# ITS/CVO
# Business Plan


**July 1998**
**v.1.4**

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# Preface

This ITS/CVO business plan is unique. It may be so unique that it will be of little direct value to other states. The tailored plan development process was designed to bring cohesion to several distinct and dramatic CVO improvement efforts underway in Kentucky.

The entire ITS team in Kentucky participated in crafting the vision and mission for ITS/CVO with its 2007 horizon. The traditional tools and techniques of strategic planning and business planning were coupled to complete this plan. Our planning effort was initiated prior to the release of the Federal guidelines and while meeting Kentucky needs, the initial plan document did not effectively mirror the guidelines. After two Federal reviews and some content and format revision the plan was accepted.

In a major way it was the process of developing the plan document (which is really just a snapshot taken in July 1998) that was most important. It did create cohesiveness and focus for Kentucky's commercial vehicle operations improvements. We intend to keep thinking strategically and periodically bring the snapshot (plan document) up-to-date. This first plan document will also serve as a benchmark tool for measuring progress.

Many people were involved in this effort from the Empower Kentucky Teams, the CVISN Working Group, and all those involved with the Kentucky statewide ITS plan development effort. We especially appreciate the work of the University of Kentucky Transportation Center Team in providing process advice and content support for this plan document.

**Ed Logsdon,**

**Commissioner of Vehicle Regulation**

**Kentucky Transportation Cabinet**

**July, 1998**

# Chapter 1: Executive Summary

## Introduction

Kentucky is in the position of having an active and growing engagement with ITS-CVO. Kentucky has acquired the mantle of regional leader in the area, and now sits in the position of providing guidance and advice even for Federal initiatives. This plan provides the goals for longer term ITS-CVO initiatives, the framework to link current and future projects together, and the forum within which future decisions will be made. In one sense this plan is after or during the fact, but in another sense it sets forth a systematic framework that will help assure future coordination and maximization of effort.

Kentucky moved forward in the short-term to capitalize on two initiatives: one state driven, focusing on process re-engineering and enhancement technology (Empower Kentucky) and the other federally driven, focusing on improving both deskside and roadside commercial vehicle operations for safety, simplicity and savings (CVISN Model Deployment). Both of these efforts (especially when combined) hold promise for significant and lasting improvements for CVO in Kentucky. Both of these efforts require attention toward continual improvement through review and evaluation to assure the intended results. Both of these efforts break new ground and in so doing run the risk of moving beyond the leading edge to the bleeding edge. Strong aggressive management is needed to assure short-term success.

Special purpose systems will get mid-term process improvement and technology enhancement consideration such as OS/OW permitting. In the mid and longer term, spreading these process improvements and technology enhancements to the entire Kentucky CVO community will be the main concern. Beyond this will be the concern for system interoperability (e.g., electronic screening) and administrative cooperation (e.g., OS/OW permitting) in a regional setting of states. As a matter of policy the pursuit of improved safety strategies and increased motor carrier involvement will get enhanced future attention.

## Kentucky's Mission for Commercial Vehicle Operations:

To engage in the enforcement of motor carrier safety and regulatory laws in a manner which maximizes public safety while enhancing motor carrier efficiencies to promote commerce in Kentucky and the nation.

***This Mission is supported by a Vision composed of the following six specific components:***

1. **Improve and streamline CVO.**
2. **Continue Kentucky as a national leader in ITS/CVO.**
3. **Conduct paperless CVO operations with timely, current, accurate and verifiable electronic information while maintaining security and privacy.**
4. **Enhance CVO productivity, safety, and efficiency by eliminating unsafe and illegal operations and providing incentives for improved performance.**
5. **Integrate and coordinate ITS operations and Empower Kentucky.**
6. **Create a CVO system that is self-sufficient, uses multiple vendors, and is user friendly.**

## Strategic Analysis

Two separate strands of analysis have converged in this plan. The first is the process analyses conducted through Empower Kentucky, the second the strategic analyses necessitated by CVISN Model Deployment. Together, they agree on the following points:

***Problems:***

- Kentucky faces significant challenges from increasing truck traffic
- Current regulatory approaches may be increasingly odious to the industry
- Safety enforcement capabilities may be compromised
- Infrastructure and crash costs may rise
- Tax collections may suffer

***Opportunities:***

- Kentucky's regulatory approach can be more unified
- Higher technology options are available
- Much of the current process can become paperless
- The resulting improvements can improve industry acceptance
- Safety can be maintained by targeting high-risk carriers
- Registration and permitting can be more thorough

## Projects

To address these opportunities, Kentucky's project array includes:

- Fully automating the credentialing, tax filing, and permitting process and participating in regional credentialing clearinghouses (CVISN and Empower Kentucky)
- Automated IRP Credentialing for Less-than-26,000 lb. CV's, in cooperation with 3 other states and interested carriers, contingent upon federal funding
- Making safety and credentialing information from national and regional information bases available to officers at the roadside in a timely manner (CVISN)
- Enabling inspection information to be uploaded from the roadside (CVISN)
- Increasing enforcement officer presence on the highway network (Empower Kentucky)
- Advantage CVO, the original electronic clearance project with the states along the I-75 corridor
- I-65 Electronic screening test
- Upgraded screening hardware and software that adopts a safety/ credentialing criteria for electronic clearance (CVISN-Model MACS)
- Cooperative weigh station operation on the Tennessee border
- Regional Institutional Issues Study with 14 other states

- Regional ITS-CVO Business planning guidance for 13 other states (Mainstreaming)
- MAPS-Advantage CVO Electronic Screening Interoperability Agreement
- Mobile Infra-red brake testing unit joint test with Virginia, North Carolina, and Tennessee

## Conclusion

The infusion of support from the CVISN initiative has jump-started Kentucky into wide-ranging ITS-CVO improvements. In the long run the Empower Kentucky initiative will provide the support needed to fully implement the technologies tested under CVISN. Key is a shift in perceptions toward process improvements that are ready to embrace technological opportunities, and an appreciation of the need for interoperability between technologies, databases, and even agencies. Increasingly, ITS-CVO initiatives will be drawn toward a regional focus, and an integration with the industry, as the regulatory sector increasingly adapts to the rapid rate of change in the industry it regulates.

# Chapter 2: Description of the State's Situation

## The Nation

There currently exists a growing climate of change at the national level as regards commercial vehicle operations (CVO). With a national initiative aimed specifically at automating CVO, and tentative budget allocations targeted to reward further ventures in this area, there appears to be a 3 to 5 year window of Federally-Supported opportunity for the implementation of ITS/CVO improvements throughout the country.

## The Region

Kentucky's membership in regional initiatives also provides a unique set of circumstances. The Inter-regional Institutional Issues Work Group, the Multi-State OS/OW Permitting members, the Advantage CVO member states, and the Alliance CVO Mainstreaming states overlap heavily, with each group being composed of 10–15 states out of a 17-state group. Thus a comparatively large informal association exists between the core states of the industrial Midwest and industrializing southeastern states. This association mirrors the economic reality of regional interaction, as the upper Midwest and the southeast continue to develop an integrated regional manufacturing system. As this system grows, and freight movements mirror this situation, Kentucky will increasingly be a critical territory, spanning the space between the Appalachians and the Mississippi River .

## The Commonwealth

Kentucky's presence in the regional and national ITS/CVO community has expanded on the basis of early I-75 and I-65 clearance projects, and subsequently with its role as a CVISN Model Deployment state and Lead State in the Mainstreaming initiative. The upshot of these successes is an expectation by FHWA/OMC and, indeed, other states, of further 'leading edge' developments.

## Carriers and Motor Coaches in the Commonwealth

Kentucky registered just under 150,000 trucks of 26,000 GVW or greater in 1997. Of these, approximately half were farm vehicles. About 13,000 (8.5% of the total) were above 36,000 GVW, and 4500 (3% of the total) were 80,000 GVW or greater. Kentucky registered about 20,000 IRP vehicles in the same year. Carriers registering for the Interstate Fuel Tax Agreement (IFTA) in Kentucky numbered 3,700. There were about 35,000 carriers registered with KYU numbers, meaning they are subject to the Kentucky Weight-Distance Tax, and 4,000 carriers are registered as Intrastate (inside Kentucky) carriers.

## Empower Kentucky

The Empower Kentucky initiative, begun by the current administration, has provided valuable input for evaluating process change in Kentucky state government, including CVO. This initiative has provided much-needed analysis to support the technology-driven changes being encouraged by CVISN Model Deployment. *(The Empower initiative provides upwards of $100 million to discover ways to improve government processes, with the particular goal of saving government $50 million/year.)*

## Carriers and Advantage CVO

The state's experience with mainline clearance systems (I-65 and Advantage CVO/I-75) has also helped develop a group of trusted carriers who can be counted on to participate in legitimate experiments and new deployments. Through this interaction, carriers have gained an understanding of the problems faced by the enforcement community, and an appreciation of the value of participating *with* the public sector in ensuring a safe and efficient transportation environment.

## CVISN

CVISN Model Deployment has driven much of the recent activity in Kentucky. With the active support of the Commissioner of Vehicle Regulation, the state's CVO enforcement processes are undergoing rapid review and change. Due to early deployment successes, the necessary resources to continue 'rapid deployment' appear to be available. Nonetheless, Kentucky's array of CVISN investments will reflect its decisions about the most pragmatic mix to gain efficiency and improve safety.

## UKTC

The Kentucky Transportation Cabinet enjoys a long-term and stable relationship with the University of Kentucky Transportation Center that allows innovative CVO approaches to be explored. Working together, the two entities have participated in most of the recent CVO successes for the state. The close association between the two also allows more flexibility in retaining specialized assistance for project work, allows the state to focus more resources on areas selected for improvement.

## Information Technology

Kentucky state government, and especially the Transportation Cabinet, has strong information technology capabilities. Most of the current software in use by the various CVO units was written by people *still working for the state*. Thus, modifications are a relatively minor adjustment for the Cabinet, and can be programmed and planned much more readily. Further, whole areas of technical deployment do not rely on outside, uncontrolled forces for their successful conclusion.

## Organizational Situation

The Transportation Cabinet is organized in such a way as to minimize the dispersion of authority, allowing projects to be coordinated and pursued in a more organized and cooperative way. However, this implies that a few key individuals will carry most of the responsibility for successful CVO project completion, especially early on. It is only as the ITS/CVO change process is accepted and pursued by functional level staff that it will survive administrative changes.

## Vehicle Enforcement in the Commonwealth

Kentucky currently has 284 size and weight enforcement personnel, supporting 16 fixed scales and 2 ports-of-entry at 11 sites. All sites use WIM screening, and 6 of the sites have been updated to use WIM sorting also. Kentucky also has 420 portable wheel-load weighers deployed in sets of four, and operated by 142 teams. The state is in the process of procuring another 130 portable scales. In fiscal year 1996, Kentucky WIM screened nearly 12 million vehicles, weighed more than 80,000 over fixed scales, and issued over 4,500 size and weight violations. Nearly 95,000 OS/OW trip permits were issued.

# Existing CVO Processes

Kentucky currently has a fairly well organized set of CVO systems, but opportunities exist for significant improvement in regulatory capabilities. The existing processes, briefly, are as follows:

### ***Safety Information Systems***

After an officer or inspector has conducted a safety inspection at station or roadside, he/she completes safety inspection form and submits to regional supervisor. The supervisory staff checks the form for obvious errors or deletions and sends it to Motor Vehicle Headquarters in Frankfort, Kentucky to be manually entered into the SafetyNet data base by our data entry staff. The time delay from the field to headquarters can be as long as 7 - 10 days and the time lapse to be entered into the system could be 15-30 days due to turnover in data entry personnel. After the data is entered into SafetyNet, it is uploaded to the Motor Carrier Management Information System in Washington, DC on a weekly basis.

### ***Hazmat Permitting***

Kentucky has no hazmat permitting requirement, having eliminated it in deference to the FHWA/OMC permitting mechanism. Kentucky enforcement does inspect hazardous loads and are trained in securing hazmat spills.

### ***Tolling Authorities***

There are currently no plans to automate the toll roads in Kentucky. An extensive system of limited access toll roads were built in the 1950's and 1960's in Kentucky, but the authority for the roads has returned to the local county as the roads have been paid off. Currently only four roads remain toll roads, and with the expectation of them converting to the public sector, the returns to automating the tolling would be small.

### ***IRP Process***

The first step in obtaining Kentucky IRP credentials is applying for Kentucky title and registration. This process is done at the County Court Clerk's office in the county of residence or base. All applicable taxes are paid and an apportioned registration certificate is issued.

The applicant then makes application to the Kentucky IRP Branch in the Department of Vehicle Regulation, Division of Motor Carriers in Frankfort, Kentucky. The application form, TC95-301 or the new Combined TC95-1, may be obtained in person at the IRP office or by mail. The application is completed by the applicant giving all necessary information and forward to the IRP Branch for processing. If the applicant walks in, the application along with all supporting documentation is reviewed and processed while they wait which normally takes about 15 to 30 minutes depending on the number of vehicles and jurisdictions. Information from the application is entered into the IRP computer system to calculate fees due and produce and invoice. The invoice is given to the applicant to review and approve. Once reviewed and approved, the applicant pays the cashier and receives 2 validated copies of the invoice. One copy of the invoice is given to the IRP clerk handling the transaction and one is maintained for the applicants record of payment. The IRP clerk then issues the credentials (plate, decal and IRP cab card or temporary permit).

If this is a mail transaction, the applicant completes and mails the application along with supporting documentation to the IRP office. The application is reviewed, processed and the invoice is prepared and mailed to applicant who then returns the payment for fees due. Once the payment is received, the credentials are prepared and mailed to the applicant.

### ***IFTA Process***

All carriers based in Kentucky which have interstate vehicles with a registered weight exceeding 26,000 pounds must obtain an IFTA license. Applications may be obtained through the Division of Motor Carriers and may be filed either by mail or in person. Upon issuance of the license the carrier will be sent a paper license (a copy of which must be carried in each vehicle) and decals to be placed on the exterior of each vehicles cab doors. Each year the license must be renewed and new decals and license must issued.

Kentucky is a member of the Regional Processing Center (RPC) which is a group of states that utilizes a single computer system to process IFTA tax returns. The licensing system described above updates the RPC on a daily basis with new licenses, status and address changes. Each quarter the RPC, which is based in Albany, NY , prints and mails the tax reports for each carrier. Completed returns are mailed back to Fleet Bank in Albany, NY for processing and depositing of funds. Each night Kentucky's account is cleared to $0.00 and all funds are forwarded to Farmers Bank, the state's depository in Frankfort, Kentucky. Errors on the tax returns result in a computer generated bill being mailed to the carrier. Carriers who do not file their reports or fail to make payment timely will be canceled in our system and be subject to being placed out of service if found operating on Kentucky highways.

### ***KIT Process***

Intrastate carriers based in Kentucky must obtain a Kentucky Intrastate Tax (KIT) license for the purpose of reporting fuel surtaxes due. To acquire the license the carrier must first obtain an intrastate DOT number if they do not currently possess a Federal DOT number. The number is issued by the Division of Motor Carriers and is then used as the carriers KIT license number. The license can be obtained either by mail or in person. The carrier must keep a copy of the license in each vehicle as well as display KIT decals on the cab door. The license and decals are issued at no charge to the carrier but must be renewed each year.

A quarterly KIT tax report is mailed to the carrier every three months on which they must compute their fuel purchased and consumption for the quarter. Reports are printed, mailed and returned to the Division of Motor Carriers for processing. Reports are entered into an online system and are billed through an automated Accounts Receivable system. Failure to file a report or pay taxes due in a timely fashion will result in the carrier's license being canceled which may cause their vehicles to be placed out of service if found operating on Kentucky highways.

### ***KYU Process***

All motor carriers operating vehicles in Kentucky with a registered weight of 60,000 pounds or more must obtain a KYU license to report Kentucky's Weight Distance Tax. Applications are obtain from and filed with Division of Motor Carriers either by mail or in person. The carrier must complete a form listing the taxable vehicles that will be operating under this license in Kentucky. This listing is entered into an enforcement officer at any of our scale facilities. Additions and deletions are made as submitted by the carrier. There is no yearly renewal required for this license.

