Smart Cards in Commercial Vehicle Operations Final Report

Executive Summary

The objective of the Smart Cards in Commercial Vehicle Operations (CVO) Project is to give the Federal Highway Administration (FHWA) and other stakeholders in the CVO community the information needed to make the right business decisions regarding the use of smart cards. This information is provided in this document and includes:

- A description of the capabilities of smart cards; Analysis of the uses for smart cards in CVO;
- A plan for the migration of smart cards into current Intelligent Transportation Systems (ITS) initiatives;
- A cost/benefit analysis of several smart card applications; and
- Several pilot implementation plans to aid the migration to this technology.

In addition, this project developed demonstration systems showing the functionality of smart cards in the CVO environment.

This project has been conducted in conjunction with other CVO technology research and coordinated with CVO stakeholders in the public and private sectors. The smart card applications developed and analyzed in this report meet critical needs in ITS designs and enhance the ability of these systems to improve highway safety and increase CVO productivity.

The Smart Cards in CVO Project had its genesis in the House-Senate Conference Report for U.S. Department of Transportation appropriations for fiscal year 1995. Congress stipulated research to "test the feasibility of a smart [card] system to enhance the security and utility of the commercial driver's license [CDL] and enforcement of hours-of-service regulations." In this analysis the term "feasibility" was defined not only as technically possible, but also institutionally viable. Analysis shows that enhancing the CDL is most feasible through use of a smart card for all drivers, not only commercial drivers. However, smart card tracking of hours of service was not found to be institutionally feasible. Although beneficial to law enforcement, smart card tracking of hours of service could be effectively opposed by drivers and carriers at several stages of system implementation.

SMART CARDS

A smart card is a credit card-sized plastic card with an embedded integrated circuit (IC) chip. This IC chip contains a central processing unit (CPU), random access memory, and non-volatile data storage similar to that found in a personal computer. These properties make the smart card a portable database capable of processing, storing, and safeguarding thousands of bytes of data, and a bridge to other databases, allowing communication between disparate computer systems.

Smart cards are currently being tested and used around the world because of their ability to streamline business processes, their ability to be easily updated without reissuance, and their ability to hold and protect a wide variety of information at one time.

PROJECT FINDINGS

According to principles established for all ITS projects, programs must be voluntary and benefits driven. After extensive research, the project team has determined the following are feasible uses for smart cards:

- **Smart Driver's License**- the smart driver's license would look like a traditional driver's license, except that the smart driver's license would include an IC chip which would digitize, store and secure demographic and photographic data in electronic form. The smart driver's license would (1) enhance positive identification by linking the card to the cardholder with a biometric; (2) reduce and prevent fraud by duplicating the printed information in the secure microchip; (3) make the license renewal process

faster, easier, and less expensive by reusing the same card; and (4) allow for electronic certification of automated transactions. Additionally, states could choose to use the remaining space on the card's IC chip to expand the role of the driver's license. This could occur through interagency use of the IC chip for other government programs, such as electronic benefits transfer, library privileges, and hunting or fishing permits. It could foster public-private partnerships in which the state would sell or lease space on the driver's license's IC chip to banks, businesses, universities and other organizations. These benefits would strengthen the current functions of the CDL.

- **Smart Vehicle Card (SVC)**- the SVC would electronically carry the numerous federal, state and local credentials required to operate a truck or bus in interstate commerce, as well as vehicle information, such as maintenance and fuel usage records. Carriers could apply for these credentials online and state agencies would transfer them electronically onto state-provided smart cards at the carrier's office. Overall, the SVC would (1) enhance automation of applications and renewals for commercial vehicle credentials, (2) allow electronic credentials screening efforts which use transponders to send vehicle-specific (and with a smart card driver's license, driver-specific) information to roadside inspectors, and (3) assist carriers in the processing of vehicle information.

- **Smart Card Electronic Toll Collection (ETC)**- smart card ETC would utilize smart cards with an electronic purse to transfer money directly from the card holder to the toll agency, either through a stop-and-pay transaction or one utilizing a transponder to pay the toll while traveling at mainline speed. This would eliminate cash handling required by current toll collection and eliminate customer account management required by current ETC systems, lowering toll collection operating costs for many toll facilities. This function could be coupled with either the smart driverÆs license or the smart vehicle card to provide additional value to either of these cards or function from a bank-issued smart card.

- The first step toward implementing smart cards will be the creation of basic standards to enable cards from different jurisdictions to operate with the same hardware and software. Smart cards systems use a translation layer of software which provides flexibility in the creation of standards and aids in implementing projects which may evolve greatly over time.

- The smart cards' ability to store and secure diverse data allows for many applications to operate from the same card. This allows the cost of a single card to reap benefits from multiple functions.

- The findings of this document further the goals of the FHWA to streamline CVO processes. Initiatives such as the Commercial Vehicle Information Systems and Networks (CVISN) require carrier, driver and vehicle information that resides in state information systems to be available at the roadside. Smart cards are the best medium to store this data, providing the portability, updatability and security that are required for driver and vehicle information. Smart cards also have the capability to go beyond the requirements of these current initiatives and help states and carriers implement other projects requiring secure data to increase productivity in government and in the private sector.