CALIFORNIA CENTER FOR INNOVATIVE TRANSPORTATION
INSTITUTE OF TRANSPORTATION STUDIES
UNIVERSITY OF CALIFORNIA, BERKELEY

Innovative Corridors Initiative: Business Model Analysis

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The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the State of California. This report does not constitute a standard, specification, or regulation.

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Task Order 1010 Final Report

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Abstract

The Innovative Corridors Initiative (ICI) Business Model Analysis examines public-private partnerships designed to deploy intelligent transportation system (ITS) technologies that can improve transportation system management and provide real-time information to users. This study builds on the business models proposed by industry in response to the ICI Call for Submissions (CFS).[1] In addition, case studies examine the business models that are developing between the private and public sectors for roadside rest stop wireless Internet access, vehicle infrastructure integration, and Traffic.com, Inc. Caltrans' current procedures for encroachment and procurement are reviewed briefly to identify possible areas of conflict that may need to be resolved prior to launching future CFS-style solicitations. Planning recommendations are provided to assist Caltrans with planning for future CFS-style solicitations, including considerations regarding goals, purpose and project partners, authority, and post-demonstration relationships. Issues for Caltrans to consider pertaining to the authority for CFS-style solicitations as well as the procurement of products that are demonstrated under these solicitations are highlighted.

Executive Summary

The Innovative Corridors Initiative (ICI) Call For Submissions (CFS) represented recognition on the part of the agency partners, the California Department of Transportation (Caltrans), the Metropolitan Transportation Commission (MTC) based in the San Francisco Bay Area, and the Los Angeles Metropolitan Transportation Authority (LA MTA) that intelligent transportation systems (ITS) technologies are changing system management and individual choices with real-time information about road conditions, public transit, and non-recurring incidents. (See Task Order 7 Innovative Corridors Initiative: CFS Implementation and Evaluation Final Report.) The agencies also recognized that these technologies have the potential to redefine the traditional relationship between the public and private sectors.

Transportation agencies are increasingly shifting their emphasis from building new capacity to improving the management of existing capacity. ITS technologies have the potential to enhance transportation system management with real-time data delivered seamlessly to the system managers that can best use the information. However, ITS technologies are evolving rapidly and installation and operation can be costly. In many ways, ITS technology belongs in the domain of the fast-paced business entrepreneur.

Call for Submissions Business Models

To foster innovation, the ICI CFS did not specify a problem to be solved nor a technology to be used. The goal was to see what ideas industry would propose when faced with minimal constraints, given their technical expertise. Beyond inviting industry to propose projects that would use public agency assets (rights-of-way or data) at no cost to the public sector (except staff time), the CFS did not specify the type of public-private relationship to be included in the CFS proposal. All 28 CFS proposals were evaluated in terms of the "business model" that was proposed either explicitly or implicitly. For the purposes of this project, "business model" refers to the relationship between the public agencies and the private sector including the assets requested, the flow of funds to install and operate the system, and the benefits to both parties. The three business models are identified as: 1) the self-sustaining model, 2) the cost-share model,

and 3) the procurement model. The self-sustaining model closely fits the traditional model of a public-private partnership (PPP) with both the public and private sectors assuming some risk as well as some of the potential benefit if successful. Under this model, no funds are exchanged. The cost-share model also closely fits the traditional model of a PPP with both the public and private sectors assuming some risk as well as some of the potential benefit if successful. Like the self-sustaining model, no funds are exchanged. However, this model requires the agency to absorb some costs for project implementation, in addition to staff time. The procurement model does not fit the traditional model of a PPP as closely as the previous two business models discussed. Under the procurement model, the private sector wants short-term access to the rights-of-way to install equipment for a limited demonstration. Under this model the private sector may absorb more risk than the public sector since the public sector is under no obligation to purchase the product.

ITS Public-Private Partnership Case Studies

In addition to the ICI project and the release of the CFS in 2003, Caltrans is active in other PPPs for ITS technologies that use public rights-of-way. These include: 1) a Roadside Rest Stop Wireless Internet Access (WiFi) demonstration, 2) a Vehicle Infrastructure Integration (VII) research project, and 3) a partnership with Traffic.com, Inc. While more time is necessary to evaluate the ultimate configuration of these PPPs, and if they will prove to be successful, the case studies are useful to contrast with CFS-style solicitations.

Caltrans Rights-of-Way and Procurement Overview

Caltrans has numerous mechanisms for interacting with the private sector that could influence the character and outcome of PPPs for ITS technology deployments. These can be broadly separated into: 1) granting access to rights-of-way (encroachment) and 2) procurement of goods and services. Encroachment governs private sector access to the public rights-of-way, while procurement governs the mechanisms and methods by which the public sector purchases goods and services from the private sector. The ICI CFS and future CFS-style solicitations touch on both of these processes. For the ICI, CFS industry partners were offered a streamlined

encroachment process, and encroachment fees were waived. Procurement was not addressed when the ICI CFS projects were initiated, as all projects were designed as demonstrations.

