

LEVEL 2
TRAFFIC
COLLECTION
REPORT

**Truck Traffic Count
Summary Report**
OCTOBER 2015

Prepared for:
Rhode Island Department of
Transportation



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Truck Traffic Count Summary Report

Executive Summary

This Level 2 Traffic and Revenue Study is analyzing potential bridge tolling options in Rhode Island. As part of the study, extensive vehicle classification counts have been conducted, along with license plate imaging surveys to provide an improved, and updated, basis for analysis. This report summarizes the results of the counts at 18 locations along interstate routes and other freeways in Rhode Island. It also discusses the video surveys and the distribution of heavy truck traffic by state of registration.

CDM Smith's data collection results indicate that truck volumes (FHWA Class 8 and above) are, in total, 27 percent higher than the raw volumes developed by RIDOT for their initial assessment for the Rhode Works Program. In addition, RIDOT applied a 20% contingency to the raw counts, resulting in an even more conservative initial assessment as compared with CDM Smith's data collection results. This refinement of our study data base can be attributed to the improved technologies used by CDM Smith and the fact that we have essentially tripled the number of sampling locations. The end result is that RIDOT's original assessment with the 20% contingency proved to be rather conservative.

CDM Smith's assessment also indicates that the truck volumes are more balanced across the locations than RIDOT's initial assessments. The license plate data collected provided state of registration and frequency of use information. It shows that that, after recognizing planned discounts for trips made more than once per day, approximately 60 percent of truck tolls would be charged to out of state registered trucks, while about 40 percent would be Rhode Island.

Truck Classification Counts

Trucks of FHWA Class 8 and above (trailers and tandems) were counted as part of the study effort using advanced radar detection and traditional tube counts at various locations across the state conducted by our subconsultant The Traffic Group, Baltimore, Maryland (TTG). The counts were conducted over the 48-hour period from the evening of August 17 through the evening of August 19 in both directions. The video imaging data collection (for license plate capture) was collected during daylight hours on August 18.

A corridor level summary of truck counts is presented in Table 1. The new counts are compared with the prior RIDOT counts, both before and after the 20 percent contingency was applied in the preliminary assessments made by RIDOT.

Overall, traffic volumes are an estimated 27 percent higher under the current "Level 2" Study. This is due to the additional information provided by the counts from TTG and the review of additional RVD data from relevant locations across the state. The initial June 2015 "Level 1" Assessment estimates were developed based on volumes collected at 6 locations using RIDOT's existing Radar Vehicle Detector (RVD) equipment, which is primarily intended to collect vehicle speed information (classification counts by RVD are simply a by-product and not as accurate as actual classification counts using enhanced radar equipment). CDM Smith supplemented these counts in the "Level 2" Study by reviewing additional RVD locations within the corridors and by

requesting our subconsultant TTG to conduct additional counts using specialized collection equipment at key locations throughout the state.

**Table 1
Comparison of Prior and Current Estimates of Average Daily Truck (Class 8+) Volumes**

Corridor	Number of Locations	RIDOT Assessment ⁽¹⁾ JUNE 2015		RIDOT Assessment ⁽¹⁾ JUNE 2015		CDM Smith ⁽²⁾ OCTOBER 2015	
		Avg. Daily Trucks without Contingency		Avg. Daily Trucks with 20% contingency		Avg. Daily Trucks	
		Per Corridor	Total	Per Corridor	Total	Per Corridor	Total
I-95: CT S/L to I-295	3	2,395	7,185	1,916	5,748	4,659	13,976
I-95: I-295 to MA S/L	4	2,966	11,864	2,373	9,492	4,888	19,550
I-295	4	1,703	6,812	1,362	5,448	2,090	8,360
I-195	1	11,532	11,532	9,226	9,226	4,928	4,928
RI 146	3	620	1,860	496	1,488	1,547	4,642
RI 6 / RI 10 Corridor	1	1,135	1,135	908	908	693	693
RI 6 / RI 10 Interchange	1	1,703	1,703	1,362	1,362	1,540	1,540
Total	17	2,476	42,091	1,981	33,672	3,158	53,689

