2000 Spring Load Restrictions Task Force
Legislative Report

Prepared February 6, 2001
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A. EXECUTIVE SUMMARY

Spring is a critical period for Minnesota’s roads because the roadbed soils and aggregate base materials are in a weakened state during and after the thawing process. Spring load restrictions (SLR) are used as a preservation strategy to reduce damage, thereby protecting Minnesota’s investment in the infrastructure. However, the imposition of spring load restrictions impacts industry, both in their operations, and financially.

While it is clear that spring load restrictions benefit the infrastructure, there are two issues of which little is known: (1) the economic impacts that result when access to the transportation system is restricted and (2) extent of enforcement efforts.

The development of the Spring Load Restrictions Task Force was in response to 1999 legislation requiring the Commissioner of Transportation to establish a task force to study spring load restrictions and report to the legislature its findings and any recommendations for legislative action by February 1, 2000. The legislation also calls for task force members that represent many interests including aggregate and ready-mix producers, agriculture, waste haulers, construction, and logging. Other members representing local agencies, associations, and enforcement have also been included.

The task force objectives were to study the current status of spring load restrictions in the state of Minnesota, explore the economic impacts of the load restrictions, and report the findings to the legislature. A key feature of this study included local agency and private sector perspectives.

To determine the effects of spring load restrictions, the Task Force met six times. They began work by identifying those issues that they felt were part of spring load restrictions. Five main issues were identified at the first meeting, including:

- Engineering
- Financial Impacts
- Safety and Public Health
- Enforcement
- Regulations and Mandates

To assist in providing data regarding the above issues, Mn/DOT staff conducted a survey of local agencies, local law enforcement, and private industry. The survey served to evaluate the current system of SLR enforcement and regulations, as well as the impacts of load restrictions on private industry.

Detailed presentations by Mn/DOT staff outlined the effects of traffic on roads, and the costs associated with upgrading roadways to higher capacity. Information about the permitting process, the effect of traffic and loads on Minnesota bridges, and the Minnesota roadway system was also provided by Mn/DOT staff. Anecdotal information regarding the impacts of SLR was obtained from task force members, including representatives of the State Patrol and private industry.

The following are the final Task Force recommendations to the Legislature:

1. The Legislature should appropriate funds for Mn/DOT to conduct a comprehensive study to determine the actual costs and benefits of spring load restrictions.

2. A comprehensive, seamless information source for SLR policy and regulations should be developed. This could be internet-based with city and county links. Cities and counties would be responsible for keeping their information updated.

3. The State Patrol should provide certification of local vehicle weight enforcement personnel. This would create increased enforcement uniformity and knowledge about SLR policies and regulations.
4. A study should be completed to identify conflicting regulations that affect health and public safety.

5. Information should be provided to the legislature regarding pavement behavior and need for SLR. This information will also be provided to local agencies. An information packet will include one of two videos. This task can be completed through Mn/DOT or the LRRB.

B. ACKNOWLEDGEMENTS

Members of the Task Force were very generous with their time in meeting and developing the final recommendations to the Legislature. With their help, a better understanding of the impacts of SLR policy was reached. Task Force members are thanked for their contributions. The Task Force included the following people:

Anita Benson, Co-chair       Don Williamson, Co-chair
Mary Ayde                   Chris Radatz
Bruce Kleven                Andy Steensma
Gene Halverson              Bruce Barker
Jim Trudeau                 Todd Iverson
Gene Ranieri                Ken Ashfeld
Mike Sheehan                Gene Wright
Deb Burke                   Fred Ettel
Dennis Berg                 Dave Ewald
Bob Zelenka                 Mike Robinson
David Fricke                Jerry Johnson
Bill Hall

Photo 1. Task Force members meeting in small groups to identify issues and recommendations.
C. INTRODUCTION

Spring is a critical period for Minnesota’s roads because the roadbed soils and aggregate base materials are in a weakened state during and after the thawing process. Spring load restrictions (SLR) are used as a preservation strategy to reduce damage, thereby protecting Minnesota’s investment in the infrastructure. However, the imposition of spring load restrictions impacts industry, both in their operations, and financially.

While it is clear that spring load restrictions benefit the infrastructure, there are two issues of which little is known: (1) the economic impacts that result when access to the transportation system is restricted and (2) extent of enforcement efforts.

The development of the Spring Load Restrictions Task Force was in response to 1999 legislation requiring the Commissioner of Transportation to establish a task force to study spring load restrictions and report to the legislature its findings and any recommendations for legislative action by February 1, 2000. The legislation also calls for task force members that represent many interests including aggregate and ready-mix producers, agriculture, waste haulers, construction, and logging. Other members representing local agencies, associations, and enforcement have also been included.

Laws 1999, Chapter 238, Section 2, Subdivision 7(f)

The commissioner shall establish a task force to study spring load restrictions and report to the legislature its finding and any recommendations for legislative action. The commissioner shall appoint members representing:

(1) aggregate and ready-mix producers;
(2) solid waste haulers;
(3) liquid waste haulers;
(4) the logging industry;
(5) the construction industry; and
(6) agricultural interests.

The task force shall report to the legislature by February 1, 2000, on its findings and recommendations.

The task force objectives were to study the current status of spring load restrictions in the state of Minnesota, explore the economic impacts of the load restrictions, and report the findings to the legislature. A key feature of this study included local agency and private sector perspectives.

D. TASK FORCE METHODOLOGY

To determine the effects of spring load restrictions, the Task Force met six times. They began work by identifying those issues that they felt were part of spring load restrictions. Five main issues were identified at the first meeting, including:

- Engineering
- Financial Impacts
- Safety and Public Health
- Enforcement
- Regulations and Mandates

The Task Force determined that, to make an accurate assessment of the impacts of spring load restrictions, additional information would be required. They listed the following:
• Surrounding states’ and Canada’s laws and policies regarding spring load restrictions
• Overview of MN spring load restriction policy
• Who gets fees from enforcement?
• What is the process for obtaining special permits?
• How are exemptions granted?
• Quantify postings in other states
• Mn/ROAD research findings, and the new restriction policy
• Term definitions
• Cost of damage to roads
• Possible solutions and brainstorming
• Costs to private and public agencies and businesses
• Enforcement issues
• Continuity/uniformity among state and local agencies

To assist in quantifying some of the above, Mn/DOT staff conducted a survey of local agencies, local law enforcement, and private industry. The survey helped the Task Force gain a better understanding of the following:

1. Evaluate current SLR system
   Respondents were asked to assess the following:
   a. Methods used in the decision-making processes. Determine local criteria used for identifying roads to be restricted as well as the duration of restrictions.
   b. Number of miles of local pavements affected by SLR for various systems and functional classes.
   c. Consistency of enforcement at all levels.

2. Identify impact of load restrictions at the local level
   a. Survey industries in selected areas to determine (1) the level of impact that SLR has on their business and how they address them, (2) traffic associated with these industries including seasonal trends, and (3) preferred routes of travel.
   b. Identify impacts to road and highway system. Survey selected local agencies to determine local experience on the impact of heavy loads on their system.

Results from those surveys are included in the Appendix.

Photo 2. Interested parties and Task Force members.

During the October meeting, Task Force members and other interested participants were asked to divide into five subgroups (one for each main issue listed above), and work on resolving each issue. Attached in
Appendix F is the worksheet that was used for that process. Work continued on the five issues at the November and December meetings.

Detailed presentations by Mn/DOT staff outlined the effects of traffic on roads, and the costs associated with upgrading roadways to higher capacity. Information about the permitting process, the effect of traffic and loads on Minnesota bridges, and the Minnesota roadway system was also provided by Mn/DOT staff. Additional information regarding the impacts of SLR was obtained from task force members, including representatives of the State Patrol and private industry.

At the December meeting, each of the five subgroups met to develop proposed recommendations for each of their issues. Those recommendations were then discussed at the two January meetings, and final recommendations prepared by the entire Task Force. Those final recommendations are included in section F of this report.

E. SUMMARY OF ISSUES

The five main issues identified by the Task Force are listed below, along with Findings and Conclusions for each. Proposed recommendations made by each subgroup working on the issue are also provided for completeness.

Some of the subgroups’ proposed recommendations were adopted by the entire Task Force and are included in the Final Recommendations.

Photo 3. Members of the engineering subgroup.
1. **Engineering Issues**

a. **Description**

The goal of applying spring load restrictions is to minimize pavement damage during the most damaging period of the year and preserve the investment in transportation infrastructure. Engineering issues that arise due to the imposition of spring load restrictions include:

- pavement technology and behavior
- the effects of climate and loading

There is an incomplete understanding about the need for spring load restrictions. As a result, many misconceptions exist, including a belief that lowering speed reduces the effect of loads on pavements, and that total load, not load distribution is the main contributor to pavement damage.

The objective of implementing spring load restrictions is to reduce damage on roads built to lower standards, as well as roads in poor condition. Spring is the harshest season for pavements. Pavement strength varies seasonally, and it is strongest in the winter, when all layers are frozen. During the spring, the pavement thaws from the top down. The asphalt concrete surface remains cold and stiff, as does the natural ground. The aggregate base layer between the two thaws and the water has nowhere to drain. This trapped water significantly reduces the strength of the base, and loss of support for the pavement leads to rutting and pavement damage.

Increasing the load carrying capacity of all roads would greatly affect roads that are limited by the bridge capacity. Any changes in SLR policy must consider the presence of bridges within routes, their capacity, and the increased fatigue damage that would result from heavier loads during winter months. Bridges are designed using projected wheel loads. The current bridge design vehicle is a 90,000 lb. truck, but the majority of Minnesota bridges were built for a 72,000 lb. load. Fifteen percent of all Minnesota bridges were designed for an even lighter load (30,000 lbs.) Bridge postings do not change during the year. However, more fatigue damage occurs in cold weather.

b. **Findings**

1. There is an incomplete understanding about the need for spring load restrictions by some of the affected groups. As a result, many misconceptions exist.
2. Minnesota road authorities are using the most current technology to determine when spring load restrictions are imposed.
3. Current spring load restriction postings are based on long-term experience and the latest technology.
4. With the current level of funding, roadway jurisdictions cannot continue to provide the current level of service without imposing spring load restrictions.
5. Funding does not exist to build all roads to carry all loads.
6. The Local Road Research Board is funding a winter loading study near Ada, Minnesota that may yield results that are applicable to SLR policy.

c. **Conclusions**

1. Additional funding is required to upgrade and build roads to reduce spring load restrictions. The Task Force acknowledges that additional transportation funding will compete with other transportation needs, such as congestion and safety issues.

d. **Subgroup’s Proposed Recommendations**
1. Provide information to legislature regarding pavement behavior and need for SLR. This will also be provided to local agencies.

2. Before making any changes to current SLR policies, conduct detailed study to assess and quantify impacts of current SLR policy.

2. Financial Impacts
   a. Description

   Members of the Task Force agreed that the financial impacts of spring load restrictions are great. These impacts affect the roadway users, including the general public and industry, as well as the roadway agencies responsible for their maintenance and construction.

   Task Force members also agreed that the financial impacts of SLR have not been quantified. Several industry representatives made presentations to the Task Force outlining the effects of SLR to their industry, including the Timber Producers Association, the Association of General Contractors, the Minnesota Trucking Association, the National Solid Waste Management Association, and Farm/Ag Groups. Costs of complying with the spring load restrictions were sometimes great, and affected how each industry does business. In some cases, businesses operate less efficiently in order to comply with the restrictions.

   Scott Peterson, Mn/DOT Economic Analyst noted that an economic analysis (in the form of a benefit/cost analysis) of current SLR policies or proposed changes would help to determine if the benefit to businesses and their customers were more than the additional public cost of removing SLR. If so, efficient policy changes could be identified.

   b. Findings

   1. The financial impacts of spring load restriction have not been quantified.
   2. Over 66% of Minnesota road miles are financed primarily through property taxes and assessments.
   3. Most local roadways require SLR. Only 13 percent of Mn/DOT’s Trunk Highway system have SLR.
   4. Businesses that comply with SLR appear to be at an economic disadvantage to non-compliant businesses.
   5. Survey results indicate that there is a low level of enforcement of SLR at the local level.

   c. Conclusions

   1. The overall cost of spring load restrictions is not known. The incremental costs for maintenance and construction to upgrade the roadways vs. the increased costs to deliver goods and services due to spring load restrictions should be quantified.
   2. Local road authorities likely incur larger long-term costs for road repair due to the low level of enforcement at the local level.

   d. Subgroup’s Proposed Recommendations

   1. Conduct a study to determine the actual costs of spring load restrictions. Present some alternatives, such as what would it cost to upgrade our roads to 10-ton capacity? Or, what are the costs associated with removing all spring load restrictions?

   2. We recommend that the Legislature appropriate funds this session to conduct a cost/benefit study.
3. Mn/DOT should conduct the cost/benefit study to determine the costs of spring load restrictions.

Photo 4. Industry representatives detail the effects of SLR on their businesses.

3. Safety and Public Health

a. Description

Imposing spring load restrictions has many impacts on safety and public health. Increased liability due to pavement damage and increased truck traffic to accommodate load restrictions are two concerns. Perishable products must still be transported during restricted times, and waste disposal requirements must be met all year. Industry must provide economical and reasonable transportation of loads at reasonable weights throughout the year.

Conflicts exist between road authority regulations and federal and state public health and safety laws. In some cases, industries cannot comply with the spring load restrictions and still conduct business. When these services are essential to the public health and safety, a real problem occurs for both the public and the affected industry. Regulations regarding milk hauling are one example. When collecting milk at dairy farms, haulers are required to empty milk tanks at one time. During spring load restriction time, this may require the milk hauler to bring more than one truck on site, which may be uneconomical, or logistically impossible. Waste haulers may be required to pick up recycling or rubbish at a regularly scheduled interval. However, during the spring load restriction period, they may not be able to accomplish this and still be within load limits.

b. Findings

1. There is conflict between road authority regulations and public health and safety laws. This includes state and federal laws.
2. SLR are imposed to maintain roads in safe driving condition.
3. Businesses may choose to upgrade roads that directly affect their operation if it enables them to operate more efficiently during SLR.
c. Conclusions

1. There may be some industries that cannot comply with SLR and other agency regulations, and still conduct business.
2. Some services are essential, even during the spring load restriction period.

d. Subgroup’s Proposed Recommendations

1. Inform the legislature, Mn/DOT and industry on the cause and effect and resulting costs of SLR. Develop a plan to prioritize and upgrade the roads and bridges, then implement the roadway improvements. Once improvements are made, report back to the legislature and the stakeholders. Review and improve the program and assess needs.

2. Conduct a study to identify conflicting regulations that affect health and public safety.

4. Enforcement

a. Description

There is a need for effective, uniform and consistent enforcement of spring load restrictions. Representatives from both industry and roadway agencies agreed that uniform enforcement would increase compliance, and result in less damage to roads during the spring load restriction period. However, many local agencies cannot afford the short-term costs associated with enforcing spring load limits.

A realistic and simple enforcement method should be developed. To accomplish the goal of restricting loads, enforcement should be uniform throughout the state.

b. Findings

1. Most local agencies provide little or no enforcement. Further study is needed to determine why.
2. Enforcement is not uniform across jurisdictions.
3. It is more expensive to follow the law than it is to break it, depending on the enforcement policies of the local agency.

c. Conclusions

1. Local agencies that enforce SLR have not been identified.
2. Methods used and the extent of training for local enforcement have not been identified.
3. The system of enforcement should be fair and uniform.

d. Subgroup’s Proposed Recommendations

1. Industry enforcement and road authorities should develop a permit process that would allow greater loads to be hauled for a fee. This would include enhanced penalties for those who do not choose to participate in the new plan. Funds captured by permitting process should be targeted to those agencies that participate in the permitting process. All exemptions should be removed to encourage trucks to participate in permitting process.

2. Certification of enforcement personnel by the State Patrol. This would create increased enforcement uniformity and knowledge about SLR policies and regulations.

3. Money obtained from fines during SLR should not financially benefit enforcement agencies beyond the cost of enforcement.
5. Regulations and Mandates

a. Description

Local and state laws regarding SLR are not in one location, and are difficult for businesses to access. Differences in regulations between local agencies makes it difficult to for industry to be informed about and comply with SLR regulations. This situation was improved with the passing of the 1999 SLR law, requiring local agencies to impose SLR at the dates established by Mn/DOT policy. Currently, most roads are restricted during the same time period.