Policy and Planning Recommendations

The ICI CFS, as well as the three case studies, revealed that there is great potential for PPPs to accelerate the deployment of ITS technologies on public roadways. However, implementing a new way of doing business requires careful consideration to ensure that all legal and procedural requirements are followed. Policy and planning recommendations are provided regarding: 1) the authority for the CFS; 2) the goals, purpose and partners for the solicitation; and 3) the post CFS agency-industry relationship.

The authority for a CFS-style solicitation may include legislative authority and/or a Feasibility Study Report (FSR). Under a CFS-style solicitation where no funds are exchanged neither legislative authority nor an FSR appear to be required in California. The relationship between the agency and the industry partner after the close of the CFS demonstrations will determine if either legislative authority or an FSR is required at that time. If the agency were purchasing products or services or receiving revenue from a profit-share arrangement, legislative authority and/or an FSR may be required.

Although a CFS-style solicitation does not guarantee an agency/industry relationship after the close of the demonstrations, planning for such an event could facilitate public access to the technologies. Under the self-sustaining business model the industry partner requires long-term access to the rights-of-way in exchange for providing data to the public agency. Under this model the industry partner does not have a product to sell to the agency, and procurement is not a factor. For the procurement model, however, the industry partner does have a product that they want to sell to the agency. Caltrans must adhere to State mandated legal requirements for fair and opening bidding. This means that, 1) the CFS should be designed so that participation would not preclude an industry partner from bidding on future solicitations from the agency, and 2) if Caltrans did want to purchase a product at the close of the demonstration, State requirements would need to be followed including an open access bidding process.

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Section I: Public-Private Partnerships and ITS

The Innovative Corridors Initiative (ICI) Call For Submissions (CFS) represented recognition on the part of the California Department of Transportation (Caltrans), the Metropolitan Transportation Commission (MTC) based in the San Francisco Bay Area, and the Los Angeles Metropolitan Transportation Authority (LA MTA) that ITS technologies are changing system management and individual choices with real-time information about road conditions, public transit, and non-recurring incidents. (See Task Order 7 Innovative Corridors Initiative: CFS Implementation and Evaluation Final Report.) The agencies also recognized that these technologies have the potential to redefine the traditional relationship between the public and private sectors. Historically the relationship has been one of client and provider with the agencies issuing RFPs or other solicitations for services or goods, industry responding with a proposal, and the award of a contract for the specified work at the bid price. More recently, public agencies have entered into public-private partnership (PPP) agreements with industry to build and operate toll roads. According to the Federal Highway Administration (FHWA), PPPs with the tolling industry began in 1992[2]. Currently, 21 states and one U.S. territory have enacted statutes that enable the use of various PPP approaches for the development of transportation infrastructure[3]. According to the FHWA, some of the benefits of using PPPs to deliver transportation projects include: expedited completion compared to conventional project delivery methods, project cost savings, improved quality and system performance from the use of innovative materials and management techniques, substitution of private resources and personnel for constrained public resources, and access to new sources of private capital. With PPP projects, risk generally rests with the party that is the best equipped to manage the risks, and contracts can include incentives that reward private partners for mitigating risk. As defined by the FHWA, risk factors can include technology performance, environmental flaws or delay, market revenues, completion costs, operation and maintenance costs, policy/political constraints/support, phasing, timing, and resources as well as liability.

Transportation agencies are increasingly shifting their emphasis from building new capacity to improving the management of existing capacity. ITS technologies have the potential to enhance transportation system management with real-time data delivered seamlessly to the system

managers that can best use the information. However, ITS technologies are evolving rapidly and installation and operation can be costly. In many ways, ITS technology belongs in the domain of the fast-paced business entrepreneur. As demonstrated with the ICI CFS projects and the three case studies outlined in Section III, there is an opportunity for PPPs in ITS, which provide a benefit to the public agency participants as well as offering a profit opportunity for the private sector partner.

The FHWA defines PPP as:[4]

> "… contractual agreements formed between a public agency and private sector entity that allow for greater private sector participation in the delivery of transportation projects."

FHWA further notes that:

> "Expanding the private sector role allows the public agencies to tap private sector technical, management and financial resources in new ways to achieve certain public agency objectives such as greater cost and schedule certainty, supplementing in-house staff, innovative technology applications, specialized expertise or access to private capital."

> "The private partner can expand its business opportunities in return for assuming the new or expanded responsibilities and risks."

