Weather Delay Costs to Trucking

Road Weather Management Program Stakeholder Meeting
Madison, WI
August 8, 2012
Commercial vehicles main mode of freight transportation

- $500 billion freight sector
- 70% of total value and 60% of weight moves by truck
- Estimates that adverse weather is responsible for 12% to 25% of all delay
- Trucking delays due to weather = $3.1 billion/yr for the 50 largest cities
- Lost commerce due to snow closures = $10 billion/day

Other economic impacts of adverse weather

- More than $2 billion/yr is spent on snow and ice control by State DOTs
- Weather accounts for 25% of non-recurring congestion
Project Objective

Quantify the Impact of Adverse Weather on U.S. Roadway Freight Operations

Key Questions

• What is the overall level of delay in the system?
• What portion of delay is incurred by CVs?
• What portion of delay is caused by adverse weather?
• What is the value of commercial shipments?

Various data sources available

Important to select the realistic level of detail
Average truck speeds, 2008 to 2010

FPMweb Tool

» Initiative of FHWA Office of Freight Management and Operations, in partnership with the American Transportation Research Institute (ATRI)

» Derived from GPS trucking data
  • Trucks that travel on interstate highways
  • Several hundred thousand trucks
  • Billions of truck data position points
Weather Data – Source

- Global Summary of the Day (GSOD)
- Department of Commerce (DOC), National Oceanic and Atmospheric Administration (NOAA), National Environmental Satellite, Data, and Information Service (NESDIS), National Climatic Data Center (NCDC)

- FTP Access (Free, Public)
  - Data available by station by year
  - 2008, 2009, 2010
Weather Data – GSOD

Data on:
- Mean temperature (.1 Fahrenheit)
- Mean dew point (.1 Fahrenheit)
- Mean sea level pressure (.1 mb)
- Mean station pressure (.1 mb)
- Mean visibility (.1 miles)
- Mean wind speed (.1 knots)
- Max sustained wind speed (.1 knots)
- Maximum wind gust (.1 knots)
- Max temperature (.1 Fahrenheit)
- Minimum temperature (.1 Fahrenheit)
- Precipitation amount (.01 inches)
- Snow depth (.1 inches)

Indicator for occurrence of:
- Fog
- Rain or Drizzle
- Snow or Ice Pellets
- Hail
- Thunder
- Tornado/Funnel Cloud
These stations were selected because they overlaid the truck speed data very well.
The performance modeling has three phases

» Weather effects on highway performance
» Delays and other operating effects on trucking
» Cost, service and other economic effects on supply chains
Substantially advances our understanding of trucking work.

It reveals that almost half (47%) of trucking activity in the states is transient.

The activity is largely unreported by conventional statistics that track origin and destination activity but have little detail on what happens in between.
This chart shows baseline speeds from which to calculate weather degradations.
Background

- Initial estimate of annual weather-related freight delay is $8.66/year billion per year

- Weather impacts distributed more evenly across country than may be thought – many small events impact travel speed

- Many unanswered questions due to:
  - Need for national, broad brush approach
  - Mismatch between high level of weather data detail and lower level of freight movement detail
  - Need for many assumptions on both sets of data

- Detailed subarea studies considered as way to validate model and improve confidence
Questions or Comments