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Organizing for ITS: Computer Integrated Transportation Phase 2: Results for Commercial Vehicle Operators

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ABSTRACT

Computer Integrated Transportation is envisioned as an integrated network **of** public and private transportation organizations, each with unique responsibilities, but working toward a common mission of facilitating travel across all modes **of** transportation. This paper extends the research on CIT to commercial vehicle operations (CVO), specifically to examine how government can work with trucking companies (i.e., "motor carriers") within a CIT framework. The research entailed a review **of** how government currently interacts with trucking companies, interviews with trucking terminal managers, and case-studies on terminal operations at five **of** the nation's largest motor carriers. Opportunities are identified in the area of unifying interaction between government and industry (along four lines: licensing, roadway information, incident clearance and enforcement), and in the area of in-vehicle devices for automated record keeping.

Keywords: **Commercial Vehicle Operators (CVO), Motor Carriers, Transportation Management, Intermodal Transportation, System Architecture**

EXECUTIVE SUMMARY

Computer Integrated Transportation is envisioned as an integrated network of public and private transportation organizations, each with unique responsibilities, but working toward a common mission of facilitating travel across all modes of transportation. CIT is designed to achieve effective coordination of the transportation system, while at the same time respecting the individual responsibilities of participating organizations.

This paper extends the research on CIT to commercial vehicle operations (CVO), specifically to examine how government can work with trucking companies (i.e., "motor carriers") within a CIT framework. The research entailed a review of how government currently interacts with trucking companies, interviews with trucking terminal managers, and case-studies on terminal operations at five of the nation's largest trucking companies

As is revealed in the research, trucking companies must interact with numerous local, state and national agencies in the normal course of their business. The nature of this interaction is anything but uniform, presenting carriers with a myriad of confusing and sometimes poorly documented requirements. As a result, it is not at all surprising when trucking companies view government more as "regulators" than as "service providers," presenting a serious obstacle to implementing Intelligent Transportation Systems (ITS) within the motor carrier industry.

Telephone interviews and site visits with terminal managers revealed great diversity in the application of information technologies to trucking. Technologies for tracking shipments, including bar-coding and mobile data terminals, are commonly used by major less-than-truckload (LTL) and package carriers, whereas technologies for tracking vehicles are more commonly used by truckload and private carriers. CB radios are still the most common means of communication to drivers, but pagers are widely used, and some companies utilize cellular phones. Wireless data transmission is less common. Regulatory compliance is largely a manual process, though some companies utilize computers to track maintenance.

Terminal managers in the survey were largely unaware of the CVO user services proposed under the federal ITS initiative. Nevertheless, there is strong support for some ITS objectives, especially with respect to reducing the complexity of regulations and easing compliance. Whereas managers (especially at larger companies) generally acknowledged the need for existing regulations, they also supported the idea of streamlining and simplifying the existing rules. And while managers were interested in improving the quality and timeliness of traveler information, they appeared to be reasonably content with the current situation. Dispatchers do not utilize information that is available today and seem to desire little new information. However, managers did state that improvements are needed in disseminating information on roadway construction and roadway conditions (e.g., ice, snow, and fog).

Despite these qualifiers, important opportunities exist to improve coordination between government and the motor carrier industry. Government fbnctions can be organized along four lines: (1) enforcement, (2) roadway information, (3) licensing, and (4) incident clearance. While multiple agencies currently exist within each category, designating a single leader should improve coordination, and simplify interactions between government and industry. From a technological standpoint, there is an important opportunity to develop an in-vehicle device, with a standard interface, that can store records on: (1) driver hours-of-service, (2) daily inspection reports, (3) vehicle maintenance, (4) cargo manifest and hazardous materials, (5) licenses and permits, and (6) fuel accounting. Most regulatory functions could be automated within an in-vehicle device. In the process, drivers and terminal managers can be provided with better information, so that it is easier for motor carriers to operate within regulations.

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1 INTRODUCTION

Computer Integrated Transportation is envisioned as an integrated network of public and private transportation organizations, each with unique responsibilities, but working toward a common mission of facilitating travel across all modes of transportation. CIT is designed to achieve effective coordination of the transportation system, while at the same time respecting the individual responsibilities of participating organizations.

In an earlier report (Hall et al, 1994), CIT was introduced, and investigated fiom the perspective of arterial and highway "Transportation Management Centers" (TMCs). Site visits and interviews were conducted at California TMCs, followed by focus group meetings with TMC managers. Institutional impediments and opportunities were identified as part of this study, particularly as it pertains to cooperation between governmental agencies. The report only touched on the issues of how transportation agencies interact with non-transportation agencies, and how they interact with the private sector.

1.1 Study Objective

This paper extends the research on CIT to commercial vehicle operations (CVO), specifically to how government can work with trucking companies (i.e., "motor carriers") within a CIT framework. The research entailed a review of how government currently interacts with trucking companies, interviews with trucking terminal managers, and case-studies on terminal operations. As is revealed in the research, trucking companies must interact with numerous local, state and national agencies in the normal course of their business. The nature of this interaction is anything but uniform, presenting carriers with a myriad of confusing and sometimes poorly documented requirements. As a result, it is not at all surprising when trucking companies view government as "regulators" instead of "service providers," presenting a serious obstacle to implementing ITS within the CVO industry.

The research presented in this report was completed in parallel with two companion studies, one on emergency operations (Lo et al, 1995), and the other on transit agencies (Hickman et al, 1995). The combined purpose of these three studies is to assess how traffic agencies at the state and local level can improve their coordination with other types of transportation organizations.

A final phase of research is in progress. This will entail focus group meetings with CVO managers, which will allow in-depth exploration of new ITS technologies.

1.2 Paper Organization

The remainder of the paper is divided into four sections. Section 2 provides an overview of the trucking industry. Section 3 reviews governmental roles in serving and regulating the CVO industry. Section 4 provides results of structured interviews with 48 CVO

companies. Section 5 offers detailed case-studies on five major trucking companies: Consolidated Freightways, **J.B.** Hunt, Roadway Package System, United Parcel Service and Yellow Freight System. Section *6* synthesizes the findings and assesses CVO opportunities within CIT, and Section **7** provides conclusions.

2 INDUSTRY OVERVIEW AND TECHNOLOGY ADOPTION

Commercial vehicle operations (CVO) encompasses a range of industries, including service and repair vehicles, private buses and taxis, and trucks. The focus of this paper is on the most prominent segment of CVO: motor carriers (i.e., trucking companies).

Trucking is a huge industry in the United States. Nationwide, trucking companies had total revenues of **$295** billion in **1992,** meaning that an average person spends more than **$1,000** per year (directly or indirectly) on trucking. Interstate trucking accounts for **$82** billion in revenue, intrastate/intercity accounts for **$96** billion and intrastate/local accounts for **$117** billion. Despite the overall size of the trucking industry, the vast majority of trucking companies are small. The largest carrier, United Parcel Service *(UPS)*, had revenues of **$12.7** billion in **1992,** just **4.3%** of the total.

Motor carriers fall into three general classifications: "common", "contract" and "private." **A** common carrier is a business that carries goods for-hire, serving the general public or other businesses at established rates. **A** contract carrier also carries goods for-hire, but on a contract basis, for specific customers. **A** private carrier is a unit that serves the internal transportation needs of an organization (e.g., the truck fleet for a supermarket chain).

The motor carrier industry can be further segmented by shipment size. UPS, for instance, is dominant in the *package* business, serving shipments under **150** pounds. Its biggest competitor in package shipments is the U.S. Postal Service (not included in the revenue total). However, UPS **also** competes with overnight package carriers, such as Federal Express and Emery Overnight, which are classified as air carriers, even though much of their business is by truck.

Less-than-trucklard (LTL) is another major segment. These carriers serve medium size shipments (1 ***00-5000*** pounds) through networks of consolidation terminals. LTL can be further segmented by longhaul and regional. The major longhaul, nationwide, carriers are Consolidated Freightways (CF), Roadway Express (operating independently of Roadway Package System), and Yellow Freight System. In California, the largest regional LTL carrier is Viking Freight System. The nationwide carriers also own, **as** separate operating units, a number of non-union regional carriers, which compete with companies like Viking.

Truckload (TL) is a third major segment. These serve full truckload shipments, which are not consolidated in terminals. Small truck fleets, ranging from the owner-operator on up, carry the majority of TL shipments. **J.B.** Hunt and Schneider National are the largest in the industry, but by no means dominate it.

Trucking can also be segmented by commodity. The most prominent companies carry boxed, palletized or otherwise packaged shipments. Bulk cargo such as fuels, agricultural products, and gravel, as well as some hazardous materials, are carried by specialized carriers, often by private fleets. Major petroleum companies, for instance, operate their own fleets of tanker trucks. Agricultural trucking (a major California industry), on the other hand, is typically served by common or contract carriers.

The motor carrier industry has undergone major changes since the passage of the Motor Carrier Act of 1980, which deregulated interstate trucking. According to Corsi (1980), LTL costs and profits have both declined since deregulation (costs declined **38%** in real dollars between 1977 and 1987). The most successful companies pursued "a strategy of differentiation" that was characterized by "supporting a high level of service quality with high prices and high rewards for employees." In the TL industry, Corsi states "major TL operators recognize that the economics of long-haul shipping dictate intermodal partnerships" and "railroads will probably gain significantly from the increasing reliance placed on their services by the TL carriers."

2.1 Technology Adoption

The last ten years have seen the development of a wide range of information technologies (IT) to serve the trucking industry. In many respects, the need for IT is greater in trucking than almost any other industry. The dispersed nature of the workforce, assets, and customers, as well as the need to comply with regulations from multiple regulatory agencies, makes trucking especially difficult to manage in their absence. IT technologies developed to serve trucking include:

- Communication Technologies and Electronic Data Interchange (EDI)
- Mobile Data Terminals and Bar-coding
- Route Planning and Scheduling Systems
- Vehicle Tracking
- Inspection Stations.

Despite the apparent need, trucking has not been quick to adopt IT. As stated in **U.S.** Industrial Outlook (1994):

> **Despite the blistering pace of hardware, software, and data transmission improvements, as well as corporate alliances among** technology **providers,** actual **trucking industry deployment of** full-**scale information and communication systems still lags. Shakeouts and refinements among systems suppliers, as well as the substantial *costs,* and lack of** technical **sophistication among some trucking companies, help explain the lag.**

In addition, the fragmented nature of the industry, low margins, and relatively low wages for drivers, have all been obstacles to adoption. More recently, the teamsters strike of 1994 jeopardized the cash-flow position of some of the larger LTL carriers, making it

difficult to make any sort of investment. In this environment, IT could only be justified when it provided immediate payback.

2.2 Technology Examples

This section provides examples of IT products being developed and marketed for trucking industries. This section will not cover vehicular technologies for such purposes as vehicle control, vehicle diagnostics, vehicle-trailer communication and enhanced vision. In addition, the section will not discuss general purpose technologies for obtaining traveler information.

2.2.1 Communication Technologies

CB radios have been used by truckers for many years. Their ostensible purpose is to allow the dispatcher to relay information about loads to drivers, and allow drivers to relay information to the dispatcher about delays, unusual loads, and breakdowns. CBs are also used for drivers to communicate with each other regarding roadway conditions, and for general conversation.

Other forms of mobile communication, such as pagers, cellular phones, and wireless data transmission, have been slowly adopted by trucking companies. For the most part, these technologies are not unique to trucking. They augment CB radios in the following ways: (1) greater area of coverage, (2) higher quality transmission, (3) enhanced mobility and (4) ability to transmit data and text (sometimes). They are especially useful when the driver spends considerable time away from the vehicle, or when the driver spends considerable time away from the dispatcher's transmitter. However, they have higher operating costs, largely due to subscription fees and the cost of connection time. Furthermore, pagers only provide one-way communication. Data communication technologies offer the additional capability to increase the quantity of information transmitted, which can be especially useful in tracking shipments and vehicles in real time.

Electronic Data Interchange (EDI) is used by some carriers to transmit and receive shipment data from their customers, primarily for billing and accounting purposes. The American National Standards Institute and the United Nations have both issued EDI standards for transportation, which are not completely compatible (Muller, 1995). EDI is also being expanded to exchange of customs and trade documents, to facilitate international cargo movements, through such organizations as ENCOMPASS (a joint venture between AMR and CSX). Larger trucking companies have also established centralized computing centers, which receive and transmit data on loads and drivers traveling between terminals. In the future, EDI might be used to request pick-ups, or to locate drivers. However, the practice today is to use conventional voice telephones for such purposes.

2.2.2 Mobile Data Terminals and Bar-coding

Mobile data terminals are hand-held devices, including a keyboard and bar-code scanner, that allow truck operators to electronically record information that would ordinarily appear on shipment documents (i.e., a bill-of-lading). They have two primary advantages: (1) eliminating paper-work and the cost of entering information into databases, and **(2)** providing immediate entry of shipment information into tracking systems. Mobile data terminals are especially effective when coupled with wireless data communication, as they allow shipment status to be tracked from the moment of pick-up to the moment of delivery. Some mobile data terminals even allow signatures to be recorded electronically, completely eliminating the need for drivers to carry paper records.

Bar-coding does not require mobile data terminals. In either case, a bar-code is affixed to the shipment, and scanned as the shipment passes through steps of its journey. When mobile data terminals are available, the shipment is typically scanned when it is picked up, when it is delivered, and at each intermediate terminal. When mobile data terminal are not available, shipments are only scanned at terminals. ***As*** soon as the shipment is scanned, its status is recorded in a central database, which is accessible for the purpose of tracking shipments, and for billing. Some trucking companies provide software to their customers that allows them to track their shipments from their own computer, and to generate bar-codes.

2.2.3 Route Planning and Scheduling Systems

Route planning and scheduling systems are used to plan vehicle routes and assign drivers to routes. These are most often proprietary or otherwise customized. They are also frequently coupled with Geographic Information Systems (GIS) for the purpose of displaying routes and for constructing route instructions. Different types of systems are applied to different types of routes. Delivery routes, as well as any route where the set of customers **is** fixed, are the most amenable to optimization as they can be pre-planned. Pick-up routes, especially those where customers call-in shipments while vehicles are in the field, are usually human optimized. In almost all cases, optimization software is limited to sequencing stops. The precise route followed from stop to stop is usually at the driver's discretion. In-vehicle route guidance devices, if customized to reflect trucking's unique constraints (e.g., trucks cannot operate on all streets), can assist the driver in this task, but are rarely **used.**

2.2.4 Vehicle Tracking

Vehicle tracking entails calculating the precise location of vehicles in real time. Tracking can be used for a variety of purposes, including: (1) monitoring driver performance, **(2)** billing shipments based on distance traveled, **(3)** measuring on-time performance, **(4)** dispatching, (5) vehicle routing, and ***(6)*** driver maydays and theft tracking. Some of these capabilities (e.g., dispatching) require that the tracking system be coupled with a

communication system. Others require installation of an in-vehicle interface (e.g., vehicle routing).