Access of all state and local SLR regulations should be made easier. There is also a need to identify and clarify both current laws and conflicting agency regulations.

b. Findings

1. Some local agencies have interpreted the state law such that all local roads are restricted to 5 tons and can’t be posted higher.
2. Local and state laws regarding SLR are not in one location.
3. Local laws and regulations are difficult to access.
4. With the passing of the 1999 SLR law, local agencies are required to impose SLR at the dates established by Mn/DOT policy.

c. Conclusions

1. Local agencies that post a road for higher than 5 tons must erect a sign.
2. SLR law language should be modified to provide clarification that allows local agencies to post local roads at greater than 5 tons.

d. Subgroup’s Proposed Recommendations

1. Develop a comprehensive, seamless information source. This could be internet based with city and county links. Cities and counties would be responsible for keeping their information updated.
2. Consolidate all state laws regarding spring load restrictions into one location in the statutes.
3. Form a group to define needs and develop a plan.
F.  FINAL RECOMMENDATIONS

The following are the final Task Force recommendations to the Legislature:

1. The Legislature should appropriate funds for Mn/DOT to conduct a comprehensive study to determine the actual costs and benefits of spring load restrictions.

2. A comprehensive, seamless information source for SLR policy and regulations should be developed. This could be internet-based with city and county links. Cities and counties would be responsible for keeping their information updated.

3. The State Patrol should provide certification of local vehicle weight enforcement personnel. This would create increased enforcement uniformity and knowledge about SLR policies and regulations.

4. A study should be completed to identify conflicting regulations that affect health and public safety.

5. Information should be provided to the legislature regarding pavement behavior and need for SLR. This information will also be provided to local agencies. An information packet will include one of two videos. This task can be completed through Mn/DOT or the LRRB.
APPENDICES

APPENDIX A – BACKGROUND INFORMATION

Appendix A presents background information presented to the Task Force. Presentations were made by Mn/DOT staff regarding the impacts of axle loads and climatic effects on pavements and the effects of traffic loads on state bridges. The Mn/DOT permitting process was also outlined, and a Mn/DOT economist outlined some of the factors that should be included in a cost/benefit study of SLR policies.

Members from several industries affected by SLR policies gave accounts of how they operate during the spring load restriction period, and a representative of the State Patrol outlined enforcement efforts by their agency. Those presentations are summarized in the following sections.

1. Pavement Design and Spring Load Restrictions

Background
The topic of SLR on our roadways has been the focus of study for several years within the Minnesota Road Research Section of the Office of Materials and Road Research. Work has focused on the use of air temperature to predict the optimal time for restriction placement. An analysis of roadway strength data supports the newly developed procedure. The results of this research were implemented February 1, 1999, in a new policy that addresses the need to predict the optimal time for placing load restrictions. The potential savings resulting from improved load restriction placement have been estimated to be substantial due to the great number of miles affected by SLR.

Background information included in this section includes pavement design and costs, climatic effects on pavements, the objectives of SLR and a summary of Mn/DOT and surrounding states SLR policies.

In Minnesota, pavements are more susceptible to damage in spring. Pavements are typically at their strongest in the winter when the layers are frozen and at their weakest in the spring when the base layer thaws to a slurry. Spring load restrictions are imposed to prevent excessive damage to the pavement during this weak time. Damage prevention is typically less expensive than repairing or reconstructing a pavement after damage has occurred.

A variety of loads and loading conditions can damage pavement. Damage can result from numerous light loads or a few heavy loads. Multiple axles help to spread out the load and reduce damage to the pavement layer, and multiple axles lower the magnitude and frequency of pavement deflections (which lead to cracking and potholes.) The damage caused by one pass of a vehicle with a unit load of 9 tons/axle is equal to ten passes of a vehicle with a unit load of 5 tons/axle.

Minnesota’s Road System
Counties are responsible for county roads and County State Aid Highways (CSAH). The main difference between the two systems is the manner in which maintenance and improvements are funded. The CSAH System is largely funded by state funds while county road maintenance is funded through property tax revenue. The CSAH System currently includes 30,202 miles of roadway. There are 15,293 miles of county roads in Minnesota that are not part of the CSAH system. The county road mileage varies from county to county, with St. Louis having the largest system at 1,553 miles and meeker County having no county road mileage. This variation is due to the size of the county, the size of the CSAH system, and other factors.

Counties in Minnesota are responsible for approximately 40 percent of the 19,775 bridges in the state. Of that number, 5,418 bridges are on the CSAH system and 2,217 are on the county road system. Approximately 20 percent of all bridges in the state are either structurally or functionally deficient.

A breakdown of Minnesota state roadway miles is as follows:
42% Township roads
10% City streets
12% County roads
2% Municipal State Aid
23% CSAH
9% State Trunk Highways
2% Other roads

Minnesota bridges are broken down as follows:

30% on township roads
4% on city streets
11% on county roads
3% on Municipal State Aid roads
27% on CSAH roads
23% on State Trunk Highways
2% on other roads

**Pavement Design and Costs**

Mn/DOT staff presented information regarding the following pavement issues:

- Design
- Damage comparison
- Pavement life
- Construction costs

**Design**

The following are considered when designing a pavement’s structural system:

- Traffic volume and load
- Material properties
- Seasonal and environmental factors
- Construction practice and variability

The road design method used in Minnesota is based on results from the American Association of State Highway Officials (AASHO) Road Test, performed from 1956 to 1962. The Road Test design procedure (termed R-value design) was adapted to Minnesota’s climate and materials in 1968, using test sections placed throughout the state. Modifications to the procedure have occurred during the last three decades.

Materials are important to the road design and performance as well. Typical subsoils in Minnesota include clay, silt and sand. Clay and silt have poor to fair support characteristics. Sand is a good supporter of loads. Most subsoils in Minnesota are considered frost-susceptible. Aggregate bases typical for this state include gravel and crushed quarry rock.
**Damage Comparison**

Mn/DOT design uses a design load of 18,000 pounds per axle, with a single axle dual tire configuration. This results in a loading of 4,500 pounds per tire, as shown in Figure 1. The amount of damage caused by traffic loads follows a 4th power relationship. That is, as weight increases, the damage factor increases by that weight increase factor taken to the 4th power. Therefore, trucks cause significantly higher damage to pavement than automobiles for each traffic pass. For example, increasing the truck axle load from 5 to 10 tons results in a weight increase factor of two and therefore the damage is $2^4$ or 16 times as great for the 10-ton load as opposed to the 5-ton load.

![Figure 1. Design Load](image)

Table A1 gives a comparison of the damage for each type of vehicle. This is based on a statewide average, and includes full and empty vehicles.

**Table A1. Damage Comparison by Vehicle**

<table>
<thead>
<tr>
<th>One pass of the following vehicle</th>
<th>Is equal to the following number of passes by a car or pick-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-axle single-unit</td>
<td>357</td>
</tr>
<tr>
<td>3-axle single-unit</td>
<td>829</td>
</tr>
<tr>
<td>3-axle tractor-trailer</td>
<td>557</td>
</tr>
<tr>
<td>4-axle tractor-trailer</td>
<td>729</td>
</tr>
<tr>
<td>5-axle tractor-trailer</td>
<td>1,614</td>
</tr>
</tbody>
</table>

**Pavement Life**

Table A2 gives estimated pavement life for a 7-ton roadway, based on the Mn/DOT R-value design procedure. These figures were determined assuming that the pavement consists of all new layers, the truck distribution remains the same, only axle loads increase over time, and that there were no defects in the pavement as a result of poor construction or materials. It is important to consider that the rate of deterioration for a pavement is higher later in life.
Table A2. Estimated Pavement Life for a 7-ton Roadway

<table>
<thead>
<tr>
<th>Roadway loading</th>
<th>Estimated Life (years)</th>
</tr>
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<tbody>
<tr>
<td>7-ton restricted</td>
<td>20</td>
</tr>
<tr>
<td>9-ton w/year-round traffic</td>
<td>9</td>
</tr>
<tr>
<td>10-ton w/year-round traffic</td>
<td>6</td>
</tr>
</tbody>
</table>

Table A3 gives an example of damage caused by a 5-axle tractor semi-trailer (TST) hauling legal and illegal loads.

Table A3. Pavement Damage Example

<table>
<thead>
<tr>
<th>Load Description</th>
<th>Gross Wt. (lbs.)</th>
<th>Payload (lbs.)</th>
<th>Damage Factor</th>
<th>No. of trips for 1,000,000 lbs</th>
<th>Total Damage Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-axle TST, 7-ton legal load</td>
<td>64,488</td>
<td>34,888</td>
<td>0.736</td>
<td>29</td>
<td>21.3</td>
</tr>
<tr>
<td>5-axle TST, illegal load</td>
<td>73,280</td>
<td>43,280</td>
<td>1.374</td>
<td>23</td>
<td>31.6</td>
</tr>
</tbody>
</table>

The example given above illustrates that, to move the same amount of total payload (1,000,000 lbs), a truck overloaded by 14 percent is 1.5 times as damaging as the legal truck.

Construction Costs

Information was presented regarding new construction costs for county roads, and estimated costs to upgrade them. Table A4 gives construction costs for county roads in the year 2000. Costs are based on two 12-foot lanes and the shoulder width, surface layer, and base layers shown. The project life for a newly constructed roadway is twenty years. Pavement layer thicknesses are based on the Mn/DOT State Aid Manual. Costs are estimated from the 1999 Annual County State Aid Needs Study.

Table A4. New Construction Costs for County Roads (Projected Year 2000)

<table>
<thead>
<tr>
<th>Roadway Type</th>
<th>Shoulder width (ft.)</th>
<th>Surface thickness (in.)</th>
<th>Base thickness (in.)</th>
<th>Traffic (ADT*)</th>
<th>Rural 2-lane roadway costs/mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravel</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>&lt;150</td>
<td>$95,000</td>
</tr>
<tr>
<td>7-ton</td>
<td>4</td>
<td>3</td>
<td>3-12</td>
<td>150-400</td>
<td>$187,000</td>
</tr>
<tr>
<td>9-ton</td>
<td>6</td>
<td>3.5</td>
<td>4-20</td>
<td>150-1,499</td>
<td>$216,000</td>
</tr>
<tr>
<td>10-ton</td>
<td>8</td>
<td>6.5</td>
<td>10-30</td>
<td>1,500-5,000</td>
<td>$366,000</td>
</tr>
</tbody>
</table>

ADT - Average Daily Traffic.

Miles of road that fall into each classification for the County State Aid Highway System (CSAH) are given in Table A5.

Table A5. County State Aid Highway System

<table>
<thead>
<tr>
<th>Roadway Type</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravel</td>
<td>5,580</td>
</tr>
<tr>
<td>5-7 ton</td>
<td>15,480</td>
</tr>
<tr>
<td>8-9 ton</td>
<td>8,260</td>
</tr>
<tr>
<td>10 ton</td>
<td>1,010</td>
</tr>
<tr>
<td>Total</td>
<td>30,330</td>
</tr>
</tbody>
</table>

Additional estimated costs to build all rural 2-lane CSAHs to 10-ton capacity were presented to the Task Force. New construction costs are given in Table A6, and costs to simply upgrade roads are given in Table A7. Improvements would include either reconstruction, consisting of subgrade improvements, grading, and revised geometric design; or rehabilitation, consisting of an overlay or partial construction of the surface or base layers. Costs given in Table A7 were calculated assuming that the roadway base layer is
adequate, there is little or no change in the traffic, and an overlay is suitable for the project. Costs do not include shouldering. For this option, eventual reconstruction would be necessary. Special problems exist when upgrading an urban roadway, due to the presence of curb and gutter and other adjacent features.

Table A6. Additional Costs to Build all Rural 2-lane CSAH to 10-ton Capacity

<table>
<thead>
<tr>
<th>Roadway Type</th>
<th>Cost/mile</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravel</td>
<td>$271,000</td>
<td>$1.51 billion</td>
</tr>
<tr>
<td>7-ton</td>
<td>$179,000</td>
<td>$2.77 billion</td>
</tr>
<tr>
<td>9-ton</td>
<td>$150,000</td>
<td>$1.24 billion</td>
</tr>
<tr>
<td>Total overall cost</td>
<td></td>
<td>$5.52 billion</td>
</tr>
</tbody>
</table>

Table A7. Costs to Upgrade all Rural 2-lane

<table>
<thead>
<tr>
<th>Roadway Type</th>
<th>Upgrade Description</th>
<th>Estimated Costs/mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-ton to 7-ton</td>
<td>2-inch overlay</td>
<td>$40,000</td>
</tr>
<tr>
<td>7-ton to 9-ton</td>
<td>3.5-inch overlay</td>
<td>$70,000</td>
</tr>
</tbody>
</table>

An example of costs for upgrading all surfaced roads in Wright County is given in Table A8. Wright County was selected for this example because all of its county roads are surfaced. Statewide, the majority of counties have far fewer hard-surfaced roadways miles. The costs shown for upgrading a 5-ton roadway to a 7-ton roadway assume both are hard-surfaced roads. The cost of upgrading an aggregate-surfaced road is much greater.

Table A8. Wright County example

<table>
<thead>
<tr>
<th>Roadway Type</th>
<th>Upgrade to</th>
<th>Costs/mile</th>
<th>Miles</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-ton</td>
<td>7-ton</td>
<td>$40,000</td>
<td>78</td>
<td>$3,120,000</td>
</tr>
<tr>
<td>7-ton</td>
<td>9-ton</td>
<td>$70,000</td>
<td>28</td>
<td>1,960,000</td>
</tr>
<tr>
<td>Upgrade Total</td>
<td></td>
<td></td>
<td></td>
<td>$5,080,000</td>
</tr>
</tbody>
</table>

Climatic Effects on Pavements

Mn/DOT staff presented information regarding climatic effects on pavements:

- Objective of Spring Load Restrictions
- Summary of Spring Load Restriction Policies
- International Practices
- Development of Current Mn/DOT SLR Policy
- Future Research Directions

Spring is the harshest season for pavements. Pavement strength varies seasonally, and it is strongest in the winter, when all layers are frozen. During the spring, the pavement thaws from the top down. The asphalt concrete surface remains cold and stiff, as does the natural ground. The aggregate base layer between the two thaws and the water has nowhere to drain. This trapped water significantly reduces the strength of the base, and loss of support for the pavement leads to rutting and pavement damage.

Objectives of Spring Load Restrictions

The objective of implementing spring load restrictions is to reduce damage on roads built to lower standards, as well as those roads in poor condition. As noted earlier, pavements are weakest in the spring, when the base layers have thawed and the subgrade soil beneath has not. In Minnesota, only about 13% of...
the state trunk highways are restricted, and that number is decreasing. However, almost all of the county, township and municipal system miles are restricted.

In the past, the Mn/DOT Truck Center coordinated the placement of SLR, based on field measurements and observations. It took about two to three days to reach a consensus within each frost zone that the ground was thawing, and SLR were placed seven days after a consensus was reached. Using that method, SLR were imposed 5 to 10 days too late. Mn/DOT found that when the roads were at their weakest, some haulers were trying to move all heavy loads before the deadline (which they were notified of seven days in advance.)

Mn/DOT desired a better method that was less subjective and more analytically based, so they implemented field testing at the Mn/ROAD test facility and other areas of the state. Their goal was to verify the relationship between air temperature, thawing and pavement damage. They found that pavement weakening can be predicted using air temperature, and that an 8-week period was needed for SLR to allow base recovery. It was estimated that implementing new policies based on these findings would extend low volume road life by an estimated 10%, saving more than $10 million annually in construction and maintenance costs.

Summary of Spring Load Restriction Policies
A summary of spring load restriction policies was distributed to Task Force members. States with spring load restrictions on state, county or city roads are shown in Figure 2, as is the approximate frost line. Several states, Canadian provinces and European countries use spring load restrictions as a method of reducing the damage to pavement structure during its weakest period. It is the general consensus of these states that this method preserves the pavement structure when economic constraints prevent reconstructing or overlaying the pavement to meet 10-ton design criteria.

![Figure 2. States with Spring Load Restrictions](Line Indicates approximate frost line.)

For most of these states, spring load restrictions begin in early March and last until late April, typically spanning an eight-week period or more. The methods used to determine when to place and remove the restrictions vary between the states, provinces and European countries. Within a state, there is a great deal of difference between the counties and cities. The methods include one or a combination of the following:

- Setting the date by the calendar each year,
- Engineering judgment,
• Pavement history,
• Pavement design,
• Visual observations such as water seeping from the pavement,
• Restrict travel to night-time hours (only applicable to unpaved roads),
• Daily air and pavement temperature,
• Frost depth measurement using frost tubes, resistivity probes and drive rods, and
• Deflection testing to determine pavement strength.

