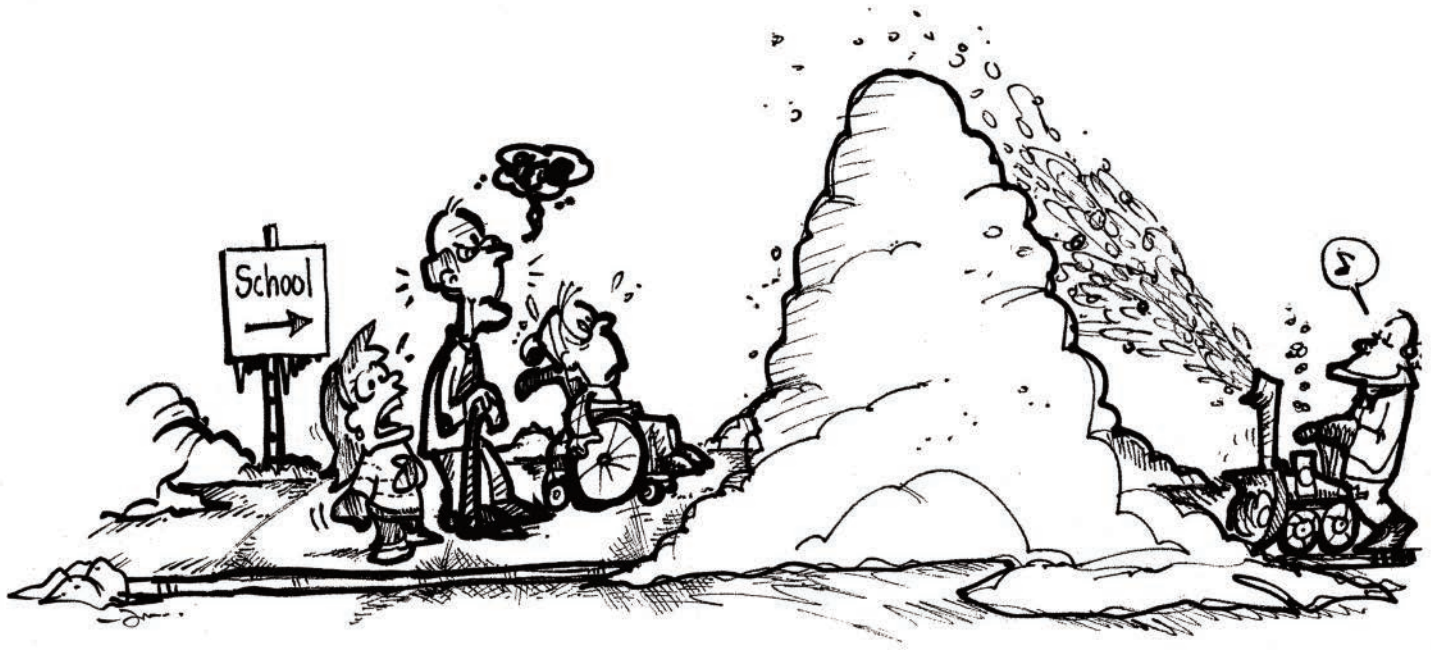


Winter Maintenance of Pedestrian Facilities in Delaware: A Guide for Local Governments

FEBRUARY 2012



illustrations: ©Jack Maypole



written by Marcia Scott and Brandon Rudd

with contributions from
Lauren Cutajar-Wynne and Hilary Primack

project co-managed by
Marcia Scott and Edward O'Donnell, AICP



Institute for Public Administration
School of Public Policy & Administration
College of Arts & Sciences
University of Delaware

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PREFACE

While automobile travel is the predominant transportation mode for most Americans, often overlooked is the fact that most trips start by walking. Slick and snowy sidewalks are problematic for all pedestrians. When curb ramps and other pedestrian facilities are blocked by snow, it can also pose special mobility issues for the one-third of Americans who do not drive—including persons with disabilities, children walking to school, commuters on foot to public transit, and older adults who no longer drive.

Winter maintenance of pedestrian facilities is both a safety and an accessibility issue. Once a state or local government provides/installs an “accessible feature” or “accessible route,” it is required by the Americans with Disabilities Act (ADA) to maintain those features “in working order.” This means that a sidewalk or pedestrian facility cannot be obstructed by snow or ice and must remain open for year-round use, even after a winter storm.

The purpose of this research is to provide assistance to Delaware local governments on tackling the issue of winter pedestrian-accessibility issues. Local governments should develop winter maintenance–management plans or amend municipal emergency-operations plans to address and delineate responsibilities of snow/ice removal—including pedestrian and bicycle facilities. Many local governments require property owners to remove snow/ice from an abutting sidewalk after a winter storm. These regulations should be clarified to ensure that all adjacent pedestrian facilities (e.g., curb ramps) are snow- and ice-free. Entities should use public-information campaigns and social media to communicate about snow-removal requirements, develop strategies to enforce ordinances, and develop citizen-assistance programs to help residents in need.

I hope this resource, *Winter Maintenance of Pedestrian Facilities in Delaware: A Guide for Local Governments*, will promote the understanding that walking is not just a recreational or fair-weather activity. Winter maintenance of pedestrian facilities is essential to ensure public safety, provide pedestrian access and connectivity, support healthy communities, safeguard public assets, and ensure compliance with ADA.

Jerome R. Lewis, Ph.D.
Director, Institute for Public Administration

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1. EXECUTIVE SUMMARY

Maintaining continuously accessible sidewalks is essential, but often problematic, following a severe winter snowstorm. For individuals who depend on sidewalks to access public transit or persons with disabilities, snow-obstructed or poorly maintained sidewalks and pedestrian facilities negatively affect safety, accessibility, and mobility. In many cases, confusion exists over which entity (state agency, local municipality, schools and other public institutions, or private property owner—both commercial and residential) is responsible for snow removal within a jurisdiction.

As part of maintenance operations, public agencies' standards and practices must ensure that the path of travel on pedestrian facilities is open and usable for persons with disabilities throughout the year (including following a snowstorm) to meet Americans with Disabilities Act (ADA) requirements. While many local governments require private-property owners to clear adjacent sidewalks within a certain time period, enforcement is often lax or non-existent. In addition, many local government ordinances and/or maintenance plans do not fully address the need to clear snow from sidewalks as well as other adjacent pedestrian facilities, such as curb ramps, crosswalks, pedestrian islands/medians, transit stops/shelters, and year-round trail systems.

Originally titled "Research of Management Plans for Sidewalk Snow Removal," the title of this report was changed to *Winter Maintenance of Pedestrian Facilities in Delaware: A Guide for Local Governments* to reflect more comprehensive research endeavors on "best practices" for winter maintenance—management plans—particularly those that address pedestrian facilities, local government sidewalk snow-removal regulations, and innovations in snow removal.

While not originally part of the scope of work, two major snowstorms in January 2011 provided the ideal opportunity to conduct field operations and photograph issues regarding winter maintenance of pedestrian facilities within incorporated Delaware jurisdictions. While these snowstorms were severe and not typical of winter weather conditions in the Mid-Atlantic region, the field observations not only provided an opportunity to document issues, but to incorporate photographs of "acceptable" and "unacceptable" winter-maintenance practices in a workshop hosted by the University of Delaware's Institute for Public Administration (IPA) on April 6, 2011.

The work on this project includes input and recommendations from a working group comprising transportation operation officials, transportation planners, transit officials, local government representatives, public works and parks and recreation directors, and ground service managers. Recommendations within Section 12 focus on amending municipal emergency-operation plans to address winter snowstorms; adopting winter-maintenance management plans; reviewing municipal procedures, ordinances, and better coordinating shared responsibilities; and considering innovative practices for tackling snow removal from pedestrian facilities.

2. INTRODUCTION

2-1. Problem Statement

Maintaining continuously accessible pedestrian pathways is essential, but often problematic, following a severe winter snowstorm. Sidewalks and pedestrian facilities that are obstructed by snow or ice impact the safety, accessibility, and mobility of pedestrians. For individuals who depend on pedestrian facilities as a regular mode of transportation, to access public transit, or to walk to school or work, snow-covered sidewalks are not only dangerous but create transportation equity concerns.



Lack of equal access to a facility of public accommodation, such as a sidewalk, may also be regarded as a civil rights issue. Title II of the Americans with Disabilities Act of 1990 (ADA) prohibits individuals with disabilities from being discriminated against on the basis of disability in the services, programs, or activities of all state and local governments (*ada.gov*). Because ADA Title II also requires “maintenance of accessible features” by public entities, snow-covered or poorly maintained sidewalks can be problematic if the public facility does not “provide ready access to individuals with disabilities” (*ada.gov*).

In many cases, confusion exists over which entity—public or private—is responsible, or shares responsibility, for winter maintenance. While there may be agreement over road-plowing duties, the need to keep sidewalks and pedestrian facilities clear of snow and ice is often overlooked. If regulations do exist for sidewalk snow removal, they may not address winter-maintenance responsibilities of other pedestrian facilities and walkable features, such curb ramps, crosswalks, pedestrian islands, street furniture, bus stops/shelters, and trails. Moreover, there may be little or no enforcement of municipal ordinances that require property owners to clear and maintain snow- and ice-free sidewalks after a winter storm. Winter sidewalk-maintenance issues are also caused by vacancies of commercial properties in central business districts, private residential properties in resort communities, and university student–rental properties at times throughout the winter. Another challenge for municipalities is how to identify and provide assistance to residents who are elderly, disabled, or physically incapable of shoveling snow. Municipalities that are unable to address these issues may increase liability or unintentionally violate provisions of the ADA.

This study will examine how sidewalk snow removal and winter-maintenance practices by Delaware municipalities can be improved so as to foster walking as a year-round activity and safe mode of transportation. For the purpose of this report, the term *pedestrian facilities* will include sidewalks, curb ramps, crosswalks, pedestrian islands/medians, bus stops/shelters, street furniture, and trails. The term *pedestrian* will describe anyone using a pedestrian facility, including individuals walking, using a wheelchair or mobility device, or pushing a stroller or cart.

2-2. Purpose of Study

The primary objective of this project is to research “best practices” for sidewalk snow removal and winter maintenance of pedestrian facilities to consider how Delaware local governments may apply such plans. Associated project tasks included the following:

- Analysis of sidewalk snow-removal ordinances, procedures, and emergency plans for Delaware local governments
- Field observation of snow-removal efforts on pedestrian facilities within Delaware municipalities after major winter-storm events in January 2011
- Research of “best practice” management plans for snow removal within Snow Belt regions of the United States and Canada
- Formation of a working group to gain input from Delaware local government public works directors, DelDOT managers of maintenance and operations, DART operations managers, and/or grounds managers of public entities

The study specifically considered how to

- Clarify and better coordinate responsibilities for winter maintenance of pedestrian facilities.
- Improve the timely removal of snow on pedestrian facilities.
- Ensure ADA compliance.
- Determine how best practices may inform procedures in Delaware.
- Consider innovative solutions to issues.

3. WHY IS WINTER MAINTENANCE OF PEDESTRIAN FACILITIES NEEDED?

Prompt and effective snow removal is critical for maintaining safe pedestrian mobility and access to pedestrian facilities—including sidewalks, walkways, curb ramps, crosswalks, pedestrian islands/medians, transit stops/shelters, and trail systems. Icy or snow-covered sidewalks are dangerous, especially when pedestrians are forced to walk in the street. While most Americans depend on automobiles for daily travel, most trips begin by walking. With the national movement toward complete streets and the adoption of a Complete Streets Policy in Delaware, greater emphasis is being placed on providing more transportation options—including walking—to meet the needs of people of all ages and abilities.



Clearing snow and ice from pedestrian facilities can also promote healthy communities, encourage walking, and increase physical activity. Finally, providing accessible and unobstructed pedestrian infrastructure is the law. Title II of the ADA requires that state and local governments provide accessible pedestrian facilities that are well maintained and free from obstacles, such as snow and ice. Local governments that fail to maintain accessible pedestrian facilities or enforce local ordinances may be at greater risk for liability or non-compliance with the ADA.

3-1. Ensure Pedestrian Safety

According to the report *Dangerous by Design 2011: Delaware*, 171 pedestrians were killed on Delaware roadways between 2000 and 2009. Most of these fatalities occurred on roadways that have little regard for the safe transportation of pedestrians, bicyclists, persons with mobility impairments, or transit users (Transportation for America, 2011). In 2009 pedestrian deaths accounted for 12 percent of all traffic fatalities nationwide. Delaware ranked 15th among states for the highest percentage of pedestrian fatalities in traffic crashes in 2009—not great, but an improvement from its eighth-place ranking in 2003 (NHTSA, 2009).

The 2009 National Household Travel Survey statistics reveal that only about 10 percent of Americans over the age of 16 walk to work, yet the survey doesn't account for nearly one-third of the national population that are unable to drive or don't own cars. While automobile travel is

the predominant transportation mode for most Americans, often overlooked is the fact that most trips start by walking. Walking is part of each daily trip—whether alone or combined with public transit, driving, or cycling. Delawareans may use a sidewalk to walk to school, go shopping, stroll down a neighborhood street, enter a place of business, walk a dog, or commute to a transit stop or station. Slick and snowy sidewalks are problematic for all pedestrians but can pose mobility, accessibility, transportation equity issues for those who do not drive, own cars, or have special needs—including children, older adults, and people with disabilities.

Sidewalks that are not cleared of snow, ice, or other impediments are dangerous and inconvenient for pedestrians. In addition to possible “slip and fall” injuries, pedestrians may be forced to walk in the street if a snow-covered sidewalk is not cleared. Walking on a street, especially after dark or during inclement weather, is dangerous for the pedestrian and the driver. Drivers do not expect to see pedestrians in the street and are not looking for them. It is especially unsafe for pedestrians pushing strollers or using wheelchairs, who take up a wider berth, to walk in roadways due to snow-obstructed sidewalks.

3-2. Provide Complete Streets

The National Complete Streets Collation definition broadly states, “Complete streets are **designed and operated to enable safe access for all users**. Pedestrians, bicyclists, motorists and transit riders of all ages and abilities must be able to safely move along and across a complete street” (National Complete Street Coalition, 2010).

On April 24, 2009, Delaware Governor Jack A. Markell issued Executive Order No. 6 to create a Complete Streets Policy for the state of Delaware. The intent of Delaware’s policy is for “the Delaware Department of Transportation (DelDOT) [to] enhance its multi-modal initiative by creating a Complete Streets policy that will promote safe access for all users, including pedestrians, bicyclists, motorists and [transit] riders of all ages to be able to safely move along and across the streets of Delaware” (DelDOT, 2009). DelDOT subsequently adopted a Complete Streets Policy on January 6, 2010. Under the policy, DelDOT is charged with creating a formal process to implement Complete Streets principles and design standards that consider all modes of transportation.

Consistent with the state’s Complete Streets Policy, Delaware local governments have the opportunity to offer safe, equitable, and accessible transportation to all users and modes of transportation on roads within their jurisdiction. Local governments can implement a vision for complete streets through the development and adoption of plans, policies, design standards, and good facility-maintenance practices—including winter maintenance of pedestrian facilities.

Planning, designing, and constructing pedestrian facilities is useless if maintenance practices are deficient and negatively impact safety, security, and/or mobility of persons of all ages and

abilities. Winter maintenance of pedestrian facilities is an often neglected but essential component of complete streets, because it ensures pedestrian facilities will be accessible to all users, even during inclement weather. The development of comprehensive local government snow-removal plans and policies can better coordinate and clarify responsibilities, timeframes, and priorities for winter maintenance of pedestrian infrastructure.

3-3. Foster Healthy Communities

Walking is one of the easiest ways to maintain functional fitness. The Surgeon General advises that 30 minutes of walking five days a week will significantly reduce adult risk of developing a host of diseases, ranging from cancer to depression. The Centers for Disease Control and Prevention (CDC) recommend that children and adolescents get twice that amount of activity daily (CDC, n.d.).

Despite these recommendations, obesity is on the rise both nationally and in Delaware. According to the Delaware Division of Public Health, over 60 percent of Delaware adults and about 40 percent of children are either overweight or obese. On average, the obesity epidemic currently costs Delaware \$222 million per year in direct healthcare costs (Finkelstein et al., 2009).

Research indicates that there is a clear connection between the built environment and the health of a community. Communities that are pedestrian-friendly can help address rising obesity rates and promote healthier lifestyles. In addition to health benefits, walkable communities offer environmental and economic benefits, as well as greater livability. Walkability improvements play a key role in placemaking, which creates a sense of community identity and unity.

Complete streets can also foster economic viability and overall livability of communities. Improved walkability can help revitalize a downtown, increase private investment, lead to higher property values, promote tourism, and support the development of a good business climate. Keeping sidewalks in central business districts clear of snow and ice after a winter storm can help keep the downtown retail environment vibrant and “open for business,” especially during challenging economic conditions.

In addition, recent studies show that property values are higher in walkable neighborhoods and in those with shorter commutes and proximity to a central business district. Finally, most public-transit users walk or ride bicycles to and from a bus stop or transit station. Accessible pathways to and from transit-access points may increase the level of physical activity while encouraging transit use (Kettel Kahn et al., 2009).

3-4. Safeguard Public Assets

Sidewalks are an essential component of a multimodal transportation system. Sidewalks, like other transportation infrastructure, are a major public investment. It is less costly to maintain sidewalks than to undertake major repair and reconstruction. Also, regular preventive maintenance of a sidewalk can extend the lifetime of the pedestrian facility and delay the need for more extensive repairs.

To safeguard these assets, routine maintenance, regular inspections, and scheduled repairs are required. In addition, care should be taken to keep a sidewalk, walkway, or trail ice-free once snow has been shoveled. The responsible party (including property owners of adjacent sidewalks) should avoid using rock salt to melt ice. Rock salt can damage concrete sidewalks, especially when it may not have been installed correctly or sufficiently cured. Instead, municipalities should advise property owners to use an environmentally friendly ice-melt pellet or de-icer.

3-5. Meet Federal Americans with Disabilities Act (ADA) Standards

For persons with disabilities and mobility impairments, unobstructed sidewalks are essential to carry out needs and activities of daily living. The Americans with Disabilities Act of 1990 (ADA) is a civil rights law that is intended to provide adequate accessibility to all persons. Title II of the ADA prohibits state and local governments from discriminating against persons with disabilities with respect to public accommodations and transportation (U.S. Department of Justice, 2005).

3-5-1. ADA Responsibilities of State and Local Governments

Under Title II of the ADA, state and local governments are required to ensure accessible design, construction, and maintenance of *all* transportation projects. In 28 Code of Federal Regulations (CFR), part 35, which implements subtitle A of ADA Title II, *all* new construction, reconstruction, and alterations to existing state and local government pedestrian facilities must meet with federal accessibility standards. Pedestrian facilities include public sidewalks, shared-use paths, trails, curb ramps, crosswalks, pedestrian islands, or other public walkways.

State and local government facilities should follow requirements of the *2010 ADA Standards for Accessible Design*, which combines ADA Title II regulations at 28 CFR, Part 35, §23.133 and the 2004 *Americans with Disabilities Act Accessibility Guidelines (ADAAG)* at 36, CFR 1191, Appendices B and D. In summary, the standards require that, to the maximum extent possible, state and local governments must (2010 ADA Standards for Accessible Design):

- Provide public facilities that are accessible to and usable by individuals with disabilities.

- Maintain “in operable working condition those features of facilities and equipment that are required to be readily accessible to and usable by persons with disabilities....”
- Keep walking surfaces cleared (of snow, debris, and any obstructions) to a minimum width of 36 inches minimum.

3-5-2. Sidewalk Snow-Removal Ordinances and Municipal ADA Requirements

Local governments operate under charters, which have powers and authorities granted to them by state statutes and the state constitution. Charters enable municipalities to govern local matters, as long as there are no conflicts with state or federal law, and create a governing body such as a board or council. City/town councils have the power to pass ordinances—local laws. With respect to sidewalk maintenance, most municipalities require by ordinance that property owners maintain abutting sidewalks. It should be noted that while sidewalk maintenance may be required of property owners, it does not absolve municipalities of the ADA requirement to provide accessible, well-maintained pedestrian facilities. If a local government has a sidewalk-maintenance ordinance, that entity should assume responsibility for communicating requirements, inspecting conditions, addressing complaints, and ultimately enforcing regulations.

3-6. Mitigate Risk

When snow and ice accumulate on walking surfaces, the potential for slip-and-fall accidents and the associated risk of liability greatly increases. As previously stated, in addition to the mandate for state and local governments to provide pedestrian facilities that meet ADA standards, maintenance of accessible features is also required. Responsible entities need to establish a snow removal–management plan that address how sidewalks, pedestrian walkways, curb ramps at street crossings, and other pedestrian facilities will be cleared after a winter storm (PROWAG, 2005).

In recent years, states and local governments have been exposed to civil liability and precedent-setting case law due to instances of non-compliance with ADA provisions. To reduce injuries and minimize exposure to liability, local governments must maintain accessible transportation facilities and features. To prevent and/or minimize lawsuits and exposure, good maintenance practices that include a plan for snow and ice removal—one that outlines responsibilities for clearing sidewalks—should be adopted and routinely updated.

Again, most local governments adopt ordinances that hold property owners responsible for clearing adjacent sidewalks. If someone slips and falls on ice or snow, there is no automatic liability to the property owner associated with such a fall. However, if a property owner fails to take reasonable measures to remove snow from adjacent sidewalks and high-pedestrian-traffic areas and disregards a municipal ordinance requirement to clear snow, it is easier for a court to

establish liability. To reduce risk of liability, in addition to shoveling snow from a sidewalk, local governments should also require and advise property owners to (Zurich Services Corporation, 2008)

- Mitigate slippery conditions caused by melting and refreezing.
- Treat adjacent pedestrian facilities with an environmentally friendly de-icer.
- Ensure that loading areas of accessible parking spaces are cleared of snow and ice.
- Prevent snow from falling from awning, trees, or roofs onto sidewalks.
- Avert melting-water run-off away from sidewalks.
- Ensure that alleys and pathways, which connect sidewalks to parking lots, are free from snow and ice.
- Address melting and refreezing of snow/ice on walking surfaces and in puddles at the base of curb ramps.
- Avoid dumping or piling shoveled snow onto roadways, bikeways, intersections, curb ramps, or bus stops/shelters.

When property owners are required under a local ordinance to maintain, repair, and clear snow from sidewalks, a municipality must ensure the accessibility of those routes in order to mitigate risk. Even if a municipality has an adequate snow-removal ordinance that clearly assigns responsibility for sidewalk snow removal to property owners, enforcement of these ordinances is critical.

The Salt Institute, a nonprofit trade association advocating responsible uses of salt, conducted an informal survey of county and municipal governments regarding their sidewalk snow-clearing practices. The survey determined that:

- Eighty-three percent of respondents had written policies directing property owners to remove accumulated snow and ice "within 24 hours of the end of the snowstorm."
- Seventy percent of respondents did not enforce sidewalk snow-removal ordinances (Briscoe, 2001).

If a municipality does not consistently enforce an ordinance that requires a property owner to maintain a sidewalk, the entity can also be named in a lawsuit that alleges negligence, in a pedestrian slip-and-fall injury. In fact, 58 percent of municipalities that responded to the survey reported having been sued for a pedestrian accident on an improperly maintained sidewalk (Briscoe, 2001). To minimize risk and control this exposure, it is critical to ensure that if a jurisdiction has a sidewalk snow-removal ordinance, the ordinance is consistently enforced.

IPA's report, *Sidewalks and Shared-Use Paths: Safety, Security, and Maintenance* reinforced the need for municipalities to oversee responsibility of sidewalk maintenance. The report highlighted case law, which determined that municipalities are responsible for the maintenance of sidewalks regardless of ownership (O'Donnell et al., 2007). Although the municipality may

have an ordinance that assigns sidewalk maintenance responsibilities to property owners, safe pedestrian facilities are still a municipal responsibility. The report notes:

Sidewalks are considered to be a facility, just like a bridge or a building, and, therefore, are protected by the full force of ADA. As a result, the local jurisdiction would most likely be held liable if a person were hurt on a residential sidewalk even where maintenance responsibility is deferred to the homeowner (Horton). At a minimum, the jurisdiction is responsible for enforcement, and therefore local government inspectors should review and approve all repairs (O'Donnell et al., 2007 and Kirschbaum et al., 8-9).

4. MUNICIPAL WINTER-MAINTENANCE PRACTICES

4-1. Shared Responsibilities



Under the complete streets philosophy, walking and non-motorized transportation are considered to be equals to other transportation modes. Prompt and effective snow clearance on pedestrian facilities is critical to maintain accessible and safe

walking conditions. Sidewalks, curb ramps, crosswalks, pedestrian islands, bus stops/shelters, and year-round trail systems that are not shoveled or remain icy are dangerous and inaccessible. People who are unable to drive, don't own cars, or walk to public transit and activities of daily living are especially challenged by snow-covered sidewalks. Moreover, lack of winter maintenance to pedestrian facilities can limit or prevent access to services, programs, and activities, which violates the ADA Title II requirement for "maintenance of accessible features" state and local governments (ADA, 2007).

DelDOT is responsible for maintenance of 89 percent of roadways in the state of Delaware. However, winter maintenance of roadways—including pedestrian facilities—is a shared responsibility in Delaware. Federal, state, and local government law, as well as cooperative and/or interagency agreements guide winter-maintenance activities. Winter-maintenance responsibilities also vary among municipalities. Depending upon the jurisdiction, snow and ice removal may be shared among DelDOT, a municipality, public agencies and entities, property owners, contractors, business proprietors, landlords, and/or tenants.

4-2. Municipal Emergency-Operations Plans and Winter Maintenance—Management Plans in Delaware

The state of Delaware can be threatened by natural and man-made emergency and disasters—including winter storms. Under the State of Delaware Code, Title 20, Chapter 31, § 3107, the Delaware Emergency Management Agency (DEMA) is authorized and directed to "prepare and maintain a comprehensive plan and program for the emergency management of the State, such

plan to be integrated into and coordinated with the emergency management plans of the federal government and of other states and political subdivisions of this State to the fullest possible extent” (State of Delaware Code). The most recent version of the State of Delaware Emergency Operations Plan, adopted in 2006, provides strategic guidance and support for emergency response by local governments in Delaware.

Generally, there are two types of plans that may guide a coordinated response in the event of an winter-storm emergency that impacts a municipality—a municipal emergency-operations plan (EOP) and a winter maintenance–management plan (also called a snow- and ice-control and/or snow removal–management plans).

4-2-1. Municipal Emergency-Operations Plans (EOPs)

Municipal EOPs provide the basis for coordinated response operations before, during, and after an emergency or disaster affecting a municipality. First and foremost, an EOP establishes the authorization and coordination of procedures to protect lives and property within a jurisdiction. Second, it provides a basis for preparing for and executing emergency operations to prevent, minimize, prepare for, respond to, and recover from injury or damage that may be caused by technological debacles, national security incidents, and/or natural disasters—which may include severe winter storms. Such plans describe a comprehensive approach to disaster operations and assigns responsibilities for emergency planning and operations.

Municipal EOPs dictate when a local government will be directed to activate an emergency-operations center, using an incident-management system. It will also specify how operations will be coordinated internally within a municipal government and externally with other government agencies, public entities, and emergency responders.

While the core of an EOP provides an overview of the emergency-operations procedures and policies, addendums or appendices can augment a plan by providing detailed measures of how to prepare and respond to hazard- or weather-specific incidents such as a winter-storm emergency.

Most local governments in Delaware have adopted basic EOPs, which:

- Provide an overview of emergency operations and policies.
- Describe the overall approach to disaster operations.
- Assign responsibilities for emergency planning, emergency response, and recovery operations.

More detailed municipal EOPs may also include incident-, hazard-, or event-specific appendices and/or annexes. These annexes outline the response to a specific incident or event—such as a winter storm emergency.

City of Lewes EOP

The City of Lewes provides a detailed, online municipal EOP—which may be viewed as a model by other Delaware municipalities. The City of Lewes’s EOP provides Hazard-Specific Annexes for radiological monitoring and protection, floods/flash floods/high tides, hurricanes, thunderstorms and lightening, and tornados (City of Lewes, 2006). Because the coastal areas of Sussex County, Del., are usually not subject to snowstorms, the City of Lewes EOP does not include “winter-storm events” within its Hazard-Specific Annexes. However, it would be appropriate for other Delaware local governments that are subject to winter storms, to include this as a topic within an EOP appendix or annex.

4-2-2. Municipal Winter Maintenance–Management Plans

The purpose of a municipal winter maintenance–management plan (also called municipal snow removal–management plans, snow-emergency plans, or snow- and ice-control programs) is to set forth the policies, procedures, and standards of performance that a city or town will use in response to a winter-storm emergency. A primary objective of a plan is to provide for the safe and orderly movement of vehicular traffic, emergency responders, and pedestrians during adverse weather conditions or following a winter weather emergency. A good plan will address the need to clear pedestrian facilities as well as roadways, act as a flexible guide, and adapt to the severity of a snowstorm or unique storm conditions. In addition, a model plan will serve as a communication tool to better inform the general public, elected officials, municipal staff, and others involved in a coordinated response about the objectives, procedures and desired outcomes of snow and ice control efforts.

The process of developing winter maintenance–management plans will be discussed further in Section 7, and model or “best practice” plans will be highlighted in Section 8 of this report. While Delaware local governments have developed municipal EOPs, plans often do not address winter-storm emergencies. Winter maintenance–management plans are also not conventional among Delaware local governments and rarely address pedestrian facilities. However, the development of Delaware municipal winter-maintenance/snow–removal plans are strongly advocated by the T² Center of the Delaware Center for Transportation, which provides training to Delaware municipalities on winter maintenance, snow, and ice control. According to the T² Center, elements of a snow- and ice-control program include the following (Delaware T² Center, 2011):

- Goals and expectations, including levels of service
- Priorities for resource allocation and maintenance activities
- Fiscal accountability
- Recognition of legal responsibilities and constraints
- Environmental protection

- Public education/outreach
- Flexibility to react to changing conditions
- Opportunity to innovate and experiment

Because a winter maintenance–management plan will set forth a plan to ensure mobility of vehicles, emergency responders, and *pedestrians*, a model plan should address snow- and ice-removal on pedestrian facilities. Responsibilities for snow removal should be specified within the plan—including the removal of snow and ice on pedestrian facilities, as specified by municipal ordinances, charters, and/or policies.

City of Dover’s Public Services Emergency Plan

The City of Dover’s 2010-2011 Public Services Emergency Plan may be considered a model plan for other Delaware municipalities, because it recognizes the need to clear snow from pedestrian infrastructure as well as streets. Statements within the plan that address the need to remove snow from pedestrian facilities include (City of Dover, 2010):

- Responsibilities of city property–maintenance inspectors to ensure that snow is cleared from high-traffic pedestrian areas and in compliance with the sidewalk snow removal ordinance:
 - When inclement weather is pending with respect to snow and/or ice, the property-maintenance inspectors will proactively begin reviewing maps for areas where there is consistent pedestrian traffic to include school areas and like facilities (p.8).
 - Once the precipitation event has ended, the property maintenance inspectors will proactively approach all residential and business entities within their assigned districts to insure that the sidewalk snow-removal ordinance is enforced in a proactive manner (p.8).
- Inclusion of pedestrian facilities in the “Priority List of Operations for Snow and Debris Removal,” which include:
 - Clearing the bus transfer area (priority 6, p. 9).
 - Clearing municipal public parking areas to allow parking during snow/debris removal operation in the downtown business section (priority 7, p. 9).
 - Clearing all crosswalks and main intersections of excess snow (priority 13, p. 9).
 - Removing snow from all sidewalks along City property. Removal will begin at 0600 hours on the next regular work day after snow stops falling and will be the responsibility of the Grounds Division (priority 14, p. 9).
- An appendix within the plan provides a list of sidewalks on city property that will be cleared of snow by city crews (p.16).