"Teletrac" fiom Airtouch and "Omnitracs" from Qualcomm are two of the major commercial products in the field. Teletrac operates off a pager network. When a dispatcher requests a vehicle's location, paging transmitters activate vehicle location units, which then emit a signal enabling its location to be determined within 150 feet. The Omnitracs system, on the other hand, is Global Positioning System (GPS) based, and utilizes satellites to communicate position information back to Qualcomm's "Network Management Center", which then sends the information by landline to the carrier. Both systems provide a range of additional capabilities, including an ability to transmit messages and data to and from vehicles, track trailers, and locate stolen vehicles. In terms of markets, Teletrac is oriented toward intra-regional trucking, whereas Omnitrac, with 100% coverage, is oriented toward long distance trucking.

2.2.6 Inspection Stations

Systems have been developed and tested to enable longhaul trucks to bypass weigh stations, and enable states to collect trucking data for planning purposes. The basic concept, utilized in the Advantage 1-75 and HELP (Heavy Vehicle Electronic License Plate) programs, is for trucks to electronically relay status information as they pass weigh stations once they have been cleared through an initial station, thus eliminating delays. Specific objectives of HELP are to: (1) allow states to check the size and weight of commercial vehicles without stopping them, **(2)** pre-clear vehicles by electronically checking documents, **(3)** automatically audit vehicle records (fuel taxes, maintenance, mileage); **(4)** issue permits electronically fiom a single location; *(5)* develop better planning data, and *(6)* assist the trucking industry with its own monitoring.

The Crescent project of the HELP program was "intended to implement and to demonstrate integrated technologies and CVO services." The following technologies were demonstrated in **six** western states (including California): "(1) automatic vehicle identification (AVI), **(2)** weigh-in-motion (WIM); **(3)** automatic vehicle classification (AVC); and **(4)** data communication networks" (Crescent, 1994). These technologies are, for the most part, well established. However, their integration into multi-location truck inspection system is new. In fact, while the HELP evaluation (Crescent, 1994) concluded "with some exceptions, the HELP technologies and procedures can perform adequately," the study also concluded "Institutional issues present the greatest obstacles to the effectiveness, and even feasibility, of CVO services." These institutional obstacles include policies that prevent common data collection standards, lack of commitment by senior state government management, and lack of training of state employees.

The HELP evaluation also examined industry perceptions of the benefits of various CVO services. Among its conclusions are: "motor carriers perceive that by-passing ...services are the only ones that could provide them significant benefits" and "motor carriers' views on HELP systems' utility is strongly related to their operations."

Looking toward the future, one limitation of the Crescent system is that visual safety inspections are impossible. Hence, participation must be limited to carriers with proven safety records. It is conceivable that visual inspections could someday be replaced with on-board diagnostic systems (perhaps coupled with spot checks) that could automatically detect major safety problems (such as brake failures).

3 GOVERNMENTAL ROLES IN COMMERCIAL VEHICLE OPERATIONS

An initial step of the study was to assess how government interacts with the CVO industry. This assessment was broad-based, covering such issues as safety regulation, licensing, permitting, inspections, taxation, and roadway operations. The assessment included collection and review of government documents, and site visits to inspection stations operated by the California Highway Patrol (CHP). The section is organized into five parts: (1) Cargo and common carrier regulations, **(2)** Driver regulations, **(3)** Vehicle regulations, **(4)** Governmental services, and (5) Summary.

3.1 Cargo and Common Carrier Regulations

Motor carrier (i.e., trucking) regulation occurs at both the state and national level. Rooted in its constitutional power to regulate commerce among the states, Congress established the Interstate Commerce Commission (ICC) in **1887** to regulate *inter*state transportation. Over time, the ICC has been used to control rates, services and routes for trucking companies, as well as railroads. However, interstate trucking was deregulated under the Motor Carrier Act of **1980** and subsequent legislation. Within California, ***intrastate*** motor carriers are regulated by the state Public Utilities Commission.

California PUC requirements focus on various aspects of financial responsibility. To obtain a PUC common carrier permit, a motor carrier must: **(1)** establish that it is financially capable of conducting the proposed operations, **(2)** obtain liability, property damage and workers' compensation insurance, **(3)** post surety bonds, **(4)** disclose all equipment, and (5) establish approved preventive maintenance and safety education programs. In addition, the PUC requires that the carrier certify compliance with a variety of other regulations (e.g., registering vehicles with the Department of Motor Vehicles). From a rate-setting perspective, Section **601** of the Airport Improvement Program Reauthorization Act of **1994** prohibited states from regulating "prices, routes or services" of motor carriers, excepting household goods carriers (Muller, **1995).**

Following the Motor Carrier Act of **1991,** the ICC adopted a "Single State Registration System" in **1993,** which requires motor carriers to carry, in their vehicles: a registration from a single base state, proof of satisfactory insurance coverage, and a copy of ICC operating authority (if operating interstate). The ICC also requires that the carrier comply with the state regulations of every state in which it operates, and that it designate a process agent in each state in which it operates. As of this writing, the ICC has a greatly

diminished role in trucking regulation, and there is some question whether it will continue to exist.

In addition to common carrier regulations, hazardous materials transportation is regulated by the California Department of Health Services and the California and Federal Environmental Protection Agencies, both of which require operating permits. The motor carrier must also obtain a Hazardous Materials Transportation License, the driver must obtain a HAZMAT endorsement, and the vehicle must display federally mandated placards.

Freight is subject to additional regulation when crossing borders. Agricultural shipments entering California are governed by the State Department of Agriculture, which operates inspection stations at border crossings with Arizona, Nevada and Oregon. Freight entering California fiom Mexico is subject to inspection fiom **U.S.** Customs, which **also** inspects for **U.S.** Department of Agriculture violations. However, under terms of the North American Free Trade Act, as well as Custom's ongoing programs to speed up inspections for reputable carriers, the scope of cargo inspections is likely to diminish (on the other hand, the importance of ***vehicle*** inspections will likely increase; see Dunn et al, **1995).**

3.2 Driver Regulations

Commercial driver licenses are governed by the Commercial Motor Vehicle Safety Act, passed by Congress in **1986** (Zogby, **1994).** This act requires each state to meet the same minimum standards for testing and licensing commercial drivers, and prohibits drivers fiom holding licenses fiom more than one state. It also establishes a national database to track driver records. To obtain a license, a driver must pass a series of four tests: **(1)** written knowledge test, **(2)** pre-trip inspection test, **(3)** skills test and **(4)** driving test. For all drivers, the knowledge test covers the subjects of safe driving (e.g., controlling speed, skid control and collision procedures) and transporting cargo (e.g., inspecting and securing cargo; see California DMV, **1993).** Additional testing is required for drivers who transport hazardous materials, operate tank trucks, or pull double or triple trailers. In California, the Department of Motor Vehicles (DMV) is responsible for testing and licensing.

Drivers are subject to a great range of vehicle code regulations, which are enforced in California by the Highway Patrol, as well as by local police departments. Many of the regulations are more stringent for commercial drivers than for the general public. For instance, commercial drivers are not allowed to operate a vehicle with any level of alcohol in their system. Drivers are also subject to "hours-of-service" regulations, which govern the number of hours that may be worked without taking a break. These rules are quite complicated, and require tracking hours over a rolling period of eight days. The regulations are different for intrastate and interstate movements (most importantly, California allows no more than **12** hours per day, while federal rules limit workdays to no more than **10** hours). In either case, drivers are required to maintain a log, which must be

presented for inspection immediately upon request by any law enforcement officer (exceptions are granted to trucks that operate within 100 miles of their terminal).

Employers are also required to register their drivers with the DMV's "pull notice" program (CHI?, 1992). The program notifies employers when: "a driver has been convicted of a violation of the California Vehicle Code, has an accident posted to his or her driving record, is classified as a negligent operator, or has his or her driver license suspended or revoked." The notices are mailed automatically at 6 or 12 month intervals (with employers held accountable for keeping records).

3.3 Vehicle Regulations

Vehicle regulations affect licensing, safety, emissions and tax collection. Under provisions of the Motor Carrier Act of 1991, motor carriers are required to register their vehicles with their base state only, which is the state of their principal place of business (Zogby, 1994). Motor carriers are also responsible for obtaining a "fuel user's tax permit" from the State Board of Equalization, and keeping records to ensure that proper fuel taxes are paid in each state (diesel taxes, unlike gas tax, are not uniformly paid at the pump). Special permits are required from the State Department of Transportation for oversize or overweight vehicles (California PUC, 1994). The Environmental Protection Agency, and the California Air Resources Board, also play a role in regulating vehicle emissions, and the Highway Patrol played a role in enforcing "opacity" requirements on emissions.

Record keeping requirements for vehicle maintenance are extensive. Drivers must make a written report each day on their vehicle's condition, which must be retained by the carrier for a minimum of one month. The carrier must also document its adherence to a preventive maintenance program, including safety inspections at 90 day, or shorter, intervals. The carrier must retain records of vehicle inspection, maintenance, lubrication and repair for a minimum of one to two years.

Within California, safety regulations are primarily enforced by the California Highway Patrol (CHI?). The CHP is also responsible for operation of truck inspection stations and for performing the *Biennial Inspection of Terminals* (BIT; see CHP, 1992). Inspection stations are positioned on highways throughout the State. When open, all commercial vehicles passing the inspection station are required to stop. The inspection may include any or all of the following checks: (1) vehicle weight, (2) vehicle and driver licenses, (3) hours-of-service logs, (4) safety inspection, (5) maintenance operations records (for vehicles assigned away from their normal base of operations). In addition, CHP officers make spot inspections on a random basis.

As part of this research, inspection stations were visited in Carson (on I-405) and San Onofre (on I-5). The Carson station is located within the Los Angeles region. There are many alternate routes by which a truck driver could bypass the station, if he or she so chose. In contrast, the only alternate to I-5 is the I-15 freeway, 20 miles east, which also

has an inspection station. Hence, it is virtually impossible to avoid an inspection station when traveling between the San Diego and **Los** Angeles regions.

The two stations operate quite differently. In Carson, hours of operations were limited to 6:00 a.m. to 2:00 p.m., though the station is open to 6:00 p.m. when staffing is sufficient. The northbound scale was broken, ***so*** trucks were not required to stop in that direction. The southbound station was limited to quickly weighing loaded vehicles and performing a simple check for obvious infractions, such as being overloaded with "junk", or failure to display a Commercial Vehicle Safety Alliance (CVSA) sticker. In fact, much of the activity at the station was directed at re-inspecting vehicles that had been ticketed earlier. In contrast, the San Onofie station had much longer hours of operation (6:00 a.m. to 10:30 p.m. Monday-Thursday; 6:00 a.m. to 6:00 p.m. Friday), nearly four times as many employees, and a more thorough inspection of each vehicle that passed by, including weighing each axle. If a violation was noticed, then the vehicle was immediately subjected to a detailed **20** to **40** minute inspection.

BIT is a program by which the CHP visits trucking terminals to inspect safety and maintenance records on an every-other-year basis, covering: **(1)** preventive maintenance program, **(2)** thorough inspection of vehicle condition, **(3)** drivers' hours-of-service records, and **(4)** if applicable, compliance with hazardous materials regulations. Under the hours-of-service category, the inspector will also look at pull notice records and records of driver proficiency. Failure to achieve a satisfactory rating in any area results in re-inspection within 90 days, and major violations can result in larger penalties.

3.4 Governmental Services

Fewer governmental agencies provide services to trucking than regulate trucking. Certainly the most important service is construction and operation of streets, highways, signals and rest areas, which in California fall under the jurisdiction of Caltrans, as well **as** county and city public works departments. Caltrans also operates a fiee statewide roadway condition phone line, and highway advisory radio and changeable message signs are available in some locations.

The state, under the direction of *CHP,* also plays the primary role in clearing incidents. The ***CHP*** is supported by Caltrans Maintenance (road repairs and debris clearance), fire departments, ambulance companies, tow operators, and hazardous material teams ***(Lo,*** 1995). In addition, the Federal Government operates the National Response Center, which provides a toll-free number for reporting chemical hazards, as well as the Chemical Transportation Emergency Center, which advises emergency personnel. Drivers are required to phone the National Response Center under certain conditions, such as when hazardous materials are released. Drivers are also required to carry emergency response idormation for the shipments they carry. Smaller incidents are sometimes handled by the Freeway Service Patrol, but these tow trucks are not well equipped for serving trucks, who rely more on private contractors. Finally, emergency call-boxes, now installed on many of the state's roads, is another important service for disabled trucks.

3.5 Summary

To summarize, the trucking industry interacts with a great many governmental agencies, largely for regulatory reasons. In addition to agencies involved in general business regulation (e.g., IRS and worker's compensation), trucking companies encounter a long list of agencies that are somewhat unique to their business:

Agency	Functions	Category
California Air Resources Board	Emission Standards	Vehicle
California Highway Patrol	Vehicle Code Enforcement Biennial Inspection of Terminals Weigh Station Operations Incident Clearance	Driver, Vehicle
Caltrans	Oversize Vehicle Permit Roadway Services Incident Clearance Road Condition Information	Vehicle
Department of Agriculture	Agriculture Inspections at State Borders	cargo
Department of Health Services	Hazardous Materials Permit	Cargo
Department of Motor Vehicles	Driver Licensing Vehicle Licensing	Driver, Vehicle
Environmental Protection Agency	Hazardous Materials Permit Emission standards	cargo Vehicle
Interstate Commerce Commission	Interstate Operating Authority Proof of Insurance	cargo
National Response Center Chemical Transportation Emergency Center	Hazardous Materials Clearance	cargo
Public Utilities Commission	Highway Carrier Permit Financial Responsibility, Proof of Insurance Safety Requirements	cargo
State Board of Equalization	Fuel Taxation	Vehicle
U.S. Customs	Inspections at U.S. Borders	cargo
U.S. Department of Transportation	Registration and Safety Rating	Vehicle

For purpose of illustration, the Appendix provides sample forms used in by regulatory agencies.

The list reveals two things. First, most of the interaction between trucking companies and government is regulatory in nature, and second, trucking companies must interact with a great many agencies. Hence, even though government provides an enormous service to the industry through the construction and operation of roadways, it is explainable why trucking companies sometimes perceive government in a negative light. This creates an atmosphere of suspicion that acts as a barrier to governmental efforts to improve trucking services.

4 INTERVIEWS WITH COMMERCIAL VEHICLE OPERATORS

Interviews were conducted with trucking terminal managers, with the objective of assessing current and planned use of technologies and attitudes toward governmental regulations and services. Within this section, the interview methodology is presented first, and results are provided second.

4.1 Methodology

The methodology is presented in two sections: (1) questionnaire design, and (2) survey administration and analysis.

4.1.1 Questionnaire Design

Interviews were semi-structured, following the questionnaire format provided in the Appendix. A draft questionnaire, developed in cooperation with Caltrans and PATH, was finalized after a pre-test with three companies.

