GRAVEL ROADS
MANAGEMENT PROGRAM

Josh Jones, E.I.T.
Traffic Engineer
WY T²/LTAP Center
Gravel Roads Management

FINAL REPORT
FHWA-WY-10/03F

State of Wyoming
Department of Transportation

U.S. Department of Transportation
Federal Highway Administration

VOLUME 1
GRAVEL ROADS MANAGEMENT
What is a Gravel Roads Management Program?

- Database of
  - Road Condition
  - Maintenance Cost
  - Maintenance Schedule
  - Performance of Materials
Benefits of a Gravel Roads Management Program?

- Performance of Materials
- Cost Tracking
- Maintenance Efficiency
- Succession
4 Fundamental Pieces of Information

- Unique Section identification
- Location
- Surface Type
- Length
Other Useful Pieces of Information

- Road Name and Number
- Top Width
- Maintenance Intervention Level
- Functional Class
- Traffic Volumes
- Traffic Speeds
- Road Use
- Land Use
- Terrain
Maintenance and Cost Tracking

- Blading
- Reshaping
- Drainage Maintenance
- Regraveling
- Dust Control
- Stabilization
- Isolated Repairs
- Major Work
Wyoming LTAP Website

- http://wwweng.uwyo.edu/wyt2/

The T2/LTAP Center assists local Wyoming agencies and individuals in gaining technical transportation knowledge. This is accomplished by communicating new and developing technology, responding to direct requests, providing reference materials, and conducting T2/LTAP workshops throughout Wyoming. T2 is part of the Local Technical Assistance Program, which supports centers in all 50 states and Puerto Rico. The T2/LTAP Center is sponsored by the Federal Highway Administration, in cooperation with the University of Wyoming, the Wyoming Transportation Department, and Wyoming cities and counties.

WyT2/LTAP Services

- Subjects ranging from: Planning and Administration; Design and Construction; Maintenance; Traffic and Safety
- 20 or more workshops per year. Low cost. Advertised statewide. Local host option available. Teleconferencing.
- The Wyoming T2/LTAP Center performs special projects occasionally. Information and/or reports on these projects will be available here.
- The Wyoming T2/LTAP Center offers certification workshops throughout the year. More information can be found here.
**CORRECTION TO LEGAL ESTABLISHMENT OF COUNTY ROADS**

The report entitled "Legal Establishment of County Roads in Wyoming" contains an error. Page 52, paragraph 5. A. (1) should read, "Failure to adequately maintain a county road does not vacate the road." The word "not" was inadvertently left out of this sentence in the final report. The same error occurred on page 4, paragraph 5. A. (1) of the laminated outline. We regret any confusion this error may have caused.

**Gravel Roads Management**

Meeting Notes and Minutes
Drafts
Email Comments
Gravel Roads Management FINAL REPORT
Gravel Roads Management PROGRAMMING GUIDE
Gravel Roads Management IMPLEMENTATION GUIDE
Ride Quality Rating Guide

**Asset Management**

Reports (as Word Documents)
Training Materials (as Powerpoint Presentations)

**Reports and Presentations**

WRRSP Paper
WRRSP Poster
ASSESSING THE IMPACTS OF OIL AND GAS DRILLING OPERATIONS ON LOCAL INFRASTRUCTURES
Background

The Wyoming Legislatures allocated funding for the purpose of evaluating impacts and formulating mitigation strategies associated with mineral exploration and production in southeastern Wyoming.
Objectives

- Assess the heavy truck traffic impacts on local roads serving oil and gas drilling operations.
- This study will concentrate on paved and unpaved local roads in Goshen, Laramie, and Platte Counties.
- Cattle guards will be evaluated as part of the study.
Background

Dead Horse Road, Johnson County, Wyoming.
Background

- Texas DOT, a single well takes about:
  - 60 Days to complete
  - 1,365 trucks larger than a standard pick up.
  - During production lasting 3 years, 150 large trucks per month serve each well.
In North Dakota,
- 21,250 wells in the next 10 to 20 years.
- Impacted Roads: Average ADT 145, 61 trucks, 26 out of the trucks are multi-units.
- Rural collector: ADT 277, 31 trucks, 17 are multi-unit trucks.
Low-volume rural roads in oil-producing areas were not initially constructed to endure the impact of intense oil field truck traffic.
Platte, Goshen, and Laramie County roads were not designed to carry traffic volumes of the state roads.