Most states use engineering judgment to place and remove spring load restrictions. Minnesota has recently changed its policy, reflecting research results from their Mn/ROAD testing facility. The policy now uses current and forecasted temperatures to predict the thaw dates and the beginning of SLR.

Information regarding the history of SLR for Minnesota is shown in Table A9. Table A10 gives a summary of spring load restriction history for the surrounding five states. This was the best available data compiled from telephone conversations and written policies received from the various states.

Also included in the tables is information on the uniformity of SLR enforcement between and within the states. This is an important issue since at the local level, non-uniform enforcement can give an unfair advantage to transporters in one area over another. It is difficult to convict an overloaded transporter since many municipalities do not enforce and understand the need for load restrictions to preserve the pavements.

### Table A9. Spring load restriction information for Minnesota

<table>
<thead>
<tr>
<th>Zones</th>
<th>North</th>
<th>Central</th>
<th>Metro</th>
<th>South</th>
<th>South East</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Beginning of SLR</td>
<td>20-Mar</td>
<td>16-Mar</td>
<td>14-Mar</td>
<td>10-Mar</td>
<td>12-Mar</td>
</tr>
<tr>
<td>Typical End of SLR</td>
<td>17-May</td>
<td>10-May</td>
<td>29-Apr</td>
<td>9-May</td>
<td>11-May</td>
</tr>
<tr>
<td>Typical Duration, weeks</td>
<td>8.0</td>
<td>7.7</td>
<td>6.0</td>
<td>8.4</td>
<td>8.0</td>
</tr>
<tr>
<td>Magnitude of Restrictions</td>
<td>5-, 7-, 9- ton axles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How is this Determined</td>
<td>Design testing and experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of Trunk Highways Restricted</td>
<td>13.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Who Enforces SLR</td>
<td>State Patrol, County Sheriff, City Police</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enforcement Uniformity</td>
<td>Non-uniform</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recipient of Fined Money</td>
<td>State/County</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table A10. Summary of the Surrounding 5-State Area

<table>
<thead>
<tr>
<th>Typical Beginning of SLR</th>
<th>% of Total Trunk Highways Restricted</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Dakota</td>
<td>15-Mar</td>
</tr>
<tr>
<td>South Dakota</td>
<td>28-Feb</td>
</tr>
<tr>
<td>Iowa</td>
<td>1-Mar</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>10-Mar</td>
</tr>
<tr>
<td>Michigan</td>
<td>Early March</td>
</tr>
<tr>
<td>North Dakota</td>
<td>Approx. 10%</td>
</tr>
<tr>
<td>South Dakota</td>
<td>12%</td>
</tr>
<tr>
<td>Iowa</td>
<td>10%</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>13%</td>
</tr>
<tr>
<td>Michigan</td>
<td>&lt; 5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Typical End of SLR</th>
<th>Who Enforces SLR County Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Dakota</td>
<td>1-Jun North Dakota Sheriff</td>
</tr>
<tr>
<td>South Dakota</td>
<td>27-Apr South Dakota Sheriff</td>
</tr>
<tr>
<td>Iowa</td>
<td>1-May Iowa State Patrol/Sheriff</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>10-May Wisconsin Sheriff</td>
</tr>
<tr>
<td>Michigan</td>
<td>Late May Michigan Motor Carrier Office</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Typical Duration, weeks</th>
<th>Enforcement Uniformity</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Dakota</td>
<td>8 to 9 North Dakota Somewhat non-uniform</td>
</tr>
<tr>
<td>South Dakota</td>
<td>8.3 South Dakota Somewhat non-uniform</td>
</tr>
<tr>
<td>Iowa</td>
<td>Approx. 8 Iowa Somewhat non-uniform</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>8.7 Wisconsin Somewhat non-uniform</td>
</tr>
<tr>
<td>Michigan</td>
<td>Approx. 8 Michigan Somewhat non-uniform</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Magnitude of Restrictions</th>
<th>How is Magnitude Determined</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Dakota</td>
<td>Differ between TH &amp; County Roads. North Dakota Deflection. Tests &amp; Experience</td>
</tr>
<tr>
<td>South Dakota</td>
<td>6- &amp; 7- ton axles South Dakota Deflection Tests &amp; Experience</td>
</tr>
<tr>
<td>Iowa</td>
<td>No Overloads Iowa Road Rater &amp; Experience</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>No Overloads Wisconsin Deflection Tests &amp; Experience</td>
</tr>
<tr>
<td>Michigan</td>
<td>30% for AC pavement Michigan Blanket 30%, Experience</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fine Money Recipient</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Dakota</td>
</tr>
<tr>
<td>South Dakota</td>
</tr>
<tr>
<td>Iowa</td>
</tr>
<tr>
<td>Wisconsin</td>
</tr>
<tr>
<td>Michigan</td>
</tr>
</tbody>
</table>

The following states and provinces rely on experience and visual observation to determine the beginning and duration of the SLR period. Visual observations can include water seeping from the subsurface layers as traffic loads are applied, rapid deterioration of the surface layer, and soft shoulders.

- North Dakota
- Idaho
- Maine
- Montana
- New Hampshire
- Oregon
- New York
- Iowa
- Wisconsin
- Michigan
- Illinois
- Manitoba
- Ontario
Manitoba sets a two-month duration according to the calendar date, regardless of the thawing condition. However, if the conditions are such that no significant thawing has occurred, the enforcement of the restrictions are delayed. This province and several others are currently researching the method used by Mn/DOT to place and remove SLR for possible implementation.

States that currently use analytical procedures in addition to engineering judgement and experience to determine dates and duration of SLR include:

- Minnesota
- Washington
- Alaska
- South Dakota

Manitoba is switching to a more analytical method, and other provinces are moving toward this method as well.

These states determine the dates and duration of the spring load restrictions using several methods including one or more of the following. Government organizations have tailored the methods specifically to their region.

- Deflection tests to determine the strength and capacity of a road.
- Frost sensors to measure thaw depth.
- Average daily air and pavement temperature to predict thawing.
- Pavement structural capacity, surface distresses and history of restrictions.
- Visual observation of pavement surface deterioration or water seeping from cracks.
- Engineering experience and judgement are used in all pavement evaluations.

**International Practices**

In Norway, a very detailed benefit/cost analysis determined that the costs for imposing SLR were greater than the benefits received (Refsdal 1998.) Mn/DOT will review Norway’s experience, and would like to complete a similar benefit/cost study for Minnesota.

Norway's highway system consisted of SLR on 50% of the 16,000 miles of main roads and 80% of the 17,000 miles of secondary roads. The SLR began when the pavements thawed between 8 and 10 inches, and ended when the thaw reached an approximate depth between 40 and 50 inches. The duration was approximately 8 weeks.

The estimated extra annual costs of lifting all SLR was $11 million (US dollars) for the 8-ton system, and $20 million for the 10-ton system. However, the estimated annual economic gain was $44 million, resulting in a $24 million annual benefit.

Beginning in 1995, all SLR were removed, bringing the whole system to a 10-ton capacity. The Public Roads Administration budget was increased by $20 million to maintain 10 and 15 year service lives of main and secondary roads. The increased budget avoided potential annual loss of $28 million due to vehicle damage, accidents and fuel costs resulting from damaged and poorly maintained roads. After three years of experience, the increased budget had covered the increased damage including some complete reconstruction.

**Development of Current Mn/DOT SLR Policy**

Washington state has pioneered a great deal of the research available today related to SLR [Rutherford et al., 1985]. The University of Washington developed a procedure for the Washington State DOT to determine when to place and remove restrictions. Its intent is to balance the benefit to the pavement and the imposition to transporters. In general, the capacity of a roadway is determined from deflection tests and engineering judgement. Placement of SLR are determined from relationships developed between average daily temperature and depth of thawing in the pavement structure. These relationships were
developed from frost sensor measurements and average daily temperatures. This procedure builds upon the basic premise of using engineering judgment and experience to place SLR, and adds analytical methods to improve when restrictions are placed and removed. The relationships originally developed in Washington have proved useful for Minnesota to accurately determine the placement and removal dates.

In Minnesota, the load restriction period begins when there is 6 to 12 inches of thaw, since this is approximately the depth of thaw at which the base layer will significantly decrease in stiffness. Thawing can be predicted using air temperatures, which are quantified using “thawing index” (TI).

The TI is calculated as the daily sum of the difference between the average daily temperature and a reference temperature. The reference temperature is typically lower than 32°F since solar heat absorbed can cause the pavement to thaw at cooler air temperatures. Mn/DOT uses a linear variation to calculate the reference temperature ($T_{REF}$) between February 1 and March 29, where the reference temperature is 29°F and 22°F, respectively [Van Deusen et al. 1998].

$$TI = \Sigma (T_{REF} - T_{AV})$$

In Minnesota, SLR are placed when the TI reaches 25°F–days.

A new policy was implemented on February 1, 1999 and is documented in Mn/DOT Technical Memorandum No. 99-06-MRR-03. This policy only applied to State Highways. Based on the success of this policy, city and county engineers recommended that the legislature require all cities and counties to follow Mn/DOT’s policy for posting SLR. Highlights of the policy are:

- Mn/DOT’s Districts submit their restricted roadway segments.
- Annual Road Restriction Map is mailed.
- A 3-day notice is given for restriction starting date.
- The beginning of SLR is determined for each zone using measured and forecast daily temperatures.
- The SLR duration is set at 8 weeks.

Roadway users are given telephone numbers and an internet site so that they can keep informed on when SLR will begin for each year.

**Future Research Directions**

Mn/DOT is involved in several research projects that relate to spring load restrictions at their Minnesota Road Research Project (Mn/ROAD) facility and at other locations in Minnesota. Mn/ROAD is a long-term pavement testing facility located near Monticello, Minnesota, which is a real-life laboratory used to study and evaluate the performance of materials used in roadway construction. The facility was designed to gather performance data to develop better strategies for road design and construction. Sensors have been installed in the pavements at the site, and measure pavement temperature, moisture, frost depth, and damage.

The research projects include a new design procedure for roadways, and exploring the effects of seasonal changes. Mn/DOT is also studying the effects of increasing load limits during the winter, and is conducting a low volume road design study as well.

**Summary**

Spring load restrictions are used as a method of protecting pavement structures against heavy loads during the critical spring thaw period when the pavement structure is at its weakest. Pavement damage does not increase directly with the amount of load. The amount of damage caused by traffic loads follows a 4th power relationship, meaning that as the load increases, the damage factor increases by that load increase factor taken to the 4th power. Therefore, trucks cause significantly higher damage to pavement than automobiles for each traffic pass. Increasing traffic loads, or imposing the same loads when the pavement is weaker has a significant effect on pavement damage.
Estimated costs to build or upgrade county roads to higher capacity was presented to the Task Force. These costs are high, and money is not available to do it.

The majority of northern tier states place and remove the restrictions using engineering judgment, visual observations and calendar date. Washington, Alaska, South Dakota and Minnesota use analytical methods such as deflection tests, measurements of thaw depth, average daily air and pavement temperature to supplement pavement structure and history, visual observation and engineering experience. Recent inquiries from several Canadian Provinces concerning the current SLR procedures used by Mn/DOT has led to cooperative research between the Minnesota Department of Transportation and several Canadian Ministries of Transportation.

Mn/DOT implemented a new SLR policy on February 1, 1999 that only applied to State Highways. Based on the success of this policy, city and county engineers recommended that the legislature require all cities and counties to follow Mn/DOT’s policy for posting SLR. The policy requires all Mn/DOT Districts to submit their restricted roadway segments to assist with the development of an Annual Road Restriction Map that is mailed to roadway users. A 3-day notice is given for restriction starting date. The beginning of SLR is determined for each zone using measured and forecast daily temperatures, and the SLR duration is set at 8 weeks.

Mn/DOT is involved in several research projects that relate to spring load restrictions at their Minnesota Road Research Project (Mn/ROAD) facility and at other locations in Minnesota. The research projects include a new design procedure for roadways, and exploring the effects of seasonal changes. Mn/DOT is also studying the effects of increasing load limits during the winter, and is conducting a low volume road design study as well.

More information about Minnesota Department of Transportation's policy on SLR and SLR announcements can be found on-line on the Mn/ROAD homepage. Also, there is information concerning the frost and thaw depth from sensors located around the state, the thawing index graphs used to decide when restrictions will be placed, and a link to forecast weather conditions around Minnesota.

2. Bridge Design and Limits

Mn/DOT Bridge Engineer Don Flemming presented information on the impact of truck weight on Minnesota bridges. Eliminating or reducing SLR would have an effect on Minnesota’s bridges since higher truck loadings affect the overall fatigue life of bridges.

Wheel loads control the bridge deck design, and vehicle load and length control the beam and truss design. The current bridge design vehicle is a 90,000 lb truck, but the majority of Minnesota bridges were built for a 72,000 lb load. Fifteen percent of all Minnesota bridges were designed for an even lighter load (30,000 lbs.)
Legal loads are governed by Federal Formula “B”, which is the same as specified Minnesota statute 169.825. The basis for using the formula is to attempt to relate design vehicles to the actual fleet. The formula is as follows:

\[ W = 500 \left[ \frac{LN}{(N-1)} + 12N + 36 \right] \]

where  
\( W \) = weight  
\( L \) = distance between axles  
\( N \) = number of axles

The allowable load can increase with axle spacing and number of axles.

A different standard truck size was used to design bridges before WWII. Bridges designed before WWII were designed for a much lighter truck, and are now being overloaded according to formula B. Today’s legal truck can run up to 40% over design on pre WWII bridges, especially on short span bridges.

Regulations are imposed based on assuming that the required bridge strength is equal to the truck effect plus the safety factor (which was originally “2”). Because of the different design vehicles for pre- and post-WWII bridges, legal trucks currently are using 75% of the safety factor on pre-WWII bridges, and 10% of safety factor on most post-WWII bridges. Mr. Flemming noted that the accepted design safety factor is lower on post-WWII bridges. Permitted vehicles are not allowed on pre-WWII bridges, and use up to 75% of the safety factor on post-WWII bridges.

Currently, there are 974 load-posted bridges statewide that were designed for much lower than legal loads. There are 22 load posted bridges on the Trunk Highway (TH) system, and 416 bridges are restricted for permit loads on the Trunk Highway system.

Mr. Flemming was asked to quantify the estimated effect on bridges for a truck weight to increase 100,000 lbs. He estimated that statewide, this increase would require posting an additional 1,000 bridges, and on the TH system, posting an additional 70 bridges. He also noted that Formula B and statutes don’t account for fatigue, age or condition of bridges. Fatigue is due to repetitive loads, and increases stress on the bridge by the cube of the gross weight. Doubling the weight increases fatigue damage by 8 times. Fatigue is especially a problem on high truck traffic bridges. Mr. Flemming gave three examples of bridges where fatigue is especially bad: 35E Lexington Avenue; the Mississippi River bridge in Hastings; and I-35W over the Mississippi River.

A recent fatigue study found that, to repair the bridges that receive the heaviest truck loads, $225 million over the next twenty years is required. This estimate includes 87 bridges. To repair general deterioration over the next 10 years, $640 million is needed, and $450 million is needed over the next ten years to replace approach roads.

Today’s annual bridge budget is approximately $40 million. The projected shortfall is about $35 million each year to keep the system running.

Questions for Mr. Flemming:

1. How does Minnesota compare with other states?
   Answer: We compare favorably; we are doing better than many other states.

2. Do those numbers include county bridges and others?
   Answer: No, these numbers are strictly for bridges on the Trunk Highway system.

At the current funding level, Mr. Flemming estimated that four times as many bridges will need repair in the future. This may result in additional postings.

Bridge postings do not change during the year. However, more fatigue damage occurs in cold weather.
3. **Mn/DOT Permitting Process**

A copy of the Mn/DOT Seasonal Road Restriction Bulletin is included in Appendix F, as well as a map of the Minnesota roads that are restricted.

