



Highway Maintenance Manual

Chapter
06

Winter Maintenance

Section
05

Road Classifications

Subject

01 Winter Highway Classifications

1.0 General Guideline

Bureau of Highway Maintenance

January 2012

State highway maintenance during the winter months has two distinct highway classifications: “High Volume” and “All Other.” These classifications are described below.

2.0 Classifications

The high volume highway classification would typically include highways with four or more lanes for through traffic and selected two-lane highways. When determining the need for providing high volume coverage on two-lane highways, the following should be considered:

- functional classification
- high traffic volumes
- special service factors
- planned conversion from a two-lane to a multi-lane facility

The “all other” highway classification would include all those highways not identified as high volume.

A map depicting the classification can also be found on the DOT Internet web site:

<http://www.dot.wisconsin.gov/travel/road/docs/winterclassmap.pdf>

3.0 High Volume Highway Expectations

When conditions warrant, 24-hour coverage should be provided during a winter storm. Depending on the severity and duration of the storm, maintaining a full complement of operators may not be practical. However, some minimal coverage should be provided (perhaps by reducing or staggering the workforce).

Typically, a plow operator’s time should not exceed a continuous 18-hour shift.

Cycle times for each route should generally not exceed 1 ½ to 2 ½ hours.

Definition of “**24-hour coverage**”: 24-hour coverage means that the county has a presence on the highway for 24 hours per day during a winter storm event unless passable roadway conditions have been achieved. This would only happen during winter storm events of long duration and when conditions warrant. When this does occur it may mean further reducing the coverage on routes in the “all other” classification to assure available manpower, or extending the winter operation section lengths on the high volume routes. However, continuous coverage does **not** mean that the service provider runs three shifts or that there are snowplows on the highway 24 hours per day throughout the winter irrespective of the weather conditions.

4.0 “All Other” Highway Expectations

When conditions warrant, coverage should be provided up to 18 hours per day during the storm. The gap in coverage is necessary to provide for operator recovery time. The operator recovery time should typically be between the hours of 10:00 PM and 4:00 AM, but will vary with specific storm conditions.

Some minimal ability to respond to emergencies should be provided during the hours that full coverage is not provided.

Typically, a plow operator’s time should not exceed a continuous 18-hour shift.

Cycle times for each route should generally not exceed 2 ½ to 3 hours.
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5.0 Exceptions

The above highway classifications and coverage times are intended as a guide in winter maintenance operations and changes may be deemed appropriate based on local conditions. Exceptions to these guidelines may include:

- reducing coverage due to extreme conditions which would include:
 - > limited visibility for operators
 - > length and severity of the storm

continuing service beyond suggested hours to prevent snow compaction or other hazardous conditions.
allowing breaks between shifts during off AADT peak hours to reduce operational costs and operator fatigue.

6.0 Service Uniformity

Customers place a high value on our ability to minimize unexpected changes in pavement condition. Therefore, a primary objective in supplying winter snow and ice control is to achieve consistent service on similar facilities. Please note that even when exceptions as listed above are made, we should strive for uniformity of service. This means that winter maintenance sections should end at logical locations where a motorist might anticipate a change in service. These might include:

high volume intersections or interchanges where traffic volumes significantly change
leaving or entering municipalities
dramatic or well defined changes in topography

Providing continuity of service across jurisdictional boundaries will require close coordination between counties and regions.

