

## Truck Weight Enforcement and Evasion

### Introduction

Intelligent Transportation System (ITS) technologies have provided a means for states to maintain enforcement of commercial vehicle regulations in the face of rapid increases in the volume of truck traffic. Weight enforcement programs in a majority of states now employ weigh-in-motion (WIM) technology to screen potentially overweight vehicles and thereby reduce queues at weigh stations. Pre-clearance systems provide more comprehensive data recovery, resulting in near-automation of weigh station operations. The implementation of these technologies has facilitated an expansion of enforcement activity that is cost effective for both states and motor carriers.

In some instances automated preclearance systems are presently being installed that do not include a WIM component, thus allowing trucks to bypass weigh stations without actually being weighed. The argument for excluding WIM capability from preclearance systems is that the incidence of weight violations is very small. For example, weight enforcement data reported to the Federal Highway Administration (FHWA) indicate that less than one percent of the vehicles weighed are cited for a weight violation.

Eliminating WIM from preclearance programs on the basis of the low reported incidence of weight violations is questionable for several reasons. First, some believe that evasion of weigh stations is extensive and that the true incidence of overloading is much greater than the weight citation data indicates. Second, it is argued that the existence of weight enforcement activity

acts to deter overloading, and that eliminating this deterrence would lead to heavier loads.

ODOT Research Group and Portland State University cooperated on a study to investigate the above mentioned concerns regarding evasion and enforcement effects. This summary of the study results is excerpted from a draft of the PSU report.

### Methods

The controlled experiment involved an extended closure of a weigh station located on northbound (NB) I-5 at Woodburn, Oregon. Weight and vehicle count data were recovered from WIM scales in the traffic lanes on I-5 at the site, as well as from newly installed WIM scales on two potential evasion routes. Data were collected before, during, and after the 70-day closure period allowing for analysis of changes in truck volumes on I-5 and the evasion routes, as well as changes in vehicle weights and the proportion of vehicles exceeding weight limits.

### Findings and Discussion

The incidence of overweight vehicles crossing the WIM scales on I-5 increased from 2.27% before closure to 3.67% during closure, a gain of 61%. After the scale was re-opened the incidence of overweight vehicles declined to 3.19%, a reduction of 13%. All of these changes

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are statistically significant at the 95% confidence level.

Data from the I-5 WIM scale identified participants in ODOT's Green Light pre-clearance program. Although the incidence of overloading was greater for non-Green Light participants than for Green Light participants in all phases of the study, the difference was statistically significant only during the closure period. Green Light program participants were less likely to overload during scale closure than non-participant vehicles.

There are several possible explanations for the relatively modest shift in the incidence of overloading observed in this study. First, state-by-state weight enforcement data submitted to FHWA indicate that Oregon has pursued weight enforcement more aggressively than other states, with relatively more weighings and relatively stiffer fines for overweight violations. In such an enforcement climate, a temporary suspension of weighing activity could be expected to yield less of a change in overloading practices.

Second, the effect of the Green Light program on compliance deserves consideration. It may be that self-selection effects have resulted in a greater likelihood of the more compliance-inclined motor carriers choosing to participate in the program. Alternatively, program participants who see a time saving may be less inclined to jeopardize such benefits by engaging in overloading. Both of these interpretations may be relevant, given observations on the relative incidence of overloading by Green Light program vehicles before, during and after scale closure.

Third, it should be recognized that I-5 serves as the major West Coast freight corridor. For interstate and international shipments, weight enforcement will be encountered at a number of locations en route. The suspension of weighing activity at a single location can be expected to yield less of a response when it is known that enforcement activity continues to be maintained elsewhere along the corridor.

In response to the question of evasion patterns in the I-5 corridor, the evidence does not suggest a tendency toward diversion from I-5 to the bypass routes. Truck counts and weights on Ehlen Road and Highway 51 failed to indicate either evasive behavior or major diversion from the bypass routes to I-5 during or after the closure period. Seasonal variations in truck traffic in this agricultural setting may be the major influence affecting traffic patterns on these routes.

### Conclusions

Removal of weight enforcement in this section of I-5 resulted in an increase in the incidence of overweight vehicles as reported by the mainline WIM scales. Reinstatement of enforcement brought about a drop in overweight vehicles. Weight enforcement does appear to decrease overweight vehicle operations in this situation.

No conclusive changes in truck volumes or weights consistent with weight enforcement evasion were found on the bypass routes monitored in this study. Evasion of the weigh station by overweight vehicles appears to be quite small at this particular location.