



INDOT Research

# TECHNICAL *Summary*

Technology Transfer and Project Implementation Information

TRB Subject Code 53-9 Weigh-In-Motion  
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Final Report

## VIRTUAL WEIGH STATION

### Introduction

Overweight trucks shorten highway life and indirectly increase the costs of maintaining roads. A study for the Oregon Department of Transportation reported that a significant relationship exists between the rate of weight violations and a commercial carrier's accident rate. Improvement in methods for enforcement of commercial vehicle weight laws may increase the number of overweight vehicles caught, thereby prolonging highway life. Improved enforcement may also reduce the number of illegally operating vehicles.

In Indiana, officers of the Commercial Vehicle Enforcement Division carry out enforcement of laws regarding trucks. Officers from this branch of the Indiana State Police regulate any commercial vehicle weighing greater than 10,000 lbs. The two primary methods used to check that vehicles are in compliance with weight limit statutes and regulations are "Port-of-Entry" static scales and portable scale units.

As a truck approaches a static "Port-of-Entry" scale on the highway, the operator

is first directed whether the scale is "open" or "closed". If the scale is "closed" (not in operation), the vehicle may proceed on the highway, uninterrupted. If the scale is "open", then the truck enters the scale via an exit ramp and is weighed. Because the Port-of-Entry permanent scales are located near Indiana's borders with other states, Indiana State Police deploy 46 portable scales to check the weights of vehicles in the interior of the state. Portable scale units are patrol cars usually equipped with four Haenni WL101 Wheel Load Scales.

While the portable scale measurements are accurate for the issuing of citations, officers must rely upon their own experience and intuition when choosing which vehicles to weigh. Because of the subjective nature of the current screening process, many legally loaded vehicles are weighed. More importantly, many overweight vehicles are not weighed because they do not usually exhibit characteristics that make it possible to identify them as being overweight.

### Findings

The concept of using existing INDOT Weigh-In-Motion equipment, a laptop computer, and wireless communication equipment, to develop a virtual weigh station system was proposed

for deployment in Indiana in 1998. The Virtual Weigh Station screening tool developed in this project allows officers to read the weights of vehicles crossing WIM scales, in real time, in their patrol cars.

Giving officers this information increases the chances that the vehicles selected for weighing on portable scales are indeed overweight. This report documents the

accuracy and precision evaluation performed on all the candidate WIM sites as well as the new infrastructure required to implement the Virtual Weigh Station concept.

## Implementation

The report describes several cases where significantly overweight vehicles were identified and impounded. For example the procedures described in this report, resulted in the identifying the early morning hours as the best time for enforcement in Merrillville. As a result, on May 18, 2001 vehicles weighing 98,700 lbs and 100,600 lbs were stopped. Those vehicles were impounded and resulted in fines of \$1,625.00 and \$1,735.50, respectively. In February 2002, Commercial Vehicle Enforcement officers stopped ten trucks on US 24 near Fort Wayne using the virtual weigh station. Eight of the trucks

were determined to be overweight and fined. The three heaviest trucks weighed 90,200 lbs, 90,900 lbs, and 91,100 lbs resulting in fines of \$1,099.50, \$1,169.50, and \$1,189.50, respectively. On April 12, 2002, another enforcement was conducted on I-65 near Merrillville. Three trucks were stopped based on the virtual weigh station data. One of the trucks weighed 87,400 lbs, resulting in a \$529.50 fine.

The report concludes by making several recommendations designed to improve the quality of the WIM data and facilitate wide spread deployment by the Commercial Vehicle Enforcement Division.

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