




# **National Symposium on Extreme Weather Event Impacts on Transportation Infrastructure**

**May 22, 2013**

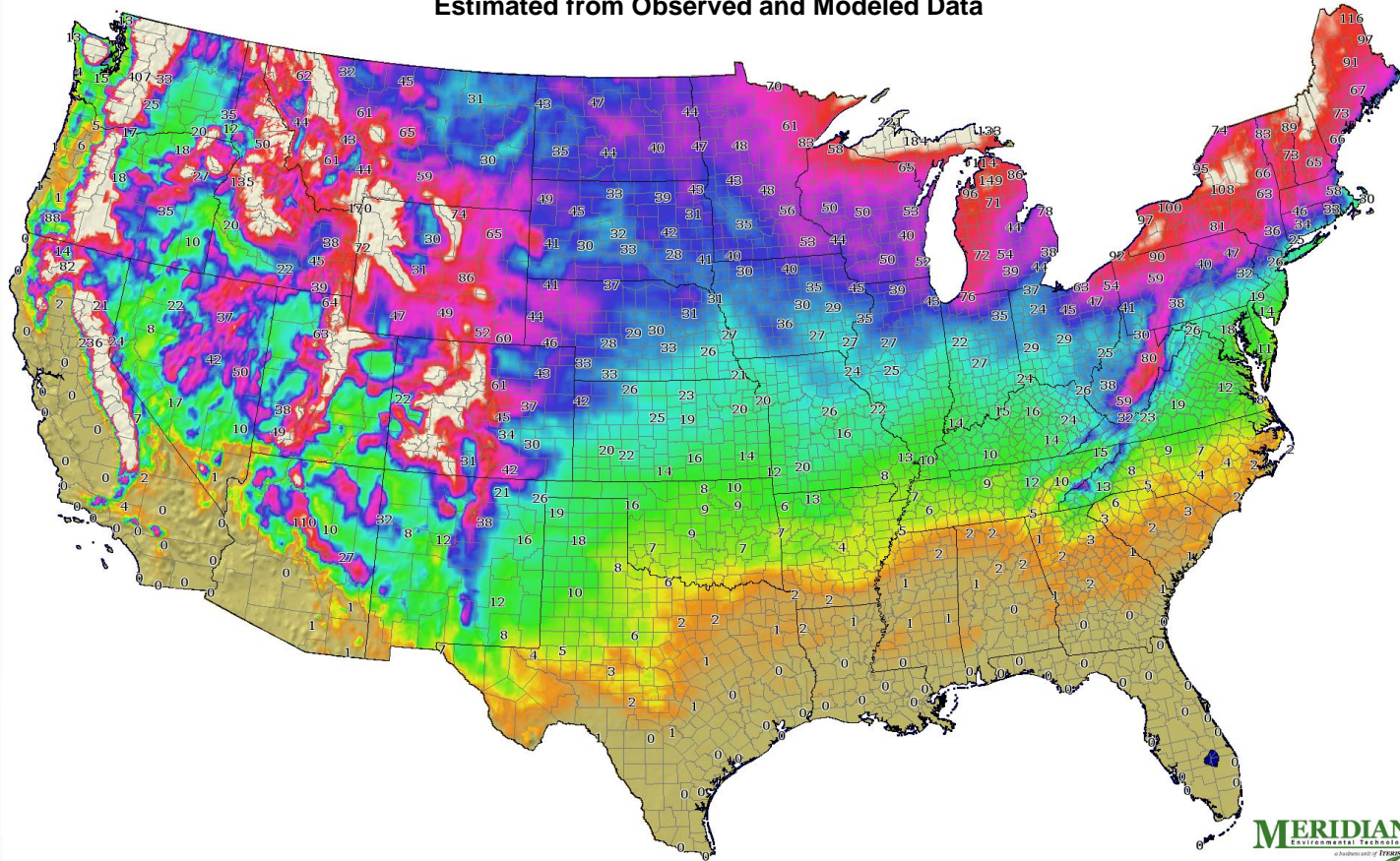
Extreme Winter Lake Effect Operations and Maintenance

**Gregory C. Johnson, PE**  
Chief Operations Officer  
Michigan Department of Transportation



# Winter Events – Continental U.S.

**U.S. Annual Snowfall**  
Estimated from Observed and Modeled Data



# Extreme Winter Events



***“Economic costs of disruption from a snow storm is \$66-\$700 million per day in some states - \$251 million for Michigan - for just a one-day shutdown due to impassible roads.”***