The National Council for Public Private Partnerships defines a PPP as:[5]

> "…a contractual agreement between a public agency (federal, state or local) and a private sector entity. Through this agreement, the skills and assets of each sector (public and private) are shared in delivering a service or facility for the use of the general public. In addition to the sharing of resources, each party shares in the risks and rewards potential in the delivery of the service and/or facility."

Central to a PPP is that both the public and private entities expect a benefit and also absorb some of the risk. In the case of toll roads, the public entity accomplishes the goal of providing improved transportation facilities, and the private entity stands to gain profit based on toll collections. The ICI project targeted a new style of PPP based on the delivery of ITS goods and services that could provide benefit to both the public and the private sectors. With ITS, the public entity accomplishes the goal of collecting real-time transportation information to better manage the system, and the private entity can gain a profit by selling the data to the public in the form of real-time travel advisories. The CFS projects also demonstrated an opportunity for entrepreneurs to showcase their technologies to agencies in real-world situations, providing partnerships in testing and refining the technology to fit agency needs.

While the ICI CFS did not specify what public asset the private industry could request, rights-of-way appeared to be the asset of greatest value to the private sector. Therefore, this business model analysis focuses on Caltrans' rights-of-way as the primary incentive for private industry to participate in PPPs to deliver ITS technologies. The ICI project demonstrated that through inter-agency cooperation between a state DOT and a local MPO, the MPOs could benefit from this business model as well. In the case of the ICI, MTC gained valuable real-time data through partnership with both Caltrans and the industry partners. Other public assets, such as data or access to public buses or trains, could also be involved in similar PPPs for ITS technologies.

Section II examines the business models that industry proposed in response to the ICI CFS and the outcomes of the ICI CFS projects after the close of the demonstrations. Section III reviews three case studies of ITS projects that involve the public and private sectors working together. The three case studies are: 1) roadside rest stop wireless Internet (WiFi) access, 2) Vehicle Infrastructure Integration (VII), and 3) Traffic.com, Inc. Section IV provides a brief overview of Caltrans' current procedures for interacting with the private sector, including encroachment and procurement. Finally, Section V closes with planning and policy recommendations for public sector consideration for future CFS-style solicitations for ITS.

Section II: ICI CFS Business Models

To foster innovation, the ICI CFS did not specify a problem to be solved or a technology to be used. The goal was to see what ideas industry would propose when faced with minimal constraints, given their technological expertise. Beyond inviting industry to propose projects that would use public agency assets (rights-of-way or data) at no cost to the public sector (except staff time), the CFS did not specify the type of public-private relationship to be included in the CFS proposal. Therefore, the 28 proposals that were submitted included a broad variety of arrangements between the public and private sectors.

All 28 CFS proposals were evaluated in terms of the "business model" that was proposed either explicitly or implicitly. For the purposes of this project, "business model" refers to the relationship between the public agencies and the private sector, including the assets requested; the flow of funds to install and operate the system; and the benefits to both parties. Not all of the proposals or business models appeared viable from an agency perspective. In some cases, the industry partner was not planning to engage in business activity based on their CFS proposal. However, in all cases examining the proposals proved instrumental in highlighting the range of possible business models from the private sector perspective.

Self-Sustaining Model

Many of the CFS projects fit some variation of what we are calling the self-sustaining model. For some of the industry partners the intent was to use the CFS as a jumping-off point to launch their businesses. In these cases, the industry partner identified a clear expected revenue stream. For other industry partners, the CFS project was confined to a demonstration, where the possible revenue stream was not articulated. In these cases, the researchers determined if a potential revenue stream could be identified, but they did not ascertain if it was robust.

The self-sustaining model closely fits the traditional model of a PPP with both the public and private sectors assuming some risk as well as some of the potential benefit, if successful. Under this model, no funds are exchanged. Because Caltrans and MTC had different assets available to

industry, the characteristics of the self-sustaining model differed between these two agencies. The characteristics for Caltrans' self-sustaining model are as follows:

- Company gets access to public rights-of-way.
- Company operates a business, generating income by selling information to the traveling public on a wholesale or membership/subscription basis.
- Company provides data to public agencies at no cost.
- Public agencies benefit through access to better data for transportation system management at no cost.
- Company benefits through access to rights-of-way from which to collect data that they can process and sell.
- The traveling public benefits through access to better information.

Examples of the self-sustaining model that relied on access to rights-of-way include SpeedInfo's Speed Sensor project and Circumnav's (now Dash Navigation, Inc.) Dynamic Route Advisory CFS project with Caltrans District 4 (in close coordination with MTC). For both of these projects, the industry partner wanted to place equipment in Caltrans' rights-of-way with the intent to sell the data as real-time transportation information either to information service providers or directly to their own subscribers. In both cases, data were provided free to Caltrans and MTC. However, the agencies agreed to restrict their use of the data, so as not to compete with the companies by providing company generated travel data via public websites. This is an important aspect of the self-sustaining style of PPP, since the companies cannot operate a successful business if the data they are generating are available to the traveling public for free.

