prioritize sidewalks, to financing and maintenance options. It is generally geared toward decision-makers and residents at the municipal or neighborhood level considering pedestrian accessibility, as opposed to technical guidance for designers or engineers.

The existing literature on sidewalk planning, financing, design and construction is extensive. This document is not intended to reiterate data that is readily available in numerous sources. Rather, it attempts to identify best resources and best practices. Additionally, this document provides data that is unique to the study area, including existing sidewalk ordinances and mapping showing Priority Zones for sidewalk infrastructure. This study is intended to serve three purposes:

- 1.) To point the user toward the best sources for information on subjects that are already well documented and summarized, such as facility design,
- 2.) Provide a summary and list of best practices and references for subject areas in which there is less readily available guidance, such as legal issues, planning and the use of porous pavements,
- 3.) Provide a summary of existing conditions and a set of Priority Zones for pedestrian infrastructure in the study area.



Figure 1-2 - Sidewalks on Falls Boulevard in the Village of Chittenango

1.3. Planning Context

New York State's Complete Streets Law

New York State's Complete Streets Law (S5411A-2011), enacted in 2011, is a milestone in terms of the inclusion of sidewalks and pedestrian facilities in highway projects in New York. Roadway rehabilitation or reconstruction may be the single best opportunity to add a substantial amount of sidewalk mileage to an existing corridor, and this law ensures that pedestrians' needs, as well as those of bicyclists and transit users, are considered when these projects are being planned.

For example, several of the Priority Zones identified in this document include suburban areas that are accessed by major roadways. The mix of land uses that have developed along some of these corridors are highly walkable, in terms of distance, but the lack of sidewalks and crosswalks makes them uninviting to pedestrians. Under the Complete Streets Law, sidewalks will likely be included as part of the eventual reconstruction of these corridors.

The law states:

(a) For all state, county and local transportation projects that are undertaken by the Department or receive both federal and state funding and are subject to Department of transportation oversight, the department or agency with jurisdiction over such projects shall consider the convenient access and mobility on the road network by all users of all ages, including motorists, pedestrians, bicyclists, and public-transportation-users through the use of complete street design features in the planning, design, construction, reconstruction and rehabilitation, but not including resurfacing, maintenance, or pavement recycling of such projects.

(B) Complete street design features are roadway design features that accommodate and facilitate convenient access and mobility by all users, including current and projected users, particularly pedestrians, bicyclists and individuals of all ages and abilities.

The law includes an exception for situations where the "cost would be disproportionate to the need," based on factors such as "land use context; current and projected traffic volumes; and population density"; or where there is a demonstrated lack of need or community support. This underscores the importance of undertaking a

New York State law identifies the following as elements of a "complete street":

- Sidewalks
- Paved shoulders suitable for use by bicyclists
- Lane striping
- Bicycle lanes
- "Share the road" signs
- Crosswalks
- Traffic signals for pedestrians
- Bus pull outs
- Curb cuts
- Raised crosswalks
- Traffic calming measures

community-wide evaluation of the type discussed in [Chapter 4](#) in the “Pedestrian Demand Model” section. The Priority Zones identified in this document are areas in which the benefits of building a complete street are most likely to outweigh the costs.

Bicycle and Pedestrian Plan, SMTC

The SMTC’s 2005 *Bicycle and Pedestrian Plan* sets forth the SMTC’s policy on bicycle and pedestrian facilities, including:

- 1.) Bicycle and pedestrian ways should be established in new construction and reconstruction projects in all urbanized areas unless one or more of three conditions are met:
 - Bicyclists and pedestrians are prohibited by law from using the roadway.
 - The cost of establishing bikeways or walkways would be excessively disproportionate to the need or probable use.
 - Sparsity of population or other factors indicate an absence of need.
- 2.) In rural and suburban areas, paved shoulders should be included in all new construction and reconstruction projects on roadways used by more than 1,000 vehicles per day.
- 3.) Highway and transit facilities should be designed, constructed, operated and maintained so that all pedestrians, including people with disabilities, and bicyclists can travel safely and independently.

Find the SMTC’s Bicycle and Pedestrian Plan in the Final Reports section of SMTC’s web site:
www.smtcmpo.org

Goals for the MPA identified in this plan include:

- 1.) To encourage the use of bicycling and walking as legitimate modes of transportation.
- 2.) To improve the safety of bicyclists and pedestrians.
- 3.) To educate bicyclists, pedestrians, motorists, law enforcement officers, and others regarding traffic laws and safety measures.
- 4.) To promote the improvement of travel and tourism and business opportunities along bicycle and pedestrian infrastructure.
- 5.) To encourage planners and municipalities to develop bicycle and pedestrian resources.
- 6.) To develop a methodology for tracking bicycle and pedestrian improvements.