– Study prepared for the American Highway Users Alliance by IHS Global Insight

# Great Lakes Region's Climate

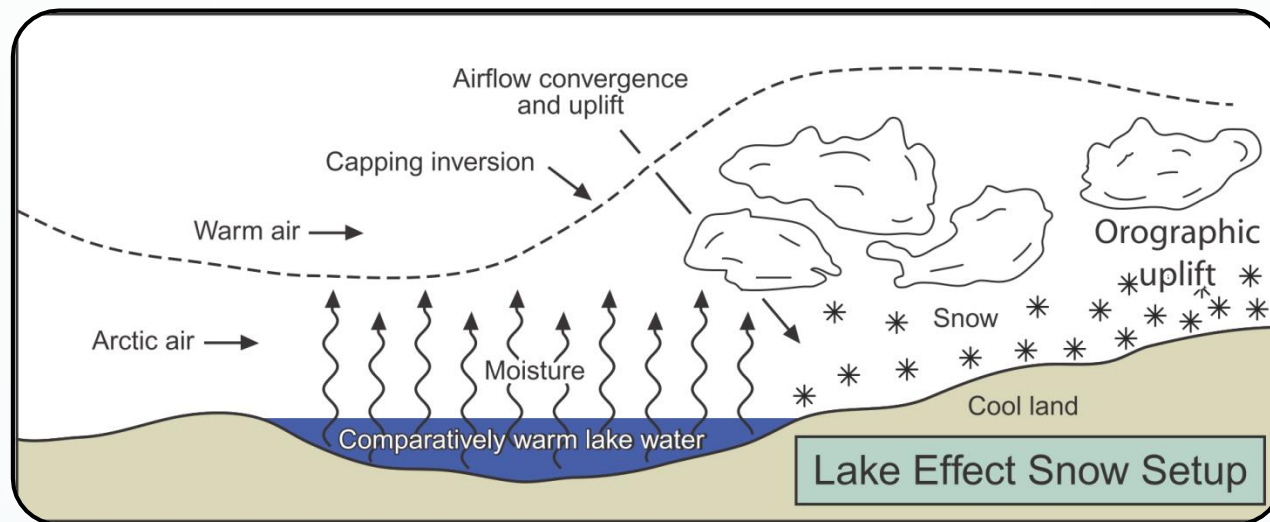


Credit: Accuweather.com

# Great Lakes Region's Climate Lake Effect

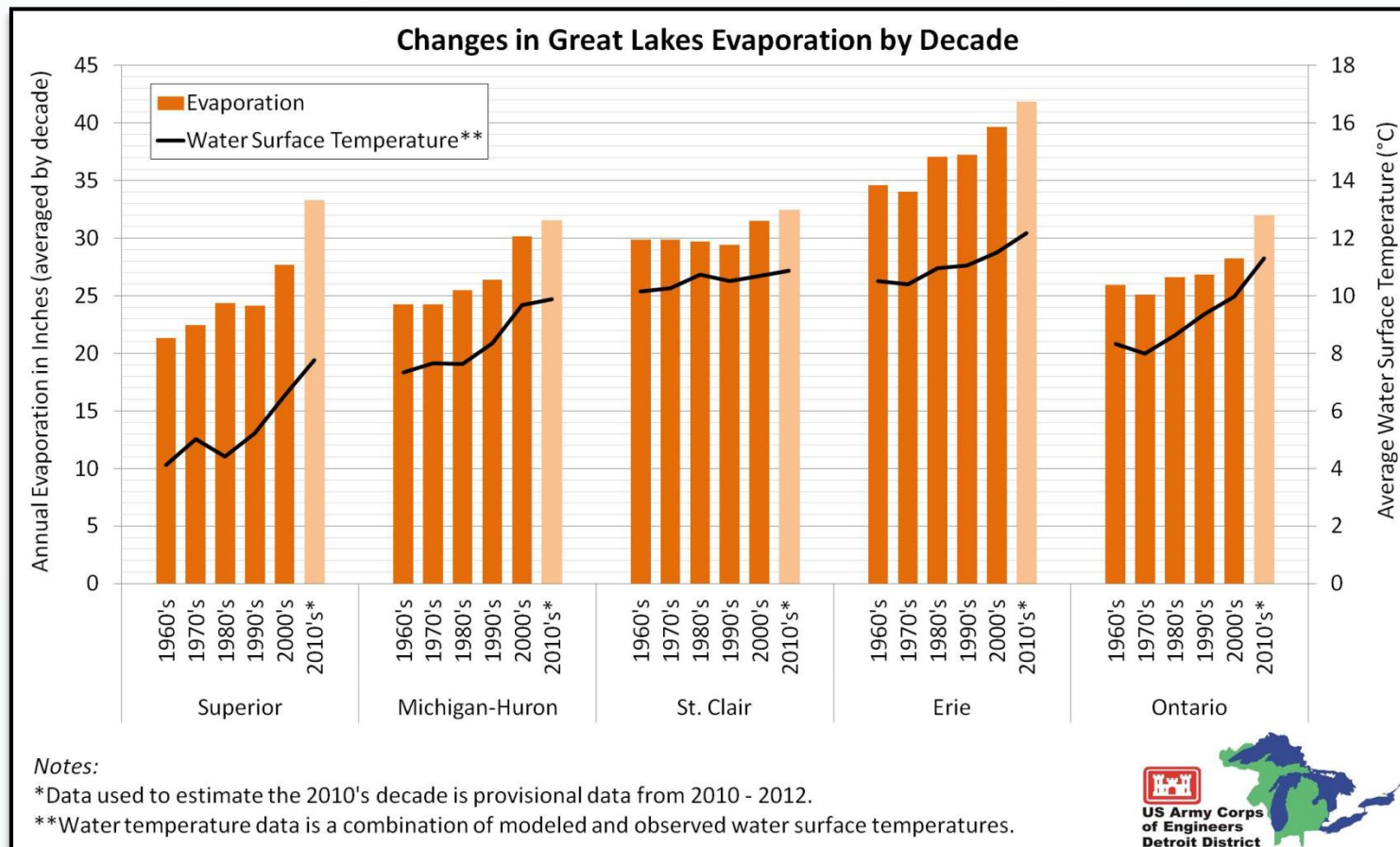
Michigan's proximity to the Great Lakes has a profound influence on its weather and climate.