For projects with MTC, the asset that the companies wanted was access to the 511 data stream or access to the 511 system. Characteristics of the self-sustaining model that rely on access to data or other resources from MTC include:

- Company processes the data (sometimes augmenting it with their own data) for presentation in a user-friendly manner directly to the traveling public or via an intermediate source, or;

- Company utilizes the 511 system to provide personalized service.
- Company sells the processed data or service.
- Benefit to the company is creating a market based on (mostly) public data.
- Agency receives the processed/augmented data for free.
- The traveling public is better informed.

Examples of self-sustaining project models in partnership with MTC include NAVTEQ's 511 Level Two Demonstration and Tele Atlas's TV511 Demonstration. For both of these projects, the companies did not intend to launch a business. The intent was to demonstrate the technology and the potential for a business model based on partnership with a public transportation agency. For NAVTEQ's 511 Level Two CFS project with MTC, NAVTEQ wanted to access MTC's 511 system to demonstrate a "concierge service" of personalized information that subscribers purchased. Although in this case, the industry partner did not provide data to the public agency, there is the potential for revenue sharing. The Tele Atlas project used the 511 data stream to create real-time maps of traffic conditions around the San Francisco Bay Area that were aired on television. From a business model perspective, the goal was to gain advertising or government sponsorship.

Cost-Share Model

The cost-share model also closely fits the traditional model of a PPP with both the public and private sectors assuming some risk as well as some of the potential benefit, if successful. Like the self-sustaining model, no funds are exchanged. However, this model requires the agency to absorb some costs for project implementation, in addition to staff time. Following are the characteristics of the cost-share model:

- Company supplies vehicles or other equipment at their own cost.
- Agency installs roadside equipment along the rights-of-way or otherwise provides infrastructure at their own cost.
- Benefit to public agencies is access to better information for system management.
- Benefit to the company is enhanced market access and data.

- Benefit to the traveling public is access to better information and products.

Although projects were proposed via the ICI CFS solicitation that followed this model, the CFS stipulated that no public funds were available. Because this model required agency resources beyond staff (i.e., installation of roadside equipment) none of these proposals proceeded to agreement.

Procurement Model

The procurement model does not fit the traditional model of a PPP as closely as the previous two business models discussed. Under the procurement model, the private sector wants short-term access to rights-of-way to install equipment for a limited demonstration. The private sector may absorb more risk than the public sector, since the public sector is under no obligation to purchase the product. A benefit to both parties is the chance to customize the equipment to fit specific agency needs. No funds are exchanged during the demonstration, but success from the private sector perspective would be that the agency purchases their product. Following are the characteristics of the procurement model:

- Company gains access to public rights-of-way to install limited technology for a demonstration at their cost.
- Agency provides access to rights-of-way. There is no cost to agency.
- If agency likes the product they can purchase from the company after the demonstration.
- Benefit to company is the opportunity to showcase new technology to the agency in a real-world setting and possibly gain a new market.
- Benefit to the agency is a chance to "test-drive" the technology before purchasing and work with company to customize technology to meet specific needs.
- Benefit to the traveling public is improved transportation system management.

Examples of CFS projects that fit the procurement model include Infotek Associates' Intelligent Loop Detector Application and ENCOM Wireless Data Solutions' Seamless Wireless Integration

for Traffic Applications. For both of these companies, the goal was to develop a relationship with the public agencies and ultimately to sell their product to the partner public agency or other public agencies that experienced their technology demonstration.

Final Resolution of the ICI CFS Projects

When the CFS was issued (October 2003), the agencies did not know what type of projects would be proposed by the private sector and ultimately agreed upon with the public agencies. Thus, it was difficult to plan for the relationship between the parties after the close of the projects. CFS Agreements between Caltrans and the companies did outline the minimum requirements at the close of the projects for the industry partners to be allowed to respond to a subsequent public bidding process for similar technology. This included the removal of all equipment from the rights-of-way at the close of the project, obtaining new encroachment permits, and steps to maintain legal requirements for open procurement processes. Following is a brief summary of the outcomes of the CFS projects from the perspective of a new business model for public-private partnerships. In some cases, the final outcome or relationship between the agencies and the companies has not been resolved.

The three projects with MTC (NAVTEQ's Level Two 511, Tele Atlas' TV511, and Outreach's Bay Area Web Congestion Mapping and Traffic) all closed before the end date of their CFS agreements, and there is no continuing relationship between the private companies and either MTC or Caltrans on these projects. While this does not indicate that there is no room for a public-private partnership regarding MTC's 511 database, it does indicate that making a business case using the 511 database may face additional challenges.

