APPENDIX B – TRAFFIC CALMING ON SNOW REMOVAL ROUTES

This section identifies applicable traffic calming devices and the unique physical design considerations necessary to implement traffic calming in geographic areas of the county that receive snowfall. The guidelines in this chapter apply to those geographic areas above 2,000 feet. At first glance, traffic calming would seem difficult in areas of snowfall due to the needs of snow removal equipment. However, a review of other jurisdictions' traffic calming practices[5] in areas of snowfall has proven otherwise. Many jurisdictions have adapted their approach to snow removal, allowing the coexistence of traffic calming on snow removal routes.

Experience shows that typical traffic calming devices do not prevent snow removal or create unsafe conditions due to residual snow build-up. The best practices for snow removal on streets where traffic calming measures have been installed include:

- Using modified equipment to accommodate traffic calming measures, such as rubber-tipped plows or rollers attached to the underside.
- Assigning staff to set routes, creating familiarity with traffic calming device locations.
- Appropriately marking the location of traffic calming devices.
- Customizing the geometric design of traffic calming devices.

The concepts presented above represent techniques employed by other agencies and does not imply changes will be made to the DPW's current practice for snow removal.

APPLICABLE TRAFFIC CALMING DEVICES

Table B-1 summarizes the traffic calming devices applicable on snow removal routes. To determine which device(s) is most appropriate given the traffic related concern, location of concern, and roadway constraints, refer to Tables 1 through 3 in Chapter 3. The DPW, at their discretion, may elect to construct any of the devices shown in Table B-1 in a temporary fashion during the summer months.

[5] Based on information contained in *Traffic Calming: State of the Practice* (Ewing, Reid H., ITE and FHA *1999), Traffic Calming Practice Revisited (Ewing, R., Brown, S., Hoyt, A., 2005), and City of Grass Valley Neighborhood Traffic Calming Program*, (2002).

TABLE B-1 APPLICABLITY OF PHYSICAL TRAFFIC CALMING DEVICES ON SNOW REMOVAL ROUTES		
Type of Measure	**Applicability above 2,000 feet**	
	No	**Yes**
Speed Control – Narrowing Measures		
Neckdown/Bulbout	√	
Center Island Narrowing/ Pedestrian Refuge	√	
Two-Lane Choker		√
One-Lane Choker	√	
Speed Control – Horizontal Measures		
Traffic Circle		√
Roundabout (Single-Lane)		√
Chicane		√
Lateral Shift	√	
Realigned Intersection		√
Speed Control – Vertical Measures[1]		
Speed Hump	√	
Speed Lump	√	
Speed Cushion	√	
Speed Table	√	
Raised Crosswalk	√	
Raised Intersection	√	
Textured Pavement		√
Rumble Strips[2]		√
Volume Control Measures		
Full Closure		√
Partial Closure	√	
Diagonal Diverter	√	
Median Barrier	√	
Forced Turn Island	√	
Notes: [1] Vertical devices should be constructed with a sinusoidal profile. [2] Rumble strips should not be constructed with raised pavement markers.		

DESIGN CONSIDERATIONS

This section summarizes various techniques for designing traffic calming measures in areas of snowfall. The techniques presented below do not represent detailed engineering designs, but rather principles to consider in such situations.

Vertical Deflection Devices

Most snowplows are capable of climbing the gentle rise of vertical devices such as speed humps, which rise to an approximate height of three inches over a six foot distance (4 percent).

Consider a sinusoidal profile for speed humps and/or speed lumps rather than a parabolic profile. The sinusoidal profile creates a zero slope gradient at the point where the hump meets the asphalt. The gradual slope allows a gentler transition of the plow blade over the hump.

Design speed tables or raised crosswalks with the above profile, or with a flat-topped ramp with sloping profiles of three to six percent. Residual snow build-up may accumulate on the down slope of vertical devices, and salt or sand applications may help to remove residual build-up.

Clearly identify speed humps with advanced warning signs and/or a sign or plastic bollard at the actual location.

Instead of raised pavement markers or Botts dots, use recessed strips into the asphalt to create rumble strips.

Narrowing and Horizontal Deflection Devices

Vertical curbs associated with narrowing devices or horizontal deflection devices are similar to those at the edge of the pavement and thus do not present additional challenges to snowplow operators.

Where typical curb lines are straight, a curb line of a two-lane choker or similar device may be unexpected and unseen without special signing. Clearly identify narrowing or horizontal deflection devices with object markers, plastic bollards, or landscaping.

Where snow cannot be plowed to the edge of the roadway (due to a traffic calming device), operators may be required to push snow to the centerline and remove it with a front-end loader.