Wisconsin Truck Size and Weight Study
Trucking Issues Group Meeting #2
October 7, 2008 | 1:00 p.m. – 3:00 p.m.

MINUTES

Attending:
Todd Szymkowski, WisDOT/UW
Scott Becker, WisDOT
Dennis Hughes, WisDOT
Kathleen Nichols, WisDOT
Lynne Judd, WisDOT
Dennis Leong, WisDOT
Greg Niva, WisDOT
Sandy Beaufre, WisDOT
Phil DeCabooter, WisDOT
Ashwani Sharma, WisDOT
John Corbin, WisDOT
Dave Vieth, WisDOT
Rory Rhinesmith, WisDOT
Col. Ben Mendez, WisDOT
Beth Cannestra, WisDOT
Capt. Charles Lorentz, WisDOT
Raymond Lukesic, FMCSA
Al Ratcliffe, FHWA
Jason Bittner, CFIRE
Donald Ludlow, Cambridge Systematics
Sam Van Hecke, Cambridge Systematics
Harry Cohen, Consultant
Jim Lucht, Earth Tech

Discussion Items

Key Questions
- Should changes be made to Wisconsin’s TSW laws?
- What impacts would changes to TSW laws have on the State’s roads and bridges, regulatory and enforcement capabilities, administrative processes, and freight transportation modes?
- What specific requirements need to be met by any vehicles operating under modified size/weight standards?

Schedule Updates (see handout)
- Delivered Tech Memos 2A, 2B, and 2D (Please comment on by Monday, 10/13)
- Tech Memos 2C, 2E, and 2F in progress
- Completed 9 formal private sector interviews and conducted Public Agency Outreach Workshop #1
- Starting to make transition from Tasks 1 & 2 into Task 3 (Cost-Benefit Analysis of Initial Possible Changes)
- Upcoming Events
  - Study Advisory Group Meeting (10/21)
  - Public Workshop #2 (10/28)
  - Safety Workshop (11/3)

Private Sector Outreach (see handout)
- Impact on drivers is important (need better pay and working conditions)
- Changes should be across the board
- Need economic justification in order to see investment in new equipment
- Several calls for increased weight, a few calls for increased size
Discussion:
The question arose of whether the truck driver shortage has come up as an issue. It has not come up in private or public sector outreach and seems to be less of an issue in the current economic environment.

As part of the private sector outreach, two groups have emerged:
1. Interstate carriers/shippers → interested in federal regulation changes
2. Intrastate carriers/shippers → typically moving 200 miles or less, interested in interoperability with neighboring states (for example, WI ethanol carriers have encountered problems with IL’s secondary highway system limitation of 73,280 pound GVWs). Intrastate industries include ethanol, timber, scrap, agriculture...

Public Agency Outreach Workshop #1 (see handout)
- Good, diversified attendance
- Concern about impact of overweight trucks on local roads
- Emphasis on lack of enforcement, minimal fines creating an “incentive for noncompliance”
- Changes should be equitable and understandable

Tech Memo Update
Tech Memos 2A, 2B, and 2D have been submitted and are open for comment until Monday, Oct. 13. Please submit comments to Sam Van Hecke svanhecke@camsys.com.

Tech Memo 2A (WI TSW Laws) results were briefly recapped.

Some new Tech Memo 2B (Neighboring State TSW Laws) displays were presented which showed the comparative levels of fines, OS/OW permit costs, and citations/CMV registrations among WI and its neighboring states.

It was mentioned that an understanding of where the fines go in WI is important. A more relevant enforcement comparison might be Truck VMT to citations issued.

Some additional Tech Memo 2D (Economic Trends) results were presented. Trends affecting load sizes and weights as well as the commodity-specific production locations of heavy hauling industries were presented.

Tech Memo 2C (Technology Trends) is in progress. The Study Team is interviewing several WI-based Original Equipment Manufacturers (OEMs). Early results have indicated that OEMs are focusing on fuel efficiency and designing trailers to accommodate heavier loads. Some common options include geo-fencing and blind spot cameras.

Tech Memo 2E (Truck Safety) is in progress and the Study Team is looking into county level truck crashes (10-year) divided among fatalities, injuries, and property damage only (PDO).

Tech Memo 2F (Potential Recommendations) is in progress.
Safety Workshop
A Safety Outreach Workshop is scheduled for on November 3.
The Agenda will include:
- Introductions
- Presentations of
  - Study Goals/Progress
  - Truck Safety Analysis Results
  - Potential Changes
- Discussion of
  - Current Safety Challenges
  - Impact of Changes
  - Recommendations for Improving Truck Safety

Potential Invitees could include:
- WisDOT Bureau of Transportation Safety
- State Patrol
- Safety Advocacy Groups
  - CRASH
  - CABT
  - PATT
- Researchers

Evaluation Approach
- For each TSW proposal, provide estimate of annual benefits (or disbenefits) in millions of dollars per year for
  - Transport costs
  - Pavements
  - Bridges
  - Safety
  - Congestion
- Provide in-depth qualitative assessment of effects on specific industries, rail, and any special enforcement problems.
- Provide quantitative estimates of impacts on
  - Energy consumption
  - Emissions of CO2, PM, and NOX