For projects that requested access to Caltrans' rights-of-way, two followed the procurement model (ENCOM Wireless Data Solutions and InfoTek Associates), and two followed the self-sustaining business model (Circumnav (now Dash Navigation, Inc) and SpeedInfo Associates).[a]

[a] NAVTEQ and Caltrans signed a CFS agreement for NAVTEQ's Vehicle Infrastructure Cooperation project. However, NAVTEQ did not place any of their roadside units in Caltrans' rights-of-way, so ultimately there was not a Vehicle Infrastructure Cooperation CFS project.

At this time, it is not known if ENCOM Wireless Data Solutions or Infotek Associates will continue to work with Districts 4 and 7 regarding their technology or if these Districts or other Caltrans' districts may purchase equipment showcased during the CFS demonstrations.

Dash Navigation has discontinued use of the equipment they placed in Caltrans' rights-of-way under their CFS agreement. Dash Navigation may donate this equipment to either Caltrans or MTC, but at this time, the final resolution of the equipment has not been determined.

Jurisdiction for the SpeedInfo devices was shifted to MTC with a new encroachment permit held by MTC. Under this arrangement, the SpeedInfo devices were not removed from the rights-of-way at the close of the CFS demonstration. MTC and SpeedInfo have established a business relationship with MTC purchasing data from SpeedInfo. Neither MTC nor SpeedInfo are being charged for access to Caltrans' rights-of-way. Under this arrangement MTC can use the SpeedInfo data for calculating and reporting driving times and traffic conditions on the 511 phone system and the 511.org web site and for transportation planning and system management. Caltrans is allowed to use the SpeedInfo data for low power AM or FM broadcasts, incident management, traveler information, highway operations, highway planning, messages on changeable message signs and for emergency management and public safety purposes.

Section III Case Studies of ITS Public-Private Partnerships

In addition to the ICI project and the release of the CFS in 2003, Caltrans has been active in other PPPs with the private sector to test and deploy ITS technologies. These include: 1) a Roadside Rest Stop Wireless Internet Access (WiFi) demonstration, 2) a Vehicle Infrastructure Integration (VII) research project, and 3) a partnership with Traffic.com, Inc. For all three case studies, the projects are in-progress with the outcomes yet to be determined. While more time is necessary to evaluate the ultimate configuration and success of these PPPs, the case studies are useful to contrast with CFS-style solicitations.

The benefits of partnering with the private sector for the deployment of ITS technologies include reduced costs to the public agencies, access to emerging technologies, and real-time information for system management and the traveling public. The benefits to the private sector are the opportunity to operate a for-profit business using some aspect of the public rights-of-way. The ability for the private sector to operate a viable business is key to private sector participation.

Roadside Rest Stop Wireless Internet Access

Wireless Internet access has revolutionized the public's relationship to the Internet, creating the ability and the expectation to be "connected" even when away from work or home locations. WiFi access at "Internet cafes" has become ubiquitous, exhibiting two dominant business models. Under one business model, the user pays a service company that has contracted with the "café" for either daily access or they join for unlimited access based on a monthly fee. Under the second business model, the service is provided at no cost to the customer with the "café" paying for the access fees. Under this model, the business presumes that additional customers offset the costs associated with providing the Internet access. The growth of WiFi availability at coffee shops and cafes indicates that customers appreciate the Internet access.

Caltrans, other State DOTs, and some private WiFi providers have hypothesized that access to WiFi for business, vacation or occasional travelers while on the road would be a valuable service. The user could check road and weather conditions, make a hotel reservation,

communicate with the office or home or check the Internet for information regarding the next portion of their journey. Roadside rest stops, provided by state DOTs to improve safety, may be the ideal location for WiFi access for travelers. Travelers stop to get refreshments from vending machines, stretch, take a nap, check maps, and generally prepare for the next segment of their trip.

Caltrans is participating in a WiFi demonstration at two roadside rest stops that includes an industry partner and a non-profit partner. In addition, a number of state DOTs have started implementing WiFi at rest stops in conjunction with private service providers. This analysis reviews the business model for the Caltrans WiFi roadside rest stop demonstration as well as a number of rest stop WiFi deployments in other states. The business models vary among the states and between the WiFi providers. The key variables are:

1) Which party (agency or industry) pays to install and operate the service,
2) Which party (agency, industry, or user) pays for the use of the service,
3) Which party (agency or industry) receives the usage fees (if charged), and
4) Which party (agency or industry) receives the revenue from advertising (if applicable).

These four variables determine the business model and are summarized below on a state-by-state basis. The three private sector providers involved in WiFi access at roadside rest stops are SBC/ATT, Coach Connect, and Zoom Information Systems. SBC/ATT also has active partnerships in California and Michigan to provide WiFi services at other public facilities such as state parks. The WiFi partnerships outlined here may not include all states that are providing WiFi at roadside rest stops nor all of the businesses involved in providing this service, as an increasing number of states are investigating or initiating roadside rest stop WiFi access.