### Table A11. Restricted Gross Weight Table (lbs)

<table>
<thead>
<tr>
<th>Truck</th>
<th>9-ton</th>
<th>8-ton</th>
<th>7-ton</th>
<th>6-ton</th>
<th>5-ton</th>
<th>4-ton</th>
</tr>
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<td>Single axle</td>
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<td>14,000</td>
<td>12,000</td>
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<tr>
<td>2 axles spaced ≤ 8 ft. apart</td>
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<td>30,222</td>
<td>26,444</td>
<td>22,667</td>
<td>18,889</td>
<td>15,111</td>
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<tr>
<td>3 axles spaced ≤ 9 ft. apart</td>
<td>*</td>
<td>38,222</td>
<td>33,444</td>
<td>28,667</td>
<td>23,889</td>
<td>19,111</td>
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<td>4 axles spaced ≤ 14 ft. apart</td>
<td>*</td>
<td>45,778</td>
<td>40,056</td>
<td>34,333</td>
<td>28,611</td>
<td>22,889</td>
</tr>
</tbody>
</table>

* 1. For 9-ton restricted routes see the 9-ton GROSS WEIGHT TABLE for maximum weights allowed on groups of 3 or 4 axles spaced less than 9 and 14 feet respectively.

2. No combination of axle weights shall exceed those weights specified for non-designated (9-ton) routes.

Prior to 1984, Minnesota restricted about 9,000 miles of state highways in the spring, and left about 3,000 as 10-ton routes. The restriction map had six zones from the south to the north. In 1985, Minnesota eliminated the 6- and 8-ton postings and revised their map from six to four zones. They also reduced the 5-ton postings from 1,300 miles to 760 miles. A total of 2,900 miles of 10-ton roads were not posted.

In 1986, 5,000 miles of 10-ton routes were available on the state system, and 5-ton postings were reduced to 670 miles. The total number of restricted roads was 7,000 miles. Mn/DOT also added new fees for oversized loads up to 16 feet wide.

Since 1987, the number of year round 10-ton routes has increased from 7,000 to 10,321, and the miles of restricted routes has decreased from 5,000 to 1,590 miles. The majority of the postings on the current state system are 7-ton postings.

Fees for permits are based on damage assessment calculations and damage factors for each load. The permits are available during the restricted spring period for isolated cases, and cost $135. Base permit fees are given in Table A13.
<table>
<thead>
<tr>
<th>Axle spacing (feet)</th>
<th>2 (9-ton route)</th>
<th>2 (10-ton route)</th>
<th>3</th>
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<td>80,000&lt;sup&gt;5&lt;/sup&gt;</td>
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<td></td>
</tr>
</tbody>
</table>

1. Refers to any distance more than eight feet, but less than nine feet.
2. These weights valid ONLY on 10-ton routes.
3. These weights only apply to vehicles manufactured prior to August 1, 1991 with axle spacing of 7-8 feet.
4. Two consecutive tandems can gross 34,000 lbs. each and total 68,000 lbs. Together when centers of first and last axle of the group are spaced 36 feet or more but a 5-axle vehicle on 9 ton route must not exceed 73,280 lbs. on all 5 axles.
5. Gross vehicle weight in excess of 73,280 lbs. Permitted on 9-ton routes only with 6 or 7 axles.
Table A13. Base Permit Fees

<table>
<thead>
<tr>
<th>Permit Type</th>
<th>Description</th>
<th>Fee ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Trip</td>
<td>Oversize only</td>
<td>15.00</td>
</tr>
<tr>
<td>Single Trip</td>
<td>Overwidth exceeding 14’6” to maximum 16’0” during spring load restrictions</td>
<td>135.00</td>
</tr>
<tr>
<td>Single Trip</td>
<td>Overweight or overweight and oversize</td>
<td>15.00 + Table A15 fee</td>
</tr>
<tr>
<td>Job</td>
<td>Oversize only</td>
<td>36.00</td>
</tr>
<tr>
<td>Job</td>
<td>Overweight or overweight and oversize</td>
<td>36.00 + Table A15 fee</td>
</tr>
<tr>
<td>Annual</td>
<td>Implement of husbandry</td>
<td>24.00</td>
</tr>
<tr>
<td>Annual</td>
<td>Round baled hay, straw and corn stalks</td>
<td>24.00</td>
</tr>
<tr>
<td>Annual</td>
<td>Jumbo rectangular baled hay</td>
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<td>Annual</td>
<td>Jumbo rectangular baled straw</td>
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</tr>
<tr>
<td>Annual</td>
<td>10% weight increase</td>
<td>60.00</td>
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<tr>
<td>Annual</td>
<td>10% weight increase for fall local hauling of sugar beets and potatoes</td>
<td>60.00</td>
</tr>
<tr>
<td>Annual</td>
<td>82,000 lbs. GVW pole length pulpwood</td>
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<td>10’ wide snow plow</td>
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<td>Annual</td>
<td>Temporary crisis-Governor emergency</td>
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<td>Self-contained refuse compactor truck</td>
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<td>Annual</td>
<td>Oversize only construction equipment, machinery, and construction supplies</td>
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<td>Annual</td>
<td>Oversize only commercial boat hauling</td>
<td>120.00</td>
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<tr>
<td>Annual</td>
<td>Oversize only manufactured homes</td>
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<td>Oversize only implements of husbandry</td>
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<td>Annual</td>
<td>Oversize only mobile crane</td>
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<tr>
<td>Annual</td>
<td>Mobile crane-overweight or oversize and overweight</td>
<td>Table A15 fee</td>
</tr>
<tr>
<td>Annual</td>
<td>Overweight or overweight and oversize construction machinery, machinery, and construction supplies</td>
<td>Table A15 fee</td>
</tr>
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Note that “Annual” means an extended time frame Permit that is obtained annually.
Table A14. Damage Assessment Cost Factors per Mile

<table>
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<th>Total axle group weights (lbs.)</th>
<th>2 axles spaced at ≤ 8’</th>
<th>3 axles spaced at ≤ 8’</th>
<th>4 axles spaced at ≤ 8’</th>
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<td>0.05</td>
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<td>72,001 &amp; above</td>
<td>This axle group combination weight N/A</td>
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</tbody>
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Notes:
1. N/A = Not available
2. Single Axle = 20,000 pounds, and has no fee
3. To calculate total damage assessment fee:
   The appropriate cost factor fees above for the group weights desired on the permit are added together and totaled.
   Example: the combination has three tandem groups of 40,000 lbs each. Therefore the cost factor fee is 0.18 x 3 groups = 0.54/mile.
   The total miles traveled are calculated.
   The damage assessment charge is found by multiplying the total cost factor fee by the total miles.
4. The total permit fee is calculated by adding the base fee from Table 13 to the damage assessment fee.

Table A15. Annual Oversize/Overweight Permit Fees

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<th>Total Gross Weight (GVW)</th>
<th>Annual Fee ($)</th>
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<td>&lt; 90,000 lbs.</td>
<td>200.00</td>
</tr>
<tr>
<td>90,001 – 100,000</td>
<td>300.00</td>
</tr>
<tr>
<td>100,001 – 110,000</td>
<td>400.00</td>
</tr>
<tr>
<td>110,001 – 120,000</td>
<td>500.00</td>
</tr>
<tr>
<td>120,001 – 130,000</td>
<td>600.00</td>
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<tr>
<td>130,001 – 140,000</td>
<td>700.00</td>
</tr>
<tr>
<td>140,001 – 145,000</td>
<td>800.00</td>
</tr>
<tr>
<td>145,000 and greater is always a single trip permit</td>
<td></td>
</tr>
</tbody>
</table>

The permits outlined in the above table are available to transport construction equipment, machinery, and construction materials, as well as mobile cranes. The truck or truck tractor must have a Minnesota base
plate, or if licensed in another state or Province, it must be licensed under the International Registration Plan (IRP) and have a registered weight with the state of Minnesota.

The permit is issued to one power unit for any trailers or towed vehicle. If the towed vehicle has more than four axles or the combination of vehicles has more than eight axles, the permittee must obtain a single trip permit. As an example:

If the permittee purchased an $800.00 annual permit, the truck tractor could be used to haul a dozer on a lowboy semi-trailer with a quad axle group carrying 72,000 lbs., the drive group tridem carrying 60,000 lbs., and the steer axle at 13,000 lbs. This results in a total GVW of 145,000 lbs.

The total GVW is governed by the permit purchased with the axle and group weights limited per Table A15 above. The table limits single axle, as well as single axles within tandem and tridem groups to 20,000 lbs. maximum on any one axle. For quad groups, single axles are limited to 18,000 lbs. The same permit could be used to tow a single axle conveyor behind the noted truck tractor with its air-lift axle raised and operating at all legal weights with a GVW of 55,000 on four axles.

Overweight loads above 60,000 pounds are allowable, as long as axle weight doesn’t exceed postings. Oversize permits are available up to a maximum width of 16 feet. Permits for widths greater than 14’-6” are charged an additional fee of $135.00.

One piece items, overweight in excess of 80,000 lbs. are permittable if the individual axle or group axle weights do not exceed the posted weight of the road traveled on. The allowable weight of the permitted load is governed by the highest restrictions on the vehicle route.

Political considerations are given for loads that affect the economic vitality of the state (as determined by the Commissioner). Emergency considerations are also given to transport essential products, such as generators, derailment equipment, and items necessary for the national defense. These loads are routed onto 10-ton segments, and Mn/DOT attempts to route them on roads that are scheduled for construction soon.

Permit revenue is approximately $1.75 million each year. It costs of $960,000 to run the permit office. All excess funds are returned to the Trunk Highway system.

4. Effect on Industry from Spring Load Restrictions

Several industry representatives made presentations outlining the effects of SLR.

a. Timber Producers Association

Bruce Barker presented on the behalf of the Timber Producers Association. He noted that 60% of wood is moved from December 1st to late March or early April. This amounts to 3.7 million cords of wood or 350,000 truckloads. Because many trees grow in swamps that are inaccessible by truck in the summer, the industry is forced to log and haul in the winter. Many of the roads that are used for harvest are non-public or winter roads. In December, equipment is driven over the roads to bring the moisture up to the surface and allowed to freeze. The ice thickness increases with the amount of travel on the roads, and with temperature. They also build non-surfaced roads to haul wood. Roads are surfaced with gravel if they are to be used year around. This allows for hauling of heavy loads during frozen conditions.

The three most important factors for the timber industry are:

- increased winter weight limits,
- spring load restrictions, and
- the flexibility of when the above are imposed and removed.
When frost goes out of the asphalt-surfaced roads, it also comes out of soils. So, many of their roads are not useable during SLR time. During that time, work is performed at night when the frost is still in the ground, and hauls are conducted between 4 am and 10 am.

Movement of their product is critical to when the restrictions or extra weights are applied or removed. Industry members watch closely for the spring postings, and are concerned about seasons when the ground freezes and re-thaws. So far, Mn/DOT has worked well with the industry in those cases.

b. Association of General Contractors (AGC)

Rick Johnson (from Barton Sand and Gravel) spoke on behalf of the construction industry. He noted that the SLR requires much improvisation by the industry. The construction industry is greatly affected by the 6-month work season, which includes the SLR season. Several companies cannot operate legally within the SLR. The SLR is a major economic factor for the industry. If rain shortens the season, or restriction increases, conditions are made even worse.

Mr. Johnson noted that permits in general are very difficult to get, and Minnesota is one of the hardest in the area. Due to the short season, when equipment needs to be loaded or moved, the industry does not have much flexibility. They cannot always wait to get a permit, due to the economic ramifications. Also, companies are trying to strategically place equipment so that it is where it is needed prior to the SLR period. The longer the notice prior to SLR makes a big difference to contracting industry.

The Aggregate Ready Mix (ARM) representative Gene Wright added that reduction in the amount hauled per truckload increases the number of truck trips and traffic. This is true for aggregate trucks that Mr. Wright noted people don’t like to drive behind. Also, they are required to deal with variability of load restrictions for a given road based on the jurisdiction (one road may be posted two different weights by two agencies.)

c. MN Trucking Association (MTA)

Todd Iverson noted that spring load restrictions don’t affect large trucking firms too much because they mostly travel on 10-ton roads. However, the agricultural industry is affected. Fuel, fertilizer, etc. has to be delivered right at SLR time. This results in increased number of trucks and trips (traffic) to deliver the product. The problem is exacerbated because it is difficult to find drivers at that time of year.

The majority of the MTA members can deal with the SLR. Uniformity of enforcement and application is a major concern for them.

Questions:

What do truckers do when faced with the need to get from a 10 ton to a smaller road to make the actual delivery?
Answer: Some truckers will meet a farmer at the road entrance to avoid getting ticketed.

It was noted that SLR is a big issue for grain elevator operators. Enforcement is able to examine the 30 days bill of lading. The industry suffers a substantial loss from having to take extraordinary measures to meet SLR.

Bruce Barker noted that the timber industry will move loads to 10-ton routes prior to SLR, then move the product on 10-ton roads during the SLR.

Dennis Berg (Anoka County) asked if increasing the TH system help?
Answer: There are still the smaller county roads that wouldn’t be legal.
Don Williamson asked if these costs accounted for when charging for the product? Gene Wright said that costs may be passed along to the customer. Sometimes the cost cannot be passed along.

Gene Wright was asked if requiring truckers to work more hours resulted in unsafe driving? Gene said no.

Gene Wright said that the main problem is inconsistency in load limits for a given design of road.

d. National Solid Waste Management Association

Don Williamson represented the National Solid Waste Management Association. He identified two main impacts of SLR on his individual business as follows:

1. Impacts to Customers
   - 1% of customers get no service ($6,600 in lost revenue) during SLR
   - 4% of customers get a scheduled change, which includes rerouting so trucks can run half full, using smaller units, changing day of service, or service frequency (estimated cost of $1,650)
   - Some contractor or cleaning services limited (costs for this are difficult to quantify)
   - 7.5% of customers experience change in the way they are serviced year-round. This includes residents living on rural township roads, whose service is changed to use 1-ton trucks. The smaller trucks are not as efficient, which costs the consumers an additional $33,750.
   - Customers are unhappy and don’t understand why change in service occurs

2. Impacts on Operations
   - Mr. Williamson has to use two swing people and three supervisors who spend 25% of their time each week to complete the smaller routes, or to cover the lighter loads with spare trucks ($7,800 estimated labor costs)
   - Ten regular routes are changed, and the time to service them is increased by 11% (estimated labor cost $2,400)
   - Mr. Williamson sends two letters of notification to all those customers impacted above (which costs at least $1,500 just in paper and postage)
   - Additional costs associated with the use of the smaller 1,500 GVW truck vs. the standard 45,000 GVW truck
   - Fines to Mr. Williamson’s company were $2,103 in 1998

Mr. Williamson noted that before the above changes were made, his fines were about $14,000 each year. Costs would be less to run over load and pay fines, but he chooses to not do that. As a result, customers are unhappy, and his operating costs are higher.

e. Representing Farm/Ag Groups

Bruce Kleven noted that it is difficult to quantify costs and impacts on the agriculture industry. There are about 80,000 farmers in the state, many who deliver in spring. The spring load restrictions definitely cost the growers money. Farmers increase trips in spring, resulting in additional fuel costs. Also, it is hard to find the additional drivers. SLR also require the farms to reroute trucks, which adds to wear and tear on roads.

Because prices increase in the spring, it is a delivery time for crops. Mr. Kleven outlined the reasons for increased trips in the spring, including higher crop prices, desire to deliver crops before spring planting occurs, goods coming to the farm (such as fertilizer, fuel and seed). He also gave some specific examples of how farmers are forced to make economic decisions because of SLR. For example, after harvesting, beets are piled, and may be subject to spoiling. If a spoiling pile is on a restricted road, the farmer may have to let it go to waste to save piles on non-restricted roads. Another example: potatoes are harvested in the fall, but they are perishable and shipped to grocery all winter.
Mr. Kleven noted that many farmers sit on township boards, are responsible citizens, and are not likely to want to destroy the roads.

Questions for Mr. Williamson and Mr. Kleven

How many trucks does Mr. Williamson have?
Answer: About 30.

Don noted an additional dilemma for his industry: Local agencies institute burn bans and recycling mandates, as well as licensure requirements depending on truck type. All of these add to weight of the trucks.

The grain elevator representative added that 40% of his business comes from North Dakota. He has had to report trucks four times since April, and is losing business due to post-delivery enforcement.

5. State Patrol Perspective

Major Gene Halverson presented on behalf of the State Patrol. He confirmed that the State Patrol does check on grain elevators. If they find over weight violations at a grain elevator, they will return. Otherwise, they typically return once a year. He emphasized that the Legislature makes the laws; it is the State Patrol’s responsibility to enforce them.

In a formal presentation, Major Halverson outlined the organization of the Administrative Truck Center. The Department of Public Safety and Mn/DOT work together. He presented the organization of the State Patrol and the Commercial Vehicle Section. Notes from his presentation are included in Appendix F. The three areas of the State Patrol are Weight, Safety Inspections, and School Bus Inspections.