Each March the four quarterly reports for that year are mailed to the carrier to be completed and returned prior to the respective due dates. The tax report and funds are processed in an online procedure which post any under payments or overpayments to our Accounts Receivable or Refund system instantly. All of these systems are linked with our scale facilities to automatically stop inactive carriers which are placed out of service until taxes are brought up to date. All notices for Accounts Receivable and late filings are computer generated with printed due dates. Failure to meet these due dates results in cancellation of the license and makes the carrier subject to detention at the scale facilities.

### ***Overweight/Over Dimensional Permits Process***

Overweight/Over dimensional permits are requested by phone, mail, or walk-ins. Information required to issue a permit is the KYU number, width, height, length, gross weight, total number of axles, and axle weights. Permits are routed according to these dimensions and weight. Permits are sent thru requested wire service, mailed or customer walk-ins. All super loads are sent to Bridge Maintenance for analysis.

House moves are checked thru District Offices for their approval on routes, time of move and restrictions. Annual permits are handled by mail or walk-in. There is an application required for these permits. Payment for permits is paid by wire services or by check or cash for walk-in or mail request.

### ***For Hire Authority Process***

The first step to obtain for hire authority is to fill out the Kentucky Trucking Application by mail or walk-in. Forms required to filled out are TC95-1, TC95-38, and TC95-150. When applying in person the motor carrier clerk will take the application and other supporting documentation to be reviewed and processed. This usually takes 15 to 30 minutes. The information from the application is entered into the for hire computer system (Illinois system). At this time all fees are collected and the credential is issued to the carrier.

## Context Conclusion

Currently the state finds itself in an enviable position. Externally, it is looked to for leadership and can reasonably expect support in playing that leadership role. Internally, it has laid the groundwork for continued success, and taken advantage of opportunities as they have come available. A variety of projects and programs are already “full speed ahead. “ The goal of this document is to begin to encompass that success by situating these projects relative to a unified vision and pointing the way for future coordinated ITS/CVO projects and deployments in Kentucky.

# Chapter 3: Organization and Management Approach

## Organizational Interrelationships

The Commonwealth of Kentucky has all of the regulatory and enforcement functions regarding commercial operations under the umbrella of the Kentucky Transportation Cabinet (KYTC) within the administrative authority of the Kentucky Secretary of Transportation (See page 14). This is a strategic benefit, however it does not automatically result in most efficient processes and highest levels of technology use internally. The challenge of efficient data exchange and appropriate technology use that is acceptable to carriers and compatible with other governments remains.

The organizational charts on the following pages depict the CVO planning and program management structure as well as the key agencies responsible for implementing ITS/CVO projects. Statewide, the state **ITS/CVO Working Group** (See page 15) is composed of the:

- Secretary of Transportation
- Commissioner of Vehicle Regulation
- Assistant to the State Highway Engineer
- Chairs of the Motor Carrier Advisory Committee and the Motor Coach Advisory Committee
- District FHWA / OMC representative
- Director (and selected staff) of the University of Kentucky Transportation Center

This group typically meets to consider issues of overall CVO planning beyond the scope of mere CVISN deployment.

As for the **CVISN Working Group** (See page 15), the Commissioner of the Department of Vehicle Regulation functions as ITS/CVO program manager. The program manager has direct contact with all responsible regulatory and enforcement parties in Kentucky and direct access to the Kentucky Secretary of Transportation. Commissioner Logsdon was appointed as program manager by the Secretary in order to assure full cooperation, integration, and timely success. The already established ITS/CVO working group with representatives of the **Kentucky Motor Carrier Advisory Committee** and **Motor Coach Advisory Committee** has the capacity to operationalize all project proposals contained in this plan. Members of the Motor Carrier Advisory Committee consult regularly with the Commissioner of Vehicle Regulation regularly on plan content and progress, and members of that committee are also among the first to install and test the new technologies.

The ITS/CVO Working Group is essentially that group designated to plan and manage and deploy Kentucky's CVO projects. The expanding role of this group has been smooth and has enabled a more seamless integration of disparate ITS/CVO projects into a cogent whole.

The University of Kentucky Transportation Center provides staff support to the CVO program manager including program and technology exchange assistance as needed. Further, the appropriate technical staff (administrative and operations) have been designated for each of the required work areas. It is expected that private sector involvement and ITS community participation in Kentucky ITS/CVO endeavors will continue to bode well for Kentucky.

The section which follows the organizational chart details those agencies responsible for CVO administration and enforcement as well as key individuals who impact CVO planning and programs.

## Motor Carriers' Role in Kentucky ITS-CVO

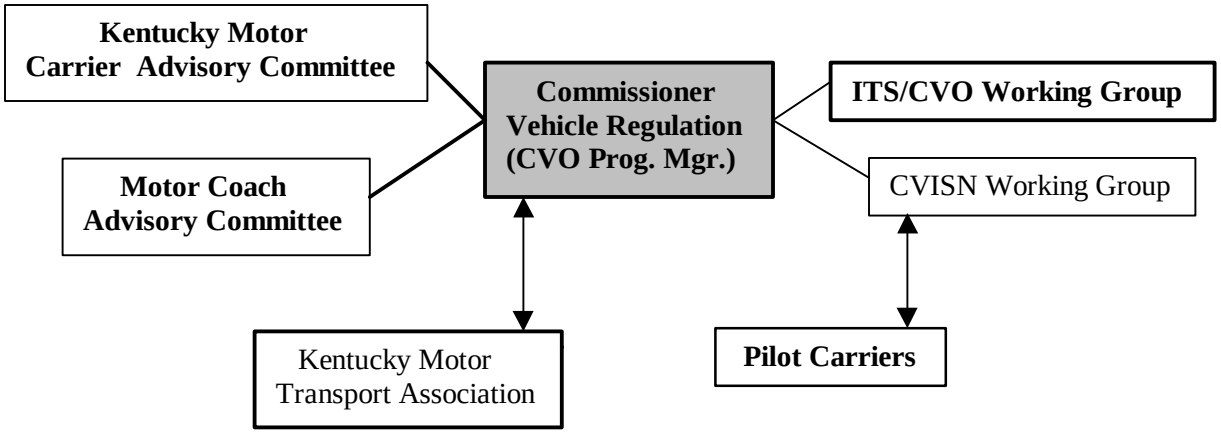
Kentucky motor carriers assist ITS-CVO deployment in several distinct ways. Most importantly, the motor carriers provide the leaders who are willing to put their reputations and good will on the line to test new and unproven technologies. Without these risk-takers in the private sector, ITS-CVO deployment would be largely irrelevant and nearly impossible. Not only do these expend the time and effort to help test new technologies, they give freely of their time to carry the message to their peers in the carrier community. Leaders (**pilot carriers**) in this effort in Kentucky have been Majors Transit Company, Carlyle Construction, and Lexington Cartage. Ryder Truck Rental, Penske Truck Leasing, and Rollins Leasing Corporations have also provided invaluable support and testimony to the benefits of ITS-CVO deployment in Kentucky.

In their roles as pioneers, these carriers also supply critical early feedback and review of the new technological configurations and installations. A technology deployment is more than mere installation of P.C.'s and communications systems. The entire logic of a system may need alterations to accommodate unanticipated situations uncovered by those first carriers willing to experiment.

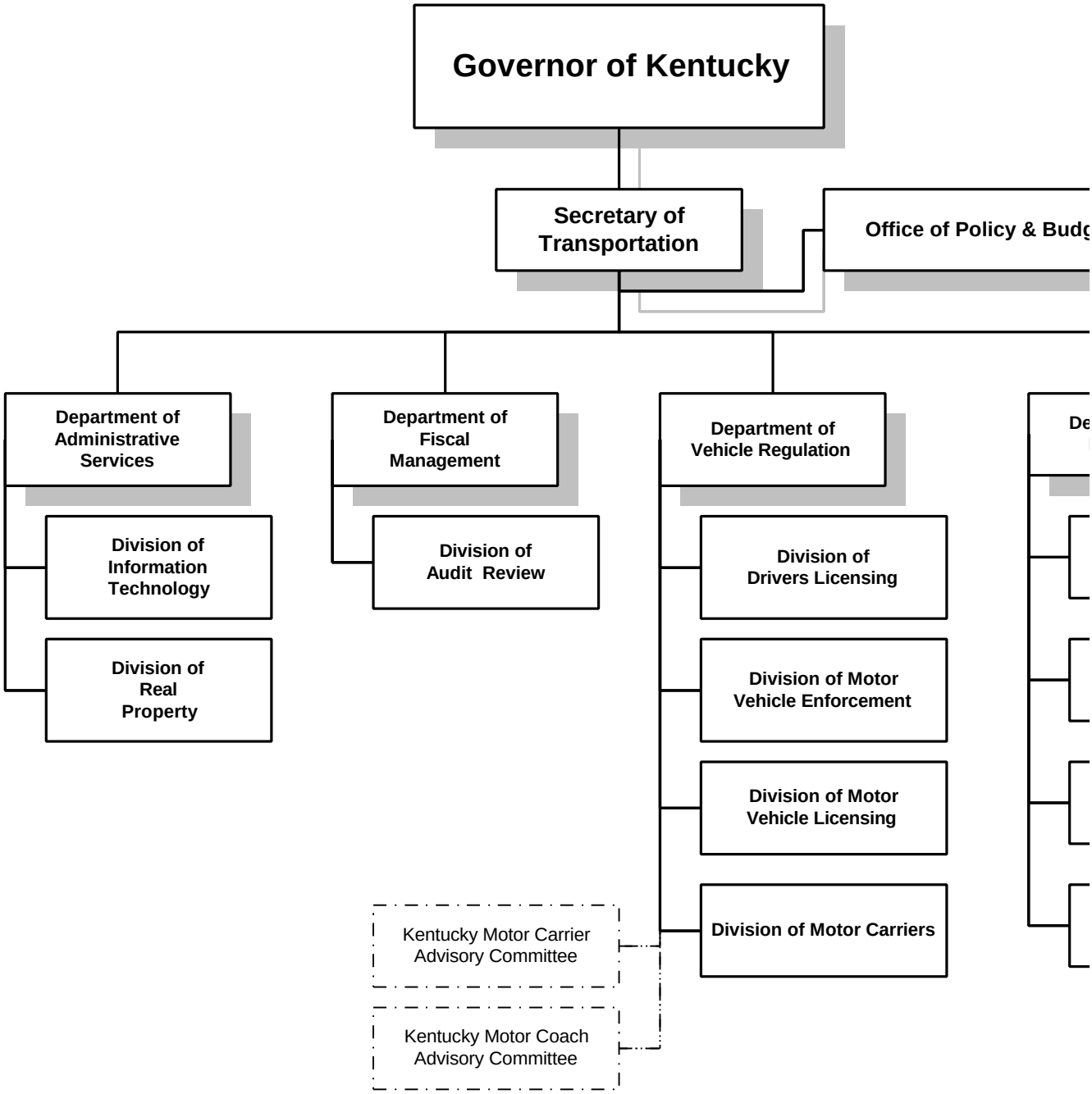
In these two roles, the leading carriers fulfill the two crucial roles required for any new innovation to be more widely adopted. They become the first innovators who absorb the lessons and losses so that later adopters won't have to, and they proselytize their experiences to ensure that their lessons benefit as many people as possible. In a very real sense, Kentucky's ITS-CVO pioneer carriers are the 'Model Deployment' leaders of the carrier community.

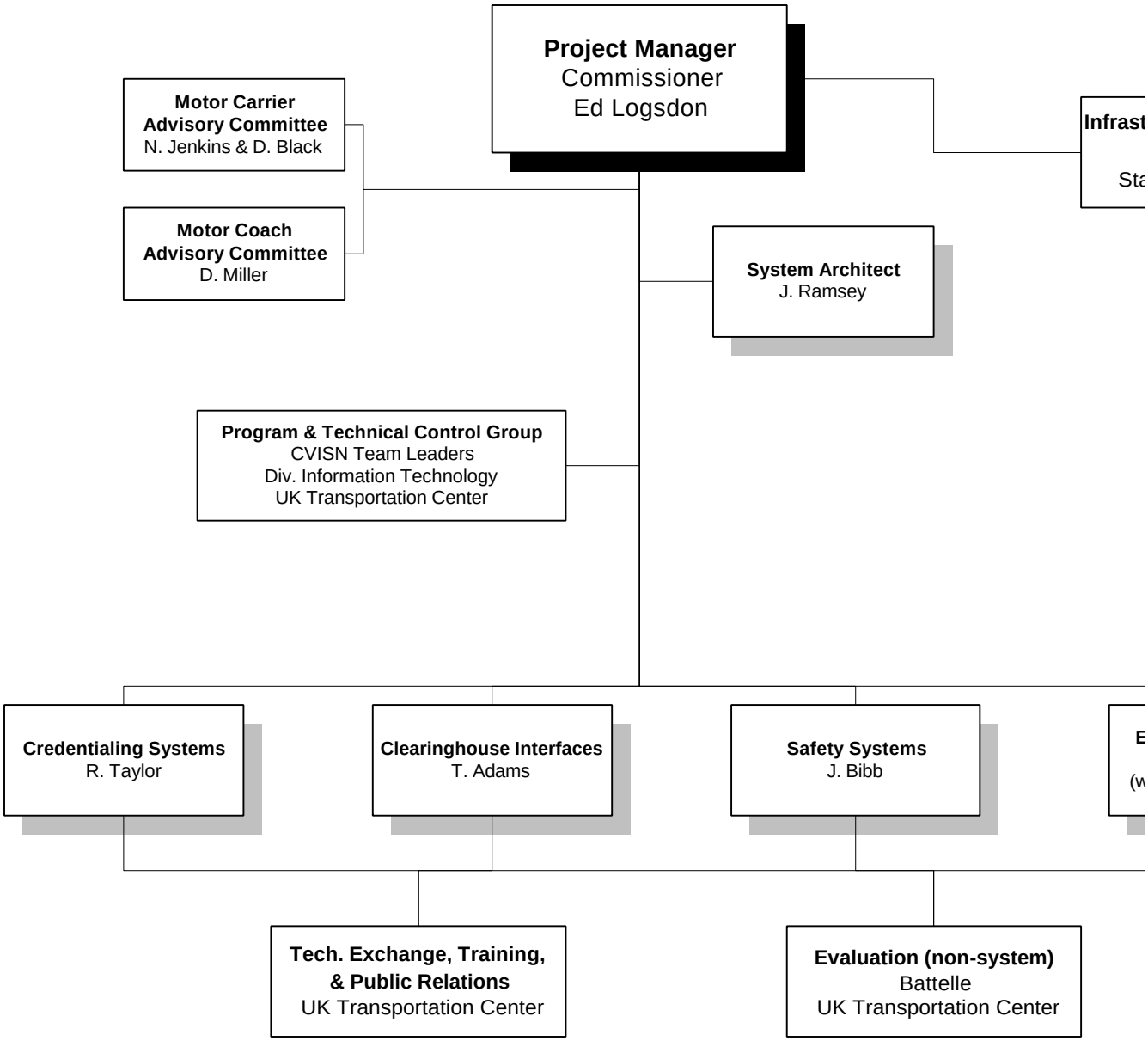
Beyond these roles, the wider Kentucky carrier community helps surface issues more generally that may be addressed by ITS-CVO. The saving opportunities presented by automating the credentialing process were touted early on by some Kentucky carriers, and probably influenced the fact that, even though Kentucky has a reputation for accomplishment in Electronic Screening, its first CVISN deployment efforts are concentrated on developing automated credentialing capabilities.

The **Kentucky Motor Transport Association** also helps provide a forum for the interaction of the carrier community with the regulatory community. They host an annual meeting that traditionally has proven to be an excellent forum for carriers and regulatory personnel across the state to develop a greater empathy for each other's concerns in CVO. The KMTA also help produce publications that complement the Transportation Cabinet's public information efforts as regards ITS-CVO. The working relationships of the CVO entities described in sections above are depicted below:



# Kentucky Organization Relating to






# Kentucky CVISN Working Group

## Strategic Business Plan Development Process

This strategic plan was developed out of the convergence of several parallel processes in Kentucky. Empower Kentucky work teams have been meeting for over two years to develop improved and more efficient processes for CVO in Kentucky. Their conclusions and recommendations prefigured and encouraged the further activities of the Kentucky ITS/CVO working group that first convened in the summer of 1996. The strategic analyses that follow represent a coherent statement that became the impetus for further work. In an effort to conceptually organize the various ITS/CVO activities in Kentucky, and as a commitment to the CVISN Mainstreaming plan, an inclusive visioning exercise was held in early 1997. Out of this exercise emerged the six critical vision elements that guide this strategic plan. So the content of the plan did not emerge in the "standard" order, but the consistency of the input from the various sources is unmistakable. The vision, which demanded a broad base of input, drew on upper level administrators familiar with the broad array of projects in Kentucky. The strategic analyses were founded in the day-to-day work experiences of those most intimately involved with administration of the programs. Consequently, the appropriate expertise was brought to bear on the appropriate issues.