California

In 2004, Caltrans embarked on a pilot project to provide WiFi access at two safety roadside rest stops in the Central Valley of California on State Route 99. The private partners for this project are the Great Valley Center (GVC), a non-profit organization and Coach Connect, a Texas-based business. Caltrans and the GVC have an agreement, which gives GVC the right to operate the WiFi service at the rest areas. GVC has contracted with Coach Connect to be the WiFi service provider. The installation and operational costs are divided between Caltrans and Coach Connect. Caltrans is responsible for providing the T1 connection to the wireless equipment. Coach Connect is responsible for all wireless hardware, development of the web portal, installation of the wireless equipment, and support services.[6]

Traveler information and other information offered on the Caltrans site and related sites are available for free. In addition, each user will be given sixty minutes of free WiFi access over the course of the pilot project to visit other sites. The project partners anticipate charging user fees for any usage over the 60-minute allocation, but the fee structure has not been determined at this time. User fee revenue will go to Coach Connect. Coach Connect will also be allowed to sell advertising space on the web site. All proceeds from the sale of advertising will go to Coach Connect.

Florida

In Summer 2006, Florida DOT began a pilot program to provide WiFi to travelers at 88 locations across the state including rest areas, weigh stations, and traveler information areas. The program also includes 40-inch plasma screens to display travel information and advertisements at select locations. Under the agreement between the Florida DOT and Coach Connect, Coach Connect is responsible for the installation and operation of the WiFi access and the plasma screens, including support services. There are no costs to the State. In the future, the program may deploy kiosks (with touch-screen traveler information systems) and/or computers (for broader Internet access) for travelers that do not have their own devices. The State may also determine that additional plasma screens to display information at more rest areas are necessary. The cost

structure for these additional installations and service had not been determined at the time of this research.[7]

The WiFi service is free to users in Florida with no time or use constraints (other than inappropriate sites) known at this time. Since there are no user fees, there is no revenue from the service. However, if a user fee were implemented, there would be profit sharing once Coach Connect meets a predetermined profit threshold. The agreement with the State allows Coach Connect to sell advertising and, after Coach Connect meets a profit threshold, there are provisions for profit sharing with the State. The threshold to be met and exact percentage shared is unknown at this time.

Iowa

Free WiFi access was introduced as a pilot project in six of Iowa's rest areas in June 2005. The pilot proved beneficial in providing travelers with access to key highway safety information, and in helping drivers stay connected to their home and office while on the road at no cost to the State. Under the pilot program, a company called I-Spot provided the service without cost to Iowa and attempted to support itself with advertising revenue. Although the Iowa DOT considered the pilot WiFi program a success from a user perspective, I-Spot went out of business. Based on the success of the pilot, Iowa DOT made a decision to expand WiFi access to all 40 of the State's rest areas and decided to pay for the WiFi service. The Iowa DOT purchased and installed the wireless equipment and is also paying the Internet service provider.[8]

In 2006, Zoom Information Systems was awarded the statewide contract to provide WiFi services in Iowa. Zoom is responsible for the costs of software development, web design, and technical support. The WiFi access is free to the user for the first thirty minutes of Internet use. The contract between the Iowa DOT and Zoom allows subscription fees to be collected for Internet access that exceeds thirty minutes. Users are allowed to pay for up to two additional thirty-minute periods. The cost to the user for the additional periods is unknown at this time because the subscription fees have not yet been implemented. Currently, users have free unlimited use of the wireless services. Once a decision is made to collect user fees, the revenue

will go to Zoom. Advertising is not allowed on any of the State sponsored travel information sites, monitors, or kiosks, but it is allowed if the user decides to visit other sites. At this time, the State is not receiving any of the revenue generated through advertising.

Kansas

The Kansas Department of Transportation (KDOT), in collaboration with Kansas Highway Patrol and the Kansas Department of Commerce, solicited proposals to partner with the State to establish WiFi service at rest areas and visitor centers with the expressed requirement that there be no cost to the State. A contract for a one-year pilot began in February 2006, and it includes the option for the State to renew the contract for one additional four-year period before having to put the services out to bid again. A contract was awarded to Coach Connect to provide these services.[9]

Coach Connect pays all operational and installation costs, including support services. There is no cost to KDOT for these services. Users will be able to use the Internet without charge for a limited period. After the free time period ends, there will be a charge for service. The cost to the user for the additional time is unclear, but fees are likely to be implemented. During the pilot project, all user fee revenues will go to Coach Connect. If the program is extended beyond the pilot, 10 percent of gross receipts of wireless subscriptions will be shared with the State. During the pilot project, all advertising revenues will go to Coach Connect. If the program is extended beyond the pilot, 10 percent of gross receipts of advertising revenue will be shared with the State.