4-3. Legal Aspects of Shared Winter-Maintenance Practices

Because winter-maintenance practices are shared, there may be misunderstandings as to which public entity (state or municipality) or private property owner is responsible for seasonal sidewalk maintenance. According to an IPA report, *Sidewalks and Shared-Use Paths: Safety, Security, and Maintenance*, “confusion over which entity (agency, private business, or homeowner) and which level of government (local or state) are responsible for the maintenance of sidewalks and shared-use paths exists in many jurisdictions” (O’Donnell and Knab, 2007, p. 9). The report also notes that “how a jurisdiction handles snow removal from sidewalks and paved shared-use paths is also an ADA issue. Snow removal is treated differently because of its temporary nature and because responsibility for clearing the snow is diffused. However, there is a legal obligation to remove snow within a reasonable period of time” (O’Donnell and Knab, 2007, p. 10). The report indicated that Nancy Horton, assistant director at the American Disabilities Act (ADA) Information Center for the Mid-Atlantic Region believes that “the local jurisdiction would most likely be held liable if a person were hurt on a residential sidewalk, even where maintenance responsibility is deferred to the homeowner” (O’Donnell and Knab, 2007, p. 60). Establishing clear maintenance agreements/MOUs, snow removal–management plans that address pedestrian facilities, and enforcement of municipal sidewalk snow–removal policies can manage risk and foster pedestrian safety and mobility.

The following provides a basic summary of the legal framework that provides the foundation for shared winter maintenance responsibilities in Delaware. While this is a broad overview of responsibilities, each municipality should consult with its solicitor to understand laws that form the basis of the jurisdiction’s winter maintenance obligations. Each municipality should also thoroughly review federal, state, and local laws as well as cooperative and/or interagency agreements to understand the extent and limitations of service requirements.

4-3-1. Federal Law and Municipal Maintenance Requirements

ADA “reasonable modifications” provision—Under 28 CFR, §35.130(b)(7), which implements ADA Title II, local governments are required to make “reasonable modifications” to policies, practices, or procedures to prevent discrimination to persons with disabilities. Reasonable modifications may include amendments to local laws, ordinances, and regulations that unintentionally, but negatively, impact people with disabilities (*ada.gov*).

ADA “operable working conditions” provision—Under 28 CFR, Part 35, §23.133, which implements Title II of ADA, all accessible public facilities and features must be maintained “in operable working condition” for use by persons with disabilities (*ada.gov*). Therefore, winter maintenance of sidewalks is required to ensure equal access to and mobility by persons with disabilities.

4-3-2. DelDOT's Winter-Maintenance Responsibilities

State-maintained roads—DelDOT will generally plow snow on all state-maintained roads within a municipality, with the exception of the cities of Wilmington, Newark, and Dover (Racca and Condliffe, 2002). The agency does not plow roads and streets that are maintained by towns, cities, or within privately owned subdivisions. It should also be noted that all roads with on-road bikeways (i.e., any road, street, path, or way designated for bicycle travel), should be plowed from curb-to-curb to safely accommodate bicyclists.

Municipal maintenance agreements—When DelDOT constructs a road within a municipality that is to be maintained by the state, the jurisdiction and DelDOT generally enter into a “municipal maintenance agreement.” Delaware local governments should be aware that there is no standard municipal maintenance agreement that governs state-maintained road within a municipality. Maintenance agreements vary among municipalities, or even among state-maintained roads within a given municipality.

Local governments should review, to the extent feasible, each specific municipal maintenance agreement to determine the limits of DelDOT maintenance. Generally, DelDOT will conduct “curb-to-curb” maintenance on a state-maintained road within a municipality. Maintenance of accessible transportation facilities that are outside a curb area, such as pedestrian facilities, falls to the responsibility of a municipality (Carter, 2011). Therefore, most municipal maintenance agreements limit DelDOT maintenance from curb-to-curb and *exclude* sidewalks.

4-3-3. Transit Agency Responsibilities

Bus stops and bus shelters are an example of a public facility that can generate questions associated with ownership, maintenance, and accessibility (Transit Cooperative Research Program, 2008). A report titled *Transit Bus Stops: Ownership, Liability, and Access* focuses on legal issues related to stand-alone bus stops and bus shelters. While ownership of bus stops/shelters varies by jurisdiction, the report provides several important principles related to duties of care to passengers that are summarized below (*Transit Cooperative Research Program*, 2008):

- In determining which entities may owe a “duty of care” to passengers, ownership and control of bus stops/shelters is considered. Responsibilities may be established by state statute or regulation, or legal agreement (p. 15).
- Based on agreement, statute, or policy, responsibilities for conditions or sidewalks next to the bus stop/shelter may fall to the transit agency, government entity, or private property owner. “Where a transit agency owns and controls the bus stop...the transit agency may be liable for injuries suffered due to unsafe conditions on property adjacent to the bus stop” (p. 16).

- A governmental entity has a “duty of care” to keep streets and sidewalks in a reasonably safe condition, including the sidewalk in front of a bus stop and sidewalk leading to/from a bus stop unless this is stated under a maintenance agreement (p. 17).
- A transit agency’s duty to provide a safe place to board/alight is generally met when a passenger reaches the sidewalk (p. 14).
- The United States Court of Appeals, Ninth Circuit, found that sidewalks are subject to requirements of Title II of ADA and Section 504 of the Rehabilitation Act. Under Ninth Circuit precedent, “maintaining accessibility of public sidewalks is a normal function of a city.” Therefore, a municipality should ensure that sidewalks leading to and from bus stops/shelters are accessible and barrier-free (unless stated under state statute, regulation, legal, or maintenance agreement) (p. 23).

4-3-4. Municipal Pedestrian Facility Maintenance/Snow Removal Requirements

Municipal charters – Municipal governments are incorporated as political subdivisions of the state and operate under a charter granted by the state government. Charters are legal documents that outline the powers, duties, and structure of a town or city’s government. Under a charter, powers of a municipality may authorize the town/city council to adopt ordinances, rules, and regulations regarding streets and sidewalks. In some instances, the term “street” may be defined to include sidewalks, lanes, and alleys. If a municipal charter stipulates that the jurisdiction is responsible for the repair and maintenance of streets, and a “street” is defined to include sidewalks, an ordinance to transfer this duty to property owners may be deemed invalid (Supreme Court of Delaware, 2004).¹

Municipal ordinances – A municipal charter also empowers council to adopt laws and ordinances to provide for the safety and welfare of its residents. Most municipalities, including those in Delaware, establish ordinances that require residential and commercial property owners to install, replace, and maintain abutting sidewalks. It is also common for municipalities to have sidewalk snow removal ordinances that require property owners or occupants to remove snow and ice from adjacent sidewalks within a certain timeframe or be subject to fines or other penalties.

While most municipal ordinances focus on the need to keep sidewalks maintained, free from obstructions, and cleared of snow, it is suggested that the term “sidewalk” be broadened to include all adjacent pedestrian facilities that should be cleared of snow by a property owner (e.g., curb ramps, walkways, stairways, fire escapes, entrances, and exits). Moreover, ADA accessibility standards should be cited within a municipal ordinance to provide guidance on the

¹ Note: See Section 4-4 on Supreme Court ruling regarding sidewalk snow removal regulations in Wilmington.

width to clear snow from a path and the need to treat shoveled sidewalks to prevent the formation of ice.

Special-Assessment Districts – Assessment districts (e.g., business-improvement districts or benefit-assessment districts) may be established by a local government to assess the costs associated with downtown commercial district–sidewalk repairs, replacement, and/or annual maintenance—including snow removal. The assessments for each parcel may be based on a variety of factors, including street and sidewalk frontage, lot size, building size, and land use (e.g., residential, commercial, vacant land, recreational use). This arrangement provides for more timely, consistent, and uniform snow removal in a commercial district or other area that has high pedestrian usage. The arrangement also addresses the need for snow and ice to be cleared from sidewalks of vacant commercial properties.

4-3-5. Maintenance Agreements

Cooperative, interagency, and mutual-aid agreements – These arrangements provide a sharing of costs and/or responsibilities (either by an informal understanding or written agreement) among several public entities, local governments, or other service providers within a geographic area (e.g., municipalities, counties, school districts, universities, transit agencies, parking authorities, Main Street or downtown business associations).

Memorandum of Understanding (MOU) – While cooperative, interagency, or municipal maintenance agreements may be in place, confusion may still exist regarding responsibilities for clearing specific pedestrian/bicycle facilities. It may be advisable for public entities to develop MOUs to further delineate winter-maintenance responsibilities for clearing snow and ice, at specific locations or under specific weather conditions, from:

- Parking areas, parking meters, walkways to parking areas
- Sidewalks, pedestrian pathways, crosswalks, pedestrian islands/medians, curb ramps
- Central business district sidewalk pedestrian zone, walkways, and street furniture (such as benches and bicycle racks)
- Recreational facilities and parks (including year-round state- and municipal-trail systems)
- Regional trail systems (that operate year round)
- Fire hydrants
- Bus stops, transit shelters, park-n-ride facilities, sidewalks/walkways/stairs leading to facilities, and on-site bicycle racks or storage
- Loading areas adjacent to accessible parking spaces
- On-road bikeways

5. DELAWARE LOCAL GOVERNMENT SIDEWALK SNOW-REMOVAL REGULATIONS

5-1. Research on Delaware Municipal Sidewalk Snow-Removal Regulations

Research on the Delaware local government sidewalk snow-removal regulations, policies, and procedures was initiated in fall 2010, as multi-step process. A total of 57 municipalities and three counties comprise the local governments in the state of Delaware. To research the extent to which local governments have regulations governing sidewalk snow



removal, IPA searched online code of ordinances, charters, websites, and contacted municipal officials. The Delaware League of Local Governments (DLLG) directory was reviewed first to determine the local governments with online municipal charters and/or codes. If the local government had online documents, the charters and codes were searched for provisions/regulations on sidewalk snow removal. Next, local government websites, listed in the directory, were thoroughly reviewed for public information regarding sidewalk snow-removal regulations or programs. Any pertinent documents or information found on the website was documented.

If information was not available online, an IPA research assistant e-mailed city/town managers, public works directors, or municipal clerks to request regulations regarding sidewalk snow removal. Thirty-three local government officials were contacted via e-mail or by phone and asked to provide an electronic or faxed copy of the government's regulation to IPA. Each of the local government officials contacted was asked the following:

- Does your local government have either a municipal charter provision or ordinance that requires sidewalks to be cleared after a snowstorm?
- If so:
 - Are there penalties for non-compliance?
 - How are sidewalk snow-removal requirements communicated?
 - Is there a program in place to assist physically challenged or elderly residents who are unable to shovel sidewalks?

5-2. Response to Requests for Information

Information was obtained from 48 out of 60 local governments. Twenty-five municipalities responded to information requests either through email, mail, fax, or over the phone. Of those 48 municipalities, 42 have regulations in place. These regulations range from charter provisions that give the municipality the authority to enforce the removal of snow from sidewalks to ordinances within municipal codes that specifically regulate sidewalk snow removal. The six municipalities that completely lack regulations regarding sidewalk snow removal also lack residential sidewalks. Fenwick Island, a Sussex County town, lacks residential sidewalks yet has a town code empowering the town to enforce sidewalk snow removal.

The following summary of responses focuses on Delaware local government sidewalk snow-removal policies that address responsibility, timeliness of snow removal, penalties, enforcement, citizen-assistance programs, and communication methods. The information is also compiled into a Delaware Local Government Regulations Matrix (Appendix A) and summarized in a Summary Table of the Delaware Local Government Regulations Matrix (Appendix B).

5-2-1. Responsibilities

In most jurisdictions, winter maintenance of sidewalks is a shared responsibility among the local government, public entities, private property owners, and/or tenants of leased properties. While plowing city-maintained roads is a priority, most Delaware local governments also clear snow from pedestrian infrastructure adjacent to municipality-owned property in front of municipal building(s) and facilities, parking lots and walkways leading to municipal building(s) and facilities, sidewalks abutting parks, and recreation facilities. Some municipalities (e.g., Odessa) contract for the removal of snow on local streets, sidewalks, and in common public areas and town parks. In unincorporated areas and in counties (e.g., Sussex County), developers of residential subdivisions may be required to form homeowners' associations, which then assume responsibility for the maintenance of private streets, roads, and sidewalks—including snow removal.

Municipal charters and ordinances allow Delaware local governments to assign sidewalk snow-removal responsibilities to private property owners. Language, similar to the statement below, was found within 23 Delaware municipal charters and essentially grant towns power to require sidewalk snow removal by property owners:

The [council or town] may [enforce or require] the removal of ice, snow, dirt, or other foreign substances from sidewalks and gutters by owners or abutting owners.

Generally, Delaware municipal ordinances focus on requirements of the property owner (or responsible party) to remove sidewalk snow within a certain time period, or face a penalty (or

penalties) for a violation. Twenty-seven Delaware local governments have ordinances with language similar to the following:

Property owners [or occupants, lessees, tenants, or agents] must remove snow and ice from the abutting sidewalk within [a range of six to 48] hours after a snow fall. Violators may pay a fine of [dollar amount and/or costs of snow removal, and possibly jail time if fines are not paid].

5-2-2. Timeliness

The most specific Delaware local government ordinance provisions impose time limits for sidewalk snow removal by property owners. The most common time limit requirement was for property owners to remove snow or ice within 24 hours after the snowfall (ten jurisdictions); and the second most common provision was a 12-hour limit (five jurisdictions). Other municipalities provided from six to eight hours for property owners to shovel snow after a storm. Because it is difficult to pinpoint an actual time when snow ceases to fall, it can be difficult to impose penalties/fines if property owners do not know the exact time limit for shoveling snow. It is especially difficult to gauge timeliness of snow removal if a storm ends overnight.

5-2-3. Penalties

Twenty-five municipalities have penalties for violations. Penalties for violations of snow-removal regulations in Delaware communities are typically monetary fines. While a typical fine is \$25, the fines ranged from \$1 to \$1,000. Ten jurisdictions impose fines and additional charges for the costs of snow removal on premises. Some jurisdictions assess additional fees for late payment of fines, administrative costs, and/or costs of prosecution.

Twenty municipalities state specific penalties will be imposed for violation(s) of a sidewalk snow removal ordinance—Bridgeville, Camden, Clayton, Delaware City, Delmar, Elsmere, Georgetown, Harrington, Laurel, Middletown, Millsboro, Milton, New Castle, Newark, Ocean View, Seaford, Selbyville, Smyrna, Wilmington, and Wyoming.

Bridgeville and Ocean View state in their provisions that notice must be given to residents from the municipality of snow-removal violations. This procedure of giving notice before issuing fine is the common practice of most municipalities, but these two municipalities have it formally listed in its provision. Georgetown, Laurel, Smyrna, and Seaford specify who is in charge of issuing fines. This important piece included in these provisions clearly puts the responsibility of regulating snow-removal penalties on particular municipal entities. The Town Manager is cited by Georgetown and Laurel, while the Town Council is cited by Smyrna.

The Town of Bellefonte's code does not levy a clear penalty but provides the discretion to

prosecute violators. Dover's property maintenance inspectors are assigned the responsibility to inspect conditions and ensure compliance with the sidewalk snow removal ordinance; enforcement activities are targeted to areas with consistent pedestrian traffic. The Town of Laurel and the City of Seaford have penalties that include possible jail time for failure to pay fines associated with a sidewalk snow-removal violation.

While a municipal ordinance may indicate the penalty (or penalties) associated with a violation, it may be difficult to enforce if a municipality does not state a specific deadline for removing snow or enforce compliance in a fair and consistent manner.

5-2-4. Enforcement

Even if a Delaware municipal code provides a penalty for the failure to shovel snow from a sidewalk in a timely manner, enforcement and the assessment of penalties are rare. Several town managers, public works directors, and/or municipal clerks that were contacted doubted if fines/penalties had ever been issued within their respective towns. Unless a property owner is a chronic or repeat offender, most violators are issued warnings and encouraged to shovel snow. The stricter penalties, such as jail time and steep fines, are often not considered. Reasons why enforcement of sidewalk snow removal is lax within Delaware municipalities may include the following:

- **Lack of personnel** – Priority response during a winter emergency is focused on roadways rather than pedestrian facilities.
- **Unsophisticated citizen-response systems** – The enforcement of sidewalk snow removal is largely reactive and complaint-driven. Yet, most small municipalities have not adopted non-emergency 311 systems and related technologies to respond to citizens' service concerns, issues, and/or complaints. In addition to 311 systems, local governments could improve customer service by developing websites that integrate social media to reach the public, share information, and broadcast weather alerts and emergencies. Social media includes social networks (Facebook), blogs, micro blogs (Twitter), social content such as photos and videos (Flickr, YouTube), podcasts, wikis, e-mail lists (Listserv, Really Simple Syndication [RSS] feeds), and message boards (*icma.org*, 2011). The State of Delaware has an Emergency Notification System (DENS), or reverse 911 system, where home, work, or cell phone numbers can be registered for notification in the event of an emergency in the area.
- **Cases of hardship** – Local governments officials are generally hesitant to impose penalties or fines that would pose a hardship to residential property owners, especially older residents or persons with disabilities/mobility issues.
- **Snow removal not regarded as a property-maintenance issue** – In most jurisdictions, failure to clear snow from a sidewalk is not considered to be a property-maintenance

violation. Traditionally, property-maintenance violations involving a health, safety, or sanitation matter have been addressed through the criminal system rather than treated as a civil matter. Therefore, there may not be a municipal department or personnel assigned to the responsibility for investigating, inspecting, and issuing citations for a sidewalk snow-removal violation. Applying a new property-maintenance-violation approach, that allows for instant “ticketing,” the assessment of civil penalties, and promotes compliance, may be a more effective approach for handling sidewalk snow-removal violations.

- **Issues with vacant properties** – Unless there is contact information for a landlord of an unoccupied rental property, it is difficult to contact residential properties that may be vacant in the winter season or inactive commercial properties that have gone out of businesses.
- **Issues regarding responsible parties** – In mixed-use districts, it may be unclear whether a property owner, landlord, or tenant is responsible for clearing a sidewalk adjacent to a property. This responsibility should be clarified within a municipal ordinance and prescribed within rental agreements.

5-2-5. Citizen Assistance Programs

Formal programs to assist the elderly and persons with disabilities with snow shoveling are not common among Delaware local governments. Informal, volunteer-based assistance may be offered by a local government but may not be sustainable during a major winter storm. The City of Harrington sends city workers out to assist those physically unable to clear sidewalk snow, if a resident calls to request such assistance. The Town of Wyoming enlists its maintenance crew to assist those in need, if community volunteers are unavailable. The Town of Middletown has a Snow Assistance Program that provides help to those with physical limitations, hardships, or a doctor’s certification of medical condition. Middletown residents must complete an online application to determine Snow Assistance Program eligibility and are advised of the following (Town of Middletown, Delaware, n.d.):

- Your sidewalk will be shoveled when all town streets and emergency facilities have been addressed. We ask that you please be patient and courteous.
- Walks will not be shoveled unless at least 1 inch of snow has fallen.
- Only the main front walk and a path to the closest door will be shoveled.

In general, assistance to the elderly and persons with physical limitations is not a standard municipal service. Individuals needing assistance are most often assisted informally by neighbors, civic associations, church groups, or other community organizations.

5-2-6. Communication

Delaware local governments have employed various methods to communicate sidewalk snow removal regulations to property owners. Town newsletters and website postings were the most common ways that municipalities inform residents. Websites often included a space for recent news, which posted reminders about clearing sidewalk snow. Municipalities that produce newsletters typically include information on snow removal regulations and procedures in fall/winter issues.

More local governments are using social media—such as Facebook and Twitter—to inform, update, and engage citizens on breaking news. Several communities, including the City of Dover and the Town of Georgetown, provide service announcements on the “wall” of Facebook pages.

The City of Newark offers a Citizen Notification System, which allows residents to receive emergency and service alerts and prioritize the method of delivery (e.g., home, mobile or business phone numbers; e-mail; fax number; and text messaging). Newark residents may sign up for the notification by completing a form in the Municipal Newsletter or an online request form. The City of Newark also uses its local television channel to broadcast public messages, announcements, and information about winter emergencies—including snow-removal operations. The City of Wilmington also has a television channel that can be utilized for public service announcements. Some websites feature options to receive e-mail notifications or RSS feeds on topics of interest, such as emergency notifications. Other tools used to communicate sidewalk snow-removal requirements with property owners include door hang notices and the use of automated telephone calls. During the 2009-2010 winter season, the Town of Middletown made robotic calls to keep residents informed about storm conditions.

5-3. Analysis of Delaware Local Government Regulations

To improve the effectiveness of a Delaware local government ordinance or regulation, it must:

- **Clarify responsible party (parties)** – Most ordinances state that a property owner is responsible for removing snow and ice from a sidewalk. However, regulations should clearly specify who is responsible if the property is mixed use (commercial and residential), leased, vacant, or only occupied seasonally.
- **Provide a specific shoveling deadline** – Most provisions state that a property owner or responsible party has specific number of hours to clear snow from a sidewalk after it ceases to fall. Instead, a more specific deadline should be considered, such as “by noon the day following a snowfall [of two inches or more]” (City of Boulder, Colo.).
- **Align regulations with ADA** – Because most charters or ordinances were probably adopted prior to the ADA of 1990, the term “sidewalk” is used instead of the broader

term “pedestrian facilities.” Unless a municipal ordinance specifically requires a property owner to clear adjacent sidewalks *and* curb ramps, there is no legal mandate to ensure that a curb ramp is cleared of snow and ice. Also, most ordinances do not stipulate that, in order to comply with ADA, “the clear width of walking surfaces must be 36 inches minimum” (*2010 ADA Standards for Accessible Design*). An exception is the City of Newark’s ordinance, which specifically requires pathways to be at least five-feet wide in business/commercial districts and at least three-feet wide in residential areas. Newark’s code specifically references ADA as follows:

Every property owner shall maintain any sidewalk abutting his property in a safe and usable condition including compliance with Americans with Disabilities Act (ADA) guidelines (City of Newark Code, Ch. 26, Art. III. § 26-25).

The City of New Castle’s ordinance also establishes a specific clear width minimum, which meets ADA requirements. It states:

The pathway must be cleared at least three feet in width along the pavement or sidewalk to the gutter to allow the free passage of pedestrians (City of New Castle Code, Ch. 209, Art. I 209-1, 209-2).

- **Provide distinct regulations for area high-pedestrian-traffic areas** – Most Delaware local governments rely on individual private property owners to remove snow from sidewalks and make no distinction for high-pedestrian-traffic areas. In central business districts, or “Main Street” areas, there can be inconsistencies or a lack of uniformity in removing snow from pedestrian facilities accommodate people walking to retail businesses, traversing between on-street and off-street parking lots, crossing streets, using street furniture, entering and exiting establishments, and boarding/alighting buses. In addition to the City of Newark’s ordinance that requires business/commercial districts to be cleared to a minimum of five feet, the City of Wilmington² specifies:

For the Downtown Mall, responsible parties must clear snow and ice at least six feet from the building line (City of Wilmington Code, Ch. 42, Article VII § 42-42).

- **Address vacant properties** – In most cases, the local government ordinance states that the property owner is responsible for sidewalk snow removal. Provisions do not address instances when a property is vacant—such as in cases of seasonal commercial and or residential vacancies in resort communities, and in university communities where students are away during winter breaks. While some local laws state that either a property owner *or* occupant is responsible for sidewalk snow removal, it is unclear who

² Note: See Section 4-4 on Supreme Court ruling regarding sidewalk snow-removal regulations in Wilmington.

will be held responsible if there is a violation of the ordinance.

- **Maintain ice-free conditions following snow removal** – Local government ordinances focus on the initial activity of removing snow or ice from a sidewalk after a winter storm. In no instances did a Delaware local government ordinance address the accumulation of ice on such a sidewalk and require cleared sidewalks to be treated with sand, environmentally safe de-icer, or other substance to prevent slippery conditions.

5-4. Snow Removal in the City of Wilmington—Legal Implications

Currently, City of Wilmington Code § 42-42 assigns the order of responsibility for sidewalk snow removal to 1) occupants, 2) lessees, 3) owners, 4) agents. However, two Delaware Supreme Court rulings determined that this ordinance is invalid because it conflicts with the City of Wilmington Charter §5-400, which grants the department of public works the power and duty [itself or by contract] to “design, construct, repair, and *maintain* city streets, which shall include highways, roads, streets, alleys, *footways*, bridges, tunnels, overpasses, and underpasses... (City of Wilmington Charter).

Because the City of Wilmington’s Charter defines streets to include *footways* (i.e., sidewalks), the Delaware Supreme Court ruled in the February 2004 case of *Schadt v. Latchford* that the city cannot transfer its responsibility of sidewalk snow removal to the abutting property owners. In order for the City of Wilmington to transfer responsibility of snow removal to the property owner the Charter must be amended. In the meantime, the city cannot enact any ordinances that contradict the provisions of its own Charter. The home rule, which was adopted by a referendum on November 7, 1978 and became effective on July 1, 1979, requires the vote of the residents of Wilmington to repeal and adopt new provisions.

In August 2004, a second Delaware Supreme Court ruling affirmed the decision made in *Schadt v. Latchford*. The subsequent ruling in *Lemos v. Winston and Willis* again stated that provisions within the City of Wilmington’s Charter require it to assume responsibility for removal of ice and snow from “streets.”

Delaware Supreme Court rulings in the cases of *Schadt v. Latchford* and *Lemos v. Winston and Willis* provide a cautionary example to other Delaware municipalities. Generally, it is the duty of a city/town to “use reasonable care to keep its sidewalks safe for passage by citizens. Nevertheless, landowners may be liable by statute, ordinance, or charter...” (Supreme Court of Delaware, 2004, 1). However, an ordinance that makes landowners responsible for sidewalks will be invalid if it directly conflicts with the city’s home rule charter (Supreme Court of Delaware, 2004).

6. FIELD OBSERVATION OF WINTER MAINTENANCE OF PEDESTRIAN FACILITIES IN DELAWARE

On average, northern Delaware sees 18.9 inches of snowfall over the course of the season, with average snowfalls of 7.5 inches in January and 6.3 inches in February each year (Office of the Delaware State Climatologist, 2011). However, during the 2011 snow season, Delaware received an unusually high snow accumulation. Based on the 45-year satellite record, January 2011 had the 5th largest January snow-cover extent for the country (National Climatic Data Center, 2011). The most significant snowfall events in 2011 in the Mid-Atlantic region and northern Delaware occurred on January 11–12 (at least 6 inches), and January 26–27 (at least 10 inches).

The IPA research team conducted extensive field observations during January 2011—one of the snowiest months in Delaware in recent history. Photographs were taken in advance of, during, and within 48-hours after each of the two aforementioned major storm events. The project team focused on areas with significant snow accumulation in New Castle County—primarily within incorporated jurisdictions. Originally, the focus of field observation was sidewalk snow-removal practices. However, during the course of observation, it became clear that many problems impacted all pedestrian facilities. Therefore, the research team observed and photographed “acceptable” and “unacceptable” snow-removal practices on sidewalks, curb ramps, multimodal access points, and bus stops/shelters. Several categories of field observation were established. It should be noted that the point of the field observation was not to criticize specific jurisdictions/entities/agencies/property owners or enforcement endeavors but to identify common winter-maintenance issues in Delaware during a major winter storm.

6-1. Preparation

Outstanding preparation activities were observed at the University of Delaware (UD) in advance of both of the January 2011 winter storms. In addition to spreading anti-icing material on sidewalks, walkways, access ramps, entrances/exits to buildings, parking lots, UD bus stations, UD personnel also addressed crosswalks and areas of high pedestrian activity leading to Newark’s central business district.



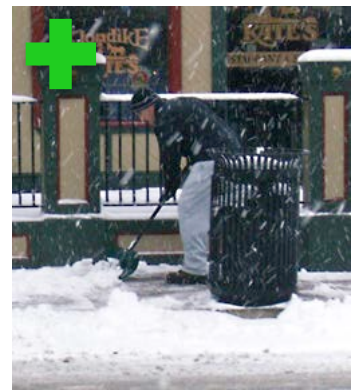


6-2. Timeliness

Generally, most local government ordinances require that private property owners clear snow from a sidewalk within a certain time period after a snowfall. In some instances, especially in central business districts, business owners proactively shoveled as snow continued to accumulate. In other many instances, snow

was not

cleared from private properties in residential and commercial areas within 48 hours. Most Delaware local government ordinances require private properties to remove snow or ice within 48 hours after a snowfall. While local government enforcement of ordinances may have occurred, the IPA research team did not observe enforcement activities during times/dates of observation.



6-3. Width

The design and maintenance of accessible facilities is required under the ADA. To ensure ADA compliance for “accessible routes,” a clear width of a walking surface should be a minimum of 36 inches. Even if a sidewalk or walkway is facility that is maintained by a private property owner, a local jurisdiction may be liable in a civil lawsuit or ADA complaint if a local ordinance is not being enforced.



6-4. Connectivity

Connectivity is important to ensure that sidewalks/walkways provide safe passage and access to parking lots, bus stops/shelters, and other pedestrian features such as crosswalks and curb ramps. Because most trips begin by walking, the importance of the need to ensure connectivity to destinations (e.g., central business districts, retail shopping areas, schools, public facilities, public transit, and residential areas) cannot be overlooked. Gaps in connectivity can pose transportation justice issues for individuals who rely on walking as a primary mode of transportation—including individuals from zero-car households, transit-dependent populations, senior citizens, persons with disabilities, and children.



6-5. Crosswalks

One problem that was repeatedly observed was access to crosswalks from sidewalks. In most cases, while a crosswalk within a roadway was cleared by a snowplow, the clearance width was equivalent to the width of the roadway—it may not have been fully cleared to a curb ramp area. In other cases, clearing of a crosswalk resulted in snow being deposited by plows onto curb ramps or pedestrian islands in the middle of a roadway. In many cases, the crosswalk areas were rendered useless and pedestrians were forced to cross streets in the middle of an intersection.



6-6. Bus Stops/Shelters/Park-n-Ride Facilities

The Victoria Transport Policy Institute recently conducted an analysis of shorter trips using National Personal Travel Survey Data. The analysis determined that the non-motorized-travel mode share is often undercounted. Frequently ignored in surveys are non-motorized links of trips that include motorized travel. According to the National Household Travel Survey, about



12 percent of total trips are by non-motorized modes—about twice as high as reported in most travel surveys. Nearly one-third of trips of three miles or less are by walking or biking (Litman, 2011). Because walking represents a large portion of shorter trips by car or public transit, it is essential that pedestrian links to and from bus stops, shelters, and park-n-ride facilities be maintained and free from snow and ice.

