

User Expectations and the Social Dimensions of Winter Maintenance



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Overview

- Societal expectations
- Traveler decision-making
- Agency performance measures
- Future considerations
- Summary



Image: <https://www.messengernews.net>

Societal Expectations

- What does the public expect?
 - Mobility
 - Safety
 - Environmental
 - Costs
- What are the benefits?
 - Reduced crashes
 - Improved mobility
 - Reduced travel costs (fuel)

Mobility

- Drive at posted speed limit within hours after of end of storm
- Time to bare pavement
- Winter severity index

Safety

- “Less comfortable” as roadway conditions deteriorate
- Some can tolerate bare wheelpaths
- Additional treatments needed on poor and icy roads

Environmental

- Impacts of materials on environment could become a concern
- Colorado (2006):
 - Chlorides that provide clear roads but also corrosive favored by 34 percent surveyed
 - Less effective materials with less corrosion favored by 21 percent surveyed
- Idaho (2014):
 - Sand and plowing – no concern
 - Chlorides – “unsure” of concern
- Public views materials similarly and hasn't differentiated impacts (yet)

Costs

- Concerned with direct costs incurred
 - Vehicle corrosion/damage
 - Car washes
- Tighter agency budgets – potentially lower LOS
- Increased accountability – reporting maintenance costs?

Traveler Decision-Making

- Providing the public with pre-trip and en-route information
 - Intelligent Transportation Systems
 - Technology-based travel information

Intelligent Transportation Systems

- Different systems have developed over time
 - Variable message signs – general info. pre-storm and during event
 - Site-specific – i.e. ice warning on curves, bridges, etc.



Technology-Based

- Smartphone and tablet ownership enables en-route traveler information
 - Traveler information websites/apps – 511, etc.
 - CCTV, RWIS data, travel speeds, etc.
 - Facebook and Twitter
- Potential drawbacks
 - Distracted driving
 - Amount of info. available may vary by route

Agency Performance Measures

- Measures of maintenance performance:
 - Level of Service
 - Maintenance goals
- Objectives are safety and mobility



Image: Des Moines Register

Level of Service

- Targeted benchmark to meet based on labor, equipment and materials
 - Numeric/alphabetic scale – Characterize different conditions (e.g. A - F or 1-5)
 - Political/customer expectations
 - Maintain roadways as safe and passable
 - Observe speeds – maintenance activities targeted to achieve a given travel speed
- Examples...

Level of Service A



Image: Western Transportation Institute

- Bare, wet pavement

Level of Service B



Image: Western Transportation Institute

- Bare wheelpaths, some lane/centerline coverage

Level of Service C



Image: D. Veneziano

- Lanes mostly/completely snow-covered

Level of Service D



- Black ice

Maintenance Goals

- Stated in terms of metrics – time-based, regain, or similar measures
 - Time-based – bare pavement within timeframe after storm
 - Traffic, corridor or route classification-based – service highest volume routes first
 - Friction levels – maintain a safe friction level

The Future

- Connected and autonomous vehicle will likely change public expectations
- Mobility any time, anywhere, right?
- No research has looked in detail at the needs of autonomous vehicles in winter
- Public may expect even faster maintenance during storms

Summary

- Public expectations are often high
- Expect safety and mobility, often during or shortly after storm
- Providing info. pre-, during and post-storm tempers expectations
- Different methods/approaches to meeting these expectations
- Expectations likely to change over time with connected and autonomous vehicles



Questions?

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