2.0. SMART CORRIDOR TRANSPORTATION PROJECTS

2.1. NEAR-TERM VEHICLE INSPECTION STATION ON SOUTHBOUND NORTHWAY

2.1.1. INTRODUCTION

The concept discussed in this section – Near-Term Vehicle Inspection Station on SB Northway – is a first step in the long-term aim of NYSDOT to perform credentialing, safety and weight screening at a dedicated facility located at the Canadian border. Although NYSDOT has plans to develop such a facility immediately south of the Port of Excellence, that facility will take a number of years to design and construct. As such, an interim facility is being proposed to partially meet the State’s need for such an inspection facility.

The proposed project will enhance the State’s capabilities to perform efficient commercial vehicle operator and equipment checks, as well as facilitate enforcement policies through the implementation and deployment of a broader range of electronic screening methods at the existing southbound High Peaks Rest Area. These methods will include weigh-in-motion (WIM) and electronic-credentialing systems, as well as similar equipment on a “bypass route” (US Route 9), as truckers often take such routes to drive around inspection sites. This type of enhanced freight management systems is fully consistent with the Smart Freight, Smart/Safe Traveler and Smart Highway goals of the Corridor Strategic Plan.

2.1.2. PROJECT DESCRIPTION

The project being proposed under this initiative is the deployment of New York’s first fully operational in-field permanent Commercial Vehicle Information Systems and Networks (CVISN) electronic screening system. The system would be deployed and operated at the I-87 southbound High Peaks Rest Area located between Exits 30 and 31 in Essex County, the location of which is shown in Figure 2.1-1. The electronic screening system would incorporate a combination of WIM, in-vehicle transponder and database technology for the purposes of electronically screening commercial vehicles prior to entering the rest area. To complement the roadside (rest area) inspection capabilities, the project will also include the deployment and operation of a “virtual WIM” installation along US Route 9. The “virtual WIM” station will monitor trucks attempting to bypass the High Peaks commercial vehicle inspection facility on the Northway.

2.1.2.1. Existing Conditions and Deficiencies

Commercial vehicle inspections conducted within New York State follow a standardized and tiered protocol recognized by the Federal Motor Carrier Safety Administration (FMCSA) and the national Commercial Vehicle Safety Alliance (CVSA). CVSA is an organization composed of federal, state, and provincial government agencies and representatives from private industry in the United States, Canada and Mexico, all dedicated to improving commercial vehicle safety. The inspection protocols are designated by levels based on the intensity and comprehensiveness of the inspections performed; i.e.:

- **Level 1** - the highest level of inspection; involving a comprehensive inspection of the vehicle and its operator’s credentials and records;
- **Level 2** involves a comprehensive evaluation of the operator with a “walk around” inspection of the vehicle;
FIGURE 2.1-1: LOCATION OF PROPOSED PROJECT

Near-Term Vehicle Inspection Station on Southbound Northway

Parsons-Clough Harbour
Level 3 is limited to a comprehensive evaluation of the operator only;
Level 4 is dedicated to special studies of the equipment (i.e. air brake checks); and
Level 5 is a detailed periodic vehicle inspection.

Since the events of September 11, 2001 and the corresponding enactment of the Federal Patriot Act, the emphasis on commercial vehicle security and safety has been a priority at the highest levels throughout all Federal and State transportation and public safety agencies. As such, there has been increasing demand placed on the commercial vehicle inspection staffs, with an increased focus on the truck operator and the security of the cargo. The number of Level 2 and Level 3 inspections, which place more emphasis on the truck driver, has doubled on New York State highways over the past two years. The largest single jump has been in the Level 2 inspections; 10 times as many Level 2 inspections are being conducted now, as were being conducted pre-September 11, 2001.