The lake effect influence results in a **cloudier, wetter, more moderate climate**



# Great Lakes Region's Climate Lake Effect

## Warmer Water – More Evaporation



# Great Lakes Region's Climate Lake Effect

## Winter Melt/Spring Rains - More Flooding



# Michigan's Climate and Transportation



- 35% of US/Canada trade flows through Michigan
- \$520 billion in freight is moved each year on Michigan's highways, rail and water ports
- Trucking accounts for 67% of all freight tonnage moved in Michigan





# Michigan's Climate – Lake Effect



# Extreme Weather Event

## Winter Operations (Operations & Maintenance)

 **Snow through Saturday** 

Slide #1

Potential Snowfall through Saturday



Blues = 5 inches or More  
Purples = 12 inches or More

### Event Summary



- 5 inches to a Foot or More of Snow
- Snow Expected Through Saturday
- All of Southwest Lower Michigan

**Created: Thursday, January 31, 2013 – 100 PM**

NOAA National Weather Service - Grand Rapids, Michigan

Website: <http://www.weather.gov/grandrapids>  
Email: [w-gr.webmaster@noaa.gov](mailto:w-gr.webmaster@noaa.gov)  
Phone: 616-949-0643

 Find us on Facebook 

 Facebook 

Phone: 616-949-0643  
Email: [w-gr.webmaster@noaa.gov](mailto:w-gr.webmaster@noaa.gov)  
Website: <http://www.weather.gov/grandrapids>

# Winter Operations

Extreme lake effect storms changing O&M



Continuously investigate policy and procedures solutions

# Winter Operations

## Extreme lake effect storms changing O&M



- Number of employees
- Numbers/start times of shifts
- Temporary winter employees
- Need for lodging