Of the locations in New Castle County where field observations were conducted, Dart First State Park & Ride facilities were sufficiently cleared of snow and ice in parking areas, accessibility-designated parking spaces, walkways, adjacent sidewalks, staircases, and bus shelters. In other areas of New Castle County, many bus stops and shelters were covered with snow. If the interior areas of bus shelters were cleared, sidewalks leading to and from transit facilities and/or access to the curb to board a bus were often inaccessible. It was not clear whether the bus agency, private-property owner, jurisdiction responsible for snow plowing, or a combination of entities



was responsible for clearing snow from transit stops and shelters. During the course of this study, DART First State launched its 2011 Adopt-A-Shelter program to enlist community and business partnerships to adopt and help maintain bus shelters in Delaware. It is hoped that volunteer assistance with maintenance will result in cleaner, more attractive shelter environments and reduce vandalism.

6-7. Curb Ramps

Curb ramps must be designed and constructed to provide an accessible route that people with disabilities can use to safely transition from a roadway to and from a curbed sidewalk. Curb ramps are considered a vital part of making pedestrian facilities—sidewalks, street crossings, and the other pedestrian routes that make up the public right-of-way—accessible to people with disabilities. The ADA requires state and local governments to provide curb ramps at pedestrian crossings to allow persons using a wheelchair, scooter, walker, or other mobility device to cross a street safely. Curb ramps are also required at public transportation stops where walkways intersect a curb (Department of Justice, 2007). Once installed, the ADA requires maintenance of accessible facilities. In Delaware, most local ordinances do not reference ADA or require property owners to clear adjacent curb ramps. Another universal problem throughout Delaware jurisdictions was the practice of depositing cleared snow from roads onto street corners—which inevitably covers or blocks the use of curb ramps.



6-8. Pedestrian Accessibility and Mobility



Walking is a basic transportation mode for many people, including those who rely on transit and those who are unable to drive a car, including youth. In several instances, pedestrians were able to use a crosswalk but were blocked from access to a sidewalk because the curb cut was not cleared. The IPA research team often observed pedestrians walking along a roadway or through a parking lot rather than navigate an uncleared sidewalk. Particularly disturbing were examples of

people walking in the street between residential and commercial areas carrying grocery bags, pushing strollers along a roadway because sidewalks were not cleared to an adequate width, using the middle of an intersection rather than a crosswalk to cross a street, and poor visibility of pedestrians walking along roadways at dawn or dusk.



6-9. Safe Routes to School

Sidewalks provide the opportunity for children to walk to school and should not be a weather-dependent transportation facility. However, sidewalks become a safety and security issue if they are not cleared consistently, in a timely manner, or to an adequate width. Problem areas included areas with school-zone signs and pavement markings that denote a school route where children walk to school.



6-10. Access to/from Other Modes

As previously discussed, non-motorized transportation represents a significant percentage of shorter trips by car or public transit and is often undercounted in travel surveys. Although



today's society is automobile dominated, walking or biking is often the first or last part of a motorized trip—whether by car, commuter rail, or bus. Again, confusion often exists as to which entity or property owner is responsible for clearing pedestrian infrastructure that is either adjacent or connects to a public transportation facility. Two good examples of access provided to and from other modes included observations that a bike-rack storage area was cleared from snow at a specific park-n-ride facility and that pedestrian facilities leading to and from the Wilmington Train Station appeared to provide a clear passageway for pedestrians.

6-11. Commercial Areas

Recent research shows a clear connection between walkable environments and a community's economic vitality. Well-designed and maintained pedestrian friendly infrastructure can enhance walkability of shoppers and support a good local business climate. Business patrons value a positive pedestrian experience, and



commercial activity gravitates toward walkable places. Central business districts, Main Street communities, and commercial shopping areas with snow-covered walkways, snow-blocked access points, or gaps in connectivity are not only unsafe but serve as a deterrent to prospective customers. Some Main Street communities contract out for snow removal services through the business

association. For example, the Bend (Ore.) Downtowners Association funds sidewalk snow-removal services within the core business district. The contractor also shovels and clears snow from curb ramps at crosswalks and accessibility-designated parking stalls (Downtown Bend, n.d).

6-12. ADA Compliance

Snow or ice on sidewalks, curb ramps, crosswalks, and/or pedestrian medians/islands are physical obstacles that limit the accessibility of facilities to persons with disabilities. Local

governments' standards, practices, and ordinances must ensure that the path of travel on pedestrian facilities is open and usable for persons with disabilities, throughout the year.



6-13. Bikeways

The maintenance of bikeways is essential to ensure the safety of bicyclists and preserve its function as a transportation facility. Snow removal is a critical component of bicycle safety. After a snow event, snow should be plowed so that it does not block on-road bikeways, sidewalks, or curb ramps. Snow should be cleared from curb-to-curb, to allow bicyclists to travel as far as possible to the right side of the road and provide for the visibility of pavement markings—designed to create awareness and identify the presence of a bicycle facility.

photo by Frank Warnock, courtesy of Bike Delaware



7. WINTER MAINTENANCE–MANAGEMENT (SNOW-REMOVAL) PLANS

7-1. Purpose of Winter Maintenance–Management Plans

More state and local governments, school districts, central business districts/business-improvement districts, institutions of higher education, and major employers are recognizing the benefits of developing comprehensive, written winter-maintenance plans (i.e., municipal snow removal–management plans, snow-emergency plans, or snow- and ice-control programs). Advocates of such plans include the American Public Works Association (APWA), Salt Institute, national and state Local Technical Assistance Programs (LTAPs), and municipal risk-management associations. A list of sources used to research the components and key elements of winter maintenance–management plans are provided in the below table.

Sources of Information for Winter Maintenance–Management Plans	
Source	Website
American Association of State Highway and Transportation Officials (AASHTO), Subcommittee on Maintenance	http://maintenance.transportation.org/Pages/NCHRPProject20-7.aspx
American Public Works Association	www.apwa.net
Canadian Public Works Association	www.cpwa.net
Cornell (University) Local Roads Program	www.clrp.cornell.edu/Library/publications.htm
Delaware T ² Center	www.ce.udel.edu/dct/T2.html
Federal Highway Administration (FHWA) Winter Maintenance Management	http://ops.fhwa.dot.gov/Weather
Metropolitan Area (Boston) Planning Council, Snow Removal Policy Toolkit	http://mapc.org/snowtoolkit
Municipal Services and Research Center of Washington	www.mrsc.org/subjects/pubworks/snow.aspx_
National Cooperative Highway Research Program (NCHRP)	
• Report 526 - Snow and Ice Control: Guidelines for Materials and Methods	http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_526.pdf
• Report 577 - Guidelines for the Selection of Snow and Ice Control Materials to Mitigate Environmental Impacts	http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_57.pdf
Pacific Northwest Snowfighters	www.wsdot.wa.gov/partners/pns
Salt Institute	www.saltinstitute.org

Winter maintenance–management plans are developed to set forth policies, procedures, and responsibilities for an agency’s response to a major winter storm. Most plans describe how a highway-maintenance agency (e.g., state department of transportation or local government public works department) will respond during a snow emergency with personnel and resources such as trucks with snowplows, graders, sanders, de-icers, and other equipment.

According to Duane E. Amsler, P.E., a former New York State Department of Transportation program manager who is internationally recognized as a snow- and ice-control operations expert, the purpose of developing a well-crafted, well-written and adopted winter maintenance–management plan is to (Amsler, 2006):

- Outline municipal policies, responsibilities, and procedures in order to prepare for and respond to a snow event and/or winter-storm emergency.
- Provide a systematic approach to keep the transportation network safe and usable during the winter.
- Set forth the policies, procedures, and standards of performance the entity will observe in meeting its responsibilities for snow and ice removal.
- Specify responsibilities of other agencies, entities, and emergency responders and how all duties and responsibilities will be shared/coordinated during to a winter-storm emergency.
- Serve as a communications tool to better inform the public, elected officials, municipal staff, partner agencies, volunteers, and other stakeholders of the local government’s plan of action for efficient, effective, safe, and environmentally responsible snow removal from local transportation networks.

7-2. Benefits of Winter Maintenance–Management Plans

Amsler stresses that good winter maintenance–management plans provide benefits to the agency responsible for responding to a winter-weather event, emergency responders, other agency partners, and the general public. Benefits include (Amsler, 2006):

- Providing a safe transportation system and enhancing the mobility of both motorists and non-motorists during a winter storm event.
- Communicating clear expectations, procedures, and levels of service to responsible snow-removal personnel.
- Setting forth a plan of action that includes year-round planning, preparation, implementation, and assessment phases.
- Achieving greater public understanding of snow-removal policies, procedures, and operations and thereby may result in fewer complaints.
- Reducing liability and addressing the need for risk management for the entity’s snow-removal operations.
- Ensuring that emergency responders—police, fire, and emergency medical services (EMS) can respond promptly to requests for service.
- Promoting the coordination of emergency services during a winter storm among the state department of transportation, the local government, emergency responders, and other responsible entities.
- Serving as a tool for training and continuous improvement.

7-3. Process for Developing a Municipal Winter Maintenance–Management Plan

Amsler suggests that a specific process be followed to develop an approved, written winter maintenance–management plan. Again, these plans traditionally focus on clearing snow from roadways, but they can be augmented to also address pedestrian and bicycle facilities. Such plans are essential to provide a framework for efficient and effective response to a winter storm that is based on policy, operational procedures, and level of service priorities. The below sections describe guidelines for developing a winter maintenance–management plan.

7-3-1. Incorporate Input from an Advisory Committee

A good plan is crafted with a high level of participation. The completed plan will help answer questions about policies and procedures that may arise at all levels of snow removal operations—from municipal managers to maintenance crews. Additionally, residential and commercial property owners can refer to the plan to understand levels of service provided and shared responsibilities of winter-maintenance operations.

An advisory committee should be assembled to prepare and provide input on a municipal snow removal–management plan. Broad-based participation, with representation by all levels of municipal staff and other external stakeholders, will ensure that the plan has public acceptance and can be practically implemented. Advisory committee members can review examples of other plans/policy documents, consider elements of the plan, recommend plan/policies for adoption by legislative body, meet annually to review the adopted plan, and recommend changes, if needed. Members of an advisory committee may include representatives from:

- Municipal departments—administration, public works, police, municipal clerk, and others involved in snow-removal operations and communications
- City/town council
- DelDOT
- DART First State, or other local transit providers
- Emergency responders
- Civic associations and community organizations
- Local business community
- School district(s), private, and charter schools
- Institutes of higher education
- Major employers
- Media

A representative from a municipal department, such as a public works director or street superintendent, may take the lead or serve as chair of the working group in order to:

- Circulate and obtain input on drafts.
- Recommend the plan for adoption (or amendment) by elected officials.
- Carry out the adopted plan.
- Communicate plan both internally and externally.
- Review and recommend plan updates as needed.

7-3-2. Review the Legal Basis for the Plan

One of the first tasks that should be undertaken is a review of all laws and policies that form the legal basis for a municipal snow removal–management plan. In order to develop a good written plan that provides a consistent level of service and results in increased safety and mobility, it is critical to review:

- **Federal laws and ADA** – including ADA provisions that require “reasonable modifications” and “operable working condition” of accessible facilities
- **State and interagency agreements** – to enhance cost-effectiveness of snow-fighting strategies by planning, coordinating, and sharing resources with other entities
- **Municipal statutes, charters, and ordinances** – that govern snow-removal responsibilities of the municipality and property owners and determine activation/declaration of an emergency-operations center, a winter emergency, emergency snow routes, and snow-emergency parking bans
- **Internal policies** – these policies may establish winter-maintenance responsibilities of city departments for clearing snow from city-maintained streets, pedestrian facilities, alleys, recreation facilities, year-round municipal trail systems, and municipal parking areas

7-3-3. Determine Hierarchy of Control and Synchronization of Plan

Prior to adoption, the municipality should determine the hierarchy of control for the plan and how its activation will be synchronized internally and externally. Similar to a municipal EOP, a winter maintenance–management plan may trigger the activation of an emergency-response center that will operate using an incident-management system. Using this approach, a municipal official will serve as the incident commander. In collaboration with designated command staff, the incident commander will direct, control, and coordinate the response to a winter-storm emergency. The incident commander will be responsible for activating the plan, exercise overall command and control over snow-removal operations, deploy municipal personnel, activate an emergency-notification system, and synchronize the plan with other public agencies and emergency responders.

7-3-4. Adoption of Plan

Once developed with input from an advisory committee, reviewed to ensure consistence with laws and policies, and established with hierarchy authority, a winter maintenance–management plan should be reviewed and formally adopted by the town council or legislative body. Next, key elements of such plans are described.

7-4. Key Elements of Municipal Winter Maintenance–Management Plans

There are three basic elements of good winter maintenance–management plans. These elements—policies, operations, and education—are each equally important to ensure efficient and effective snow-removal operations. Plans that have been vetted by an advisory committee and formally adopted should clearly delineate the scope and level of services to be provided, define a plan of operations, and communicate snow-removal responsibilities of the jurisdiction, outside agencies, and property owners.

While a plan should contain at least the three basic elements, more detailed plans may be warranted. Detailed plans will help to clearly delineate service requirements, especially in municipalities that share snow-removal responsibilities with other state agencies, public entities, and property owners. It is important to again emphasize that a plan should be tailored to the specific needs, operational requirements, level-of-service priorities, personnel and budgetary limitations, and extent of coordination with other agencies. Recommended chapters or sections of municipal winter maintenance–management plans are described below.

7-4-1. Introduction

The introduction of a winter maintenance–management plan serves to:

- Provide users with an overview of the plan.
- Summarize policies and procedures to be followed by city personnel.
- Explain that the document is a work-in-progress that is subject to continuous improvement.

Introductory Content

The introduction should set forth the purpose of the winter maintenance–management plan, goals and objectives of snow-removal efforts, roles and responsibilities of municipal personnel, and general guidelines for deploying crews during a winter-weather emergency. The basis of the authority for the plan—federal, state, and local government statutes or policies—should be cited either within this section or an appendix to the document. This section will serve as a roadmap or

guide for the remainder of the document and emphasize the need to provide mobility and safety for all roadway users during a winter storm, including pedestrians.

Definitions

Terms that are frequently used by municipal officials, but may not be clear to constituents (e.g., pedestrian facilities, right-of-way, levels of service), should be defined. Definitions may also clarify what aspects of winter maintenance will be the responsibility of the municipality, residents, other entities, or contractors.

Examples

The below excerpts provide examples of introductory statements within various winter maintenance–management plans.

Rawlins, Wyo. – The objective of the Snow Control Operations Plan is to provide “for the safe and orderly movement of emergency equipment, vehicular traffic, and pedestrians in the City of Rawlins” (City of Rawlins, 2010, p. 1).

Fraser, Colo. – “The purpose of the Snow Management Operations Plan is to provide safe travel on Town maintained streets, rights-of-way, and trails for the traveling [by automobile] and the pedestrian public by assuring that these areas are kept reasonably clear of snow and ice” (Town of Fraser, n.d.).

Crested Butte, Colo. – “The Town of Crested Butte developed a Snow and Ice Control Operations Plan with the primary purpose of outlining municipal responsibilities and procedures for controlling snow and ice accumulation on the streets and sidewalks of this community. Appropriate snow and ice control is necessary to maintain emergency services and routine travel. These responsibilities and procedures will provide a guide for efficient and effective snow and ice control” (Town of Crested Butte, 2009).

7-4-2. Communication

For a municipality’s plan to be successful, both internal and external communication is critical. Not only is there a need to coordinate and communicate internally among municipal departments, but externally with other agencies, emergency service providers, constituents, and stakeholders.

Internal Communication

Incident commander or designated staff member – An internal communications plan will clearly state who will be responsible for activating a municipal winter-storm emergency or EOP,

deploying municipal crews based on the severity of winter conditions, and providing updates/directives on emergency operations. It is essential to maintain a continuous flow of communication between field personnel involved in plow operations and other municipal departments, such as the police, administrative, and utility departments that may be addressing other weather-related emergencies that require cleared roadways, parking areas, and pedestrian infrastructure. An incident commander or designated staff member should be assigned the responsibilities of activating an emergency-notification system, informing elected officials, issuing media releases, answering phone calls, and updating phone hotlines, winter alert information, and/or websites and social-media outlets.

Notification of personnel – Another aspect of an internal communications plan is notifying municipal personnel once a winter-storm emergency has been declared at either the state or local level. A list of municipal personnel/field crews/contractors should be prepared and annually updated to provide emergency contact information for those involved in winter-storm emergency operations. Crews should be apprised of emergency “call-out” or “standby” procedures, which may be based on either a pending winter-weather advisory, predicted accumulation, or severity of road conditions.

Reporting and debriefing – An internal communications plan should also incorporate reporting and debriefing requirements. For each storm event, detailed reports should be prepared on manpower deployment levels and personnel time sheets; resource and material usage; accident/safety reports; performance reporting; equipment usage, maintenance, and repairs; use of contractors; and incident debriefing.

External Communication

Interagency communication – Communication among agencies will ensure a smooth response to a weather-related emergency. A plan should be in place and activated by the municipality’s incident commander or designated staff person to provide proactive communication and regular updates to DelDOT, emergency responders, school districts and higher-education institutions, medical facilities, transit providers, major employers, contractors, and other agencies/service providers to ensure a smooth response to a weather-related emergency. Involving outside agencies in an advisory group to develop a winter maintenance–management plan and coordinate pre-season planning activities will ensure a proactive approach to snow removal.

Public information – In addition, a proactive public information campaign should be initiated to inform the media and residents how and when a municipality will respond during a winter storm. Residents should be informed of ordinance requirements for sidewalk snow removal, parking bans, emergency snow routes, and snow-removal priorities and procedures. A new or updated snow- and ice-control management plan should be publicized to educate the public about municipal policies and operational procedures.

Traditional ways of communicating with the public include brochures, newsletters, print media, local television, radio and newspaper ads, and public service announcements. Newer and increasingly effective forms of e-communication include social media, electronic media, and websites. Many local jurisdictions establish winter “hotlines” and winter alerts via a municipal website that are activated during an emergency. In addition, the state has developed the Delaware Emergency Notification System (DENS) for public warning and notification in the event of a statewide, regional, or local emergency. Delaware residents can register home or mobile telephone numbers in a statewide database that will be used when the DENS is activated. Appropriate emergency alert system radio and television stations will also be notified under DENS (*dema.org*). Establishing good lines of communication minimizes questions and complaints that may arise from citizens later in the process (Florquist, 2010).

7-4-3. Level of Service (LOS)

This section of a winter maintenance–management plan defines the scope and level of snow removal service that the municipality will provide to residents. While definitions vary, “level of service,” may be defined as “observed or desired pavement conditions at various points in time, during and after winter weather events” (Amsler, 2006, p. 2). To describe a level of service, municipalities should take into account the following factors:

Objectives

These include the strategies, tactics, sequence of treatment, level of effort, and levels of deployment based on the:

- Type of storm
- Forecasted conditions
- Actual storm severity and snow accumulation
- Priority locations (e.g., access to emergency and medical facilities, school zones, transit routes, major employers, and significant commercial and industrial areas)
- Priority classification for entire transportation system (including arterial or collector roadway status, critical pedestrian networks, bikeways, and transit/bus stations)

Responsibilities

This will describe shared or interagency responsibilities for clearing roadways, pedestrian facilities, and other aspects of the transportation system. Lists, maps, and verbal descriptions of public infrastructure may be used to delineate which entities are responsible for plowing or shoveling snow in areas such as:

- Roads, streets, alleys
- Parking areas, parking meters

- Sidewalks, pedestrian pathways, crosswalks, handicap-accessible ramps, pedestrian islands
- Public facilities and parks (including bike paths, hiking paths, trails)
- Bus stops, transit shelters, park-n-ride facilities
- Fire hydrants
- Street furniture
- Pedestrian facilities abutting or adjacent to private property
- High-traffic pedestrian areas
- Bicycle facilities

LOS Goals and Priorities

Level of service goals should be described based on roadway classification, transportation modes, and clearing priority levels. Establishing LOS goals and priorities can help to communicate customer-service expectations based on weather conditions, standards of accountability, and snow-removal priorities. LOS should also address all aspects of operations, including pre-treatment, plowing, and de-icing (Wells and Jennings, n.d.). To graphically illustrate priority areas, this section may include street lists, maps, and charts that describe treatment priority based on LOS goals. If a municipal ordinance requires property owners to clear snow and ice from adjacent sidewalks and other pedestrian facilities (e.g., curb ramps), the policy should be stated and referenced in this section. Topics to be covered in this section may include:

- Conditions in which winter-storm operations will begin
- Frequency and time periods of treatment based on storm conditions
- When various types of treatments (e.g., chemical, plow, abrasives) will be used
- Levels of effort based on storm conditions
- Priority classification of the entire roadway and multimodal transportation system. An example:
 - Level 1 – Emergency routes (main roads used for EMS, fire, police, and access to hospitals), transit routes (school buses and public transit), major and high-volume roads, accident-prone roadways, and areas with hills, curves, or major intersections
 - Level 2 – Main roads traversing the business district, public service buildings
 - Level 3 – Residential streets
 - Level 4 – Pedestrian facilities in high-traffic areas, sidewalks and parking lots adjacent to municipal-owned property, parks, and facilities
- Goals for pavement conditions
- Storm clean up and safety restoration priorities (Amsler, 2006, p. 2)

7-4-5. Planning

With regard to preparation, a section should outline what activities the municipality will undertake during each of the four seasons in order to prepare for a winter-storm emergency. Some municipalities begin planning each fall with a “snow summit,” to bring municipal personnel and other stakeholders together to discuss snow-removal policies and procedures, review communications and operational plans, outline any proposed changes, and exchange ideas for improvements (Town of Crested Butte, 2009).

7-4-6. Risk Management

A risk management section should outline activities and programs that the municipality will undertake to mitigate and manage risk related to snow- and ice-control operations. Documentation will include municipal safety–training programs, measures to identify and address high-accident locations, tracking of and response to winter-weather conditions/advisories, accident investigation measures, training on snow-removal policies and procedures, review of recordkeeping requirements, and environmental preservation (Amsler, 2006, p. 3).

7-4-7. Operational Plan

This critical section will outline the operational procedures during a storm event based on the type, severity, and duration of weather conditions. Generally, the public works department will assume responsibility for the overall coordination of snow- and ice-control operations in cooperation with other municipal departments, agencies, and/or contractors. The public works director or other designated municipal staff member will determine the sequence of snow removal operations and the discretion to revise strategies/personnel assignments based on changing storm conditions.

To ensure that winter-storm operations can provide the appropriate response during a winter storm emergency, the following should be considered:

- LOS deployment guidelines
- Human resource requirements including training, call-out procedures, overtime/shift/scheduling policies, and when temporary personnel and contractors will be utilized
- Material-management necessities including the types of snow removal materials, storage requirements, and environmental controls/responsibility issues
- Equipment management issues (e.g., inventory, outsourcing, partnerships, inspection/safe operating procedures, maintenance)

- Consideration of personnel policies, labor agreements, and their impact on operating procedures
- Calibration and fueling procedures
- Record keeping and cost accounting requirements
- Legal issues (e.g., when snow emergencies will be declared, how property damage will be addressed, contracting procedures and policies, inspection and enforcement of municipal sidewalk snow removal regulations)

7-4-8. Plan Appendices

The appendices to a winter maintenance–management plan should support the written plan and further communicate its purpose, goals, and operations. Appendices may include:

- Applicable state or local government statutes, ordinances, or policies
- Municipal personnel policies or portions of union agreements
- Map(s) of interagency snow-removal responsibilities
- Map(s) and lists of snow-removal routes/priorities [including roadways and pedestrian facilities]
- Snow storage/disposal locations
- Contact information for municipal personnel and external partners/stakeholders involved in carrying out an EOP and/or snow- and ice-control management plan (Amsler, 2006)

8. BEST PRACTICE WINTER MAINTENANCE—MANAGEMENT PLANS

Traditionally, winter maintenance—management plans have focused on roadway transportation—stressing the need to keep roads clear to ensure the safety of motorists, emergency responders, and a free flow of commerce. Newer and “best practice” plans also:



- Address the need to keep pedestrian facilities safe, accessible, and free from snow and ice.
- Clarify responsibilities for winter-maintenance activities, including pedestrian facilities.
- Provide level of service priorities and deployment guidelines.
- Stress environmentally friendly de-icing strategies.
- Consider new technologies to carry out operations more efficiently and effectively.
- Stress the need for continuous improvement, training, and performance measurement.
- Mitigate risk and manage costs.
- Utilize electronic communications and social media to enhance outreach.
- Ensure compliance with federal and state laws.
- Incorporate innovative and/or environmental sustainability practices that provide cost-savings measures, foster efficiency of operations, and/or aid in efforts to preserve air and water quality.

Research was conducted on “best practice” winter maintenance—management plans of municipalities within Snow Belt areas of the Canada and the United States. Aspects of these plans are highlighted in the sections below.

8-1. Winter Maintenance—Management Plans in Canada

8-1-1. Calgary, Alberta

In Canada, Calgary established a snow- and ice-control policy in 2009 that was amended in June 2011. The policy establishes priorities, standards, and levels of service for snow and ice removal. The program recognizes the importance of “reduc[ing] snow and ice hazards and provid[ing] reasonable winter mobility on City infrastructure including roadways, sidewalks, and pathways” (City of Calgary, 2011, p. 1). The policy states that the intent of the snow and ice control program is “to minimize the economic loss to the community, reduce the inconvenience and hazards of winter conditions for motorists, cyclists and pedestrians, and facilitate the

operation of Transit and Emergency Services vehicles” (City of Calgary, 2011, p. 2). The plan is divided into the five sections, as follows:

The **Background** outlines the reasons for, and agency limitations of, a snow removal–management plan. **Definitions** give a common understanding of terms that are used within the plan. The **Purpose** justifies the need for the plan, including:

- Maintain reasonable conditions on roadways and sidewalks so as to minimize hazards and economic loss to the community
- Ensure safe access for emergency vehicles providing fire, police, and emergency medical services
- Provide guidelines for management and operating personnel in the handling of winter maintenance operations
- Outline citizens’ responsibilities regarding sidewalk snow- and ice-control on private property

Policy – provides a plan of action, levels of service, factors that determine priority areas for:

- Level 1 – business districts, highest vehicle-traffic volumes, designated arterial routes
- Level 2 – high vehicle-traffic volumes, traffic lights and controlled crosswalks, designated emergency routes, roadways with on-street bike lanes, problem areas
- Level 3 – designated feeders, collectors and bus routes at school and playground zones, designated hills, stop/yield signs, bus stops
- Level 4 – residential areas at school/playground zones and designated hills

A chart within the plan clearly explains the LOS within each priority area. This section explains that the policy is also designed to “maintain reasonable walking and cycling conditions along City-controlled sidewalks and pathways for pedestrians and marked, on-street bike lanes for cyclists” (City of Calgary, p.6). The section delineates sidewalk snow–removal responsibilities and priority levels of the municipality and responsibilities of property owners.

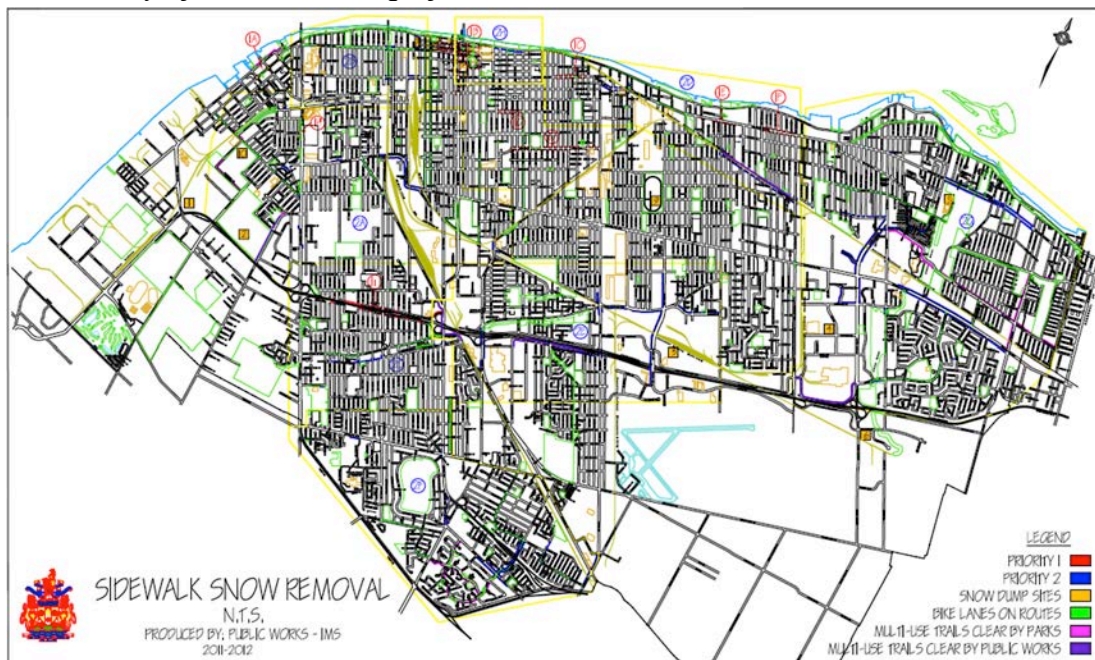
Procedures and Responsibilities – outlines the hierarchy of control and responsibilities for plan implementation including the city council, city manager, general manager of the transportation department, the director of the roads business unit, and the manager of the maintenance division (City of Calgary, 6).

8-1-3. Windsor, Ontario

As posted on its website, the City of Windsor explains that “Winter Control Levels of Service” are prioritized by category of transportation infrastructure and level of snow accumulation. Levels of service priorities are as follows:

- **Main roads** (classified as expressway, arterial, and collector) – plowed/treated when accumulation exceeds two inches
- **Local/residential roads** – plowed/treated when main roads are cleared and accumulation exceeds four inches
- **Sidewalks owned by the city, underpasses, and overpasses** – cleared as a third priority during a normal workday
- **Bus stops** – shoveled once all roadways have been cleared, when accumulation exceeds six inches, and as deemed a priority by the local transit entity

City of Windsor – Map of Sidewalk Snow Removal Routes/Priorities



Source: City of Windsor, Ontario, Canada (www.citywindsor.ca/000340.asp)

8-1-2. Ottawa, Ontario

The City of Ottawa has established maintenance quality standards to ensure that all transportation infrastructure is safe and cleared of snow and ice.

Roadway Maintenance Quality Standards – The city groups together in classes all roads, sidewalks and pathways with similar characteristics and functions. These classes are then used to prioritize the delivery of maintenance, including the frequency of snow plowing, ice control, and snow removal. The following chart illustrates road quality–maintenance standards and when city crews are deployed by priority area to clear snow and ice from roads, sidewalks, and pathways.