To conduct those commercial vehicle inspections, NYSDOT Passenger and Freight Safety Division and the NY State Police’s Commercial Vehicle Enforcement (CVE) Unit, work cooperatively with nearly 150 inspectors at approximately 115 sites throughout the State. On any given day, 15 to 20 roadside inspections sites across the State are staffed and operational.

Recognizing that our nation’s most vulnerable points for breaches in homeland security are at our borders and entry points, there has been an increased focus and priority on New York’s primary Interstate trade corridors providing access to and from Canada, including I-87.

Despite the number of active inspection sites, only a very small percentage of commercial vehicles can actually be inspected due to the limited number of personnel and resources. As an inspection site’s physical or staffed capacity is reached, two types of events can occur: (1) vehicles may be able to bypass the inspection procedure or (2) backups of commercial vehicles waiting for inspection processing queue onto the highway’s traffic lanes. Either scenario reduces the effectiveness of the inspection process and results in public safety concerns.

Another issue impacting the effectiveness of inspection sites is vehicle bypass. Most interstate highways have alternate routes running roughly parallel to them in close proximity. Many of these parallel non-Interstate routes are easily accessible and readily available to commercial vehicles. It is a common occurrence that once an inspection site is activated, the volume of commercial vehicles approaching the inspection location drops within minutes. Commercial vehicle drivers communicate the location of active inspection sites to other drivers, who may choose to bypass them to avoid delays or to avoid violations.

Simply increasing the capacity or number of inspection sites, for the purpose of expanding the traditional manner of inspecting vehicles and drivers, would have the undesirable effect of delaying the flow of commercial goods through the corridor. Using traditionally labor-intensive methods of physically inspecting every vehicle at each inspection site would improve highway safety, but at an unrealistically high economic cost. Deploying and utilizing CVISN electronic screening along with “virtual WIM” systems can greatly increase the efficiency, accuracy, and productivity of existing inspection sites at relatively low costs. Currently, there are no electronic screening facilities available in the I-87 corridor.
2.1.2.2. Existing Actions and Programs

The increased demand for commercial vehicle inspections has put a strain on the State resources assigned to conduct commercial vehicle inspections. In an effort to maximize the effectiveness of the limited number of personnel assigned to carry out these necessary inspections, New York State has implemented the first level of the CVISN program.

The overall CVISN Initiative began in 1996 with two "prototype" states -- Maryland and Virginia -- and eight "pilot" states: California, Colorado, Connecticut, Kentucky, Michigan, Minnesota, Oregon, and Washington. The main purpose of the initiative was to demonstrate the feasibility, costs, and benefits of using Intelligent Transportation System (ITS) systems to support Commercial Vehicle Operations (CVOs). The FMCSA manages this initiative.

An initial goal of the CVISN initiative is to have every state reach a Level 1 deployment. To accomplish Level 1 deployment, states must¹:

- Establish an organizational framework among state agencies and motor carriers for cooperative system development
- Create a state CVISN System Design that conforms to the CVISN architecture and can evolve to include new technology and capabilities
- Implement specific capabilities in the following three areas:
  - **Safety Information Exchange**: Facilitate the collection, distribution and retrieval of motor carrier safety information at the roadside.
  - **Electronic Screening**: Allow commercial vehicles that maintain good safety and legal status to bypass roadside inspection and weigh stations.
  - **Electronic Credentialing**: Assist in the areas of electronic submission, processing, approval, invoicing, payment, issuance of credentials, electronic tax filing and auditing, and participation in clearinghouses for electronic accounting and distribution of registration fee payments among states.

Through the use of electronic screening, electronic credentialing, and the exchange of safety information, state and Federal enforcement agencies and personnel can focus more attention on high risk (unsafe and non-compliant) carriers and drivers.