The questionnaire was divided into five sections. The first explores acquisition and use of roadway and traffic information, from the perspective of terminal managers/dispatchers and from the perspective of drivers. The second section explores regulatory aspects of transportation, such as licensing, inspection, hours-of-service records, and maintenance records. The third section examines use of technologies, for such purposes as vehicle tracking, communication to and from vehicles, and security. The fourth section covers attitudes toward ITS user services, as identified by the Federal Highway Administration (FHWA, 1995). The fifth and final section develops a company profile, with respect to size (number of vehicles and drivers), service coverage, commodities carried and fleet composition.

The questionnaire contains a variety of question types, ranging from simple yes/no to completely open-ended. In general, questions regarding existing operations were highly structured, while attitudinal questions, as well as questions regarding future plans, were open-ended and allowed probing. Phrasing of questions regarding ITS user services was as neutral as possible and mirrored FHWA's language. For example, mangers were asked:

> **For each of the** following: will provision **of the service have** a significant impact on **your** operations. **What is the** impact **and why?**

followed by a list of services, such as:

> Commercial vehicle electronic clearance, to facilitate domestic and international border clearance.

The wording is an abbreviation of FHWA's description.

4.1.2 Survey Administration

The survey group was managers **of** trucking terminals located in the State of California. They were identified through two sources: phone directories (for-hire carriers only) and California Trucking Association's list of terminal managers (private and for-hire carriers) . In the former case, names of individuals were unavailable, ***so*** the interviewer simply asked for the terminal manager. In the latter case, names were available, but were frequently not current, in which case a replacement was accepted. Companies were selected at random from the lists. However, the following companies were intentionally contacted, all of which are prominent in the industry:

Consolidated Freightways
J.B. Hunt
Roadway Express
United Parcel Service
Viking Freight System
Yellow Freight System

Companies rarely refused to participate in interviews. However, there was considerable variability in the depth and length of responses. Typical interviews lasted 20-60 minutes. Company identity was kept confidential in individual responses. Interviews were administered by telephone.

Where appropriate, responses were tabulated, and in some cases cross-tabulated by company size. More qualitative responses are simply summarized.

4.2 Interview Results

A total of **48** terminal managers, representing 47 companies, were interviewed. 18% were classified as small (**1** - 10 trucks), ***50%*** as medium (11- **100** trucks) and **34%** as large (more than 100 trucks). Roughly half of the companies only operated tractor-trailers, and about **8%** operated no tractor-trailers. The remainder were roughly evenly spread between **10** and **90%** tractor-trailers. ***58%*** of the companies were primarily intrastate carriers **(80%** or more of business in California), 17% were regional carriers (about half of their business in California), and 20% were national carriers (10-20% of their business in California) and **3%** of companies declined to state). In terms of commodities, **33%** reported that they carried general freight. These were predominantly national and regional companies. The remainder specialized in many different commodities, the most common of which were

agriculture and produce **(23%)** and household goods **(8%).** The other companies (predominantly intrastate) carried such products as explosives, electronics, chemicals and construction products.

4.2.1 Information Acquisition

Information on roadway conditions is obtained by dispatchers through various means (Figure **1;** question allows multiple responses). The two most important are radio traffic reports and the information that is relayed back by drivers. Only a few of the respondents cited on-line services as an information source. Dispatchers use information for a variety of purposes, the most common of which is advising drivers about routes and conditions ***(58%).*** Responses **also** include advising shippers/receivers about pick-upldelivery times **(29%)** and re-assigning pick-ups to different drivers **(17%).**

Drivers, like dispatchers, also rely on radio traffic reports and other drivers (via CB radio), with no other source cited by more than **13%** of respondents (Figure 2). By far the most important use of this information was to change routes (60%), though some respondents cited re-sequencing stops (4%), advising shipperslreceivers of pick-upldelivery times **(10%)** and requesting re-assignment of pick-ups **(8%).**

Combining the dispatcher and drivers questions, it appears that trucking companies are relatively rigid in how they assign shipments to drivers, and in altering pick-up and delivery times. The primary use of roadway information is for route selection, and that information is used by the driver, who is typically responsible for routing. Further, most companies seem to be less interested in minute-to-minute traffic conditions than in major events, such as roadway construction and closures. **This** reflects the philosophy that routes, for the most part, cannot be changed in the short run (at least at the dispatcher level).

In terms of preferred means of accessing information from Caltrans, telephone information lines (45%), on-line information by modem **(40%)** and radio broadcasts **(30%)** were all popular (Figure **3).** It should be noted that the preference for modem based information was far stronger than its actual usage, indicating an area for future growth.

Overall, there **is** some level of dissatisfaction with the quality and accuracy of information that is currently available from the state. Most importantly, terminal managers desire better information on roadway conditions (e.g., snow, flooding, etc.), roadway closures and roadway construction. **This** information needs to be reliable and up-to-date, as well as complete enough to provide expected time to clearance. Information should also be provided in advance, ***so*** that terminals can plan ahead when they dispatch a truck. And information should be readily accessible, without delay or busy signals.

Regarding incident clearance, interviewees offered few criticisms or suggestions on current services. In responding to the questions, it was evident that companies did not view government as the primary service provider for disabled trucks.

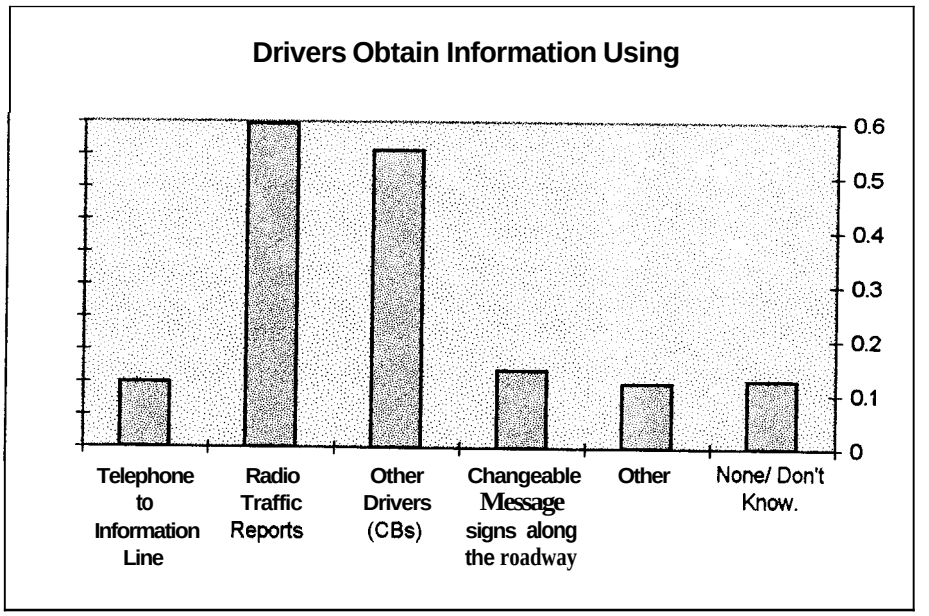

Figure 2. Driver **Information** *Sources*

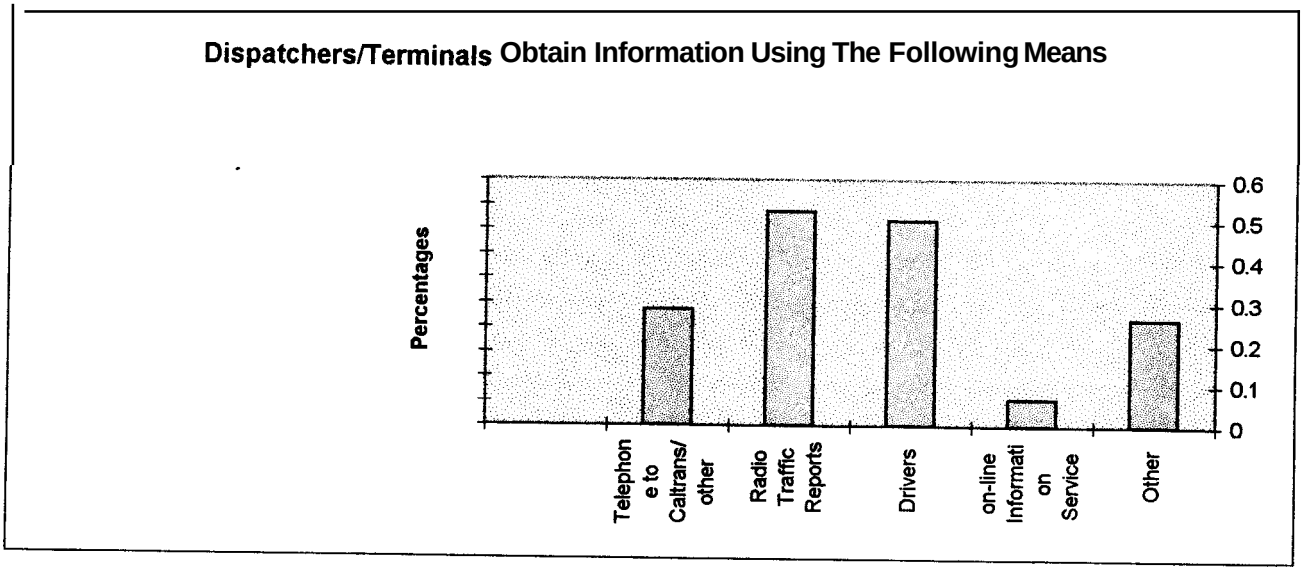

Figure 1. Dispatcher Information Sources

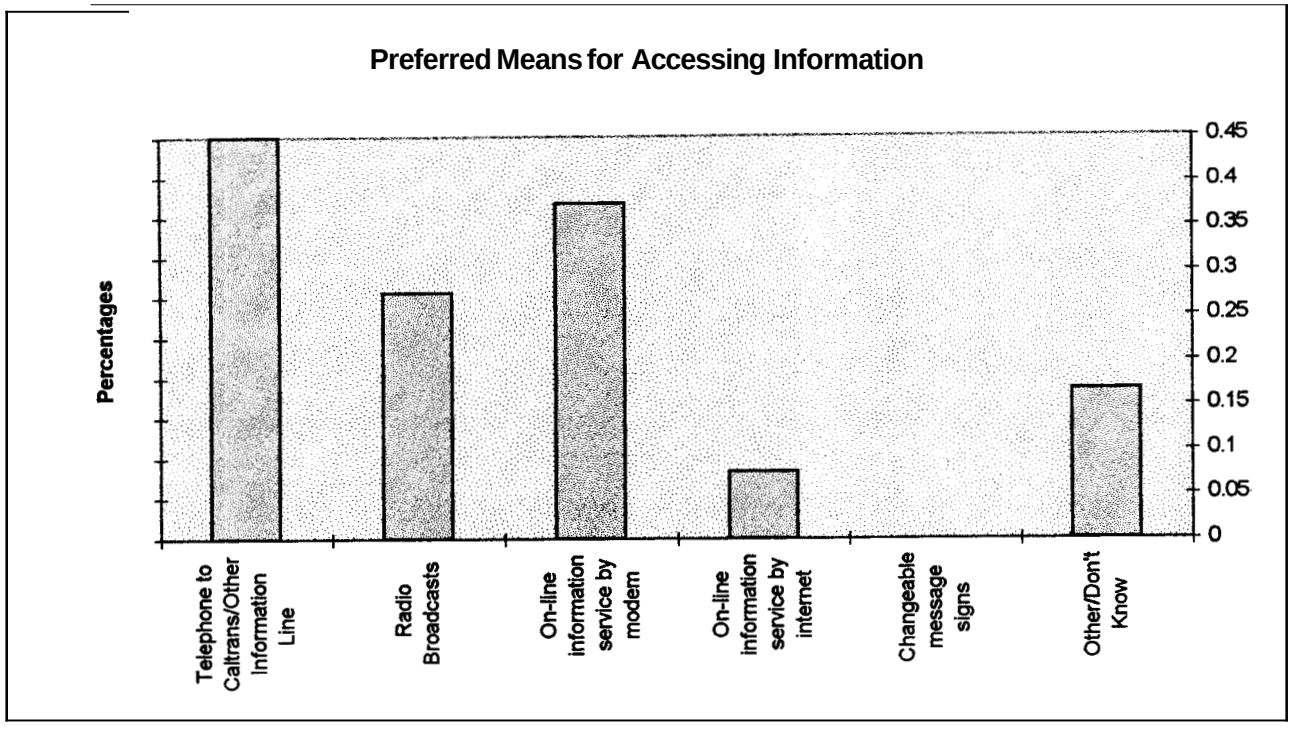

Figure 3. Preferred Means of Acquiring Information

4.2.2 Use of Technologies

A wide range of technologies are used for communicating to/from drivers. CB Radio (42%), pagers (39%) and cellular phones (22%) are frequently used. A small number of companies (4%) had wireless data transmission capabilities. A significant percentage only communicated by conventional telephone (33%) or not at all. Most companies only communicate with their drivers on an infrequent basis. In terms of landline communication, capabilities were limited. Just 35% of the large companies, 20% of the medium companies and 10% of the small companies utilized computer modems, and even smaller numbers were Internet accessible (26% of large, 21% of medium and none of the small companies).

Vehicle tracking devices have achieved a reasonable market penetration. Whereas none of the small companies had vehicle tracking, 25% of the medium companies and 29% of the large companies utilized tracking. Computers were widely used by large companies in regulatory compliance (close to 80%), but only a minority of the medium (25%) and small (38%) companies utilized computers in this regard. In most cases where computers were used, the scope of their use was limited

Only one company had installed "panic buttons" on vehicles for issuing maydays. This was a medium sized company operating exclusively in Southern California. However, many other companies indicated that CB radios were available for maydays.

4.2.3 Regulations

Virtually all companies stated that regulations are necessary, especially in the area of vehicle maintenance and licensing. Companies recognize the need for safe operation, and they recognize that many of the regulations add to their protection. Some companies felt that regulations could be more stringent, including greater vigilance in preventing drivers from obtaining multiple licenses.

On the other hand, many of the regulations are viewed as confusing and burdensome. The strongest complaints were directed at the paperwork and complexity of hours-of-service rules, and the delays imposed by inspection stations. Managers were concerned that even when companies make good faith efforts to follow the rules, violations inevitably occur. Some companies also felt that hours-of-service rules added to their cost of doing business by reducing their flexibility in scheduling drivers. Several mentioned that the hours-of-service rules should be changed, to allow more hours, or to implement the "24-hour-restart" program (which re-sets the driver's "clock" after a 24-hour rest period).

Other comments included:

- Vehicle inspections should be the responsibility of owner-operators, rather than the companies that contract them.
- There needs to be just one agency to enforce regulations

- Waiting periods should not be included in hours-of-service time.
- Stricter regulation is needed on insurance
- Regulations are inconsistently enforced and CHP officers do not always know the rules.

