Chapter 2

5B1-Snow and Ice Level of Service Data Collection Processes Statewide Weather Forecasting Services
5B1-MAP Snow and Ice Level of Service (LOS)

Data Collection Requirement – The Highway Activities Tracking System (HATS) will be the platform for recording all MAP LOS entries, whether or not trucks are equipped with AVL systems. Trucks equipped with AVL systems do not automatically gather the information needed to determine Snow and Ice MAP LOS. The LOS ratings will be input into HATS with an IPAD. The only exception to this policy is NCR will continue to use their respective Allowable Surface Condition and Road Surface Goal LOS metrics.

What: WSDOT snow and ice operation performance is measured in terms of the results of sanding and/or deicing operations. The measured result is the condition of the travel lanes provided by these operations in response to winter weather events (i.e. snow, ice, frost). Measurement of these conditions is used to determine the Level of Service (LOS) provided by the maintenance program throughout the winter season.

When: Road surface conditions are assessed after sanding or deicing activities occur. There are no specified days or times during which road surface conditions should be documented. Assessment and documentation should be made after the activity is completed and the outcome (i.e. bare pavement, wheel tracks bare, etc.) is known.

How: Maintenance personnel conduct the road condition assessments by observing the surface condition of a roadway (all lanes, both directions). Observations shall be documented on the Snow and Ice MAP LOS form in HATS. The minimum requirement is the completion of one LOS rating form per shift, when there is some kind of a measurable condition. If there is no winter weather event, no form should be completed as there is nothing to measure. When there is a winter weather event, a form should be completed for the operators’ primary route. Additional MAP level of service records are recommended when an operator changes routes.

- A primary route is defined as the main route assigned or the majority of time spent on an operators’ shift.

Ratings: Road surface conditions are assigned different point values based on the assessed condition of that roadway. The point values are used to calculate the LOS ratings. There are two classes of road surface conditions on the form that represent the two primary methods by which WSDOT provides snow and ice control. One is to enhance traction on top of snow/ice by spreading abrasives (i.e. sand) on the travel lane. The other is to attempt to provide a bare pavement surface by applying chemicals to the travel lane. Point values for different conditions are as follows with commensurate LOS ratings:

Exception: In the event a truck is only plowing snow (no application of sand or deicer), a LOS form will not be required.
Road Condition Rating for Sand Treatment

<table>
<thead>
<tr>
<th>Points</th>
<th>LOS Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% of roadway has sand present</td>
<td>3</td>
</tr>
<tr>
<td>50% or more of roadway has sand present</td>
<td>3.5</td>
</tr>
<tr>
<td>All emphasis areas have sand present</td>
<td>4</td>
</tr>
<tr>
<td>50% or more of emphasis areas have sand present</td>
<td>5</td>
</tr>
<tr>
<td>50% or less of emphasis areas have sand present</td>
<td>5.9</td>
</tr>
</tbody>
</table>

Road Condition Rating for Chemical Treatment

<table>
<thead>
<tr>
<th>Points</th>
<th>LOS Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare Pavement</td>
<td>1</td>
</tr>
<tr>
<td>Patches of frost, black ice, slush, or compact.</td>
<td>1.5</td>
</tr>
<tr>
<td>Wheel tracks bare, frost, snow, or ice encountered.</td>
<td>2</td>
</tr>
<tr>
<td>50% of roadway with compact snow and ice.</td>
<td>3</td>
</tr>
<tr>
<td>Entire roadway covered with compact snow and ice.</td>
<td>4</td>
</tr>
</tbody>
</table>

Note: Emphasis Areas include hills, bridges, curves, intersections and known problem areas.

Chemical vs. Sand Treatment Application

**Chemical application** is defined as a straight liquid application or a granular application that is a mix of **5:1** (five parts sand one-part salt) or stronger.

**Sand application** would be a granular application only of weaker than **5:1**, for example 7:1 or 10:1. For any further definition of material applications please reference Chapter 6 of the Snow and Ice Plan.

**Plowing Only Guidance**

In the event a truck is only plowing snow (no application of sand or deicer), a LOS from will not be needed.

