Doing More with your Weigh-In-Motion System

INVESTING IN A GLOBAL FUTURE
Doing More With Your WIM System

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Introduction

• With changes in today’s technology Weigh-in-Motion is being used in many new and innovative ways.

• There are many new and emerging technologies and uses for today’s Weigh-in-Motion data.

• The industry is demanding the ability to deploy one system that will meet the needs of multiple State agencies – doing more with less.
Commercial Vehicle Enforcement

How can we catch more bad guys?
How can we design better roads?
How can we protect our bridges?
Can we Share the WIM System?

• With today’s technology and by strategically selecting your WIM location it can be used for
  • Enforcement,
  • Pavement Design and Planning
  • and Bridge Protection.

• By placing WIM devices near State Lines Data can even be shared between State agencies.

• Advancements in Weigh-in-Motion Electronics can allow all this and more to occur seamlessly
Site Location and Assessment

Hurley, Wisconsin

Virtual Scales
Weigh-in-Motion Scales
Roadside Electronics
Networked Camera
Bridge Monitoring System

Bridge Instrumentation Panel

Bridge Structural Health Monitoring System

Internet Link

WIM Link
WisDOT Structure B26-007: WB US-2 over the Montreal River
Hurley, Wisconsin - Ironwood, Michigan

- Strain gauge on top flange over pier
- 2-axis displacement measurement between bearing and abutment (SE corner only)
- Strain gauge on top flange over pier
- Traffic
- 3 strain gauges at end of welded cover plate (middle of right lane only)
- Strain gauge and accelerometer on bottom flange at midspan (3 girders under right lane)
- Thermocouples on fascia and middle
- Pier 1
- Wisconsin
- Michigan
Strain Gauge – Bridge Instrumentation
Heavy Loading
Axle Weight Limits

Axle Weight Limits

<table>
<thead>
<tr>
<th>Axle</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13,000 lb</td>
</tr>
<tr>
<td>2,3</td>
<td>34,000 lb</td>
</tr>
<tr>
<td>4,5</td>
<td>34,000 lb</td>
</tr>
</tbody>
</table>

GVW: 80,000 lb
Real-Time Display

Virtual Weight In Motion - Windows Internet Explorer

Lane 1 - Vehicle #00534 - Class 9 - 5 Axle - PAUSED

Class: Length: Speed: GVV: Max GVW: Date:
9 79 ft 65 mph 03237 lb 80001 lb Wed Jun 16 19:53:28 2010

Axle Separation Left Weight Right Weight Total Weight Allowable Weight Group
1 0.0 ft 5035 lb 4516 lb 9551 lb 20000 lb 3
2 2.1 ft 8037 lb 6448 lb 14485 lb 17000 lb 3
3 4.4 ft 10135 lb 9391 lb 19526 lb 17000 lb 3
4 6.7 ft 9784 lb 8376 lb 18160 lb 20000 lb 3
5 12.4 ft 8956 lb 8987 lb 17943 lb 20000 lb 3

Status: Overweight Status: Over GVW

Lane 1 - Total Vehicle Count: 5085 - PAUSED

#00534 - Class 9 - 5 Axle
#00538 - Class 9 - 5 Axle
#00536 - Class 9 - 5 Axle
#00534 - Class 9 - 5 Axle
#00530 - Class 5 - 2 Axle

Lane 2 - Total Vehicle Count: 1477

#00537 - Class 5 - 2 Axle
#00477 - Class 5 - 2 Axle
#00390 - Class 9 - 5 Axle
#00374 - Class 5 - 1 Axle
#00308 - Class 0 - 2 Axle
Accessible Anywhere via Internet
Historical Reporting on Collected Data

Class By Gross Vehicle Weight

| Weight Range | 0  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 |
|--------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 0 - 60       | 1  | 8  | 186,736 | 23,943 | 1,491 | 15,293 | 832 | 28 | 1,777 | 8,059 | 69 | 104 | 3 | 12 | 0 | 0 | 238,449 |
| 60 - 64      | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 8  | 3  | 5  | 519 | 8 | 10 | 0 | 0 | 226 |
| 64 - 68      | 0  | 0  | 0  | 0  | 0  | 7  | 0  | 0  | 210 | 8 | 11 | 0 | 0 | 0 | 0 | 0 | 236 |
| 68 - 72      | 0  | 0  | 0  | 0  | 0  | 1  | 1  | 0  | 247 | 4 | 5 | 0 | 1 | 1 | 0 | 0 | 259 |
| 72 - 76      | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 388 | 5 | 4 | 0 | 0 | 0 | 0 | 0 | 387 |
| 76 - 80      | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 460 | 0 | 1 | 0 | 0 | 0 | 0 | 462 |
| 80 - 84      | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 117 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 11 |
| 84 - 88      | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 460 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 15 |
| 88 - 92      | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 117 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 10 |
| 92 - 100     | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 96 - 100     | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 100 - 104    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 104 - 108    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 108 - 112    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 112 - 116    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 116 +        | 1  | 8  | 186,736 | 23,943 | 1,491 | 15,293 | 849 | 36 | 1,780 | 9,743 | 93 | 233 | 3 | 14 | 0 | 0 | 246,226 |

1,684 Tractor-Trailer Units are over the posted limit. (17.3%)
Graphical Reporting of Loading by Truck Class

Site 025 Lane 1 Monthly Peak loaded and unloaded points for class 9 trucks!
Hurley WIM Project Summary

- Enforcement
- Data Collection
- Truck Weight / Bridge Component Strain Correlation
- Real Time Access over Internet
- Historical Data Processing & Reporting
The Weigh to the Future!
Requirements for Success

• Multiuser Seamless Operation
• Timing Critical Event Delivery
• Powerful Multitasking Capabilities
• XML Open Architecture
• Network Ready
Thank You

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