## Business Plan Maintenance Approach

Because the Business Plan is considered a 'living' document, and a marker for the overall progress of ITS-CVO in Kentucky, the ITS-CVO working group has determined that a semi-annual revisit of the Strategic Business Plan is needed. The mid-year review will seek to track adherence to the philosophy and schedule laid out in the plan, noting both successes and obstacles experienced in the previous two quarters. The year-end revision will adjust the plan to accommodate the new realities and information available to the working group. This will allow the document to remain useful and relevant, as it is exceedingly difficult to anticipate the course of events accurately over an extended period of years.

It is expected that major portions, such as vision components, will change less dramatically and often, while project milestones will have been accomplished and logged each year, and new projects will have been conceived and designed to further the ITS-CVO deployment in Kentucky. The ITS-CVO plan will also be verified against Kentucky's overall ITS plan to ensure that opportunities for capitalizing on joint deployments are not lost, and that duplicative or redundant systems are combined and jointly deployed to be of benefit to multiple systems.

## Future Activities and Anticipated Results

The results of the initial strategic planning activities have been used to develop biennial program plans/budgets, including goals and objectives, and provide focus to activities of business process re-engineering and funding proposal preparation. A continued program of strategic planning is being followed by the Kentucky ITS/CVO working group. The first round (full cycle) of strategic planning activities is expected to be completed within 1998. The use of overall strategic planning coupled with program/business planning for units along with process re-engineering and technology application promises more effective and efficient commercial vehicle operations.

Strategic planning for commercial vehicle operations in Kentucky will provide management guidance for all of the subsequent program and business planning to be carried out in the future. Strategic thinking that is implemented will provide clearer targets of opportunity and better advance warning of threats in commercial vehicle operations. It will also allow Kentucky to direct its limited resources on the most critical issues whether maintaining key strengths or correcting a critical weakness. Subsequent strategic planning sessions will be broadened to include industry, technical and legislative participants beyond the diverse state and federal interests represented in the earlier planning sessions.

# Chapter 4: Mission and Vision of ITS/CVO for Kentucky

## Kentucky's Mission for Commercial Vehicle Operations:

***To engage in the enforcement of motor carrier safety and regulatory laws in a manner which maximizes public safety while enhancing motor carrier efficiencies to promote commerce in Kentucky and the nation.***

This mission is nested within the larger mission of the Kentucky Transportation Cabinet, that mission being:

***To provide a safe, efficient, environmentally sound, and fiscally responsible transportation system which promotes economic growth and enhances the quality of life in Kentucky.***

## Elements of the Vision

Kentucky's vision for ITS/CVO is composed of a series of explicitly defined elements, each of which can be used to evaluate individual projects in the state. These elements represent Kentucky's fundamental values and essential goals for the future. Following these Vision elements is a clarification of each one in turn. The elements are:

1. **Improve and streamline CVO**
2. **Continue Kentucky as a national leader in ITS/CVO**
3. **Conduct paperless CVO operations with timely, current, accurate and verifiable electronic information while maintaining security and privacy**
4. **Enhance CVO productivity, safety, and efficiency by eliminating unsafe and illegal operations and providing incentives for improved performance**
5. **Integrate and coordinate ITS operations and Empower Kentucky**
6. **Create a CVO system that is self-sufficient, uses multiple vendors, and is user friendly**

### *I. Improve and Streamline CVO*

This is the overriding goal of all ITS/CVO deployment in Kentucky. Remaining focused on this element improves the quality of choices made between different operational and process alternatives.

**Goal:** ***Reduce the steps, paper, time, dollars, or people needed to fulfill a regulatory obligation, by either the private or public sector.***

**Objectives:**

- Reduce required registration forms from 12 to no more than 2
- Cut deposit time from 10 to 25 days down to an average of 3 days or less

## *II. Continue Kentucky as a National Leader in ITS/CVO*

Because of the advantages garnered from a leadership role in the region and nation, it is important that Kentucky continue to strive to excel. By continuing to experiment and improve, Kentucky will fulfill its vision of more effective CVO while continuing to receive the recognition and benefits of advancement at the national level.

**Goal:** ***Be at the forefront of recognizing and operationalizing legitimate ITS/CVO opportunities.***

**Objective:**

- Be among the first to recognize new opportunities and the last to approach them carelessly

## *III. Conduct Paperless CVO with Timely, Current, Accurate and Verifiable Electronic Information While Maintaining Security and Privacy*

This element unifies the opportunities of paperless CVO for both the public and private sectors, posed in contrast to each other. The configuration of this goal statement emphasizes the necessity of keeping both concepts linked so that parallel benefits accrue to both the public and private sectors.

**Goal:** ***Convert current paper-based registration, permitting, and payment functions to electronic transfers, without creating additional information requirements or compromising carriers' confidentiality.***

**Objectives:**

- Reduce the delinquent notification process from a minimum of 75 days to a maximum of 45 days
- Gain access to all citation dispositions through the administrative Office of the Courts
- Develop a citation tracking system for repeat offenders
- At a minimum, meet the national average for timeliness of crash data uploads to MCMIS
- Reduce inspection data uploads 10 percent, while maintaining the extremely high quality of the data

## *IV. Enhance CVO Productivity, Safety, and Efficiency by Eliminating Unsafe and Illegal Operations and Providing Incentives for Improved Performance*

This element clarifies the relationship and usefulness of effective enforcement at the roadside. Not only does the general public gain a safer system, those carriers that operate ever more safely can expect increased efficiency by virtue of the ability of enforcement to recognize and reward that performance. Similarly, enforcement is both more effective and efficient by virtue of a strategy that focuses attention on unsafe operators. All of this implies more effective training and consumer-friendly employees.

**Goal:** ***Reduce the rate and severity of crashes involving commercial vehicles in Kentucky, while lowering the time and dollar cost of compliance for safe carriers.***

**Objectives:**

- A five percent reduction of Commercial Motor Vehicle crashes and fatalities
- Improved use of moving vehicle citations
- Initially increase, then decrease the OOS percentage from safety inspections

## *V. Integrate and Coordinate ITS Operations and Empower Kentucky*

Less immediately obvious, but perhaps more valuable in the long run, is the ITS/CVO integration with other ITS initiatives and other process improvement initiatives in Kentucky. Not only is the cross-feed between CVO projects still to be fully articulated, the benefits of cooperation and integration of traveler information systems, rural ITS, and others with CVO need to be developed.

**Goal:** ***Prepare a statewide plan that shows how ITS/CVO is to support Kentucky's ITS vision, and outlines the most fruitful areas of future endeavor in ITS. (in progress)***

**Objective:**

- Produce plan with components specifically incorporating ITS/CVO by 1/1/99
- Produce plan that specifically accommodates the goals of Empower Kentucky

## *VI. Create a CVO System that Is Self-Sufficient, Uses Multiple Vendors, and Is User Friendly*

A significant facet of technology-supported process change is the issue of personnel retraining and reconfiguring. Public sector capabilities should be developed so the ability to capture future changes and opportunities can be maintained for the benefit of the general public and the carriers, not merely transformed into commodities. That ability is reliant on the recognition that CVO regulatory processes are driven by the public interest and are thus inherently a public trust, not to be transformed into a market relationship. A CVO system is self-sufficient, then, in the sense that the operating agency has the ability to reconfigure and modify its processes as needed.

**Goal:** ***Use externally-based technologies for which at least two fully developed and compatible versions exist, not owned or controlled by the same legal or public entity.***

**Objective:**

- Employ CATS software that is interoperable with at least one other CATS software
- Test and install transponder / reader systems at the roadside that will support at least one other transponder / reader system
- Encourage the same objectives in other states

## *Toward a Kentucky **ITS/CVO** Vision:*

**Technology Enhanced Commercial Vehicle Operations in 2007**

***The processes of documenting and assuring the safe operation of commercial vehicles in Kentucky has shown dramatic improvement over the past several years. A streamlined process has been designed and installed, demonstrating Kentucky's ongoing leadership from that landmark success with Advantage I-75 near the end of the 20th Century. Now, secure and accurate electronic information allows commercial vehicle operations to proceed without the burden of paper documents.***

***The new information technology systems enhance safety, efficiency, and productivity providing numerous benefits to both government and industry. Unsafe and illegal operations have been effectively eliminated and an incentive-driven process of continuous performance improvement exists. Commercial vehicle operations also benefit from the many integrated improvements made as part of the North American Intelligent Transportation System initiative – especially the traveler information and hazard warning capabilities that have been fully deployed by Kentucky.***

***And most remarkably, this was done in an environment of cost-reduction for both government and industry. These systems, which now assure greater over-the-road transportation productivity, have been built as a service to industry. No new taxes or surcharges were placed on the industry. Efficient technology goods and services have been developed by the private-sector largely because of the open systems and modular architecture standards that were championed by Kentucky in the national arena.***

***The success of Kentucky's approach has been attributed to its relentless pursuit of process improvement and enabling technologies– carriers and states working together to produce significant improvements for commercial vehicle operations supported by the research and development capabilities of industry and university.***

# CHAPTER 5: INTERNAL STRATEGIC ANALYSIS

## Introduction

The ITS/CVO working group met in mid-1996 and developed the Strengths, Weaknesses, Opportunities and Threats to CVO in Kentucky**.** The SWOT analysis report is attached in the appendix. In addition, problems perceived by the two Empower Kentucky process teams involved with commercial vehicle operations (Kentucky Vehicle Enforcement and Motor Carriers Tax Collection) have been included. These reports are also included in the appendix.

This examination was conducted in order to determine if the vision elements address problems listed by Empower Kentucky process teams, as well as the threats identified by the ITS/CVO working group. Moreover, it was logical to perform such an analysis in order to determine existing similarities and differences between the ITS/CVO opportunities and threats and the Empower Kentucky problems.

Each of the vision elements addresses one or more opportunities and threats listed in the SWOT analysis. Similarly, each vision element addresses one or more Empower Kentucky problems. The following lists each vision element, the SWOT opportunities and threats, as well as the Empower Kentucky problems addressed by the vision element.

| Vision Element | SWOT Opportunity | SWOT Threat | E |
|---|---|---|---|
| I. Streamline & Improve CVO | • Uniform System Direction<br>• Higher Use Of Technology<br>• Improved Image | • High Levels Of Truck Traffic<br>• Mission<br>• Safety Compromised | •<br>• |
| II. Continue Kentucky As A National ITS/CVO Leader | • Increased Funding<br>• Improve Image<br>• Improve Industry Awareness | • Changing Funding<br>• Considered "Unfriendly" | • |
| III. Paperless CVO | • Paperless Environment<br>• Higher Use Of Technology<br>• Uniform System Direction<br>• Hi-Risk Safety Targeting | • High Levels Of Truck Traffic<br>• Mission Safety Compromised<br>• Lower Fuel Tax Collections | •<br>•<br>• |
| IV. Improved Safety Performance | • Hi-Risk Safety Targeting<br>• Higher Use Of Technology<br>• Improve Image Awareness Improve Carrier Base | • Mission Safety Compromised<br>• Considered "Unfriendly" | •<br>•<br>• |
| V. Integrate & Coordinate | • Uniform System Direction<br>• Paperless Environment<br>• Hi-Risk Safety Targeting<br>• Higher Use Of Technology<br>• Improve Image | • Changing Funding<br>• Considered Unfriendly<br>• Mission Safety Compromised | •<br>•<br>•<br>•<br>• |
| VI. Self-sufficient, User Friendly, Multi-Vendor | • Uniform System Direction<br>• Improve Image<br>• Increase Carrier Base | • Changing Funding<br>• Considered Unfriendly | •<br>• |

## Improve and Streamline CVO

The first vision element enables Kentucky to pursue opportunities in establishing *a systematic and uniform direction for CVO*. Such improvements will make *tax and other CVO application processes quicker and easier* for both the applicant and the administrator. This vision element also provides the opportunity *to use higher forms of technology* in improving CVO. Streamlined CVO using higher forms of technology should help *reduce roadside delays* for commercial vehicle operators and enforcement personnel. It is anticipated that improved and streamlined CVO will *improve Kentucky's image* as a proactive, technologically advanced and customer-driven state.

Kentucky believes that improving and streamlining CVO are necessary in order to address *increased commercial vehicle traffic* on the Commonwealth's roadways. While better and more efficient CVO present Kentucky with the chance to improve its image, it should be noted that process reengineering will *not compromise the State's highway safety mission.*

## Continuation of Kentucky's Leadership Role in ITS/CVO

By continuing its leadership role in ITS/CVO, Kentucky stands to *improve its image* as a technologically advanced and customer-driven state. By focusing enforcement efforts on unsafe and non-compliant carriers, the state may create a more fair and equitable environment for commercial vehicle operations and *help eliminate any industry perception that Kentucky is a regulatory "unfriendly" state.* As a leader in ITS/CVO, Kentucky also has the opportunity *to improve industry awareness* of highway safety issues and motor carrier safety and economic regulations.

Through this leadership role, the Commonwealth also positions itself positively *to address funding challenges*. Kentucky believes its ITS/CVO leadership role will directly enhance its ability to conduct commercial vehicle enforcement in an effective and efficient manner, and continue to ensure full *Federal compliance* and enjoy Federal support.

## Conduct Paperless CVO Operations with Timely, Current, Accurate and Verifiable Electronic Information, while Maintaining Security and Privacy

One of the primary opportunities of Kentucky's ITS/CVO initiative, the conduct of electronic CVO operations allows the State to *use technology in higher capacity.* This will *help improve the current CVO application processes*. Furthermore, the development of this "paperless" application environment will help *ensure a systematic and uniform direction for CVO application processes.* The electronic application processes will provide "real time" carrier economic regulatory and credentialing data which, coupled with timely carrier safety data, will assist enforcement personnel in *targeting carriers which pose a high safety risk* on the Commonwealth's roadways.

Conducting paperless CVO which emphasizes timely, current, accurate and verifiable electronic information is attractive because it will allow administrators to effectively and efficiently *process the ever-increasing volume of carriers* moving through Kentucky. The data gathered will help the Transportation Cabinet *collect additional tax revenues* and help *reduce damage to the Commonwealth's highway infrastructure.*

## Enhance CVO Productivity, Safety and Efficiency by Eliminating Unsafe and Illegal Operations and Providing Incentives for Improved Performance

Kentucky envisions an operational environment that emphasizes the detecting of motor carriers found operating in an unsafe and/or illegal manner. Conversely, safe carriers will see the amount of time spent in weigh station queues and inspection facilities reduced, saving the carrier money. By reducing unsafe and/or illegal carriers, the Commonwealth will *reduce CMV-related crash costs* and *infrastructure damage*.

It is anticipated that these process refinements address the opportunities to use technology in a higher capacity to target high-risk carriers, while also improving industry awareness of highway safety issues and motor carrier safety regulations. Furthermore, by enhancing CVO productivity, safety and efficiency, Kentucky stands to improve its image as a customer-oriented, safety-based state. Similarly, this will also promote just-in-time logistics, which is critical for attracting high-value manufacturing jobs. This may provide a climate suitable to increasing the state's motor carrier base.

## Integrate and Coordinate ITS Operations and Empower Kentucky

Empower Kentucky has produced the change environment supportive of ITS/CVO deployment. *Uniform system direction* relies on coordination, and a thorough integration of processes is necessary to fully realize a *paperless environment*, speeding up the *slow application process. Targeting high-risk carriers* demands accurate and timely information from a variety of sources be shared in a coordinated manner, so that *mission safety* is not *compromised*. The *higher use of technology* can emerge in an environment where all parties understand its role and usefulness. Successful implementations that reduce paperwork and enforcement costs for carriers encourage all segments of the enforcement community to act in concert to reward safe carriers will then *improve the image* externally of Kentucky and it will not be *considered unfriendly* by carriers.