In response to the CVISN initiation, NYSDOT and the Departments of Motor Vehicles and Taxation and Finance established the One-Stop Credentialing and Registration (OSCAR) System for on-line truck and bus registration and credentialing. The OSCAR web-based program is a user-friendly system to enable motor carriers to apply on-line and at one time for four essential credentials necessary to operate legally in New York State. The four credentials are (1) international registration for the Department of Motor Vehicles; (2) highway use tax and (3) international fuel tax for the Department of Tax and Finance; and (4) state registration for the Department of Transportation. OSCAR complies with the electronic credentials administration part of the CVISN program.

New York State completed CVISN Level 1 Compliance in September 2003 with the rollout of OSCAR and the successful in-field demonstration of a mobile commercial electronic screening 

¹ Evaluation of the CCVISN Model Deployment Initiative. Federal Motor Carrier Safety Administration (FMCSA), 2002
system (NORPASS) on the westbound side of I-90 at the Schodack rest area in Rensselaer County.

2.1.3. PROPOSED SOLUTION

2.1.3.1. System Overview

The proposed solution involves the construction of the infrastructure and deployment of the equipment to develop a CVISN-compliant CVO electronic screening system at the southbound High Peaks rest area, located between Exits 31 and 30 in Essex County (see Figure 2.1-1). The proposed system would use a combination of WIM and in-vehicle transponders, to evaluate a variety of credentials or information particular to a specific commercial vehicle. All of the system components would be connected through a CVO database so that the necessary checks could be made immediately prior to entering an inspection site.

The transponders proposed are similar to E-ZPass transponders, and can be used for both electronic screening and toll collection. As commercial vehicles approach an inspection site, they are automatically weighed within the traffic lane while traveling at highway speeds. This is done as the vehicle crosses over a weighing device embedded in the pavement. At the same time and location, an in-vehicle transponder (specific to that truck) is simultaneously read by roadside equipment. The weight and transponder identification tag (ID) are then sent to a computer located at the inspection site.

The transponder ID is compared against a database of tax, safety and vehicle information records. If there are problems with any of these records for the particular vehicle, or if the vehicle weight is not in compliance with acceptable weight limits, the vehicle is identified for pull-in to the inspection facility. As the vehicle continues towards the inspection site, its in-vehicle transponder is read again. If it has been marked for pull-in, a message is automatically sent to the truck’s transponder, signaling the driver to enter the inspection site. If the vehicle records and vehicle weight are determined to be acceptable as it passes through the electronic screening devices, then the transponder is provided with a signal indicating that the vehicle may bypass the inspection site.

NYSDOT and the NYS Police currently use the I-87 southbound High Peaks rest area as a commercial vehicle inspection site. The current conditions of this rest area, which was recently reconstructed and modernized by NYSDOT, offers the necessary accommodations to support the portable “roving” types of inspections conducted by...
NYSDOT and the NY State Police. These accommodations include ample truck parking for inspections, vehicle staging and detention, and rest rooms and designated office space for use by inspection personnel. The proposed project would use these accommodations for the set-up and deployment of the proposed electronic screening equipment.

The CVISN electronic screening system will be based on the Model “Mainline Automated Clearance System” (MACS) screening software developed by the State of Kentucky and adopted by New York State. The WIM device and transponder readers, which are integral to the electronic screening system, must be compatible with Model MACS software.

2.1.3.2. System Components

Figure 2.1-2 indicates schematically the approximate location of the various system components. This project will establish an electronic screening system in the southbound direction of I-87 slightly north of the High Peaks rest area. Two variable message signs (VMSs) will be placed along the southbound roadside well in advance (north) of the rest area to clearly instruct commercial vehicle drivers that an active inspection is ahead. These signs will be located sufficiently upstream of the screening equipment to allow ample time for drivers to understand the message. A third VMS will be located in advance of the exit ramp leading to the rest area, providing final directives to drivers as they approach the inspection site. All messaging will provide bi-lingual (English/French) text messaging at a minimum.