Major Halverson gave the following weight enforcement information:

Vehicles weighed in FFY 1998:

| Fixed scales | 830,710 |
| Portable scales | 59,721 |
| Screened by WIM | 978,000 |
| **Total Weighed** | **1,868,431** |

The Patrol puts most of its efforts into weighing. Major Halverson gave the following information about the CVSA (certified vehicle safety alliance) Inspections Program. A total of 35,644 CVSA inspections were completed in 1998. During those inspections, 19,929 out of service defects were identified, and 142,192 total defects.

He noted that all 50 states and Canada use the same criteria.

Data is transferred to Mn/DOT daily, and Mn/DOT uploads to OMC Tuesdays and Thursdays. The average time to transfer information from roadside to the OMC is two days. Almost all officers have a laptop to speed up the process.

Government trucks are not inspected. The State Mandatory Inspection Program began in 1990. Vehicles over 26,000 pounds GVWR (Gross Vehicle Weight Rating) must display a current decal. There are 6,230 certified self-inspectors. Re-certification is required every two years, and the State Patrol provides certification.
Major Halverson outlined the school bus inspection program as well. There are seven inspection teams, and two Commercial Vehicle Inspectors (CVI’s) per team. The State Patrol inspected 12,537 school buses in 1998.

In summary, Major Halverson stated that there is nothing worse for a trooper than to enforce an unpopular law.

Questions for Major Halverson:

Of the 19,000 out of service violations referenced earlier; how many are trucks?
Answer: All are trucks or buses.

Do drivers get an inspection report even if there aren’t any violations?
Answer: Yes.

Could you outline the extent to which the Patrol works in conjunction with local enforcement?
Major Halverson asked Dave Brown, Hennepin County Sheriff’s department, who does full time truck enforcement to describe how the Patrol works with local enforcement. He noted that post-delivery enforcement is not tracked in a computer system. A tally sheet is recorded.

Very few counties have any officers trained to weigh trucks. Ken Urquhart works for the State Patrol in the metro, and gets a lot of requests for assistance from local agencies. Local agencies don’t have staff to focus on just weighing.

6. Explanation of Economic Analysis and Cost/Benefit Studies

Scott Peterson, Mn/DOT Economic Analyst outlined the goals of Mn/DOT’s transportation policy:

- Efficiency: lowest total social cost
- Equity: those who impose the costs pay the costs.

He noted that all resources consumed directly or indirectly in transportation are costs. Mr. Peterson outlined the cost of SLR to business, which are generally increased operation costs:

- more frequent trips with lighter loads: added time and vehicle costs
- longer trips from diversions: added time and vehicle costs
- stockpiling: inventory and handling costs
- delayed shipping: sub-optimum production value
- equipment modifications

Costs to government as a result of SLR are generally increased highway maintenance and enforcement costs:

- faster pavement degradation: more frequent repairs and rehabilitation
- base deterioration: more extensive rehabilitation
- enforcement: officers’ time and equipment
- judicial: process violations

Highway users experience increased transportation costs due to SLR as follows:

- rougher rides: increased rate of vehicle depreciation and added discomfort
- reduced speeds: longer travel times
- more detours and construction zones: increased time, added vehicle costs, and more crashes
Mr. Peterson noted that a proposed economic analysis of current policies or proposed changes (in the form of a benefit/cost analysis) would try to determine whether the cost of policy change is less than the benefits. Another way to evaluate it is to determine if the reductions in business costs divided by the additional public cost are greater than or equal to one? If so, efficient policy changes could be identified. Parties who create additional costs could be identified, and costs assessed. He said that Mn/DOT would like to perform the analysis, but it would be a large and difficult project.

Discussions about the proposed study have been ongoing over the last year. Mr. Peterson estimated it would take several years to perform the study. The prime data gathering time is before, during and after any changes to SLR policy. Changes in traffic patterns would be measured. Business could provide changes that occur in response to SLR policies.

The question arose: If that study was performed, and additional public costs determined from eliminating SLR, who would pay the additional cost? Would it be the users who save money, or paid for by a gas tax? The Task Force agreed that the consumer ends up paying anyway. However, it was also noted that not everyone buys every product. The question arises: do we assess everyone (via the gas tax) for the additional cost to a company for its additional cost to transport their goods, or just those who buy their products?

Mr. Peterson also noted that the gas tax only pays for a small portion of the roads. Property taxes and assessments pay for the majority of county township and city roadway costs.


http://www.dot.state.mn.us/engserv/tecsup/edata/tmemo/tm99/9906mrr3.htm


APPENDIX C - SURVEY RESULTS

A survey was developed by Mn/DOT’s Office of Communications, and distributed to city and county engineers, law enforcement agencies, and commercial businesses. Information from law enforcement agencies was obtained from local sheriff departments.

To identify commercial businesses, staff at Mn/DOT Districts were each asked to identify key customers from each district. The Office of Communications obtained names for 193 key business. It was difficult to identify contact names for the businesses, which may have affected response rate.

Copies of the surveys and results are included in Appendix F.

Lee Brady, Statewide Market Research Director for Mn/DOT’s Office of Communications, presented the survey results to the Task Force.

Table C1. Survey Response Rates

<table>
<thead>
<tr>
<th>Target</th>
<th>Distributed</th>
<th>Returned</th>
<th>Response Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>County engineers</td>
<td>87</td>
<td>70</td>
<td>80.5</td>
</tr>
<tr>
<td>City engineers</td>
<td>127</td>
<td>64</td>
<td>50.4</td>
</tr>
<tr>
<td>Law enforcement</td>
<td>87</td>
<td>58</td>
<td>66.7</td>
</tr>
<tr>
<td>Commercial businesses</td>
<td>193</td>
<td>Not tallied as of 12/20/99</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

The Task Force was provided with two packets. The first gave all answers to the questions, and the second included all verbatim responses. (Included in Appendix F.) Responses from commercial businesses were difficult to obtain, and insufficient data was available to make conclusions. Those responses were not summarized or presented to the Task Force.

Law Enforcement Responses
Mr. Brady noted that responses were obtained from county law enforcement agencies.

1. How are weight restriction laws enforced?
   12.5% not at all
   37.5% 2
   23.2% 3
   21.4% 4
   5.4% very strictly enforced

   Method used?
   15.1% fixed weigh stations
   75.5% portable scales
   3.8% road blocks

2. Type of truck that is specifically targeted?
   SU 3 & 4 were the majority noted (87%)

3. Are they involved in partnerships to enforce SLR?
   State 37.3%
Comments:
Major Halverson noted that the State Patrol performs 90% of the enforcement. So, results are only for 10%
of the enforcement activities. He noted that portable expensive. Each scale costs approximately $3,000,
and eight are required per weigh site. There are additional costs for recertifying the scales by the
Department of Commerce as well.

Government Responses

1. How to identify roads that are to be restricted?
   Cities:
   Judgment 26.3%
   Visual observations 25.3%
   Mn/DOT Guidelines 21.1%
   Counties:
   Judgment 27.5%
   Visual observations 24.9%
   Mn/DOT Guidelines 19.2%

2. How to identify WHEN to restrict roads?
   Cities
   Judgment 19.3%
   Visual observations 15.8%
   Mn/DOT Guidelines 71.9%
   Counties
   Judgment 54.9%
   Visual observations 53.5%
   Mn/DOT Guidelines 91.5%

3. How to identify HOW LONG to restrict roads?
   Cities
   Judgment 25%
   Visual observations 17.9%
   Mn/DOT Guidelines 73.2%
   Counties
   Judgment 64.3%
   Visual observations 62.9%
   Mn/DOT Guidelines 87.1%

4. Rate (1-5, with 5 being very significant) the level of damage from overloaded trucks during spring
   load restrictions.
   Cities
   1 3.3%
   2 39.3%
   3 29.5%
   4 21.3%
   5 6.6%
5. What is their estimated annual maintenance costs savings from having SLR?

<table>
<thead>
<tr>
<th>Cities</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>0-4</td>
<td>23.3%</td>
</tr>
<tr>
<td>5-10</td>
<td>53.5%</td>
</tr>
<tr>
<td>11-20</td>
<td>9.3%</td>
</tr>
<tr>
<td>Over 20%</td>
<td>14.0%</td>
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<table>
<thead>
<tr>
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<tr>
<td>0-4</td>
<td>7.7%</td>
</tr>
<tr>
<td>5-10</td>
<td>20.0%</td>
</tr>
<tr>
<td>11-20</td>
<td>28%</td>
</tr>
<tr>
<td>Over 20%</td>
<td>45%</td>
</tr>
</tbody>
</table>

6. Savings on annual construction budget?

<table>
<thead>
<tr>
<th>Cities</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4%</td>
<td>36%</td>
</tr>
<tr>
<td>5-10%</td>
<td>39%</td>
</tr>
<tr>
<td>11-20%</td>
<td>8%</td>
</tr>
<tr>
<td>Over 20%</td>
<td>17%</td>
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<table>
<thead>
<tr>
<th>Counties</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4%</td>
<td>19%</td>
</tr>
<tr>
<td>5-10%</td>
<td>20%</td>
</tr>
<tr>
<td>11-20%</td>
<td>19%</td>
</tr>
<tr>
<td>Over 20%</td>
<td>42%</td>
</tr>
</tbody>
</table>

7. What level of enforcement is used for SLR?

<table>
<thead>
<tr>
<th>City</th>
<th></th>
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<tbody>
<tr>
<td>1</td>
<td>13%</td>
</tr>
<tr>
<td>2</td>
<td>36</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>23</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>County</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22%</td>
</tr>
<tr>
<td>2</td>
<td>38</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>
8. Are they involved in partnerships with any other units of government?

Cities
None 81%

Counties
None 78%

9. Are they collecting traffic data on SLR?

Cities
No 92%

Counties
No 99%

10. No. of person-hours spent annually on SLR?

Cities
0 21%
Results ranged up to 550

Counties
Results approximated more of a normal curve. 17% spent about 100 hours. Up to 1000.

11. Who gets exemptions?

Cities
Garbage haulers 27
School buses 21
emergency 8
Buses 5
electrical trucks 2
agriculture 1
fuel delivery 1
other 21

Counties
Agriculture 12
School buses 11
garbage haulers 6
emergency vehicles 4
vehicles exempt by state law 2
other 5

Segment Comparison

1. Average Rating Regarding Strictness of Enforcement
(5 = very strictly enforced, 1= not enforced at all.

Law enforcement 4.1
Business 3.9
Government 4.4
Comments:

Dennis Berg noted that county forces cannot enforce the laws, they can only post the restrictions. He also noted that we should survey the citizens, who are the ones who have to pay for the restrictions.

Someone asked if privacy laws protected information received from businesses? That may have affected response rates. Mr. Brady noted that responses were confidential.

What other things account for the difference in perspective between cities and counties regarding why the SLR make a big difference? Dennis Berg noted that city streets are short, and haulers do not have the incentive to run loads overweight. Trucks more often use county roads. Even through streets through cities are usually county roads.
## APPENDIX D - TASK FORCE MEMBERS AND INTERESTED PARTIES

### Task Force Members

<table>
<thead>
<tr>
<th>Name</th>
<th>Representing</th>
<th>Address</th>
</tr>
</thead>
</table>
| Anita Benson, Co-chair| League of MN Cities                                    | Chanhassen City Hall  
690 City Center Drive  
Chanhassen, MN  55317-0147  
Phone: (612) 937-1900    |
| Don Williamson, Co-chair| National Solid Waste Management Association            | West Central Sanitation  
Box 796  
Willmar, MN  56201  
Phone: (320) 235-7630    |
| Mary Ayde             | MN Waste Association                                   | 1030 Evergreen Trail  
Lino Lakes, MN  55014-2104                                         |
| Bruce Kleven          | Minnesota Association of Wheat Growers (& Sugar Beets and Potatoes) | 6008 Eleventh Ave S  
Minneapolis, MN  55417                                      |
| Gene Halverson        | Minnesota State Patrol                                 | 1110 Centre Point Curve, Suite 420  
Mendota Heights, MN  55118                                       |
| Jim Trudeau           | Minnesota State Sheriffs Association                   | 1210 S. Concord Street  
South St. Paul, MN  55075                                         |
| Gene Ranieri          | Association of Metro Municipalities                    | 145 University Avenue West  
St. Paul, MN  55103-2044                                           |
| Mike Sheehan          | Minnesota County Engineers                             | Olmsted County Public Works  
2122 Campus Drive SE  
Rochester, MN  55904-4744                                         |
| Deb Burke             | Builders Association of Minnesota                      | 570 Asbury Street,  #301  
St. Paul, MN  55104                                                |
| Dennis Berg           | Association of Minnesota Counties                     | Anoka County  
18111 Nowthen Blvd. NW  
Ramsey, MN  55303-9650                                            |
| Bob Zelenka           | Farmers Elevator Association of Minnesota              | 852 Grain Exchange  
Minneapolis, MN  55415                                             |
| David Fricke          | Minnesota Association of Townships                     | Box 267  
St. Michael, MN  55376                                             |
| Chris Radatz          | Minnesota Farm Bureau Federation                       | Box 64370  
St. Paul, MN  55164                                                |
| Andy Steensma         | Minnesota Farmers Union                                | 600 County Road D W, Suite 14  
St. Paul, MN  55112-3521                                          |
| Bruce Barker          | Minnesota Timber Producers Association                 | 903 Medical Arts Building  
324 W Superior St.  
Duluth, MN  55802                                                 |
| Todd Iverson          | Minnesota Trucking Association                         | 2515 Wabash Ave, Suite 150  
St. Paul, MN  55114                                                |
| Ken Ashfeld           | Minnesota City Engineers                               | Maple Grove City Engineer  
9401 Fernbrook Lane  
Maple Grove, MN  55369                                         |
| Gene Wright           | Aggregate Ready Mix Association of MN                  | 275 Market Street, Suite C13  
Minneapolis, MN  55405                                           |
| Fred Ettel            | Milk Haulers                                          | 212 Fourth Ave SE, Box 13  
Freeport, MN  56331                                               |
| Dave Ewald            | Liquid Waste Haulers                                   | 26 E Exchange, 5th floor  
St. Paul, MN  55101                                               |
| Mike Robinson         | Mn/DOT District Engineers                              | 1123 Mesaba Ave  
Duluth, MN  55811  
(218) 723-4820                                              |
| Jerry Johnson         | Minnesota Solid Waste Association                      | 601 N. 20th Ave  
St. Cloud, MN  56303                                             |
| Bill Hall             | MN Power                                               | 30 W. Superior St.  
Duluth, MN  55802                                                 |
### Interested Parties

<table>
<thead>
<tr>
<th>Name</th>
<th>Representing</th>
<th>Address</th>
</tr>
</thead>
</table>
| Representative Carol Molnau | Chair, Transportation Finance Committee           | 443 State Office Building  
St. Paul, MN  55155  
Phone:  651.296.8872 |
| Representative Tom Workman  | Chair, Transportation Policy Committee            | 537 State Office Building  
St. Paul, MN  55155  
Phone:  651.296.5066 |
| Douglas M. Carnival         | McGrann Shea Franzen Carnival Straughn And Lamb, Chartered | 2200 LaSalle Plaza  
800 LaSalle Ave  
Minneapolis, MN  55402-2041  
Phone:  612.338.2525 |
| Remi Stone                  | League of Minnesota Cities                        | 145 University Ave West  
St. Paul, MN  55103  
Phone:  651.281.1256 |
| Erik Rudeen                 | Committee Administrator, Transportation Finance Committee | 432 State Office Building  
St. Paul, MN  55155  
Phone:  651.296.5528 |
| Carol Lovro                 | Association of Minnesota Counties                 | 125 Charles Street  
St. Paul, MN  55103  
Phone:  651.224.2344 |
| Mary Cummins                | Committee Administrator, Transportation Policy Committee | 532 State Office Building  
St. Paul, MN  55155  
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APPENDIX E - MEETING MINUTES

1. Meeting held September 22, 1999

Introductions
Co-chair Don Williamson made introductions, and co-chair Anita Benson made announcements.

Betsy Parker, Mn/DOT gave a brief description of the law passed that created the need for the Task Force (TF) (see Attachment 1.) The TF is required to develop a report by February 1, 2000. In addition to a copy of the law, each TF member was provided with a packet of information for today’s meeting, which included the following:

- Draft survey questions (Attachment 2)
- Statement of Mn/DOT’s spring loading policy (Attachment 3)
- Capacity data for County and Municipal State Aid Highways (Attachments 4A and 4B)

The objective of the TF meetings is to study the issue, hear from the many sides involved with the issue, and make recommendations to the Legislature. Betsy noted that the TF might not reach conclusions by December. The TF will identify the issues, and it is conceivable that the TF will ask for more time to study the cost/benefit analysis of spring load restrictions.