Having a coherent plan for the implementation of improvements avoids *complicated and competing funding issues* for complementary ITS initiatives, and each implementation leverages the resources invested in all other implementations. External grant applications are easier to generate when the overall logic and role of each component is fully understood and rationalized. The Empower Kentucky charge to *avoid lost taxes* makes Intelligent Transportation Systems truly "intelligent", and focuses deployment on the need to lower *crash costs* and *infrastructure damage.*

## Create a CVO System that is Self-sufficient, Uses Multiple Vendors, and is User Friendly

This vision is important for the long-term health of Kentucky's ITS-CVO community. To maintain a *uniform system direction,* Kentucky must be able to control and modify its processes and the accompanying technologies at will. By being able to draw on *multiple vendors* in addition to its own expertise, Kentucky can choose processes that optimize user friendliness, *improving its image* with the carrier base. This should *increase the carrier base*, reducing the demand on redundant legacy systems. Increased participation in a faster process then minimizes both *slow application process and roadside delays* for carriers. Kentucky can reduce costs by having options for each process, relieving some of the *funding issues* with new projects.

# Conclusion

Although emerging at different times and with different purposes, Kentucky's ITS-CVO Vision Process, SWOT analysis, and Empower analyses combine to form a powerful rationale and framework for situating current projects and assessing the potential for deployment projects in the future. Each vision element is made more concrete by the specific opportunities, threats, and problems it speaks to. In the following chapter, existing Kentucky ITS-CVO projects are arrayed within this framework, so that we may understand how well we currently are meeting our vision.

# Chapter 6: Practices and Projects

Kentucky already has planned or in place an array of complementary projects. In particular, some of the specific practices advocated through Empower Kentucky are already encompassed by planned CVISN Model Deployment activities. To simplify the array of projects, these items have been folded into the appropriate Model Deployment category. Specifically, the Empower MVE Initiative identified the use of Roadside Video Systems and Linked Information Systems as important elements. Current Model Deployment plans call for the use of Roadside Video Systems under MACS2, and Linked Safety Information Systems are an important component of the entire Safety Information Systems portion of Model Deployment. Similarly, the Empower Tax Process Initiative calls for modifications to Kentucky's existing licensing and taxation software (ALTS), the linking of information systems through EDI, and the equipping of the tax collection staff with PC's. Again, these goals are part of Model Deployment plans for Credentialing Systems and Clearinghouse Interfaces.

What remains are the currently identifiable projects either already planned and funded or still receiving strong attention as possible projects. In the test, each project or recommendation is described as to its operational concept. In the matrix, each project is portrayed as it addresses the six vision elements. If the element is an important consideration of the project, it is shaded. If the element is of peripheral concern to the project, it is left white.

Rather than rank all projects relative to each other, Kentucky grouped the project areas by category. Because the logic of the systems is such that they can all be advanced together, and were indeed conceived as an integrated system, the category areas can be given modest priority rankings. Because of the desire at the local and federal level to deploy CVISN technologies as rapidly as possible, the CVISN activities are assigned category I. All Empower Kentucky related initiatives, because they partially rely on the successful implementation of CVISN technologies, and because they require more extensive personnel training and implementation considerations, are in category II. The balance of projects reflect a combination of more regionally-focused projects, longer range and less-definite concepts, and so are assigned category III. Realistically, however, Kentucky intends, and has demonstrated the willingness, to pursue desired projects without slighting others.

# ITS/CVO Vision and Project Matrix

| Vision Element | | ***Projects*** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CVISN Model Deployment (Category I) | | | | Empower Kentucky "MVE Initiative" (Category II) | | | | Empower Kentuc (Categ | | |
| | | Credentialing & Carrier Systems | Clearinghouse Interfaces | Safety Info Systems | Electronic Screening | Increased MVE Field Presence | Increase MVE Audit Staff | Technology & Computer Advances | Modify OS/OW Penalty System | Fewer & Simpler Forms | Staff & Taxpayer Training | Eliminate Bonding Requirements |
| | I. Streamline And Improve CVO | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | II. Continue Kentucky As A National ITS/CVO Leader | ■ | ■ | ■ | ■ | | | ■ | ■ | ■ | | ■ |
| | III. Conduct Paperless CVO Operations | ■ | ■ | ■ | ■ | | | ■ | | ■ | ■ | ■ |
| | IV. Improved Safety Performance | | | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| | V. Integrate & Coordinate | ■ | ■ | ■ | ■ | ■ | | ■ | ■ | ■ | ■ | |
| | VI. Self-sufficient, User Friendly, Multi-Vendor | ■ | ■ | ■ | ■ | | ■ | ■ | | ■ | ■ | ■ |

# Project Descriptions

The projects as proposed in the Vision and Project Matrix above represent an idealized domain of opportunities. Because the initiating agency or program underlying many of these projects differ many of the efforts appear to overlap. The project descriptions which follow are the harmonized list. That is, they represent the integrated and harmonized execution of effort in Kentucky which is required for a cohesive and effective deployment of technology and process change.

Whereas the matrices above indicate how individual projects can be expected to meet needs, solve problems, or increase efficiency and effectiveness, the descriptions which follow are a more realistic indicator of how these projects are being or will be deployed to meet "clusters" of needs.

Several observations are relevant. Advantage CVO provides recognition and legitimacy upon which subsequent regional initiatives are being built, and is supplying the basis for the Electronic Clearance portion of CVISN in Kentucky. CVISN Model Deployment is providing the vehicle for a fairly thorough introduction of technology to CVO. Second, the Empower Kentucky initiatives, because they reflect the experience and unique circumstances of Kentucky, provide process improvement input that can multiply the benefits of CVISN Model Deployment. Mainstreaming, as an explicit planning-intense process, becomes one of the important long-term means for Kentucky to maintain its leadership position.

## (Empower) MVE Process Improvement

***Sponsoring Projects/Agencies:***

Empower Kentucky: $1.03 million

***Other Agencies/Clients:***

FHWA/OMC CVISN Model Deployment, Motor Carriers, General Public

***Project Objectives:***

Increase enforcement presence and cause greater compliance with MVE regulations.

***Products/Outcomes:***

Initially higher, then ultimately lower, OOS rates among Commercial Vehicles. Improved interception of vehicles not on main line roads. Penalties that promote the enforcement function.

***Project Narrative:***

This process improvement focuses on the effort to move officers out onto the road system to intercept and inspect trucks that are avoiding inspection stations. It is a sampling strategy designed to increase the intensity of the random sampling of the truck population, and potentially reach a 'new' portion of the carrier spectrum. Along with the improved interception rate, the project calls for inspection data to be available on PC's in the patrol cars, so that any past information can be brought to bear on the inspection process. Current weigh station officers will

move into the field, and only inspection staff will operate the stations. Additional audit staff will be added at the central office also.

## ***Technical Approach:***

**Increased MVE Field Presence**

The participants in the Empower Kentucky process recognized that part of the key to safer roads is an increased enforcement presence on the roads. This recommendation includes a commitment to hire 22 new weigh station officers, and move them out of the weigh stations and onto the roads bypassing the weigh stations. If they prove to be effective, up to 44 additional officers may be hired and used in the same manner.

**Increased MVE Audit Staff**

Similarly, the ability to effectively monitor the safe carrier is augmented by additional staff. Five new audit staff will be added to better monitor the information developed by the field officers.

**Provide Laptop Computers in the Field**

Roving officers will need immediate access to safety information to adequately monitor truck activity away from the weigh stations. This recommendation focuses on the paperless safety enforcement process, reliant on the thorough integration of information sources.

**Modify OS/OW Penalty System**

This recommendation is aimed more at policies that help enforcement to operate more effectively, so it is an integration of a different kind. Nevertheless, detection of unsafe operators is meaningless without appropriate penalties.

## ***Resources Required:***

**Implementation**

Personnel: PC and communications installation in patrol cars, training

Capital Investment: Portable PC's and communications hardware

**Operations**

Personnel: 22 new inspectors + 5 new auditors

Maintenance: Hardware/software proofing in cars (on going cost to be determined)

Operations: Communications/transportation costs

**Total Cost**

$1.03 million over 3 years, plus yearly personnel costs after that, not including a potential additional 44 inspectors.

## ***Major Issues/Problems:***

Deployment is partial to evaluate the effectiveness of additional field officers. Communications for cars, and reliable PC's in cars, are still under study. A major problem has been the data

communications carriers. A test of three sites using a satellite based communications system proved to be too slow. Modification of the OS/OW laws will require legislative action.

***Schedule/Timing:***

First 22 hired, trained and on the job by 7/1/98. If successful, additional 44 in place by 7/1/02. Laptops and communications systems operational by 1/1/99.

# Advantage CVO (I-75)

***Sponsoring Projects/Agencies:***

FHWA/OMC: 80% cash; Participating States: 20 % cash + infrastructure preparation (approximately 50%-50% split for total costs); Post-Pilot Funding: Participating States: $100,000/year

***Other Agencies/Clients:***

6 states and 2 provinces along the I-75 corridor from Florida to Canada, commercial carriers, general public

***Project Objectives:***

Test the efficacy of technologies for screening trucks along major highways, and build the necessary institutional framework to support a multi-state communications and technology system.

***Products/Outcomes:***

A safety and weight-based screening system for a set of approved carriers operating on the I-75 corridor that reduces the frequency of stops. This contributes to efficiency and safety for all traffic on the corridor.

***Project Narrative:***

This project is responsible for much of Kentucky's current opportunity, by providing a regional test-bed for roadside ITS-CVO. It has nearly reached maturity, having demonstrated the potential for electronic information systems to screen and clear trucks at highway speeds. It has brought together an array of states and two countries and tested a variety of technologies while maintaining a stable institutional umbrella within which to conduct an operational test. It is now the vehicle that will allow the deployment of a new MACS, an improved and rationalized version that provides greater interoperability and improved carrier service. Enrollment in the system will be increased to over 10,000 in the next year, even as the system is transitioning. While it faces internal integration weaknesses, it has at the same time demonstrated superb external integration capabilities, bringing together a great many public and private entities in a common endeavor.

***Technical Approach:***

A DSRC system combined with mainline WIMS, ramp WIMS, and truck dectors was fully integrated in a corridor setting. The DSRC transponder carries event information and the bypass

is dependent on an enrolled vehicle list resident in the reader. Bypasses are also subject to random pull-in. Event data during the operational test has been maintained for evaluation purposes. The operational test system provided operators with an approaching vehicle list and the ability to interrupt the automated bypass. The new MACS (including an updated MACS75 version) functional requirements can be found in Appendix A.3.

***Resources Required:***

**Implementation**

Personnel: Installation and modification of hardware/software

Capital Investment: WIMs, Readers, Communication system, Transponders, PCs, Software

**Operations**

Personnel: Operations center to track enrollments and daily data

Maintenance: Hardware and software modifications and troubleshooting at an annual cost of less than $15,000 per station.

**Total Cost**

Estimated $13.5 million to date for all participating states

***Major Issues/Problems:***

Hardware reliability posed the greatest challenge. System complexity created many opportunities for failure. Current system reliable. Institutional issues of cooperation mostly solved. System finance strategy unsolved at national level.

***Schedule/Timing:***

System shifts from Federally-supported test-bed to stand-alone operation on October 1, 1997. Participating states have adopted a modified operational concept that enables them to continue operation of the system with state funding. Entire system is anticipated to shift to CVISN compliance in next 2 years. (See Electronic Screening Project)

# Registration, Taxation, and Permitting Improvements

***Sponsoring Projects:***

FHWA/OMC CVISN Model Deployment: $269,000; Empower Kentucky & KTC: $685,000 & $456,000

***Other Agencies/Clients:***

Commercial Vehicle Operators, Safety and Enforcement, Taxation

## ***Project Objectives:***

Reduce time and money costs to public and private sectors of registration, taxation and permitting. Increase levels of compliance with registration, taxation and permitting requirements.

## ***Products/Outcomes:***

Simplified registration, taxation and permitting processes through electronic application, information sharing, employee cross-training, and improved compliance incentives. Relatively greater benefits for smaller carriers, but significant benefits for nearly all carriers.

## ***Project Narrative:***

This project is a cooperative effort composed of electronic upgrades sponsored by CVISN Model Deployment and process improvements advocated by the Empower Kentucky initiative. The Empower Tax Process Team recognized at the outset that the registration process was costing enforcement and carriers time and money. Thus they concentrated on improving processes. Registration will be performed from carriers' PC or through public access points, such as county court houses or libraries. Cross-trained staff will assure that in-person visits will involve a minimum of contact people. Participation in regional registration and fuel tax clearinghouses will speed and smooth allocation of tax funds. Oversize/Overdimensional permitting will be automated so that they may be issued more rapidly. Registration information will also be made available to enforcement personnel at the roadside. Conceptually, the overall project addresses Credentialing and Carrier Systems, Clearinghouse Interfaces, Bonding Requirements, Staff Training, and Regulation Uniformity.

## ***Technical Approach***

**Credentialing and Carrier Systems**

As part of CVISN Model Deployment, the credentialing projects are aimed primarily at reducing the time and labor costs of the permitting function. They involve automating the current paper-based registration process, so that electronic information transfers can substitute for information and money currently transmitted through the mail. Successful deployment of this component is especially reliant on user-friendly software.

One of the objectives of the Kentucky model deployment is to demonstrate electronic application for credentials by motor carriers through appropriate PC software interface (CATS) in the carriers' office and a similar interface in the state office for purposes of entering data in that office, when needed. A further articulation of this concept envisions the interface as web-based, so that carriers can use most popular web browsers to reach a CAT interface that resides on the state's servers.

As part of Kentucky's objective to—

- demonstrate electronic application, permitting, and tax processing for credentials by motor carriers and
- interface the state's systems to the International Registration Plan (IRP) and the International Fuel Tax Agreement (IFTA) Clearinghouses

the state is planning to demonstrate the implementation of a Credentials Interface (CI) that will communicate with the CAT or Web Interface on one hand and translate the information into a useable format for legacy systems on the other. Those legacy systems interfaces to be upgraded are

- KY Intrastate Tax System
- Oversize / Overweight
- Single State Registration
- KY Weight-Distance Tax
- KY Special Permitting (Temporary Authority)
- IFTA
- IRP

The Credentialing System improvements will also include establishing a state web interface for the IRP, IFTA, and Overweight/Overdimensional, along with appropriate connections to the IFTA and IRP clearinghouses.

**Clearinghouse Interfaces**

Clearinghouse interface improvements concentrate on completing the information circuit with regional clearinghouses, so that important tax and registration information about carriers can be shared between states. Thus integration and coordination are the primary concerns of Clearinghouse Interface projects, and user-friendliness is slightly less of a concern.

**Eliminate Bonding Requirements**

This initiative responds to a problem whereby the price to ensure compliance is greater than the compliance fees themselves. The current bonding arrangement costs carriers several million dollars a year, while yielding the Cabinet around $775,000. The new policy will only require bonding from carriers with a record of poor reliability.

**Regulation Uniformity with Other States**

This initiative, while broadly stated, is aimed at improving the operational climate for carriers by reducing the complex of regulations faced by them.

**Cross-Train Staff**

While process improvements often take the form of new configurations of people and technology, few recognize the need for versatile staff that can accommodate the increasing rate of change.

## ***Resources Required:***

**Implementation**

Personnel: Software modifications, Employee retraining

Capital Investment: Software & hardware in agency , carriers' sites, and public sites

**Operations**

Personnel: Four to five new staff. Training at remote sites

Maintenance: Software & hardware maintenance and upgrades (the full extent of on-going cost to be determined)

Operations: Carrier Outreach, Local Site Support

**Total Cost**

$1.4 million over 3 years.

***Major Issues/Problems***

External software development schedule lagging. Carrier support and training obligations may grow with increasing adoption of the concept. Additional money may be needed to extend coverage to more carriers in following 3 years.

***Schedule/Timing***

Initial IRP installations of system and 3 pilot carriers by 1/1/98. Extension to 12 carriers by 1/1/99, 10% of carriers by 1/1/00, and 50% of carrier market by 1/1/02. Motor carrier education on the adoption and use of the system will need to extend to at least 7/1/99.