4.2.4 Attitudes Toward ITS Technologies

As stated earlier, managers were asked to comment on a range of ITS technologies. Unfortunately, the survey group proved to be largely unfamiliar with ITS or its objectives, so responses were one of ambivalence mixed with skepticism. However, it can be said that none of the services elicited negative comments and that there was general support for any service that simplifies paperwork and speeds up processes, Nevertheless, without knowing more specifics than can be provided in a telephone interview, respondents could not provide detailed comments on the services. As a result, attitudes toward ITS user services will be deferred to the second phase of the study in which focus groups will be conducted.

4.2.5 Summary of Interview Results

The interviews revealed several things. First, trucking companies, while desiring better information, are primarily interested in obtaining maintenance related information (i.e., roadway conditions, closures and construction). Furthermore, roadway information is viewed as more critical to routing than to dispatching. Because routing is usually up to the driver's discretion, communication media need to be developed for reaching the driver.

Second, adoption of advanced technologies has been relatively slow. While most drivers possess some type of device for mobile communication, relatively few have an advanced mechanism for communicating text or data. As a result, it may take some time before technologies are in place that allow drivers to receive detailed traffic information.

With respect to regulation, computers were used by many companies to aid in regulatory compliance. Nevertheless, as will be discussed in the following section, companies have not developed integrated and automatic mechanisms for satisfying regulations. Furthennore, it appears that driver log sheets (daily inspection reports and hours-of-service) are almost always on paper, making it difficult for companies to process the data and ensure that their employees are in compliance.

5 CASE STUDIES WITH MAJOR COMPANIES

Case studies were conducted with five major trucking companies to explore the issues raised in Section 4 in depth, The case studies are based on site visits to trucking terminals, including tours of their dispatching operations and in-vehicle technologies. These case studies are not intended to be representative of the industry as a whole. Rather, the companies were selected specifically because of their prominence. The case studies may be indicative of the industry's direction, and possibly the leading edge of technological innovation. However, it should be recognized that, inevitably, there will continue to be a large gap between major and small trucking companies, and that small trucking companies may be quite slow to adopt new technologies. Because small companies account for the majority of the nation's trucking capacity, they should not be overlooked.

The case-studies are formatted as follows. First, a general description of the company is provided, along with a physical description of the terminal visited. Then dispatching procedures are described, including routing, and assignment of orders to drivers, Finally, information technologies are described.

5.1 Consolidated Freightways

Consolidated Freightways (CF, along with Roadway Express and Yellow) is one of the three largest LTL carriers in the U.S. It operates a nationwide network of terminals, and specializes in longhaul shipments. The system operates something like a hub-and-spoke network. Shipments are picked up and delivered from local terminals, which are referred to as "city", "end-of-he" or "satellite" terminals. From the city terminals, shipments are "shuttled" to a "consolidation center" (the hub), where they are sorted according to destination. From there, shipments may either be transported by "linehaul" drivers to another consolidation center or possibly to a satellite terminal, at which point the process reverses for delivery.

The Southern California region is served by a single consolidation center located in Miraloma (near the I-15/I-60 interchange outside of Riverside). The terminal has about 750 employees, 1/3 of whom are drivers (45 city, 75 shuttle and 125 line-haul). Within two buildings, the terminal has three operations: inbound freight, outbound freight and city (serving the local Riverside area). The terminal processes about 2.5 million pounds of freight per day outbound, and 1.5 million pounds per day inbound. The terminal operates as a "cross-dock facility", meaning shipments are taken directly fiom truck to truck without inventory. The material handling system is entirely manual (i.e., only fork-lifts and hand-trucks are utilized).

5.1.1 Dispatching

The terminal has separate dispatching facilities for city drivers and for linehaul/shuttle (i.e., terminal-toterminal) drivers. City drivers work within prescribed zones (called "routes") that are more or less fixed fiom day to day. Drivers bid for their zones, and are assigned

on the basis of seniority. One of the advantages of fixed zones is that drivers can develop a rapport with their customers and promote business with CF. However, assignments can vary to some degree based on load sizes (overload can be handled by "shag" drivers, who pick up the excess from more than one route).

Delivery routing is computer automated. CF's computer generates a "load manifest" each morning, specifying which stops are assigned to which trucks and the order in which stops should be visited (the load manifest is sometimes adjusted by the dock supervisor). The manifest is also used to sequence the loading of the truck. Once the truck is loaded, it is difficult or impossible to alter the sequence of deliveries.

Pick-up routing is a dynamic, computer assisted, process. Though many of the stops visited are regular from day-to-day, others are served on a call-in basis. Furthermore, unlike deliveries, the exact size and quantity of shipments are unknown prior to the pick-up, creating some uncertainty as to how many stops can be made prior to filling up the truck or running out of time. The dispatcher's job is fast-paced. His role is to receive incoming phone calls from customers and relay orders to drivers. The computer assists the dispatcher in sequencing and assigning orders, partially to the dispatcher's pre-entered specifications. The computer is also used to call-up customer records (e.g., address and billing information), and to begin processing the order.

Linehaul and shuttle dispatching is a slower paced operation. The dispatchers do not interface with customers, but do interface with other terminals, with whom they must coordinate driver and truck movements. The dispatcher's job is to assign drivers to loads, taking into account the driver's domicile and hours-of-service restrictions (i.e., whether the driver is eligible for undertaking a trip of a given length). Computers are used to call up records for shipment quantities and release times.

5.1.2 Use of Technologies

CF utilizes computers extensively for a variety of accounting, tracking and dispatching purposes. As soon as a shipment is picked up, the driver applies a bar-code, which is used to track the shipment's progress as it moves from terminal to terminal. Customers can then check the status of their shipments electronically (through software provided by CF) or by phone. However, CF drivers do not carry data-terminals, and bills-of-lading are created in paper form (and later entered into the computer). Alternatively, CF can receive shipment documents by EDI.

CB radios and pagers are used to communicate with city drivers. Some of the linehaul drivers (sleeper/driver pairs) carry cellular phones, whereas others only communicate by conventional phone. CF does not currently utilize vehicle tracking at Miraloma (a pilot test is underway in Las Vegas). CF has also established an "Emergency Road Coordinator" (ERC) facility in Chicago to serve linehaul drivers nationwide. Linehaul drivers are required to phone the ERC when they encounter a problem on the road, such

as a vehicle malfunction or major roadway delay. The ERC then formulates a response. The **ERC** also issues daily status reports back to the consolidation centers.

CF's city dispatcher does not monitor roadway or traffic conditions, except to the extent that drivers communicate information regarding unusual delays. CF's linehaul dispatcher monitors roadway conditions somewhat more closely, especially in the winter (often using the Caltrans 1-800 number). However, drivers are somewhat more attuned to road conditions than dispatchers. On intercity routes, CB radio is used extensively to communicate road information. Within cities, traffic reports are monitored on AM radios. In addition, one driver stated that he monitored snow plow communication to assess their progress in clearing roadways.

Hours-of-service, daily inspection reports, and vehicle maintenance records were all examined. Of the three, computers are only used for vehicle maintenance on the linehaul trucks. A detailed tractor history is stored on-line, including dates and mileage for major repairs and component replacements.

5.2 Yellow Freight System

Also one of the three largest LTL carriers, Yellow Freight System operates similarly to Consolidated Freightways. Shipments are transported through **a** network of satellite and hub terminals. Unlike CF, however, Yellow ships direct between pairs of satellite terminals.

Yellow has many driver categories for their line-haul routes. ***Bid drivers*** do not have to be sent back to their domicile. ***Flag staff*** drivers drive between the terminal and the major consolidation center in Barstow. Yellow **also** operates ***sleeper teams*** for long distance routes, as well as a shuttle operation to cover the LA basin. Trains are used extensively for long-distance (especially coast-to-coast) routes. Like the other companies, Yellow **also** uses relays in its routing.

The Gardena satellite terminal was visited as part of the study. **99** percent of their customers are larger daily pick-up customers and the rest are **"call-up"** customers. The terminal maintains about 150 28-foot trailers, 50 48-foot trailers and seven vans, and employees 101 drivers. All of these drivers and vehicles are used for pick-up and delivery; line-haul drivers come from the hub terminal. They handle 1100-1300 shipments a day. Like CF's terminal, Yellow's was a cross-dock facility with manual material handling.

5.2.1 Dispatching

Gardena uses about 70 "city" drivers for pick-up & delivery on Mondays & Tuesdays and 45 on other weekdays. Pick-ups tend to be stable from day to day, but deliveries vary. On an average day there are 72 regular daily pick-ups and about 150 people calling in for pick-ups. To handle this load, the total area of operation has been divided into zones which represent equal volumes. One driver is assigned to each zone and this assignment

remains fixed *so* that the driver can become familiar with the area and the routes (zones are sometimes combined on light traffic days). The arrivals and the departures are scheduled *so* that the trailers from other hubs arrive at Gardena at night, when they are unloaded and transferred onto pick-up and delivery trucks for delivery the next morning.

Each zone is further divided into three segments -- "tail," "center" & "nose" -- which define groupings of deliveries. These also define how shipments are loaded in the trailer and the general route to be followed by the driver. The nose part of the trailer is usually reserved for the most voluminous pick-up and delivery region within the zone, and the tail part is usually reserved for residential packages/smaller customers. While loading the trailer, palletized freight is placed on the bottom and hand freight on the top. Although a computerized delivery manifest is prepared, the driver is free to make changes in the sequence.

5.2.2 Use of Technologies

Similar to CF, Yellow uses computers in many of its operations. **A** shipment is bar-coded as soon as it is picked up, and the same bar-code is also applied to the freight bill. Shipments are scanned at terminals. Yellow Freight System is in the process of implementing many new technologies in their dispatching system. This includes mobile data terminals for the line-haul drivers, tracking systems for city drivers and a computerized dispatching system. Yellow sends, via modem, information on packages that are expected in the next arriving trailer and the expected time of arrival of the trailer. Customers can check shipment status be either calling in or by utilizing software provided by Yellow to log into Yellow's network via modem.

Record keeping methods were examined for hours-of-service, daily inspection reports, and vehicle maintenance. Only maintenance records are computerized. **A** computerized database is maintained showing when a tractor or trailer needs to be sent to the shop. Record are also kept on the parts replaced. Repairs are performed on site, except major repairs, which are sent to Pico Rivera. *All* paper records are archived at the Barstow hub, where regulatory information on other satellites is also maintained.

5.3 Roadway Package System (RPS)

Within the package shipment industry, Roadway Packaging System (RPS) holds the number two position in terms of packages handled (the first being UPS, and excepting the **U.S.** Post Office). It carriers one million packages per day, and covers **99%** of the country. RPS, like UPS, serves packages up to 150 pounds, but allows odd dimensions. Most of their shipments are business-to-business and, unlike UPS, **RPS** makes few residential deliveries. **RPS** is a unit of Roadway Services, Inc., which also owns Roadway Express (one of the top three LTL carriers).

RPS is a non-union carrier and has gone to the extreme of contracting with owner-operators for all of its truck routes, including pick-up and delivery. The owner-operators

are paid according to the amount of freight carried, and are responsible for covering all costs of purchasing and operating their trucks. The result is a system that directly compensates drivers for increased productivity. On the other hand, **RPS** has less direct control over the workforce than other companies. Owner-operators, for instance, can hire their own employees to assist on routes. RPS does offer a range of services to its contractors, including low cost insurance.

Like the LTL companies, **RPS** uses a network of satellite and hub terminals. Shorter inter-terminal routes are covered by relays, and long routes are usually covered by sleeper/driver teams (one of whom is often an employee of the owner-operator). RPS believes in being a "Monday-Friday" company and tries to schedule drivers *so* that they are able to return home for the weekends.

The Vernon hub was visited for the study. It handles approximately **140,000** packages per day. *50* contractors (and **174** drivers) serve line-haul and pick-up and delivery routes out of the hub. The terminal is highly automated, employing a bar-code based sortation system and automated material handling.

5.3.1 Dispatching

Compared to other carriers, pick-up and delivery routing is quite rigid at RPS. Each contractor serves all of the pick-ups and deliveries generated in a zone. Because compensation is based on the number of shipments carried, they seldom cross over to serve shipments from another driver's zone. This approach has the benefit of encouraging drivers to develop a bond with customers and promoting business.

The route sequence affects the way the trailer is loaded. Unlike LTL carriers, trucks are not completely "cubed out" from front to back. *An* aisle is left free, allowing drivers to access shipments throughout the truck. Therefore, the loading sequence does not define the delivery sequence. Drivers have great discretion over the pick-up and delivery sequence and routing. Pick-ups are all at fixed customers (no call-ins), *so* drivers follow highly standardized routes.

5.3.2 Use of Technologies

RPS uses a rather sophisticated bar-coding systems, in which the following information is encoded: (1) Shipper ID, (2) Package Number, (3) Payment, (4) Package Weight, and *(5)* Destination zip code. In the future, two-dimensional bar-codes will carry even more idormation. The bar-codes are applied on the packages by the shippers themselves. **A** "S.W.A.K." (scan, weigh and , key-in) operation is performed on each package that enters the sortation system. **RPS** offers EDI capabilities, allowing shippers to electronically transmit shipment information to RPS, and provides equipment for generating bar-codes. Drivers **also** carry data terminals, including a light pen for reading bar-codes

Pick-up and delivery drivers carry a mobile data terminal called the "star-scanner" (including a bar-code scanner) to record deliveries. The terminal, when placed in the van, directly transmits information back to the terminal by wireless means. Pick-up and delivery drivers carry pagers to receive information, and utilize conventional phones to communicate back to the terminal. Most line-haul drivers own CB radios, but this is not a requirement. Furthermore, CB puts them out of range of communication for much of their journey.

Although trucks are owned by drivers, and maintained by independent vendors, **RPS** still assumes responsibility for compliance with ***safety*** and maintenance regulations. **RPS** maintains **full** files in its terminals, in paper form, **on** all equipment and drivers, and participates in the DMV pull-notice program. Records are overseen by **RPS** headquarters in Pittsburgh.

5.4 United Parcel Service

UPS is the nation's largest trucking company. It is best known for carrying packages (under 150 pounds), but is also prominent in the express mail industry. Systemwide, UPS handles about 12 million packages daily.

Like the other trucking companies, UPS operates **an** extensive network of terminals (called "facilities"). Within Los Angeles, several terminals are located within 10 miles of each other. ***UPS*** relies on rail for its regular long-distance shipments. *All* regular shipments crossing the Rockies travel by rail. On medium distance routes (about 400 miles), UPS utilizes relays, allowing drivers to turn around midway and return home the same day. During peaks (i.e., Christmas time), ***UPS*** subcontracts some of its work to LTL companies.