Long Range Transportation Plan, SMTC

The SMTC's Long Range Transportation Plan (LRTP) provides a review of existing conditions in the MPA and a set of goals and objectives for improving the region's transportation system. According to the 2011 LRTP Update, four percent of workers over age 16 in the MPA walked or biked to work in the year 2000. The LRTP states that: "The region lags behind the rest of the state, where 6.2% of workers walked to work and 0.8% used other means in 2000. Of those who walked or bicycled to work in the MPA, 70.8% lived within the City of Syracuse. The next highest percentage, 4.2%, lived in Salina." (Syracuse Metropolitan Transportation Council, 2011)

One of the LRTP's Mobility Objectives is:

To reverse the decline in the share of trips made by modes other than the single occupant vehicle by 2000 and to increase the share of trips made by high occupancy vehicles (including fixed and demand-responsive transit), bicycle, and walking by 25% collectively, by the year 2020.

The LRTP also includes the following Land Use Objective: "To support development patterns, densities and design options that are conducive to transit service, pedestrian and bicycle travel." This is in contrast to recent development seen in the rural areas of the MPA that frequently has the characteristics of suburban sprawl: "unmanaged, low density development patterns that lack a sustainable environmental, economic, and social balance".

Sustainable Development Plan, Onondaga County (future.ongov.net)

Onondaga County's *Sustainable Development Plan* (available online at future.ongov.net) also discusses sidewalks and pedestrian infrastructure. As the plan points out, "Generally, the more densely developed the area, the more likely it is to be walkable and have sidewalk infrastructure." (Syracuse-Onondaga County Planning Agency, 2012)

This plan also states that "Complete Streets policy and practice, which rethinks the design and function of roadways to incorporate a more multi-modal approach for all segments of the population, has been noted as having numerous social, fiscal and environmental community benefits."

Local Plans and Ordinances

In general, it is the local (city, town or village) ordinance that determines sidewalk location, maintenance responsibility, material, and width. Local ordinances are summarized in this document for reference (see [Chapter 3](#)).

1.4. Design Standards

Discussions with highway engineers and local departments of public works have indicated that design guidance is readily available and that presenting it in this document would be duplicative. One exception is the use of permeable pavements in the construction of pedestrian facilities, which has only come into widespread use within the past 10 years or so. For information on pedestrian facilities and porous materials, see Appendix D. For a brief selection of key design parameters gleaned from these resources, see Appendix F. The following annotated list identifies some of the essential resources on designing pedestrian facilities.

[*Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*](#), Institute of Transportation Engineers (ITE)

The ITE's approach is based on four context zones: Suburban, General Urban, Urban Center and Urban Core. It cross-references these context zones with several street types, such as boulevard, avenue and street, and provides specific recommendations for numbers of lanes and pedestrian facilities for each street type in each context zone.

[*Design and Safety of Pedestrian Facilities*](#), Institute of Transportation Engineers (ITE)

This 1998 guidance provides details on the technical aspects of designing pedestrian facilities and makes a good complement to the ITE's guidance on context sensitivity.

[*Chapter 18 – Pedestrian Facility Design*](#), *Highway Design Manual*, New York State Department of Transportation

This guidance from NYSDOT provides the state's standards for a variety of features, including:

- Americans with Disabilities compliance
- Guidelines for locating sidewalks in developed areas
- Minimum sidewalk widths (five feet is standard, but four-foot sidewalks are allowable if conditions require it)
- Crosswalk striping patterns
- When to install crosswalks
- Sidewalk width needed for various levels of pedestrian activity

[*PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System*](#), FHWA

This online reference includes an interactive countermeasure selection system, designed to assist users in picking out a design solution for an existing issue. This site also provides information on how to plan for pedestrian infrastructure.

[*Highway Design Handbook for Older Drivers and Pedestrians*](#), FHWA

Detailed design guidelines for roads and pedestrian facilities, based on the increased likelihood of various physical limitations (such as slower reaction time and reduced visual acuity) that can accompany aging. This document includes references to standard design guidelines throughout.

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[Guide for the Planning, Design, and Operation of Pedestrian Facilities](#), American Association of State Highway and Transportation Officials (AASHTO)

An overview of accepted practices in the planning and design of pedestrian facilities.

[Stormwater Management Handbook](#), US Environmental Protection Agency
Chapter 5 of this handbook presents examples of streetscape improvements that minimize stormwater runoff, including porous pavement sidewalks and street trees.

[Urban Street Design Guide](#), National Association of City Transportation Officials (NACTO)

The *Urban Street Design Guide* provides brief summaries of design elements like chicanes, along with helpful visuals. This guide also tackles knotty issues such as balancing the need for clear recovery zones along the sides of roads with the desire to foster pedestrian scale and a sense of enclosure.