Break out Sessions

The TF broke into three groups, and each TF member identified the main issues that they would like the whole to address. The three groups were directed to summarize the issue topics, and report back to the group as a whole.

Prior to breaking into groups, Representative Tom Workman gave his view of the spring load restriction problem.

Results of the three break out sessions are listed below. Each of the three groups identified the main topics that they felt should be addressed during future TF meetings.

Break out group one:

Engineering Issues
- No. of loads vs. weight
- What roads are the main problem?
- Raise tonnage, and lower speed on lower tonnage roads
- Get more higher tonnage roads

Safety and Public Health
- Weight restrictions to do required utility work to keep system running
- Public health codes require services that require weekly, heavy vehicular traffic past every household in the state
- Ensure that waste materials are transported to protect public health
- Roadway damage is a traffic safety concern

Education
- Give industry opportunity to help solve problems voluntarily
- Lower speed on lower tonnage
- Creative solutions to a common problem
- No. of loads vs. weight of loads
Financial Impact to Industry

- Economic impact of load restrictions
- Industry compliance costs
- What is the effect on the economy/industry if no exemptions are given
- What is the cost to business of restrictions?
- Can we reduce the impact of restrictions on business?
- Transportation concerns; efficient movement
- Less economic impact

Financial Impact of Road Damage

- No. of loads vs. weight of loads
- Damage to pavement
- Background – any new study on road damage by specific industry vehicles?
- Who should bear the cost of road damage?
- Axle weight vs. gross weight
- How can we protect roads from damage?
- Road damage costs during spring
- Economics of building better roads
- How much damage is actually caused by being over weight?
- Cost of repairing roads damaged by heavy use of trucks

Guidelines – Uniformity and Equity

- Lower speed on lower tonnage (surrounding states)
- Equality among industries
- 9-ton limits – all highways single axle raise weights (counties should also)
- Consistency of regulations by public agencies
- On level playing field with surrounding states.

Enforcement – Method and Uniformity

- Enforcement issues
- Fairness
- Are fines the best way to deal with being overweight, or would permits be more fair?
- Uniformity of enforcement
- Standardized consistent enforcement

Permits and Exemptions

- Weight exemption to do utility work to keep systems running
- Exemptions for perishables
- Look at the current and past use of the overweight permits – urge waste haulers to use

Cost to Public

- Costs of rough roads to public

Pervasive

- Reality Check

Main Themes

- Engineering Issues
- Safety (Public health/Traffic)
- Education
- Financial Impact to Industry
- Financial Impact to Roads
- Gap Analysis of Impact
- Guidelines – Uniformity/Equity
- Enforcement – Method/Uniformity
Permits and Exemptions
Cost to Public
Reality Check

Issues

1. What are the engineering issues?
2. What are the political ramifications?
   “reality check”
   guidelines
   enforcement/penalties
3. How should/could/can the costs be assessed?
   Industry
   Road damage
   Public
4. How do we ensure equity?
   Guidelines
   Enforcement
5. What are “essential” services?

   Consider common sense as it relates to public safety and other areas.

Break out group two:

Supplier/User Costs
   Revenue loss to private companies
   Loss of efficiency
   Wear on extra trucks
   Increased number of trucks required
   Just-in-time delivery and inventory issues
   Cost of ticket vs. benefit to business

Logistics
   Specific routes work for some industries, but not others
   Perishables need to be hauled daily
   Weight limit change from one road to another

Innovations/New Ideas
   Gradual restrictions
   Diminishing returns: what is the most effective load restriction?
   Special permit for fee

Road Design
   What is the most new information

Truck Design
   Innovations in axle configurations, such as in Michigan

Safety
   Liability to public agencies from road damage
   Traffic safety

Enforcement
Permitting policies
Special permits
Enforcement consistency
Adherence to regulations varies
Summer and winter road weights
Concern that some restrictions cover too broad of a time span
Constant tickets and unavoidable law-breaking
Current system leads some to choose to break restrictions for “greater good”

Cost/Benefit Issues
Lack of understanding of the cost to society on all sides
Environmental costs of more trucks
Understand tradeoffs if changing the policy

Infrastructure costs
Cost to construct all roads to carry loads
Increase no. of ten ton roads
Why build roads that will be restricted?
Cost to upgrade bridges
Cost to repair roads
If policy changes, who pays for the road upgrades?

Break out group three:

Research and Education
Road structure
Road damage
What has been done to improve spring weight limits since the inception of the law?
What new technology is available to provide more accurate information, such as better scales?
What is the new research showing about improved road life and capacity?
Road construction technology advances – are they the answer?

Safety
Loads can cause immediate failure
Structural capacity and lane width
Safety for user
Is this an issue of money or safety?

Enforcement
Timing of postings
Allow extra weight in winter
Enforcement and collection of damages
30-day look back rule
restrictions based on type of vehicle
fairness
who enforces what
special permits
procedure to establish restrictions
30-day retention of scale tickets
spotty enforcement
surrounding state/province weight limits
NAFTA exemptions for Canadian hauls
Border issues

Money
Cost to upgrade pavement and bridges to higher standard
Cost to pavement
Where does the money go?
Money or safety issue
Funding levels
Road costs collected from trucking industry
Compare to other sectors of transportation
Money spent on rural roads and bridges vs. 4 lane roads

Cost to industry
Cost to deliver products
Economic analysis
How do we quantify benefits to customer
Need to serve customer
Who is the customer of each: industry, Mn/DOT, city, county, etc
Product, deliver put number to them
Delivery of services that can’t be deferred
Cost passed on to customer
Damages and cost to citizens, customer under restrictions

Government/beaurocracy
Conflict between government requirements and USDA, solid waste administrations, etc.
What different policies might MN adopt to alleviate the economic burden and preserve industry’s ability to operate
Codify laws and exemptions in one place

Approaches to the Problem
Are there other solutions than “prohibitions”?
How can we harmonize the interest of government and industry to promote commerce?
How do all the industries handle the business impact of at least two months of disruptions?

Proposed Survey

Dave Van Deusen, Mn/DOT outlined the proposed survey questions included in the packet (Attachment 2.) He noted that the survey will help to obtain a perspective of the issue that is broader than the TF can provide. The objective of the survey is to determine the state of the practice summary and the impacts of spring load restrictions. A private consultant would distribute the survey in October of this year. Results would be available for discussion in November, and be included in the TF report.

Dave went through all proposed questions. Survey recipients would include local agencies, private industries, law enforcement and elected officials.

Suggestions from the TF were as follows:

- Will survey be done blind? (The answer was no, it will not be done blind.)
- Businesses do not have time for surveys.
- Grain related business have already participated in a large cooperative study; make sure we utilize that information and do not duplicate.

- Some information we may be asking for could be proprietary and/or companies simply do not want to release information.
- Phrasing of questions may invite erroneous results. Need to be careful they are worded properly.
• Suggestions on law enforcement questions: what methods are used, what are revenues and what happens to this money, strategies used, roadblocks or random stops, what are most frequent violations, are certain industries targeted?
• Need to address gravel roads.
• How will diverse industries be handled? (e.g., wood products that have goods going in and out in several forms in many directions.) Concern that the survey and its results may get too complicated. Concern that through the course of answering questions it becomes apparent that the business has broken the law. (Assured them that no action will be taken.)
• Utilities representative (Noreen Maki) was concerned that the survey go to appropriate companies and associations. She provided a list as follows:

    Otter Tail Power Co.
    Northern States Power Co.
    Interstate Power Co.
    Minnesota Power Electric
    Minnesota Rural Electric Association members
    Minnesota Municipal Utilities Association members
    Monegasque
    Other utilities not listed here – gas/water/electric/water/sanitary (not garbage)

Need to contact associations to get recommendation on specific contact.

Betsy Parker noted that each of the three target groups (private industry, public agency, and enforcement) will get their own survey, and TF members will get copies of all three.

Tom Workman asked if the survey would provide any new information that the TF could not provide? Do industry and the public agencies really know more than the TF members, or can the TF be used to get the same information?

Dave Van Deusen noted that one goal of the survey is to obtain cost information for future cost/benefit analysis, from which to draw conclusions.

Noreen asked if the survey could address the implications following special permits for overloads? Anita Benson asked if Mn/DOT has addressed the cost issue of allowing special loads as well.

Glen Engstrom (Mn/DOT) stated that they could look at the cost issue, but need more data. He felt that the survey was a very important element of this study.

Bobbie noted that if locals are able to provide information relating to cost of damage to roads, they should be asked what method they use, so that others could get the same information for their system. Anita noted that the information would also be good for comparison.

Mary Ayde noted that the business survey should ask what service their business provides. Are they a required service, is their product mandatory, or optional?

Someone asked how Mn/DOT will identify the survey recipients, and noted that it could be very difficult. Lee Brady, from Mn/DOT noted that the NW Freight flow study offers a good example of how businesses were identified by their SIC codes. He also recommended asking each Mn/DOT district for the main industry in their area.

Bruce Kleven noted that on the business survey, question 2 needs to account for the difference in hauling raw materials (such as timber) from the finished product (such as paper or lumber). He also noted that farmers use all roads at all times. The survey will come at a bad time for farmers, and it may be hard to identify them.
One of the ARM representatives asked how the capacity of roads was selected, and if new roads are
designed with a system approach? For example, do engineers look at the system, and provide a route for
heavy loads to use when spring restrictions are imposed?

Betsy Parker noted that the survey is preliminary, as there isn’t enough time to complete a comprehensive
survey. However, the survey may steer the TF into the right direction.

A decision was made to proceed with the survey provided comments of the task force members are
considered. A meeting will be held next week to discuss revisions to the survey. Task force members will
get comments to Dave Van Deusen by next Friday.

Next Meeting Agenda

At the next meeting, the following will be discussed:

- Surrounding state’s and Canada’s laws and policies regarding spring load restrictions
- Overview of MN Spring load Restriction policy
- Who gets the fees from enforcement?
- What is the process for obtaining special permits?
- How are exemptions granted?
- Quantify postings in other states.
- Mn/ROAD research findings, and the new restriction policy
- Term definitions
- Cost of damage to roads
- Possible solutions and brainstorming

Other topics:

Co-Chair Don Williamson noted that we soon have to begin addressing the cost issues.

Betsy Parker suggested that a literature search be conducted, specifically looking for information on how to
proceed with the cost/benefit analysis. She also suggested that one or two industry representatives be
asked how their costs are determined.

The TF asked that all information needed for the next meeting be sent out at least one week in advance.

Don Williamson requested that all industry representatives on the TF who know of someone able to share
costs of doing business to get that person’s name to Betsy, Don, or Anita.

The utility companies representative noted that on the business survey, it is important for businesses to
identify their primary business, whether it is trucking or another, such as using the truck for a working
platform.

Betsy Parker noted that a working group will develop a proposed agenda for approval by chairs Don and
Anita.

The ARM lobbyist noted that the report should cover the following:

What can we do about the issues?
What are reasonable solutions?
Talk about solutions soon, so we have time to work on them as a group.
Mary Ayde noted the need to copy other agencies that will be impacted.

The following will be addressed at the next two meetings:

**November:** Costs to private and public agencies/businesses
**December:** Solutions
Enforcement issues
Continuity/uniformity among state and local government.

A Mn/DOT representative asked if the TF wanted Mn/DOT staff to turn the issues identified during the break out sessions into a Table of Contents for the report. The group agreed that that would be a good idea.

Betsy noted that the copy of the law included in the packet was not the most current, as it doesn’t include the most recent amendments. The most current law will be included in the next mailing.

Don invited all TF members to suggest speakers for future meetings, to address the issues identified during the break out sessions.

The meeting was adjourned at 2:25 p.m.
2. Meeting held October 20, 1999

**Present:** See attached attendance sheet.

**Introductions**

**Task Force Rules**

Facilitator Cathy Tilsen outlined rules and group norms. The Task Force (TF) decided on a decision-making process. It will use a system where thumbs up means a voter is in favor of a motion, thumbs down means that they are not, and thumbs sideways means they are okay with it, but not strongly. All decisions will be made by consensus.

**Mn/DOT Presentations**

1. **Dave Van Deusen – Impacts of Axle Loads on Roadways**

Dave Van Deusen began by showing a video entitled, “Weather and Loads: The Effect They Have on Roads” (See Attachment 1)

Dave, Jill Ovik, John Siekmeier and Glenn Engstrom then presented information on the Impact of Axle Loads on Roads (See Attachment 2). Comments are included on the Attachment.

2. **Don Flemming – Bridge Design and Limits**

Don Flemming then presented on the impact of truck weight on MN bridges. He provided information on how bridges are designed for truck loads. The bridge deck design is controlled by wheel loads, and the beam and truss design are controlled by vehicle load and length.

The current bridge design vehicle is a 90,000 lb truck, but the majority of Minnesota bridges were built for a 70,000 load. Fifteen percent of all MN bridges were designed for an even lighter load (30,000 lbs.)

Legal loads are governed by Federal Formula “B”, which is the same as specified MN statute 169.825. The basis for using the formula is to attempt to relate design vehicles to the actual fleet. The formula is as follows:

\[ W = 500 \left( \frac{LN}{(N-1)} \right) + 12N +36 \]

where
- \( W \) = weight
- \( L \) = distance between axles
- \( N \) = number of axles

The allowable load can increase with axle spacing and number of axles.

Don noted the relationship of legal trucks to pre- and post-WWII design trucks: pre WWII bridges are being overloaded according to formula B. A legal truck can run up to 40% over design on pre WWII bridges, especially on short span bridges.

Regulation are imposed based on assuming that the required bridge strength is equal to the truck effect plus the safety factor (originally = 2). Legal trucks currently are using 75% of safety factor on pre-WWII bridges, and 10% of safety factor on most post-WWII bridges. Don noted that the safety factor is lower on post-WWII bridges. Permitted vehicles are not allowed on pre-WWII bridges, and use up to 75% of the safety factor on post-WWII bridges.
Don identified the current load posted bridges statewide (974) that were designed for much lower loads. He also identified load posted bridges on TH system (22) and those restricted on the TH system (416).

Don was asked what the estimated effect on bridges for a truck weight to increase 100000 lbs. He estimated that statewide an additional 1,000 bridges would be posted, and on the TH system, an additional 70 bridges would be posted.

Don noted that Formula B and statutes don’t account for fatigue, age or condition of bridges. Fatigue is due to repetitive loads, and increases stress on the bridge by the cube of the gross weight. Double the weight increases fatigue damage by 8 times. Fatigue is especially a problem on high truck traffic bridges. Don gave three examples where fatigue is especially bad: Lexington Avenue; Hastings; and I-35W over the Mississippi River.

A recent fatigue study found that, of the bridges that receive the heaviest truck loads, it will take $225 million in repair over the next twenty years, and includes 87 bridges.

Don noted that about $225 Million is needed to repair bridge fatigue problems (over the next 20 years), $640 million to repair general deterioration (over the next 10 years), and $450 million to replace approach roads (over the next 10 years).

Today $40 million is spent a year. The projected shortfall is about $35 million each year to keep the system running.

Questions for Don:

1. How does MN compare with other states? Don: we are not a bad state; we are doing better than others.
2. Do those numbers include county and others? Don: no, these numbers are strictly trunk highway.

At the current funding level, Don estimated that 4 times as many bridges will need repair in the future. This may result in additional postings.

He also noted that not using as much of the safety factor eliminates much of the fatigue problem. Bridge postings are not dependent on time of year. However, the cold period results in the worst fatigue damage.

3. Darrell Schierman – Mn/DOT Permitting Process

See Attachment 4 - Map in handout showing SLR. Darrell noted the two boxes: the upper left is blown up in handout, and shows what the restricted gross weight is for each axle configuration. In the upper right is the gross weight table, which shows the allowable gross weight for 9 ton based on number of axles and the distance between axles.

Mr. Schierman also outlined the history of current load restriction map (Attachment 5), and gave the following information:

Permits are available on overwide loads from 14’6” to 16’ during SLR and cost $135.

Overweight loads above 80,000 pounds are allowable, as long as axle weight doesn’t exceed postings.

In certain cases, the Commissioner can make exceptions. Emergency considerations also given for things like generators, derailment equipment, and national defense. These loads are routed onto 10-ton segments, and Mn/DOT attempts to route them on roads that are scheduled for construction soon.
Permits bring in $1.75 million each year, at a cost of $960,000 to run the permit office. All excess goes back to trunk highway system.