What to expect during a storm

Ottawa's resources are deployed systematically

Minimum depth of snow accumulation for deployment of resources		Time to clear snow accumulation from the end of snow accumulation or Time to treat icy conditions
As accumulation begins	Hwy 174, Transitway, most arterials and most major collector roads	2 to 4 hours
2.5 cm	Most sidewalks in downtown core	4 hours
5 cm	Most minor collector roads	6 hours
5 cm	Most primary sidewalks	12 hours
5 cm	Most residential sidewalks	16 hours
7 cm	Most residential roads	10 hours
10 cm	Most lanes	16 hours
Clean up	Most intersections and pedestrian crossings	16 hours
	Most Bus stops	24 hours

Source: City of Ottawa, Canada

(www.ottawa.ca/residents/onthemove/driving/road_sidewalk/plowing_salting/when_how_en.html#expect)

Sidewalk Maintenance Quality Standards – The City of Ottawa has also established a priority system to ensure that sidewalks, pathways, and bus pads are safe and clear from snow and ice. The below table describes the maintenance quality standards for snow and ice control on city-maintained pedestrian facilities.

Sidewalk/pathway maintenance classification		Minimum Depth of Snow Accumulation for Deployment of Resources	Time to Clear Snow Accumulation from the end of Snow Accumulation or Time to Treat Icy Conditions	Treatment standard	
				Bare surface	Snow Packed
1	<ul style="list-style-type: none"> Downtown business district Byward Market Large employment centres Special tourism areas 	2.5 cm	4 hours	X	
2	<ul style="list-style-type: none"> Downtown/urban residential neighbourhoods where sidewalks are only safe place to walk Sidewalks in villages Pathways that serve as main community links or to access transit services Sidewalks along roads with transit service, emergency facilities, public facilities or retail/commercial frontages Pathways designated as part of City cycling routes 	5 cm	12 hours	Sidewalks directly adjacent to arterial roads	All other locations
3	<ul style="list-style-type: none"> Sidewalks along rural and suburban collector and residential roads Paved pathways in rural and suburban neighbourhoods (pathways that are winter maintained) 	5 cm	16 hours		X
3	<ul style="list-style-type: none"> Unpaved pathways and trails Paved pathways that are not winter maintained 	Not winter maintained			

Source: City of Ottawa, Ontario

(www.ottawa.ca/en/roads_trans/road_sidewalk/wintermaintenance/sidewalks/index.htm)

Environmental Quality Standards – In addition to maintenance quality standards for roadways and sidewalks, the City of Ottawa has developed environmentally friendly practices associated with snow removal–management practices. The City of Ottawa is among the municipalities working with Environment Canada to develop a Code of Practice for the Environmental Management of Road Salts. The Code recommends that Canadian municipalities, like Ottawa, develop salt-management plans and implement best management practices for salt application, storage, and disposal (Environment Canada, 2009).

The city’s comprehensive Snow Removal and Disposal Program provides efficiencies while disposing snow in an environmentally safe manner. Since 2001, the City of Ottawa has improved its processes for the design and management of its snow disposal facilities that helped to improve operations and mitigate potential contamination from the run-off of treated, melted snow. In winter 2011, the City tested an environmentally friendly salt substitute on sidewalks along the Rideau Canal. The product, EcoTraction, is an abrasive made from a natural volcanic mineral that sticks to ice to prevent slipping. If successful and cost-effective, grant funding will be sought to research other “green” alternatives to salt on sidewalks (Madwar and Washchysyn, 2011).

8-1-3. Toronto, Ontario

In the City of Toronto, the service standards and priorities are outlined slightly differently, but still effectively. The City monitors weather forecasts and pavement temperatures in anticipation of a winter weather emergency. Prior to a storm, anti-icing operations begin by applying a brine mixture to roads and bridges. Once the snow begins to fall, main roads and expressways will receive priority treatment. Then, the accumulation of various amounts of snow will trigger priority-level response as follows (City of Toronto, n.d.):

- After five centimeters (~2 inches) of snow, all other main roads in the city are plowed. The City’s main priority is to keep these roads open for emergency vehicles.
- After eight centimeters (3.15 inches) or more, side streets will be plowed. This will take place only after the snow has stopped accumulating.
- Mechanical sidewalk clearing is performed in areas where it is feasible after eight centimeters (3.15 inches) of snow. Multiple rounds of clearing may be necessary for heavy snowfalls, or to address continually icy conditions.
- Where sidewalks are not cleared mechanically, manual clearance is available for elderly and disabled persons who register for the service.
- Transit stops and crosswalks are cleared after all main roads have been plowed.

8-1-4. Montreal, Quebec

The City of Montreal's strategic snow-removal plan is specifically geared toward pedestrian mobility, safety, and access to public transportation. The priority levels outlined by the strategic plan go into effect under three situations (City of Montreal, n.d.):

Snowstorms of 30 centimeters (11.8 inches) or less – In response to this snowfall, 11 of the main roads in the city are plowed and reserved for buses. Sidewalks and bus stops along these routes are also cleared.

Snowstorms exceeding 30 centimeters (11.8 inches) – When accumulation exceeds 30 centimeters, 15 additional streets are plowed for vehicular traffic. Six routes are also designated as snow emergency routes and are given priority to ensure access to snow trucks, public transportation, and emergency response vehicles. All parking is to be restricted along these routes when the plan is in effect. During all snow removal operations, there are 22 additional priority zones that are cleared because they have been deemed important in keeping public transportation moving. These include routes that are used by multiple buses and routes with steep hills.

Extreme snowfall events – This triggers a response plan that is specific to storm conditions and accumulation in order for the city to adjust its operations to be most effective.

8-2. Winter Maintenance–Management Plans in the United States

8-2-1. Seattle, Wash.

The Seattle Department of Transportation (SDOT) Winter Readiness and Response Plan is guided by *Pedestrian Master Plan* criteria and is fully integrated when its Emergency Operation Plan (EOC) is activated. The plan was updated in 2010 and (SDOT, n.d.):

- Incorporates national best practices
- Integrates satellite-based global positioning system (GPS) and weather-forecasting technologies
- Augments facilities improvements, organizational structure, and staff training
- Enhances communications with citizens and agency partners
- Emphasizes objective performance measures

The following aspects of Seattle's Winter Readiness and Response Plan make it a model for other agencies:

LOS – This section focuses on Seattle’s snow-fighting approach, goals of the plan, and the strategies employed to achieve those goals. A stated goal is to have the streets completely cleared, and for public transportation to be easily accessible, within eight to 12 hours of a lull in the storm. Also, this section outlines methods of snow removal—de-icing, anti-icing, and sanding—that will be employed. The service levels are described as (City of Seattle, n.d.):

- Level 1 – All lanes on these roads are cleared from curb to curb and kept bare and wet.
- Level 2 – One lane in each direction is cleared and kept bare and wet.
- Level 3 – Only curves, hills, and stopping zones are treated.

Facility improvements – Content in this section describes SDOT’s additional investments and improvements to the facilities and equipment. Seattle has recently equipped snow plows with GPS systems that report the plow’s position, blade position, and application of materials data to ensure accountability and improve navigation of routes.

Communications – This section of Seattle’s plan provides information on strategies used to inform the public. SDOT contacts media to issue news advisories with links to its winter-weather website page at www.seattle.gov/transportation/winterweather.htm. A winter-weather brochure is published annually and distributed to parents of elementary-school children (“Seattle’s Winter Weather Readiness and Response Plan”).

Primary communication tools include a website and social media (e.g., blog and Twitter). One of the most unique aspects of SDOT’s website is that during a snow event, the homepage transforms to an up-to-the-minute snow-removal operational update. The webpage highlights which routes have been treated by snowplows, conditions of roadways, key road closures, and links to traffic cameras.

8-2-2. Elkhorn, Wis.

The City of Elkhorn’s Snow and Ice Control Plan is periodically reviewed and was last adopted by elected officials in June 2010. The city’s snow removal—operations model is based on a route system that is divided into eight patrol zones—one of which is the Central Business District—that are established based on mileage and travel time. Sections of the plan highlight departmental responsibilities, service levels based on priority areas, and performance standards based on four categories of storm severity. The plan provides “exhibits,” which include streets/sidewalks listed in priority order to be plowed within each patrol zone and route maps. An appendix to the plan serves as an operations manual that focuses on employee orientation, training, calibration of equipment, operators’ checklist, risk-management information, and deployment guidelines/assignments (City of Elkhorn, 2010).

Sidewalk Snow Removal Plan – Within Elkhorn’s Snow- and Ice-Control Plan are two sections that address the Parks Division’s responsibility for snow removal on sidewalks that are adjacent to city-owned property and buildings. The plan lists priority areas for sidewalk snow removal, starting with the downtown area, EMS facilities, building, and then city hall. A specific list of priority sidewalk routes to be cleared by the Parks crews is also provided within the plan’s exhibits.

The plan also summarizes a city ordinance requirement for private property owners to clear snow from adjacent sidewalks. It provides a plan of action to address non-compliance with the sidewalk snow removal ordinance that includes a written warning by the Police Department, removal of snow by city crews if inaction continues, followed by issuance of a citation for violation (City of Elkhorn, 2010).

8-2-3. Bloomington, Minn.

The City of Bloomington has a comprehensive Snow Response Program. As part of the program, city ordinances are referenced that address responsibilities for clearing snow from pedestrian facilities. While the city ordinance requires property owners to clear snow and ice from sidewalks, over 250 miles of sidewalks in the city are cleared by the city’s Park Maintenance Department. The city code specifies a priority system that requires Park Maintenance to clear pedestrian facilities as follows (City of Bloomington, n.d.):

- First priority: School walking areas, heavily used wheelchair-accessible areas, and high-use areas along main roads
- Second priority: Walks expanding out from a school and along major roads
- Third priority: Residential and industrial areas

It is clearly communicated that extreme weather events and long-term snowfall may cause the city to return to high priority areas before getting to the lower priority areas. Also, Bloomington’s plan notifies citizens to keep obstructions—such as trash cans—off sidewalks so crews can complete their job more efficiently and quickly (City of Bloomington, n.d.).

8-2-4. Longmont, Colo.

The City of Longmont’s Snow- and Ice-Control Plan is a comprehensive 34-page document that is available to the public via its website. The purpose of the plan is to “organize safe travel ways during snow storms” (City of Longmont, 2010, p. 3). The plan provides guidelines for snow-operations deployment, deployment levels, personnel responsibility, snow-plowing priorities, safety and training considerations, use of equipment, and environmental protection. The plan emphasizes the need to ensure motorist safety, cost effectiveness, environmental benefits, and operational logistics.

Deployment levels – is based on factors such as expected accumulation, air and ground temperature, potential for back-to-back storms. Deployment levels consider the need for pedestrian accessibility in downtown areas and school zones. A snow team leader is assigned to each anticipated snow event and is responsible for deploying snow teams based on the category for four deployment levels as follows (City of Longmont, 2010):

- **Level 1** – Little or no accumulation is predicted; no back-to-back storm events predicted—limited deployment of on-call staff is on an as-needed basis
- **Level 2** – 0- to 6-inch accumulation predicted; possible back-to-back storms—Entire maintenance staff required for 12-hour on and 12-hour off shifts. Fleet mechanics are placed on-call, and one sanitation truck is ready for deployment. *Limited and/or targeted snow removal operations are possible along the Downtown area and school zones based on conditions.*
- **Level 3** – 6- to 15-inch accumulation predicted; regardless of multiple storm events—Entire snow team is called on for duty. Other city staff assistance and private contractors may be required. *School zones are cleared curb-to-curb; walk-to-school routes may be cleared by staff/contractors.*
- **Level 4** – 15-inch or greater accumulation; additional accumulation expected—Entire snow team is called on for duty; additional city staff and private contractors are called for duty; *school zones cleared curb-to-curb by staff/contractors and walk-to-school routes cleared by staff/contractors.* A level 4 deployment is triggered by:
 - Declaration of snow emergency by city manager
 - Activation of city’s emergency operations center where “incidence commander” takes charge of operations

Environmental protection – is emphasized in the “Air and Water Quality Responsibility” section of the plan. The city is aware of the environmental impact of snow removal practices and makes a conscious effort to responsibly select granular and liquid products used on the roadways, note distribution rates of such products, and conduct street sweeping efforts after snow events. In addition, the city continuously tests new abrasives that substitute for chip and sand, new liquid de-icers such as magnesium chloride which substitute for solid salt, and new technologies such as computerized de-icer application equipment (City of Longmont, 2010).

8-2-5. Barnstable, Mass.

While the Town of Barnstable Snow- and Ice-Control Operations Plan is only five pages in length, it is thorough and concise. The plan’s mission is to ensure “the safety and mobility of the community,” which includes responsibility for snow and ice removal for designated roadways, municipal parking areas, “70 miles of town sidewalk and four miles of bike paths,” and several business districts (Town of Barnstable, 2008, p. 1).

The plan provides information on LOS goals, authorization for snow removal operations, hierarchy of control, and coordination with other agencies. Snow and ice operations are categorized into four phases—pre-preparation, readiness, control, and clean-up. The control phase specifies three levels of response based on the severity of storm conditions. A Level Two phase dispatches public works and contract personnel for snow removal on streets and sidewalks in the primary business district. During a blizzard, a Level Three response focuses on keeping major thoroughfares open for emergency vehicles with assistance and coordination among all town departments, private contractors with heavy equipment, and other state/emergency agencies. During the clean-up phase, if needed the town may undertake sidewalk plowing on sidewalks in “village centers” and adjacent/radiating from public school areas (Town of Barnstable, p. 4).

9. LOCAL GOVERNMENT BEST PRACTICE SIDEWALK SNOW-REMOVAL REGULATIONS

9-1. Research Process

In Canada, many local governments address the need for sidewalk snow removal within municipal snow- and ice-control plans. In recent years, citizen advocacy groups in the United States, such as those described below, have begun to demand that local governments



address multimodal transportation needs of citizens, even in inclement weather.

League of Women Voters of Newton, Mass. – a nonpartisan, grassroots political organization pressured town aldermen to adopt a mandatory sidewalk snow-removal ordinance for all property owners. Under the March 2011 ordinance, Newton residents who are elderly, disabled, or under “financial duress,” may apply annually for an ordinance exemption (League of Women Voters, n.d.).

Metropolitan Area Planning Council (MAPC) – in 2011 this metropolitan planning organization in the Boston area developed a Snow Removal Policy Toolkit, which was updated for the 2012 snow season. The toolkit provides cities and towns with tools to increase snow-removal compliance and safety and includes sidewalk snow-clearance policies, maps, examples of ordinances that address timeframes and fees for snow removal, and sample snow removal-policy brochures from municipalities (MAPC, 2011).

Mid-Michigan Environmental Action Council – a Michigan Complete Streets partner, was the driving force behind the City of Lansing’s adoption of a sidewalk snow-removal ordinance in October 2010. The ordinance is a natural extension of the City’s Complete Streets Policy as it ensures that the sidewalks will be accessible to all users, even during winter months (*midmeac.org*).

Neighborhood Access Group – a grassroots organization dedicated to improving street-level access for people with disabilities, lobbied the City of Boston to adopt a sidewalk snow-removal ordinance in 2007 to better address the needs of pedestrians, transit users, and others who rely on sidewalks for transportation (*TheBostonChannel.com*, 2011).

Walk Boston – through pedestrian advocacy, educational outreach, and innovative initiatives, this organization has focused on making communities safer and more walkable for pedestrians. WalkBoston has developed basic recommendations to improve sidewalk snow and ice clearance (Walk Boston, n.d.).

Research was conducted on “best practice” regulations adopted by municipalities in Canada and the United States for snow removal on sidewalks and pedestrian facilities. The purpose of the research was to identify aspects of municipal ordinances and programs governing sidewalk snow removal. Municipal websites provided the best source for examples of “best practice” snow-removal programs, practices, and regulations. Websites were specifically searched to identify municipalities with snow-removal protocols that provide clear regulations and enforcement provisions, feature public-communication campaigns, and offer citizen assistance programs. Local government best practices in the United States and Canada are described below. A Sidewalk Snow Removal — National Best Practices Matrix, which summarizes the research is provided (Appendix C).

9-2. Best Practice Ordinances, Enforcement, and Penalties

To be effective, best practice snow-removal ordinances:

- Clearly delineate responsibilities of property owners and the municipality for snow removal.
- Require property owners to both clear and *maintain* the sidewalks abutting their property from snow and ice.
- Require snow to be removed from adjacent pedestrian facilities, not just sidewalks.
- Stipulate clear deadlines or timeframes for when snow/ice must be cleared.
- Convey the required width to clear pathways, to ensure ADA compliance.
- Designate the official/staff/departments in charge of enforcement, stipulate penalty (penalties) for non-compliance, and enforce regulations fairly and consistently.

9-2-1. Municipal Sidewalk Snow-Removal Regulations in Canada

Many local governments in Canada, where snow steadily accumulates over the winter, consider municipal sidewalks and walkways essential transportation infrastructure. In addition, many Canadian municipalities with heavy snowfalls use mechanical clearing devices on sidewalks and walkways. For these reasons, sidewalk snow removal may be addressed within municipal snow- and ice-control plans rather than a municipal ordinance or “by-law.”

Hamilton, Ontario – A city “by-law” requires homeowners, tenants, and businesses to clear snow and ice from walkways, stairs, entrances and all sidewalks adjacent to their property within 24 hours of a snowfall. The by-law also requires that property owners and tenants remove the snow and ice that builds up on roofs or eaves that overhang sidewalks to ensure the safety of pedestrians.

The following actions will be taken against property owners that fail to comply with the by-law (City of Hamilton, n.d.):

- A “Notice to Comply” will be issued to direct property owner/occupant as to what actions need to be taken.
- Fines of up to \$5,000 may be levied, in addition to other court proceedings.
- The City may clear snow and ice at the property owner’s expense.
- Costs for snow removal and a “Fee for Inspection” charge will be added to the property taxes.

Hamilton’s enforcement provisions have been very successful. It is estimated that 80 percent of warnings given to property owners result in their compliance without having to be fined. The enforcement provision is applied across the city, without exception, and is combined with aggressive communication efforts to ensure that citizens know their responsibilities (City of Hamilton, n.d.).

Toronto, Ontario – The City mechanically clears public sidewalks in most areas, except center city. Within this core area, property owners are responsible for clearing snow from abutting sidewalks. Property owners have 12 hours after a snowfall to comply or be subject to a fine of \$100 plus a \$25 administrative surcharge (City of Toronto, n.d.).

9-2-1. Municipal Sidewalk Snow-Removal Regulations in the United States

Madison, Wis. – The City of Madison’s sidewalk snow-removal ordinance specifies that a property owner must remove snow and ice from an adjacent sidewalk and curb ramps by noon the following day. Property owners must treat ice on abutting sidewalks with sand, salt, or other suitable abrasive. Penalties are assessed for each day of an offense. Fines start at \$20 for a first offense and may escalate up to \$100 for subsequent offenses.

The city’s Department of Planning and Community and Economic Development is charged with ordinance enforcement. For non-compliant property owners, the City may levy a special tax against the offending property and collect it like other real estate taxes. This method provides an effective deterrent and provides a streamlined process to address non-compliant property owners. (City of Madison, n.d.).

Ann Arbor, Mich. – The City of Ann Arbor provides different regulations for commercial and residential properties. Non-residential property owners must remove sidewalk snow that accumulates before 6 a.m. by noon of the same day, while residential properties have 24 hours after a snowfall to remove sidewalk snow. Property owners who fail to comply within 24 hours of the notification of a violation will be charged for removal by the city, plus a \$50 administrative fee. If a financial hardship is proven, the fees may be paid in installments or waived. Failure to pay fees or to obtain a financial hardship waiver can result in fines of up to \$1,000 (City of Ann Arbor, n.d.).

Boulder, Colo. – The City of Boulder’s sidewalk snow-removal regulations require all commercial and residential property owners to clear ice and snow from adjacent sidewalks or walkways no later than 24 hours after a snowfall (or snowdrift). Property owners, tenants, and property managers can all be held responsible for failure to remove snow under the ordinance.

Violation of the ordinance can result in a municipal court summons and fine (\$100 for first offense) or abatement, in which the city hires a contractor to clear the sidewalk at the property owner’s expense. Beginning late October 2011, enforcement of the sidewalk snow-removal ordinance is being transferred from Public Works to a new code enforcement unit in the Boulder Police Department (City of Boulder, 2011).

Champaign, Ill. – The City’s Code was amended in 2007 to provide specific requirements for removal of snow from sidewalks in designated areas. Property owners within the City’s University District and Downtown Business District are required to remove snow from sidewalks after at least two inches of accumulation and also after accumulations of ice, sleet, or freezing rain. A path the width of the sidewalk or 48 inches, whichever is less, is required to be maintained.

If an owner has property at a corner location, the owner is also responsible for removing the snow, ice, sleet or freezing rain from the accessible ramps so that pedestrian access is provided from block to (City of Champaign, n.d.).

9-3. Communication Initiatives and Social-Awareness Campaigns

Good communication initiatives and social-awareness campaigns can help spread the word as to why it is important for property owners to clear the snow from pedestrian facilities and sidewalks. Property owners should be reminded that most trips begin by walking. Clear and unobstructed sidewalks are important to ensuring the safety of pedestrians, who may be forced to walk in the street if facilities are covered with snow and ice. The elderly, persons with disabilities, children, and no-car households are impacted and risk injury on snowy/icy walkways. Successful public communication campaigns use electronic and print media, press

releases, public announcements, websites, and social networking to enhance community awareness of an issue, shape behavior, generate specific outcomes, and/or mobilize public action for policy change (Coffman, 2002).

9-3-1. Communication Practices in Canada

Vancouver, British Columbia – The City utilizes a user-friendly website with webpages on “snow and ice removal,” “snow-and-ice frequently asked questions,” and “do your part.” The latter section informs citizens of sidewalk-maintenance responsibilities and is supplemented by news releases and online public service announcements. The website urges residents to use public transportation and to participate in the Snow Angels citizen assistance program. The site provides an interactive map that shows snow removal routes with live views from cameras installed along the roadways. Finally, the website includes tips to effectively and safely remove snow from sidewalks and driveways (City of Vancouver, 2010).

Montreal, Quebec – The city’s website provides information on snow-removal operations, policies, and responsibilities. The website explains the city’s snow removal–management plan and response policies. It also features a budget for snow and ice operations, detailed maps of priority areas, and performance measures. Because the city is responsible for sidewalk snow removal, the website provides estimates as to when sidewalks and roadways will be cleared. Similar to Vancouver, the City also provides an interactive map with information about snow removal activities (City of Montreal, n.d.).

Ottawa, Ontario – Because the City clears most sidewalks for citizens, the municipal website includes a table that explains priorities for shoveling snow from streets and sidewalks. The city also maintains a citizens’ assistance hotline (311), similar to those that are maintained by some U.S. cities (City of Ottawa, n.d.).

9-3-2. Communication Practices in the United States

Chicago, Ill. – The City of Chicago’s webpage on “Sidewalk Snow Removal” provides a YouTube video that explains why a clear path through snow and ice is important for pedestrian safety—especially for people with disabilities, seniors, and children. An online link to the Municipal Code of Chicago provides information on requirements for property owners and occupants to keep sidewalks clear of snow and ice.

A online, downloadable brochure explains sidewalk snow removal responsibilities, timelines for clearing snow, width of clearance, how to report an uncleared sidewalk either online or via a 311 call, and guidance for effectively clearing snow from walkways as follows (City of Chicago, n.d.):

- Remove snow along ALL of the sidewalks adjacent to your property.
- Move snow to your yard or the parkway adjacent to your property.
- Do not push snow from the sidewalk into the street.
- Do not cover the crosswalks with snow.
- Do not block alley entrances with snow.
- Do not push snow from driveways onto sidewalks.

A “door hanger” program serves two purposes (Appendix D). First, it informs property owners and occupants about the importance of sidewalk snow removal for safe pedestrian travel and reminds them to clear their sidewalks. Second, it offers information of how individuals who are physically unable to shovel snow can receive assistance. Coordinated by the Chicago Department of Transportation (CDOT), the door hangers are mailed to aldermanic offices, businesses, and community groups for distribution throughout city neighborhoods (City of Chicago, n.d.).

To promote voluntary compliance and recognize exemplary sidewalk snow-removal efforts by businesses, CDOT and the Mayor's Pedestrian Advisory Council (MPAC) have instituted a “Winter Wonder” annual award. The public can nominate locations that do an outstanding job of removing sidewalk snow and ice by calling in a nomination or completing an online form. Businesses and organizations can promote their participation in this program by displaying the Winter Wonder Participation Poster (City of Chicago, n.d.).

Madison, Wis. – A “Winter” webpage is offered by the City of Madison to provide public sidewalk-clearing updates by the Building Inspection & Code Enforcement Director, information on sidewalk snow-removal regulations, and color-coded alert to declare a snow emergency (**YES** or **NO**). Social media (e.g., Facebook and Twitter), subscriptions to e-mail lists, and an AlertMadison text messaging informational notification help residents stay informed.

Philadelphia, Pa. – Snow- and ice-removal information is provided on the City of Philadelphia Street Department website. It summarizes owner, agent, and tenants responsibilities for clearing and de-icing at least a 36” path (*including the curb cuts*) of snow from sidewalks within six hours of the end of a snowfall (City of Philadelphia, n.d.). Residents are advised to call the Street Department Customers Affairs Unit to report a sidewalk or curb cut that has not been cleared.

The City of Philadelphia’s website has a printable brochure that outlines its SnowCat program, a snow- and ice-management program that outlines the city’s response to adverse weather conditions and provides a standardized approach to snow removal based on storm category or severity. Using multiple forms of media to communicate to the public, the City will announce the “SnowCat” level. Citizens will use the SnowCat brochure to understand the city’s level or response and their role in assisting snow-removal operations.

For example, the most basic level—SnowCat1—involves the city salting primary and secondary routes, as well as residential streets in areas that have high elevation and steeply sloped streets. In addition to city response information the brochures include ways that residents can help out. For SnowCat1, citizens are advised to salt sidewalks, clear a sidewalk path at least 36 inches wide within six hours of inclement weather, and use public transportation. These recommendations are designed to increase public safety during snow emergencies (City of Philadelphia, n.d.).

Other examples of municipal snow-removal brochures and print media from the cities of Boulder, Colo., Champaign, Ill., and Omaha, Neb., are included in Appendix E.

9-4. Citizen-Assistance Programs

If a municipality lacks resources to assist individuals who are physically incapable of shoveling snow, programs should be developed in collaboration with civic associations, faith-based groups, homeowner associations, and service organizations.

9-4-1. Citizen-Assistance Programs in Canada

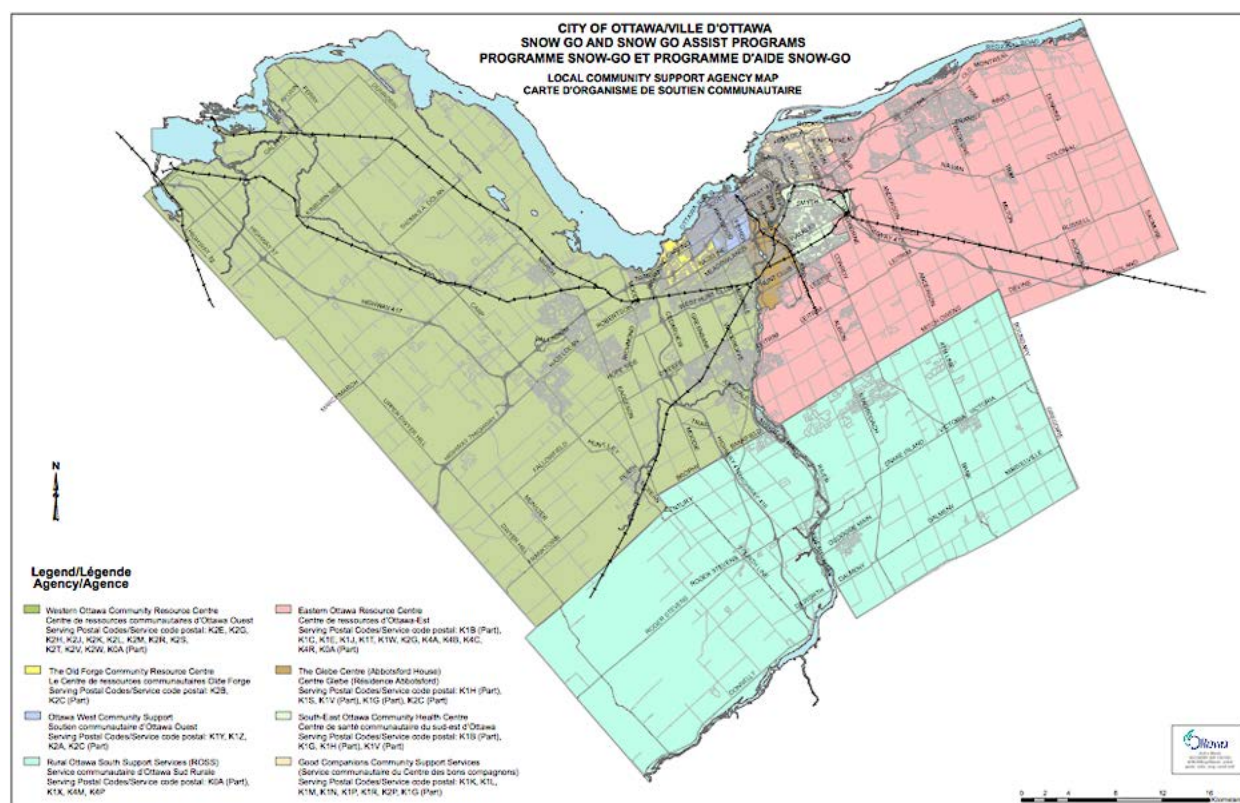
Property owners with disabilities, or older residents, may be physically incapable of removing snow and ice from sidewalks in a timely manner or to appropriate accessibility standards. Local governments should encourage citizens to be good neighbors and assist others that may be physically challenged and unable to carry out an ordinance that requires snow and ice to be removed by an adjacent property owner. Many cities in Canada recognize the importance of citizen-assistance programs that make use of volunteers, target those deemed eligible to receive snow-removal services, and ensure that pedestrian facilities are cleared of ice and snow in a timely manner.

City of Toronto – Toronto encourages citizens to be “good neighbors” and voluntarily provide assistance to nearby senior citizens and persons with disabilities. Seniors and persons with disabilities who live in the core area of the city and cannot obtain volunteer assistance may apply to receive snow-shoveling services from the City’s citizen assistance program. If an individual meets eligibility requirements the following services will be provided (City of Toronto, 2011):

- Sidewalks will be cleared when the snow has stopped and the accumulation has reached eight centimeters (three inches) in November, December, and March and five centimeters (two inches) in January and February.
- The service does not include the clearing of snow from driveways or private sidewalks leading to a residence.
- This service can take up to 72 hours after the snow has stopped.
- Corner sidewalk areas will not necessarily be cleared at the same time as the front sidewalks because it is sometimes performed by a different piece of equipment.