Michigan

In Michigan a partnership was developed between Michigan's Department of Information Technology, Department of Natural Resources, the Department of Transportation, the Michigan Economic Development Corporation and SBC to provide WiFi throughout the State. WiFi access is available at three rest areas/welcome centers and seven parks/harbors. Michigan has over 80

rest areas. In 2004, Michigan and SBC entered into a three-year agreement for the pilot project. The installation and operational costs, including support, are paid by SBC. There is no cost to Michigan in providing this service. SBC has developed a web page, which allows users to either connect through a link to Michigan state sites, which are free, or directs users to sign-in and use the system for a fee.[10]

The fees for the users to surf the web vary based on plan length, and if the user is a current SBC customer. SBC customers who subscribe to DSL services at home or in the office have the option to pay an additional $1.99 per month with a one-year term commitment for unlimited access to all SBC hotspots. Those who are not currently SBC customers can purchase a 24-hour session for $7.95 or a monthly subscription for all SBC hotspots for $19.95 and receive unlimited access to SBC hot spots nationwide. All user fee revenue goes to SBC. Michigan's partnership with SBC allows advertising on sites that the user is paying to use and all advertising revenue will go to SBC.

Oregon

In 2005 the Oregon Travel Information Council (TIC) began a two-year pilot project with Coach Connect to provide WiFi access at five rest areas and four state parks. There are over sixty rest areas throughout the State. TIC is a semi-independent state agency or Inter-Governmental Agency (IGA), which acts as an intermediary in the interest of the State. IGA's have different purchasing guidelines than a state department, which allowed TIC the flexibility to research wireless providers and contract with the company of choice without going through an open bid process.[11]

Costs for the service are shared between TIC and Coach Connect. TIC purchased the wireless equipment and paid for installation and development of the website portal. Coach Connect pays all operational costs and support services. Access to Oregon's traveler information sites is free, but users must pay to view other websites. Rates for visitors to access other sites are $1.99 for 20 minutes, $3.99 for 24 hours, $7.99 for seven days, and $32.99 for one month. User fees and advertising revenue are shared equally (50 percent) between TIC and Coach Connect.

Texas

After a series of successful pilot projects beginning in 2003, the Texas Department of Transportation made the decision to provide WiFi services at all 102 public rest stops and welcome centers in Texas in 2006. Along with the WiFi access, the Texas centers offer touch screen kiosks for travelers without wireless devices. A State contract was awarded to Coach Connect to provide these services. TXDOT paid Road Connect (affiliated with Coach Connect) to develop their website portal. TXDOT also pays a monthly hosting fee for the website. Coach Connect is responsible for the rest of the installation and operational costs, including support services.[12]

Prior to Fall 2006, the use of the wireless service was free to all users. Subscription fees were allowed as of November 2006 for users to access sites other than the traveler information and State website. The subscription rates (if charged) are $1.99 for 20 minutes, $3.99 for 24 hours, $7.99 for seven days, and $29.99 for one month. After Coach Connect meets a profit threshold, 25 percent of the subscriptions fees will go to TXDOT. Coach Connect is allowed to sell advertising and keep all advertising revenue.

Washington

Beginning Summer 2006, WiFi has been available at 28 of 42 roadside rest areas along I-5 and I-90 in Washington. A State contract was awarded to Parsons Transportation Group to provide these services, and Coach Connect is the prime subcontractor under this contract.[13] There is no cost to the State of Washington. Coach Connect is responsible for all installation and operational costs, including support services. Traveler information and other information offered on the Washington DOT site and related sites are available for free. To view additional websites, users must subscribe to Road Connect and pay the following fees: 20 minutes - $1.99, Daily - $3.99, Weekly - $7.99, Monthly - $29.99. Coach Connect shares a flat gross percent of all user fees and advertising revenues with the State.[14]

Overview Summary of Roadside Rest Stop WiFi

This review of the current business arrangements that have developed between state DOTs and WiFi service providers reveals that there is not one dominant model (See Table 1: WiFi Comparison Chart). The degree of risk sharing varies depending on the structure that determines whether the public or private participant pays for equipment, installation, and operations. In some cases, such as Iowa, the State has assumed a higher degree of risk by paying all installation and operational costs. This model would not be considered a PPP and does not fit the model established during the ICI CFS process where access to the rights-of-way was provided free of charge in return for a private sector service that is also provided free of charge. At the other extreme Florida, Kansas, Michigan, and Washington pay nothing for the WiFi service at their rest stops. In these cases the right-of-way is available for free to the WiFi provider, which is presumed to make a profit from user fees and selling advertisements. This model closely follows the self-sustaining model of the CFS projects with the private sector absorbing a greater share of the risk. In between these two extremes California, Oregon, and Texas have implemented cost share systems where the state and WiFi providers share the costs (risk) and/or the revenue (benefit).