Continuously investigate workforce solutions

# Winter Operations

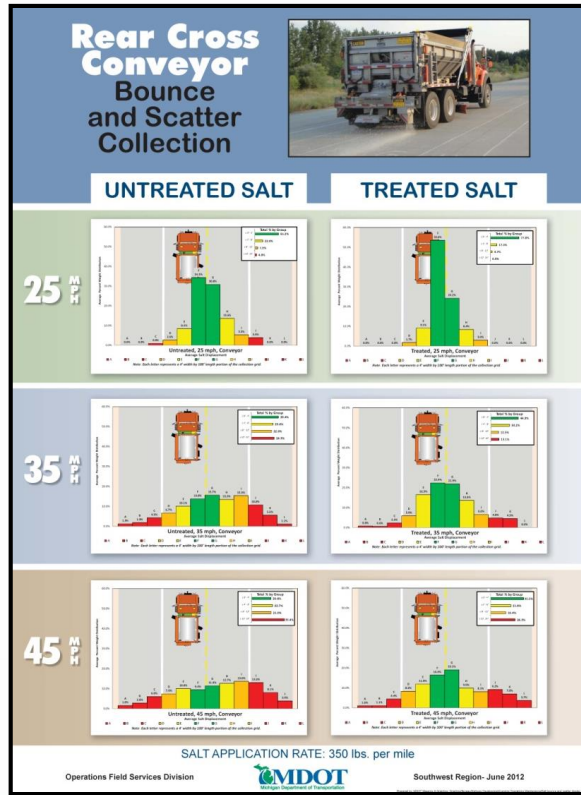
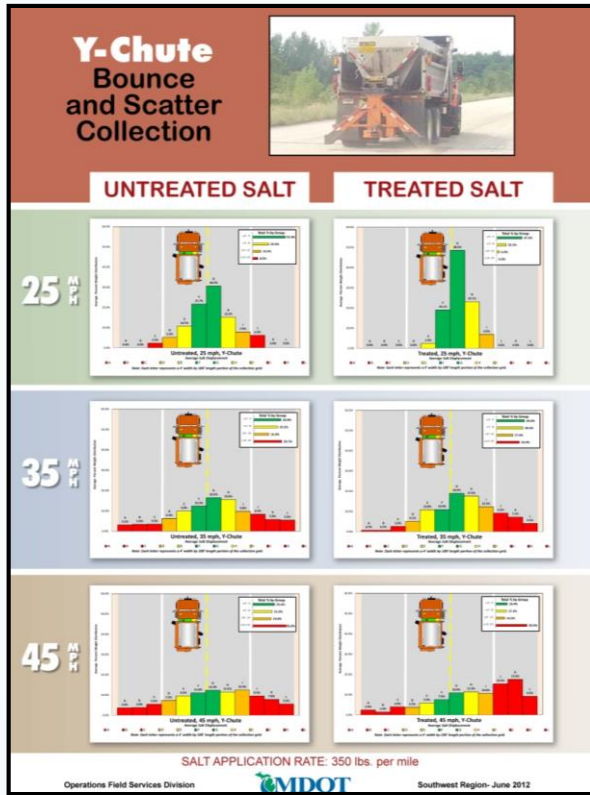
## Extreme lake effect storms changing O&M



Continuously investigate equipment solutions

# Winter Operations

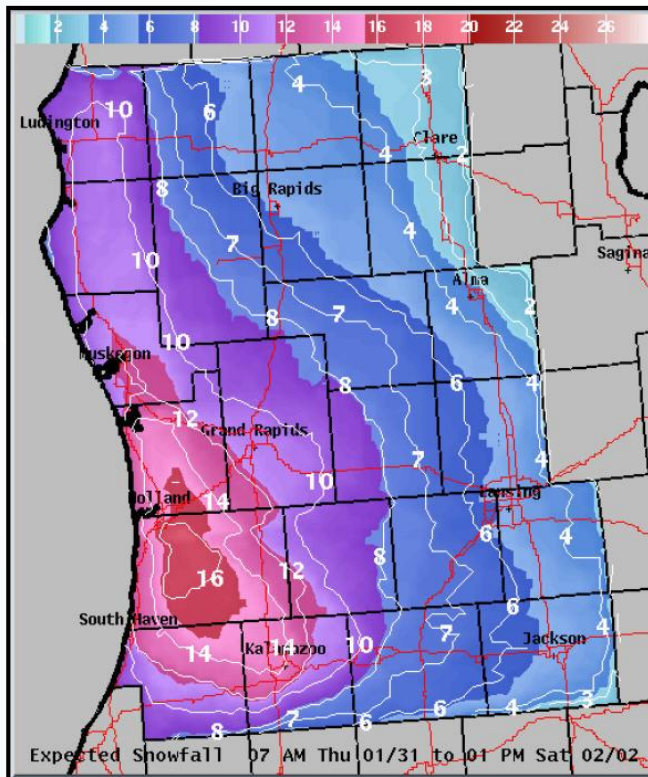
## Extreme lake effect storms changing O&M