# Electronic Screening

***Sponsoring Projects:***

FHWA/OMC CVISN Model Deployment: $630,000; Kentucky Transportation Cabinet: $313,000

***Other Agencies/Clients:***

Commercial Vehicle Operators, JHU/APL, Other States, and General Public

***Project Objectives:***

Improve speed and selectiveness of current method of screening. Extend screening capability to all weigh stations in state. Reward safe carriers, target unsafe carriers.

***Products/Outcomes:***

Screening hardware/software that relies on CVISN-based information as to safety history, registration and permitting records, to indicate the likelihood of selecting trucks for weighing and/or inspection. Installations that are interoperable technically and institutionally with other CVISN compliant screening systems. Unmanned, remote installations on selected bypass routes to better monitor carriers who may be avoiding mainline inspection stations. Remote sites would employ the same screening philosophy as mainline stations.

***Project Narrative:***

Kentucky's redesigned roadside clearance system emphasizes clearing safe carriers and weighing those who are pulled in for other reasons. This creates a system more user-friendly, and reliant on good safety performance and information integration. Again, the primary issue is currency and accuracy of information.

While Kentucky has had much experience with mainline automated clearance systems (MACS), the expansion of the concept to include satellite sites and video/OCR capability results in a more dynamic and effective system.

MACS exists at 4 stations in Kentucky along the I-75 corridor in the Advantage CVO Partnership. While currently a post operational test, the Advantage CVO MACS will not be deployed as the CVISN electronic screening model for Kentucky. A different and more open model known as the new or model MACS will be developed and deployed instead. Using lessons learned from the Advantage CVO Partnership, the new MACS will be relying less on the in-vehicle transponder and more on the processing of snapshot data at the roadside. Kenton County will be retro-fitted as a CVISN compatible weigh station. Ideally, this will also serve to demonstrate MACS75 and model MACS system inter-operability generally.

## ***Technical Approach:***

Model MACS will be the primary DSRC-based electronic screening sub-system within Kentucky's screening strategy. Satellite sites and video/OCR technology, however, will greatly enhance mainline screening. Satellite sites will be unmanned sites located on by-pass routes remotely operated by the nearby mainline station. The basic system will utilize video readers for vehicle identification. The system will be designed to permit OCR and WIM upgrades when determined cost-effective for this application.

OCR readers offer great flexibility to the screening process. The basic configuration entails a video/OCR reader at the ramp sorting WIM processing against the snapshot database. An additional function of this reader would be to validate the registered weight against actual weight.

[See Appendix A.3 for the functional requirements driving the technical approach, design and implementation of the new MACS]

## ***Resources Required:***

**Implementation**

Personnel: Software modifications, training

Capital Investment: Readers, WIMs, Cameras, Computers, Land and Installation at satellite site

**Operations**

Personnel: Monitor Satellite Sites, Retraining

Maintenance: Hardware/Software Upgrades, WIM and Camera Care (Annual cost for station and one satellite site is estimated at less than $20,000)

**Total Cost**

$943,000 over 5 years, including all weigh stations

## ***Major Issues/Problems:***

Smooth conversion path from current weight-based Advantage CVO installations to CVISN information-based evaluation. Adoption of philosophical shift from weight-based to safety and compliance-based screening. Evaluation of effectiveness of remote (satellite) sites.

## ***Schedule/Timing:***

Testing new system at one station by 9/1/98. Accompanying remote site by 1/1/99 Three sites by 1/1/00, all sites by 6/1/02.

# I-65 Electronic Screening Test

***Sponsoring Projects:***

Kentucky Transportation Cabinet $100,000; Indiana DOT: $100,000

***Other Agencies/Clients:***

Commercial carriers.

***Project Objectives:***

To develop a low-cost approach to electronic screening which encourages maximum participation.

***Products/Outcomes:***

A system design which can be (relatively) inexpensively procured, installed, and maintained.

***Project Narrative:***

In the process of redesigning the Advantage CVO Mainline Automated Clearance System (MACS) software for CVISN a number of interoperable, but alternative models, were designed. It became clear from the experiences learned from Advantage CVO that a low-cost alternative was needed to maximize the number of states which could deploy electronic screening systems. The challenge was to eliminate the need for a weigh-in-motion scale and the expensive networking between weigh stations, which are/were features of the original I-75 MACS.

***Technical Approach:***

I-65 MACS will utilize a "quality control" approach to screening where trucks will be pulled-in for weight and safety checks randomly. As a history of their weight and safety performance is compiled over time, the rate of "pull-ins" can be varied according to their weight and safety performance. This system and methodology is very similar to the electronic screening system to be used by Kentucky for CVISN (*Model MACS*); however, it does not require the near real-time data link to acquire snapshot data from the CVIEW.

[See Appendix A.3 for functional requirements driving the technical approach, design, and implementation]

***Resources Required:***

**Implementation**

Personnel: Installation of new software

Capital Investment: New software

**Operations**

Personnel: No effect

Maintenance: Reader maintenance (Annual cost expected to be less than $10,000 per station)

Operations: Expanded screening capabilities

**Total Cost**

$200,000 over two years

***Major Issues/Problems:***

Acceptance of the motor carrier industry of this screening approach.

***Schedule/Timing:***

Installation at one station to be completed by 1/1/00.

# Institutional Issues Working Group

***Sponsoring Projects/Agencies:***

FHWA/OMC: $600,000

Participating States: $600,000 (Kentucky $50,000)

***Other Agencies/Clients:***

14 Southeast and Midwest states

***Project Objectives:***

Devote collective resources of member states to solving common institutional issues of CVO.

***Products/Outcomes:***

1. Descriptions of the processes and systems of each of the 12 states.
2. A data dictionary for all data elements for all 12 states.
3. A requirements document for the carrier-agency interface and to maintain CVISN compliance.
4. An implementation plan for each of the 12 member states.

***Project Narrative:***

Current attention is aimed at common data requirements and format for CVO registration. Deadline is September 1998. The prime contractor tasked is the Georgia Institute of Technology.

***Technical Approach:***

The study approach includes detailed interviews, data requirement analysis, and process/organization mapping.

***Resources Required:***

**Implementation**

Personnel: Interviews, collating, dictionary preparation, requirements summary

**Total Cost**

$1.2 million

***Major Issues/Problems:***

Conducting the research and implementation in a manner that is complementary to the CVISN architecture. Potential exists to define an extended CVIEW snapshot common to a region.

***Schedule/Timing:***

ASAP: Project must be completed by 10/98.

# Kentucky-Tennessee Joint Weigh Station Project

***Sponsoring Projects:***

Kentucky Transportation Cabinet, Tennessee DOT, and Tennessee Department Safety

***Other Agencies/Clients:***

Commercial carriers

***Project Objectives:***

Reduce enforcement costs by cooperating on the enforcement efforts in weigh stations along shared borders.

***Products/Outcomes:***

Tandem weigh stations, one on each side of the border, that both meet the weight and inspection enforcement and information needs of both states, thereby eliminating the need for two additional stations. The northbound weigh station would be provided by Kentucky, and the southbound by Tennessee.

***Project Narrative:***

This project is an outgrowth of the regional philosophy pioneered by the Advantage CVO (I-75) project and formalized by the CVISN architecture. The exact nature of this field enforcement cooperation is in part a function of the final form of other ITS-CVO projects underway in the two states, so that enforcement philosophies and needs can be harmonized. This project will also help enable future similar efforts with West Virginia.

***Technical Approach:***

CVISN compatible facilities are anticipated to include DSRC-based electronic screening. Technical interoperability is achievable, however administrative interoperability is a significant roadblock. Tennessee has declared their intent to achieve interoperability using Lockheed-Martin/HELP as their electronic screening provider. Kentucky continues to demonstrate its willingness to achieve interoperability while maintaining its concept of an open DSRC system that does not depend on transaction fees in Kentucky. (Discussions are on-going.)

***Resources Required: (to be jointly determined)***

**Implementation**

Personnel

Capital Investment: Communications equipment installation at both stations

**Operations**

Personnel

Communications

Maintenance

Operations

***Major Issues/Problems:***

Cooperation on issues of enforcement needs, requirements, registration information, inspection techniques, and electronic information sharing. A major difference occurs when the profit requirements of privatization oppose the regulatory responsibilities/incentives of the public sector. The conflict centers on government's concern for competition with its efficiency and innovation vs. the monopolistic intent of the private firm to control the market which tends to drive up costs to customers/users.

***Schedule/Timing:***

No firm schedule has been established, as it is reliant on resolving other interoperability issues.

# CVISN Mainstreaming for Great Lakes and Southeast Regions

***Sponsoring Project:***

FHWA/OMC CVISN Mainstreaming Initiative: $529,000; Kentucky Transportation Cabinet: $30,000

***Other Agencies and Clients:***

13 client states in two truck-sheds concerned with CVO regulation. (Agencies vary by state.) Commercial vehicle operators, general public.

### ***Project Objectives***

To improve CVO regulatory processes in each state, including Kentucky, through process improvement and leveraging of the developing national-level CVISN architecture for CVO.

### ***Products/Outcomes***

State ITS-CVO business plans and implementation schedule, and the initial process of implementation. A regional coordination plan for each of the two regions dovetailing the individual state efforts and capitalizing on opportunities available to groups of states.

### ***Project Narrative***

Mainstreaming is an activity supporting CVISN Deployment, and concentrates on the sharing of knowledge and the development of plans for the implementation of ITS-CVO projects across the country. Kentucky's role is thus threefold: the support of the business planning process in states in the Great Lakes and Southeast States, the preparation of a regional CVISN business plan, and the preparation of its own plans for the long-term deployment of ITS-CVO projects. The Kentucky Transportation Center, as Regional Champion, provides planning guidance, general information resources and support, information and communications support, through conferences, visits, information products, planning tools, and communications tools.

### ***Technical Approach:***

The state planning process encouraged relies upon established techniques of strategic and business planning including situation analysis and group facilitation methods. Various approaches are used for information sharing including case studies of 'best practices' and a web site for distribution. Regional forums allow a high level of personal interaction among states and planning coordination is conducted through focus groups and work groups.

### ***Resources Required:***

**Personnel**

Planning, Business, Information Systems, Project Management, Client Outreach, Public Information

**Capital Investment**

PC's for Electronic Communications, Presentation Tools, Electronic Information Management Software

**Total Cost**

$529,000 for two years

### ***Major Issues/Problems:***

Imprecise benefits to states, due to early stage of technologies. Small grant amounts to individual states to finance business planning process. Institutional conflicts within states due to reconfigured processes.

***Schedule/Timing:***

State plans complete by 4/1/98. Regional plans complete by 7/1/98. Implementation support to continue for duration of five-year plan.

# Mini-CVO IRP Joint State Test

***Sponsoring Projects:***

Kentucky Transportation Cabinet, interested private carriers

***Other Agencies/Clients:***

Other states

***Project Objectives:***

Extend the advantages of electronic registration to the less-than-26,000 lb. parcel van.

***Products/Outcomes:***

Expanded registration capabilities for CATS. Extension of registration, taxation, and permitting information to cover small CVO as well as TL and LTL.

***Project Narrative:***

The primary advantage of CATS is the time and inconvenience saved in registering large numbers of trucks. Some companies have equally large numbers of small CV that require registration. While attention has been focused on large CV because of their greater complex of regulation requirements, the advantages of the automated process can nevertheless be extended to smaller vehicles.

***Technical Approach: (not applicable)***

[For reference see previous Registration, Taxation, and Permitting Improvements project.]

***Resources Required:***

**Implementation**

Personnel: Modification of existing software

**Operations**

Operations: Expanded volume of automated registration

**Total Cost**

Unknown at this time

***Major Issues/Problems:***

Unknown.

***Schedule/Timing:***

Following proofing of system under CVISN: 1999 or later.

# Safety Information Systems

***Sponsoring Projects/Agencies:***

FHWA/OMC CVISN Model Deployment: $60,000; Empower Kentucky: $1.04 million; MCSAP $100,000

***Other Agencies/Clients:***

Commercial Vehicle Operators, General Public

***Project Objectives:***

Make near real-time safety and compliance information available to enforcement officers at inspection stations.

***Products/Outcomes:***

Electronic access to safety, registration and taxation databases, both nationally and state-based (CVIEW snapshot), on PC's in each inspection station. PC's also provide input to same databases for inspection results. Communication network extending into each inspection station for purposes of carrying data in and out.

***Project Narrative:***

Safety information system projects are designed to get current safety information to the roadside for immediate evaluation of carriers. The emphasis is on improving safety and rewarding safe carriers, regardless of whether the information is paperless or not.

In its most simple form, the CVISN safety system involves the collection of safety information at the roadside, the forwarding of that information so that it can be aggregated with other information, and finally making that aggregated data available to those making screening decisions and conducting inspections. This process, while not requiring a real-time automated screening decision, is greatly limited without one.

***Technical Approach:***

To accommodate the volume of data flowing to and from the weigh stations, we anticipate installing a high speed network connection such as frame relay which offers some measure of backward compatibility.

Suggestions arising from the Empower Kentucky initiative have pointed to alternatives to the strict use of pen-based computers for inspection purposes. While offering the mobile officer a greater degree of autonomy, at fixed sites we believe we can be more productive with networked workstations on which all weigh station operations will be integrated.

This offers several advantages. First, the workstation will not be dedicated to only one function, thereby permitting weigh station personnel greater flexibility in performing their duties. Second,

the intended network architecture at the weigh station will offer better system reliability in the event one machine fails. Third, the workstations will offer generally improved communications between field and administrative personnel. Accordingly, laptop PCs, which offer the portability of the pen-based units and the flexibility of the workstation, will be used. Ultimately, these machines can be expected to perform many associated functions such as automated citations and accident reporting.

### ***Resources Required:***

**Implementation**

Personnel: Communications infrastructure installations, PC installations

Capital Investment: Software & hardware

**Operations**

Personnel: Retraining

Maintenance: Software & hardware upgrades (ongoing costs to be determined)

Operations: Subscription costs to databases

**Total Cost**

$1.2 million over 3 years

### ***Major Issues/Problems:***

Persuading carriers that extensive information access is in their best interest. Reliability and current nature of information.

### ***Schedule/Timing:***

All 18 weigh stations to be networked by 1/1/99.

# Kentucky Statewide ITS Plan

### ***Sponsoring Projects/Agencies:***

Kentucky Transportation Cabinet, Division of Planning: $200,000

### ***Other Agencies/Clients:***

MPOs, ADDs, and Commercial Carriers

### ***Project Objectives:***

Create a forum for the long-term coordination of ITS deployment in Kentucky.

***Products/Outcomes:***

Produce a guiding document that unifies the ITS community and coordinates ongoing and future ITS projects in Kentucky.

***Project Narrative:***

This project has arisen out of the need to give better direction to a wide range of projects underway throughout the Commonwealth, sponsored by disparate agencies at the state and regional level. Traffic information systems, tunnel monitoring, CVO regulatory processes, and weather monitoring systems all fall under the umbrella category of ITS, yet currently operate independently of each other.

***Technical Approach:***

The study approach calls for an examination of the ITS potential for all user services. The plan will be developed in sections that focus on traditional ITS areas including CVO. This strategic/business plan in a somewhat modified form will constitute the CVO section of the statewide ITS plan. Opportunities for synergy among the ITS areas will be closely examined. This examination may result in some modification to this plan.

***Resources Required:***

**Implementation**

Personnel: Planning, Business, Information Systems, Project Management, Client Outreach, Public Information

**Total Cost**

$400,000

***Major Issues/Problems:***

Creating a common vision from a wide array of views and approaches to ITS. Producing a document and framework that has buy-in from all parties and is flexible enough to accommodate change.

***Schedule/Timing:***

Complete plan due 7/1/99, draft segments will be issued as developed.

# MAPS-Advantage CVO Interoperability Agreement

***Sponsoring Projects/Agencies:***

Advantage CVO Partnership, Multi-Jurisdictional Automated Preclearance System

***Other Agencies/Clients:***

Member states, Future member states, Commercial carriers

***Project Objectives:***

Create a common application, technology, and clearance environment for the participating carrier

***Products/Outcomes:***

Participating carriers can use one transponder to electronically clear weigh stations allied with either system.

***Project Narrative:***

This agreement is the first of its kind to commit to operationally solve the potential interoperability issues between two independently developed electronic screening systems, all the while remaining compliant with the CVISN architecture.