These 3 Counties with small populations and tax bases will be struggling to maintain their county roads.

The grid system will result in more impact in these counties.
Once production begins the Counties will start to see significant revenues from the oil and gas extraction.

But while wells are being drilled there are substantial impacts to the counties roads without funding.
Project Steps

- Implement the developed methodology in 3 Counties (Goshen, Platte, Laramie).
- Identify roads with predominantly drilling traffic.
- Collect condition data.
- Roads with inadequate surface conditions for their functional class will be recommended for improvements.
Project Steps

- Based on the distresses on impacted roads, appropriate M&R activities will be recommended.
- Cattle guards improvements will be recommended.
- Proposed improvements will be summarized by county (This study will not compare projects from different counties)
- Required M&R activities will be compared on impacted versus un-impacted roads.
GIS Map of Existing and Proposed Well Sites

Legend
- Existing Well Sites
- Temporary Water Haul for Oil & Gas
- Plan Approved Well Sites
Central Laramie County

South Central Laramie County

- Existing Well Sites
- Temporary Water Haul for Oil & Gas
- Plan Approved Well Sites
Laramie County Impact Map
Developing a Database

- Conduct Traffic Counts on Impacted Roads
- Evaluate Distresses on all the roads.
- Recommend mitigation depending on the distresses of the road.
- Record Maintenance Schedules
- Evaluate Total Cost to the Counties
TAMS

Pavements 3.0
Transportation Asset Management System
With a point-and-click inventory system, customizable exportable maps and queries, a virtual maintenance tool to optimize use of maintenance dollars, and easy to use Work Order Tool, TAMS is designed to simplify and streamline your asset management.
Ride Quality Guide

- Ranks the road on a 1 to 10 scale.

1) Failed
2) Very Poor
3) Poor (closer to Very Poor)
4) Poor (closer to Fair)
5) Fair (closer to Poor)
6) Fair (closer to Good)
7) Good (closer to Fair)
8) Good (closer to Very Good)
9) Very Good
10) Excellent
Pub Works – Asset Management
Pub Works – Asset Management

Annual Activity Summary

<table>
<thead>
<tr>
<th>Year</th>
<th>Labor Hours</th>
<th>Labor Cost</th>
<th>Eqp Cost</th>
<th>Mat Cost</th>
<th>Con Cost</th>
<th>Overhead</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>27,272.0</td>
<td>$521,022.95</td>
<td>$471,230.58</td>
<td>$397,263.36</td>
<td>$40,236.00</td>
<td>$48,379.57</td>
<td>$1,478,154.47</td>
</tr>
<tr>
<td>2005</td>
<td>27,040.0</td>
<td>$535,871.96</td>
<td>$484,236.84</td>
<td>$407,041.39</td>
<td>$55,125.00</td>
<td>$54,032.68</td>
<td>$1,536,307.87</td>
</tr>
<tr>
<td>2006</td>
<td>27,080.0</td>
<td>$555,658.05</td>
<td>$501,662.79</td>
<td>$418,343.70</td>
<td>$0.00</td>
<td>$69,232.45</td>
<td>$1,544,896.99</td>
</tr>
<tr>
<td>2007</td>
<td>27,144.0</td>
<td>$575,930.41</td>
<td>$520,237.72</td>
<td>$432,973.04</td>
<td>$0.00</td>
<td>$74,669.66</td>
<td>$1,603,910.82</td>
</tr>
<tr>
<td>2008</td>
<td>27,570.0</td>
<td>$605,670.28</td>
<td>$542,555.91</td>
<td>$464,594.64</td>
<td>$45,891.00</td>
<td>$79,793.50</td>
<td>$1,738,505.34</td>
</tr>
<tr>
<td>2009</td>
<td>27,461.0</td>
<td>$620,377.21</td>
<td>$559,338.75</td>
<td>$465,855.75</td>
<td>$125,466.00</td>
<td>$89,463.61</td>
<td>$1,860,501.32</td>
</tr>
<tr>
<td>Total</td>
<td>163,567.0</td>
<td>$3,414,530.85</td>
<td>$3,079,362.60</td>
<td>$2,586,071.87</td>
<td>$256,740.00</td>
<td>$415,571.47</td>
<td>$9,762,276.80</td>
</tr>
</tbody>
</table>