Continuously investigate material solutions

# Winter Operations

## Extreme lake effect storms changing O&M

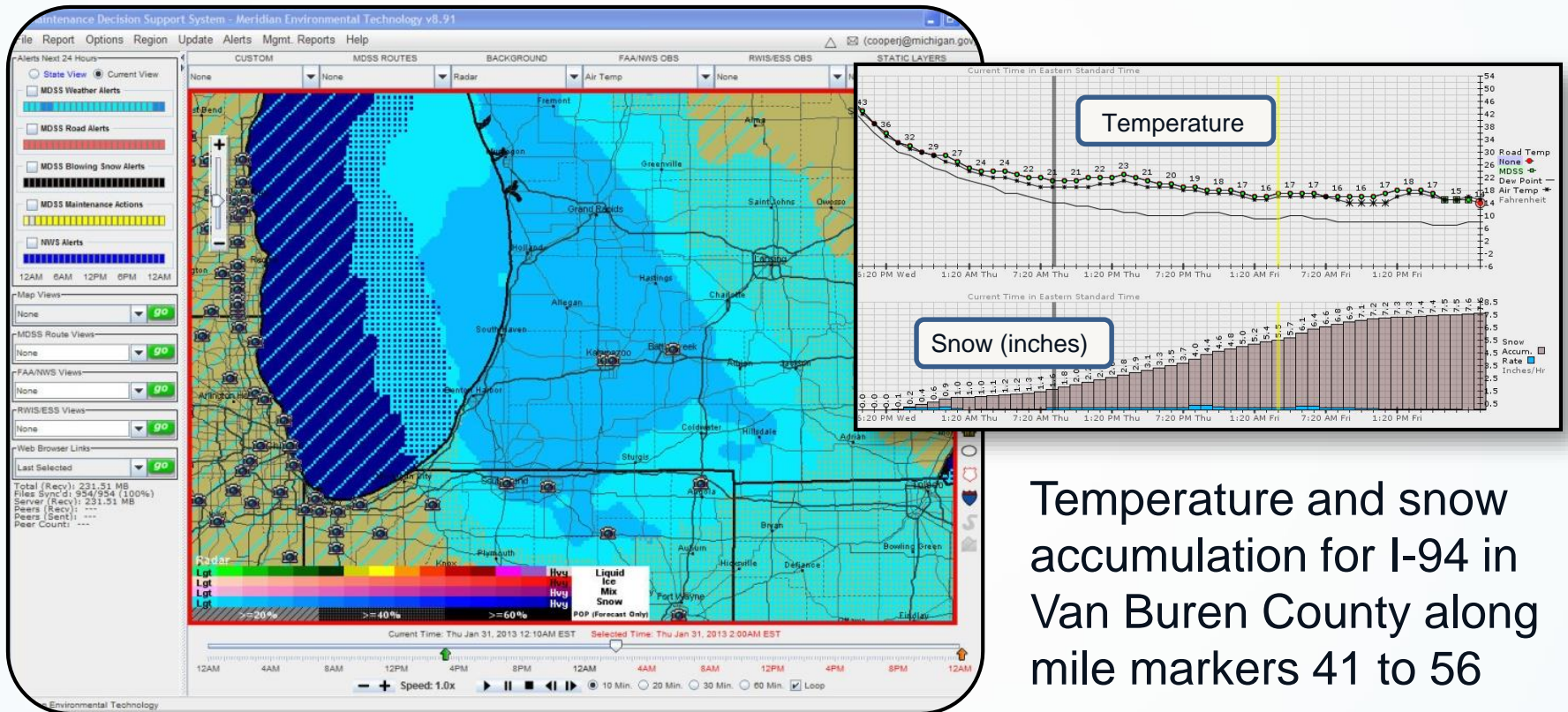


### Maintenance Decision Support System - Predictions for the Southwest Region's I-94 corridor:

- Start of storm event – **January 30, 2013 at 8:00 pm**
- Average temperature – **16 degrees**
- Inches of snow – **7 inches**
- Wind speed – **20 mph with 35 mph gusts**
- Recommended action:  
**Patrol and plow, no material**