***Technical Approach:(not applicable)***

***Resources Required:***

**Implementation**

Personnel: Information Systems, Project Management, Client Outreach, Public Information

**Total Cost**

Unknown, anticipated to be minimal

***Major Issues/Problems:***

Creating a common application form. Resolving differences in the market approach to distributing transponders.

***Schedule/Timing:***

Initial agreement signed January 29, 1998. Full implementation expected by September 30, 1998.

# Infra-red Brake Testing Technology (IRISYSTEM)

***Sponsoring Projects/Agencies:***

FHWA/OMC, Kentucky Transportation Cabinet, Virginia, North Carolina, Tennessee

***Other Agencies/clients:***

Commercial Carriers

***Project Objectives:***

Assess the utility of a system for quickly measuring the condition of brakes, under a variety of conditions and geographical settings.

***Products/Outcomes:***

Recommendations as to improvements to and further deployment of brake testing technologies in the participating states.

***Project Narrative:***

This technology appears to hold promise as a way to quickly evaluate the condition of brakes on a large number of trucks, thus speeding up the inspection process and improving the quality. An infrared camera detects a surplus or deficit of heat in brakes, tires, and loads, thus indicating overloaded or low pressure tires, failing or non-functioning brakes, and certain characteristics of some cargo. An added video camera provides overall truck identification for later use, if needed.

***Technical Approach:***

The technology is basically prepackaged (like a speed detecting radar unit, only larger). Use/application training is required.

***Resources Required:***

**Implementation**

Personnel: Extensive training required (min. one week)

**Maintenance Costs (Unknown)**

(vehicle cost at least $0.25/mile)

**Total Cost**

App. $500,000 (per equipped van)

***Major Issues/Problems:***

High cost of equipment. Requires a trained crew for effective use. Reliable and useful results require personnel dedicated to that enterprise alone, removing them from other enforcement activities.

***Schedule/Timing:***

Complete by 7-1-99

**Chapter 6 -- Final Note on Project Funding**

Only two of the above projects are considered unfunded as this plan is published: 1) KY-TN Joint Weigh Station Project and 2) Infra-Red Brake Testing Technology Project. However, several projects have continuation aspects that will be impacted by future funding availability at both state and federal levels. A statement on funding policy/strategy for ITS/CVO can be found in Chapter 8 of this plan.

# Chapter 7: Implementation Schedule

# Chapter 8: Deployment Strategy

## Outreach and Training

Currently and in the future, the outreach and training to the Kentucky motor carrier industry is taking many forms.

The North American Trucking Show is held each year in Louisville, Kentucky, and provides an excellent forum to reach very large numbers of carriers in one location. Each year, the Kentucky Transportation Cabinet, Vehicle Enforcement Division, occupies a very visible booth and invites the Kentucky Transportation Center to share this space for distribution of Mainstreaming brochures and give aways. In 1997, we attempted to display an ongoing slide show with sound with limited success. The noise level did not lend itself to the any outreach mechanism that relies on sound. Therefore, we have abandoned the idea of using any type of sound in the future and plan to concentrate on simplified and plain spoken brochures, handouts and freebies. Again, this is an annual event and plans to attend each year exist.

Mainstreaming updates are also a part of the Kentucky Motor Transport Association's Annual Meeting. Traditionally more of a recreational event than a structured meeting, the KMTA graciously sets aside as much time as we (Kentucky Transportation Cabinet and Kentucky Transportation Center) request to present an update on CVISN, Mainstreaming, and the improvements being made in the services and methods of operations for commercial vehicle community. We take advantage of this opportunity to educate and the carriers present on the important role these programs have played in improving commercial vehicle operation throughout the state. Discussions are now underway to change this delivery mechanism, beginning next year, to a half day, and jointly sponsor a Saturday session, independent of the KMTA's annual meeting in an effort to reach a maximum number of carriers.

Under the direction of Commissioner Logsdon, two separate advisory committees have been formed: the Kentucky Motor Carrier Advisory Committee and the Kentucky Motor Coach Advisory Committee. The purpose of these boards is two-fold. First of all, they provide an excellent opportunity for the carrier industry to give input and voice their concerns directly to the commissioner. Secondly, these committees provide another means of communicating about Mainstreaming, the program's advantages and benefits, directly to the carriers. These committees have been and will continue to meet quarterly. They have proven to be an effective tool in collecting and disseminating information, as well as enhancing a solid partnership between the carriers in the state and the state government agency that serves them.

Recently, training sessions, under the direction of the Kentucky Transportation Cabinet, were initiated. The purpose of these sessions is to inform and educate carriers on the correct methods of completing all paperwork associated with legally operating their commercial vehicles in Kentucky. Additionally, instructions are given on the proper procedures regarding tax payment. Four sessions have taken place to date in the cities of Shelbyville (northwest), Maysville (northeast), Winchester (central), and Morehead (eastern). The sessions are held in the evenings in the hope of attracting carriers following usual business hours. The announcement procedure involves several avenues. Initially, personal invitations are sent to carriers in the geographical area where the session is to be held. Also, advertisements are placed in the local newpapers, as well as announcements in the KMTA monthly newsletter. All totaled, plans exist for 15-20 sessions to be held in the coming months. This plan includes two sessions, one during the day and one at night, for the most heavily populated cities, Lexington and Louisville.

In the late fall or early next year, when the electronic IRP registration system is operational, this process will begin once again to educate and in some cases reeducate carriers on the use of the internet to register their commercial vehicles.

Currently, several carriers are piloting the use of the InterCAT software that enables users to register their commercial vehicles over the internet. Provided all goes well during this testing phase, user availability will be expanded in the fall of this year. The present test carriers were chosen in terms of their size, safety record and geographical location. Accordingly, additional carriers will be added through this same innovation/diffusion method. Currently, the installation of the software and the training on the use of this software has been done in person by a Transportation Cabinet employee. In the fall/winter of this year, training sessions will be held for carriers in various cities, much like the present training sessions are done for the education on the paper version of registration.

It is forseeable for the incorporation of this new technology to produce the need for a help desk, located directly in the Kentucky Transportation Cabinet, to exclusively assist users with their questions and concerns. We are hopeful that the number of users will increase steadily throughout 1999 and that a help desk will provide users the most effective and easily accessible method of assistance in addition to initial training sessions.

Kentucky utilizes several web sites in an effort to provide the ITS-CVO community and the general public access to information about ITS-CVO technologies, events and people. These searchable web sites provide contact and data information, as well as focused electronic discussion lists for the purpose of maintaining contact and discussions across many miles and between many people. These web sites have proven to be a valuable tool in the sharing of information of all types and will continue to be updated and enhanced to ensure an informative, user friendly, medium exists.

## Funding Strategies

The primary ITS/CVO improvement funding policy/strategy is to:

- Use state regular state funds to provide an expanding operating base
- Use special state funds (i.e., Empower Kentucky Program) for targeted improvements
- Use state funds to aggressively leverage federal funds to enhance safety and efficiency

In addition, full utilization will be made of special state and agency funds for developing and maintaining information technology systems. Cooperative ventures among state and federal agencies focusing on ITS will be persued. Cooperative ventures with motor carriers and other private sector firms to further safety and efficiency will be encouraged.

Kentucky does not anticipate special charges or transaction fees to implement ITS/CVO technology resident in facilities. It is realized that some improvements could potentially generate some measure of extra fees from the trucking community. However, these same benefits accruing to carriers can also serve as an added incentive for safety compliance. This kind of payoff will accrue to the carrier and the general public in terms of safer highways. Other efficiency savings can help reduce the cost of the regulatory burden on the trucking industry—this opportunity should not be lost.

## Long Term Goals for Kentucky ITS-CVO

When Kentucky first became involved with CVISN Model Deployment in 1996 the Kentucky team ask the FHWA/OMC and JHU/APL briefing representatives—"What comes after CVISN (Level 1)?" The silence was telling, not much thought had been given to the beyond. Finally, someone said – "well, this is a lot to keep us all busy for the next several years." As we know Level 1 Model Deployment provides only an architectural foothold for advanced deskside and roadside CVISN deployment. It may be thought of as proof of concept, but can then be scaled up (e.g., more carriers making electronic application more weigh stations with electronic screening). This scaling up would then realize the fullest benefit of Level 1.

It should be noted that some delay has been experienced in receiving critical components of the CVISN architecture from JHU/APL and other consultants/vendors. Kentucky has developed contingency plans/approaches to the extent possible. While federal funding has also lagged this has not, to date, been a significant problem to Kentucky. What had been considered short-term project activity (even with the two CVISN pilot states) has been extended to at least the mid-term for CVISN Level 1.

But what about beyond? It is clear that there are additional gains that need to be made in safety, simplicity, and savings regarding commercial vehicle operations in Kentucky. Consideration in the future will be given to:

**Improving safety strategy**

- High-risk carrier/driver identification
- Performance improvement tools/incentives

**Increasing carrier involvement and responsibility**

- On-board safety technology
- Carrier self-inspections and certifications

**Improving special purpose permitting and monitoring**

- Over Size and Over Weight Permitting
- HAZMAT Monitoring

**Improving administration of special carrier/truck populations**

- Delivery trucks/vans
- Intracity trucks

**Improving interstate incident handling involving trucks**

- Truck recovery efficiency
- Special incidents including HAZMAT

These are the kinds of improvements that will be given consideration in subsequent iterations of the strategic/business planning process (The strategic vision statement in this plan already extends to 2007, see Chapter 3 in its entirety for a longer range perspective). However, we acknowledge the significant changes entailed by CVISN Level 1 (and its systematic extension) and the Empower Kentucky initiatives. As these changes are implemented and evaluated subsequent improvement/refinement will undoubtedly be required. Extending CVISN and making CVISN work will be a continuing Kentucky CVO focus for the foreseeable future.

# Appendices

**A.1 Results of Strategic Planning Workshop**

**A.2 "Empower Kentucky" Motor Vehicle Enforcement Process Redesign**

**A.3 Functional Requirements for New MACS Software**

# Appendix A.1 Results of Strategic Planning Workshop

Report on Strategic Planning Results

## Commercial Vehicle Operations

Commonwealth of Kentucky

Summer 1996

## Mission for Commercial Vehicle Operations

As a result of the strategic thinking to date, Kentucky has set forth the following draft mission statement:

> ***to engage in the enforcement of motor carrier safety and regulatory laws in a manner which will not significantly impede the motor carrier industry or the promotion of commerce in Kentucky and the nation***

This statement must be coupled with the overall mission of the KYTC, to:

**provide a safe, efficient, environmentally sound, and fiscally responsible transportation system which promotes economic growth and enhances the quality of life in Kentucky.**

At the core of this evolving mission statement is a set of concerns which include safety, credentials and revenue, infrastructure protection, and efficient and uniform administrative processes.

## Issue Analysis

The work group developed an extensive list of issues (46 individual issues) that were grouped into six categories: government role, private sector role, technology use, uniformity, safety, and revenue/ funding level. After all the individual issues within these categories were discussed, the group selected the key issues by scoring (in priority order) as follows:

| Key Issue | Score |
|---|---|
| ❑ **safety (public, carrier, and officer)** | **32** |
| ❑ **uniformity and technology use** | **22** |
| ❑ **consistent / adequate funding** | **22** |
| ❑ **government / private sector roles** | **14** |
| ❑ **industry awareness** | **6** |
| ❑ **electronic linkages** | **6** |
| ❑ **timely and accurate data** | **6** |

The above seven issues were considered to be of strategic concern with the highest priority being placed on safety. Scores were tied for the second priority issue (uniformity/technology and consistent/adequate funding) and there was a three-way tie for the final priority issue. Goals and objectives are to drawn from the results of this analysis to guide the use of resources.

**SWOT Analysis Results**

The ITS/CVO working group discussed and decided on the strengths, weaknesses, opportunities, and threats to CVO operations in Kentucky. The following summarizes their findings:

| SWOT | + | – |
|---|---|---|
| | **Strengths** | **Weaknesses** |
| **Internal** | • program for safety and revenue<br>• important functions together<br>• expertise in many areas<br>• technology use<br>• positive state/federal partnership<br>• scale facilities<br>• good enforcement record<br>• problem/solution orientation<br>• potential for Federal funds<br>• location of Kentucky<br>• highway system in Kentucky<br>• considered "fair" by industry | • low staffing level<br>• no electronic access for industry<br>• tax controversy<br>• too much with too little<br>• training in new technology<br>• lack of industry presence in Kentucky<br>• industry awareness of services<br>• systems interfaces<br>• funding level/equity<br>• communication re: new things<br>• mind set to resist change (negativity) |
| | **Opportunities** | **Threats** |
| **External** | • increased funding<br>• uniform system direction<br>• paperless environment<br>• high risk safety targeting<br>• higher use of technology<br>• improve image (econ. dev.)<br>• improve industry awareness<br>• increase carrier base population | • high levels of truck traffic<br>• CVO tax structure<br>• considered "unfriendly" by industry<br>• more efficient trucks (fuel tax impact<br>• funding "shell game" (fed/state)<br>• move from people to technology<br>• mission being safety compromised |

# Appendix A.2 "Empower Kentucky" Motor Vehicle Enforcement Process

## Involved parties included line, staff, and management personnel

- Inspectors
- Officers
- Information technologist
- KYU clerks

## Goals / Issues to Solve

***Increased highway safety***

Estimated total cost of accidents to Kentucky in 1995 > $500 M

Even small gains create huge savings

Ability to make improvements has been demonstrated; it's possible

***Increased tax compliance***

Experience shows that increasing observation data improves audits and, thus, revenue collection

Better data is even more vital for audits in the IFTA context

***Reduction in motor carrier downtime***

A conservative estimate of 6 minutes lost per weigh station visit becomes large when multiplied by 10 M annual KY weigh station stops

***Increase in registration fees***

By identifying vehicles which are registering for weights much less than reality

Benefits Feds as well because of "use tax"

***Highway infrastructure protection***

Save $$

***Preservation of Federal Highway Construction Funding***

Danger of losing a potential $38 M annually because of non-compliance; particularly, low conviction rates

Also non-compliance in CDL mandate

(Law adopted but no penalty section)

## Key process linkages

- Admin data to MVE operations at roadside; MVE personnel empowered to confront non-compliance at roadside
- Data collection at roadside to admin; tax and audit improved
- Other
- More roving and mobile enforcement
- Some legislative change required

## Problems Cited

- Lack of support for increase of employee cap
- Legislative support needed is not clearly available
- Industry does not support enforcement enhancements
- All technology enablers not yet on-the-shelf

## Recommendations

- Hire and train more inspectors to work in the stations
- Roving patrols; hire more officers
- Acquire more portable computers
- Link databases
- Uniform enforcement and penalties
- Electronic clearance
- Focus emphasis on drivers not vehicles
- Hire more auditors
- Install WIMs
- Intrastate safety management audit
- Share MVE and tax data
- Establish communication districts for improved dispatching

## Evaluation standards

- Increased revenue collection
- Time and $$ saved to motor carriers at weigh station
- $$ saved from reduced accidents / improved safety
- Avoidance of lost Federal funding due to non-compliance

# DEPARTMENT OF VEHICLE REGULATION

**Ed Logsdon, Commissioner**

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## Division of Driver Licensing

Purpose: This division maintains a driving history record for each licensed driver in the Commonwealth. Driver Licensing also handles license reinstatements, driver licensing hearings, medical review board, commercial driver licenses, and miscellaneous driver license services.

CVO Related Activities: The division works closely with the FHWA Office of Motor Carriers to administer Commercial Driver Licenses (CDLs).

## Division of Motor Carriers

Purpose: The division regulates all for-hire transportation within Kentucky and administers the state's IRP, fuel (IFTA), and highway usage taxes. The division also provides proper credentials for adequate enforcement.

CVO Related Activities: All overweight/overdimensional permits are issued to trucking companies in Kentucky by this division. The division collects fuel and highway user taxes from motor carriers as stated in KRS 138.655 through 138.725. They also regulate interstate and for-hire motor carriers of property and passengers. This division is also responsible for regulation of U-Drive-It rental and leasing companies within the Commonwealth.

## Division of Motor Vehicle Enforcement

Purpose: This division enforces state and federal laws and regulations pertaining to commercial motor vehicle operation in the Commonwealth of Kentucky.