Key Sources
- Transportation Research Board Special Reports 225, 227, and 267
- US DOT 2000 Comprehensive Truck Size and Weight Study
- Minnesota Truck Size and Weight Study
- Highway Economic Requirements System (HERS)
- ATRI report on Energy and Emissions Impact of Operating Higher Productivity Vehicles

Truck Usage
- Changes in TSW laws cause changes in types of vehicles used and operating weights for existing truck freight movements
- Changes might also affect amount of freight carried (e.g., diversion from rail) and highway systems used.
• For each proposed change, predict vehicle miles by truck type, operating weight, and highway system.
• Truck usage forecasts “drive” estimates of impacts on transport costs, pavements, bridges, safety, congestion, energy, and emissions.
• Use Base Case Truck Weight Distributions to identify traffic that might shift to longer or heavier vehicles
• Have access to data on trucks weighed in Wisconsin through FHWA Vehicle Travel Information System (VTRIS)
  o Urban Interstate (2004, 2005)
  o Urban Other Freeways (2006, 2007)
  o Urban Other Principal Arterials (2004, 2005, 2007)

Transport Costs
• Develop using unit costs ($/VMT by truck type and operating weight) from US DOT Comprehensive Truck Size and Weight Study
• Vehicle types include five and six axle tractor-semis, conventional doubles, Rocky Mountain doubles, turnpike doubles, and three and four axle dump trucks.
• Includes costs for drivers, vehicles, fuel, tires, repair, and overhead.
• Will be updated to 2008 dollars to account for inflation

Pavement Impacts
• Equivalent single axle loads (ESALs) are used to measure the effects of traffic loadings on pavements.
• Determine ESALs per vehicle by vehicle type and operating weight for flexible and rigid pavements (roughly a fourth power function of axle weight)
• Use truck usage forecast for each proposed TSW change (VMT by vehicle type, operating weight, and highway system)
• Calculate change in ESAL-miles by highway system due to proposed TSW change.
• Estimate added cost per ESAL-mile under two different assumptions:
  o Agency costs are increased (or decreased) so that there is no change in pavement condition
  o Agency costs are constant so that changes in ESAL-miles result in changes in pavement condition (which affect road users)
• Note that cost per ESAL-mile can vary by highway system and season (e.g., due to the weakened condition of pavements during spring thaw)
• Calculate pavement benefits (or disbenefits) as the product of the change in ESAL-miles and cost per ESAL-mile
Increase in Pavement Cost Per Additional ESAL-Mile from Minnesota Truck Size and Weight Study (note: costs are increased 5x during spring load restriction)

<table>
<thead>
<tr>
<th>Highway System</th>
<th>Cost Per ESAL-mile (cents)</th>
<th>Agency Pays</th>
<th>Road Users Pay</th>
</tr>
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<tbody>
<tr>
<td>Rural</td>
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<td></td>
</tr>
<tr>
<td>Interstate</td>
<td>6.3</td>
<td>35.5</td>
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</tr>
<tr>
<td>Other “10 Ton”</td>
<td>18.6</td>
<td>25.7</td>
<td></td>
</tr>
<tr>
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<td>Urban</td>
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</tr>
<tr>
<td>Other</td>
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<td>36.7</td>
<td></td>
</tr>
</tbody>
</table>

Notes on Table: “Agency Pays” = assumption that agency increases pavement resurfacing schedule to hold condition constant. “Road Users Pay” = assumptions that agency continues to resurface at same rate but roads are in worse condition, paying for damage to vehicles, slower travel times.

Safety Impacts

- Use accident rates (by vehicle type and operating weight) from TRB Special Report 225, adjusted to be consistent with Wisconsin experience
- Apply Wisconsin DOT unit costs for fatal, injury, and property damage only accidents
- Special analysis of safety considerations in issuing and enforcing permits
- Ideally, insure that new trucks are safer than those that they replace.

Crash Rates from TRB Special Report 225

<table>
<thead>
<tr>
<th></th>
<th>Crashes per million vehicle miles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fatal</td>
</tr>
<tr>
<td>Single Unit Trucks</td>
<td>7.7</td>
</tr>
<tr>
<td>Tractor Semi-Trailers</td>
<td>10.2</td>
</tr>
<tr>
<td>Doubles</td>
<td>11.2</td>
</tr>
</tbody>
</table>

Effect of Gross Vehicle Weight on Crash Rates (From TRB Special Report 225)

0.25% increase in crash rate for each 1% increase in GVW

\[ R = R_0 * (1 + 0.25 * \frac{G}{G_0}) \]

Economic Loss from Crashes (2006$) (From 2006 Wisconsin Traffic Crash Facts)

- $1,187,000 per fatality
- $62,400 per incapacitating injury
- $20,200 per non-incapacitating injury
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- $7,700 property damage
- Update these costs to 2008$

Discussion: National Safety Council numbers are conservative. FHWA requirements are significantly higher. PDO crashes involving trucks are significant. HERS model uses $3M for fatal crashes. Going conservative may understate safety impacts. FHWA requires comprehensive cost. Dennis HSIP annual reports require higher unit. Conversation with Dennis offline. In Minnesota, FHWA numbers were used. Safety may have CODES data (Crash Outcome Data Evaluation System) that could be linked to truck data.