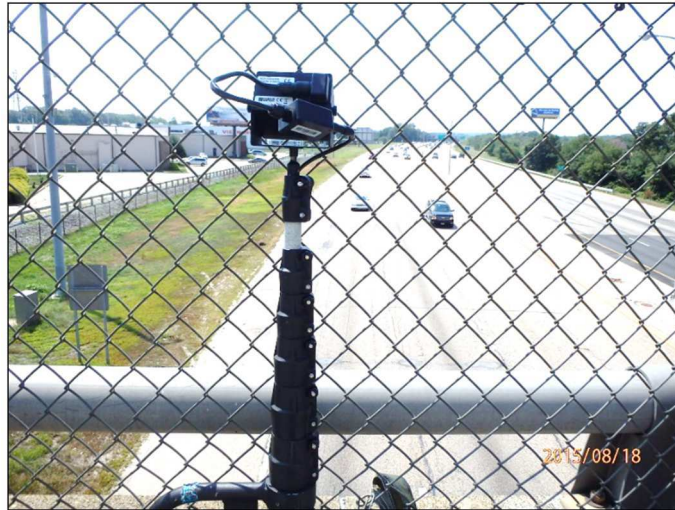
⁽¹⁾ Average Daily Trucks based on 2014 WIM and RVD Data.
⁽²⁾ Average Daily Trucks estimated based on traffic counts conducted August 2015 and 2014 RVD Data.

As shown in the table, the truck counts included in the current “Level 2” Study are higher than those of the June 2015 “Level 1” Assessment. Under the current “Level 2” Study, truck counts on the I-95, I-295 and RI 146 corridors increase by an average of 75 percent, 22 percent and 150 percent, respectively. Trucks counts on the I-195 corridor are, however, significantly lower. The volumes on I-195 were 11,532 on average under the June 2015 “Level 1” Assessment, as compared to the 4,928 counted under the current “Level 2” Study. This is due to the use of additional count data collected by TTG and the use of additional data from the nearby RVD locations. The resulting truck volume of 4,928 is more consistent with the volumes on the I-95 corridor, which average roughly 4,700 trucks, than the count included the June estimate.