CVO Related Activities: This division enforces state and federal laws and regulations pertaining to commercial motor vehicle operation in the Commonwealth of Kentucky as they relate to vehicle size, weight, registration, operation authority, fuel tax reporting, insurance, and safety requirements. Officers interdict commercial vehicle drivers who are drug or alcohol impaired, and interdict transportation of illegal drug shipments in commercial vehicles. The division also conducts vehicle safety, hazardous materials and driver inspections.

# Division of Motor Vehicle Licensing

Purpose: This division provides county clerks with supplies and computer programs necessary to register and license all vehicles, trailers, and boats in Kentucky. The division is subdivided into the Automated Systems Branch, Registration Branch, and Title Branch

CVO Related Activities: This division provides county clerks with supplies and computer programs necessary to register and license all vehicles and trailers in Kentucky.

# Kentucky Motor Carrier Advisory Committee

Purpose: The duties of the committee shall be to advise the executive and legislative branches of government of the Commonwealth on issues regarding industrial expansion, promotion of motor carrier development, and improvement of motor carrier taxation and regulation methods.

CVO Related Activities: The duties of the advisory committee include the promotion of motor carrier development and improvement of motor carrier taxation and regulation methods. Representatives of the Advisory Committee attend some CVISN staff meetings, but the frequency of meetings encourages a monitoring approach on the part of the members. Issues of particular importance are brought to the attention of the Advisory Committee for their input. Some members of the committee are already closely involved in the pursuit of CVISN implementation, and have committed their companies to participate in the first tests of new technologies. Consequently, the committee represents a significant and ongoing relationship with the carrier community as regards ITS/CVO.

Interactions With Private-Sector Entities: The committee consists of nine (9) representatives of the motor carrier industry engaged in transportation of persons or property within the Commonwealth.

Interactions With Other State Government Offices/Agencies: The committee consists of the secretary of the Transportation Cabinet, the secretary of the Revenue Cabinet, the secretary of the Cabinet for Economic Development, the Speaker of the House, the President of the Senate, or their respective designated representatives. The Governor shall appoint the motor carrier industry representatives to the committee.

# DEPARTMENT OF ADMINISTRATIVE SERVICES

**Ed Roberts, Commissioner**

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## Division of Information Technology

Purpose: The Division of Information Technology manages all information processing activities and equipment utilized by the Transportation Cabinet. The Division consists of two branches:

Data Processing Branch - Supports data processing systems. Reviews and processes requests for mainframe related programming and new equipment acquisition.

Automation Support Branch - Systems development and analysis, Engineering Graphics System including GIS, network (LAN/WAN), and user support.

CVO Related Activities: Development of systems and interfaces to assist in administration of commercial vehicle issues.

## Division of Real Property

Purpose: This division maintains and repairs the Cabinet's 940 buildings statewide, and develops plans and specifications for all new real property construction projects. The division also oversees the communications network for the Cabinet.

CVO Related Activities: The division is responsible for the maintenance and repair of the Transportation Cabinet's buildings in the Commonwealth, which includes all highway weigh stations.

# DEPARTMENT OF FISCAL MANAGEMENT

**Glen B. Mitchell, Commissioner**

**Phone: (502) 564-4786**

## Division of Audit Review

Purpose: The Division of Audit Review provides auditing functions in order to meet the various needs of Transportation Cabinet management.

CVO Related Activities: It provides selected audits of over 34,000 trucking companies traveling in Kentucky to ensure compliance with the state's fuel and weight-distance tax laws. The Division audits motor carriers with apportioned registration applications as required by the Motor Vehicle International Registration Plan.

# DEPARTMENT OF HIGHWAYS

**James C. Codell III, Commissioner**

**Phone: (502) 564-4890**

**Fax: (502) 564-4809**

## State Highway Engineer

Purpose: The State Highway Engineer manages, directs, and coordinates the engineering and support functions of the Department of Highways at both the central office and district levels. The State Highway Engineer is the chief technical advisor to the Commissioner of Highways and supervises the daily activities for the Department of Highways.

CVO Related Activities: The State Highway Engineer manages engineering and support functions for the Department of Highways, including the engineering and support required for weigh station construction.

## Office of Project Development

### Deputy State Highway Engineer for Project Development

Purpose: The D.S.H.E. formulates and implements all pre-construction phases

of highway projects. The D.S.H.E. oversees the following divisions:

Bridge Design

Environmental Analysis

Highway Design

Professional Services

Right of Way & Utilities

CVO Related Activities: The D.S.H.E oversees the Environmental Analysis, Highway Design, Professional Services, and Right of Way & Utilities divisions. These divisions are involved in the process of weigh station construction and modification.

# Office of Construction & Operations

## Deputy State Highway Engineer for Construction & Operations

Purpose: The D.S.H.E. formulates and implements all construction phases of highway projects. The D.S.H.E. also formulates and implements all maintenance, traffic control, and equipment utilization for the state highway system. The D.S.H.E. oversees:

Construction

Contract Procurement

Equipment

Materials

Operations

Traffic

CVO Related Activities: The Construction, Contract Procurement, Equipment, Materials, Operations, and Traffic divisions under the supervision of the D.S.H.E are involved in weigh station construction and modification.

# District Offices

Purpose: District Offices are responsible for the field implementation of highway programs.

CVO Related Activities: The District Offices are responsible for the field implementation of highway programs, including the construction and modification of weigh stations.

# Functional Requirements for New*MACS* Software

prepared by

Kentucky Transportation Center

University of Kentucky

November 12,1997

BACKGROUND

The Kentucky Transportation Center at the University of Kentucky, under direction from the Kentucky Transportation Cabinet, has initiated action to develop new software for the Mainline Automated Clearance System (***MACS***). This software will be used in weigh station computers (and at the ***MACS*** Operations Center) to accomplish mainline electronic screening of commercial vehicles. The new ***MACS*** software will support three different operational concepts of mainline screening. These three concepts, and the names by which they are known, are as follows:

- ***MACS-75***: This concept will be used at existing ***MACS*** sites on Interstate 75 and Canadian Highway 401. It is almost identical to the current concept at those sites, but includes a few improvements. Under this concept, screening decisions are made in the Advance AVI (automatic vehicle identification) Reader using an enrolled vehicle list and weight data. The weight data can come from mainline weigh-in-motion equipment, if installed, or may be carried on the transponder from a previous station.

- ***MACS-65***: This concept will be used for the Interstate 65 Electronic Screening Project in Kentucky and Indiana. It provides a simplified, low-cost approach to mainline screening, using quality control sampling techniques for screening enrolled vehicles. Under this concept, screening decisions are made in the weigh station host computer using identifying information from the transponder, an enrolled vehicle list, and a screening algorithm designed for intelligent sampling. If desired, mainline weigh-in-motion equipment can be used to incorporate weight data into the screening decision. For this concept, no trip-specific data is carried on the transponder.
- ***Model MACS***: This concept will be implemented at Kentucky's CVISN Model Deployment Site(s). It is identical to ***MACS-65***, except that screening decisions will be based on "snapshot" data from SAFER and CVIEW[1], rather than an enrolled vehicle list.

[1]SAFER is the Safety and Fitness Electronic Records system. CVIEW is the Commercial Vehicle Information Exchange Window. Both of these systems are being developed as part of the national Commercial Vehicle Information Systems and Networks (CVISN) architecture.

It is anticipated that a single software package will support both the ***MACS-65*** and ***Model MACS*** concepts. A modified version of the software may be produced to support the ***MACS-75*** concept.

Each of these operational concepts is described in much greater detail in the following sections.

## ***MACS-65* AND *MODEL MACS***

**Brief Overview of *MACS-65*:**

***MACS-65*** will employ a quality control sampling approach to selecting trucks for pull-in. For this system, each enrolled carrier will be assigned a pull-in probability based on the carrier's prior performance in safety, weight compliance, and other appropriate areas. (In the future, this pull-in probability may be assigned on a vehicle-specific level rather than a carrier level.) When a participating truck approaches a participating weigh station, it will be identified by an Advance AVI Reader, which will communicate the transponder ID number to the weigh station host computer. The host computer will make a screening decision based on the following logic:

1. Trucks that are not on the enrolled vehicle list (EVL) will be ignored.
2. Trucks that have EVL "flags" indicating a credentials or safety problem will receive a pull-in indication.
3. If the station has a mainline weigh-in-motion (WIM) system in operation (and weight checking is "required" or "enabled,", then trucks with weight violations will receive a pull-in indication.
4. Trucks with no problem flags or weight violations will be subject to random selection based on the carrier's assigned pull-in probability.

(This screening logic is described in more detail in a later section.)

The host computer will communicate the results of the decision to the Notification AVI Reader (some distance downstream of the Advance Reader), which will send the information to the truck's transponder. If there is sufficient spacing between the Advance and Notification Readers, the weigh station operator will have the opportunity to override the screening logic and select the truck for either bypass or pull-in.

The system will also have a Compliance AVI Reader, which will identify all transponder-equipped trucks bypassing the station. The system will provide an indication for enforcement personnel to distinguish valid bypasses from unauthorized ones. As an option, truck detectors may be installed in

the pavement at the compliance location to detect non-transponder-equipped trucks that bypass the station.

This system does not require mainline weigh-in-motion equipment or compliance truck detectors (both are optional). Hence, there is no requirement for any equipment installed in the pavement of the highway. In addition, there is no need for the AVI readers to write information to the transponder for use by subsequent readers or weigh stations.

**Brief Overview of *Model MACS*:**

The operational concept for ***Model MACS*** is identical to that for ***MACS-65***, except that ***Model MACS*** has no enrolled vehicle list. Screening decisions for ***Model MACS*** are based on "check flags" and rating information contained in "snapshot data" resident in the weigh station's server databases. The snapshot data will be updated periodically from the Safety and Fitness Electronic Records (SAFER) system and the Commercial Vehicle Information Exchange Window (CVIEW) system. The "snapshot" concept is part of the national architecture for Commercial Vehicle Information Systems and Networks (CVISN), and ***Model MACS*** is intended for use at sites where the CVISN architecture has been implemented.

As with ***MACS-65***, ***Model MACS*** uses three AVI readers at a weigh station: an Advance Reader, a Notification Reader, and a Compliance Reader. It can be operated with or without mainline weigh-in-motion equipment, and with or without compliance truck detectors. It does not require that any information be carried on the transponder (other than the transponder ID).

**Required Host Computer Functionality for *Model MACS* and *MACS-65*:**

In order to achieve the operational concepts described previously, the weigh station host computer will need to perform various functions. Those functions are described in the following paragraphs. Certain functions will be enabled or disabled based on which operational concept is being used (***Model MACS*** versus ***MACS-65***) and what options are installed (e.g., mainline weigh-in-motion and/or compliance truck detectors). Those functions that may not be enabled at every site are noted as such in the discussion.

1. The host computer will allow input and editing (local or remote) of the following information and will store the information in databases for use in various processes:

    a. A list of enrolled vehicles[2], with the following information for each vehicle:

        (1) Transponder ID number

[2]This function will be disabled at ***Model MACS*** sites.

(2) Carrier identification data, such as:

- ➔ company name
- ➔ standard company identification number (per CVISN architecture)
- ➔ terminal (base) location

(3) Truck identification data, such as:

- ➔ unit number (assigned by carrier/terminal)
- ➔ standard vehicle identification number (per CVISN architecture)
- ➔ license plate number

(4) Appropriate check flag(s) to indicate if the carrier or vehicle has a current problem with regard to safety or credentials, has a special enrollment status (such as "gold card"), has been designated for pull-in by site personnel, or has a special permit (such as oversize/overweight).

(5) Appropriate safety rating data, such as:

- ➔ Overall safety rating
- ➔ Out of service percentage(s)
- ➔ Date of last inspection

(6) Appropriate weight compliance history data, such as:

- ➔ Overweight percentage
- ➔ Number/frequency of overweight citations

(7) Assigned "multiplier" for determining random pull-in probability.

(8) Registered weight

(9) Permitted weight (for trucks with special permits)

(10) Other? (reserve space for future use)

b. Site configuration data, including:

(1) Site identification

(2) Site operational concept (***Model MACS*** or ***MACS-65***)

(3) Site physical configuration

- ➔ mainline weigh-in-motion scale present? (yes/no)
- ➔ scale/reader correlation parameters (relative position, spacing, etc.)
- ➔ truck detectors present? (yes/no)
- ➔ truck detector/reader correlation parameters (relative position, spacing, etc.)

(4) Station status (open/closed)

(5) Units (English/metric)

(6) Weight checking required/enabled/disabled

(7) Weight limits (for sites with mainline weigh-in-motion scales)

- ➔ gross
- ➔ single axle
- ➔ tandem axle
- ➔ tridem axle

(8) "Base" random pull-in percentage for trucks with verified legal weight (weight checking required or enabled)

(9) "Base" random pull-in percentage for trucks with unknown weight (weight checking enabled or disabled)

(10) Truck detector parameters and reporting threshold (if installed)

(11) Other? (reserve space for future use)

c. AVI reader configuration data for each applicable reader, including:

(1) Type of reader (Advance, Notification, Compliance)

(2) Reader/tag communication parameters (as specified by AVI vendor)

(3) Reader/tag diagnostic parameters (as specified by AVI vendor)

(4) Number of antennas associated with this reader?

(5) Other? (reserve space for future use)

2. The host computer will send configuration data to each AVI reader as required, using message formats to be determined in cooperation with the AVI vendor. The following situations will result in the host computer sending configuration data to an AVI reader:

a. When an AVI reader requests configuration data from the host computer.

b. When the configuration data for an AVI reader is edited in the host computer (locally or remotely).

c. When directed by the system operator

d. Other situations as may be identified

System operation will not be disrupted while configuration data is being sent from the host computer to an AVI reader.

3. When a participating truck approaches the station, the Advance Reader will read the transponder and send the transponder ID (and other applicable data[3]) to the host computer, using a message

[3]The Advance Reader may request and receive other data from the transponder, in accordance with IEEE message set and layer seven standards. If so, the Advance Reader will pass this message data directly to the host computer. Initially, the host computer will use only the transponder ID, but future enhancements may allow additional data items to be used.

format and protocol to be determined in cooperation with the AVI supplier. If the station has mainline weigh-in-motion (WIM) equipment, the WIM system will also send a record for the truck to the host computer, using a message format and protocol to be determined in cooperation with the WIM supplier.

4. When the host computer receives a transaction message from the Advance Reader, it will make a screening decision using the appropriate logic for the selected operational concept. For a site using the ***MACS-65*** concept, the following logic will be used:

   a. Using the transponder ID, the host computer will attempt to locate the vehicle on the enrolled vehicle list (EVL). If the vehicle is not on the EVL, the transponder will be ignored, and the rest of the logic can be skipped.

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   b. If the vehicle is on the EVL, the check flag(s) will be examined to see if a problem is indicated. If a problem is indicated, then the truck will be pulled in, and the rest of the logic can be skipped.

   c. If weight checking is set to "disabled," the computer will skip to step "e". If weight checking is set to "enabled" or "required," the host computer will attempt to correlate a weight record (received from the mainline WIM) with the transponder ID. If no weight record can be correlated and weight checking is "required," the truck will be pulled in, and the rest of the logic can be skipped. If no weight record can be correlated and weight checking is "enabled," the computer will skip to step "e".

   d. If a weight record is correlated, the weight data will be checked against legal limits for gross weight, axle weights, and the Federal Bridge Formula. It will also be checked against the truck's registered weight in that jurisdiction (from the EVL). If a weight violation is detected, the truck will be pulled in, and the rest of the logic can be skipped. (If the EVL indicated that this truck has a special permit, the weight checking logic will be altered accordingly.)

   e. If no problem has been identified in the check flags or weight, then the carrier's assigned "multiplier" for pull-in probability (contained in the EVL) will be used, in conjunction with the appropriate "base" percentage (contained in the site configuration data) and a random number generator, to determine whether or not to pull the truck in.

For a site using the ***Model MACS*** operational concept, the logic will be identical, except that the database of carrier/vehicle snapshot data, resident on the weigh station's server, will be used in place of the enrolled vehicle list. The snapshot data will be formatted to contain the same data fields as an enrolled vehicle list, along with additional fields that are not found in an enrolled vehicle list.

**Note: The decision logic presented here assumes that the weigh station is open. When the station is closed, no trucks will be pulled in, and no indication will be given to trucks by the Notification Reader.**

5. The results of the screening decision (for trucks on the enrolled vehicle list) will be communicated to the Notification AVI Reader, using a message format to be developed in cooperation with the AVI supplier.