UPS utilizes a private fleet of aircraft for its express mail service. Shipments are transported through its hub terminal in Louisville, along with several other regional terminals, such as the west-coast hub in Ontario, California. Both express and regular shipments are delivered by ***UPS'*** familiar brown trucks. However, ***UPS*** maintains a separate fleet of vans to make "on-call" pick-ups (i.e., serving customers who call in on the day of pick-up).

The Olympic terminal was visited in Los Angeles, which serves West **Los** Angeles and Downtown. It handles about 95,000 packages (50,000 outgoing and 45,000 in-coming) each day, utilizing 215 "package cars" for pick-up and delivery. From this site, regular packages are sorted for delivery to **30** destination terminals. However, partial loads would be sent to the Grande Vista facility in Vernon for consolidation. Express packages (12,000 of the total) are loaded into aircraft containers, which are placed on flatbed truck and transported to Los Angeles International Airport. The departure time of this flatbed is tightly coupled with the return of pick-up and delivery trucks to the terminal.

The terminal (a two-story facility) utilizes conveyors to transport packages internally. However, unlike RPS, the sortation process is manual. Unlike other terminals, UPS does not segregate in-bound from out-bound trucks within the terminal. UPS places both types of trucks on the same line *so* as to maximize their flexibility in utilizing space. This is accomplished by providing bi-directional conveyors, with the top side taking packages to trucks, and the bottom side taking packages away from trucks.

5.4.1 Dispatching

Drivers leave for pick-ups and deliveries by about 8:30 a.m. and usually return between 5:00 and 6:00 p.m. Drivers serve fixed zones, though some flexibility is provided during peak periods. They have tremendous discretion over stop sequence, keeping with UPS' philosophy of employee empowerment. Pick-up locations are almost entirely fixed from day-to-day, but deliveries vary depending on the shipments carried. If someone wants a special pick-up for a regular package, they usually must call the day before to make arrangements. Drivers typically finish their day by clearing drop boxes maintained by UPS for express mail.

UPS' on-call pick-up vans follow more dynamic routes. Their purpose is to pick up express mail shipments from irregular customers, who call in on the day of pick-up. **A** dispatcher assigns work to drivers, and drivers have discretion over routing.

5.4.2 Use of Technologies

UPS operates a central call center to receive requests for express mail pick-ups within Utah, California, Arizona and Nevada. The call processors enter information on the pick-up on their computers, then electronically transmit the information to the appropriate facility. The dispatcher at the facility then assigns the shipment to the appropriate on-call van. Communication to vans occurs through a generic Motorola system, which provides a textual display.

Package car drivers carry mobile data terminals called "DIAD" (Delivery Information Acquisition Device). DIAD is used to electronically record deliveries. It contains a bar-code scanner, keyboard, and an interface to electronically record signatures. This creates a paperless transaction at point of delivery, which is electronically transmitted to the terminal as soon as the DIAD is placed in a base set in the truck. The DIAD is also used as an electronic time card to track hours-of-service. Some package car drivers also carry pagers.

The pick-up process, unlike the delivery process, is not entirely paperless. Smaller customers must list out their shipments on **forms.** Larger shippers utilize UPS' "MAXI-*SHIP"* software, which allows them to electronically submit shipment information. UPS also offers software for tracking shipments, as well as an Internet web site for tracking shipments. ***UPS*** only utilizes bar-codes on its express shipments. These are scanned within terminals and at point of delivery.

Maintenance records are maintained on computer, as are hours-of-service records. For pick-up and delivery drivers, hours-of-service are recorded through DIAD. For line-haul drivers, an electronic time card system is utilized, which downloads information once the driver has returned to its home terminal.

5.5 J.B.HUNT

J.B. Hunt is a major TL company, meaning that it carries shipments in truckload quantities. The major operating difference between a TL company and an LTL company is the absence of consolidation centers and also the hub and spoke arrangements that result **from** the consolidation centers. In addition, J.B. Hunt does not sort shipments. Hence, its terminals do not have material handling equipment. J.B. Hunt operates nationwide.

Southgate, one of their regional "centers," was visited near Los Angeles. The center handles about 1300 loads a week and has 103 trucks and 125 drivers. J.B. Hunt carries all types of freight. Its responsibility is for transporting the entire trailer, no matter what it contains. In almost all cases, service is from one origin to one destination, though occasionally multiple stops are made.

5.5.1 Dispatching

The operations at J.B. Hunt are divided into: (1) local (within 100 miles), (2) regional (within 100-200 miles), and (3) over the road (OTR, more than 200). Smaller terminals only provide local and regional service. The local area at Southgate has been divided into four pie slices, each handled by an individual dispatcher with a dedicated computer terminal and a dedicated group **of** drivers. **A** separate dispatcher is responsible for OTR and regional operations. Loads that travel between areas are coordinated by a logistics manager to make efficient use of backhauls.

Most of the long distance shipments are sent by rail, which are loaded on site. J.B. Hunt has a contract to use Santa Fe, but sometimes uses Southern Pacific and Union Pacific, depending on the destination. J.B. Hunt also utilizes sleeper teams (most of whom are husband and wife pairs) for some long distance moves.

5.5.2 Use of Technologies

Because of the nature of its business, J.B. Hunt does not track individual packages and does not use bar-coding. It does, however, track its vehicles on a real time basis, using Airtouch Teletrac. Truck locations are pinpointed on the dispatchers' terminals on a continuous basis, and displayed on a map. Information on the start time, expected arrival time, and special comments, are also computerized. The system is used for directing pick-ups and deliveries, and for coordinating backhauls. Some shippers are also supplied with software that helps them track their trailers. This is analogous to the tracking of individual

shipments in LTL and package carriers. All of J.B.Hunt's hubs are inter-connected by fiber-optic cables and each hub now has an individual router.

J..B.Hunt also utilizes Rand McNally software to assist in routing its longhaul trucks. The software provides both a primary route and alternate routes, such as routes that are less susceptible to delays during the winter. Managers sometimes call into Caltrans' information line for roadway conditions for the longer routes; usually, calls are not made for local routes. It is up to the terminal manager to select the route, rather than the driver.

Communication to drivers occurs through a device that merges 2-way radio and cellular phone. Using this system, the dispatcher can talk to a specific driver or to many drivers at the same time. JB Hunt also uses computers extensively in regulatory compliance. This includes maintaining computer records of hours-of-service logs, vehicle inspection records and repair records.

5.6 Case Study Summary

From the case studies, several important trends can be observed:

(1) The primary motivator of technology implementations has been enhancement of customer service. This is reflected in technologies for tracking shipments and electronic data interchange.

(2) Pick-up and delivery routing (especially pick-up) is usually a manual process, at the discretion of the driver. This partially reflects the complexity of routing these vehicles, and partially reflects the desire to empower employees.

(3) Companies have not invested heavily in technologies to simplify regulatory compliance, which does not appear to be viewed as a value added investment.

From the standpoint of CIT, the emphasis of the trucking industry is much more on integration with customers than on integration with government, presenting a serious obstacle to implementing many of the ITS user services. (See Table 1 for a summary of case studies).

6 SYNTHESIS WITH COMPUTER INTEGRATED TRANSPORTATION

Implementation of the CIT concept entails development of a structure for organizing transportation activities through the sharing and exchange of idormation. The specific focus of this paper is to develop a strategy for motor carriers to work with government within a CIT framework. Congressional legislation in **1986** and **1991** went far toward integrating vehicle and driver regulations among the states. However, progress is still needed in integrating regulations across *functions*.

Table 1. Features of Carriers Visited

	Consolidated Freightways	J.B. Hunt	RPS	United Parcel Service	Yellow Freight System
Market	LTL	TL	Package	Package	LTL
Size local	4 million lbs./day	300 loads per day	14,000 packages per day	95,000 packages per day	1100-1300 shipments per day
Dispatching	Computer Assisted	Computer Assisted	Manual	Manual	Computer Assisted
Vehicle Tracking	No	Yes	No	No	No
Communication	Radio	Radio, Cell Phone	Radio, Pagers	DIAD, Pagers	Radio
Maintenance Records	Computerized	Paper Files	Paper Files	Computerized	Computerized
Hours of Service	Paper Files	Computerized	Paper Files	Computerized	Paper Files
Use of Bar Codes	Yes	No	Yes	Yes	Yes
Driver Scanners	No	No	Yes	Yes	No (planned)

6.1 Organizational Opportunities

In earlier work on CIT, the concept of "leader" and "satellite" transportation management centers was introduced (Hall et al, **1994).** Within the context of CVO, it appears that multiple leaders are needed, divided along functional lines. These leaders would coordinate with each other, and with supporting agencies. They would serve as the primary points of contact with the CVO industry.

Based on our review **of** governmental regulations, and interviews with trucking companies, government/carrier interactions can be divided into four basic categories: (1) permitting and licensing, **(2)** enforcement, **(3)** roadway information, and **(4)** incident clearance. Natural candidates for leadership follow:

Permitting and Licensing	Department of Motor Vehicles *(DMV)*
Enforcement	Highway Patro
Roadway Information	State Department of Transportation (DOT)
Incident Clearance	Highway Patrol

To be a leader, an agency must assume the *coordination* role within its functional area. This may mean becoming the sole point of contact or, if not, ensuring that all points of contact within its function are consistent and compatible. For instance, in the enforcement category, the highway patrol would not necessarily assume responsibility for agricultural and customs inspections, but would ensure that they are coordinated with vehicle inspections.

Figure **4** diagrams an organizational structure. The CVO industry is divided into two elements, vehicles and terminals, to distinguish between mobile and landline communication. In the case of licensing, the primary interface is landline, from terminal to DMV, due to the relatively static nature of the function. The primary interface for incident response is mobile, from highway patrol to vehicle, due to the dynamic nature of that function. Information and enforcement functions include a combination of mobile and landline communication, as terminals are integral to enforcement (i.e., BIT) and dispatchers need to receive some traffic information. Other important communication links are between highway patrol and state DOT, to convey incident information, and between DMV and highway patrol, to facilitate enforcement of licensing regulations.

BIT is something of a unique case, in that it serves both an enforcement function and a licensing function. It would be worthwhile to consider ways to better integrate these periodic inspections with the granting of vehicle licenses.

6.2 Technological Opportunities

As indicated in the surveys, regulatory compliance, today, is largely a manual process, entailing extensive paper records. There exists an opportunity to greatly simplify regulations within a paperless system. Some companies are already doing this for their

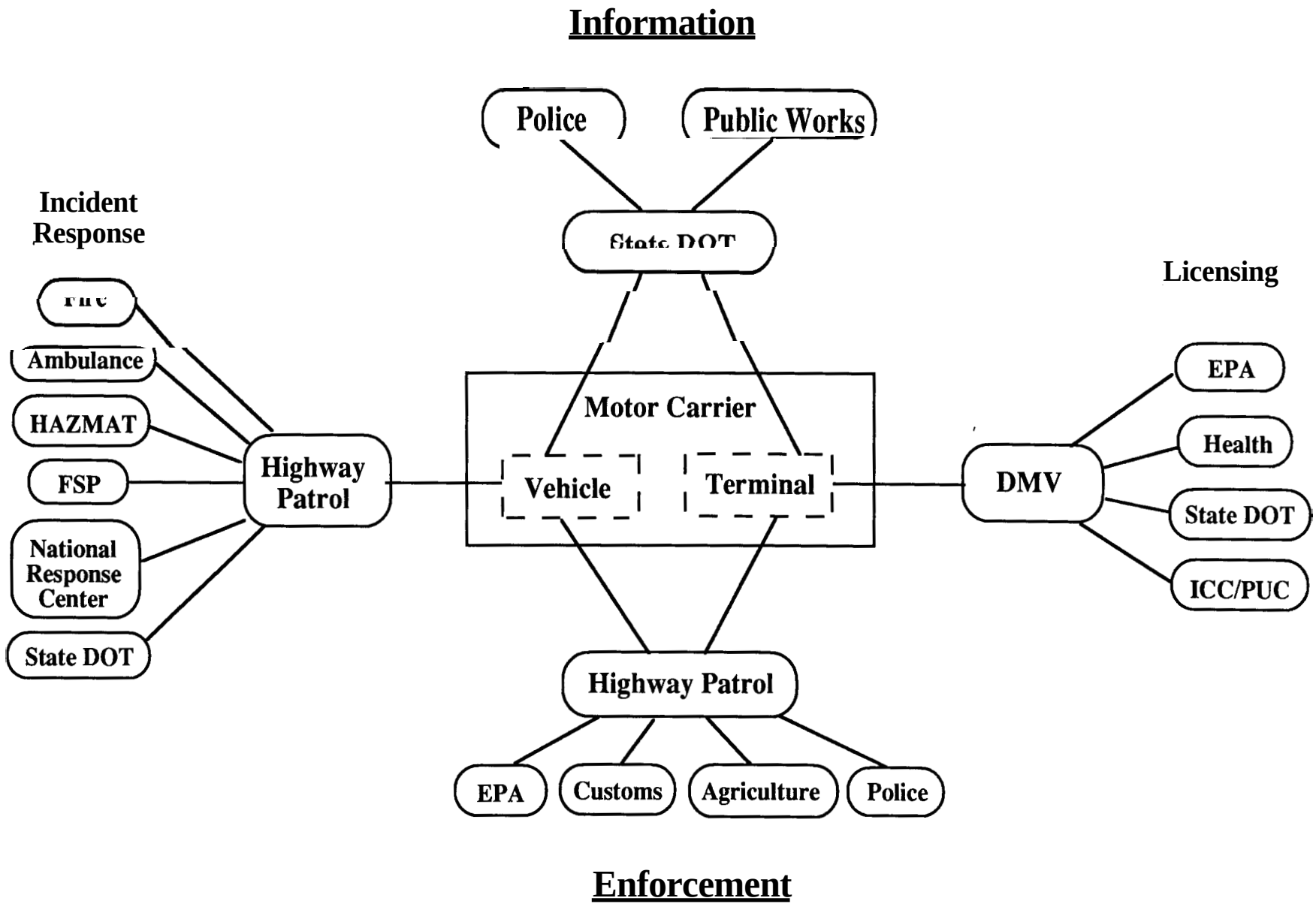

Figure 4. CIT Organizational Structure

vehicle maintenance. Through development of standard record formats, and data interchange standards, opportunities exist to greatly simplify inspections, while at the same time providing trucking companies with improved data for planning and dispatching.

Perhaps the greatest opportunity is to develop an in-vehicle device that satisfies multiple regulatory requirements, while supporting internal operations. Potential functions would be:

- Coupled with a "smart card" carried by the driver, calculate hours-of-service, as well as support driver dispatching.
- Maintain complete history of vehicle maintenance and support scheduling of preventive maintenance.
- Track fuel consumption, by state, and support automated fuel tax payments.
- Receive, retain and evaluate driver's daily vehicle inspection report
- Store manifest for all cargo on board, along with HAZMAT information
- Store all license and permit information
- Interface with on-board diagnostic equipment to detect failures.