- If a sidewalk has not been cleared after 72 hours after the end of a snowfall, residents are encouraged to please call and be placed on a “missed list”

City of Ottawa – Ottawa’s “Snow Go” Program matches up seniors and persons with disabilities with volunteers or contractors that will assist them with snow removal. Through the Snow Go assistance program low-income seniors and disabled persons can apply for financial assistance to hire a contractor. The city has developed the below “Local Community Support Agency Map,” which color-codes areas that have community support services available from eight agencies (City of Ottawa, 2011).



Source: City of Ottawa, Ontario, Canada

(<http://ottawa.ca/cs/groups/content/@webottawa/documents/pdf/mdaw/mdy2/~edisp/con063519.pdf>)

Snow Angel Programs – Among cities in Canada with Snow Angel programs are Windsor, Calgary, Edmonton, Hamilton, and Guelph/Wellington. Windsor’s Snow Angels program matches volunteers with persons with disabilities and seniors who may need assistance (City of Windsor, n.d.). While the City of Calgary’s Snow Angels program does not match eligible citizens with volunteers, it encourages citizens to assist their neighbors (City of Calgary, 2010).

In Edmonton, citizens who participate in the Snow Angels program can receive a letter and pin of recognition from the city’s mayor (City of Edmonton, 2011). In Hamilton, over 50 volunteers assisted 74 citizens in the first year of their Snow Angels program. Volunteering to help out elderly and disabled citizens, Snow Angels in Hamilton must be at least 14 years old and be

screened to ensure that volunteers can carry out a commitment to shovel snow. A unique aspect of this program is that local businesses sponsor the program so that volunteers may receive benefits and discounts for their services (City of Hamilton, 2011).

The Volunteer Centre of Guelph/Wellington's Snow Angels program has established eligibility requirements. Youth volunteers over 14 years of age can receive community service–project credits for their service. To be eligible for assistance, beneficiaries must (Volunteer Centre of Guelph/Wellington, 2007):

- Reside in a home with a private driveway.
- Be unable to remove their own snow and cannot afford to pay for snow removal.
- Have no abled-bodied person living in the household to shovel snow.



*Source: Volunteer Centre of Guelph–Wellington, Ontario, Canada
(www.volunteerguelphwellington.on.ca/useredit/image/Snow%20Angels_logo_LOW%20RES.png)*

9-4-2. Citizen-Assistance Programs in the United States

Fargo, N.Dak. – The citizen-assistance program applies to those residents who are low-income, elderly, and/or disabled. Citizens must meet the following eligibility requirements (City of Fargo, n.d.):

- Annual household income at or below 50 percent of area median income
- Age 65 or older and/or disabled (as defined by eligibility for Paratransit services).
- Unable to remove snow themselves
- Not living with, or have another individual available who is physically able to shovel

In addition to meeting the above eligibility requirements, an applicant must also (City of Fargo, n.d.):

- Sign and complete a Snow Removal Application (Appendix F).
- Sign and complete an Income Determination Worksheet.
- Provide a statement of last year's Social Security benefits.
- Provide a statement of last year's pension benefits.
- Provide a statement of last year's interest income.

The city will verify eligibility of program applicants and will provide contractors with a list of pre-qualified households.

Aurora, Colo. – The City of Aurora’s innovative Snow Busters program enlists volunteers to assist Aurora’s elderly and people with disabilities with snow shoveling. To be eligible to receive free assistance, the individual must (City of Aurora, 2011):

- Be a resident of Aurora.
- Be over 60 years of age or a person with disabilities.
- Have limited financial resources (maximum income of \$21,000 for a 1-person household and \$27,000 for a 2-person household).
- Be unable to shovel his or her sidewalk.

Snow Buster volunteers are:

- Matched with a resident who lives within two miles of the volunteer.
- Shovel the sidewalk of the resident within 24 hours of a snowfall of two inches or more.
- Assist the resident for one snow season beginning in the fall and ending in the spring.
- Complete an application online and agree to a criminal background check and parental consent if under 18 years of age.



*Source: City of Aurora, Colorado
(www.auroragov.org/LivingHere/GivingBack/SnowBusters/index.htm)*

Manhattan, Kan. – This program urges citizens to volunteer to help those who are physically unable to fulfill an ordinance requirement obligation to clear snow from abutting sidewalks. Manhattan runs the program jointly with Kansas State University—enlisting volunteer help from students to shovel sidewalks of neighbors in need (City of Manhattan, 2011).

Milwaukee, Wis. – This program is targeted to provide for the removal of snow from the sidewalks abutting the property of elderly and disabled residents. Residents must apply with the sanitation office to receive snow-removal services and must meet the guidelines established by the city (City of Milwaukee, n.d.).

10. SNOW-REMOVAL INNOVATIONS



In addition to the issues outlined in this report, there are several innovations being made in the realm of snow-removal equipment and treatment materials. A few of the innovative techniques are highlighted below.

10-1. Coordinated Response by Universities

Universities in northern and Snow Belt regions utilize a coordinated response to ensure the mobility of both pedestrians and automobiles. Pedestrian mobility is a priority to ensure that students, employees, visitors, and service vendors can access facilities, conference centers, labs, classes, dining halls, dormitories, parking lots, adjacent neighborhoods, and campus services during winter-weather events.

10-1-1. Purdue University (West Lafayette, Ind.)

With 54,000 students, Purdue University's snow-removal mission encompasses not only primary and secondary roadways, but *all* parking lots, sidewalks, pathways, and building entranceways. These additional responsibilities require a comprehensive planning effort. The University's Grounds Department uses Unified Command principles of the National Incident Management System (NIMS) to conduct snow removal operations. Purdue's snow-removal plan includes (Purdue University, 2008-09):

Pre-treatment – For an anticipated snow or ice event, the Grounds Department uses a brine-solution roadway-pre-treatment system to minimize accumulation. Beet juice is combined with the brine solution to extend the life (up to one week on pavement) and enhance the effectiveness of the preventative solution.

Light-snow response – Trucks and grounds crews that ensure ADA compliance respond to any light snow. The sidewalk brooms and parking-garage trucks are deployed from ¼ inch accumulation and up, and the parking lot plows at 2+ inches.

Large-storm event – An on-call crew chief will determine the appropriate response level. The order of response is as follows:

- Personnel will first be deployed to plow, salt, and sand all campus, some streets, and

some state highways.

- Next, hand-shoveling crews are deployed to respond to ADA needs with two Bobcat skid-steer loaders and hand shovels. All disabled-access and reserved parking, sidewalk curb cuts, building entrances, and steps are cleared and spread with an ice-melt compound.
- At the same time, two parking-garage vehicles are deployed using four-wheel-drive pickups with snow blades and sanders.
- Sidewalk brooms are then deployed simultaneously at eight separate sections on campus. The broom priorities concentrate on major walks and high-traffic areas. Nylon brooms are used to minimize damage to clear-colored and stamped-concrete surfaces.
- Tractor- and truck-mounted snowplows and loaders are next to be deployed to clear campus parking lots and assist with widening streets and detail intersections.
- Finally, an abrasives crew combines with the brooms, blades, hand crews to spread abrasives and ice melting compound.

10-1-2. Syracuse University (Syracuse, N.Y.)

With an enrollment of over 20,000 students, Syracuse University worked in collaboration with the University Neighborhood Partnership Committee (UNP) and hired a local contractor to create a new sidewalk snow-removal pilot program beginning in winter 2010. Called the “University Neighborhood Consolidated Sidewalk Snow Removal Program,” the program initially targeted five miles of sidewalk snow removal in a neighborhood east of campus, with plans to expand to other areas and possibly city wide if successful. The goal of the program is “to provide continuous snow removal on sidewalks—with highest quality service at lowest possible cost—to students, faculty, staff and community members living in the area who reside on critical pedestrian traffic routes” (*cnylink.com*, 2010). The impetus for the program was safety of pedestrians who are forced to walk on streets during rush hour as they walk between the campus, local businesses, and residential areas.

The sidewalk snow-removal program entails the plowing of eight streets within the pilot program area once in a 24-hour period when snow accumulation reaches three inches or more. Private property owners agree to pay a local contractor a lump sum per property to plow sidewalks between the hours of 2 a.m. and 8 a.m. Snow events that occur after this time are cleared the following day to avoid plowing during times of high-pedestrian traffic. The contract price also includes moving snow banks back with a snow blower twice per season, if large amounts of snow accumulate without a thaw. With 100 percent participation, estimated costs are \$45 per property for the season and could possibly be lowered as the pilot program expands (*Cnylink.com*)

10-1-3. State University of New York at Albany (Albany, N.Y.)

The State University of New York at Albany (17,500 enrollment) has adopted a Snow Response Guide to ensure that all university streets, parking lots, sidewalks, stairwells, and podium areas are safe for pedestrians and accessible for vehicles. The university's snow- and ice-removal plan is activated based on weather forecasts for minor, moderate, and major snow events that will trigger special snow- and ice-removal procedures as categorized in the below table (SUNY at Albany, 2011).

	MINOR	MODERATE	MAJOR
Snow level	< 3" snow expected	3" – 10" snow expected	> 10" snow expected
Ice level	None or minor	Sleet and freezing rain	Major ice storm
Alternate parking for Snow Emergency?	No.	Potentially.	Very likely.
Actions to streets and roadways	<ul style="list-style-type: none"> • Apply salt mixture when safety hazards are anticipated • Salting done from outset of hazardous conditions until point where snow plowing inevitable 	<ul style="list-style-type: none"> • All Physical Plant staff may be assigned to 24/7 coverage • Snow clearing may be directed as described in section C below • Special parking rules may be likely 	<ul style="list-style-type: none"> • All Physical Plant staff may be assigned to 24/7 coverage • Snow clearing will be directed as described in section C below • Special parking rules are highly likely
Actions to sidewalks	<ul style="list-style-type: none"> • De-icer mixture when safety hazards are anticipated • Sidewalk plowing and sweeping begins when >1" accumulates 	<ul style="list-style-type: none"> • All Physical Plant staff may be assigned to 24/7 coverage • Snow clearing may be directed as described in section C below 	<ul style="list-style-type: none"> • All Physical Plant staff may be assigned to 24/7 coverage • Snow clearing will be directed as described in section C below

Source: SUNY at Albany Snow Response Guide,
www.albany.edu/facilities/documents/snow_emergency_procedures.pdf

10-2. Environmentally Friendly Practices

10-2-1. Toronto, Ontario

Toronto performs snow removal at a scale that many cities could not imagine. With 9,000 lane miles of roads, 4,500 miles of sidewalks, and an average of 52 inches of snow each year, the city uses approximately 143,000 tons of salt each winter season. The city spends about \$50 million annually on snow operations, with a fleet comprising 200 salt trucks, 900 road and sidewalk plows, and 1,600 employees. In order to ensure mobility within North America's fourth largest city, Toronto employs a number of innovative and environmentally friendly practices. After snowplows pass by and at least three inches of snow accumulates, the city mechanically plows sidewalks, bus stops, and corner radii using skid-steer (Guthrie, 2006).

Salt-Management Plan

Toronto recognizes that snow and ice can negatively impact public safety, roadway capacity,

travel time and economic costs. The City has traditionally incorporated salt in its snow-removal strategies to maintain safe roads and sidewalks during the winter.

In 2001 Environment Canada, a department responsible for coordinating environmental policies and programs within the Canadian government, released an assessment report regarding environmental risks of road salt use. While the report recommended that salt be designated toxic under the Canadian Environment Protection Act, the government never took action to regulate the use of road salt. A multi-stakeholder working group was formed by Environment Canada, which released an April 2004 *“Code of Practice for the Environmental Management of Road Salts”* (City of Toronto, 2004).

In response to both Environment Canada’s assessment and growing environmental concerns regarding road salt, the City of Toronto’s Transportation Services adopted a Salt Management Plan in 2002. While road salt (sodium chloride) is still the most cost-effective de-icer, the City is exploring use of alternatives. In addition, the “Salt Management Plan strives to minimize the amount of salt entering the environment by including best salt-handling practices and using new technologies to ensure its most effective use over the road system (City of Toronto, 2004, p. 3).

Winter-Maintenance Depots

Toronto uses private contractors to help deliver winter-maintenance services in an efficient, cost-effective, and environmentally safe manner. Winter Maintenance Depots (WMDs) in the city are winter maintenance yards staffed entirely by contracted personnel. Operators and support staff live in the Depots 24/7 from the beginning of the winter season to the end. WMD responsibilities include salting, plowing, driveway windrow clearing, bus-stop clearing and other snow-removal services. Since the WMDs are always staffed, they are ready to act no matter when a snow emergency may arise (Guthrie, 2006).

10-2-2. University of Minnesota, Twin Cities

University of Minnesota, Twin Cities, has recalibrated its equipment to dispense smaller amounts of salt, which preserves the supply and is better for the environment. They have conducted research to determine amounts that are appropriate to keep the sidewalks safe while reducing the amount applied as much as possible. First, the University uses proactive anti-icing techniques prior to a snowfall to provide a quicker response time and overall less use of materials. They have also greatly reduced the amount of materials used on campus sidewalks and roadways and have begun using liquid magnesium chloride as an anti-icing agent on sidewalks. In addition to this more responsible use of salt, the university has committed to using more mechanical snow removal in order to further reduce salt and other chemical use. These changes led to a decrease in

total material usage from 912 tons in 2005 to 295 tons in 2006. This change not only saves money, it is also good for the environment (Schaefer, 2007).

10-3. Equipment Technologies



In Snow Belt areas, where sidewalk snow removal is part of winter-maintenance operations, a combination of snow blowers, plows, and salters may be used. The cost of a small, single-stage “push” snow blower may begin at \$500, while a municipal-grade power unit that clears through deep snow can cost around \$100,000 (*goplow.com*, n.d.). Snow blowers are the least costly, cause little damage, but cannot clear heavy snowfalls. Trackless machines, which can have plow or brush attachments are versatile for year-round pedestrian-facility maintenance. However, trackless machines will have a short, 10-year lifespan due to more frequent use throughout the year. Commercial-grade sidewalk plows are the most costly (approximately \$75,000), have a 15- to 20-year lifespan, can clear heavy snow accumulations, but may cause damage to sidewalks (*WalkBoston.com*, n.d.). V-Plows are specifically designed for sidewalk snow removal. V-Plows have universal couplers that can be attached to both skid-steers and tractors, which are generally already in use by most municipalities. The following chart (pp. 71-74) illustrates available, state-of-the-art equipment being used for sidewalk snow removal.

10-3-1. Montreal, Quebec



In Montreal snow-removal brigades are deployed to mechanically remove snow and ice from high-traffic and tricky pedestrian areas. A team of workers are deployed before dawn to take care of these areas so that pedestrians will remain safe. Commercial areas and the downtown core are given priority (“Montreal to deploy...,” 2010).

10-3-2. Fairbanks, Alaska




The City of Fairbanks recently switched from using small skid-steer loaders for sidewalk snow removal to a Holder C242 Multi-park vehicle. The 42-inch-wide, articulated machine is perfectly suited for plowing narrow sidewalks. It pivots in the middle and has a sharp turning radius on sidewalk corners. The \$95,000 machine can be fitted for three attachments—a blade, snow blower, or broom—to clear snow under varying conditions. A back-mounted utility box holds tools or can be mounted with a water tank to clean sidewalks in warm weather.

EQUIPMENT	PROS	CONS
SHOVELS/SNOW PUSHER Price: \$15-\$100 	<ul style="list-style-type: none"> • Lightweight, flexible, and gets into tight spaces • Easy to detail in areas with nooks and crannies such as around light bollards, ramps, curbs and steps • Comes in varying widths • Low impact and is not likely to cause property damage • Plastic or polycarbonate blades glide easily over pavement cracks • Can be used any time 	<ul style="list-style-type: none"> • Requires muscle/hand labor • Less effective on heavy/wet snow, particularly over 6-in. • Less sturdy models will break under commercial use • Straight handles are less efficient than "D" handles • Metal or aluminum may bend or round at the corners decreasing effectiveness
<p>Hand labor production rates will vary dramatically based on the detail of the service area. Production rate will decrease significantly with increased snowfall. Snow pushers clear snow faster than shovels but do not lift or place heavy snow and slush as well as shovels.</p>		
BLOWER: SINGLE STAGE (Prosumer lines) Price: \$500-\$900 	<ul style="list-style-type: none"> • Lightweight, portable and easily maneuverable • Good substitute for shovel/pusher on long sidewalks. Doesn't wear out operator like a shovel • Better on narrow walks where one pass down and back will clear the full width (typical width about 21-in.) 	<ul style="list-style-type: none"> • Less effective on wet snow • Limited throw distance • Throws snow and may risk property damage • 2-cycle gas odor • Limited ability to move compacted snow & ice • Can't use around pedestrians or traffic
<p>Good for long walk/runs on lighter snowfalls as an alternative to shoveling. The larger/wider the area, the single-stage blower will lack throwing distance, particularly on snow with more moisture.</p>		



more on next page

EQUIPMENT	PROS	CONS
BLOWER: TWO STAGE Price: \$600-\$3,000 	<ul style="list-style-type: none"> • Can throw snow out of area • Traction to power through deep snow • Can cut into chunky ice/snow pack • Multiple speed settings • Sizes ranging from 20-in. to larger than 40-in. • Manufactured for durability 	<ul style="list-style-type: none"> • Less portable, heavy • Requires ramps for loading off trucks or trailer • Power and throw distance increases risk of property or personal injury • Can't use around pedestrians or traffic
<p>Production rate will not drop off with heavier snowfalls. It can clear 6 to 8 in. almost as efficiently as 2-in. Production rate will vary by width and horsepower.</p>		
ATV Price: \$5,500-\$10,000+ 	<ul style="list-style-type: none"> • Better for long straight runs • Lower cost relative to high production rate • Good ground speed to go from site to site • Lightweight, easy to transport • Can be used around pedestrians with caution 	<ul style="list-style-type: none"> • Lacks maneuverability in tight areas • Minimal attachment options • Light operating capacity • No enclosed cab/heat • Limited ability to windrow snow over 12-in. to 18-in. • "Hot rodding" can lead to injury
<p>Production is well suited in areas where limited turning and angling of blade is necessary. Bigger is not necessarily better. Smaller units (under 500 cc) have the power to clear snow. Blades/attachments are manufactured by third parties. Use a urethane cutting edge to reduce damage to pavement and likelihood of tripping the blade.</p>		

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EQUIPMENT	PROS	CONS
UTV Price: \$10,000-\$30,000 	<ul style="list-style-type: none"> • Enclosed cab/heat options • Seats two with good visibility • Bed for salt spreader or tools • Can handle 6-ft. blades and multi-positional V blades • Can drive moderate distances from site to site • More maneuverable than Jeep or small truck 	<ul style="list-style-type: none"> • Not street legal • Powered attachments may require separate power units • Lighter-weight plows may not be suitable for commercial use • Power steering and 4WD necessary • Needs better suspension packages to carry loads
<p>Well-suited for larger, more open sites. Electric over hydraulic plows can be used on properly sized stout units, allowing UTVs to operate like Jeeps but in smaller areas requiring greater maneuverability.</p>		
SKID STEER Price: \$22,000-\$50,000 	<ul style="list-style-type: none"> • Zero turn, highly maneuverable • Multiple attachment options • Smaller sizes available for narrower sidewalks • Can scale up from walks to parking lots depending on attachments • Stacking and loading capabilities 	<ul style="list-style-type: none"> • Weight, limited by site restrictions • Cost • Reduced visibility • Operator comfort. Difficult to work out of for extended periods
<p>Great maneuverability for getting into small areas is offset by reduced visibility and potential to cause damage in tight areas. Wide range of attachments make skid steers very versatile.</p>		
TOOL CAT Price: \$45,000-\$60,000 	<ul style="list-style-type: none"> • Multiple attachment options compatible with skid steers • 3-point hitch option • Maneuverable with switchable 4-wheel steering • Driveable from site to site • Seats two with good visibility • Good lifting for stacking • Bed for spreader/materials/tools • Intuitive for new operators with some equipment experience 	<ul style="list-style-type: none"> • Weight (use may be limited by site restrictions) • More specific to certain size/type of sites • Cost can be limiting without a second-season application
<p>In many cases has the ability to outperform a truck. It is fast enough to drive from site to site, with very good maneuverability and versatility to perform many tasks.</p>		

more on next page

EQUIPMENT	PROS	CONS
TRACTOR SERIES Price: \$3,000-\$30,000 	<ul style="list-style-type: none"> • Options range from lower-end consumer to higher-end prosumer series with multiple attachments • Comfortable to operate • Good visibility • Cab enclosures with heat available on certain units • Prosumer grade better equipped to handle travel between sites • Lightweight 	<ul style="list-style-type: none"> • Limited cab enclosures on lower-end units • Consumer units limited to site work or must be transported • Weight kits necessary to improve performance • Can't stack without loader arms • Single seat
<p>Probably best visibility for small equipment. Small units are efficient on midsized sites (10,000 sq.ft. +) where continuous service is needed during heavy events. Size up for larger sites where higher production is needed.</p>		
POWER UNITS Price: \$20,000-\$100,000+ 	<ul style="list-style-type: none"> • Articulating design makes for good maneuverability • Heated cab enclosure • Multiple attachment options • Municipal versions have 120+ hp units available for heavy snow and high-production regions 	<ul style="list-style-type: none"> • Smaller units must be transported from site to site • Larger municipal units have high entry price points • Need a winter/snow tire for best operation and weight kits for proper balance • More advanced operator training required
<p>For smaller-sized power units production rates will be higher when performing more detailed work when compared to an ATV or consumer series tractor. Versatility and maneuverability make this a good detailing machine. Municipal-grade units can provide tremendous capacity to cut through deep snow and travel for miles but come at a significant investment. An array of attachments will allow equipment to be used in varying conditions without a significant reduction in production.</p>		

Source: <http://goplow.com/operations/sidewalk-equipment.html>

10-4. Smart-Pavement Technology

Engineers across the nation are developing high-tech pavement surfaces to melt snow and ice and possibly convert excess energy into electricity. An inventor from Idaho has received funding from the federal government and attracted attention from General Electric to further develop his idea for a solar-powered roadway made from super-strong glass, instead of asphalt or concrete. Installing solar road panels comprising glass layers, solar power cells, heating elements, and LED road markers would allow the surface to act as a solar-power generator. The embedded heating elements would render snowplows and other snow-removal equipment nearly obsolete. In fact, it is believed that widespread adoption of solar roadways could eventually generate clean electricity globally (Patterson, 2011).

Worcester Polytechnic Institute (WPI) in Massachusetts has been awarded grants from the National Science Foundation and the Massachusetts Technology Collaborative, to tap into the energy potential of asphalt. Civil engineering researchers are working to develop stronger, heat-absorbing pavements that are energy-efficient and temperature-regulated. WPI's idea is to implant pavement with pipes filled with a freeze-resistant fluid. In cold weather, hot fluid is sent through the pipes to melt ice and snow. In warmer weather, sun-heated fluid is stored in an insulated chamber, where it stays hot. During the summer, the system could save electricity by transferring heat from the asphalt to water tanks in adjacent buildings (Patterson, 2011).

Financial and political barriers are the greatest obstacles to advancing smart-pavement technology. While the Federal Highway Administration supports smart-road research, state and federal budgets are stretched to the limit and would have difficulty justifying the initial high-cost of installing anti-snow, smart-pavement technology. It is hoped that smart-pavement technology could be piloted in downtown areas of snow-prone cities or congested urban areas to test its cost effectiveness. Another thought is to tap into the energy-generating potential of smart-pavement areas. For example, energy from solar-powered, interactive, temperature-controlled parking spaces could be sold to electric-vehicle owners. A federally backed program at the University of Nebraska at Lincoln is researching the energy potential of hybrid solar- and wind-based generators. If positioned along roadsides, these generators can power highway infrastructure—including melting of snow and ice—and generate excess electricity could be sold to power adjacent communities (Patterson, 2011).

11. PROJECT WORKSHOP

11-1. Stakeholders

A critical aspect of this project was forming a stakeholder group to solicit input. Stakeholders representing Delaware local governments, municipal public works departments, DelDOT, DART First State Transit, municipal planning organizations (MPOs), Delaware T² Center, Main Street organizations, and the Delaware Economic Development Officer were invited to a workshop hosted on April 6, 2011, at the University of Delaware Perkins Student Center.

April 6, 2011, Workshop Participants			
Name	Organization	Name	Organization
Alfonso Ballard	City of Wilmington	Richard Lapointe	City of Newark, Public Works
Roger Bowman	University of Delaware	Kathleen Layton	Dover/Kent County MPO
Marco Boyce	DelDOT, Planning Division	Rusty Lee	Delaware T ² Center
Matheu Carter	Delaware T ² Center	John McGonegal	
Sarah Coakley	DelDOT, Safe Routes to School	Charles McMullen	Town of Ocean View
Vincent Damiani	DART First State	Chris Natrin	New Castle County
Heather Dunigan	WILMAPCO	Ralph Reeb	DelDOT, Planning Division
Charlie Emerson	City of Newark, Parks and Recreation	John Sisson	DART First State
John (JR) Ennis	Delaware Economic Development Office	Kyle Sonnenberg	City of Newark
John Giles	Town of Elsmere	Brian Urbanek	DelDOT, Maintenance and Operations Division
Robert Harvey	Town of Newport	Brett Warner	Town of Bethany Beach
Bonnie Hitch	DART First State	Joseph Wright	DelDOT, Maintenance and Operations Division
Scott Koenig	City of Dover and the Dover/Kent County MPO Technical Advisory Committee	Martin Wollaston	University of Delaware IPA

The workshop solicited input from stakeholders on how to:

- Clarify and better coordinate responsibilities for sidewalk snow removal among local governments, schools and other public institutions, and private-property owners—both commercial and residential.

- Improve the timely removal of sidewalk snow by better communicating requirements and procedures to responsible parties and property owners, enforcing regulations, and assisting property owners that may be disabled or elderly.
- Discuss how best practices for sidewalk snow removal, particularly in Snow Belt regions, may be applied in Delaware.

The agenda for the workshop is provided in Appendix G. The PowerPoint presentation, “Sidewalk Snow Removal: Issues and Best Practices,” is included in Appendix H. The table on the previous page provides a list of workshop attendees and the organization each represents (also Appendix I).

11-2. Presentation

IPA Policy Scientist Ed O’Donnell introduced the project team that includes Associate Policy Scientist Marcia Scott, IPA Graduate Research Assistant Brandon Rudd, and Public Administration Fellow Hilary Primack. The workshop participants introduced themselves and stated the agency/organization that each represent.

The IPA research team presented “Research of Management Plans for Sidewalk Snow Removal.” The presentation provided an overview of the project, reasons to maintain sidewalks, and study methodology. The presentation highlighted outcomes of the research of management plans for sidewalk snow removal (particularly in Snow Belt regions of the United States and Canada), analysis of Delaware local government sidewalk snow-removal policies, and field observation before, during, and after major snow events in January 2011.

11-2-1. Response to Question: “What did we miss in the presentation?”

- **Needs of bicyclists** – If snow is plowed further back from a street to open up a bike lane, then this can have a negative effect on the clearing of sidewalks.
- **Offsite snow storage areas** – Instead of depositing plowed snow from streets onto the corner of sidewalks, excess snow can be removed and stored offsite in vacant parking lots and/or fields within city parks.
- **Maintenance of cleared sidewalks** – While property owners may clear snow within the required time period, it is difficult to address the issue of the snow melting and then refreezing on previously cleared sidewalks. Residents should be informed about the need to maintain shoveled sidewalks with de-icers that will not damage sidewalks.
- **Problems clearing snow from vacant residential properties** – Several Delaware communities have seasonal residents or renters where properties are left vacant for long periods of time (e.g., beach communities and college towns during holidays/winter break). How can local governments better communicate sidewalk snow-removal requirements to owners of vacant properties?

- One jurisdiction requires property owners to be responsible for all property maintenance, including sidewalk snow removal. A lease, which may require the tenant to clear snow from sidewalks, does not absolve the property owner from that responsibility.
- **Vacant commercial properties** – Uncleared sidewalk snow in front of vacant commercial properties can discourage patrons from shopping in central business districts. Can towns with Main Street organizations or downtown partnerships join together to address sidewalk snow removal for vacant businesses? One Delaware town utilizes volunteers, who are assigned to a particular business property, to address this issue.
- **Americans with Disabilities Act (ADA) requirements** – To what extent are local governments liable for not enforcing local ordinances that require property owners to clear snow from sidewalks? Is there any case law that cites an example of where a local government was sued for a property owner's lack of compliance to a local sidewalk snow removal ordinance?
 - New Public Right of Way Accessibility Guidelines (PROWAG) may increase accessible sidewalk width standards from 36 to 48 inches.
 - The Federal Highway Administration (FHWA) notice on the use of draft PROWAG may be found at www.fhwa.dot.gov/environment/bikeped/prwaa.htm.
- **Subdivision design standards** – It was suggested that subdivision regulations provide design guidelines to install sidewalks a 4- to 6-foot distance from the street, to allow for snow storage in the grassy area between the sidewalk and street.
- **Identification of public vs. private walkways** – Often, it is difficult to determine the responsible property owner for adjacent sidewalks. Local government staff may have to monitor problem areas to determine if this is why a section of sidewalk is not being shoveled.
- **Need for review of sidewalk snow-removal regulations** – Local governments need to review sidewalk snow-removal regulations (either within charter provisions and/or local government ordinances) to make sure penalties are both reasonable and realistic. Communication of regulations is essential; homeowners' associations (HOAs) can help communicate requirements to residents.
- **Budgetary issues are a concern** – The gap between the annual budgeted amount for snow removal and actual costs is significant in most Delaware local governments, particularly during recent years with record-breaking snowfall.

11-2-2. Research Questions Asked of Working Group—How can local governments:***Develop and communicate snow removal–emergency plans that include sidewalks?***

- A local government can address sidewalk snow removal within its Public Services Operations Plan or Emergency Operations Plan. These plans establish basic procedures to maintain operations within a town or city during severe weather conditions and other declared emergencies.
- Not all Delaware local governments clearly communicate resident responsibilities for sidewalk snow removal.
- Local governments in Snow Belt regions use creative methods, including use of social media, to conduct public outreach. Good communication plans can help set the level of expectations by residents, clarify the extent of local government responsibilities vs. property owner responsibilities, and indicate priorities based on storm severity.
- Delaware local governments need to work on having searchable town websites, so residents can more easily find information regarding sidewalk snow-removal regulations.
- While some Snow Belt municipalities provide social media (Facebook/Twitter) updates on snow plowing progress, the group cautioned against this practice as it takes away from emergency operations and requires administrative staffing during a snow emergency.

Identify priority sidewalk snow–removal areas?

- It was noted that many universities have developed snow emergency–response plans to ensure that campuses are safe for pedestrians and accessible for vehicles during and after each winter storm.
- The University of Delaware’s Grounds Services unit has established priorities for its 25 miles of sidewalk snow removal—sidewalks abutting public roads, connecting residence halls, leading to the health services building, adjoining handicapped accessible ramps, and leading to buildings where classes are held and employees work. UD will clear curb ramps, crosswalks, areas leading up to the central business, or other areas frequently traveled by students, staff, and/or visitors—even if UD is not officially responsible for clearing those pedestrian areas.
- The City of Newark’s Parks and Recreation Department is responsible for clearing 10 miles of city-owned sidewalks. High-pedestrian-traffic areas are cleared first. The City’s Public Works Department is responsible for plowing city-maintained streets.
- DART First State has over 3,000 bus stops. Prioritization for clearing snow from bus stops is determined by data on bus route ridership and populations with mobility issues.
- WILMAPCO has data on pedestrian-priority areas, which may be helpful to jurisdictions in New Castle County that wish to determine priority areas for clearing sidewalk snow.

