2 WHAT IS ELECTRONIC SCREENING?

Screening is a selection mechanism to target high-risk operators and make efficient use of weigh station and inspection resources. **Electronic screening** is the application of technology to make more informed screening decisions. Properly implemented, electronic screening results in improved traffic flow, focuses vehicle inspections and ultimately achieves the goals of increased safety and reduced operating costs. In electronic screening:

- Dedicated Short Range Communications (DSRC) is used to identify the vehicle, store and transfer other screening data, and signal the driver of the pull-in decision.
- Electronic Data Interchange (EDI) may be used to transmit safety and credentials history (snapshot) data from the information infrastructure to the roadside systems to assist in the screening decision.

The application of electronic screening will be affected by many constraints, including site limitations, availability of support staff, and funding. Each roadside check station is likely to have a unique design. Each station's design is unique because of:

- State policy and practices
- Traffic flow, volume, and number of lanes
- Available site space
- Legacy system characteristics
- Existing proprietary solutions
- Vintage of roadside facilities and communications equipment
- Resources available for making changes

2.1 Technologies

There are a variety of technologies that can be applied to electronic screening in support of the commercial vehicle weigh and inspection process. There are also a number of ways in which these technologies can be applied. The purpose of this section is to briefly describe some of the basic technologies used in electronic screening.

2.1.1 Dedicated Short Range Communications (DSRC)

DSRC is used to provide data communications between a moving vehicle and the roadside equipment to support the screening process. This is accomplished by means of a transponder (also known as a "tag") mounted in the cab of the vehicle, and a reader and antenna mounted at the roadside. The tag may contain identifiers specific to the vehicle (carrier and vehicle IDs), plus optional prior screening event information. The transponder has audio and visual indicators which may be used to signal the driver.

The term **Automated Vehicle Identification (AVI)** is often used when referring to DSRC systems. Strictly speaking, AVI is any technology, including DSRC, used to identify vehicles. This category also includes optical, audio, and other RF identification systems.

2.1.2 Weigh In Motion (WIM)

WIM is used to measure approximate axle weights as a vehicle moves across the sensors, and to determine the gross vehicle weight and classification based on the axle weights and spacings. Although not as accurate as a static scale, WIM allows the weight of a vehicle to be estimated for screening purposes, while maintaining traffic flow.

2.1.3 Automatic Vehicle Classification (AVC)

Axle detectors are used to classify the various vehicle types. This information is necessary at WIM-equipped sites because vehicle classification plays a role in the determination of legal weight. AVC units are also used in compliance subsystems to detect vehicles bypassing the station.

2.1.4 Vehicle Tracking Loops

Inductance loops may be used to track vehicle positions as they proceed through the site. This information is required to synchronize lane signaling with the correct vehicles, and to verify compliance with these signals.

2.1.5 Automatic Signing

Lane signals and variable message signs should be automatically controlled by roadside operations and coordinated with the detected location of the vehicle. Precise timing and control of these signals is required in order to ensure that unambiguous direction is given to the intended vehicle. Misdirection, confusion and ambiguity may result if signals intended for one vehicle are visible to and misread by another.

2.2 Data Exchange

A critical component of the CVISN architecture is the standardization of two interfaces: computer-to-computer exchanges using EDI and vehicle-to-roadside exchanges via DSRC. The EDI interfaces are primarily used to transfer information between public (e.g., state government to state government) agencies or between a public agency and private sector entity (e.g., state government to motor carrier).

Another component to standardization of data exchange between state and/or public systems is the use of common data “snapshots.” Snapshots contain information to provide a quick picture of carrier/vehicle/driver safety performance history and basic credentials information. Carrier and vehicle snapshots exchange safety and credentials data between state and national systems. The snapshots are used in conjunction with DSRC messages to support roadside operations as shown in Figure 2-1.

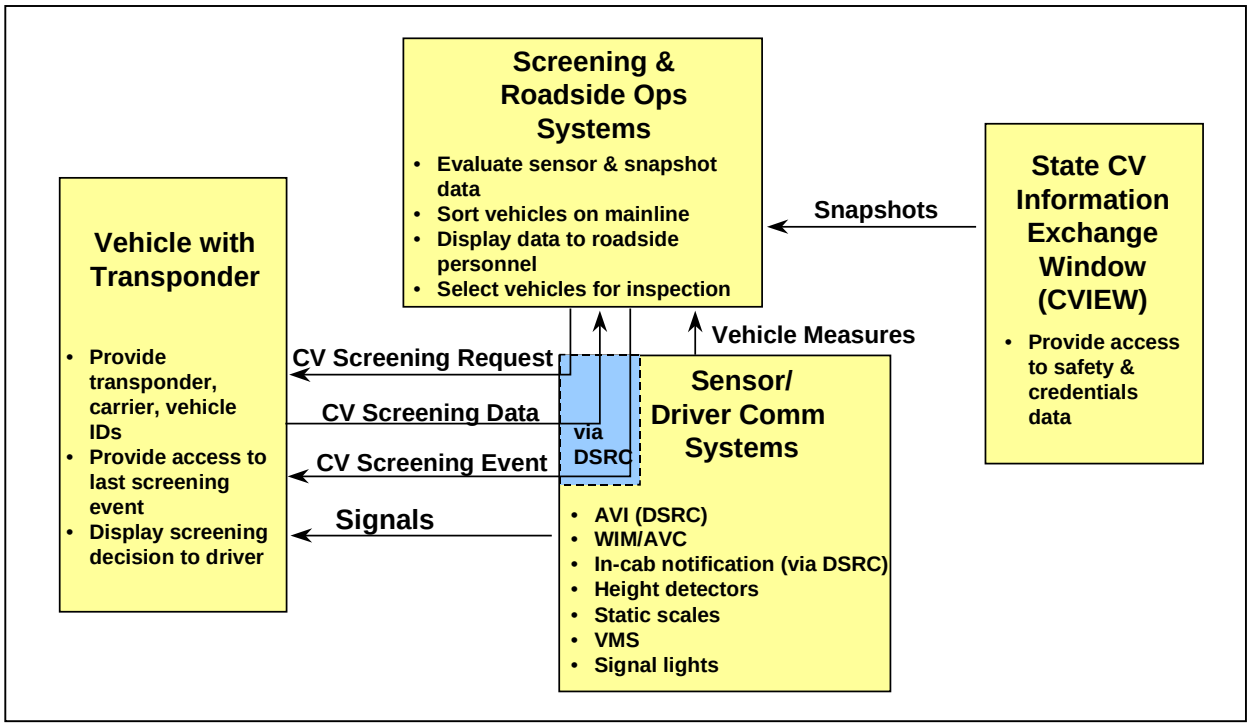

Figure 2–1. Roadside Systems Use Technology to Support Electronic Screening and Inspections

Figure 2-1 shows the data flow between the various systems supporting electronic screening.

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