Note: See the Statewide and Regional Snow and Ice Plan on how to track materials for all Non-AVL Equipment.
<table>
<thead>
<tr>
<th>Expected Season LOS</th>
<th>Expected Road Condition after Treatment Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A to B</strong></td>
<td>Snow or ice buildup encountered rarely. Bare pavement attained as soon as possible. Travel delays rarely experienced.</td>
</tr>
<tr>
<td><strong>B to C</strong></td>
<td>Snow or ice buildup encountered at times but infrequent. Travel at times may experience some isolated delays with roads having patches of black ice, slush, or packed snow.</td>
</tr>
<tr>
<td><strong>C to D</strong></td>
<td>Snow or ice buildup encountered regularly. Travel likely to experience some delays with roads having black ice or packed snow with only the wheel track bare.</td>
</tr>
<tr>
<td><strong>D to F</strong></td>
<td>Compact snow buildup encountered regularly. Traveler will experience delays and slow travel.</td>
</tr>
<tr>
<td><strong>N/A</strong></td>
<td>Closed periodically or for the duration of the winter season.</td>
</tr>
</tbody>
</table>
HATS Snow and Ice MAP Level of Service (LOS) Records

To add a new “MAP LOS Snow and Ice” record to HATS iPad:
1. Launch the HATS application by tapping on the HATS icon.
2. Tap the “Other” tab and choose “Snow and Ice.”
3. Hit Start Record and choose either Chemical MAP LOS or Sand MAP LOS (for AVL equipped Trucks) or hit Material Application (For Trucks without AVL) the MAP Evaluation is part of the form.

4. Tap “Add Record.”
5. Fill out “MAP LOS and/or Evaluation”; date, time, SR, MP, etc.
6. Fill out the observation according to what material was placed; i.e. chemical or sand treatment.
7. Fill out form questions accordingly and tap “Save Record.”

Sync iPad to “Send Records” when complete or at the end of shift.
Example of IPAD Snow and Ice record for trucks with AVL:

*Driver/Operator: Complete one MAP Level of Service rating per shift, on the drivers' primary route.

*Additional MAP Level of Service ratings are recommended as driver changes routes.

Road condition rating for sand treatment: *
Please select one.

- 100% of roadway has sand present
- 50% or more of roadway has sand present
- All emphasis areas have sand present
- 50% or more of emphasis areas have sand present
- 50% or less of emphasis areas
Example of IPAD Snow and Ice record for NON-AVL trucks:

- **Road Condition Rating for Chemical Treatment**
  - Please select one.
  - Bare Pavement
  - Patches of frost, black ice, slush, compact
  - Wheel tracks bare, frost, snow, or ice encountered
  - 50% of roadway with compact snow and ice
  - Entire roadway covered with compact snow and ice

- **Road Condition Rating for Sand Treatment**
  - Please select one.
  - 50% or more of roadway has sand present
  - All emphasis areas have sand present
  - 50% or more of emphasis areas have sand present
  - 50% or less of emphasis areas
To add a new “MAP LOS Snow and Ice” record to HATS on a PC

1. Launch the HATS application by clicking on the HATS icon on the Maintenance and Operations Portal page.

2. Under the “Other Activities” tab choose an activity and select “Add Record.”

3. Choose Chemical MAP LOS, Sand MAP LOS (for AVL equipped Trucks) or hit Material Application (Non-AVL Trucks) the MAP Evaluation is part of the form.
4. Select “Add Record.”
5. Fill out “MAP LOS and/or Evaluation”; date, time SR, MP, etc.
6. Fill out the observation according to what material was placed; i.e. chemical or sand treatment.
7. Fill out form questions accordingly.
8. Save when complete.
Example of HATS PC record for trucks with AVL:

NOTE: If the truck is not equipped with AVL you would choose Materials application and then fill out all questions for MAP Evaluation.

To add new “Snow and Ice” records to HATS web do the following (see image on 2-9):
1. From Other Activity Add record page, select “Material Application - For Trucks without AVL.”
2. Click “Add New Record.”
3. Select “Snow and Ice” from the drop down menu with the activity “Material Application – For Trucks without AVL.”
4. Fill out the form questions accordingly and click “Save.
Example of HATS PC record for NON-AVL trucks:

[Image of a form with fields for Organizational Information, Material Application - For Trucks without AVL, Snow and Ice, Route, Material Application - For Trucks without AVL Information, Materials, MAP Evaluation, and Comments]
Statewide Weather Forecasting

Good winter maintenance response decisions are heavily reliant on accurate weather forecasting. Crew scheduling, equipment deployment, material stockpiling, and material application rates are examples of elements which are dependent upon accurate weather forecasting. All of these decisions correlate directly to our ability to provide winter time mobility, keep passes open, and work within budget constraints.

Northwest Weathernet (Weathernet) is the contract forecast provider for WSDOT. Weathernet provides area specific weather forecast services and 24 hours a day support consultation via telephone to WSDOT maintenance personnel. Text forecasts (of an agreed upon format), are generated twice daily during the winter months - October 1st through April 30th. Forecasts include narratives for all maintenance areas and site-specific forecasts for each section within the maintenance area. Written forecasts are made available to authorized persons on the Weathernet website, and sent via email or fax to requested locations. Weathernet meteorologists monitor weather conditions throughout the state and will provide alerts to WSDOT personnel for any abrupt changes to the forecast. Weathernet meteorologists archive daily forecasts and communications, and document storm events for future evaluation.