Since the events of September 11, 2001, US Customs and Border Protection (CPB) has increased the frequency and visibility of immigration checks being conducted on I-87 southbound traffic. Currently, CPB conducts routine and random immigration checks of southbound vehicles on the highway immediately upstream of the High Peaks Rest Area. These checks are performed by manually stopping all traffic in the southbound direction (two lanes) and allowing CPB personnel to conduct individual vehicle screenings and occupant questioning in a “stop and go” manner. Vehicles that are selected for additional questioning or inspection are directed by CPB personnel to exit into the High Peaks Rest Area for further processing.

In order to ensure the safety of both the traveling public and enforcement agency personnel, and to make any vehicle or occupant inspection as efficient as possible, coordination between all involved agencies (e.g., NYSDOT, NYS Police, CPB, and local enforcement or emergency response agencies) is paramount to the success and effectiveness of these programs. Depending upon the nature and time of either type (commercial vehicle or random immigration) of inspection, the traffic safety and operational logistics of I-87 and the rest area would need to be thoroughly understood and addressed as part of standard operating protocol.

The screening system will consist of three transponder readers and antennas constructed along the roadside edge of the I-87 southbound mainline north of the rest area deceleration ramp and one portable roadside computer in the rest area for data processing and information distribution.

- Starting upstream from the rest area, the first series of roadside/roadway devices is the transponder detection (or advance) reader and the embedded WIM device. This advance reader is located along the roadside and captures the in-vehicle transponder ID of passing vehicles while the WIM devices (at the same location, but embedded in the pavement of each travel lane) records the vehicle’s weight and axle configuration to enable the synchronization of the weight data with the transponder ID.
• The next roadside device is the **transponder notification reader**, which receives and stores pull-in/bypass messages from the Roadside Operating Computer (ROC) for each transponder ID (the ROC is located within the rest area property). As the commercial vehicle passes the notification reader, it sends a signal to the in-vehicle transponder, which in turn notifies the vehicle operator of acceptance or rejection. Acceptance or rejection is based upon an electronic query of the commercial vehicle's credentials through the ROC, which accesses the comprehensive registration database.

• The third roadside transponder reader is a **compliance reader**. The compliance reader monitors the transponder IDs of vehicles that have bypassed the rest area inspection station. If a vehicle that was issued a rejection or “pull-in” signal passes by the inspection station without proper authorization, then a warning is indicated on the ROC alerting the inspector of the bypassing vehicle.

• Immediately upstream of the compliance reader, an optional truck detector apparatus may be embedded in the right-most travel lane. This truck detector, which is essentially a loop detector that records and classifies every vehicle that passes over it, would aid in the identification of commercial vehicles without transponders that attempt to bypass the inspection facility. The truck detector is optional because any commercial vehicle that is not equipped with a transponder should be identified by the transponder detection (or advance) reader and directed into the inspection facility prior to reaching the loop detector.

All reader antennas will be pole mounted off the travel lane at a minimum height of 18 feet above the travel lane. Transponder reader units will be self-contained and housed in locking cabinets attached to the roadside antenna poles. In order for the system to be functional, the distance between the notification reader and the entrance ramp, and between the notification reader and the detection reader, will be a minimum of ¼ mile.

Underground conductors will supply electrical power and communications to the VMSs, WIM, and roadside transponder readers. The electrical power and communications sources will come from the High Peaks Rest Area. Communications between the readers and the ROC will be carried across conventional telephone lines. A small, secure, cabinet-type structure at the rest area inspection site will house communications connections, power outlets and sign controllers. When inspections are active the ROC will be connected to the roadside readers through this structure.