4. Industry Presentations: Effect on Industry from SLR

Bruce Parker: Timber Producers Association

Bruce noted that 60% of wood is moved from December 1st to late March or early April (2.3 million cords of wood or 200,000 truckloads). Because many trees grow in swamps, which are inaccessible, by truck in the summer, the industry is forced to load during SLR. Many non public roads are used, and many are winter roads. In December, the roads are tramped to bring the moisture up to the surface and allowed to freeze. The ice gets up to 9 feet thick. They also build non surfaced gravel roads (not blacktop). Roads are surfaced if they are to be used year around.

Two most important factors for the timber industry:

Winter weight limits or exceptions
Spring load restrictions

When frost goes out of blacktop, it also comes out of soils. So, many of their roads are not useable. They then work at night when the frost is still in the ground, and haul between 4 am and 10 am.

Much movement is critical to when the restrictions or extra weights are put on or taken off. They watch closely for the spring postings, and are concerned about seasons when the ground freezes and rethaws. So far, Mn/DOT has worked well with the industry in those cases.

Rick Johnson (Barton Sand and Gravel) - AGC

Rick spoke on behalf of the construction industry. He noted that the SLR requires much improvisation by the industry. The construction industry is greatly affected by the 6 month work season, which includes the SLR season. Several companies cannot operate legally within the SLR. The SLR is a major economic factor for the industry. If rain shortens the season, or restriction increases, conditions are made even worse.

Rick noted that permits in general are very difficult to get, and Minnesota is one of the hardest in the area.

Due to the short season, when equipment needs to be loaded or moved, there is not much flexibility. They cannot always wait to get a permit, due to the economic ramifications. Also, companies are trying to strategically place equipment so that it is where it is needed prior to the SLR period. The longer the notice prior to SLR makes a big difference to contracting industry.

ARM representative Gene Wright added that amount hauled per truckload reduced increases the number of truck trips and traffic. This is also important for aggregate trucks (that people don’t like to drive behind.) Also, they are required to deal with variability of load restrictions for a given road based on the jurisdiction (one road may be posted two different weights by two agencies.)

Todd Iverson: MN Trucking Association (MTA)

Todd noted that SLR don’t affect large trucking firms too much because they mostly travel on 10 ton roads. However, the agricultural industry is affected. Fuel, fertilizer, etc. has to be delivered right at SLR time. This results in increased number of trucks and trips (traffic) to deliver the product. It is difficult to find drivers at that time of year.

The majority of the MTA members can deal with the SLR. Uniformity is a big concern for them.
Questions:

Someone asked about smaller roads, and the need to get from a 10 ton to a smaller road to make the actual delivery. Some truckers will meet a farmer at the road entrance to avoid getting ticketed.

Grain delivery: enforcement can look at 30 day tickets, post delivery. Substantial loss from having to go way out of the way to meet SLR. No longer have first haul exemptions.

Bruce noted that the timber industry will move loads to 10 ton routes prior to SLR, then moved on 10 ton roads during the SLR.

Dennis Berg (Anoka County): would increasing the TH system help? There are still the smaller county roads that wouldn’t be legal.

Don Williamson: are these costs accounted for when charging for the product? Gene Wright said that costs may be passed along to the customer. Sometimes the cost cannot be passed along. Also, asked if SLR results in more hours resulted in unsafe driving? Gene said no.

Gene said that the problem is inconsistency for a given design of road.

5. Cathy Tilsen - Critical Issues Identified During September meeting

All of break out session topics were consolidated into major themes from last meeting. (Attachment 6) Cathy noted that the themes were not rated in order of importance. She asked the TF if the main themes identified on Attachment 6 reflected their work in September.

TF input about the main themes:

Add to Financial issues: Property owners

Group agreed that those five issues covered the main topics adequately.

Concerns and additions:

1. Need to address consistency of postings between agencies. Put under regulations and mandates section.

2. Add to the Regulations section: implementation of regulations

3. About enforcement: How to quantify the effectiveness of enforcement? How to measure the effect on the road? Cathy recommended that we think of the issue, and not how to solve it or determine if we can solve or answer the question.

4. More about enforcement: Gene Halverson offered to present how little enforcement is really conducted in MN. Cathy noted that there will be an opportunity to do that at a later meeting.

5. About safety: Waste disposal requirements all year; add public health. Also add truck equipment issues from hauling overweight.

6. Safety: change “pavement” to “roadway”.

7. Safety: include the effects from spending all the funding on maintenance and not enough on upgrading the roads. Will include under financial: New construction vs. repair included under public agency.
8. Financial Issues: Roadway users (industry, citizens), public agencies, property owners. Will clarify who fits under each of these three bullets in further discussion.

9. Engineering issues: break out pavement research and new technology. New technology will then include truck design, routing systems, etc. Latest best practices.

(NOTE: the Attachment was changed to reflect the above concerns, and is included in the minutes.)

Cathy then suggested a process for completing the report. She asked the TF members to break into five small groups and address each of the five topics. Mn/DOT staff and interested observers could join the groups, based on their expertise, and provide technical background. The ultimate goal will be for the smaller groups to make recommendations as to how to address the issues.

Don Williamson suggested that we have a five hour meeting in November, to work on the five issues. Anita noted that there are already several agenda items set for the November meeting, including the survey results.

The TF agreed that working in small groups would be more effective. TF members will be allowed to choose the issue that they’d like to work on. Members were encouraged to select the issue that they have the most expertise. If too many people are in one group, volunteers will be asked to move to other issues.

Cathy asked that TF members select an issue to work on. TF members broke into groups as follows. Note that TF members not present at the meeting were assigned a group:

**Engineering**
Ken Ashfeld  
Mike Sheehan  
Anita Benson  
Mike Robinson  
Chris Radatz

**Financial**
Don Williamson  
Todd Iverson  
Dennis Berg  
Gene Wright  
Gene Ranieri

**Safety and Public Health**
Mary Ayde  
Jerry Johnson  
Fred Ettel  
Andy Steensma

**Enforcement**
Tom Workman  
Bob Zelenka  
Gene Halverson  
Dave Ewald  
Sheriff’s Representative

**Regulations and Mandates**
Doug Carnival  
Troy Gilchrist  
Bill Hall, or representative from MN Power
Bruce Barker
Deb Burke

Cathy distributed Attachment 8, Action Planning Worksheet (note that this attachment is included in the minutes, and should be used when working in small groups.) Groups were encouraged to make contact before the next meeting.

The next meeting will be held on Tuesday, November 23rd from 10:30 to 4:00.
<table>
<thead>
<tr>
<th>Name</th>
<th>Representing</th>
<th>Address</th>
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<tbody>
<tr>
<td>Mike Robinson</td>
<td>Mn/DOT District Engineers</td>
<td>1123 Mesaba Ave Duluth, MN  55811 (218) 723-4820</td>
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<tr>
<td>Jerry Johnson</td>
<td>SWAA</td>
<td>601 N. 20th Ave St. Cloud, MN  56303</td>
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<tr>
<td>Rep. Tom Workman</td>
<td>House of Representatives</td>
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<tr>
<td>Mary Cummins</td>
<td>House of Representatives</td>
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<tr>
<td>Lois Spadgenske</td>
<td>House of Representatives</td>
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<tr>
<td>Doug Carnival</td>
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<td>Migrann Shea Carnival 2200 LaSalle Plaza Minneapolis, MN  55402</td>
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<td>Bob Zelenka</td>
<td>MN Grain and Feed Association</td>
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<td>Fred Ettel</td>
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<td>Bill Hall</td>
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<td>Todd Iverson</td>
<td>MTA</td>
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<tr>
<td>Bruce Barker</td>
<td>MTPA</td>
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<tr>
<td>Gene Wright</td>
<td>Aggregate and Ready Mix Association of MN</td>
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<tr>
<td>Mary Ayde</td>
<td>MN Waste Association</td>
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<tr>
<td>Matt Shands</td>
<td>Transportation Policy Institute</td>
<td>2515 Wabash Ave #LL2 St. Paul, MN  55114</td>
</tr>
<tr>
<td>Anita Benson</td>
<td>League of MN Cities</td>
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<tr>
<td>Don Williamson</td>
<td>National Solid Waste Management Association</td>
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<tr>
<td>Dennis Berg</td>
<td>Anoka County</td>
<td>AMc</td>
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<tr>
<td>Gene Halverson</td>
<td>State Patrol</td>
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3. Meeting Held November 23, 1999

Co-chair Anita Benson called the meeting to order at 1:00.

Anita reported that the surveys were not sent out, so the report and discussion will be delayed.

Industry Panel Discussion on the Effect of Load restrictions

Don Williamson - National Solid Waste Management Association

Don identified two main impacts of SLR on his individual business as follows:

1. Impacts to Customers
   - 1% of customers get no service ($6,600 in lost revenue)
   - 4% of customers get a scheduled change, which includes rerouting so trucks can run half full, using smaller units, changing day of service, or service frequency (estimated cost of $1,650)
   - Some contractor or clean out services limited (costs for this are difficult to quantify)
   - 7.5% of customers experience change in the way they are serviced year-round. This includes residents living on rural township roads, whose service is changed to use 1-ton trucks. The smaller trucks are not as efficient, which costs the consumers an additional $33,750.
   - Customers are unhappy and don’t understand why change in service occurs

2. Impacts on Operations
   - Don has to use two swing people and three supervisors who spend 25% of their time each week to complete the smaller routes, or to cover the lighter loads with spare trucks ($7,800 estimated costs)
   - Ten regular routes are changed, and the time to service them is increased by 11% (estimated cost $2,400)
   - Don sends two letters of notification to all those customers impacted above (which costs at least $1,500 just in paper and postage)
   - Additional costs associated with the use of the smaller 1,500 GVW truck vs. the standard 45,000 GVW truck
   - Fines to Don’s company were $2,103 in 1998

Don noted that before the above changes were made, his fines were about $14,000 each year. Costs would be less to run over load and pay fines, but he chooses to not do that. As a result, customers are unhappy, and his operating costs are higher.

Bruce Kleven - Representing farm/ag groups

Bruce noted that it is difficult to quantify costs and impacts on the agriculture industry. There are about 80,000 farmers in the state, many who deliver in spring. The spring load restrictions definitely cost the growers money. Farmers increase trips in spring, resulting in additional fuel costs. Also, it is hard to find the additional drivers. SLR also require the farms to reroute trucks, which adds to wear and tear on roads.

Spring is a delivery time for crops, since prices go up in spring. Bruce outlined the reasons for increased trips in the spring, including higher crop prices, desire to deliver crops before spring plating occurs, goods coming to the farm (such as fertilizer, fuel and seed).

Bruce also gave some specific examples of how farmers are forced to make economic decisions because of SLR. For example, after harvesting, beets are piled, and may be subject to spoiling. If a spoiling pile is on a restricted road, the farmer may have to let it go to waste to save piles on non-restricted roads. Another example: potatoes are harvested in the fall, but they are perishable and shipped to grocery all winter.
Bruce noted that many farmers sit on township boards, are responsible citizens, and are not likely to want to destroy the roads.

Questions for both:

How many trucks does Don have? About 30.
Don noted an additional dilemma: between local agencies. Burn bans and recycling mandates; subject to licensure depending on truck type. All of these add to weight of the trucks.

The grain elevator representative added that 40% of his business comes from ND. He has had to report trucks four times since April. Losing business due to post-delivery enforcement.

Major Gene Halverson - State Patrol

Major Halverson noted that the State Patrol does focus on grain elevators. If they find over weight violations at a grain elevator, they will return. Otherwise, they typically return once a year.

He noted that the Legislature makes the laws; it is the State Patrol’s responsibility to enforce them.

In a formal presentation, Major Halverson outlined the organization of the Administrative Truck Center. The Dept. of Public Safety and Mn/DOT work together. He presented the organization of the State Patrol and the Commercial Vehicle Section.

The 7 areas are Training, Winona, Metro, Worthington, Red River/Erskine, North Central Mobile Enforcement, School Buses, and the Saginaw scale. There are 8 fixed scale sites and 37 CVI’s, one mobile enforcement team; 33 CVI’s and 13 troopers. Major Halverson outlined all the scale sites and the organization of each division.

Major Halverson gave the following weight enforcement information:

Vehicles weight in FFY 1998:

| Fixed scales | 830,710 |
| Portable scales | 59,721 |
| Screened by WIM | 978,000 |
| Total Weighed | 1,868,431 |

The Patrol puts most of its efforts into vehicle inspections

CVSA (certified vehicle safety alliance) Inspections:

35,644 in 1998
19,929 out of service defects
142,192 total defects

He noted that all 50 states and Canada use the same criteria

Data is transferred to Mn/DOT daily, and Mn/DOT uploads to OMC Tuesdays and Thursdays. The average time to transfer information from roadside to the OMC is two days. Almost all officers have a laptop to speed up the process.
Government trucks are not inspected. The State Mandatory Inspection Program began in 1990. Vehicles over 26,000 pounds GVW must display current decal. Re-certification is required every two years, and the State Patrol provides certification. There are 6230 certified self inspectors.

Major Halverson outlined the school bus inspection program as well.

In summary, Major Halverson stated that there is nothing worse for a trooper than to enforce an unpopular law.

Questions:

Of the 19,000 out of service violations referenced earlier; how many are trucks? Maybe 30-34% have a violation.
Do drivers get an inspection report even if there aren’t any violations? Yes.
Could you outline the extent to which the Patrol works in conjunction with local enforcement? He presented Dave Brown, Hennepin County Sheriff’s department, who does full time truck enforcement.

Post delivery enforcement is not tracked in a computer system. A tally sheet is recorded.

The Patrol weighs 400-500 trucks per year each. Gene noted that each county has no more than one or two trained officers.

Ken Urquhart works in the metro, and gets a lot of requests for assistance from local agencies. They don’t have staff to focus on just weighing.

Scott Peterson - Explanation of Economic Analysis and Cost/Benefit Studies

Mr. Peterson outlined the goals of their transportation policy:

- Efficiency: lowest total social cost
- Equity: those who impose the costs pay the costs.

He noted that all resources consumed in transportation directly or indirectly are costs. Mr. Peterson outlined the costs to business, which are generally increased operation costs:

- more frequent trips with lighter loads: added time and vehicle costs
- longer trips from diversions: added time and vehicle costs
- stockpiling: inventory and handling costs
- delayed shipping: sub-optimum production value
- equipment modifications

Costs to government are generally increased highway maintenance and enforcement costs:

- faster pavement degradation: more frequent repairs and rehabilitation
- base deterioration: more extensive rehabilitation
- enforcement: officers’ time and equipment
- judicial: process violations

Other highway users experience increased transportation costs as follows:

- rougher rides: increased rate of vehicle depreciation and added discomfort
- reduced speeds: longer travel times
- more detours and construction zones: increased time, added vehicle costs, and more crashes
Mr. Peterson noted that a proposed economic analysis of current policies or proposed changes (in the form of a benefit/cost analysis) would try to determine whether the cost of policy change is less than the benefits. Another way to evaluate it is to determine if the reductions in business costs divided by the additional public cost are greater than or equal to one? If so, efficient policy changes could be identified. Parties who create additional costs could be identified, and costs assessed. He said that Mn/DOT would like to perform the analysis, but it would be a large and difficult project.

Discussions about the project have been ongoing over the last year. Mr. Peterson estimated it would take several years to perform the study. The prime data gathering time is before, during and after any changes to SLR policy. Changes in traffic patterns would be measured. Business could provide changes that occur in response to SLR policies.

The question arose: If that study was performed, and additional public costs determined from eliminating SLR, who would pay the additional cost? Would it be the users who save money, or paid for by a gas tax? The Task Force agreed that the consumer ends up paying anyway. However, it was also noted that not everyone buys every product. The question arises: do we assess everyone (via the gas tax) for the additional cost to a company for its additional cost to transport their goods, or just those who buy their products?

Mr. Peterson also noted that the gas tax only pays for a small portion of the roads. Property taxes and assessment pay for the majority of county township and city roadway costs.

Small Group Meetings

Small groups for each of the five issues then met to work on the Action Planning Worksheet.

Cathy noted that by December meeting, recommendations need to be made for inclusion in the report. The worksheet was designed to help make those recommendations. She asked if there was information that Mn/DOT staff could provide for the December meeting? The following were identified:

- Financial Impacts group asked if Scott Peterson could participate in their group.
- Need lane miles for each jurisdiction (city, county, state aid) to illustrate what percentage is supported by the trucking industry.
- Existing laws and regulations affecting load restrictions
- Comparing other states spring load restrictions to determine if MN is consistent

Small groups were encouraged to meet before the next meeting, and identify solutions or action items based on their group issues. Note: revised break out issues are attached.

