



By Pat Kennedy, P.E.
Contributing Author

Blanket response

When snow covers area, plows need to hit all sections

Most urban emergency snow-response programs focus on one aspect of travel: the automobile.

Plow routes are designed to move vehicular traffic safely around the city. However, lifestyle changes are occurring now and people are using alternate modes of travel. Mass transit like light rail and bus, bicycles and pedestrian travel are becoming commonplace. Pockets of high-density housing become focal points for these alternative travel modes. Snow-response plans must be reviewed to ensure the various travel methods are addressed.

Getting to everything

To accommodate the multimodal urban environment, street construction includes dedicated travel ways for each mode. High-occupancy vehicle (HOV) lanes are often separated from other lanes with vertical barriers and require separate plowing operations. Cycle tracks are on-street bike lanes and may or may not have physical separation from auto lanes. To accommodate these facilities vehicle lanes and parking areas are reduced or eliminated, resulting in diminished areas for snow storage. Pedestrian paths and sidewalks may need different equipment, and reliance on citizen effort is necessary in most cities to keep them clear. Above all of this, it is important to

Pedestrian paths and sidewalks may need different equipment, and reliance on citizens is necessary in most cities to keep them clear.



remember disabled persons have a difficult time navigating the urban environment. Snow response, or lack thereof, can have the unintended consequence of creating additional barriers.

Street construction frequently involves the use of roundabouts and intersection bulb outs. These are good for traffic calming, but create difficulties for winter response. Snow storage is adversely affected; plows can have a hard time navigating the turns, and drainage can be an issue. Snow managers need to be aware of these installations and ensure their equipment can safely maneuver and effectively plow these areas. The center of a roundabout may be an inviting place for snow storage, but with most roundabout construction the pavement slopes away from the center, and melt from the middle will sheet across the pavement with the potential to refreeze. Bulb outs and other traffic-calming or channeling devices can be difficult to see during falling snow and are difficult to fully clean.

On-street dedicated bike lanes are common in most cities. Minneapolis has nearly 50 lane-miles; Denver has just hit the 100-mile mark. Winter weather is not foreign to either city, and with a dedicated bicycling constituency, snow response must take into consideration the cycling traffic. Clearing snow from cycle tracks with a physical separation barrier may require different equipment, bringing with it added capital equipment costs and increased manpower needs. Vehicular traffic will scatter and eliminate the last vestiges of snow and slush after plows have come through. This may not be the case with bicycle lanes. This, plus some of the dry deicers or sands that may be placed, can add to the hazards of cycling in the winter. Managers must be aware of these concerns and be able to adjust plowing plans to account for changes to traffic lanes, loss of snow-storage areas and the dangers of mixing vehicles with bicycles during inclement weather.

When snow is actively falling lane stripes can become obliterated by accumulating

snow. When lane definition is unclear, confusion can ensue as to where each mode of travel should be. Additionally, many types of striping materials can become slick with moisture. It is important that cyclists are made aware of the changing environment during the weather event.

Establishing a delineated bicycle network involves a significant capital investment for signage and striping. The act of plowing and distribution of deicers can have a damaging and corrosive effect to all parts of the transportation infrastructure. Managers should consult with their material suppliers to ensure the products they are using will last as long as expected.

Maintaining clear paths for pedestrians brings along a whole host of other problems. Most cities require the abutting property owner to clear walks within a few hours to a day after the end of a storm. Failure to remove snow from a single property can create a barrier for wheelchairs and increase the difficulty for other pedestrians. The adjacent property does not have to be inhabited by an apathetic citizen—vacant properties, elderly, sick or disabled citizens can lead to lack of clearing of a walk.

Cities can have ordinances to make clearing a requirement, but compliance can often be better achieved through the use of “Good Buddy” or “Friendly Neighbor” programs.

Another common problem can arise when sidewalks are immediately adjacent to curbs along street-plow routes. Plows are trying to clear streets fully to create a safe environment and clear drainage paths, but this can result in snow and ice being pushed onto walks. A continual no-win battle can ensue between the person trying to clear their walk and the plow trying to clear the street. The traveling public is the loser in both cases. Well-trained plow drivers and a plow plan taking this into consideration can reduce these conflicts. On

some streets it may be possible to push all snow to one side of the street, preferably the sunny side, to speed melt and utilize a larger snow-storage area. In order to do this plowing must be coordinated using trucks in echelon or rapid turnaround to keep the travel lanes clear of snow berms.

Pedestrians also have bridges and other structures along their routes. As with all bridges, it is rarely possible to throw snow directly off the structure so it must be stored at the bridge approach areas or windrowed along the structure. Pedestrian structures are often narrow with difficult approaches and using large equipment is not possible. Hand shoveling or smaller equipment must then be employed.

During and in the days following a snow-storm, travel is difficult and can have increased hazards, but for members of our society with disabilities it can become impossible. It is important that snow programs are designed to try as best as possible to account for the needs of those citizens. Plows can do a great job of clearing travel lanes, but the berms they throw to the side can block bus stops, crosswalks and pedestrian ramps. High-pedestrian-traffic areas should be cleared of these barriers and as previously stated, all walks cleared to a width that allows for the safe passage of wheelchairs. Truncated domes at the base of pedestrian curb ramps can collect snow and ice. These become a hazard to all pedestrians. Special attention, whether through the use of ice-melt

products or other mechanical means, should be employed to clear these areas.

Everybody involved

In all cities it is important to have a detailed snow program that clearly defines the general response but also addresses the complexities of a multimodal transportation system. Elected officials, managers, operators and citizens need to be part of the design process. Officials and managers may have the big picture in mind, but the operators know the capabilities of the equipment and the resources that may be needed to provide the requested level of service (LOS).

The final plan and associated LOS must be communicated to the public on a continual basis throughout the season using all available resources. There will always be the citizen that wants it all, immediately and at no cost to the taxpayer, so it is important as well that the customer service staff is trained on what the plans are and what the citizens can expect. A simple set of talking points addressing the various details of a multimodal snow response can keep the message clear and concise and consistent to all citizens. An example of a talking point for the cycling community is that dedicated bike lanes should be viewed as shared bike lanes while a storm is in progress and until pavement is cleared to bare pavement and striping is again visible.

Probably one of the most important things to keep in mind as part of a snow-response team is to be flexible. No two storms are the same: Moisture content, wind, temperature, time of day and duration can all impact and require an altered response plan. Buses, cars, bikes and pedestrians have competing needs, and the managers and operators need to be able to adjust response to avoid creating a clear path for one at the expense of another.

The multimodal world is growing and snow operations are no longer just plowing the streets for cars. The snow responders of today can stay ahead by growing and learning at the same time. **R&B**



Establishing a delineated bicycle network involves a significant capital investment for signage and striping. The act of plowing and distribution of deicers can have a damaging and corrosive effect to all parts of the transportation infrastructure.

Kennedy is with Denver Public Works.

For more information about this topic, check out the Maintenance Channel at www.roadbridges.com.