For instance, by electronically storing hours-of-service records, it would be possible to implement software for linehaul dispatching that optimizes assignment of drivers to runs. By automating maintenance records, it would be possible to optimize replacement and preventive maintenance schedules. Alarms could also be provided to alert the driver when a violation is imminent. At the same time, if a standard interface is created, these records could be provided to highway patrol in a format that simplifies or eliminates on-the-road inspections. Most importantly, an objective of creating such a device would be to assist drivers and carriers in satisfying complex regulations. It would circumvent violations that result from shere confusion.

Development of the in-vehicle device might also be viewed as a step toward eliminating or drastically changing the current inspection station system. While on-the-road inspection will undoubtably be needed in the future, there is some question whether performing these inspections at fixed locations with limited hours of operation is effective. Furthermore, much of the information that is collected at inspection stations could just as easily be collected "off-line" through down-loading information from automated recorders. Thus, in addition to following the strategy of automating existing stations, the alternative of replacing inspections stations with something radically different should be explored.

8 CONCLUSIONS

The motor carrier industry is an important and significant part of the United States economy, with respect to its size, and with respect to the service it provides to other segments of the economy. It is also a highly dynamic industry, due to drastic changes in regulation at both the federal and state level over the last **15** years. Motor carriers also stand to benefit fiom the implementation of information technologies, falling under the Intelligent Transportation System (ITS) umbrella.

Nevertheless, ITS faces important obstacles in **CVO,** including:

(1) Mistrust of government due to confusing and inconsistent regulation across too many agencies.

(2) The financial state of the industry, and the limited capital available for investment in technology.

(3) Shortage of technically trained employees within the industry.

(4) Decentralized structure of companies, giving considerable power to individual drivers and terminals.

(5) Priority given to automating customer services over automating governmental functions.

Despite these qualifiers, important opportunities exist to improve coordination between government and the motor carrier industry. Specific objectives include:

(1) Reducing the complexity of regulations, especially in the area of hours-of-service.

(2) Reducing or eliminating delays that occur at inspection stations.

(3) Ensuring that data collected for regulatory purposes are also useful for internal operations.

(4) Providing more timely, complete and accurate information on roadway conditions.

These objectives may entail a re-organization of governmental functions along four lines: (1) licensing and permitting, **(2)** enforcement, **(3)** roadway information, and **(4)** incident clearance. While multiple agencies exist within each category, designating a single leader for each should improve coordination, and simplify interactions between government and industry.

From a technological standpoint, there is an important opportunity to develop in-vehicle devices, with standard interfaces, that can store records on: (1) driver hours-of-service,

(2) daily inspection reports, **(3)** vehicle maintenance, **(4)** cargo manifest and hazardous materials, (5) licenses and permits, and *(6)* fuel accounting. Many regulatory functions could be automated within such an in-vehicle device. In the process, drivers and terminal managers can be alerted in advance, *so* that it is easier for motor carriers to operate within regulations.

9 REFERENCES

California Department of Motor Vehicles **(1993).** "California Commercial Driver Handbook," Sacramento, California.

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10 APPENDIX

1) EXAMPLE REGULATORY FORMS
2) QUESTIONNAIRE

INTERSTATE COMMERCE COMMISSION
FORM OP-1
APPLICATION FOR MOTOR PROPERTY CARRIER AND BROKER AUTHORITY

Approved by OMB
3120-0047
Expires 12/97

This application is for all individuals and businesses questing authority to operate as motor property common or contract carriers or property brokers.

FOR COMMISSION USE ONLY

Docket No. MC-_____

Filed _____

Fee No._____

CC Approval No._____

SECTION I

Applicant Information

Do you now have authority from or an application being processed by the ICC?
☐ NO ☐ YES If yes, identify the lead docket number(s)_____

LEGAL BUSINESS NAME

DOING BUSINESS AS NAME

BUSINESS ADDRESS

_____ (___)_____
Street Name and Number City State Zip Code Telephone Number

MAILING ADDRESS (If different from above)

_____
Street Name and Number city State Zip Code

REPRESENTATIVE (Person who can respond to inquiries)

_____
Name and title, position, or relationship to applicant

_____
Street Name and Number city State Zip Code

Telephone Number (_____)_____ FAX Number (_____)_____

U.S. DOT Number (If available; if not, see Instructions.)_____

FORM OF BUSINESS (Check only one.)

☐ Corporation	State of Incorporation	_____
☐ Sole Proprietorship	Name of Individual	_____
☐ Partnership	Identify Partners	_____

SECTION II

Type of Authority

You must submit a filing fee for each type of authority requested (for each box checked).

☐ MOTOR COMMON CARRIER OF PROPERTY (except HOUSEHOLD GOODS)
☐ MOTOR CONTRACT CARRIER OF PROPERTY (except HOUSEHOLD GOODS)
☐ MOTOR COMMON CARRIER OF HOUSEHOLD GOODS
☐ MOTOR CONTRACT CARRIER OF HOUSEHOLD GOODS
☐ BROKER OF PROPERTY (except HOUSEHOLD GOODS)
☐ BROKER OF HOUSEHOLD GOODS

SECTION III

Insurance Information

This section must be completed by ALL motor property carrier applicants. The dollar amounts in parentheses represent the minimum amount of bodily injury and property damage (liability) insurance coverage you must maintain and have on file with the Commission.

NOTE: Refer to the instructions for information on cargo insurance filing requirements for motor common carriers and surety bond/trust fund agreement filings for property brokers.

☐ Will operate vehicles having Gross Vehicle Weight Ratings (GVWR) of 10,000 pounds or more to transport:
- ☐ Non-hazardous commodities ($750,000).
- ☐ Hazardous materials referenced in the Commission's insurance regulations at 49 CFR 1043.2(b)(2)(c) ($1,000,000).
- ☐ Hazardous materials referenced in the Commission's insurance regulations at 49 CFR 1043.2(b)(2)(b) ($5,000,000).

☐ Will operate only vehicles having Gross Vehicle Weight Ratings (GVWR) under 10,000 pounds to transport:
- ☐ Any quantity of Class A or B explosives, any quantity of poison gas (Poison A), or highway route controlled quantity of radioactive materials ($5,000,000).
- ☐ Commodities other than those listed above ($300,000).

SECTION IV

safety **Certification (Motor Carrier Applicants Only)**

APPLICANTS SUBJECT TO FEDERAL MOTOR CARRIER SAFETY REGULATIONS - If you will operate vehicles of more than 10,000 pounds GVWR and are, thus, subject to pertinent portions of the U.S. DOT's Federal Motor Carrier Safety Regulations at 49 CFR, Chapter 3, Subchapter B (Parts 350-399), you must certify as follows:

Applicant has access to and is familiar with all applicable U.S. DOT regulations relating to the safe operation of commercial vehicles and the safe transportation of hazardous materials and it will comply with these regulations. In so *certifying*, applicant is verifying that, at a minimum, it:

(1) Has in place a system and an individual responsible for ensuring overall compliance with Federal Motor Carrier Safety Regulations;
(2) Can produce a copy of *the* Federal Motor Carrier Safety Regulations and the Hazardous Materials Transportation Regulations;
(3) Has in place a driver safety training/orientation program;
(4) Has prepared and maintains an accident register (49 CFR 390.15);
(5) Is familiar with DOT regulations governing driver qualifications and has in place a system for overseeing driver qualification requirements (49 CFR Part 391);
(6) Has in place policies and procedures consistent with DOT regulations governing driving and operational safety of motor vehicles, including drivers' hours of service and vehicle inspection, repair, and maintenance (49 CFR Parts 392,395 and 396);
(7) Is familiar with and has in place a *system* for complying with U.S. DOT regulations governing alcohol and controlled substances testing requirements (49 CFR 390.5).

☐ YES

EXEMPT APPLICANTS - If you will operate only small vehicles (GVWR of 10,000 pounds or less), and are, thus, exempt from Federal Motor Carrier Safety Regulations, you must *certify* as follows:

Applicant is familiar with and will observe general operational safety guidelines, as well as any applicable *state* and local laws and requirements relating to the safe operation of commercial motor vehicles and the safe transportation of hazardous materials.

☐ YES

SECTION V

Affiliations

AFFILIATION WITH OTHER ICC-REGULATED ENTITIES. Disclose any relationship you have or have had with any other ICC-regulated entity within the past 3 years. For example, this could be through a percentage of stock ownership, a loan, or a management position. If this requirement applies to you, provide the name of the company, ICC number, DOT number, and that company's latest U.S. DOT safety rating. (If you require more space, attach the information to this application form.)

SECTION VI

Household Goods Certifications

HOUSEHOLD GOODS MOTOR COMMON *CARRJER* APPLICANTS must certify as follows:
Applicant is fit, willing, and able to provide the specialized services necessary to transport household goods. This assessment of fitness includes applicant's general familiarity with ICC regulations for household goods movements and also requires an assurance that applicant has or is willing to acquire the protective equipment and trained operators necessary to perform household *goods* movements. The proposed operations will serve a useful public purpose responsive to a public demand or need

☐ YES

HOUSEHOLD GOODS MOTOR CONTRACT CARRIER APPLICANTS must *certify* as follows:
Applicant is fit, willing, and able to provide the specialized services necessary to transport household goods. This assessment of fitness includes applicant's general familiarity with ICC regulations for household goods movements and also requires an assurance that applicant has or is willing to acquire the protective equipment and trained operators necessary to perform household goods movements. The proposed service will be consistent with *the* public interest and the transportation policy of 49 U.S.C. 10101.

☐ YES

HOUSEHOLD GOODS BROKER APPLICANTS must certify as follows:
Applicant is fit, willing, and able to provide household goods brokerage operations and to comply with all pertinent statutory and regulatory requirements. The involved services will be consistent with the public interest and the transportation policy of 49 U.S.C. 10101.

☐ YES

NOTE: Applicant may attach a supporting statement to *this* application to provide additional information about any of the above certifications. This evidence is optional.

SECTION VII

Household Goods Contract Carrier Applicants Only

SCOPE OF **OPERATING** AUTHORITY. **Complete one or** both **box(es)** below, as applicable.

☐ **Contracting shippers have one or more of the distinct needs delineated in *Interstate Van Lines, Inc., Extension - Household Goods*, 5** I.C.C.2d **168** (1988).
Describe **briefly the distinct need**(s):

_____

_____

_____

☐ **Contracts provide for assignment** of one *or* more **vehicles for the** exclusive use **of** *each* shipper **in the manner specified in *Interstate*** Van ***Lines, Inc., Extension - Household Goods*, 5** I.C.C.2d **168 (1988).**

SECTION VIII

Applicant's Oath

This oath applies to all supplemental filings to this application. The signature must be that of applicant, not legal representative.

I, _____,verify under penalty of
Name and title

perjury, under *the* **laws of** *the* United **States** of America, that all **information** supplied *on* this form or relating **to** this application **is** *true* and **correct.** Further, I **certify** that I **am** qualified and authorized to **file this** application. I know that willful **misstatements or omissions of material** facta **constitute** Federal criminal **violations punishable** under **18** U.S.C. **1001** by imprisonment *up* to 5 **years and fines** up to $10,000 for *each* offense. Additionally, these misstatements **are** punishable as **perjury** under 18 U.S.C. **1621,** which provides for **fines** up to $2,000 or imprisonment *up* to *5* years for *each* **offense.**

I further certify under penalty of perjury, under the laws of the United States, that I have not been convicted, **after** September **1, 1989,** of any Federal **or** *state* **offense** involving the **distribution or** possession **of** a **controlled substance, or** that **if** I have **been** so convicted, I **am** not **ineligible to receive Federal** benefits, **either by** court **order or** *operation* **of** law, **under 21** U.S.C. **853a.**

Finally, I certify that applicant is not domiciled in Mexico or owned or controlled by persons of that country.

Signature _____ **Date**_____

Filing Fee Information

All *applicants* must submit a filing fee for each type of authority requested. The enclosed fee schedule will show the appropriate filing fee. The total amount due is equal to the fee times the number of boxes checked in ***Section II***. Fees for multiple authorities may be combined in a single payment.

Total number of boxes *checked* in ***Section II***: _____ x filing fee $_____ = $_____

INDICATE AMOUNT $_____ AND METHOD OF PAYMENT

☐ *CHECK* or ☐ MONEY ORDER, payable to Interstate Commerce Commission

☐ VISA ☐ MASTERCARD

Credit Card Number _____ Expiration Date _____

Signature _____ Date _____

Fee Policy

- Filing fees must be payable to the Interstate Commerce Commission, by check drawn upon funds deposited in a bank in the United States or money order payable in U.S. currency or by approved credit card.
- Separate fees are required for each type of authority requested. If applicant requests multiple types of permanent authority on one application form (for example, common and contract carrier authority) or if applicant submits more than one form in the OP-1 Series in a single filing, multiple fees are required. The applicant may submit a single payment for the sum of the applicable fees.
- Filing fees must be sent, along with the original and one copy of the application, to Office of the Secretary (Attn: Applications), Interstate Commerce Commission, 1201 Constitution Avenue, N.W., Washington, DC 20423-0001.
- After an application is received, the filing fee is not refundable.
- The ICC reserves the right to discontinue processing any application for which a check is returned because of insufficient funds. The application will not be processed until the fee is paid in full.

PAPERWORK BURDEN. It is estimated that an average of 2.5 burden hours per response are required to complete this collection of information. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Comments concerning the accuracy of this burden estimate or suggestions for reducing this burden should be directed to both the Interstate Commerce Commission, Section of Publications, Room 2221, 1201 Constitution Avenue, N.W., Washington, DC 20423-0001, and to the Office of Management and Budget, Office of Information and Regulatory Affairs (OMB No. 3120-0047), Washington, DC 20403.

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA 200

APPLICATION FOR HIGHWAY CARRIER PERMIT

File No. T- FOR PUC USE ONLY

IMPORTANT–A FIUNG *FEE* OF ***$1,000 MUST*** ACCOMPANY ***THIS APPLICATION*** AND ***IS NOT*** REFUNDABLE. PAYMENT TO THE COMMISSION SHOULD **BE MADE BY** CHECK **OR** MONEY **ORDER.**

PLEASE TYPE OR PRINT

PART I: STATEMENT OF OWNERSHIP

1. Applicant ☐ HAS ☐ HAS NOT been previously licensed by this Commission. **If so,** T number is/was _____
2. Applicant is:

☐ Individual: _____
First Middle *Last* Name

☐ Partnership: _____

_____
(List all partners - use additional sheet if necessary. All partners must sign all forms.)

☐ **Corporation:** _____
(Show *exact* name as registered with the California Secretary of *State)*

Doing Business As (DBA): _____

Note: **Any entity** doing business **under one or more fictitious** names shall, with **respect to each** fictitious name comply with **Sections 17900-17930 of the** California **Business** and Professions **Code entitled 'Fictitious** Business Names.'

Physical Address: _____
Street Address City County State Zip Code

Mailing Address if different than above: _____
Street Address City County State Zip Code

Phone: ( ) _____
Area Phone No.