The use of geographic information systems (GIS) data can also provide a basis for pedestrian infrastructure improvements.

- While it was agreed that sidewalk snow-removal plans should remain flexible, there was also a cautionary note that when a plan becomes formalized as a policy or practice, there is pressure not to deviate from that plan.
- From a tort liability point of view—if there is a lack of connectivity in clearing a pedestrian walkway or sidewalk, and it prevents a person with disabilities from having equal access to facilities, it becomes an ADA issue. Shoveling snow from curb ramps needs to be addressed.
- To address ADA compliance, some jurisdictions have established pedestrian-system master plans that address sidewalk priorities based on primary, secondary, and tertiary use. The priority levels can be applied to sidewalk snow removal and can address areas of critical use by pedestrians, persons with disabilities, transit users, and children who walk to school.

Clarify maintenance responsibilities? (e.g., curb ramps, crosswalks, vacant properties, etc.)

- The issue of turning radii and clearing of curb ramps is a huge problem for many local governments. Municipal public works departments need to be educated about problems associated with depositing plowed snow onto curb ramps.
- UD's Ground Services unit has assumed responsibility for several "high-traffic" pedestrian areas that are not officially under their purview. The unit hires a labor crew (20 laborers, or four crews of five) to hand shovel:
 - Steps connected to areas on campus
 - Crosswalks and curb ramp areas
 - Traffic-calming areas in the central business district (western end of Main Street)
 - Pedestrian-refuge islands (in the middle of a roadway) within a major crosswalk
- Some of the sidewalk areas that frequently are not cleared in a timely manner are those that are adjacent to government property. Federal, state, and local governments should set an example to property owners who are responsible for clearing snow from abutting sidewalks.
- Again, a good communications plan was suggested to clarify sidewalk snow-removal responsibilities. Some municipalities ask their residents to clear fire hydrants that abut their property. Residential and commercial property owners could also be asked to voluntarily clear snow from curb ramps and ramps leading to crosswalk areas.

Establish reasonable compliance timelines?

- Participants debated whether there should be a strict time period for ordinance compliance or whether a graduated response should be developed based on the severity of a snowfall.
 - One jurisdiction suggested providing regular public service announcements (PSAs) rather than impose graduated response requirements—which can be difficult to communicate and even more difficult to enforce.
 - Another jurisdiction stated that local ordinances may not be enforced until the municipality has cleared municipal sidewalk infrastructure for which *it* is responsible.
 - Participants acknowledged that requiring snow to be cleared from sidewalks by a specific time the following day (e.g., noon) is both clear and unambiguous.

Better enforce local ordinances?

Delaware local governments discussed enforcement strategies as follows:

- Using complaint-based enforcement
- Clearing sidewalks of non-compliant properties, then placing a lien against the property
- Invoicing non-compliant properties for time/materials of clearing snow (or not less than \$100)
- Monitoring sidewalk snow removal on “problem properties,” which have a history of property-maintenance violations
- Issuing instant tickets (i.e., door knocker with \$100 ticket) in order to avoid going through local court system, which would help the violator avoid a misdemeanor. Assessing a non-compliant property owner can be effective and can be appealed before a Board of Adjustment. Property maintenance violations can be difficult to enforce in jurisdictions that don’t have Alderman’s Courts.
- For rental properties—requiring that the property owner (rather than tenant) be responsible for property maintenance and sidewalk snow removal.
 - Send photograph of violation to property owner
 - Need a reason to send summons

Assist property owners with special needs?

- One jurisdiction attempted to establish a volunteer program to assist property owners with special needs, but there was no volunteer interest.
- While many contractors will offer driveway-shoveling services, few offer sidewalk snow-removal services.
- While DART has an “Adopt-A-Shelter” program, the challenge is getting sidewalks cleared leading up to the bus shelter.

- DART paratransit services face additional difficulties when servicing patrons where snow-covered driveways and walkways have not been cleared and access is problematic. Volunteers to assist sidewalk and driveway snow removal for persons with disabilities, who are serviced by paratransit vehicles, would be extremely helpful.
- Participants suggested the following ideas for assisting property owners with special needs:
 - Having HOAs, civic associations, and community and faith-based organizations maintain online lists of persons with special needs that need help clearing snow from sidewalks.
 - Considering sidewalk snow-removal volunteer services as a community service project for youth that need volunteer hours.
 - In lieu of school detention for youth, providing the option of logging hours for sidewalk snow removal for persons in need.
 - Proposing an organized program, similar to DelDOT's Snow Removal Reimbursement Program (which provides partial reimbursement to civic associations with state-maintained streets)—which would apply to priority sidewalk infrastructure.
 - In university towns, working with the Student Government Association (or similar organization) to provide volunteer service to residents with special needs.

12. RECOMMENDATIONS FOR DELAWARE LOCAL GOVERNMENTS

Prompt removal of snow from sidewalks is important because it helps facilitate safe pedestrian travel in adverse weather conditions. Many people rely on sidewalks in order to conduct their daily affairs and virtually every trip, even those by car, includes some walking, so it's important that sidewalks are cleared of snow in a timely manner.



12-1. Amend a Municipal EOP to Include Winter-Storm Emergencies

A municipal emergency operations plan (EOP) provides a description of roles and responsibilities, tasks, integration, and actions required of a jurisdiction during emergencies. Many Delaware local governments have already developed municipal EOPs. Delaware local governments that are faced with handling winter storms, or incidents with large accumulations of snow, should amend its municipal EOP to include “winter-storm emergencies” as a topic within the Hazard-Specific Annex or appendix.

12-2. Adopt a Winter Maintenance–Management Plan

Winter maintenance–management plans are developed to set forth policies, procedures, and responsibilities for an agency’s response to a major winter storm. Most plans describe how an agency will respond during a snow emergency using personnel and equipment such as trucks with snowplows, graders, sanders, de-icers, and other equipment. Traditionally, snow removal–management plans have focused on roadway transportation—stressing the need to keep roads clear to ensure the safety of motorists, emergency responders, and free flow of commerce. Newer and “best practice” plans recognize that pedestrian facilities need to be kept snow- and ice-free to accommodate pedestrians and bicylists and ensure ADA compliance. Based on IPA’s research of winter maintenance–management plans, Delaware local governments should:

Adopt a Basic Winter Maintenance–Management Plan to:

- Outline municipal policies, responsibilities, and procedures in order to prepare for and respond to a snow event and/or emergency.
- Provide a systematic approach to keep the municipal transportation network safe and usable during the winter.

- Set forth the policies, procedures, and standards of performance the municipality will observe in meeting its responsibilities for snow and ice removal.
- Serve as a communications tool to better inform the public, elected officials, municipal staff, partner agencies, and other stakeholders the local government's plan of action for efficient, effective, safe, and environmentally responsible snow removal from local transportation networks.

Integrate “Best Practices” within a Winter Maintenance–Management Plan to:

- Address the need to keep pedestrian facilities safe, accessible, and free from snow and ice.
- Clarify responsibilities for winter-maintenance activities, including pedestrian facilities.
- Provide level of service priorities and deployment guidelines.
- Stress environmentally friendly de-icing strategies.
- Consider new technologies to carry out operations more efficiently and effectively.
- Stress the need for continuous improvement, training, and performance measurement.
- Mitigate risk and manage costs.
- Utilize electronic communications and social media to enhance outreach.
- Ensure compliance with federal and state laws.
- Incorporate innovative and/or environmental sustainability practices that provide cost-saving measures, foster efficiency of operations, and/or aid in efforts to preserve air and water quality.
- Address the need to keep on-road bicycle facilities (e.g, bike lanes) clear of snow, ice, and debris.

Incorporate “Model” Elements When Preparing a Comprehensive Winter Maintenance–Management Plan

In recent years, more local governments are updating their snow- and ice-control plans to better address needs for multimodal transportation, pedestrian safety, municipal cost management, risk control, as well as to comply with the Americans with Disabilities Act (ADA) of 1990. Research indicates that a comprehensive winter maintenance–management plan should consider incorporation of the following “model” elements:

- Incorporate input from an advisory committee, which includes both internal (municipal) and external (outside agencies, organizations, institutions) stakeholders.

- Receive review and formal adoption by the legislative body of the local government.
- Provide the legal basis for the plan, including relevant municipal regulations and risk-control requirements.
- Ensure consistency with federal law (including the American with Disabilities Act), state policies, and other local government policies and ordinances.
- Undergo annual review and updates by the municipal public works department.
- Synchronize with other emergency operations plans of the local government, state agencies, departments of transportation, school districts, emergency responders, and transit agencies.
- Incorporate “best management practices” and consider new technology to provide responsible use of materials and products to aid in efforts to preserve air and water quality.
- Consider multimodal transportation needs to ensure safe access and mobility of motorists, pedestrians, bicyclists, and transit users.
- Outline when and how an employee training and safety program will be conducted.
- Stress the need for accurate record-keeping, cost-containment strategies, and data collection.

Address the Need for Risk Management

Outline a clear snow emergency–operations plan that includes:

- A communications plan that describes how internal (municipal) and external communications will take place during a snow event or weather emergency.
- A description of snow-removal responsibilities of the local government, property owners, transportation and transit agencies, school districts and universities, and as per interagency agreements
- A level-of-service (LOS) plan that provides municipal strategies and tactics based on type of storm, storm conditions, and treatment-level goals based on priority classification for the entire transportation system (including roadways, bikeways, pedestrian network, and transit stations)
- Deployment guidelines and protocols, for each municipal department, based on LOS
- An operational plan that describes the fundamentals of a snow- and ice-control plan and addresses personnel, equipment, materials management, budgetary, and risk-management needs

- A map of snow-removal routes and priorities, including areas where sidewalk snow removal is provided by the local government

12-3. Review Municipal Procedures and Clarify Responsibilities

- Conduct annual training of public works crews and other departments responsible for snow removal (e.g., parks and recreation departments) is recommended.
- Within an annual training session, educate municipal crews about problems associated with depositing plowed snow from roads onto curb ramps and pedestrian facilities.
- Within an annual training session, educate municipal crews about the need to clear a wider snow path on roadways to accommodate bicyclists.
- Determine what municipal department will be responsible for enforcement of local ordinances, which govern snow removal on sidewalks and other pedestrian facilities adjacent to private property owners. Again, even if a municipality has an adequate snow-removal ordinance that clearly assigns responsibility for sidewalk snow removal, a local government may be held liable for injuries or lack of ADA compliance.

The Delaware Center for Transportation's T2 Center at the University of Delaware has developed a new winter maintenance-workshop training module. Presentations from each module are available on the T2 Center website at:
www.ce.udel.edu/dct/T2TechBriefs.html.

- Thoroughly review federal, state, and local laws as well as cooperative and/or interagency agreements (e.g., municipal maintenance agreements, MOUs, cooperative/mutual-aid agreements) to understand the extent, limitations, and obligations of a local government to maintain pedestrian facilities—including winter maintenance.
- Work with Main Street Associations, Downtown Business Partnerships, or other business organizations to ensure that pedestrian areas of downtown commercial districts are well maintained and free from snow and ice. The formation of a special-assessment district may be advised if snow and ice removal from pedestrian facilities is inconsistent, lacks timeliness, or not conducted at vacant business properties.

12-4. Review and Update Municipal Ordinances/Regulations

To improve the effectiveness of a Delaware local government ordinance or regulation, it must:

- Clarify responsible party (parties), particularly for properties that have mixed uses, are leased, vacant, or seasonally occupied.
- Provide a specific shoveling deadline.

- Align regulations with ADA; clarify who is responsible for clearing curb ramps.
- Clearly state at what width to clear snow in residential and commercial districts.
- Provide distinct regulations for high-pedestrian-traffic areas.
- Address responsibilities for clearing snow from pedestrian facilities adjacent to vacant properties.
- Require that ice-free conditions be maintained following snow removal.
- Institute a citizen-assistance program to solicit volunteers to shovel snow for property owners who are elderly or have mobility limitations or disabilities; solicit support from HOAs, civic associations, student groups, and community and faith-based organizations.
- Strengthen enforcement of local ordinances/regulations; consider applying a property maintenance-violation approach that allows for instant “ticketing” and the assessment of civil penalties (misdemeanor avoided).
- Invoice non-compliant property owners for time/materials of clearing snow (not less than \$100 was suggested) and/or place a lien against the property.
- Monitor snow removal on “problem private properties,” which have a history of property-maintenance violations.
- In addition to a municipal ordinance that clearly delineates snow-removal responsibilities of private-property owners, a local government should consider amending subdivision regulations to:
 - Ensure compliance with soon-to-be-updated PROWAG standards for accessible sidewalks (from 36 to 48 inches).
 - Install sidewalks four to six feet from a street to allow for snow storage in the grassy area between a sidewalk and street.

12-5. Improve Communications

- Develop a plan for interagency communication to ensure a smooth response to a weather-related emergency.
- Involve outside agencies in an advisory group to develop a winter maintenance management-plan and coordinate pre-season planning activities.
- Develop a proactive public-information/social-awareness campaign to inform the media and residents how and when a local government will respond during a winter storm. In addition to the publication of newsletters/brochures and use of print media, e-communications—social media, electronic media, and websites—should be utilized.
- DART First State should continue to promote its Adopt-A-Shelter program to heighten

awareness for volunteers to adopt and help maintain bus shelters in Delaware.

12-6. Consider Innovative Practices

- In high-pedestrian-traffic areas with shared maintenance responsibilities, adopt a coordinated response such as is used by many universities to establish priority areas for pedestrian-facility snow removal and ensures that pedestrian mobility is a priority.
- In high-pedestrian-traffic areas that are maintained by private-property owners, consider a snow-removal pilot program that coordinates the contracting of pedestrian-facility snow removal on a fee basis that provides an economy of scale.
- Institute environmentally friendly practices and recalibrate equipment to manage environmental risks of salt use.
- Consider the use of specialized equipment designed to clear snow from sidewalks, curb ramps, and other pedestrian and bicycle facilities, if economically feasible.
- Look to future advances in smart-pavement technologies to solve snow- and ice-removal issues in downtown areas of snow-prone cities or congested urban areas.

APPENDIX A: Research of Management Plans for Sidewalk Snow Removal - Delaware Local Government Regulations Matrix

Local Govt.	Population	Regulation(s)	Penalty(ies)	Source	Assistance Program	Communication
Arden (NCC)	502	*No public sidewalks	N/A	N/A	N/A	N/A
Ardencroft (NCC)	282	*No public sidewalks	N/A	N/A	N/A	N/A
Ardentown (NCC)	325	*No public sidewalks	N/A	N/A	N/A	N/A
Bellefonte (NCC)	1243	The removal or abatement of all obstructions and nuisances -- whether in the streets, lanes, alleys, or gutters, on the sidewalk.	Commissioners have the authority to prosecute violators.	Cht. § 12	N/A	N/A
Bethany Beach (SC)	4302	The town may enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by abutting property owners.	N/A	Cht. § 4, 4.2.8	N/A	N/A
Bethel (SC)	188	*No residential sidewalks	N/A	N/A	N/A	N/A
Blades (SC)	1166	The town may enforce the removal of snow, ice, dirt or other foreign substance from sidewalks and gutters by owners or abutting owners.	N/A	Cht. § 27, 27.9	N/A	N/A
Bowers Beach (KC)	385	No	N/A	N/A	N/A	N/A
Bridgeville (SC)	1835	Property owners or occupant are required to remove ice or snow from abutting sidewalks within 24 hours after a snow fall.	Notice will be served to owner or occupant if snow and/or ice has not been removed within 24 hours. The property will be then be inspected no earlier than 48 hours from the date of the notice. If upon inspection the sidewalk is found to be in violation, the property owner or occupant will be charged the cost of abatement.	Code Ch. 197, § 197-2, 197-3, 197-4	No	Yes, Town Newsletter http://www.townofbridgeville.net/pdfs/Newsletter-Dec_102.pdf
Camden (KC)	3260	Every owner, tenant, occupant, or other person in charge of any premises fronting on any public street or alley must remove all snow and ice from sidewalks within twenty-four hours after a snow	Violators of the ordinance will be fined the following: 1 st offense: \$50.00	Code Ord. 81	No	No

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APPENDIX A: Research of Management Plans for Sidewalk Snow Removal - Delaware Local Government Regulations Matrix *(cont'd)*

Local Govt.	Population	Regulation(s)	Penalty(ies)	Source	Assistance Program	Communication
Cheswold (KC)	1309	The town may enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by owners or abutting owners.	N/A	Cht. § 4, 4.2.8	No	No
Clayton (KC)	2456	The Council shall have the power to require the removal of ice, snow, dirt or other foreign substances from sidewalks and gutters by owners or abutting owners. Property owners must remove snow or ice within 48 hours after a snowfall.	Violation is punishable by a fine of \$25.00	Cht. § 4, 4.2.e.12 Code § 1, 1.3-2.1	No	No
Dagsboro (SC)	530	Town council has the power to enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by owners or abutting owners.	N/A	Cht. § 28, 28.1	No	No
Delaware City (NCC)	1682	Occupants, lessees, owner, or agents of a property abutting a public street must remove all such snow and ice within twenty-four hours after a snow fall.	For each day of a violation, the responsible party will pay a fine of not less than five dollars nor more than twenty-five dollars besides costs of prosecution.	Code Article III, § 8 8-10, 8-10.8-	No	Yes, Town Newsletter http://www.delawarecity.delaware.gov/citynews/10113citynews.pdf
Delmar (SC)	1407	The town has the power to enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by owners or abutting owners. All, snow, ice, sleet or other frozen precipitation must be removed from sidewalks by property owner/responsible party within twelve hours after the frozen precipitation ceases to fall. *No residential sidewalks	Violators are fined not less than \$10.00 nor more than \$50.00, or imprisoned not less than 5 days nor more 20 days, or both. Each day the violation continues to exist shall be considered as a separate offense.	Cht. § 4, 4.a.9 Code 17 § 1, 5	No	Yes, Town Newsletter http://www.townofdelmar.us/pdfs/Winter_2010_newsletter.pdf
Dewey Beach (SC)	1997		N/A	N/A	N/A	N/A
Dover (KC)	36359	The Grounds Division is responsible for removing snow from 3.75 miles of sidewalks on City property. Property owners of tenants are responsible for maintaining sidewalks and landscaped areas within the street right-of-way. Responsible parties must remove snow or ice from an abutting sidewalk within 12 hours of daylight after a snow fall.	Fines may be imposed	Plan Ch. 8 Code § 98-5	No	Yes, via online PSAs: http://www.cityofdover.com/media/documents/Snowremoval.pdf Facebook: http://www.facebook.com/pages/Dover-DE/City-

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APPENDIX A: Research of Management Plans for Sidewalk Snow Removal - Delaware Local Government Regulations Matrix *(cont'd)*

Local Govt.	Population	Regulation(s)	Penalty(ies)	Source	Assistance Program	Communication
						http://www.cityofdover.de.gov/media/documents/CityofDoverEmergencyPlan.pdf
Ellendale (SC)	332	The town has the power to enforce the removal of snow, ice, dirt or other foreign substance from sidewalks and gutters by owners or abutting owners.	N/A	Cht.	No	No
Elsmere (NCC)	5935	Property owners or tenants must remove snow and ice from the abutting sidewalk within eight hours after a snow fall. The removed snow and ice must not be placed in any public street or curbs that drain into storm sewers.	A violation is not less than \$50 or more than \$100.	Code Ch. 192	No	Yes, Website under current news section and public works section: http://elsmere.delaware.gov/town-administration/public-works/
Farmington (KC)	122	The town may enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by owners or abutting owners.	N/A	Cht. § 4, 4.2.8	No	N/A
Felton (KC)	1347	The town may enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by owners or abutting owners.	N/A	Cht. § 3, 3.2.8	No	N/A
Fenwick Island (SC)	1400	The town has the power to enforce the removal of snow, ice and dirt from sidewalks and gutters by the occupant or owner thereof. *No residential sidewalks.	N/A	Code § 26, 26.B	No	No
Frankford (SC)	591	The town may enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by owners or abutting owners.	N/A	Cht. § 18, 18.A.9	No	No

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APPENDIX A: Research of Management Plans for Sidewalk Snow Removal - Delaware Local Government Regulations Matrix *(cont'd)*

Local Govt.	Population	Regulation(s)	Penalty(ies)	Source	Assistance Program	Communication
Frederica (KC)	761	The town may enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by property owners.	N/A	Cht. § 20	No	No
Georgetown (SC)	5157	The town may enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by abutting property owners. Property owners must remove snow or ice on an abutting sidewalk within eight hours of daylight following a snowfall.	If snow or ice remains for a period of longer than eight hours the town will charge the property owner with the removal of the snow.	Cht. § 30, 30.9 Code Article 1, 190-1, 190-2	No	Yes, Via news media, web site, newsletter http://www.georgetowndel.com/media/TakeNote_Newsletter_-_January_2011.pdf
Greenwood (SC)	837	The town may enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by the abutting property owners or abutting owners.	N/A	Cht. § 29, 29.a.9	No	No
Harrington (KC)	3279	Property owners or occupants must remove snow or ice from an abutting sidewalk within twelve hours following a snow storm.	First offense: \$25 Second offense: \$50 Third and subsequent offenses: \$100 Additional charges or assessments may be levied.	Code Article III, 365-22, 365-27, 365-28	No formal program. If a resident needs help, a public works employee will be sent to assist.	Yes, Via town newsletter, and notices on residents' doors that have not yet cleared their snow.
Hartly (KC)	107	No	N/A	N/A	N/A	N/A
Henlopen Acres (SC)	380	No	N/A	N/A	N/A	N/A
Houston (KC)	487	The Town of Houston shall have the power to enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by owners or abutting owners.	N/A	Cht. 30, 30.a.9	N/A	N/A
Kent County	144000	Sidewalks shall be free of utility poles, bushes, plants, and all other obstructions... Home owners' associations are responsible for perpetual maintenance of private streets	No	Code Article XI 187-58,	No	No

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APPENDIX A: Research of Management Plans for Sidewalk Snow Removal - Delaware Local Government Regulations Matrix *(cont'd)*

Local Govt.	Population	Regulation(s)	Penalty(ies)	Source	Assistance Program	Communication
Kenton (KC)	232	The town may enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by owners or abutting owners	N/A	187-60 Cht. § 2, 2.b.12	No	No
Laurel (SC)	3814	The town has the power to enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by owners or abutting owners. Property owners must remove snow or ice from the abutting sidewalk within 24 hours after a snow fall.	Violators will be invoiced the actual cost of removing sidewalk snow or ice plus an additional charge of twenty percent to pay administrative costs. If payment is not made within 30 days, accrued interest is charged at the rate of ten percent per annum from the date of completion of the work. Upon conviction, the offender shall be fined not less than \$50 or more than \$500 or imprisoned for thirty days, or both. The offender also pays the costs of prosecution and the assessment for the Victim Compensation Fund.	Cht. § 30, 30.a.9 Code Chapter 141, Article II, 141-7, 141-10, 141-12	No	No
Leipsic (KC)	236	No	N/A	N/A	N/A	N/A
Lewes (SC)	3670	The city has the power to enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by owners or abutting owners. Adjacent property owners are responsible for maintenance and snow removal from sidewalks.	N/A	Cht. § 29, 29.9 Plan Part 2, 2-3	No	Yes, Via Website under Rules and Regulations: http://www.ci.lewes.de.us/Rules-and-Regulations/
Little Creek (KC)	172	No	No	N/A	No	No
Magnolia (KC)	211	No	No	N/A	No	No
Middletown	18600	Property owners or occupants must keep sidewalks free from all obstructions and snow. Snow must be removed from sidewalks	Violations are punishable by a fine of \$25 per offense, with each day being	Code	Yes. Snow Assistance	Yes, Via the local newspaper

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APPENDIX A: Research of Management Plans for Sidewalk Snow Removal - Delaware Local Government Regulations Matrix *(cont'd)*

Local Govt.	Population	Regulation(s)	Penalty(ies)	Source	Assistance Program	Communication
(NCC)		within 24 hours after a snow fall.	a separate offense. Fines not enforced.	Article IV 146-11, 146-13	Program. Application for assistance is available on town website: http://www.middletownde.org/forms_downloads.htm	and "robo-calls." Code enforcement officers tell individual residents about the ordinance if necessary.
Millford (KC/SC)	9302	Property owners are responsible for maintaining, repairing, or replacing sidewalks and for keeping sidewalks in good repair, in safe condition, free of vegetation, and not permit hazards to either pedestrians or vehicular traffic to exist.	May be enforceable by code enforcement officer, but seems to apply to sidewalks in disrepair.	Code Chapter 174, §197-4	Volunteer group available	Door hangers
Millsboro (SC)	2360	The town has the power to enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by owners or abutting owners. Property owners/occupants must remove snow from abutting sidewalks within six daylight hours after a snow fall.	Violators may pay a fine of not more than \$10 for each offense, plus the cost of snow removal by the town. Each parcel owned or occupied is considered a separate violation.	Ch. § 30 30.a.9 Code Article III 174-19, 174-20, 174-21	No	No
Millville (SC)	272	The town has the power to enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by abutting property owners.	No	Ch. § 31 31.a.9	No	No
Milton (SC)	2301	The town has the power to enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by abutting property owners or abutting owners. Property owners or occupants must remove snow from adjacent sidewalks or pavement within 24 hours after a snow fall	Violators must pay a fine of \$50 for such offense. The violator will also be charged the cost of snow removal.	Ch. § 29 29.a.5 Code Article VII 183-54	No	No
New Castle	5164	Property owners, tenants, or occupants must remove any snow,	Any person, corporation, company or	Code	No	No

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APPENDIX A: Research of Management Plans for Sidewalk Snow Removal - Delaware Local Government Regulations Matrix *(cont'd)*

Local Govt.	Population	Regulation(s)	Penalty(ies)	Source	Assistance Program	Communication
(NCC)		hail, or ice any adjacent pavement, sidewalk or footway within 24 hours after a snow fall. The pathway must be cleared at least three feet in width along the pavement or sidewalk to the gutter to allow the free passage of pedestrians.	other entity found guilty of a Violators must pay a fine of not less than \$25 nor more than \$100.	Ch. 209 Article 1 209-1, 209-2		
New Castle County	471417	No. A bill requiring the removal of ice and snow from sidewalks along public streets appears to have been defeated in 10/77 and reconsidered but tabled (no action) in 6/79.	No	N/A	No	No
Newark (NCC)	30613	Residents are required to remove all snow or ice from the abutting sidewalk within 24 hours after a snow fall. Property owners of multiple businesses are responsible for snow and ice removal on sidewalks abutting those properties. Pathways must at least five feet in width in business and commercial districts and three feet in width in residential districts. The ordinance restricts residents from shoveling snow or ice into the gutter or street. Every property owner shall maintain any sidewalk abutting his property in a safe and useable condition including compliance with Americans with Disabilities Act (ADA) guidelines Municipal code is not available online, but there appears to be an ordinance regulating the sidewalk snow removal. Maintenance staff is responsible for snow removal on the town's street and roadway network.	Persons responsible for snow and ice removal for properties classified as "RS" under the city's electric service rate classification, must pay a fine of from \$125 - \$300 for each day of the offense. If the city has to pay private contractors to remove snow from the offending property, the property owner will be assessed the actual charge, 50% overhead, and interest, but not less than \$100.	Code Ch. 26, Article 1, 26-3 Code , Ch. 26, Article III, § 26-25	Yes, Website connects persons in need with contractors	Yes, Via city website: http://www.cityofnewark.de.us/index.aspx?NID=220 , Television Newark Channel 22, and Newsletter: http://www.cityofnewark.de.us/DocumentView.aspx?DID=1125
Newport (NCC)	1240		N/A	Plan § 4, 4.7.3	Yes, Volunteer "Snow Angels" program	Yes, Via city newsletter: http://newport.delaware.gov/files/2010/12/NewsletterNov10.pdf
Ocean View (SC)	1099	Residents are required to remove all snow or ice from the abutting sidewalk within 24 hours after a snow fall, or it is considered a nuisance. In cases of extreme hardship or difficulty, additional or alternative snow removal methods may be allowed, including but not limited to sanding or salting of the sidewalk.	First, a written warning will be issued and the resident will be given 24 hours to shovel snow. Second, a follow-up inspection will be made within 48 hours from the date of the notice. If no action has been taken, the town will remove the snow, charge the property the actual cost plus administrative fees. In addition, violators may fined up to a maximum of \$100.	Code Ch.187, Article X, §. 187-30/31	No	Via the town website and notice sent to the property owner.

