MINIMIZING THE IMPACT OF WEATHER ON CRASHES
A STORY ABOUT
WEATHER & VARIABLE
SPEED LIMITS

John MacAdam, P.E.
THE PROBLEM
THE PROBLEM
THE PROBLEM

Keep this... From turning into this
50-vehicle pileup shuts Ohio interstate for 14 hours

Doug Stanglin, USA TODAY Published 11:18 a.m. ET Dec 9, 2016 | Updated 1:18 p.m. ET Dec 9, 2016

Interstate 90 east of Cleveland reopened early Friday after a shutdown of more than 14 hours as crews untangled a 50-car pileup triggered by heavy, lake-effect snow.

The Lake County sheriff’s office said about 20 people were injured in the chain-reaction crash late Thursday that halted traffic. At least three people were seriously injured, Cleveland.com reported.

The initial crash involved a Greyhound bus and over a dozen trucks on the interstate near the Ohio-Pennsylvania border.

Bus passenger Greg Carmichael, who was en route to Buffalo, told Fox 8 News that a truck hit the bus from behind, causing a domino-effect pileup.

A similar pileup, which left three dead and 11 injured, closed stretches of eastbound and westbound I-96 near Fowlerville, Mich., on Thursday. That crash involved between 30 and 40 cars.

The National Weather Service expects snow to continue into Saturday near the Great Lakes as cold Canadian air streams across the relatively warm waters. Snow may be heavy over localized areas and gusty winds are also possible, the weather service warned.
December 2016 - More than 50 car crash on I-90 in Lake County
(Source: Lake County Sheriffs Department)
THE SOLUTION(S)

- Policy
- Communications
- Tools
- Staff
- Traveler information
- Collaboration
- Weather Data
- Variable Speed Limits
TEMPORARY VSL SOLUTION
PERMANENT VSL SOLUTION
<table>
<thead>
<tr>
<th>Severity Level</th>
<th>National Weather Service (NWS) Alert</th>
<th>Pavement Conditions “Measured” (or Visual)</th>
<th>Weather</th>
<th>Visibility</th>
<th>Precip Conditions</th>
<th>Incidents</th>
<th>Congestion</th>
<th>Original 70 mph</th>
<th>Original 65 mph</th>
<th>Original 60 mph</th>
<th>Original 55 mph</th>
<th>Original 50 mph</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>NWS Product Advisory/Warning Issued</td>
<td>“Dry” or “Trace” (Dry) “Wet” or “Chemically wet” (wet)</td>
<td></td>
<td>Good; ≥ 0.5 miles</td>
<td>“Light” Precip</td>
<td>No lanes and/or Shoulder blocked</td>
<td></td>
<td>70</td>
<td>65</td>
<td>60</td>
<td>55</td>
<td>50</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Fog; &lt; 0.5 miles</td>
<td>“Moderate” Precip</td>
<td>60</td>
<td>60</td>
<td>55</td>
<td>55</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>“Ice Watch” (Snow Covered Road, Wet road &lt;33 Deg)</td>
<td>Poor; &lt; 0.25 miles</td>
<td>“Heavy” Precip</td>
<td>Lanes blocked &amp; traffic &gt; 50MPH</td>
<td></td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>“Ice Warning” (Blowing/Drifting Snow, Icy pavement)</td>
<td>Poor; &lt; 0.1 miles</td>
<td>Lanes blocked &amp; traffic &lt; 50MPH</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Full road closure or other high impact situation*</td>
<td></td>
<td></td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

*Verify with District personnel before posting for Level 4 Severity
COMMUNICATION: PATHFINDER

- Collaborative effort
  - National Weather Service (NWS)
  - ODOT
  - Weather Contractor (DTN)

- High-impact weather

- Unified message
  - What, when, how
  - Before, during, after
Shift from Traffic Monitoring to Traffic Management
Ohio Department of Transportation District 12 Cleveland

December 26, 2017 - 🔴

*UPDATE* The accident has been cleared as of 11:15 a.m. The current speed limit of I-90 is 40 mph as of 11:20 a.m.

A jack-knifed semi has closed I-90 eastbound past SR 44. Speed limit on I-90 in Lake County is 30 mph as of 10:39 a.m. (12/26/17)
A snowy start to April in much of Ohio. Thankfully, pavement temperatures are warm enough to melt most of the snow on contact. We have nearly 400 crews out across the state patrolling, treating, and plowing roads, as needed. Please give them room to work. #ODOTwinter
WEATHER DATA

- Pavement temperature and condition
- Precipitation type, intensity, and visibility
- Temperature and dew point
- Wind speed and direction
CONCORD, Ohio – A portion of Interstate 90 east was closed in Lake County Tuesday morning because of a jack-knifed semi truck, the Ohio Department of Transportation said.

The highway was shut down from state Route 44 to Vrooman Road for about an hour until the crash was cleared.

At point, the speed limit on I-90 between SR 44 and SR 528 was down to 30 mph. It is now at 50 mph.
### RESULTS

<table>
<thead>
<tr>
<th>Speed Reduction</th>
<th>Winter</th>
<th>Avg. Roadway Clearance (Minutes)</th>
<th>Change in time from previous year</th>
<th>Change in time from 2015-16</th>
<th>Avg. Incident Clearance (Minutes)</th>
<th>Change in time from previous year</th>
<th>Change in time from 2015-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>2015-16</td>
<td>112.57</td>
<td></td>
<td></td>
<td>113.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 mph (entire corridor)</td>
<td>2016-17</td>
<td>169.15</td>
<td>56.58</td>
<td>-31.15</td>
<td>169.15</td>
<td>56.10</td>
<td>-30.37</td>
</tr>
<tr>
<td>Variable</td>
<td>2017-18</td>
<td>81.42</td>
<td>-87.73</td>
<td>-31.15</td>
<td>82.68</td>
<td>-86.47</td>
<td>-30.37</td>
</tr>
</tbody>
</table>

Down over 31 minutes from 2015-16

Down over 30 minutes from 2015-16
### RESULTS

<table>
<thead>
<tr>
<th>Speed Reduction</th>
<th>Winter</th>
<th>Total Crashes</th>
<th>Secondary Crashes</th>
<th>Secondary %</th>
<th>Change in % from previous year</th>
<th>Change in % from 2015-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>2015-16</td>
<td>63</td>
<td>30</td>
<td>47.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 mph (entire corridor)</td>
<td>2016-17</td>
<td>39</td>
<td>13</td>
<td>33.3%</td>
<td>-14.3%</td>
<td>-24.7%</td>
</tr>
<tr>
<td>Variable</td>
<td>2017-18</td>
<td>48</td>
<td>11</td>
<td>22.9%</td>
<td>-10.4%</td>
<td>-24.7%</td>
</tr>
</tbody>
</table>

Down almost 25% from 2015-16
LOOKING FORWARD

- Expanded technology
- Expanded policy
- Increased communications
- Dedicated staff
- Connected patrol vehicles