IF A PARTNERSHIP, a copy **of** the partnership agreement shall be attached to this application. **If** a partnership agreement has already been filed, the application shall make specific reference thereto and the date the filing was made. If there *is* **no** written partnership agreement, **complete** an agreement **Form** TL706-B and attach **to** application.

PARTNERSHIP AGREEMENT: ☐ ENCLOSED ☐ NO AGREEMENT

FORM TL706-B: ☐ ENCLOSED

PARTNERSHIP AGREEMENT PREVIOUSLY FILED: ☐ YES ☐ **NO**

IF YES, DATE FILED: _____ **T-NO.:** _____

IF A CORPORATION, exact corporate name is: _____

Date **of** Incorporation: _____ Incorporated in State of _____

NAME OF OFFICERS	TITLE	ADDRESS	NO OF SHARES

Control **of** Corporation Held By: ☐ Officers **Listed** ☐ Other (Specify: _____).

If applicant is a California Corporation, a **certified copy of its articles** of incorporation shall be attached to the application. If already filed with the Public Utilities Commission. make specific reference to the prior proceeding **and** the date **of** filing. If corporation is more than one year **old,** provide a certificate of status.

If the Corporation **was** organized and exists under the laws **of** a state other than California, a Certificate of Qualification **must be obtained** from the Secretary of State, State of California and must **be** filed **with** the articles of incorporation when **submitted.**

ARTICLES OF INCORPORATION/CERTIFICATE OF QUALIFICATION/STATUS: ☐ ENCLOSED ☐ PREVIOUSLY FILED

IF PREVIOUSLY FILED PROCEEDING NO.: _____ DATE FILED: _____

3. Applicant Business Affiliation:

(a) Applicant is associated or affiliated with the following shippers, receivers or carriers by reason of common ownership, control or management (Own part or all of the company, hold a responsible position in the company or guide the operations of the company, directly or indirectly.).

(Please list and indicate if partnership, company or corporation.)

NAME	PARTNERSHIP, COMPANY OR CORPORATION

(b) ☐ No affiliation exists.

4. Applicant ☐ HAS ☐ HAS NOT an operating authority from the Interstate Commerce Commission.

If so, MC/EX Number is _____

5. If you are an individual or partnership and your business is located out-of-state, you must provide the name, address and telephone number of an agent for service of process in California. Name: _____

Address: _____

Street Address City State Zip Code Area Code/Telephone No.

PART II: SCOPE OF OPERATIONS PROPOSED AND INSURANCE REQUIREMENTS

1. Equipment to be Operated: Complete Form TL706-D and attach to application.
2. Commodities Certification: Complete Form TL706-H and attach to application.
3. General Highway Safely Requirements: Complete Form TL706-I and attach to application.
4. Owner Operator Questionnaire: Complete Form TL706-J and attach to application.
5. Workers' Compensation Form: Complete Form TL706-K and attach to application.
6. Carrier Profile Information: Complete CHP Form 362 and attach to application.
7. Applicant ☐ WILL ☐ WILL NOT handle C.O.D. shipments requiring the filing of a surety bond of not less than $2,000, as required by General Order 84 series.
8. Applicant ☐ WILL ☐ WILL NOT lease equipment from employees requiring the filing of a surety bond of not less than $15,000, as required by General Order 102 series.
9. Applicant ☐ WILL ☐ WILL NOT engage subhaulers requiring the filing of a surety bond of not less than $15,000, as required by General Order 102 series.
10. Applicant shall deposit evidence of adequate bodily injury and property damage insurance as required by General Order 100 series. A permit will not be issued without insurance being on file with the Commission. Minimum public liability and property damage insurance coverage is $500,000/$1,000,000/$200,000 or a combined single limit of $1,200,000 for carriers hauling bulk petroleum commodities in tank or vacuum trucks or $250,000/$500,000/$100,000 or a combined single limit of $600,000 for most other commodities. Carriers of hazardous materials have higher liability requirements.

☐ Applicant will transport commodities other than petroleum, petroleum products, waste petroleum or waste petroleum products.

☐ Applicant will transport hazardous materials.

☐ Applicant will transport bulk petroleum commodities in tank or vacuum trucks.

Name(s) appearing on all certificates of insurance must be exactly the same as the applicant's name(s) as listed in Part 1, No. 2 of this application.

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

REPORT OF EQUIPMENT TO BE OPERATED

NAME

T

(FOR PUC USE ONLY)

ADDRESS

CITY | STATE | ZIP CODE

AREA CODE AND TELEPHONE NUMBER

( )

PLEASE LIST ALL VEHICLE INFORMATION REQUESTED BELOW FOR ALL FOR-HIRE EQUIPMENT (INCLUDING LEASED VEHICLES) TO BE OPERATED BY YOU.

DO NOT LIST: Service trucks, passenger cars, fork lifts or equipment used exclusively off highways.

PLEASE USE THE APPROPRIATE 2-LETTER ABBREVIATION FOR THE STATE OF REGISTRATION. (e.g. - CA for California)
PLEASE SEE ADJOINING PAGE FOR EQUIPMENT AND BODY CODES. (USE ONE LINE FOR EACH UNIT OF EQUIPMENT.)

STATE	LICENSE PLATE NUMBER	VIN (VEHICLE IDENTIFICATION NUMBER)	EQUIP CODE	BODY CODE

Continue on back if necessary.

CERTIFICATION

I (WE) CERTIFY (OR DECIARE), UNDER PENALTY OF PERJURY, THAT THE FOREGOING INFORMATION IS TRUE AND CORRECT.

Date: _____

_____
Signature of Applicant(s)

If applicant is a corporation:

_____
Signature of Corporate Officer

_____
Title of Corporate Officer

SAMPLE

BT-400-MUF FRONT Rev. 2 (12-90)

APPLICATION FOR FUEL USER'S TAX PERMIT

STATE BOARD OF EQUALIZATION
DEPARTMENT OF BUSINESS TAXES

APPLICATION OBTAINED FROM
☐ Dept. of Motor Vehicles ☐ Board of Equalization

FOR BOARD USE ONLY			
TAX	OFFICE		NUMBER
F			—

Business Code _____
Area Code _____ 0-000-0000
Preparer _____

Section I: Ownership Information

1. Please check type of ownership

☐ Sole Owner ☐ Husband/wife co-ownership ☒ Partnership ☐ Corporation ☐ Other

2. If incorporated, enter full corporate name.

3. Federal Employer Identification Number (FEIN)

4. Corporate Number

	Owner/Partner/President	Co-Owner/Partner/Vice-President	Partner/Secretary	Partner/Treasurer
5. Full name (incl. mid. name)	Michael Jackson	Dianna Ross		
6. Address (residence)	128 Spring Hill Rd.	11 Fruitvale Ave.		
	Fresno	Fowler		
7. Telephone (residence)	(209) 555-9853	(209) 555-1918	( )	( )
8. Daytime telephone	(209) 555-5283	(209) 555-5286	( )	( )
9. Social Security No.	332-21-1233	454-55-5881		
10. Driver License No.	B 1662321	G 0631211		
11. Signature	Michael Jackson	Dianna Ross		

Section II: Business Information

1. Business name: Jackson Transport Inc. — Business telephone: (209) 555-5285

2. Business address (Do not use P.O. Box or address of mailing service): 2556 Mariposa St. — City: Fresno — State: Ca — Zip Code: 93721

3. Mailing address (If different from no. 2 above) — City — State — Zip Code

4. Major fuel supplier: Central Valley Fuels — Address: 1800 College Way Fresno — Telephone: (209) 555-6600

5. Products generally hauled

6. Are you
☒ Starting a new business? ☐ Adding or dropping partner? (If so, indicate name: _____)
☐ Incorporating?
☐ Buying a business? ☐ Other? _____

7. Types of trips
☐ Interstate ☒ California only
Estimated fuel used in California: 4,000 gallons per month

8. Date use of Diesel or LPG in California began
Month 3 Day 1 Year 90

9. Do you have bulk storage facilities in California?
☒ Yes ☐ NO If yes, list address 2550 Mariposa St., Fresno

Are you currently under lease to another carrier?
☐ Yes (Attach copy of lease)
☒ NO

If yes, please provide the following information
Name _____
Address _____
California Fuel Permit No. _____

(Continued on reverse)

SAMPLE

BT-400-MUF BACK Rev. 2 (12-90)

APPLICATION FOR FUEL USER'S TAX PERMIT

STATE BOARD OF EQUALIZATION
DEPARTMENT OF BUSINESS TAXES

11. Name of accountant/bookkeeper	Address	Telephone
Hannah Greenly	2600 Mariposa St., Fresno	(209)555-5621
12. Name of bank or other financial institution (checking and savings account)	**Location**	**Account Number**
Chartor Oak Savings	123 Main Fresno	3 1589856
Bank of Tulare	Visalia Branch Visalia	63/201903

13. Other account numbers issued to you by the Board
NONE

Section III: Vehicle information

PLEASE PROVIDE PHOTOCOPY OF REGISTRATION DOCUMENT FOR EACH VEHICLE LISTED

Make and Year	Engine or I.D. Number	License Number	Type of fuel used	Registered Owner	Legal owner and address
87 Mack	7866 NLR 205544	DLLS001	Diesel	Douglas Bros. Transport	B of A 123 Main St. Fresno

Section IV: Certification

The statements contained hereon are hereby certified to be correct to the best knowledge and belief of the undersigned who is duly authorized to sign this application.

Dianna Ross
SIGNATURE

Partner
TITLE

Dianna Ross
NAME (TYPED OR PRINTED)

8-21-90
DATE

FOR BOARD USE ONLY
Furnished to Taxpayer

Reporting Basis _____

Security Review ☐ BT-1009 ☐ GA-324-A

☐ BT-598 $ _____ ☐ BT-512

By _____ ☐ BT-858

Approved By _____

Remote Input Date _____

By _____

PERMIT ISSUED ☐ Date _____

REGULATIONS

RETURNS

PAMPHLETS

STATE OF CALIFORNIA
DEPARTMENT OF CALIFORNIA HIGHWAY PATROL

CARRIER PROFILE INFORMATION

CHP 362 (Rev. 2-94) OPI 065

1. ☐ NEW	2. ☐ CHANGE	3. CALIFORNIA IDENTIFICATION NUMBER CA

4. COMPANY NAME

5. TELEPHONE NUMBER *(Include Area Code)* ( ) -

6. IF THIS IS A NAME CHANGE, ENTER PREVIOUS NAME

7. ☐ STATE/LOCAL GOVERNMENT

8. DOING BUSINESS AS *(DBA)*

9. ALSO DBA

10. ALSO DBA

11. ALSO DBA

12. ADDITIONAL DBAs? ☐ YES *(List additional DBAs on reverse side)* ☐ NO

13. ESTIMATED COMPANY MILEAGE WITHIN CALIFORNIA DURING THE LAST YEAR

YEAR: _____

CHECK ONE BOX

- A ☐ Under 15,000
- B ☐ 15,001 - 50,000
- C ☐ 50,001 - 100,000
- D ☐ 100,001 - 500,000
- E ☐ 500,001 - 1,000,000
- F ☐ 1,000,001 - 2,000,000
- G ☐ 2,000,000 - 5,000,000
- H ☐ 5,000,001 - 10,000,000
- I ☐ More Than 10,000,000

14. MAIN OFFICE STREET ADDRESS

15. *coy*

16. STATE

17. ZIP CODE

18. MAILING ADDRESS *(If different from main office address)*

19. CITY

20. STATE

21. ZIP CODE

OPERATING AUTHORITIES

CALIFORNIA PUC NUMBERS	ICC NUMBERS			
22. T-	24. ☐ MC ☐ MX	26. ☐ MC ☐ MX	28. I.R.P. NUMBER	30. BASE STATE
23. PSG ☐ TCP ☐ PSC	25. ☐ MC ☐ MX	27. ☐ MC ☐ MX	29. US DOT NUMBER	

TYPE OF OPERATION (Check all that apply.)

31.
- ☐ A. TRUCK
- ☐ B. HAZARDOUS MATERIALS CARRIER
- ☐ C. HAZARDOUS MATERIALS SHIPPER
- ☐ D. HAZARDOUS WASTE TRANSPORTER
- ☐ E. FLAMMABLE LIQUID CARGO TANK
- ☐ F. BUS WITHOUT OPERATING AUTHORITY
- ☐ G. TOUR BUS (PUC or ICC authority)
- ☐ H. SCHOOL BUS
- ☐ I. SCHOOL PUPIL ACTIVITY BUS
- ☐ J. YOUTH BUS
- ☐ K. GENERAL PUBLIC PARATRANSIT VEHICLE
- ☐ L. FARM LABOR VEHICLE

32. LEGAL OWNER

33. LEGAL OWNER

34. EMERGENCY CONTACT	35. DAY PHONE *(Include Area Code)* ( ) -	36. NIGHT PHONE *(Include Area Code)* ( ) -
37. EMERGENCY CONTACT	38. DAY PHONE *(Include Area Code)* ( ) -	39. NIGHT PHONE *(Include Area Code)* ( ) -

CALIFORNIA TERMINAL INFORMATION

California Vehicle Code Section 34601.10 requires the employer of any person required *to* keep log books, records of physical examination and other driver records as may *be* required by the Department of California Highway Patrol, the Department of Motor Vehicles or the State Department of Health Services, to register with the Department of California Highway Patrol *the* address where log books and other records are available for inspection.

DRIVER RECORDS AT THIS ADDRESS?	VEHICLE RECORDS AT THIS ADDRESS?	TERMINAL STREET ADDRESS	*coy*	ZIP CODE
40. ☐ YES ☐ NO	☐ YES ☐ NO			
41. ☐ YES ☐ NO	☐ YES ☐ NO			

42. ADDITIONAL TERMINALS? ☐ YES *(List additional terminals on reverse side)* ☐ NO

43. DATE PREPARED

FOR CALIFORNIA HIGHWAY PATROL USE ONLY

44. CARRIER'S LOCATION CODE	45. CARRIER'S COUNTY CODE	46. REVIEWED BY	47. I.D. NUMBER

DESTROY PREVIOUS EDITIONS

STATE OF CALIFORNIA
DEPARTMENT OF CALIFORNIA HIGHWAY PATROL

SAFETYNET DRIVER/VEHICLE INSPECTION REPORT

CHP 407F (Rev 9-93) OPI 062

2013103

DATE	TIME START	LEVEL	LOC CODE	BEAT	INSPECTED BY	ID NO.	TIME END

DRIVER INFORMATION

FIRST NAME	MI	LAST NAME	DDL NO.	STATE

CARRIER INFORMATION

CHP NO. CA-	PUC NO.	ICC NO. MC-

CARRIER NAME	DOT NO. US DOT-

STREET ADDRESS	CITY	STATE	ZIP CODE

VEHICLE INFORMATION

VEH	YEAR	MAKE	TYPE	LIC NO.	STATE	EQPMT. NO.
1						
2						
3						
4						

DRIVER QUALIFICATIONS

COMPLIANCE		NO	O/S	DIS
Driver's License	A			
Medical Cert.	B			
Driver's Log	C			
Driver's Hours	D			

VEHICLE INSPECTION

COMPLIANCE		VEHICLE 1 NO	VEHICLE 1 O/S	VEHICLE 1 DIS	VEHICLE 2 NO	VEHICLE 2 O/S	VEHICLE 2 DIS	VEHICLE 3 NO	VEHICLE 3 O/S	VEHICLE 3 DIS	VEHICLE 4 NO	VEHICLE 4 O/S	VEHICLE 4 DIS
Steering Components	E												
Exhaust	F												
Warning Devices	G												
Low Air Warning Device	H												
Air Loss: Unapplied	I												
Air Loss: Applied	J												
Brake Adjustment	K												
Brake Drums/Shoes	L												
Other Brake Parts	M												
Fuel System	N												
Lights: Stop/Turn	O												
Connection Devices	P												
Wheels	Q												
Tires	R												
Frame	S												
Suspension	T												
Maintenance/Other	U												
Registration	V												

DISPOSITION CODES

1 - Repaired at Scene
2 - Towed/Escorted
3 - Other
4 - Unknown

BRAKE ADJUST.