Continuously investigate operating system solutions

# Winter Operations Maintenance Decision Support System

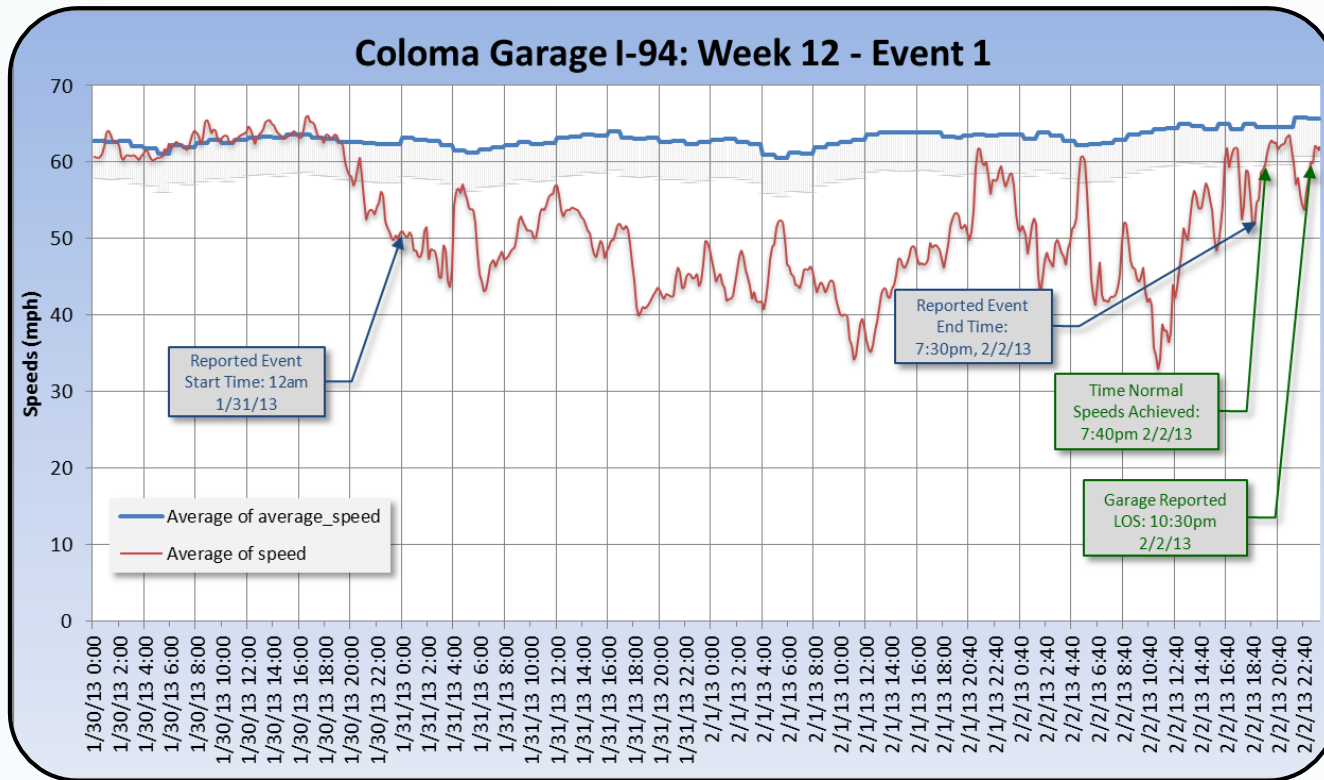


Temperature and snow accumulation for I-94 in Van Buren County along mile markers 41 to 56



# Winter Operations

## Good Government in Action: User Delay Costs



Winter event impact to I-94 users:

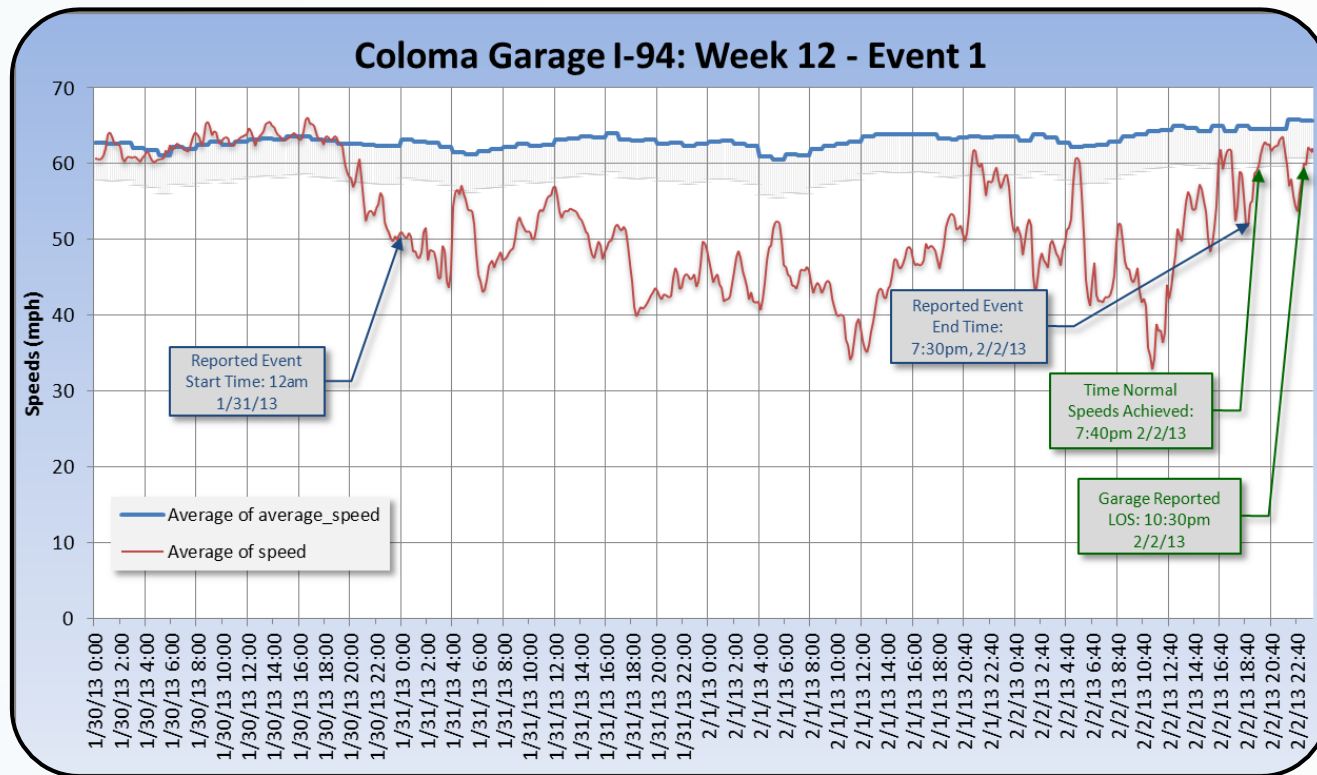
- Actual user delay costs **\$223,898**
- Target user delay costs **\$35,000**



