

Florida Department of Transportation Research Commercial Vehicle Inspection: Virtual Weigh-in-Motion BD441 (10/07)

The Florida Department of Transportation is responsible for enforcing state and federal regulations governing commercial truck freight carriers in Florida. Regulating commercial truck weight and size is a major concern because overweight and oversize trucks are likely to be in violation of other safety regulations. They also cause excessive wear to roadway pavement and bridges.

Unfortunately, the traditional commercial vehicle enforcement procedure which requires trucks to leave the highway to enter weigh stations has many drawbacks. The carriers lose

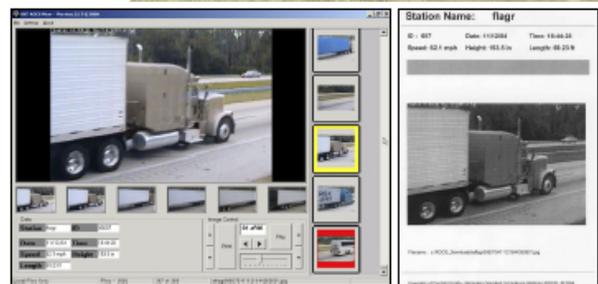


Entrance lane Flagler Weigh Station

time waiting in line and the concentration of idling trucks contributes to air pollution. Where new stations are needed, purchasing the right of way on which to build them, especially near urban areas, can be prohibitively costly (budget restraints already limit station operating times). Finally, trucks can simply bypass the stations. More recent weigh-in-motion stations provide drive-through facilities that speed up the process, but they address neither the carriers who bypass the stations nor the land requirement.

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FDOT wanted to test the possibility of using new technologies to create automated virtual weigh stations that would be more efficient and cost effective, and harder to evade. Researchers created and installed two prototype virtual stations on major highway right-of-ways near existing weigh stations. They incorporated cameras and several infrared, laser, and ultrasonic scanning technologies. The system captured and transmitted to the nearby weigh stations images and data about vehicle brake function, size, classification, speed, and direction of travel.



Commercial Vehicle Remote Operated Compliance Station (top) and CVRC output (bottom).

The researchers tested the prototypes under actual conditions and demonstrated that virtual stations can capture and send data and images to computers at any location, including motor carrier enforcement vehicles. The virtual weigh station system has the potential to be an effective, relatively low-cost method of enforcing carrier compliance. The researchers have created an on-line database that details the technologies investigated in this study.