Front / Left / Right

Axle 1
Axle 2
Axle 3
Axle 4
Axle 5
Axle 6
Axle 7
Axle 8

HAZARDOUS MATERIALS INSPECTION

COMPLIANCE		NO	O/S	DIS
Ship Paper/Manifest	HA			
HM License	HB			
HW Registration	HC			
Placards	HD			
Packaging	HE			
Marking	HF			
Labels	HG			
Loading/Securement	HH			
Cargo/Portable Tanks	HI			
Safety Equipment	HJ			

CODES	RQ?	HW?

Placards Req'd? ☐ Yes ☐ No

HM CODES

A - Explosives A
B - Explosives B
C - Explosives C
D - Flam. Liquid
E - Flam. Solid
F - Flam. Gas
G - Nonflam. Gas
H - Corrosives
I - Oxidizers
J - Poison A
K - Poison B
L - Combustible Liq.
M - Radioactive Mat'l
N - Organic Peroxide
O - Irritating Liquid
P - ORM A, B or C
Q - ORM E
R - Etiologic Agt.
S - Blasting Agt.
T - Cryogenics
Z - Other

CVSA STICKERS ISSUED	V-1	V-2	V-3	V-4

CITATION NO.	NO. CITATIONS ISSUED	OFFICER ID NO.	OWNER'S RESP. ☐ Yes ☐ No	RESP. PERSON

COMMENTS

THIS INSPECTION COMPLIES WITH CVSA/NUDVIP REQUIREMENTS.
KEEP THIS REPORT OR A COPY IN THE VEHICLE UNTIL NEXT INSPECTION.

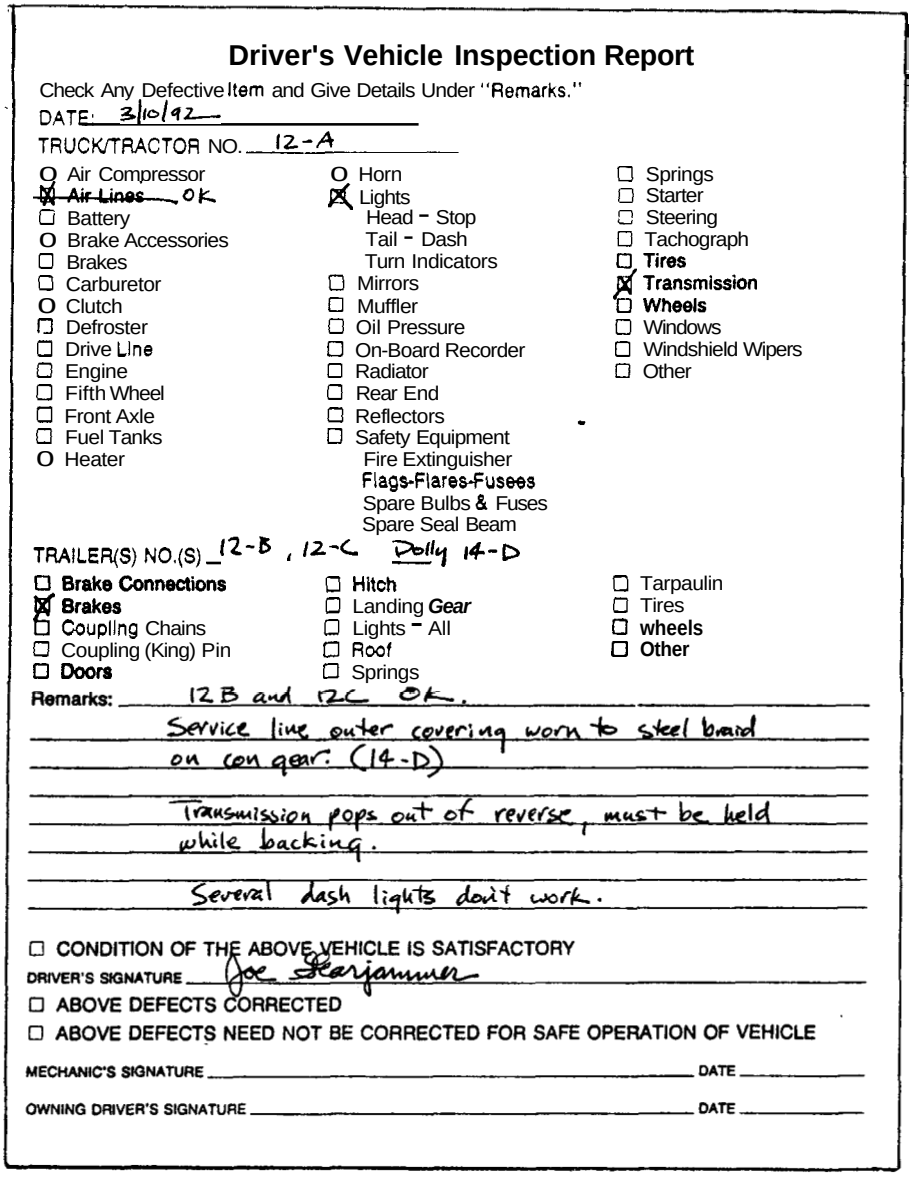
REVIEWED BY	
OFFICER/M.C.S.	I.D. NO.

I acknowledge that I have reviewed and received a copy of this report.

DRIVER'S SIGNATURE

If there are violations noted above, please comply with the instructions on the reverse side of this form.

- Destroy All Previous Editions -



Driver's Vehicle Inspection Report

Check Any Defective Item and Give Details Under "Remarks."

DATE: 3/10/92

TRUCK/TRACTOR NO. 12-A

O Air Compressor	O Horn	☐ Springs
☒ ~~Air Lines~~ OK	☒ Lights	☐ Starter
☐ Battery	Head - Stop	☐ Steering
O Brake Accessories	Tail - Dash	☐ Tachograph
☐ Brakes	Turn Indicators	☐ **Tires**
☐ Carburetor	☐ Mirrors	☒ **Transmission**
O Clutch	☐ Muffler	☐ **Wheels**
☐ Defroster	☐ Oil Pressure	☐ Windows
☐ Drive Line	☐ On-Board Recorder	☐ Windshield Wipers
☐ Engine	☐ Radiator	☐ Other
☐ Fifth Wheel	☐ Rear End	
☐ Front Axle	☐ Reflectors	
☐ Fuel Tanks	☐ Safety Equipment	
O Heater	Fire Extinguisher	
	Flags-Flares-Fusees	
	Spare Bulbs & Fuses	
	Spare Seal Beam	

TRAILER(S) NO.(S) 12-B, 12-C Dolly 14-D

☐ **Brake Connections**	☐ Hitch	☐ Tarpaulin
☒ **Brakes**	☐ Landing Gear	☐ Tires
☐ Coupling Chains	☐ Lights - All	☐ **wheels**
☐ Coupling (King) Pin	☐ Roof	☐ **Other**
☐ **Doors**	☐ Springs	

Remarks: 12B and 12C OK.

Service line outer covering worn to steel braid on con gear: (14-D)

Transmission pops out of reverse, must be held while backing.

Several dash lights don't work.

☐ CONDITION OF THE ABOVE VEHICLE IS SATISFACTORY

DRIVER'S SIGNATURE Joe Hardjammer

☐ ABOVE DEFECTS CORRECTED

☐ ABOVE DEFECTS NEED NOT BE CORRECTED FOR SAFE OPERATION OF VEHICLE

MECHANIC'S SIGNATURE _____ DATE _____

OWNING DRIVER'S SIGNATURE _____ DATE _____

Figure 1.

A typical driver's daily vehicle condition report is not complicated. Most do not include items that would require a driver to *go* under a vehicle, but many do include items that only a trained professional driver would understand.

Commercial Vehicle Operator Survey

I. Contact Record

Company Name: _____

Person Contacted: _____

Phone Number: _____

Date: _____

II. Introduction

I am conducting a survey for Caltrans, to assess how they can serve the motor carrier industry through the provision of better information on roadway conditions, and ease regulatory requirements. I will be asking questions about your use of information and information technologies for fleet management. All information will be strictly confidential.

III. Communication

*1. By each of the following means, do **your dispatchers/terminals regularly** obtain information on roadway conditions (closures, accidents, congestion) from:*

(a) Telephone to Caltrans/other Information Line _____(y/n/dk)
(b) Radio traffic reports _____(y/n/dk)
(c) Drivers _____(y/n/dk)
(d) On-line information service _____(y/n/dk)
(e) Other _____(y/n/dk)

*2. **(Yes to any of above)** How do **your dispatchers** use this information:*

(a) Advise drivers about routes\conditions

(b) Advise shippers\receivers of pickup/delivery times

(c) Re-assign pickups to different drivers

(d) Other

3. ***(no to all on 1)*** *Why don't your dispatchers use this information:*

4. *By each* ***of*** *the following means, do your* ***drivers*** *regularly obtain information on roadway conditions (closures, accidents, congestion) (at least once per day, at least once per week, less than once per week, never)*

(a) **Telephone** to **Information Line** _____(y/n/dk)
(b) **Radio traffic reports** _____(y/n/dk)
(c) **Other drivers (CB)** _____(y/n/dk)
(d) **Changeable message signs along roadway** _____(y/n/dk)
(e) **Other** _____(y/n/dk)

5. ***(If yes to any on 4)*** *How do your* ***drivers*** *utilize this information:*

(a) **Change to alternate routes**

(b) **Re-sequence stops**

(c) **Advise shippers/receivers of pickup/delivery times**

(d) **Request re-assignment of pickups**

(e) **Other**

6. ***(If no to all on 4)*** *Why don't your drivers utilize this information.*

7. *More generally, what type of information would you like to have available from Caltrans or from the CHP?*

8. *Would you prefer to get the information directly* ***from*** *Caltrans/CHP, or via* ***a*** *third party (private company)*?

9. *What is your preferred means for accessing the information?*

(a) **Telephone to Caltranslother Information Line** _____
(b) **Radio broadcasts** _____
(d) **On-line information service by modem** _____
(e) **On-line information service by internet** _____
(f) **Changeable message signs** _____
(e) **Other** _____

10. *In what* ***ways*** *could incident clearance be improved to help the trucking industry?*

(a) **Communication to tow operators/CHP, etc.**

(b) Availability of suitable equipment to clear incidents and helpfulness of **Freeway Service Patrol**

IV. Regulatory Functions Performed

With respect to each of the following, ***what changes*** *would you like to see to ease the administrative burden associated with regulations?*

1. *Driver hours* ***of*** *service logs.*

2. *Driver's daily vehicle inspection.*

3. *Inspection, maintenance, lubrication and repair records.*

4. *Weight inspection*

5. *Inspection at ports* ***of*** *entry*

(a) Agricultural Inspections from **other states (e.g., Arizona/Nevada)**

(b) Customs Inspections from **Mexico**

6. *Issuance* ***of*** *licenses and credentials.*

7. *In each of the areas above, how are* ***you*** *currently using computers or other* ***forms*** *of automation?*

a) *Hours* ***of*** *service logs* _____

b) *Vehicle Inspections* _____

c) *Port* ***of*** *Entry Inspections* _____

d) *Licensing/Credentials* _____

8. *What is the single-most important change needed in regulation?*

V. Use of Technologies

1. *What means do* ***you*** *have available* ***for*** *tracking vehicle and trailer locations (get name of system):*

(a) Vehicle locations

(b) Trailer locations

2. *(if yes to 1a or 1b) How do you use tracking information?*

3. *(if yes to 1a or 1b) Does your system allow you to monitor vehicle speeds and/or locations in real time?*

4. *What means do you have available for communication to/from drivers?*

(a) Pager _____

(b) **Cell Phone** _____

(c) Radio _____

(d) Wireless data transmission _____

(e) Other _____

5. *(if yes to a, b, c, d or e) What is the primary use of these communication systems?*

6. *What are your vehicles' capabilities for issuing maydays or other requests for service in the event of emergencies or in the event your vehicle or trailer is stolen?*

Does the system communicate to a dispatcher or to police?

7. *Do your dispatchers have computers with:*

a) modems? _____

b) internet access? _____

8. *Do your vehicles have mobile data terminals?*

(a) If yes, what percentage of fleet? _____

(b) If yes, what type? _____

(c) If yes, what functions are performed? _____

9. *Of the above mentioned technologies, which (if any) does your company plan to acquire within the next 12 months?*

VI. Intelligent Transportation System User Services

For each of the following: will provision of the service have a significant impact on your operations. What is the impact, and why?

1. *Commercial vehicle electronic clearance, to facilitate domestic and international border clearance.*

2. *Automated roadside safety inspections (allows real-time access at the roadside to safety performance records, and automate safety inspections through sensors and diagnostics).*

3. *On-board safety safety monitoring, to sense the safety staus of a comercial vehicle, cargo and driver*

4. *Commercial vehicle administrative processes toprovide electronicpurchasing of credentials and automated mileage and fuel reporting and auditing.*

5. *Hazardous material incident response, providing immediate description of hazardous material to emergency responders.*

6. *Emergency notification and personal security, tuprovide immediate notification of an incident and an immediate request for assistance.*

VII. Company Profile

1. *How many drivers and vehicles doyou have?*

(a) **At your location** _____ _____
(b) **Company wide** _____ _____

2. *Whatpercentage of yourfleet is 3 tons or greater or tractor/trailer?* _____

3. *What commodities doyou carry?*

4. *What region do you serve?*

5. *Do your drivers follow fixed routes?*

   If no -- under what conditions are routes altered?

6. *What percentage of your company's business is in California?* _____

7. **What percentage of you company's business is intra-regional (i.e., shipments that do not leave a metropolitan region)** _____