7.0 Winter Highway Classifications Map

Each region, working with the service providers within the region, will develop a map by October 1 of each year showing the high volume highways. These maps will be submitted to central office for concurrence and verification of service uniformity across region boundaries. The central office will develop a statewide map that will be a compilation of the district maps. This statewide map will be available for public distribution no later than October 31 of each year. The map can also be found on the DOT Internet site at the following web address:

<http://www.dot.wisconsin.gov/travel/road/docs/winterclassmap.pdf>

WINTER HIGHWAY CLASSIFICATION TABLE

HMM 06-05-01 Winter Highway Classifications

Typical Types of Highways	Winter Highway Class	Traveled Way	Paved Shoulder	Gravel Shoulder	Cycle Time
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Major Urban Freeways Most 6 Lanes and Greater	High Volume	24-hr service as conditions require... (see Section 6-15-5 for additional Guidance)	Wing plow during the storm to the shoulder point... make extra shoulder pass with the wing plow if necessary... shoulders should be cleared during normal (non-overtime) work hours under non-drifting conditions.	High volume highways do not typically have gravel shoulders... the gravel portion of the shoulder should remain white... shoulders should be cleared during normal (non-overtime) work hours under non-drifting conditions.	Generally 1 ½ to 2 ½ hours
Some 6-Lanes High Volume 4 Lanes with AADT >25,000 and Some 4-Lanes with AADT <25,000 Most 2-lane with AADT >5000 and Some 2-Lanes with AADT <5000 Includes Interstates	High Volume	24-hr service as conditions require... (see Section 6-15-5 for additional Guidance)	Wing plow during the storm to the shoulder point... make extra shoulder pass with the wing plow if necessary... shoulders should be cleared during normal (non-overtime) work hours under non-drifting conditions.	High volume highways do not typically have gravel shoulders... the gravel portion of the shoulder should remain white ...shoulders should be cleared during normal (non-overtime) work hours under non-drifting conditions.	Generally 1 ½ to 2 ½ hours
Some 4 Lanes with AADT <25,000 Most 2-Lane With AADT <5000 and Some 2-Lanes with AADT >5000	All Other	18-hr coverage as conditions require... Some minimal ability to respond to emergencies should be provided during hours that full coverage is not provided (see Section 6-15-5 for additional Guidance)	Plow with traveled way, do not make extra pass... shoulders should be cleared during normal (non-overtime) work hours under non-drifting conditions.	Wing shoulders while plowing traveled way, do not make extra pass... <i>shoulders should remain white...shoulders should be cleared during normal (non-overtime) work hours under non-drifting conditions.</i>	Generally 2 ½ to 3 hours

The above highway classifications and coverage times are intended as a guide in winter maintenance operations and changes may be deemed appropriate based on local conditions. Exceptions may include:

- Reducing coverage due to extreme conditions which would include limited visibility for operators or length and severity of the storm.

- Continuing service beyond suggested hours to prevent snow compaction or other hazardous conditions.

- Allowing breaks between shifts during off AADT peak hours to reduce operational costs and operator fatigue.

- Where heavy (deep) snow on the shoulder becomes a problem, such as when large trucks pull the snow back onto the roadway just by driving past at highway speed, plowing of the shoulders may be

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completed during the storm or on overtime hours. However, completion of shoulder cleanup on non-overtime hours is preferred.



Highway Maintenance Manual

**Bureau of Highway
Maintenance**

**Chapter
06** **Winter Maintenance**

January 2012

**Section
10** **Storm Management Responsibilities**

**Subject
40** **Hours of Service**

1.0 Hours of Service

Each service provider should consider limiting the number of continuous hours a plow operator should work on a shift. The limitations should be done with the public's and plow operator's health and welfare in mind. Excessive continuous hours can be hazardous to both the operator and the public and can lead to an increased potential for crashes.

The Wisconsin Department of Transportation's Winter Highway Classification 06-05-01 calls for 18 and 24-hour coverage roadways. The intent is to provide service to the public for those hours based on the highway usage and traffic volumes. It is not the intent of the department to have plow operators work continuously for those hours during winter storm conditions.

Ideally, the service provider's contract would limit hours of continuous service during winter storm events in such a way as to not exhaust labor resources and yet still have the ability to maintain the winter highway classification service hours and respond to emergency situations.

The department feels that the typical upper limit for continuous hours of service should not exceed 18 hours.