### 2.1.3.3. By-Pass Detection System

This project will also include deployment of a “virtual WIM” system. Virtual WIM is a remote weigh-in-motion device typically used to supplement dedicated commercial vehicle inspection sites. These systems are typically located on prominent bypass routes often used by commercial vehicle drivers to avoid conventional inspection sites. As part of this initiative, the “virtual WIM” will be deployed at a discrete location embedded within the southbound travel lane along US Route 9 in close proximity to the High Peaks rest area (see Figure 2.1.2 for a schematic of a possible location for this system). The virtual WIM system would be linked to, and integrated with, the inspection facility at the High Peaks rest area. A commercial vehicle drives over the...
FIGURE 2.1-2: SCHEMATIC DESIGN OF PROPOSED PROJECT

CVIEW Mobile Electronic Screening Process Flow Diagram
WIM, a full color, hi-resolution picture of the truck is captured through the use of high-speed digital photography. If the vehicle is overweight, the picture, along with the weight data, is sent to a computer with a full color display monitor at the inspection site (High Peaks rest area), alerting the inspector. The inspector can then send an enforcement vehicle to intercept the potential violator and escort them to the inspection site.

The roadway placement of the “virtual WIM” must:

- be sufficiently far from the reentry point to I-87, which is Exit 29, to allow for a chase vehicle to intercept any potential violators;
- be suitable for communications with the inspection site and have available power, and
- have sufficient pavement quality to meet the sensor’s specifications to achieve the rated accuracy.

Communication links between the “virtual WIM” site and the rest area may be direct or utilize dial-up or high speed Internet access. Whatever system is used, the link-up must be sufficiently fast to allow time for targeted vehicles to be intercepted. The “virtual WIM” can also store raw weight data, which will be periodically downloaded or stored on removable media to provide a profile of truck weights along that section of highway for other uses by NYSDOT (i.e. maintenance database development and scheduling, vehicle activity profiling, etc.)

2.1.4. **PROJECT IMPLEMENTATION**

The proposed project is a stand-alone project that can be readily implemented with nearly immediate benefits. Although the greatest benefit from the project will be recognized if the “virtual WIM” is deployed and operated as an enforcement tool at the same time as the I-87 mainline equipment, the functionality of the system does allow the deployment and operation of only the mainline equipment independent of the “virtual WIM”. It is intended that the “virtual WIM” station will be deployed as part of this initiative and integrated into the High Peaks Rest Area operations. Its primary purpose in the initial stages of its roll-out will be to assess and evaluate the amount and patterns of evasive or bypass commercial vehicle traffic on US Route 9. During a subsequent phase of this initiative, the “virtual WIM” station can be used as an enforcement means at such time when the NYS Police can provide personnel and vehicles at the High Peaks Rest Area to intercept non-compliant bypass vehicles identified from the “virtual WIM” photography links. This project would serve as an interim solution until a dedicated permanent full-service commercial vehicle inspection facility could be constructed on new location just south of the US/Canada border for interception of all southbound commercial vehicles.

2.1.4.1. **Regulatory, Environmental, and Agency Coordination Issues**

Electronic screening utilizes Dedicated Short Range Communications (DSRC) technology, which currently shares its frequency with other devices such as wireless telephones, electronic toll payment systems and military radio-location systems. Interference from these devices may be a problem at any given site. Also, federal law requires that DSRC applications do not interfere with military uses. DSRC systems require an FCC (Federal Communications Commission) license to operate. However, due to its isolated location, the High Peaks Rest Area should not experience significant interference, or cause sufficient interference to other systems to prevent the FCC from granting a license to operate.
The site is located within the Adirondack Park and coordination with the Adirondack Park Agency will be necessary for the specification and placement of the transponder readers and variable message signs. No other significant environmental issues or impacts are expected.

### 2.1.4.2. Project Costs

The following are the projected costs for the proposed system:

| Near-Term Vehicle Inspection Station on Southbound Northway: Project Implementation Cost |
|-------------------------------|---------------------------------|
| **Element**                   | **Cost**                        |
| Engineering/Design            | $60,000                         |
| Equipment/Materials           | $300,000                        |
| Construction/Installation     | $200,000                        |
| **TOTAL**                     | **$560,000**                    |

As indicated, the projected capital costs for the proposed project would be approximately $560,000, with annual incremental operating costs of approximately $40,000.