Legend: NCC= New Castle County, KC= Kent County, SC= Sussex County, Cht.=Charter, Ch. = Chapter, Ord. = Ordinance, N/A = Not available/ not applicable

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APPENDIX A: Research of Management Plans for Sidewalk Snow Removal - Delaware Local Government Regulations Matrix *(cont'd)*

Local Govt.	Population	Regulation(s)	Penalty(ies)	Source	Assistance Program	Communication
Odessa (NCC)	286	Property owners and occupants must keep sidewalks free from obstructions, and remove snow within six hours from the start of a snow fall (except when the snow ceases to fall between the setting and rising of the sun). In that case, the snow must be removed by 12 noon the following day. The town contracts for the maintenance and removal of snow on local streets, sidewalks, and in common areas and town parks. The city has the power to enforce the removal of snow, ice, dirt or other foreign substance from sidewalks and gutters by owners or abutting owners. Code does not address sidewalk maintenance, but does however require curb maintenance by abutting property owner.	Under a penalty of \$1 and costs for each and every offense.	Plan Ch. 2 2-2 Code 1873 #8	No	No
Rehoboth Beach (SC)	6060		N/A	Cht. § 29 29.a.9 Code Ch. 232, Article 1 § 232-1.	No	No
Seaford (SC)	6699	City council has the power to enforce the removal of snow, ice, or dirt from the sidewalks and gutters by the property owner or occupants. Property owners are responsible for maintaining the curbing, sidewalk, trees and vegetation abutting the property. Property owners must clear sidewalk in front of a house or business within 8 hours after the snow stops.	City council may prescribe the fines and penalties for violations. If the violator fails to pay the fine, the Mayor, Alderman, or Justice of the Peace may order the violator to be placed in jail for any time not exceeding sixty days, or until such fines and costs shall be paid.	Cht. § 32 Code (not online)	No	Yes, Within 2008 winter newsletter
Selbyville (SC)	2335	The town has the power to provide, by ordinance, for the removal of snow, ice, dirt or other foreign substances from the sidewalks, gutters and pavements, at the expense of property owners or occupants. Property owners and tenants must remove snow by six daylight hours after a snow fall. For purposes of citation for nonconformance, to each parcel so owned or occupied as a separate violation.	Property owners/tenants convicted of a violation may be fined not less than \$1 nor more than \$5 and costs, including attorney fees, Victim's Compensation Fund assessment and the cost of any removal. Each day of a violation is deemed a separate offense.	Cht. § 4 4.2.4 Code Ch. 155 Article III §155	No	Yes, Code enforcement officers notify individuals of the snow removal policy if necessary.
Slaughter Beach (SC)	524	No	No	N/A	No	No

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APPENDIX A: Research of Management Plans for Sidewalk Snow Removal - Delaware Local Government Regulations Matrix *(cont'd)*

Local Govt.	Population	Regulation(s)	Penalty(ies)	Source	Assistance Program	Communication
Smyrna (KC)	10805	Town council may enforce the removal of ice, snow or dirt or other foreign substance from sidewalks and gutters by owners or abutting owners. Property owners must remove snow from a sidewalk, pavement or walkway, within 12 hours of daylight after it has ceased snowing. Town adopted an Emergency Operations Plan, which includes snow storms, in 2009.	Violations must pay a fine up to, but not exceeding \$1,000. Each day the violation continues is a separate offense. Violators are also charged the cost of the removal of snow from the adjacent sidewalk.	Cht. § 4 4.2.8 Code Ch. 1 1-11 Ch. 58 Article V §58 Code Ch. 22, Article 3	No	No
South Bethany (SC)	1848	*No residential sidewalks. The town takes care of the snow removal on the town owned sidewalks.	No	N/A	No	No
Sussex County	192747	Appears that in most cases that a residential developer is required to form a homeowner's association, which is responsible for the maintenance of streets, roads, forested buffers, stormwater management facilities, sidewalks, pedestrian paths, and other common areas.	No	Code	No	Yes, Emergency Operations Center PSA http://www.sussexcountysd.gov/docs/pressreleases/2011/01/winter.wx.ppt
Townsend (NCC)	1140	Property owners or occupants must remove snow or ice from an adjacent sidewalk within twelve (12) hours after daylight after a snow fall.	For violators, the town will remove the snow and charge the property owner or occupant.	Code Ord. 11	Volunteers, no formal program	Yes, Via town website, newsletter
Viola (KC)	162	No information	No information	N/A	N/A	N/A
Wilmington (NCC)	72432	The Code assigns the order of responsibility for sidewalk snow removal to 1) occupants, 2) lessees, 3) owners, 4) agents. However, the ordinance has been challenged in court. In 2004, the Delaware Supreme Court found that the existing ordinance conflicts with the City of Wilmington's Charter, in which the city assumed responsibility for removal of snow and ice from streets (and the definition of streets includes sidewalks). Therefore, the existing	Not enforceable	Code Ch. 42 Article VII §42	No	No

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APPENDIX A: Research of Management Plans for Sidewalk Snow Removal - Delaware Local Government Regulations Matrix *(cont'd)*

Local Govt.	Population	Regulation(s)	Penalty(ies)	Source	Assistance Program	Communication
Woodside (KC)	228	ordinance seems to be invalid and unenforceable. The town has the power to require the removal of ice, snow, dirt or other foreign substances from sidewalks and gutters by abutting property owners	No	Cht. § 1 1.27.1	No	No
Wyoming (KC)	1141	Property owners or occupants must remove snow from an adjacent sidewalk, pavement, or walkway within 48 hours after a snow fall. Enforcement of this ordinance shall be limited to areas where the general public has access to the sidewalks, pavement and walkways. The town has the authority to have the snow removed from the sidewalk, pavement, or walkway where a owner or occupant is in violation.	For residents in violation of the law, the town will remove the snow and charge the property owner or occupant. Violations are punishable by a fine of \$50.00 for each incidence of offense and must be paid within 30 days from date of issuance.	Plan Ch. 2 2-5 Ord. #P2-07 § 2-5	Town maintains a list of volunteers	Yes, Via town website: http://wyoming.delaware.gov/?s=snow+removal Newsletter: http://wyoming.delaware.gov/files/2011/02/january-2011-Newsletter.pdf

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APPENDIX B: Sidewalk Snow Removal - Summary Table of the Delaware Local Government Regulations Matrix

Local Govt. (County)	Regulation	Time Allotted for Property Owners	Penalty/Fine	Assistance Program	Communication
Arden (NCC)	No	N/A	N/A	N/A	N/A
Ardencroft (NCC)	No	N/A	N/A	N/A	N/A
Ardentown (NCC)	No	N/A	N/A	N/A	N/A
Bellefonte (NCC)	Yes	N/A	N/A	N/A	N/A
Bethany Beach (SC)	Yes	N/A	N/A	N/A	N/A
Bethel (SC)	No	N/A	N/A	N/A	N/A
Blades (SC)	Yes	N/A	N/A	N/A	N/A
Bowers Beach (KC)	No	N/A	N/A	N/A	N/A
Bridgeville (SC)	Yes	Within 24 hrs.	Charge for snow removal	No	Newsletter
Camden (KC)	Yes	Within 24 hrs.	\$50 - \$300	No	No
Cheswold (KC)	Yes	N/A	N/A	No	No
Clayton (KC)	Yes	Within 24 hrs.	\$25	No	No
Dagsboro (SC)	Yes	N/A	N/A	No	No
Delaware City (NCC)	Yes	Within 24 hrs.	\$5- \$25	No	Newsletter
Delmar (SC)	Yes	Within 12 hrs.	\$10- \$50	N/A	N/A
Dewey Beach (SC)	No	N/A	N/A	N/A	N/A
Dover (KC)	Yes	Within 12 hrs.	May be imposed	N/A	Online PSAs, Facebook, Snow Operations Plan
Ellendale (SC)	Yes	N/A	N/A	No	No
Elsmere (NCC)	Yes	Within 8 hrs.	\$50- \$100	N/A	Website under Current News and Public Works
Farmington (KC)	Yes	N/A	N/A	No	No
Felton (KC)	Yes	N/A	N/A	No	No
Fenwick Island (SC)	Yes	N/A	N/A	No	No
Frankford (SC)	Yes	N/A	N/A	No	No
Frederica (KC)	Yes	N/A	N/A	No	No
Georgetown (SC)	Yes	Within 8 hrs.	Charge for snow removal	No	News media, website, newsletter
Greenwood (SC)	Yes	N/A	N/A	No	No
Harrington (KC)	Yes	Within 12 hrs.	\$25 - \$100	Town may assist	Newsletter and door notices
Hartly (KC)	No	N/A	N/A	N/A	N/A
Henlopen Acres (SC)	No	N/A	N/A	N/A	N/A
Houston (KC)	Yes	N/A	N/A	No	No
Kent County	Yes	No	No	N/A	N/A
Kenton (KC)	Yes	N/A	N/A	No	No
Laurel (SC)	Yes	Within 24 hrs.	Charge for snow removal + \$50 - \$100	No	No
Leipsic (KC)	No	N/A	N/A	N/A	N/A
Lewes (SC)	Yes	N/A	N/A	No	Website
Little Creek (KC)	No	N/A	N/A	N/A	N/A
Magnolia (KC)	No	No	No	No	No
Middletown (NCC)	Yes	Within 24 hrs.	\$25 per offense	Yes	Newspaper and "robo-calls"
Milford (KC/SC)	Yes	No	No	Volunteers	Door Hangers
Millsboro (SC)	Yes	Within 6 hrs.	Cost of removal + \$10	N/A	No
Millville (SC)	Yes	N/A	N/A	No	No
Milton (SC)	Yes	Within 24 hrs.	Cost of removal + \$50	No	No
New Castle (NCC)	Yes	Within 24 hrs.	\$25 - \$100	No	No

APPENDIX B: Sidewalk Snow Removal - Summary Table of the Delaware Local Government Regulations Matrix *(cont'd)*

Local Govt. (County)	Regulation	Time Allotted for Property Owners	Penalty/Fine	Assistance Program	Communication
New Castle County	No	N/A	N/A	No	No
Newark (NCC)	Yes	Within 24 hrs.	Up to \$300 per day	Yes	Website, TV Channel 22, online newsletter, and New Resident Brochure
Newport (NCC)	Yes	N/A	N/A	Yes	Newsletter
Ocean View (SC)	Yes	Within 24 hrs.	Cost of removal + up to \$100	No	Website and resident notices
Odessa (NCC)	Yes	Within 6 hrs.	Cost of removal + \$1	No	No
Rehoboth Beach (SC)	Yes	N/A	N/A	No	No
Seaford (SC)	Yes	N/A	Fine + jail for non- payment	No	2008 Newsletter
Selbyville (SC)	Yes	Within 6 hrs.	\$1 - \$5 for each offense + costs	No	Code enforcement officer notification
Slaughter Beach (SC)	No	N/A	N/A	N/A	N/A
Smyrna (KC)	Yes	Within 12 hrs.	Cost of removal + up to \$1,000 per offense	No	No
South Bethany (SC)	No	N/A	N/A	N/A	N/A
Sussex County	Yes	No	No	N/A	Emergency Operations PSA
Townsend (NCC)	Yes	Within 12 hrs.	Cost of Removal	Volunteers	Website and newsletter
Viola (KC)	No	N/A	N/A	N/A	N/A
Wilmington (NCC)	Yes, but ruled invalid; conflicts with Charter	N/A	Not enforceable	No	N/A
Woodside (KC)	Yes	N/A	N/A	N/A	N/A
Wyoming (KC)	Yes	Within 48 hrs.	Cost of removal + \$50	Volunteers	Website and newsletter

The summary table provides a synopsis of the Delaware Local Government Regulations Matrix. In fall 2010, the University of Delaware Institute for Public Administration (IPA) e-mailed Delaware local governments to ask:

1. Does your local government have either a Charter provision or municipal ordinance that requires sidewalks to be cleared after a snow storm?
2. If so:
 - a. Are there penalties for non compliance?
 - b. How are sidewalk snow removal requirements communicated?
 - c. Is there a program in place to assist physically-challenged residents who are unable to shovel sidewalks?

Counties:

- No counties responded to the request for information
- Research of regulations indicates that one county does not seem to regulate sidewalk snow removal while two counties require homeowner's associations to maintain private streets (presumably including sidewalks)

Municipalities:

- 48 out of 57 municipalities responded to the request for information
- 43 have sidewalk snow removal regulations; 14 have no sidewalks and/or no regulations
- 21 require property owners to remove snow within a certain time period
- 22 issue penalties and/or fines for non compliance
- Only 6 have some type of assistance program
- 18 provide some form of communications to property owners regarding sidewalk snow removal requirements






APPENDIX C: Sidewalk Snow Removal – National Best Practices Matrix

Snow Removal Management Plans that Address Sidewalks			
Jurisdiction (Population)	Description	"Model" Elements	URL for More information
City of Seattle, Department of Transportation (SDOT) (608,660)	Seattle Disaster Readiness and Response Plan Volume II: Snowstorm Incident Annex, November 2010	<ul style="list-style-type: none"> Plan developed in collaboration with multiple agencies, organizations and jurisdictions National Weather Service forecast triggers the activation of the Emergency Operations Center SDOT coordinates operations with Washington State DOT, King County DOT, and transit agencies Snow and ice clearing strategy has three levels of response Deploys pedestrian safety crews to deice and remove snow on critical sidewalk landings and public stairways located in the right-of-way, as identified using criteria in Seattle's Pedestrian Master Plan 	<p><i>Snowstorm Incident Annex:</i> http://www.seattle.gov/emergency/publications/documents/SnowstormIncidentAnnexFinal11-02-10</p> <p><i>Seattle Pedestrian Master Plan summary:</i> http://www.seattle.gov/transportation/pedestrian_masterplan/docs/PMP%20Summary_Low%20Res.pdf</p>
Calgary, Alberta, Canada (988,193)	Snow and Ice Control Policy, Policy Number: TP004 Report Number: TTP2003-39, C2007-44	<ul style="list-style-type: none"> Concise and easily understandable to elected officials, operations staff, and the public Goal is to maintain reasonable conditions on BOTH roadways and sidewalks Provides definitions of specialized terms so that citizens can understand all components Delineates responsibilities of all actors in the snow removal process 	http://www.calgary.ca/docgallery/bulr/oads/snow_ice_control/SNIC_Interim_Policy_2010_TP004.pdf
City of Rawlins, Wyoming Public Works Dept., Streets Division (8,538)	Snow Control Operations	<ul style="list-style-type: none"> Establishes objective to "provide a plan for the safe and orderly movement of emergency equipment, vehicular traffic, and pedestrians" Informs citizens of their responsibilities, including sidewalk snow removal Provides multiple ways to contact the agency with questions and complaints 	http://rawlins-wyoming.com/DocumentView.aspx?DID=98

APPENDIX C: Sidewalk Snow Removal – National Best Practices Matrix *(cont'd)*

Local Ordinances Governing Sidewalk Snow Removal			
Jurisdiction (Population)	Description	“Model” Elements	URL for More information
City of Madison, Wisconsin (208,054)	Madison City Ordinance 10.28, Snow Enforcement Policy	<ul style="list-style-type: none"> Requires property owners to: <ul style="list-style-type: none"> Remove snow from sidewalks by 12 noon the following day after a snow fall Clear adjacent curb ramps Use de-icers to maintain conditions Pay escalating fines each day of noncompliance Pay additional assessment if city clears sidewalk Requires property owners to: <ul style="list-style-type: none"> Remove sidewalk snow within 24 hours after the snow and ice have stopped falling Clear corners with crosswalks if applicable Clear sidewalk within 24 hours of being notified of a violation Deposit snow in yards, not on roadways Pay assessment to property tax bill if city clears sidewalk 	http://www.cityofmadison.com/BI/snowrem.html
City of Milwaukee, Wisconsin (605,013)	City of Milwaukee Code of Ordinances, Vol. 1, 116-8, Sidewalks to be Kept Clean	<ul style="list-style-type: none"> Requires non-residential property owners to remove snow that accumulates on an adjacent sidewalk prior to 6:00 a.m. by noon of the same day Requires residential property owners to remove snow on adjacent sidewalks within 24 hours after accumulation ceases Imposes fines and assessment, with exceptions for hardship cases 	http://library.municode.com/index.aspx?clientId=11782&stateId=22&stateName=Michigan
City of Ann Arbor, Michigan (114,024)	Ann Arbor, Michigan Code of Ordinances, Title IV, Ch. 49	<ul style="list-style-type: none"> Requires property owners to: <ul style="list-style-type: none"> Remove snow and ice from their sidewalks within 3 hours of the end of a snowfall Clear sidewalks a minimum of 42 inches wide to accommodate strollers and wheelchairs Clear snow blocking a handicapped ramp, fire hydrant, or catch basin Pay fines (\$50 - \$200) for each day of an offense 	http://www.cityofboston.gov/snow/snowremoval.asp

APPENDIX C: Sidewalk Snow Removal – National Best Practices Matrix *(cont'd)*

Forms of Communication			
Jurisdiction (Population)	Description	"Model" Elements	URL for More information
Vancouver, B.C., Canada (578,041)	Snow and ice removal website	<ul style="list-style-type: none"> Clearly communicates citizen responsibilities Informs citizens of possible penalties Provides links to other media Outlines citizen assistance program Provides a Helpful Hints and Safety Tips section Urges citizens to use public transportation Promotes Snow Angels citizen assistance program 	http://vancouver.ca/engsvos/streets/maintenance/snow/YourPart.htm
Metropolitan Area Planning Council, Boston Area (4,522,858 MSA)	Model brochures for the cities of Brookline, Cambridge, and Salem, Massachusetts	<ul style="list-style-type: none"> Each summarizes sidewalk snow removal policies and ordinances, citizen vs. municipal responsibilities, and citizen assistance programs Brookline: Informs residents of media sources for public announcements, recycling during the snow season, and a Seasonal Information Line phone number and website Cambridge: Provides link to online snow removal information, link to report uncleared sidewalk locations, penalties for ordinance violations, and sidewalk snow and ice removal tips Salem: Informs citizens of the need to clear sidewalks, catch basins, and fire hydrants; winter sand locations; and emergency contact numbers 	http://mapc.org/sites/default/files/Section6.pdf
City of Chicago, Illinois (2,695,598)	Annual sidewalk snow clearance campaign to increase pedestrian safety	<p>Campaign provides:</p> <ul style="list-style-type: none"> Informational door hangers (in English and Spanish), which are distributed by Aldermanic Offices, volunteers, businesses, and inspectors responding to 3-1-1 complaint calls A Sidewalk Snow Clearance Recognition Program, which lauds businesses that are outstanding in their clearing of snow and ice 3-1-1 to report uncleared sidewalk locations 	http://www.cityofchicago.org/city/en/depts/cdot/supp_info/sidewalk_snow_removal.html
City of Madison, Wisconsin (208,054)	Social media utilization:  Get email updates  Subscribe to RSS  Find on Facebook  Follow on Twitter  Explore on Flickr	<ul style="list-style-type: none"> Social media includes Facebook and Twitter Provides "real time" sidewalk clearing and snow plowing updates Provides an AlertMadison communication tool to inform residents of snow removal notifications and updates prior to an enforcement activity 	http://www.cityofmadison.com/residents/winter/Snow/ice/snowRules.cfm http://www.facebook.com/CityofMadison http://twitter.com/madisonwinter

APPENDIX C: Sidewalk Snow Removal – National Best Practices Matrix *(cont'd)*

Service Standards and Priorities			
Jurisdiction (Population)	Description	"Model" Elements	URL for More information
City of Bloomington, Minnesota (85,238)	Priorities for municipal sidewalk snow removal	<ul style="list-style-type: none"> Parks Maintenance provides snow removal on over 250 miles of sidewalks Five sidewalk snow removal units will clear snow according to three walkway priorities: <ul style="list-style-type: none"> First priority: School walking areas, heavily used wheelchair accessible areas, and high-use areas by main roads Second priority: Walks expanding out from the school and along major roads Third priority: Residential and industrial areas 	http://www.ci.bloomington.mn.us/cityhall/dept/pubworks/mainten/strmain/snow.htm#nojust
City of Newtown, Massachusetts (85,146)	GIS map of Sidewalk Snow Removal Priorities	<ul style="list-style-type: none"> While Newtown has 531 miles of sidewalk, the city plows 60 miles of high priority sidewalk areas Map identifies critical sidewalk snow removal priority areas including: <ul style="list-style-type: none"> School routes and high school sidewalks Municipal sidewalks Parks and recreation routes Transit stations 	http://www.ci.newton.ma.us/dpw/Sidewalk%20Plowing.pdf
City of Elkhorn, Wisconsin (9,535)	City of Elkhorn Snow and Ice Control Plan	<ul style="list-style-type: none"> Plan addresses snow and ice removal responsibilities, service level, priorities, and performance Sidewalk snow removal priorities are addressed within the "Level of Service and Determination Need Section" Operations response time (including sidewalks) is determined by storm classification A – D (major) The Parks Division clears sidewalk snow in the following priority: <ol style="list-style-type: none"> Downtown areas, starting with city-owned property and public buildings Sidewalks adjacent to city owned buildings/property Sidewalks adjacent to private property, where sidewalks have not been cleared after 24 hours and a warning was issued (property owner will be issued a citation for violation of the municipal ordinance and billed for sidewalk snow removal) 	http://www.cityofelkhorn.org/cityservices/PublicWorks/2010%20Snow%20Policy.pdf

APPENDIX C: Sidewalk Snow Removal – National Best Practices Matrix *(cont'd)*

Citizen Assistance Programs			
Jurisdiction (Population)	Description	"Model" Elements	URL for More information
City of Fargo, North Dakota (105,549)	City-funded snow removal assistance program	<ul style="list-style-type: none"> To be eligible, applicants must: <ul style="list-style-type: none"> Have an annual household income at or below 50% of area median income Also be elderly (age 65 or older) and/or disabled (as defined by eligibility for Paratransit services). Be unable to remove snow and have no other household member who is physically able to remove the snow Eligible residents are placed on contractor list of pre-qualified households 	http://www.cityoffargo.com/Residential/SnowRemoval/Residentresponsibilities/Snowremovalassistance.aspx
City of Brookline, Massachusetts (57,107)	Shovel our Snow Program	<ul style="list-style-type: none"> Sponsored and coordinated by Brookline Recreation Serves as a referral program that enables residents to hire students to shovel sidewalks snow (for a negotiated fee) Residents register to be on program list, which provides youth who shovel after school and weekends, not during school hours 	http://www.brooklinema.gov/index.php?option=com_content&view=article&id=193&Itemid=877
Volunteer Centre of Guelph/Wellington, in partnership with the City of Guelph, Ontario, Canada (114,943)	Snow Angels Program	<ul style="list-style-type: none"> Offers a volunteer snow removal service for eligible seniors and persons with physical disabilities To qualify, seniors and those with disabilities must: <ul style="list-style-type: none"> Reside in home with private driveway Be unable to remove their own snow and cannot afford to pay for snow removal Have no able-bodied person living in the household to shovel snow Youth at least 14 years old may volunteer and receive community service project credits 	http://www.volunteerguelphwellington.on.ca/snow.aspx
City of Aurora, Colorado (325,078)	Snow Busters Program	<ul style="list-style-type: none"> Assists Aurora's elderly and people with disabilities, who have limited financial resources, with snow shoveling Matches eligible residents with a nearby neighborhood volunteer Requires volunteers to shovel within 24 hours following a snowfall of 2 inches or more Volunteer commitment lasts the entire snow season 	https://www.auroragov.org/AuroraGov/Departments/HumanResources/VolunteerOpportunities/SnowBusters/index.htm?ssSourceNodeid=660&ssSourceSiteid=621&ssTargetNodeid=

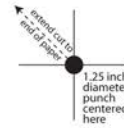
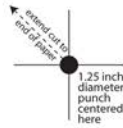
APPENDIX C: Sidewalk Snow Removal – National Best Practices Matrix *(cont'd)*

Enforcement			
Jurisdiction (Population)	Description	"Model" Elements	URL for More information
City of Boulder, Colorado (94,268)	Outlines proposed changes to enforcement aspect of Boulder, Colorado, sidewalk snow removal ordinance	<ul style="list-style-type: none"> Current ordinance: <ul style="list-style-type: none"> Requires property owners to clear sidewalks by noon of the day following a snow fall Allows for both the issuance of a citation (municipal court summons) or abatement where the city has a private contractor remove snow at the property owner's expense Proposed ordinance change: <ul style="list-style-type: none"> Clarifies that the requirement for prior notification "warning" is specific to abatement Defines that the minimum notification required prior to abatement is one notice per snow season Revises the cutoff for the end of a snowfall from midnight to 5 a.m. to eliminate the extended grace period currently allowed for snows ending after midnight Clarifies that enforcement action can be in the form of a summons, abatement, or both Increases the administrative fee for abatement cases from \$25 to \$50 	http://www.bouldercolorado.gov/index.php?option=com_content&view=article&id=13647&Itemid=4633
Radnor Township, Pennsylvania (30,878)	Radnor Township Sidewalk Snow Removal Warning Process	<ul style="list-style-type: none"> If property owner does not shovel sidewalk within 24 hrs after the last snow, then: <ul style="list-style-type: none"> Police department issues a written warning Police conduct a follow-up investigation If a violation is observed, a non-traffic citation is issued either in person or via mail 	http://www.radnor.com/egov/docs/1201883311710.htm
Commonwealth of Massachusetts (6,547,629)	<ol style="list-style-type: none"> 2010 ruling (<i>Papadopoulos v. Target Corp.</i>) on Massachusetts Snow Removal Law 2010 "Green Tickets Bill" 	<ol style="list-style-type: none"> Ruling states that all Massachusetts property owners are legally responsible for the removal of snow and ice from their property; implications for towns with municipal-owned sidewalks Massachusetts Governor Deval Patrick signed the "Green Tickets Bill" in February 2010 that expands a local government's authority to collect unpaid fines, including those related to snow and ice removal <ul style="list-style-type: none"> Municipalities can now charge penalties for late payments and issue sanctions for failure to pay 	<ol style="list-style-type: none"> http://www.scribd.com/doc/34891739/Mass-SJC-Ruling-In-Papadopoulos-v-Target-Corporation http://mapc.org/sites/default/files/Section2.pdf

APPENDIX C: Sidewalk Snow Removal – National Best Practices Matrix *(cont'd)*

Innovations			
Jurisdiction (Population)	Description	"Model" Elements	URL for More information
City of Toronto, Ontario, Canada (2,503,281)	Winter Maintenance Services	<ul style="list-style-type: none"> Utilizes 300 sidewalk snow plows Budgets \$50 million annually for snow removal on sidewalks and roads Use Winter Maintenance Depots (WMDs), which are staffed by contracted personnel who own and operate all of the equipment and perform snow removal operations on roads and sidewalks for the city Use de-icing liquids such as salt brine, which sticks to the road better than dry salt and allows for the use of less salt overall 	http://www.apwa.net/publications/reporter/transportation/index.asp?DISPLAY=ISSUE&ISSUE_DATE=102006&ARTICLE_NUM=BER=1376
University of Minnesota, Duluth (11,190 Students)	Facilities Management	<ul style="list-style-type: none"> Redesigned and recalibrated equipment to distribute salt at lower rates Includes more mechanical snow removal to lower the use of salt Sweeps sidewalks after plowing for more snow removal Uses proactive methods such as anti-ice pretreating 	http://www.apwa.net/publications/reporter/transportation/index.asp?DISPLAY=ISSUE&ISSUE_DATE=102007&ARTICLE_NUM=BER=1625
University of Minnesota, Twin Cities Campus (51,611 Students)	Snow Removal Program	<ul style="list-style-type: none"> Improved employee training and equipment calibration to increase awareness of proper application rates and significantly reduce the amount of chemicals used for de-icing Adopted an aggressive anti-icing program with liquid magnesium chloride for sidewalks and salt brine for the streets Saved \$55,071 in one year by increasing use of mechanical snow clearance and anti-icing liquids and decreasing the use of rock salt and sand 	http://www.apwa.net/publications/reporter/transportation/index.asp?DISPLAY=ISSUE&ISSUE_DATE=102007&ARTICLE_NUM=BER=1625
City of Montreal, Quebec, Canada (1,620,693)	Operation Snow Removal	<ul style="list-style-type: none"> Employs "snow brigades" to clear sidewalks Uses mini-plows to clear sidewalks Plows snow into streets and uses blowers to move snow into dump trucks that haul away the snow 	http://dc.thecityfix.com/snow-removal-best-practices-the-right-path/ http://www.montrealgazette.com/montreal+deploy+snow+removal+brigades/3777222/story.html

APPENDIX D: Chicago Department of Transportation Sidewalk Snow-Removal Reminder Door Hanger



SHOVELING YOUR SIDEWALK

IT'S THE NEIGHBORLY THING TO DO!

(IT'S ALSO THE LAW)

Make Chicago safe for everyone by clearing snow and ice from the public sidewalk in front of your property.

We are all pedestrians at some point in the day, whether walking to the bus, to a car, or to a neighborhood store. Without a wide, clear path, snow and ice on the sidewalk make it difficult for everyone—especially people with disabilities, seniors, and children—to walk safely.

Be a good neighbor and offer help to those in your community who are physically unable to clear their own sidewalks.

Chicago Municipal Code, sections 4-4-310 and 10-8-180, specifies that both homes and businesses must clear snow from sidewalks next to their property.

**Please help make Chicago safe
for everyone!**



SAFE Streets for CHICAGO



LIMPIE LA NIEVE DE LA ACERA

¡ES LO QUE DEBE HACER UN BUEN VECINO!

(TAMBIEN ES LA LEY)

Ayude a hacer que Chicago sea una ciudad segura para todos y limpie la nieve y hielo de la acera pública delante de su propiedad.

Si caminamos al autobús, al carro o a la bodega, en algún momento del día, todos somos peatones. Es difícil para todos- pero especialmente para personas con discapacidades, personas de la tercera edad y niños- caminar con seguridad por la acera sin un camino ancho y limpio de nieve y hielo.

Sea un buen vecino y ofrezca su ayuda a las personas de su comunidad que no tienen la capacidad física de limpiar la acera delante de sus propiedades.

El Código Municipal de Chicago, secciones 4-4-310 y 10-8-180, especifica que las casas y negocios deben mantenerse limpios de nieve.


**¡Por favor, ayude a hacer que Chicago
sea un lugar seguro para todos!**



SAFE Streets for CHICAGO



APPENDIX E1: City of Boulder, Colo., Snow Season Newsletter



BOULDER SNOW SEASON Information and Helpful Tips

Sidewalk Snow Ordinance – RECENT CHANGES

Prompt removal of snow from sidewalks is important in Boulder because it helps facilitate safe pedestrian travel in adverse weather conditions. Many people in Boulder rely on sidewalks in order to conduct their daily affairs and virtually every trip, even those by car, includes some walking, so it's important that sidewalks are cleared of snow in a timely manner.

Boulder Revised Code Section 8-2-13 requires adult residents, property owners, agents, tenants and landlords to clear the sidewalk adjacent to their property by noon the day following a snowstorm. This includes any sidewalk that abuts the property.

Failure to remove snow before the deadline may result in a summons and/or an abatement process. Each property will only receive one warning per snow season before the abatement process begins. A warning does not have to be issued in order for a Code Enforcement Officer to issue a summons. Abatement includes the use of a private snow removal contractor to clear the sidewalks. The property owner will be charged a \$50 administrative fee along with the contractor's fee for removing the snow.

If a summons is issued, the maximum fine is \$1,000 and 90 days in jail as determined by the Municipal Judge. The fine for a first-time offense is \$100.

To report sidewalk snow removal violations, visit www.bouldercolorado.gov/ezeo or contact the Environmental and Zoning Enforcement Office at 303-441-3239.

The city will post information on sidewalk snow removal deadlines on its "Winter Tips" website, visit www.bouldercolorado.gov and select "Winter Tips" to learn more.

ICEBUSTERS sidewalk snow removal assistance

If you are physically unable to clear snow from your sidewalks the ICEBUSTERS program will pair you with someone who can help. Volunteers are also needed to help those who cannot complete the work themselves. To volunteer or to learn more, contact the Retired Senior Volunteer Program (RSVP) at 303-443-1933 or send an E-mail to richardvarnes@rsvp.org.

NEW – If the snowstorm ends prior to 5 a.m., you have until noon that day to clear sidewalks of snow and ice.

If the snowstorm ends after 5 a.m., you have until noon the following day to clear sidewalks of snow and ice.

Important Phone Numbers:

City of Boulder Transportation Maintenance
Monday-Friday (7 a.m. – 3:30 p.m.), 303-413-7162

Snow Dispatch
After hours and weekends (during snow storms), 303-413-7109

Street & Bikeway Maintenance Hotline
Operational 24-hours-a-day, 303-413-7177

City of Boulder Police Dispatch
For non-emergencies – Operational 24-hours-a-day, 303-441-3333
If it is an emergency, dial 911

Environmental and Zoning Enforcement
To report and issue with sidewalk snow removal, visit www.bouldercolorado.gov/ezeo or call 303-441-3239.

Boulder County Road Maintenance
Winter hours Monday-Friday (7:30 a.m. – 4 p.m.), 303-441-3962 or 303-441-3963. After hours and weekends, 303-441-4444 (Boulder County Sheriff Dispatch).