Highway Maintenance Manual Bureau of Highway Maintenance Chapter 06 Winter Maintenance January 2012 Section 15 Snow Removal Subject 01 Passable Roadway – During a Winter Storm

1.0 Purpose

To define the level of effort expectations for winter maintenance during a winter storm event. One of the goals of winter maintenance is to achieve “passable roadways” within the limitations imposed by climatological conditions, the availability of resources, and environmental concerns during a winter storm event.

2.0 Passable Roadway Definition

A “**passable roadway**” is defined as a roadway surface that is free from drifts, snow ridges, and as much ice and snow pack as is practical and can be traveled safely at *reasonable speeds*. A passable roadway should not be confused with a “dry pavement” or “bare pavement” which is essentially free of all ice, snow, and any free moisture from shoulder to shoulder. This “dry/bare pavement” condition may not exist until the weather conditions improve to the point where this pavement condition can be provided.

The definition of “**reasonable speed**” is considered a speed that a vehicle can travel without losing traction. During and immediately after a winter storm event, a reasonable speed will most likely be lower than the posted speed limit. Motorists can expect some inconvenience and will be expected to modify their driving practices to suit road conditions.

3.0 Passable Roadway Expectations

Category 1: Major urban freeways and most highways with six lanes and greater

(These highways are considered “high volume” and receive 24-hour coverage, during the winter storm event. See HMM 06-05-01.)

Highways in this category often have traffic congestion and snow storage problems, making typical plowing and deicing agent applications very difficult or inappropriate. Therefore, when traffic volumes and snow storage are problems on these highways it may be appropriate to use extraordinary efforts, such as chemical removal, so that snow does not pack on the roadways during the winter storm event.

On these highways service providers should strive for “passable roadway” conditions on **all lanes and ramps**, during the winter storm event. Plowing is the first priority for snow removal, however extraordinary efforts (as described above) **may** be taken so that snow does not pack on the roadways during the winter storm event.

Category 2: High volume four-lane highways (ADT \geq 25,000) and some enumerated four-lane highways (ADT $<$ 25,000), and some 6-lane highways.

(These highways are considered “high volume” and receive 24-hour coverage, during the winter storm event. See HMM 06-05-01)

Highways in this category typically do not have the traffic congestion and snow storage problems of those in category 1. However, they still have high traffic volumes that make it necessary to focus on more than just the driving lanes during the winter storm event.

On these highways service providers should strive for “passable roadway” conditions on the **driving lanes, ramps, and passing lanes** during the winter storm event. Plowing is the first priority for snow removal. The counties should strive to keep the snow from packing on the **driving lanes, ramps, and passing lanes (if not needed for snow storage)** during the winter storm event. Only enough de-icing agents should be used to keep the total accumulation workable, thereby minimizing bonding during the winter storm event. It is considered inappropriate to attempt to melt the snow as fast as it hits the ground or keep the highway wet so as to eliminate any accumulation or packing. If packing should occur, service providers will strive for “passable roadway” conditions and eventually “bare pavement” as soon as practical after the winter storm event has ended.

Category 3: All other four-lane highways (ADT $<$ 25,000)

(These highways may be considered either “high volume” or “all other” and should receive either 18-hour or 24hour coverage, during the winter storm event. See HMM 06-05-01.)

Highways in this category have lower traffic volumes and do not fit into either category 1 or 2. The typical cycle times in this category are long enough that it can sometimes be impractical to keep the snow “workable” in both the driving and passing lanes without excessive de-icing agent usage.

On these highways service providers should strive for “passable roadway” conditions on the **driving lanes and ramps** during the winter storm event. Plowing is the first priority for snow removal. The service providers should strive to keep the snow from packing on the **driving lanes and ramps** during the winter storm event. Only enough de-icing agents should be used to keep the total accumulation workable, thereby minimizing bonding during the winter storm event. It is considered inappropriate to attempt to melt the snow as fast as it hits the ground or keep the highway wet so as to eliminate any accumulation or packing. If packing should occur, counties will then strive for “passable roadway” conditions and eventually “bare pavement” conditions on the **driving lane and ramps only** as soon as practical after the winter storm event. Plowing should be conducted on the **passing lanes** throughout the winter storm event but the majority of effort required to achieve “passable roadway” conditions and eventually “bare pavement” conditions on the **passing lanes** should be done, as soon as practical, after the winter storm event.