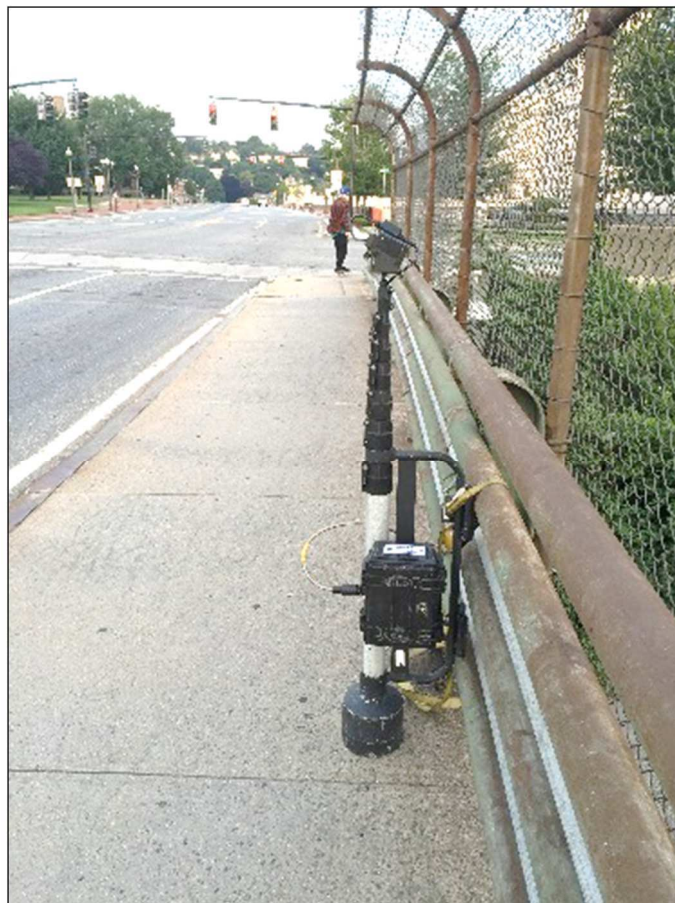
License Plate Survey

As part of the data collection effort, a license plate survey was conducted that provided estimates of the distribution of Rhode Island vs. out-of-state vehicles. This distribution was based on video imaging surveys of heavy trucks conducted by TTG on August 18, 2015. TTG placed about 50 Miovision “Scout” Automatic License Plate Recognition (ALPR) cameras on overpasses and side-fire positions at several different locations along the state’s freeway system. These cameras are special-purpose cameras which are specifically designed to capture license plate images at high speeds in all types of traffic conditions. Figure 1 provides photos of the Miovision cameras in action during the surveys in Rhode Island.

Basically, ALPR is the capture, interpretation, and recording of a vehicle’s license plate. The process begins when a vehicle crosses into the field of view of the specialized camera. In order to capture trucks and not their trailers the cameras were set to collect the front license plates of the tractor trailer. Most locations were operated during daylight hours, although five of the locations also captured plate data at night. Night capture relied on a pulsed array of Light Emitting Diodes (LED) for target illumination of vehicle license plates based on the license plate’s surface reflectivity. The integrated illuminator camera device is essentially a highly sensitive, zoom capable digital camera surrounded by hundreds of small infra-red light LEDs.



Cameras Mounted Over I-95 in Providence



Miovision Scout ALPR Camera

**VIDEO IMAGING EQUIPMENT
USED IN TRUCK PLATE SURVEY**

States of Registration

The license plate surveys captured plates of thousands of heavy trucks (FHWA class 8 and above). These were identified through optical character recognition, and manually reviewed and verified for accuracy. Data collected at the different locations were then “matched” to develop estimates of heavy truck travel patterns in the state for use in the Level 2 traffic and revenue analysis. Records were kept of the state of vehicle registration and the number of times the same plate was interpreted at each individual location. This data is used in estimating the potential revenue impact of the proposed multiple trip discount program.

Table 2 provides a summary of the distribution of trucks by state, at all imaging locations combined. Before adjusting for any possible multiple trip discounts, the survey found that just under 52 percent of trucks observed during the day were registered outside Rhode Island. As might be expected, this increased to over 63 percent during the overnight hours. Over a full 24-hour period, at all locations combined, about 45 percent of all trucks were from Rhode Island, while about 55 percent were from out of state.

Table 2 also illustrates distribution of Rhode Island versus out of state plates under two scenarios; unadjusted for multi-trip discount and adjusted for multi-trip count. Since the proposed tolling program will not charge for trips by the same truck passing through the same toll location in the same direction more than once per day, it is possible to adjust for the effect of multiple trip discounting. This more accurately reflects the Rhode Island share as a percent of potential toll transactions charged. After adjusting for the multi-trip discounts, about 60 percent of truck tolls would be charged to out of state trucks, while about 40 percent would be Rhode Island.

Table 2
Summary of Truck Plate Distribution
August 18, 2015 Plate Imaging Survey

State of Registration	Observed Truck Plates		
	Daytime	Night	Total Day
<u>Before Adjusting for Multi-Trip Discount</u>			
Rhode Island Percent	48.2%	36.5%	44.7%
Out-of-State Percent	51.8%	63.5%	55.3%
<u>After Adjusting for Multi-Trip Discount</u>			
Rhode Island Percent	43.7%	31.0%	39.8%
Out-of-State Percent	56.3%	69.0%	60.2%