Examples of guidance from other states and cities:

- [Pedestrian Facilities Guidebook](#), Washington State Department of Transportation
This source includes a chapter on designing sites for pedestrian access, including walkways in parking lots.
- [Pedestrian and Streetscape Guide](#), Georgia Department of Transportation
A comprehensive handbook for pedestrian facility design.
- [Urban Street Design Guidelines](#), City of Charlotte, North Carolina
Charlotte's *Urban Street Design Guidelines*, like ITE's *Context Sensitive Solutions* guidance, focuses on making sure that complete streets solutions "fit" adjacent land uses. The guidelines are based around a set of street classifications, with associated

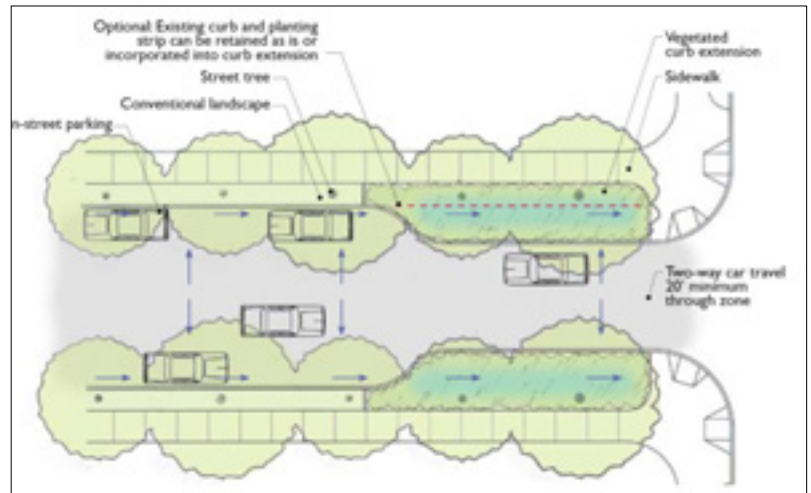
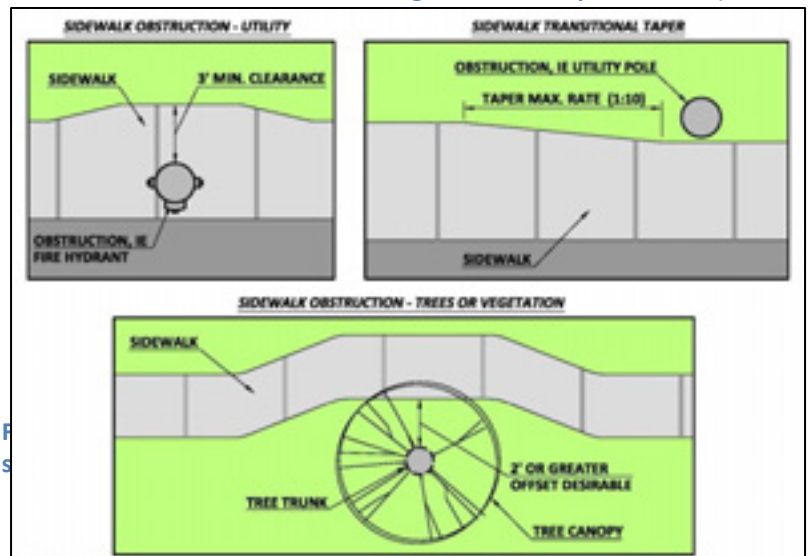


Figure 1-3: A vegetated curb extension captures stormwater, calms traffic and means a shorter crossing distance for pedestrians (Source: [Urban Street Design Guide](#))



speed limits and cross-sections, and a six-step process to match land use and transportation facility recommendations.

- [Comprehensive Pedestrian Plan](#), City of Raleigh, North Carolina
Raleigh's pedestrian plan uses a geographic model to prioritize sidewalk investments, similar the SMTC's Priority Zone modelling (see Chapter 4). This plan also includes design specifications for pedestrian facilities.

1.4.1 Additional Information and References

- New York State Complete Streets Law
<http://open.nysenate.gov/legislation/bill/s5411a-2011>
- SMTC Bicycle and Pedestrian Plan
www.smtcmpo.org/docs/bike-ped/Final_Report/FINAL_REPORT.pdf
- SMTC Long Range Transportation Plan
<http://www.smtcmpo.org/lrtp.asp>
- Onondaga County Sustainable Development Plan
<http://future.ongov.net/>
- City of Syracuse Sustainability Plan
http://www.syr.gov.net/Sustainability_Plan.aspx
- Statewide Bicycle and Pedestrian Plan, New York State Department of Transportation
https://www.dot.ny.gov/display/programs/bicycle/maps/app_repository/bike_and_ped_plan.pdf
- John Pucher, *Walking and Cycling in the United States, 2001 - 2009: Evidence from the National Household Travel Surveys*, American Journal of Public Health, 2011
http://policy.rutgers.edu/faculty/pucher/NHTS_TRB_25Jan2011.pdf