Category 4: Most high volume two-lane highways (ADT \geq 5,000) and some 2-lanes (ADT $<$ 5000)

(These highways are considered “high volume” and receive 24-hour coverage, during the winter storm event. See HMM 06-05-01.)

On these highways service providers should strive for “passable roadway” conditions on the **driving lanes**, during the winter storm event. Plowing is the first priority for snow removal. The service providers should strive to keep the snow from packing on the **driving lanes** during the winter storm event. Only enough de-icing agents should be used to keep the total accumulation workable, thereby minimizing bonding during the winter storm event. It is considered inappropriate to attempt to melt the snow as fast as it hits the ground or keeping the highway wet so as to eliminate any accumulation or packing. If packing should occur, counties will then strive for “passable roadway” conditions and eventually “bare pavement” conditions as soon as practical, after the winter storm event.

Category 5: All other two-lane highways

(These highways are considered “all other” and receive 18-hour coverage, during the winter storm event. See HMM 06-05-01)

On these highways service providers should strive for “passable roadway” conditions on the **driving lanes**, during the winter storm event. Plowing is the first priority for snow removal. The service providers should strive to keep the snow from packing on the **driving lanes** during the winter storm event. Only enough de-icing agents should be used to keep the total accumulation workable, thereby minimizing bonding during the winter storm event. It is considered inappropriate to attempt to melt the snow as fast as it hits the ground or keep the highway wet so as to eliminate any accumulation or packing. If packing should occur, counties will then strive for “passable roadway” conditions and eventually “bare pavement” conditions as soon as practical after the winter storm event, during normal work hours (including Saturdays and Sundays). During the time between the winter storm event ending and achieving “passable roadway” conditions, it is acceptable that only clear wheel tracks be provided when conditions warrant.

4.0 Exceptions

Exceptions to this guideline will occur when subsequent winter storm events happen at a frequency where it is not possible to obtain passable roadway conditions and subsequently bare pavement between the events. The severity of a winter storm event, roadway temperatures, and availability of resources along with other factors will dictate how soon passable roadway conditions and subsequently bare pavement can be obtained. Also, it may be deemed appropriate to use extraordinary means when impending weather or an influx of traffic, such as traffic prior to a holiday, is anticipated.

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HMM 06-15-01 Passable Roadway During Winter Storm

Another exception can occur when the department, because of budget restrictions or unavailability of de-icing agents, has requested that service providers reduce the level of effort or passable roadway condition expectations during the winter storm event. In such a case the department, after notifying and in cooperation with the service providers, may reduce level of effort expectations on one, several, or all five categories described above.



**Highway Maintenance Manual Bureau of Highway Maintenance Chapter 06 Winter Maintenance
January 2012 Section 15 Snow Removal Subject 05 Level of Effort by Category of Roadway**

1.0 General

The purpose of this guideline is to outline the level of effort that should be undertaken on the five different categories of roadway during a winter storm event. After the event has ended the effort will switch to cleanup with the intermediate goal of bare/wet pavement and finally the ultimate goal of bare/dry pavement. The time to achieve these goals will depend on the limitations imposed by climatological conditions, the availability of resources, and environmental concerns.

2.0 Level of Effort by Roadway Category

Category 1: Major urban freeways and most highways with six lanes and greater

(These highways are considered "high volume" and receive 24-hour coverage, during the winter storm event. See HMM 06-05-01.)

Highways in this category often have traffic congestion and snow storage problems, making typical plowing and deicing agent applications very difficult or inappropriate. Therefore, when traffic volumes and snow storage are problems on these highways it may be appropriate to use extraordinary efforts, such as chemical removal, so that snow does not pack on the roadways during the winter storm event.