Congestion Impacts
- Use passenger car equivalents (PCEs) by vehicle type and operating weight from US DOT Comprehensive Truck Size and Weight Study
- Use speed vs. volume functions from HERS to estimate added delay due to a unit increase in traffic volumes (depending on current congestion levels as reflected by AADT/Capacity).
- Use Wisconsin HPMS data to estimate current congestion levels by highway system.
- For each TSW proposal, calculate the change in congestion delay and excess fuel consumption on each highway system.
- Apply value of travel time and cost per gallon of fuel to calculate cost of congestion.

Discussion: Study team proposes using HERS value for this study. US DOT and Minnesota values of time are the same.

Energy, Global Warming, and Other Emissions
- For each proposed TSW change, estimate changes in fuel consumption using gallons per mile by vehicle type and operating weight.
- Estimate changes in CO2 (22.2 pounds per gallon of diesel fuel)
- Estimate changes in particulate matter (0.11 grams per gallon of diesel fuel)
- Estimate changes in nitrogen oxides (23.0 grams per gallon of diesel fuel)

Three level option: 1) not include, 2) include as pollution level, 3) include as $ impact

Discussion: Most comfortable with option #2. Will account for biodiesel? WI has seen ethanol growth, has fledgling biodiesel market.

Bridge Evaluation - Posting and Replacement
- Obtain bridge data for Bureau of Structures
- Define “worst case” legal bridge loading for each truck loading scenario for additional evaluation
  - Design Loading;
  - Inventory Rating;
  - Operating Rating;
  - Special Vehicle Permit Rating
- Estimate the number of additional bridges requiring posting
  - Representative number of bridges;
  - Typical configuration of bridges;
- Estimate costs for bridge posting
  - Inspection cost;
  - Enforcement cost;
• Map posted bridges to identify unacceptable routes
• Identify bridges requiring replacement
• Estimate costs to replace bridges
• Planning level cost estimate
• Document results

Discussion:
Office of Structures could view representative samples and help identify results (impacts of trucks on bridges) through use of their analysis software.

Study Team should look into evaluating risk and potentially incorporating it into C/B analysis. There may be more bridge failures if TSW law changes result in a changed inventory of what trucks are doing.

Inadequate bridges may be unable to accommodate heavier loads, which can lower the routing efficiency of carriers. The Study Team should consider how to balance reduction in routing efficiency with gains in efficiency due to increased load size/weights. The Study Team should consider the availability of OS/OW permitting.

The State doesn’t own all the bridges. There is backlash from county highway administrators when facing heavier weights, and they sometimes use posting restriction to limit allowable weights on bridges.

Potential Configurations for Analysis (see handout)
A handout was provided with details on the potential configurations for detailed review and potential recommendations.

Additional TSW Changes for Analysis
• Extend Frozen Road Declaration’s Allowable Overweight Operations
• Review Non-Permitted Weight Exceptions for Dairy, Forest Products, Septage, and Livestock (potential for repeal or extension)
• Increase Fines for Commercial Vehicle Size/Weight Violations
• Increase Resources for TSW Enforcement
• Improve OS/OW Permit Process

Discussion:
The question was raised of whether public sector participants have argued for increased funding. There have been few examples thus far.

OS/OW Permitting
Kathleen Nichols of the Department of Motor Vehicles, OS/OW Permit Office presented an overview of WisDOT’s OS/OW permitting practices.

Summary
• There are significant differences in Midwestern states OS/OW regulation
• Permit automation is a saving grace
• IA, MN, IL and WI all trying to balance energy, business and transport issues with wind industry. More interstate policy development desirable.
• Communication between states during permit suspensions need to be regularized
• Develop maps and shared vocabulary
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- Set daily calls with minutes for a record

Some discussion highlights included:
- AASHTO group has been active in coordinating future directions for OS/OW permitting among states
- Wind tower issue has been significant challenge for Permit Office and has required detailed review of routes
- Scrap permit has no cap on GVW, no axle requirements, so new commodities are being pushed into “scrap” category
- Processing time is generally one day, 72 hours maximum
- Typically loads are issued in one day or issued within the business week
- Single trip permits are valid for two weeks (no extensions), in other states they are valid for 5 days or one week
- Pavement is rarely a cause for rejection (due partially to spring thaw)

Next Steps
- Looking for comments on Tech Memos 2A, 2B, 2D by Monday (10/13)
- Study Advisory Group Meeting on 10/21
- Public Agency Workshop #2 on 10/28
- Safety Workshop on 11/3
- Trucking Issues Group Meetings
- Tuesday, November 4 (1-3)
- Tuesday, December 16 (1-3)

Meeting Adjourned