Annual Activity Summary

Annual Cost Summary Report
Pub Works – Asset Management

Cost Summary by Task Type

<table>
<thead>
<tr>
<th>Task Type</th>
<th>Labor Hours</th>
<th>Labor Cost</th>
<th>Eqp Cost</th>
<th>Mat Cost</th>
<th>Con Cost</th>
<th>Overhead</th>
<th>Total Cost</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>900 Administrative</td>
<td>6,900.0</td>
<td>$134,290.95</td>
<td>$123,284.63</td>
<td>$92,614.99</td>
<td>$0.00</td>
<td>$13,823.01</td>
<td>$365,453.58</td>
<td>3.7%</td>
</tr>
<tr>
<td>300 Culverts and Drainage</td>
<td>7,725.0</td>
<td>$161,267.03</td>
<td>$145,068.42</td>
<td>$105,519.05</td>
<td>$0.00</td>
<td>$18,756.46</td>
<td>$430,650.96</td>
<td>4.4%</td>
</tr>
<tr>
<td>200 Engineering</td>
<td>9,312.0</td>
<td>$194,246.66</td>
<td>$180,277.69</td>
<td>$152,566.35</td>
<td>$266,740.00</td>
<td>$23,823.35</td>
<td>$817,996.05</td>
<td>8.4%</td>
</tr>
<tr>
<td>100 Sign Management</td>
<td>17,886.0</td>
<td>$374,684.22</td>
<td>$338,085.90</td>
<td>$277,089.58</td>
<td>$0.00</td>
<td>$45,587.42</td>
<td>$1,035,427.12</td>
<td>10.6%</td>
</tr>
<tr>
<td>500 Storm Water Maintenance</td>
<td>109,701.0</td>
<td>$2,288,575.01</td>
<td>$2,058,495.97</td>
<td>$1,743,848.67</td>
<td>$0.00</td>
<td>$280,816.43</td>
<td>$6,371,736.09</td>
<td>65.3%</td>
</tr>
<tr>
<td>800 Street Maintenance</td>
<td>9,211.0</td>
<td>$192,070.40</td>
<td>$173,065.04</td>
<td>$159,871.29</td>
<td>$0.30</td>
<td>$22,204.94</td>
<td>$548,011.68</td>
<td>5.6%</td>
</tr>
<tr>
<td>600 Trash</td>
<td>5,192.0</td>
<td>$118,074.59</td>
<td>$111,194.95</td>
<td>$55,161.95</td>
<td>$0.00</td>
<td>$8,459.86</td>
<td>$192,301.34</td>
<td>2.0%</td>
</tr>
</tbody>
</table>

Task Types: 7

Cost Summary by Task Type

- Administrative: 3.7%
- Culverts and Drainage: 4.4%
- Engineering: 8.4%
- Sign Management: 10.6%
- Storm Water Maintenance: 65.3%
- Street Maintenance: 5.6%
- Trash: 2.0%
- Total: 100.0%
THE END