The next meeting will be on Monday, December 20th at 10:30 am at the Arden Hills Training Center.
### Attendees at the November meeting

<table>
<thead>
<tr>
<th>Name</th>
<th>Representing</th>
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<tr>
<td>Mike Robinson</td>
<td>Mn/DOT</td>
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<td>Wayne Murphy</td>
<td>AGC</td>
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<td>Bruce Kleven</td>
<td>Ag groups</td>
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<td>MN Association of Townships</td>
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<td>Johnnie Ohr</td>
<td>MN Association of Townships</td>
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<td>Ken Ashfeld</td>
<td>City Engineer’s Association of MN</td>
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<td>Gene Halverson</td>
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<td>Dan Goodsell</td>
<td>Waste Management Association</td>
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<td>Doug Carnival</td>
<td>NSWMA</td>
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<td>Rick Johnson</td>
<td>Barton Sand and Gravel</td>
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<td>Betsy Parker</td>
<td>Mn/DOT</td>
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<td>Remi Stone</td>
<td>League of MN Cities</td>
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<td>Harold Lasley</td>
<td>Mn/DOT</td>
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<td>Mike Sheehan</td>
<td>MN County Engineers</td>
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<td>Scott Peterson</td>
<td>Mn/DOT OMRR</td>
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<td>Carol Lovro</td>
<td>Association of MN Counties</td>
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4.  **Meeting held December 20, 1999**

Cathy Tilsen reviewed the agenda for the day.

**Preliminary Report**

Ann Johnson reviewed the draft report, and outlined the procedure for getting the final report completed. Her expectation is to get the report in near completed form by early January, using the information from the small group discussions today.

**Survey Results**

Lee Brady outlined the survey results. (See attachments)

The survey was mailed to city and county engineers, law enforcement agencies, and commercial businesses. Information from law enforcement agencies was obtained from local sheriff departments. Mn/DOT Districts were each asked to identify key customers from each district. Lee’s office obtained 193 business names. They experienced a problem identifying contact names for the businesses, which may have affected response rate.

Response rates:

<table>
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<tr>
<th>Target</th>
<th>Sent out</th>
<th>Responses (response rate)</th>
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</thead>
<tbody>
<tr>
<td>County engineers</td>
<td>87</td>
<td>70 (80.5%)</td>
</tr>
<tr>
<td>City engineers</td>
<td>127</td>
<td>64 (50.4%)</td>
</tr>
<tr>
<td>Law enforcement</td>
<td>87</td>
<td>58 (66.7%)</td>
</tr>
<tr>
<td>Commercial businesses</td>
<td>193</td>
<td>responses not tallied as of 12/20/99</td>
</tr>
</tbody>
</table>

The audience was provided with two packets. The first gave all answers to the questions, and the second included all verbatim responses.

**Law Enforcement (attachments 1A and 1B): See Lee’s handouts**

(Note these are county law enforcement.)

2.  How are weight restriction laws enforced?

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>12.5%</td>
<td>not at all</td>
</tr>
<tr>
<td>37.5%</td>
<td>2</td>
</tr>
<tr>
<td>23.2%</td>
<td>3</td>
</tr>
<tr>
<td>21.4%</td>
<td>4</td>
</tr>
<tr>
<td>5.4%</td>
<td>very strictly enforced</td>
</tr>
</tbody>
</table>

Method used?

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.1%</td>
<td>fixed weigh stations</td>
</tr>
<tr>
<td>75.6%</td>
<td>portable scales</td>
</tr>
<tr>
<td>3.8%</td>
<td>road blocks</td>
</tr>
</tbody>
</table>

3.  Any vehicles that are specifically targeted?

SU 3 & 4 were the majority noted (87%)

4.  Are they involved in partnerships to enforce SLR?

State 37.3%
Comments:

Major Halverson noted that the State Patrol performs 90% of the enforcement. So, results are only for 10% of the enforcement activities. He noted that portable scales are big and expensive, and local governments couldn’t afford to purchase them.

**Government (see attachments 1C, 1D)**

1. How to identify roads that are to be restricted?

   Cities:
   - Judgment: 26.3%
   - Visual observations: 25.3%
   - Mn/DOT Guidelines: 21.1%

   Counties:
   - Judgment: 27.5%
   - Visual observations: 24.9%
   - Mn/DOT Guidelines: 19.2%

2. How to identify WHEN to restrict roads?

   Cities
   - Judgment: 19.3%
   - Visual observations: 15.8%
   - Mn/DOT Guidelines: 71.9%

   Counties
   - Judgment: 54.9%
   - Visual observations: 53.5%
   - Mn/DOT Guidelines: 91.5%

3. How to identify HOW LONG to restrict roads?

   Cities
   - Judgment: 25%
   - Visual observations: 17.9%
   - Mn/DOT Guidelines: 73.2%

   Counties
   - Judgment: 64.3%
   - Visual observations: 62.9%
   - Mn/DOT Guidelines: 87.1%

4. Rate (1-5, with 5 being very significant) the level of damage from overloaded trucks during spring load restrictions.

   Cities
   - 1: 3.3%
   - 2: 39.3%
   - 3: 29.5%
   - 4: 21.3%
   - 5: 6.6%

   Counties
   - 1: 3%
   - 2: 13%
   - 3: 24%
   - 4: 33%
5. What is the estimated annual maintenance costs savings from having SLR?

Cities
- 0-4: 23.3%
- 5-10: 53.5%
- 11-20: 9.3%
- Over 20%: 14.0%

Counties
- 0-4: 7.7%
- 5-10: 20.0%
- 11-20: 28%
- Over 20%: 45%

6. Savings on annual construction budget?

Cities
- 0-4%: 36%
- 5-10%: 39%
- 11-20%: 8%
- Over 20%: 17%

Counties
- 0-4%: 19%
- 5-10%: 20%
- 11-20%: 19%
- Over 20%: 42%

7. What level of enforcement is used for SLR?

City
- 1: 13%
- 2: 36
- 3: 18
- 4: 23
- 5: 10

County
- 1: 22%
- 2: 38
- 3: 25
- 4: 13
- 5: 3

8. Are they involved in partnerships with any other units of government?

Cities
- None: 81%

Counties
- None: 78%

9. Are they collecting traffic data on SLR?

Cities
- No: 92%
10. No. of person-hours spent annually on SLR?

Cities
0 21%
Results ranged up to 550

Counties
Results approximated more of a normal curve. 17% spent about 100 hours. Up to 1000.

11. Who gets exemptions?

Cities
Garbage haulers 27
School buses 21
emergency 8
Buses 5
electrical trucks 2
agriculture 1
fuel delivery 1
other 21

Counties
Agriculture 12
School buses 11
garbage haulers 6
emergency vehicles 4
vehicles exempt by state law 2
other 5

Comments:

Dennis Berg noted that county forces cannot enforce the laws, they can only post the restrictions. He also noted that we should survey the citizens, who are the ones who have to pay for the restrictions.

Someone asked if information received from businesses was protected by privacy laws? That may have affected response rates. Lee noted that responses were confidential.

What other things account for the difference in perspective between cities and counties regarding why the SLR make a big difference? Dennis noted that city streets are short, and haulers do not have the incentive to run loads overweight. County roads are more often used by trucks. Even through streets through cities are usually county roads.

Small Group discussions

Anita noted that cost is a large issue, but a study to quantify the costs would take a long time. We should focus on other goals and recommendations in the small group work. Use the main issues handout as well to identify suggestions for the smaller issues as well.

All five groups then separated to different rooms, to develop recommendations and goals for each issue.

Small Group Presentations
1. **Safety and Public Health**

Used landfill cleanup issue model. Address concerns due to liability from pavement damage, need for milk delivery year round.

Problem: Address the concerns and increased liability due to pavement damage and management, increased truck traffic, transport of perishable products, and meet waste disposal requirements all year. Increased truck traffic results in environmental pollution and accident potential.

Recommendation: economical and reasonable transportation of loads at reasonable weights to produce the least damage to roads, while protecting public safety and public health. Consolidation and technology changes are faster than the ability to upgrade the roads and bridges. Plan will include equipment manufacturers.

**Step 1** Educate the stakeholders (legislature, Mn/DOT, and industry) on the cause effect and cost of SLR.

**Step 2** Develop a plan to prioritize upgrading the roads and bridges.

**Step 3** Implement the improvements to the roads

**Step 4** Report back to the legislature and the stakeholders. Review and improve the program and assess needs.

Barriers: Where is transportation as a need compare to other services, such as health, etc.? Has it slipped in importance? Convincing legislators that this is a need may be a barrier to accomplishing the goals.

Signs of success: We will have upgraded more of the road systems so that trucks will be able to use the roads, and load restrictions will be less of an issue.

2. **Financial Impacts**

Problem: no one understands the real costs of load restrictions. There needs to be a study conducted to determine the actual costs. And to present some alternatives, e.g. what would it cost to upgrade to 9 ton, etc.? What costs result if load restrictions are just removed?

Recommendation: Conduct a study to determine the total current cost of SLR, as well as the total cost of alternatives. Some alternatives to be studied include upgrading roads to 9 or 10 ton, and removal of current restrictions.

**Action/Steps:**
1. Appropriation to conduct study this section by legislature.
2. Conduct study by Mn/DOT

Barriers: Obtaining funding.

3. **Engineering**

Problem: we need to optimize pavement life and preserve our investment in transportation infrastructure.

Recommendation:

1. Provide information to legislature regarding pavement behavior and need for SLR. This will also be provided to local agencies. This accomplished by distribution of one of two videos: one from LRRB and one from SD. Also assemble information packet for use by legislature and local agencies. Done through Mn/DOT or LRRB.

4. Before making any changes to current SLR policies, conduct detailed study to assess and quantify impacts of current SLR policy.
4. **Enforcement**

Goals: To develop a realistic recommendation that is simple for enforcement and industry to understand.

Steps:

1. Industry and enforcement to develop a permit plan/process.
2. Enhanced penalty for those who do not chose to participate in new plan.
3. Funds captured by permitting process targeted to those agencies that participate in the permitting process.
4. Remove all exemptions to encourage trucks to participate in permitting process.
5. Certify enforcement by the State Patrol. Would inform businesses about who is enforcing the policies. Would also create increased uniformity in enforcement, increased uniformity in knowledge, eliminate ticket stacking.
6. Fund study by ADA to continue to assess border issues and extra weight allowance in winter.

Barriers: Differing enforcement philosophies (public safety vs. revenue enhancement)
County/City enforcement penalties stay within municipalities. (fear losing $)

Signs of success:

- Less sneaking around to avoid the law
- Less complaints about lack of consistency and fairness.

5. **Regulations and Mandates**

Issues: Current system does not have method to identify and clarify both laws and conflicting agency regulations. Need to codify laws and exemptions in one place.

Goals: to develop a comprehensive, seamless information source. Currently, there is a lack of knowledge as to what laws, rules, and policies and standards are and where they are kept. There is a need to standardize what and where laws and rules are kept.

Action:

3. To develop a comprehensive, seamless information source. This could be web-based with city/county links. It could also be a map driven system that could use a pointer to site of state. Cities and counties would be responsible for keeping their information updated.
4. Consolidate all state laws into one location.
5. Form a group to define needs and develop a plan.

Barriers: time and money.

Discussion:
Regarding “equality among industry” for exemptions, permits, weights.

- Need a hierarchy of public needs and how to provide them.
- Classify needs into emergency, essential, necessary, and nice or good.
- Who needs travel?
- Who should have permits rather than an exemption
- Who should divide their loads, or simply wait to deliver them.
- Need emergency exemption practices.
• Standards of when permits are needed, how to price. Toll road for SLR time based on infrastructure loss. Cost to government to repair, vs. the cost loss to business. Benefit/costs assessment needs to be done. Use fees from permits to upgrade roads to higher standards.

How to create a level playing field?

There is a need to know the truth about what others are doing on a state, local and federal level. There is also a need to develop consistency without worsening our roads.

Look at research to improve longevity of roads.

Summary and Final Recommendations by Entire Task Force

1. Certification of local enforcement personnel by State Patrol.
2. Compile and clarify laws in one place.
3. Assess method for granting exemptions and permits. What can be clarified? What can be made more uniform?
4. Inform and educate legislature and other stakeholders about pavement behavior and need for SLR.
5. Conduct more in depth study:
   Are we managing the system right?
   What is the cost benefit analysis of increasing the loads on the roads, and of removing the SLR all together?
6. Private associations agree to provide information for study, and work with Mn/DOT to complete study.
7. Create partnership of private sector/public sector/that will continue to consider issue of SLR.
8. Look at landfill issue task force as a model for solving this problem.
9. Create a gas tax index that is tied to inflation.
10. Target 1-2 communities to do study on actual costs associated with SLR.

To do: Recommendations will be broken down into short- and long-term recommendations.

The final report will be developed and sent out for committee review prior to the January 19th meeting.
Present at the December 20, 1999 meeting

<table>
<thead>
<tr>
<th>Name</th>
<th>Representing</th>
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<tbody>
<tr>
<td>Bruce Barker</td>
<td>Timber Producers Association</td>
</tr>
<tr>
<td>Jerry Johnson</td>
<td>MN Solid Waste Administration</td>
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<td>Ag groups</td>
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<td>Andy Steensma</td>
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<td>Facilitator, Dept. of Administration</td>
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5. **Meeting held January 19, 2000**

Cathy Tilsen reviewed the agenda for the day. Poor weather prevented many Task Force members from attending, but the meeting continued. Another meeting was scheduled for Monday, January 31, 2000.

Ann Johnson led a discussion regarding Findings and Conclusions for each of the five issues identified at the September meeting. The members present identified Findings and Conclusions for Engineering Issues and Financial Impacts. The remaining three issues will be completed at the January 31st meeting. Also, final recommendations from the entire Task Force will be developed then.

Comments regarding the Preliminary Report content were discussed, and will be incorporated into the final report.

**Present at the January 19, 2000 meeting**

<table>
<thead>
<tr>
<th>Name</th>
<th>Representing</th>
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<tbody>
<tr>
<td>Bruce Barker</td>
<td>Timber Producers Association</td>
</tr>
<tr>
<td>Scott Peterson</td>
<td>Mn/DOT</td>
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<tr>
<td>Mike Robinson</td>
<td>Mn/DOT</td>
</tr>
<tr>
<td>Anita Benson</td>
<td>League of MN Cities</td>
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<tr>
<td>Don Williamson</td>
<td>National Solid Waste Management Association</td>
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<tr>
<td>Gene Halverson</td>
<td>MN State Patrol</td>
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<tr>
<td>Dennis Berg</td>
<td>AMC Anoka County</td>
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<tr>
<td>Ken Urquhart</td>
<td>MN State Patrol</td>
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<tr>
<td>Craig Cooper</td>
<td>City of Minneapolis Public Works</td>
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<tr>
<td>Ken Ashfeld</td>
<td>City Engineers</td>
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<tr>
<td>Lois Spadgenske</td>
<td>House Transportation Policy Committee</td>
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<td>Glenn Engstrom</td>
<td>Mn/DOT</td>
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<td>Dave Van Deusen</td>
<td>Mn/DOT</td>
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<td>Betsy Parker</td>
<td>Mn/DOT</td>
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<td>Brian Burke</td>
<td>Ferrellgas</td>
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<td>Todd Holmquist</td>
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<td>John Siekmieier</td>
<td>Mn/DOT</td>
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<tr>
<td>Cathy Tilsen</td>
<td>Facilitator, Dept. of Administration</td>
</tr>
</tbody>
</table>
6. **Meeting held January 31, 2000**

Ann Johnson led a discussion regarding Findings and Conclusions for the remaining three issues: Safety and Public Health, Regulations and Mandates, and Enforcement. She also asked for and recorded feedback on the two issues that were worked on at the January 19th meeting. Those findings and conclusions are included in the Final Report as recorded.

Task Force members then voted on all of the Subgroup Recommendations for each of the five issues. Those recommendations that were approved by the majority of Task Force members present were included in the report as final recommendations. The Task Force determined that, if three Task Force members were opposed to the inclusion of a specific recommendation, it would not be included as a final recommendation from the Task Force. No strong opposition was heard from any Task Force members regarding a specific Final Recommendation.

Additional comments regarding the Preliminary Report content were discussed, and will be incorporated into the Final Report.

The list of those present at the January 31, 2000 meeting was not available.