

# *ROVER: Prototype Roving Verification Van*



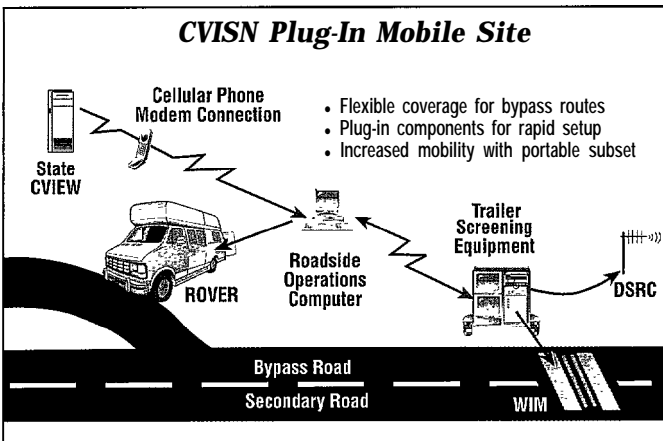
## *Transportation Project Summary*

- PURPOSE:** To verify the safety and legality of commercial vehicles at both fixed and mobile roadside sites, improving the efficiency, safety, and effectiveness of commercial vehicle operations through the use of timely, accurate electronic clearance information.
- PROBLEM:** Enforcement of commercial vehicle safety and administrative regulations is constrained by limited personnel resources and the lack of available information. Vehicles that do not routinely pass by fixed weigh stations may never be checked. With better screening, scarce resources could be better focused on unsafe and/or illegal carriers and drivers.
- DESCRIPTION:** Develop a portable electronic system to effectively and efficiently verify safe and legal vehicles, allowing them to pass check points at mainline speeds instead of pulling off for roadside checks. Demonstrate prototype system in specially equipped van operating from roadside locations or weigh stations.
- CLIENT:** Federal Highway Administration.

## Electronic Screening

Commercial vehicle operations (CVO) on the nation's roadways is a key element of intelligent transportation systems (ITS). The Commercial Vehicle Information Systems and Networks (CVISN) architecture, which provides the technical framework for implementing CVO information systems, is being defined by The Johns Hopkins University Applied Physics Laboratory (APL). Electronic screening of commercial vehicles is one ITS user service addressed by that architecture.

The purpose of electronic screening is to sort out safe and legal carriers, vehicles, and drivers for bypass at both fixed and mobile sites so that enforcement resources can



be directed at higher-risk vehicles. The system envisioned will provide safety and credentials data at the roadside to support electronic screening and inspection selection, and will enable vehicle-to-roadside communications and a "weigh-in-motion" (WIM) capability to implement the electronic screening. Oversized, overweight, improperly registered, or tax-delinquent vehicles will be identified. Carriers with poor safety records would also be identified. Higher-risk operators would then be subjected to closer inspection. A critical part of electronic screening is timely, accurate electronic information for screening checks.

## Operational Environment

Electronic screening can be conducted from fixed sites, mobile roadside sites, or moving enforcement vehicles. Screening can be performed at mainline speeds well in advance of the mobile or fixed site, or it can be conducted at slower speeds on an exit ramp or pull-out area. Some sites may have dedicated short-range communications (DSRC) systems and license plate readers. Fixed sites may be equipped with a static scale and WIM device. Automatic vehicle classification (AVC) systems will perform size and length checks. Mobile enforcement

units can be equipped with various combinations of DSRC, WIM, and AVC systems. Commercial vehicles that employ the DSRC transponders can receive clearance notification via an in-cab device.

## Prototype Roving Verification Van (ROVER)

APL's ROVER is a prototype fully-portable roadside electronic screening and safety inspection system. The unit is equipped with a DSRC reader, allowing it to interface with vehicle transponders. Identification data about approaching vehicles are then available to ROVER, in addition to vehicle weights and measurement data obtained from roadway sensor WIM and AVC equipment. These physical descriptive and identification data, gathered from the moving vehicle, are then combined with credentials and safety information stored in ROVER's computers. The results from electronic screening can be communicated to the vehicle's driver via a transponder interface inside the cab. Vehicles can be directed to pass the checkpoint or pull in for closer checks. A portable license plate reader can provide an alternate means to capture identifying information for a vehicle directed to pull in before it stops by capturing a video image of its license plate number and converting it to digital form. Vehicles that are directed to pull in can then be weighed on the state scale and perhaps subjected to a safety inspection. A pen-based unit can be used to automate the safety inspection. Vehicles configured like ROVER could be used in an area where violations are known or suspected to occur, such as a road that allows vehicles to avoid a fixed checkpoint.

Using many commercial off-the-shelf components, ROVER is designed as a prototype to demonstrate the CVISN approach to electronic screening at both fixed and mobile sites. The lessons learned from ROVER are being made available to state enforcement agencies to aid in eventual nationwide deployment of electronic screening systems.

For more information, contact:

**Karen S. Smith**

Project Manager

(301) 953-6000 x8747 (410) 792-6000x8747

**Dennis L. Kershner**

Director

Transportation Program Development Office

(301) 953-6512 (410) 792-6512

The Johns Hopkins University  
Applied Physics Laboratory  
Johns Hopkins Road  
Laurel, Maryland 20723-6099