On these highways service providers should maintain all lanes and ramps equally, during the winter storm event. Plowing is the first priority for snow removal, however extraordinary efforts (as described above) may be taken so that snow does not pack on the roadways during the winter storm event. The appropriateness of using extraordinary efforts shall be agreed upon with the region maintenance office. When extraordinary efforts are not deemed appropriate, de-icing application rates should be followed.

Category 2: High volume four-lane highways (AADT \geq 25,000) and some four-lane highways (AADT $<$ 25,000), and some 6-lane highways.

(These highways are considered "high volume" and receive 24-hour coverage, during the winter storm event. See HMM 06-05-01)

Highways in this category typically do not have the traffic congestion and snow storage problems of those in category 1. However, they still have high traffic volumes that make it necessary to focus on more than just the driving lanes during the winter storm event.

On these highways service providers should maintain the driving lanes, ramps, and passing lanes equally during the winter storm event. Plowing is the first priority for snow removal. De-icing applications should be conducted according to HMM 06-05-01 of the Maintenance Manual. The service providers should strive to keep the snow from packing on the driving lanes, ramps, and passing lanes (if not needed for snow storage) during the winter storm event. Only enough de-icing agents should be used to keep the total accumulation workable, thereby minimizing bonding during the winter storm event. It is considered inappropriate to attempt to melt the snow as fast as it hits the ground or keep the highway wet so as to eliminate any accumulation or packing. If packing should occur, service providers should continue to plow and use sensible salting. When the winter storm event ends and conditions allow, service providers will remove any packed snow and continue working towards the goals of bare/wet and ultimately bare/dry pavement.

Category 3: All other four-lane highways (AADT $<$ 25,000)

(These highways may be considered either "high volume" or "all other" and should receive either 18-hour or 24hour coverage, during the winter storm event. See HMM 06-05-01.)

Highways in this category have lower traffic volumes and do not fit into either category 1 or 2. Also some of the highways in this category do not receive 24-hour coverage. The typical cycle times in this category are long enough that it can sometimes be impractical to keep the snow "workable" in both the driving and passing lanes without excessive de-icing agent usage.

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HMM 06-15-05 Level of Effort by Category of Roadway

On these highways service providers should maintain the driving lanes and ramps equally as a first priority during the winter storm event. Plowing is the first priority for snow removal. De-icing applications should be conducted according to HMM 06-20-25 of the Maintenance Manual. The service providers should strive to keep the snow from packing on the driving lanes and ramps during the winter storm event. However, only enough deicing agents should be used to keep the total accumulation workable, thereby minimizing bonding during the winter storm event. It is considered inappropriate to attempt to melt the snow as fast as it hits the ground or keep the highway wet so as to eliminate any accumulation or packing. If packing should occur, service providers should continue to plow and use sensible salting on the driving lane and ramps only according to the appropriate coverage (either 18 or 24 hours). When the winter storm event ends and conditions allow, service providers will remove any packed snow and continue working towards the goals of bare/wet and ultimately bare/dry pavement.

Plowing with minimal salting should be conducted on the passing lanes throughout the winter storm event but the majority

of effort required to eliminate any packing conditions and eventually obtain bare/wet and ultimately bare/dry pavement conditions on the passing lanes should be done, as soon as practical, after the winter storm event.

Category 4: Most high volume two-lane highways (AADT \geq 5,000) and some 2-lanes (AADT $<$ 5000)

(These highways may be considered either "high volume" or "all other" and should receive either 18-hour or 24hour coverage, during the winter storm event. See HMM 06-05-01.)