Xcel Energy (gas and electrical service)
Customer Service – 800-895-4999
Gas or Gas Odor – 800-895-2999

Colorado Department of Transportation
Conditions within Boulder Monday-Friday (8 a.m. – 4:30 p.m.), 303-442-4382. Highway conditions within two hours of Denver (24-hour recording), 303-639-1111 or www.cotrip.org.

Qwest (phone and internet service)
Repair and outages – 800-573-1311

Comcast (cable and internet service)
Customer service and outages – 303-930-2000

Prevent Frozen Pipes

When frigid arctic air hits, water can freeze, then expand and finally cause pipes to burst and possible flooding to occur. Avoid frozen water pipes and possible costly repairs by taking these easy precautions when cold weather is forecasted:



- Keep garage doors closed if there are water lines running through that area
- Open kitchen and bathroom cabinet doors to allow warmer air to circulate around plumbing, but be sure to move any harmful cleaners or chemicals out of children's reach
- When it's really cold outside, let the cold water drip (very minimally) from the faucet. Running water through the pipe, even at a trickle, helps prevent pipes from freezing.
- During extreme cold, keep the thermostat set to the same temperature during both the day and night.
- If you will away during cold weather, leave the heat set no lower than 55° F.

Before cold weather hits:

- Drain water from swimming pools and sprinkler supply lines, but do not add antifreeze to the lines unless directed. Antifreeze is environmentally harmful and is dangerous to most living animals and plants.
- Remove, drain and carefully store outdoor hoses
- Check around the home for other areas where water supply lines are located in unheated areas. Both hot and cold water lines in these areas should be insulated.
- Add insulation to attics, basements and crawl spaces.

In case of pipe burst, Boulder's Fire Department recommends that every member of a household know where the water shut-off valve is in the house and how to use it and encourages practicing turning the valve on and off.

Learn more about surviving the winter in Boulder visiting www.bouldercolorado.gov and clicking on "Winter Tips."

APPENDIX E1: City of Boulder, Colo., Snow Season Newsletter

(cont'd)

TEMPORADA DE NIEVE EN BOULDER

Información y consejos útiles

Reglamento municipal de nieve en las aceras – cambio reciente

Quitar a tiempo la nieve de las aceras es importante en Boulder porque ayuda a facilitar el tránsito de los peatones en condiciones climáticas adversas. Muchas personas en Boulder cuentan con las aceras para realizar sus quehaceres diarios y virtualmente cada viaje, incluso en automóvil, conlleva algo de caminar, por eso es importante que las aceras estén libres de nieve a su debido tiempo.

La Sección 8-2-13 del Código Revisado de Boulder requiere que los residentes adultos, propietarios de propiedades, agentes, inquilinos y dueños limpien las aceras adyacentes a su propiedad para el mediodía del día después de una tormenta de nieve. Esto incluye cualquier acera colindante con la propiedad.

NUEVO – Si la tormenta de nieve termina antes de las 5 a.m., usted tiene hasta el mediodía de ese día para limpiar la nieve y el hielo de las aceras..

Si la tormenta de nieve termina después de las 5 a.m., usted tiene hasta el mediodía del día siguiente para limpiar la nieve y el hielo de las aceras.

El no quitar la nieve antes del tiempo límite puede tener como resultado una citación y/o un proceso de mitigación. Cada propiedad recibirá sólo una advertencia por temporada de nieve antes de comenzar el proceso de mitigación. No es necesario dar una advertencia para que un Oficial de Cumplimiento de Código dé una citación. La mitigación incluye el uso de un contratista privado de limpieza de nieve para limpiar las aceras. El dueño de la propiedad tendrá que pagar una tarifa administrativa de \$50 más lo que cobre el contratista por quitar la nieve.

Si se da una citación, la multa máxima es de \$1,000 y 90 días en la cárcel según lo determine el Juez Municipal. La multa por una primera infracción es de \$100.

Para reportar violaciones a la limpieza de la nieve en las aceras, visite www.bouldercolorado.gov/ezeo o comuníquese con la Oficina de Cumplimiento Ambiental y Zonificación al 303-441-3239.

La ciudad publicará información sobre los tiempos límites para quitar la nieve de las aceras en su sitio "Consejos de Invierno", visite www.bouldercolorado.gov y seleccione "Consejos de Invierno" para saber más.

ICEBUSTERS

asistencia para quitar la nieve de las aceras

Si usted no puede físicamente quitar la nieve de sus aceras, el programa ICEBUSTERS lo reunirá con alguien que pueda ayudarlo. También se necesitan voluntarios para ayudar a quienes no pueden completar el trabajo por sí mismos.

Para ser voluntario o para saber más, comuníquese con el Programa de Voluntarios para Mayores Jubilados (RSVP) al 303-443-1933 o por correo electrónico: richardvarnes@rsvp.org.

Evite que se congelen las tuberías

Cuando llega el aire ártico helado, el agua puede congelarse y expandirse hasta provocar que las tuberías se rompan y haya posibles derrames. Evite que se congelen las tuberías y las posibles reparaciones costosas tomando estas fáciles precauciones cuando se anuncia que hará frío:

- Mantenga cerradas las puertas del garaje si hay tuberías de agua en ese lugar.
- Abra las alacenas de la cocina y el baño para permitir que el aire caliente circule alrededor de las tuberías, pero asegúrese de quitar cualquier limpiador o químico peligroso para que no quede al alcance de los niños.
- Cuando haga verdaderamente mucho frío afuera, deje gotear el agua fría (apenitas) del grifo. El agua que circula por la tubería, aunque sea una cantidad mínima, ayuda a evitar que se congele la tubería.
- Durante el frío extremo, mantenga el termostato en la misma temperatura tanto de día como de noche.
- Si se ausentará durante el tiempo frío, deje el termostato a 55° F como mínimo.

Antes de que llegue el frío:

- Saque el agua de las piscinas y drene el agua de las tuberías de suministro de las regaderas de jardín, pero no agregue anticongelante a menos que se lo indiquen. El anticongelante es dañino para el medio ambiente y es peligroso para la mayoría de los seres vivos y las plantas.
- Quite, drene y guarde cuidadosamente las mangueras para exteriores.
- Revise los alrededores de la casa para ver dónde hay otras áreas con tuberías de suministro de agua que se encuentren en lugares sin calefacción. Las tuberías tanto de agua fría como caliente de esas áreas deben aislarse contra el frío.
- Agregue aislamiento a los áticos, sótanos y semi-sótanos.


En el caso de que una tubería se rompa, el Departamento de Bomberos de Boulder recomienda que cada miembro de la casa sepa dónde se encuentra la válvula de cierre de suministro de agua de la casa y que sepa cómo usarla y anima a que practique abrir y cerrar la válvula.

Teléfonos importantes:

<p>Mantenimiento del Transporte de la Ciudad de Boulder Lunes a viernes (7 a.m. – 3:30 p.m.), 303-413-7162</p> <p>Despacho de Nieve Después del horario normal y fines de semana (durante tormentas de nieve), 303-413-7109</p> <p>Línea de Ayuda de Mantenimiento de Calles y Senderos para Bicicletas Funciona las 24 horas del día, 303-413-7177</p> <p>Despacho de la Policía de la Ciudad de Boulder Para asuntos que no sean emergencias – Funciona las 24 horas del día, 303-441-3333 Si es una emergencia, marque 911</p>	<p>Cumplimiento Ambiental y Zonificación Para reportar un problema con la limpieza de la nieve en las aceras, visite www.bouldercolorado.gov/ezeo o llame al 303-441-3239.</p> <p>Mantenimiento de Carreteras del Condado de Boulder Horario de invierno, lunes-viernes (7:30 a.m. – 4 p.m.), 303-441-3962 o 303-441-3963. Después del horario normal y fines de semana, 303-441-4444 (Despacho del Sheriff del Condado de Boulder)</p> <p>Xcel Energy (servicio de gas y electricidad) Atención al cliente – 800-895-4999 Gas u olor a gas – 800-895-2999</p>	<p>Departamento de Transporte de Colorado Condiciones dentro de Boulder, lunes-viernes (8 a.m. – 4:30 p.m.), 303-442-4382. Condiciones de carreteras dentro de dos horas de Denver (mensaje grabado las 24 horas), 303-639-1111 o www.cotrip.org.</p> <p>Qwest (servicio telefónico y de Internet) Reparaciones y pérdida de servicio – 800-573-1311</p> <p>Comcast (servicio de cable y de Internet) Atención al cliente y pérdida de servicio – 303-930-2000</p>
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Aprenda más sobre cómo sobrevivir el invierno en Boulder visitando www.bouldercolorado.gov y haciendo clic en "Consejos de Invierno".


APPENDIX E2: City of Champaign, Ill., Information About Designated Snow-Removal Areas



City of Champaign
Neighborhood
Services
Department

Sidewalk Snow Removal

**City of Champaign
University District &
Downtown Champaign**




Designated Snow Removal Areas

University District

Defined boundaries begin at the intersection of University at First, east along University to Wright. South on Wright to Windsor. West on Windsor to Neil. North on Neil to Springfield. East on Springfield to First. Ending north on First at University.

Downtown Business District


Defined as that area bounded by Columbia on the north, State on the west, Springfield on the south and Second on the east.



**City of
CHAMPAIGN**

Neighborhood Services Department
Code Compliance Division
102 North Neil Street
Champaign, IL 61820
Phone- (217) 403-7070
Fax- (217) 403-7090
www.ci.champaign.il.us
CGTV—Cable Channel 5

Designated Snow Removal Areas



**Pursuant to Section 9-5
of the City's Municipal Code
as amended**

APPENDIX E2: City of Champaign, Ill., Information About Designated Snow-Removal Areas *(cont'd)*

Champaign University District and Downtown

Who is responsible?

- Beginning November 1, 2007, owners of property located within the University District and the Downtown area are responsible for removing snow, ice, sleet or freezing rain from the sidewalk adjacent to their property.

What area has to be cleared?

- A path the width of the sidewalk or 48", whichever is less, is required to be maintained.
- If an owner has property at a corner location, the owner is also responsible for removing the snow, ice, sleet or freezing rain from the accessible ramps so that pedestrian access is provided from block to block.
- If the snow, ice, sleet or freezing rain has become so hard that it can not be removed without damage to the sidewalk, the owner is required to apply an abrasive, such as sand or salt, so that the path is safe.

When does this ordinance apply?

- The ordinance applies when accumulations are of 2" or greater.

Who determines accumulation and what is the time frame?

- The City of Champaign Public Works Director will publicly declare when the ordinance requirements are officially in effect. Owners then have 48 hours to comply with the declaration.

Who can you call to help with clearance?

- Private snow removal contractors may be identified by utilizing the Yellow Pages in the Champaign telephone book. Otherwise, the City's Neighborhood Services Department will maintain a list of volunteer resources that may be able to assist owners with removal.

What if an owner doesn't comply?

- If an owner does not comply with these requirements, the City will notify the owner of the requirement. If the owner is not responsive to the order to comply, the City will provide for removal and bill the property owner for the costs plus an additional administrative fee.

How will you know?

- Watch and listen for Sidewalk Snow Removal announcements on Cable Channel 5 (CGTV), the City's web site at www.ci.champaign.il.us; and the local media outlets.

These ordinance requirements

DO NOT APPLY to property located outside of the designated areas.



APPENDIX E3: City of Omaha, Neb., Snow Plan and Winter Operation Procedures Brochure



❄️ Don't Move Snow into the Street

It is a violation of the Omaha Municipal Code to shovel, blow or plow snow onto an alley or street. The Public Works Department may remove improperly placed snow from a street or alley. The cost of the removal will be charged to the responsible property. Report violations to 444-4919.

We have all faced the problem of driving on a plowed street only to run into a spot where someone has placed snow onto the street. This is a significant hazard to drivers.

Your help is greatly appreciated!

❄️ Good Neighbor Policy

Many people require assistance after a snowstorm. The elderly and disabled often need help removing snow from their sidewalks and driveways. Some people require transportation or other assistance. Many organizations are looking for volunteers to assist those in need during and after snow events.



❄️ Major Streets

In the event of a winter storm, the Public Works Department will clear major streets of ice and snow as soon as possible. Major streets are defined as commuter routes and collector streets in neighborhoods.

The time necessary to achieve this goal varies significantly with the amount of snow and the length of the snowfall. Snow removal on major streets continues after the end of the storm.

❄️ Interstate and Expressway Systems

The Nebraska Department of Roads, 595-2497, removes the snow and ice from the Interstate System, Kennedy Expressway, North Expressway and West Dodge Expressway.

❄️ Additional Information

For additional information, visit the City's website at www.cityofomaha.org and click on the Snow Button. Off season, this information can be found under the Public Works Department.

Requests for snow removal, snow operations information, and for any street maintenance or street repair activity may be directed to the Omaha Street Maintenance Division at 444-4919.



CITY OF OMAHA
PUBLIC WORKS DEPARTMENT
STREET MAINTENANCE DIVISION

Snow Plan and Winter Operation Procedures
October 2010



City of Omaha
Jim Suttle, Mayor

www.cityofomaha.org Twitter: @Omahapublicwrks

APPENDIX E3: City of Omaha, Neb., Snow Plan and Winter Operation Procedures Brochure (cont'd)

Snow Emergencies

The City of Omaha, Public Works Department strives to provide effective snow and ice removal to allow motorists to travel safely within the City during winter weather. Each snowstorm is unique, and the snow or ice control operation changes depending on the amount, type and intensity of the precipitation. Motorists should always exercise caution and drive appropriately for the road conditions.

Residential Streets

Residential streets provide access to homes and businesses. They are not high volume thorough streets. Clearing of residential streets will begin soon after accumulating snowfall ends.

Parking Restrictions

Omaha will declare a snow emergency when conditions warrant. Parking is not permitted on snow routes. Parking on streets east of 72nd Street must comply with the odd/even parking plan. Park on the odd number side of the street on odd calendar days. Park on the even number side of the street on even calendar days.

Please Clear Your Sidewalks

The Omaha Municipal Code requires all sidewalks to be shoveled within 24 hours after the City's major streets are cleared. We need your cooperation to keep your sidewalks safe and passable. Report uncleared sidewalks at 444-5283.



No Parking Signs in Residential Neighborhoods



No parking zones indicated by this sign are waived during a snow emergency. The odd/even side parking rules apply.

No parking zones indicated by these signs are always in effect, even during a snow emergency.



During a snow emergency, a handicap parking stall may be used by a properly tagged vehicle only when parking is permitted on the side of the street where the stall is marked.



Snow Plowed on Sidewalks and Driveways

Snow on the street is plowed to the curb. Previously cleared sidewalks and driveways may be re-covered with snow. The Public Works Department asks for property owners' cooperation in removing the snow again. Cleared sidewalks provide a safe walkway for pedestrians, including school children.

Mailboxes and Fire Hydrants

Curbside mailboxes and fire hydrants may become blocked by plowed snow. The U.S. Post Office has a policy regarding access to mailboxes. The U.S. Post Office does not require all snow to be removed from the mailbox, but enough to allow the mail trucks to drive up to the mailbox for delivery. This is the responsibility of the postal customer.

Removing snow around fire hydrants greatly assists the Fire Department. It is important that fire hydrants be visible and accessible at all times.



Snow and Ice Control

In response to most snow and ice events, the roads are treated with salt or a salt / sand mixture. If conditions and accumulations warrant, the City switches to plowing operation.

Sand Barrels

The Street Maintenance Division takes sand barrel requests from October 1 through November 30. Street Maintenance may not be able to comply with requests taken after November 30. Requests will be reviewed and if street conditions warrant, a sand barrel will be placed at the requested location.



APPENDIX F: City of Fargo, N.Dak., Citizen Snow-Removal Financial-Assistance Application

REQUEST FOR FINANCIAL ASSISTANCE FOR PAYMENT OF SNOW REMOVAL - APPLICATION Fargo Community Development Program 2011-2012

SECTION A: GENERAL INFORMATION		
Name:	# of People in Household:	Date:
Address:	Home Phone:	Work:
SECTION B: ANNUAL INCOME		SECTION C: RACE/ETHNICITY
Applicant: \$ _____	The Applicant is: <input type="checkbox"/> White <input type="checkbox"/> Hispanic <input type="checkbox"/> Black/African American <input type="checkbox"/> Asian <input type="checkbox"/> American Indian/Alaskan Native <input type="checkbox"/> Native Hawaiian/Other Pacific Islander <input type="checkbox"/> American Indian/Alaskan Native & White <input type="checkbox"/> Asian & White <input type="checkbox"/> Black/African American & White <input type="checkbox"/> American Indian/Alaskan Native & Black <input type="checkbox"/> Other Multi-Racial	
Spouse: \$ _____		
Other Dependents: \$ _____ (Over Age 15)		
Total Income: \$ _____		
SECTION D: CERTIFICATION		

I certify that to the best of my knowledge all the above information is correct. I understand that if I have knowingly given false information, I will not be eligible to receive any assistance and may be subject to other penalties.

Signature of Applicant

Date

REQUIRED DOCUMENTATION - PLEASE NOTE !!!

This Program requires that you complete and sign the attached "Income Worksheet" (form attached) with your application for assistance. **Send the following five items to our Office:**

- ***Completed Application Form***
- ***Signed and Completed Income Determination Worksheet***
- ***Statement of Social Security Benefits for 2010***
- ***Statement of Pension for 2010***
- ***Statement of interest income for 2010***

If you have any questions when filling out this application, please call Monica Graber in Planning at 241-1474.

NOTE: Race/Ethnicity info is obtained for statistical purposes only. Data will not be considered by any local or Federal official in determining the applicant's eligibility.

SEND APPLICATION TO:
MONICA GRABER
FARGO PLANNING & DEVELOPMENT
200 3RD STREET NORTH
FARGO, ND 58102



APPENDIX G: IPA “Sidewalk Snow Removal: Issues and Best Practices” Workshop Agenda



180 Graham Hall / University of Delaware / Newark, DE 19716-7380 / USA

phone / 302-831-8971
fax / 302-831-3488
email / ipa@udel.edu

serving the public good, shaping tomorrow's leaders

Workshop Agenda

Sidewalk Snow Removal: Issues and Best Practices

Wednesday, April 6, 2011

8:30 a.m. – 11:30 a.m.

UD Perkins Student Center, Ewing Room

325 Academy Street

Newark, Delaware 19716

8:30 a.m. – 9:00 a.m.	Registration/Sign-In Continental Breakfast	Edward O'Donnell, IPA Policy Scientist and AICP
9:00 a.m. – 9:15 a.m.	Welcome/Introductions Overview of Workshop Review Agenda	Edward O'Donnell
9:15 a.m. – 10:00 a.m.	Project Presentation Overview of Project Why Maintain Sidewalks? Study Methodology: <ul style="list-style-type: none"> • Research of management plans for sidewalk snow removal • Analysis of Delaware local government snow removal policies • Field observation 	Edward O'Donnell Marcia Scott, IPA Associate Policy Scientist Brandon Rudd, Graduate Research Assistant Hilary Primack, Public Service Fellow
10:00 a.m. – 10:10 a.m.	Break	
10:10 a.m. – 11:20 a.m.	Workshop Discussion	Edward O'Donnell
11:20 a.m. – 11:30 a.m.	Wrap-Up	Edward O'Donnell

Notes: Parking is available in the adjacent University of Delaware Perkins Student Center garage.
Please bring your parking ticket with you to the workshop, and we will validate it for you.

APPENDIX H: IPA “Sidewalk Snow Removal: Issues and Best Practices” Presentation

Dare to be first.
UNIVERSITY of DELAWARE.

Sidewalk Snow Removal Issues and Best Practices

Presented by
Edward O'Donnell, Marcia Scott, Lisa Moreland,
Brandon Rudd, and Hilary Primack

Working Group Meeting
Perkins Student Center, University of Delaware
April 6, 2011

—In Cooperation with the Delaware Department of Transportation—

INSTITUTE FOR PUBLIC ADMINISTRATION • SCHOOL OF PUBLIC POLICY & ADMINISTRATION • COLLEGE OF ARTS & SCIENCES

UNIVERSITY of DELAWARE

Introductions

- **IPA Project Team**
 - Ed O'Donnell, AICP and Policy Scientist
 - Marcia Scott, Associate Policy Scientist
 - Lisa Moreland, Associate Policy Scientist
 - Brandon Rudd, Graduate Research Assistant
 - Hilary Primack, Public Service Fellow
- **Working Group Members**
 - Local government leaders and public works officials
 - DelDOT representatives
 - MPO representatives
 - DEDO's Downtown Delaware

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Purpose of Study

- Clarify and better coordinate responsibilities for sidewalk snow removal
- Improve the timely removal of sidewalk snow
- Ensure ADA compliance, particularly “maintenance of accessible features”
- Determine how best practices in Snowbelt regions may inform procedures in Delaware
- Consider innovative solutions to issues

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Problem Statement

- Sidewalks and pedestrian infrastructure are critical parts of the transportation system
- Accessible public facilities are not consistently maintained following snowstorms
 - Lack of awareness of mobility needs of individuals who do not drive, rely on transit, or walk to school
 - Confusion over responsibilities
 - Lax enforcement of local government ordinances
 - Difficulties faced by elderly and disabled property owners with shoveling snow
 - Need for improved communications

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Why Maintain Sidewalks?

- Ensure public safety
- Provide connectivity and access
- Support health and multi-modal mobility needs
- Safeguard public assets
- It's the law!
 - ADA
 - Local ordinances



Source: 2011 League of Women Voters, Newton, Massachusetts

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2010 ADA Standards for Accessible Design

State and local government facilities must follow the requirements of the 2010 Standards:

- ADA Title II Regulations at 28 CFR 35.151
- 2004 ADAAG at 36 CFR 1191, Appendices B & D

28 CFR
part
35.151

+

2004
ADAAG

=

2010 ADA
Standards
for
Accessible
Design

Source: 2010 ADA Standards for Accessible Design

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APPENDIX H: IPA “Sidewalk Snow Removal: Issues and Best Practices” Presentation *(cont’d)*

Maintenance of Accessible Features
28 CFR 35.133 and ADA Title II, II-3.10000

“Public entities must maintain in working order equipment and features of facilities that are required to provide ready access to individuals with disabilities.”

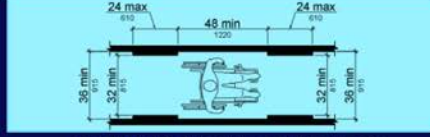
“Where a public entity must provide an accessible route, the route must remain accessible and not blocked by obstacles...”



Source: ADA Title II Technical Assistance Manual Covering State and Local Government Programs and Services

2010 ADA Standards
Chapter 4: Accessible Routes

Sec 403.5.1 Clear Width
 “...The clear width of walking surfaces shall be 36 inches minimum” (exceptions apply)




Clear Width of an Accessible Route

Source: 2010 ADA Standards for Accessible Design

Snow and Lawsuits – Salt Institute

- 83% of agencies surveyed nationally have a written policy requiring homeowners to remove snow within 24 hours after the end of a snowstorm
- 70% of the surveyed agencies do not enforce it
- 58% of the agencies surveyed have been sued



Source: The News Journal, E. Varisco

Study Methodology

1. Research of management plans for sidewalk snow removal
2. Analysis of Delaware local government sidewalk snow removal policies and programs
3. Field observation of sidewalk snow removal practices

1. Research of Management Plans for Sidewalk Snow Removal
An Analysis of Best Practices in the United States and Canada



Source: 2011 League of Women Voters, Newton, Massachusetts

Snow Removal Management Plans

- Research process
- Purpose of plans
- Common components
- Important criteria:
 - Working committee
 - Data collection
 - Timely updates
 - Communications




APPENDIX H: IPA “Sidewalk Snow Removal: Issues and Best Practices” Presentation (cont’d)

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Disaster Readiness and Response Plan: Seattle, Washington

- SDOT's snow removal management plan is guided by:
 - 2010 Disaster Readiness and Response Plan (snow)
 - Activation of EOC
 - Pedestrian Master Plan criteria



Source: Seattle Department of Transportation

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Snow Removal Management Plan: Calgary, Canada

Focuses on both roadways and sidewalks

- Outlines citizen responsibilities
- Provides response guidelines for management and operating personnel
- Outlines priority areas



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MAPC Snow Removal Policy Toolkit

Six Components:

- Implications of recent lawsuits
- Sidewalk snow clearance policies map
- Boston Region Pedestrian Transportation Plan
- Ordinance comparison table
- Ordinance examples
- Sample brochures

Cambridge, Massachusetts: Online Sidewalk Snow Removal Reporting System



Source: MAPC Snow Removal Policy Toolkit

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Ordinances Governing Sidewalk Snow Removal Responsibilities

- Municipality vs. property owner
- Ordinances should:
 - Be consistent with ADA
 - Specify responsibilities
 - Provide response timeline
- Inspection
- Enforcement
 - Need consistency
 - Need penalties

Have you Shovelled?

If you own a property or business please remember to do the following:

- Maintain all sidewalks abutting your property or business in a non-slippery condition free of ice and snow.
- If you are out of town, or are unable to clear ice and snow due to physical limitations, please be sure to have someone else prepared to maintain the sidewalk for you.
- Clear openings at intersections and crosswalks so pedestrians can cross safely.
- Always have a supply of ice-melt (CaCl₂ or KCl) on hand and apply frequently after a storm and during the winter season to prevent snow from packing down and forming ice.
- Whenever possible please help to assist your Public Safety Departments by clearing catch basins and snow covered fire hydrants adjacent to your property. Remember, every second counts during an emergency.

Source: Town of Brookline, Massachusetts

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Sidewalk Snow Removal Ordinance: Madison, Wisconsin

Requires property owners to:

- Remove sidewalk snow by 12 noon the following day after a snowfall
- Clear adjacent curb ramps
- Use de-icers to maintain conditions
- Pay escalating fines each day of noncompliance
- Pay additional assessment if city clears sidewalk



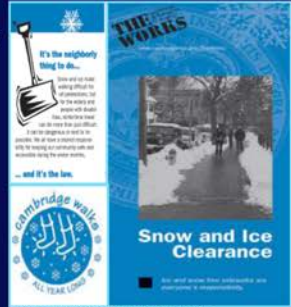
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Communication

- Internal and external communications plan
 - Clarify responsibility
- Types
 - Door hangers
 - Brochures
 - Telephone hotline
 - Television, radio, and newspapers
 - Internet
 - Websites
 - Social Media



Source: MAPC Snow Removal Policy Toolkit

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Service Standards and Priorities

- Timeline
- Levels of Service
 - Accurate estimate
 - Charts and maps
- **Bloomington, Minnesota – Plows both streets and sidewalks:**
 - First priority: School walking areas, heavily used wheelchair accessible areas, and high-use areas by main roads
 - Second priority: Walks expanding out from the school and along major roads
 - Third priority: Residential and industrial areas



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Citizen Assistance Programs


Canada	United States
	
<ul style="list-style-type: none"> – Calgary – Winnipeg – Edmonton – Guelph/Wellington 	<ul style="list-style-type: none"> – Fargo, North Dakota – Boulder, Colorado – Aurora, Colorado – Brookline, Massachusetts

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Enforcement

- Importance
- Clarity
 - Time period
 - Penalties
 - Abatement fees
- Complaints



Source: Radnor Township, Pennsylvania

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Sidewalk Snow Removal Innovations



Photo Sources: APWA, City of Toronto

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2. Research on Delaware Local Government Sidewalk Snow Removal Policies and Programs

Analysis of Current Regulations Governing Sidewalk Snow Removal, Enforcement, and Penalties



Source: The News Journal, R. Craig

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Summary of Delaware Local Regulations

- Requested information from 60 Delaware local governments
- 48 out of 57 municipalities gave information
- 42 have sidewalk snow removal ordinances
- 6 have no regulations
- Most have snow shoveling timelines for property owners

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Summary of Delaware Local Regulations


- **Communication methods:**
 - Most use town newsletters and/or websites
 - Some use social media or television
- **Fines for lack of snow removal range from \$1 to \$1,000**
- **Lax enforcement of regulations**
- **Some municipalities have programs to aid the removal of snow for the elderly and/or people with disabilities**

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3. Field Observation

Photographs of Sidewalk Snow Removal Efforts January 2011




Source: The News Journal, J. Williams

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3. Field Observation

- **IPA Project Team took photos:**
 - In advance of major January 2011 snow events
 - Following major January 21 and 26 snowstorms
- **Observed “acceptable” and “unacceptable” sidewalk snow removal practices**



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Preparation



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Sidewalk Snow Removal – Timeliness



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Sidewalk Snow Removal – Width

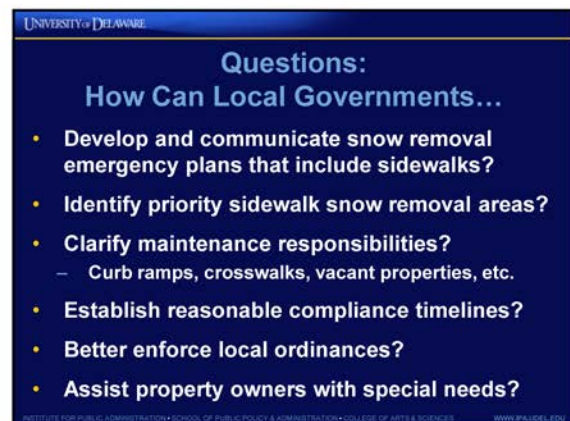


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APPENDIX H: IPA “Sidewalk Snow Removal: Issues and Best Practices” Presentation *(cont’d)*



APPENDIX I: IPA Working-Group Participants

IPA Working Group Research of Management Plans for Sidewalk Snow Removal

Name	Jurisdiction or Organization
Anthony Aglio	Bicycle Coordinator, DelDOT
Allen Atkins	Public Works Supervisor, Town of Milton
Alfonso Ballard	Public Works Director, City of Wilmington
Roger Bowman	Grounds Services Manager, University of Delaware
Marco Boyce	Planning Supervisor, DelDOT
Matheu J. Carter	Delaware T ² Center, Municipal Engineer Circuit Rider
Sarah Coakley	Safe Routes to School Coordinator, DelDOT
Heather Dunigan	Principal Planner, WILMAPCO
Charlie Emerson	Parks and Recreation Director, City of Newark
John (J.R.) Ennis	Development and Outreach Coordinator, DEDO
Bobbie Geier	Planning Supervisor, DelDOT
John Giles	Town Manager, Town of Elsmere
John Hanlin	Mayor, Town of Townsend
Bonnie Hitch	Customer Service Manager, DART
Wendy King	Town Manager, Town of Newport
Scott Koenig	Public Works Director, City of Dover
Richard Lapointe	Public Works Director, City of Newark
Kathleen Layton	Public Liaison, Dover/Kent County MPO
Rusty Lee	Director, Delaware T ² Center
Charles McMullen	Public Works Director, Town of Ocean View
John Ness	Councilmember, Town of Townsend
Ralph Reeb	Assistant Director, DelDOT Planning Division
Rich Sinegar	Statewide Pedestrian Coordinator, DelDOT
John Sisson	Projects and Facilities Manager, DART
Kyle Sonnenberg	City Manager, City of Newark
Jeff Swift	Acting Property Maintenance Director, New Castle County
Brian Urbanek	DelDOT Maintenance and Operations Division
Brett Warner	Public Works Director, Town of Bethany Beach
Joseph Wright	DelDOT Director of Maintenance and Operations

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