Continuously improve performance measurements and outcomes

# Winter Operations

## Good Government in Action: Event Regain Time



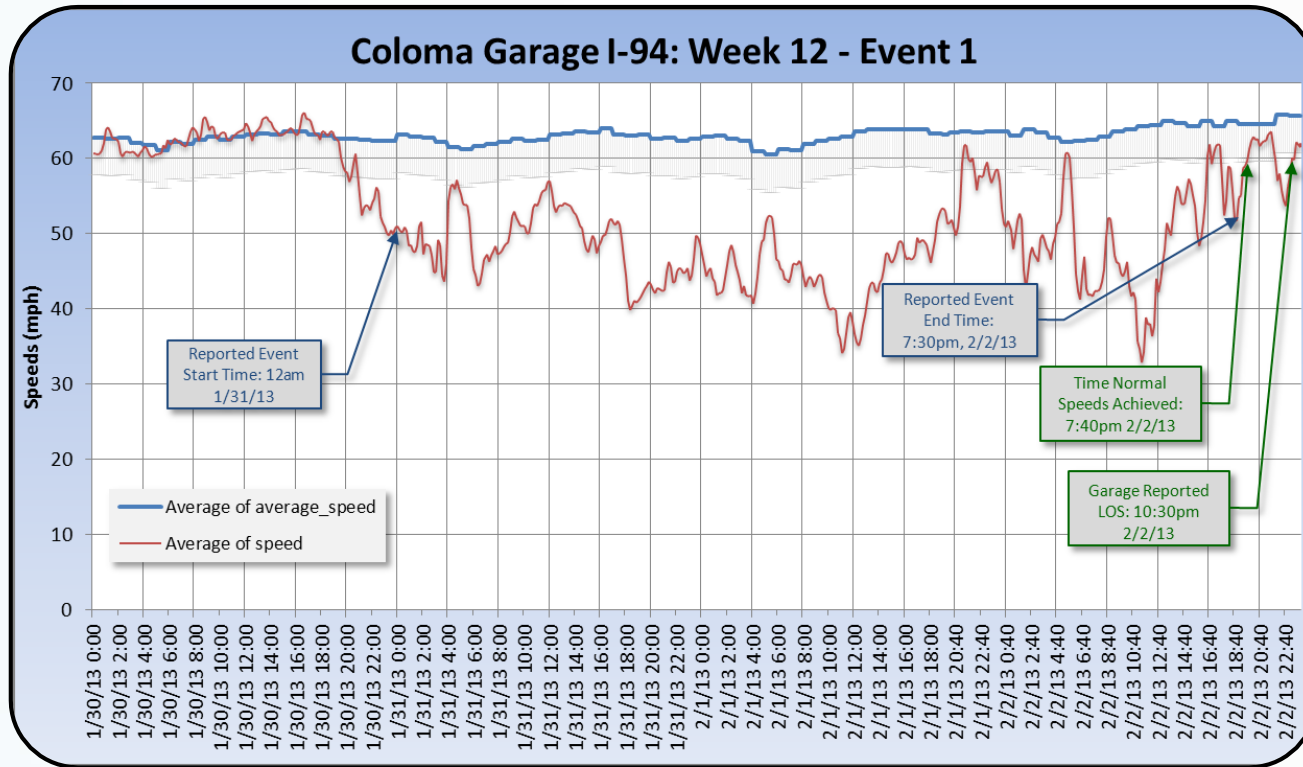
**Winter event impact to I-94 users:**

- Average travel speed 47 mph
- Regain time achieved in 10 minutes



# Winter Operations

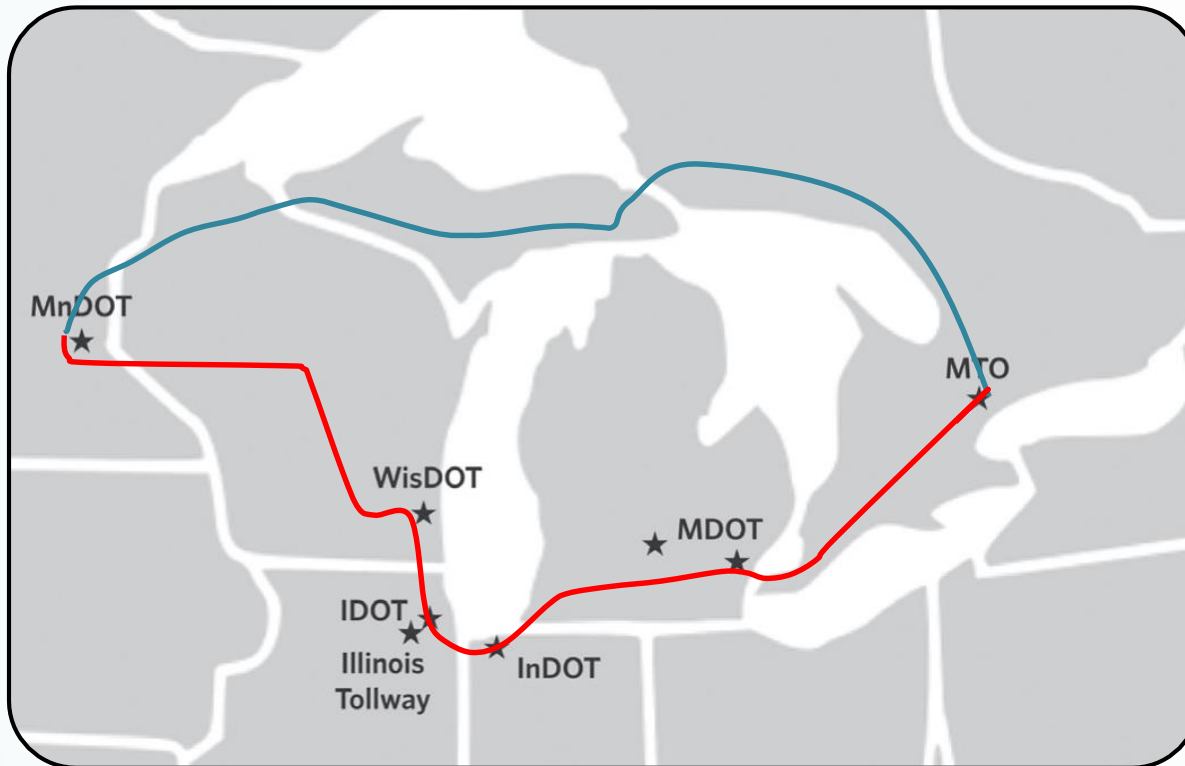
## Good Government in Action: Traffic Incident Mgt.



**Weather event impact to I-94 users: Traffic incidents – six ( two over 2-hrs)**

# Winter Operations

## Great Lakes Regional Transportation Operations Coalition



We are not in this alone.



- 1) Connecting Traffic Operations Centers
- 2) Seeking to expand the Gateway Traveler Information System from part of three states to five states plus Ontario
- 3) Regional Operations Forum in June 2014

# Winter Operations

## The Future State

- Better management of our performance
  - More advanced logistics with workforce, equipment, materials, decision-making, communication, etc.
  - Improved regain time (clearer roads)
- Better results and satisfied customers

**It is all about Customer Satisfaction!**

# Questions?



**Customer Service is Important  
Please take our customer survey:**

**[www.michigan.gov/mdot](http://www.michigan.gov/mdot)**