On these highways service providers should maintain the driving lanes, during the winter storm event. Plowing is the first priority for snow removal. De-icing applications should be conducted according to HMM 06-20-25 of the Maintenance Manual. The service providers should strive to keep the snow from packing on the driving lanes during the winter storm event. Only enough de-icing agents should be used to keep the total accumulation workable, thereby minimizing bonding during the winter storm event. It is considered inappropriate to attempt to melt the snow as fast as it hits the ground or keeping the highway wet so as to eliminate any accumulation or packing. If packing should occur, service providers should continue to plow and use sensible salting. When the winter storm event ends and conditions allow, service providers will remove any packed snow and continue working towards the goals of bare/wet and ultimately bare/dry pavement.

Category 5: All other two-lane highways

(These highways are considered "all other" and receive 18-hour coverage, during the winter storm event. See HMM 06-05-01)

On these highways counties should maintain the driving lanes, during the winter storm event. Plowing is the first priority for snow removal. De-icing applications should be conducted according to HMM 06-20-25 of the Maintenance Manual. The counties should strive to keep the snow from packing on the driving lanes during the winter storm event. Only enough de-icing agents should be used to keep the total accumulation workable, thereby minimizing bonding during the winter storm event. It is considered inappropriate to attempt to melt the snow as fast as it hits the ground or keep the highway wet so as to eliminate any accumulation or packing if packing should occur, service providers should continue to plow and use sensible salting. When the winter storm event ends and conditions allow, service providers will remove any packed snow and continue working towards the goals of bare/wet and ultimately bare/dry pavement, during normal work hours (including Saturdays and Sundays).

During the time between the winter storm event ending and achieving the ultimate goal of bare pavement it is acceptable that only clear wheel tracks be provided when conditions warrant.

3.0 Exceptions

Exceptions to providing the desired level of effort on the five categories of roadway can occur when the department, because of budget restrictions or unavailability of de-icing chemicals, has requested that service providers reduce the level of effort during the winter storm event. In such a case the department, after notifying and in cooperation with the service providers, may reduce level of effort expectations on one, several, or all five categories described above.

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HMM 06-15-05 Level of Effort by Category of Roadway

4.0 Best Practices for Acceptable Roadway Conditions After the Storm has Ended (While Crews are on Overtime).

If the following roadways conditions exist on the five categories of roadways after the storm has ended and while crews are on overtime hours, then it is desirable and acceptable to cease plowing and salting and to wait until the next day (on normal hours) to continue working towards the bare/wet and ultimately bare/dry pavement conditions.

The termination of plowing and salting at this time assumes that the weather forecast and other factors will allow this to happen.



Category 1: Major urban freeways and most highways with six lanes and greater



Category 2: High volume four-lane highways (ADT \geq 25,000) and some four-lane highways (ADT $<$ 25,000), and some 6-lane highways.



Category 3: All other four-lane highways (ADT < 25,000)



Category 4: Most high volume two-lane highways (ADT >= 5,000) and some 2-lanes (ADT < 5000)



Category 5: All other two-lane highways

4.0 Exceptions

Exceptions to this guideline will occur when subsequent winter storm events happen at a frequency where it is not possible to obtain passable roadway conditions and subsequently bare pavement between the events. The severity of a winter storm event, roadway temperatures, and availability of resources along with other factors will dictate how soon passable roadway conditions and subsequently bare pavement can be obtained. Also, it may be deemed appropriate to use extraordinary means when impending weather or an influx of traffic, such as traffic prior to a holiday, is anticipated.

Another exception can occur when the department, because of budget restrictions or unavailability of de-icing agents, has requested that service providers reduce the level of effort or passable roadway condition expectations during the winter storm event. In such a case the department, after notifying and in cooperation with the service providers, may reduce level of effort expectations on one, several, or all five categories described above.



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January 2012 Section 15 Snow Removal Subject 45 Mailboxes **1.0 Mailboxes** A mailbox damaged by the impact of plowed snow or ice shall be replaced or repaired by the mailbox owner and at the owner's expense. When a mailbox is hit by a plow and damaged, the incident is subject to each county's policy. If the mailbox is damaged by another service provider, other than a county highway department, the replacement or repair of the mailbox will be the responsibility of the service provider.