6. Each time the host computer makes a bypass/pull-in decision, it will display selected information for the weigh station personnel, including:

   a. Carrier identification (name, identification number, terminal, etc.)
   b. Vehicle identification (unit number, VIN, license plate number)
   c. Result of screening decision
   d. Reason for pull-in, if applicable
   e. Date and time processed
   f. Other?

   The system operator will have the capability to pull up additional information related to this transaction, including the following:

   g. The EVL record for this vehicle (or the appropriate snapshot data)
   h. Vehicle gross weight, if known
   i. Vehicle length
   j. Number of axles, if known
   k. Axle weights and spacings, if known
   l. Other?

   Where the Advance and Notification Readers are separated by a sufficient distance, the system operator will be provided with an opportunity to override the screening decision before the decision is sent to the Notification Reader.

7. When a transponder is read by the Compliance AVI Reader, that reader will send a transaction message to the host computer, using a message format to be determined in cooperation with the AVI supplier. The host computer will check to see if this transponder was authorized to bypass. If so, a positive verification will be provided to the weigh station personnel. If this transponder was directed to pull in, an alarm will be provided and the identity of the violator will be displayed. If this transponder is not on the EVL, it will be ignored. If it is on the EVL, but was not reported by the Advance Reader, then an alarm will be provided, and he identity of the violator will be displayed. The computer display will be updated to reflect the latest status and information. Note: When an alarm is generated for a participating truck, the weigh station operator will have the capability to generate a printed report of the violation, if desired.

8. If the station has truck detectors installed at the compliance location, these truck detectors will send a vehicle record to the host computer for any truck that passes. When such a record is received by the host, it will attempt to correlate that record with a transponder transaction message from the Compliance AVI Reader. If the truck detector record can be correlated with a transponder, and that transponder was processed (i.e., assigned a bypass or pull-in decision) by the host computer, then the truck detector record will be ignored. If the truck detector record cannot be correlated with a transponder that was processed by the host, then the host computer will sound/display an alarm for the weigh station personnel, indicating the passage of a non-participating or unidentified truck.

**Note: No alarms will be provided when the weigh station is closed. Weigh station personnel will be given the capability to disable the audible alarm.**

9. The host computer will maintain a record of each transaction with a participating, transponder-equipped truck. These records will be archived for periodic retrieval by the Operations Center or other remote location.

10. The host computer will receive input on the station open/closed status from an automatic open-closed interface, which senses the condition of the station open/closed sign and provides this input to the host computer via a serial interface port.

**Required Operations Center Computer Functionality for *Model MACS* and *MACS-65*:**

For the Interstate 65 Electronic Screening Project, the ***MACS*** Operations Center will be responsible for enrolling motor carriers, for creating and maintaining the "master" enrolled vehicle list, for initializing and maintaining the site configuration data, for monitoring the performance of each site, and for evaluating the system. In order to accomplish these functions, it will be necessary for certain functionality to be available on one or more computers at the Operations Center. The required functionality will include the following:

1. The Operations Center computer will allow input and editing of the following information and will store the information in databases for use in various processes:

   a. A "master" list of enrolled vehicles. The master EVL will have the following information for each vehicle (as was described in the required host computer functionality):

      (1) Transponder ID number

      (2) Carrier identification data

      (3) Truck identification data

(4) Appropriate check flags

(5) Appropriate safety rating data

(6) Appropriate weight compliance data

(7) Assigned "multiplier" for determining random pull-in probability

(8) Registered weight

(9) Permitted weight

(10) Other?

For items 4-10 in the master EVL, the capability will exist to enter different values for different jurisdictions. For example, a truck may have a different registered weight in Indiana than in Kentucky, or a truck may have a credentials-related problem in Kentucky but no such problem in Indiana.

b. A "master" database of the default configuration data for each site. This can be used as a "backup" to simplify restoring a site's configuration data if it is lost.

2. The Operations Center Computer will have the capability to download a complete enrolled vehicle list (EVL) or a change in the EVL to any ***MACS-65*** site's host computer when directed to do so by Operations Center personnel.

3. The Operations Center Computer will have the capability to access any ***MACS-65*** site and download any transaction data that is stored on the site host computer.

4. The Operations Center Computer will have the capability to access any ***MACS-65*** site's host computer and perform any function that is available to an operator at the site (including viewing the same screens that are viewed at the site).

## ***MACS-75***

**Brief Overview of *MACS-75*:**

***MACS-75*** will continue with the current operational concept of ***MACS***, i.e., clearance decisions will be made in the Advance AVI Reader, based on the following criteria:

1. Credentials: Is the transponder for this vehicle on the enrolled vehicle list for this location? If so, is the credentials flag set to "OK."

2. Weight: Do we have valid weight data for this truck, either from mainline WIM (at this location) or from a previous weigh station on this trip? If we have weight data, is the weight legal when compared to legal maximums, the truck's registered weight (as specified in the enrolled vehicle list), and the Federal bridge formula?

If the truck's credentials and weight check out OK, then the truck will get a green light, unless: (1) the truck is selected for a random pull-in; or (2) enforcement personnel have selected the truck for a pull-in, thus overriding the automated system. The probability of random pull-in will be variable by company, based on information in the enrolled vehicle list.

With regard to weight checking, enforcement personnel at a given station will have the capability to set weight checking to "required", "enabled", or "disabled". If weight checking is required, no truck can receive a green light unless valid weight data is available for that truck. If weight checking is enabled, then weight data will be checked if available, but trucks can receive green lights without weight data (subject to random sampling). If weight checking is disabled, then weight data will not be used in the screening decision, and all screening decisions will be based on random sampling.

Event data (date, time, location, weight and axle data, a scale "quality" code, etc.) will be recorded on the transponder at each weigh station to be carried to subsequent stations.

**Required Host Computer Functionality for *MACS-75*:**

The host computer functionality for ***MACS-75*** sites will, in many respects, be identical to the ***Model MACS*** and ***MACS-65*** sites. However, there will also be some modifications required in order to accommodate the existing ***MACS*** architecture. This discussion will not restate the entire host computer functionality, but will simply describe those areas where ***MACS-75*** is different from ***MACS-65***.

The operational concept for ***MACS-75*** differs from ***MACS-65*** in two fundamental ways:

- ☆ For ***MACS-75***, the mainline screening decision is made by the Advance Reader. As a result, there is no need for a separate Notification Reader, and there is no need for screening algorithms in the host computer.
- ☆ ***MACS-75*** is designed to write weight and axle spacing data on the transponder, to be carried to subsequent stations. The weight data can be read by the Advance Reader at subsequent stations and used in the screening decision.

The effects of these differences on the host computer functionality are as follows:

1. The host computer will download (as required) the complete enrolled vehicle list (EVL), or a change in the EVL, to the Advance AVI Reader, using the message format specified in the ***MACS*** Functional Requirements Document (FRD). Where necessary, the message format specified in

the FRD can be modified in cooperation with the AVI supplier. The following situations will result in the host computer sending an EVL to the Advance Reader:

a. When the EVL is edited locally or remotely (send change only).

b. When the host computer receives a new EVL from the Operations Center (send complete EVL).

c. When an EVL is requested by the Advance Reader (send complete EVL).

d. When directed by the system operator (local or remote--send complete EVL).

e. When a truck on the "approaching vehicles" list is selected by the operator for manual pull-in (send change only)

The EVL that is downloaded to the Advance Reader should include only those data fields to be used by the Advance Reader in the screening process. This would include the following information for each vehicle:

a. Transponder ID number

b. Credentials status

- known credentials problem? (yes/no)

- special status (gold card, temporary permit, operator pull-in, etc.)

c. Registered weight

d. Permitted weight (for temporary permit)

e. Multiplier for random pull-in percentage

f. Other? (reserve space for future use)

System operation will not be disrupted while the EVL is being downloaded. The EVL download should be accomplished in the most efficient manner possible (which may require coordination with the AVI supplier for changes to the AVI Reader software).

2. The Site (and AVI reader) configuration data maintained by the host computer will include the following information in addition to the data required for ***MACS-65***:

a. Scale quality codes for weight data written to tag

b. Minimum acceptable scale quality code for screening decisions

c. A table of upstream location codes and allowable travel times (up to six locations)

d. Jurisdictional weight value

e. Site-to-site communications configuration

(1) Phone numbers to be used for sending transaction data to downstream sites

(2) Time interval at which data should be sent to each downstream site

(3) Other (reserve space for future use)

With regard to the site physical configuration, the data will need to accommodate the presence of Ramp Sorter AVI Readers, Exit Readers, and ramp sorter WIMs.

3. Because of the more complex processing performed by the AVI readers under the ***MACS-75*** concept, the configuration data passed from the host to the readers is more extensive for ***MACS-75*** than for ***MACS-65***. The host computer will send configuration data to each AVI reader, as required, using the message format specified in the ***MACS*** Functional Requirements Document (with possible modifications/improvements that may be developed in cooperation with the AVI supplier). The configuration message sent to the AVI reader will include some data from the site configuration and some from the AVI reader configuration. Specifically, the following data will be included in the message:

a. Location code (site identification)

b. Type of reader (Advance, Compliance, Ramp, Exit)

c. Station status (open/closed)

d. Weigh-in-motion scale or truck detectors present?

e. Weigh-in motion or truck detector parameters (if applicable)

- ➔ lane number
- ➔ scale error mask
- ➔ other?

f. Scale quality for weight data written to tag by this reader

g. Minimum acceptable scale quality for screening decisions[4]

h. AVI/WIM (or truck detector) correlation parameters (as specified by AVI supplier)

i. Table of preceding locations and allowable travel times[4]

j. Units (English/metric)

k. Weight limits[4]

- ➔ gross
- ➔ single axle
- ➔ tandem axle
- ➔ tridem axle

l. "Base" random pull-in percentage for trucks with verified, legal weights[4]

m. "Base" random pull-in percentage for trucks with unknown weights[4]

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[4]This information would be used only by the Advance Reader.

n. Number of antennas associated with this reader?

4. When a transponder-equipped vehicle approaches the station, the Advance Reader will read the transponder, make a clearance decision (using logic in the reader's programming), and (if the transponder is on the enrolled vehicle list) write data to the transponder, including the result of the clearance decision. The reader will also send a transaction message to the host computer, with a format as specified in the ***MACS*** Functional Requirements Document (FRD).

5. When the host computer receives a transaction message from the Advance Reader, it will use the transponder ID to look up the vehicle in the enrolled vehicle list. It will then display appropriate information for the enforcement personnel. In addition to the list of information provided for ***MACS-65***, the computer should (if applicable) display the date, time, and location of previous screening and the scale quality associated with the truck's weight data.

6. If the transaction message from the Advance Reader indicates that the transponder does not contain valid weight data (either from this site's mainline WIM or from a previous site), then the host computer will send a "weight data" message for this transponder to the Exit Reader, using a message format to be determined in cooperation with the AVI supplier. As a minimum, this message will include the transponder ID number, the jurisdictional weight value, and a scale quality code indicating that it is a jurisdictional weight.

7. When the participating truck passes any other AVI reader (e.g., Ramp, Compliance, or Exit), the Reader will send a transaction message to the host computer. The host computer will update the display to reflect the latest status and information.

8. When a transaction message is received from the Ramp Reader indicating that weight data (from the ramp WIM) was correlated with a transponder, the host computer will compare the scale quality code of the ramp WIM with the scale quality code of the weight data (if any) currently stored in the transponder. If the ramp WIM's scale quality is equal to or greater than that of the transponder's data, then the host computer will send a "weight data" message to the exit reader, using the same message format as described above (paragraph 6). As a minimum, this message will include the transponder ID number, the weight data from the ramp WIM, and the scale quality code of the ramp WIM. (Note: the Ramp AVI Reader will never write data to a transponder).

9. When a transponder is read by the Exit Reader, the Reader will only write to the transponder if it has received a "weight data" message from the host computer for that transponder ID number.

10. When a transaction message is received from the Compliance Reader, the host computer will determine whether or not to sound/display an alarm, using the following logic:

    a. If the Compliance Reader reports a transponder that was reported as a "bypass" by the Advance Reader, no alarm is necessary.

b. If the Compliance Reader reports a transponder that was reported as a "pull-in" by the Advance Reader, sound an alarm and display the identity of the violator.

c. If the Compliance Reader reports a transponder that was not reported by the Advance Reader, check to see if the transponder is on the EVL. If so, check the transponder data (i.e., bypass/pull-in flag) to see if an alarm is necessary. If the transponder is not on the EVL, ignore the transponder.

d. When a truck detector actuation is reported by the Compliance Reader and it cannot be correlated with an enrolled transponder, sound an alarm and display a violation by an unidentified truck.

(Note: the Compliance Reader will never write data to a transponder.)

11. When a participating truck has passed the Compliance Reader or Exit Reader, indicating that it has left the station, the host computer will maintain a record of the truck's transaction data. Periodically, these records (i.e., "history list") will be sent to downstream stations as specified in the site configuration data. The history data will also be archived on the host computer for periodic retrieval by the Operations Center.

12 Whenever transaction data is received from an upstream station, the data will be displayed to the station operator as an "approaching vehicles" list. This list may be displayed full-time or on-demand. The following information shall be displayed (or readily available) for each vehicle on the approaching list:

a. Carrier identification

b. Vehicle identification

c. Location where last screened

d. Result of screening decision

e. Reason for pull-in (if applicable)

f. Date and time processed

g. Weight and axle data (if available)

A truck shall be removed from the approaching vehicles list when it arrives at the station (i.e., it is reported by the Advance AVI Reader). It will also be removed if it does not arrive within a reasonable time (e.g., allowable travel time from upstream station plus some margin).

13. The operator will have the capability to select any truck on the approaching vehicles list and specify that truck for operator pull-in. Doing so will cause the EVL entry for that truck to be modified so that the truck receives a pull-in indication when it arrives. Once the truck has been pulled in (or after a reasonable time period elapses), the EVL entry will be restored to normal.

14. For any truck that is within the weigh station (i.e., has passed the Advance Reader but has not yet passed the Exit Reader), the operator will have the capability to manually edit the truck's weight data. When the weight data has been edited and submitted by the operator, the host computer will send a "weight data" message to the Exit Reader (using the message format described in paragraphs 6 and 8 above). As a minimum, the message will include the transponder ID number, the edited weight data, and a scale quality code associated with manually entered data. When the truck leaves the weigh station, the Exit Reader will write the edited weight to the truck's transponder.

**Required Operations Center Computer Functionality for *MACS-75*:**

In support of the ***Advantage CVO*** Partnership, the ***MACS*** Operations Center is responsible for enrolling motor carriers, creating and maintaining the "master" enrolled vehicle list, initializing and maintaining the site configuration data, monitoring the performance of each site, troubleshooting system problems and dispatching maintenance personnel (when appropriate), and evaluating the system. In order to accomplish these functions, it is necessary for certain functionality to be available on one or more computers at the Operations Center. The required functionality includes the following:

1. The Operations Center computer will allow input and editing of the following information and will store the information in databases for use in various processes:

    a. A "master" list of enrolled vehicles. The master EVL will have the following information for each vehicle (as was described in the required host computer functionality):

        (1) Transponder ID number

        (2) Carrier identification data

        (3) Truck identification data

        (4) Credentials status indicators

        (5) Appropriate safety rating data (optional)

        (6) Appropriate weight compliance data (optional)

        (7) Assigned "multiplier" for determining random pull-in probability

        (8) Registered weight

        (9) Permitted weight

        (10) Other?

        For items 4-10 in the master EVL, the capability will exist to enter different values for different jurisdictions. For example, a truck may have a different registered weight in Ohio than in Kentucky, or a truck may have a credentials-related problem in Tennessee but no such problem in Florida.

b. A "master" database of the default configuration data for each site. This can be used as a "backup" to simplify restoring a site's configuration data if it is lost.

2. The Operations Center Computer will have the capability to download a complete enrolled vehicle list (EVL) or a change in the EVL to any ***MACS-75*** site's host computer when directed to do so by Operations Center personnel.

3. The Operations Center Computer will have the capability to access any ***MACS-75*** site and download any transaction data that is stored on the site host computer.

4. The Operations Center Computer will have the capability to access any ***MACS-75*** site's host computer and perform any function that is available to an operator at the site (including viewing the same screens that are viewed at the site).