Table 1 - WiFi Comparison Chart

	Costs		**Revenues**	
State	**Installation**	**Operation**	**User Fees**	**Advertising**
California	DOT	Shared	Company	Company
Florida	Company	Company	Shared	Shared
Iowa	DOT	Shared	Company	N/A
Kansas	Company	Company	Company	Company
Michigan	Company	Company	Company	Company
Oregon	DOT (TIC)	Company	Shared	Shared
Texas	DOT	Shared	Shared	Company
Washington	Company	Company	Shared	Shared

At this time it is too early to know which business arrangement(s) will succeed. If the traveler information services provide enough of a benefit, but the customer chooses not to pay user fees to access other web sites, the Iowa model may be the most appropriate. In this case, the value of

the traveler information in terms of safety and more efficient use of the transportation system is a high enough public value that it becomes a public rather than a private good. However, if the value of Internet access to travelers is high enough that they are: 1) willing to pay the user fees or 2) generate enough Internet traffic that advertisers are willing to pay, then the service might be best configured as a private good with the public sector gaining the benefit of improved traveler information in return for allowing the WiFi provider access to the right-of-way. This model fits the self-sustaining PPP for ITS identified during the ICI CFS process.

Vehicle Infrastructure Integration (VII)

Vehicle Infrastructure Integration (VII) is an advanced vehicle-vehicle, vehicle-infrastructure, and infrastructure-vehicle communications initiative. VII can provide significant improvements to the safety and operation of the transportation system, resulting in benefits to public agencies, the private sector, and the traveling public. The primary benefits to the public sector will be improved traffic information for more efficient incident and special event management as well as overall traveler management to reduce congestion and optimize the network. For the private sector, VII benefits range from allowing auto manufacturers to access vehicle information to the entertainment industry developing in-vehicle media applications. The potential benefits to the traveling public with the full implementation of VII include: improved safety, reduced congestion, better traveler information, and access to entertainment while on the road.

The characteristics of VII, integrating communication between public roadways and vehicles, are ideal for the development of public-private partnerships. VII is currently in the research phase, which means the applications and the ideal business models are still being developed. Some states are conducting VII research from the perspective of a PPP with cost and risk sharing, while others have defined a more traditional model with the public agencies paying the costs of the research and assuming the risk.

Since there are benefits to the public sector from real-time information, improved safety, and more efficient use of the system, and there are benefits to the private sector in the form of profits and/or enhanced customer service, questions regarding implementation and operational costs are

paramount. Generally, it is presumed that automobile companies or aftermarket suppliers will provide the on-board devices.

Purchase, installation, and maintenance of the roadside equipment (RSE) are issues yet to be determined, and the answer may depend largely on the business models of the participants. RSEs could be the responsibility of the public sector based on the assumption that the RSEs represent the public sector's share of the costs in return for the benefits. In this case, the DOTs would need to determine if the public costs are justified by the benefits that are accruing to the public. An alternative model might place all of the costs with the private sector, including installation of the RSEs. It is possible that more than one business could obtain benefit from the VII infrastructure, each carving out a niche based on the service they provide. Finally, questions regarding responsibility for quality control, system security, privacy, and technology disruptions remain to be answered.

Joyce Wenger with Booz Allen Hamilton has identified some of the key challenges for VII business models as:

- Numerous business models for numerous stakeholders;
- VII environment requires that business models recognize the interdependency with other models;
- "Chicken and egg" deployment issue; and
- Most models are in early development and are not yet solidified. [15]

A VII consortium has been established to determine the feasibility of widespread deployment and to establish an implementation strategy.[16] Two of the consortium participants, California and Michigan, are reviewed in more detail here. These states have structured their VII research from the perspective of PPPs and may be instrumental to understanding key components for successful longer-term deployment business models.

California[17]

VII California (VIICA) is a PPP research project with the goal to implement a field operational test (FOT) to test and show specific VII capabilities. VIICA is being implemented in two phases. Phase I took place in November 2005 at the Innovative Mobility Showcase (IMS) of the ITS World Congress in San Francisco, California. Phase II, the VIICA Bay Area Test bed, includes development and operation through early 2008.

Caltrans and MTC are the primary public sector participants. Caltrans and its sub-contractors are responsible for the development of the roadside infrastructure and provide overall project management. California PATH, under contract with Caltrans will develop the RSEs, including vehicle-infrastructure messaging and communication of the VII data at the roadside. MTC and its sub-contractors serve as the facilitator/coordinator with local agencies and lead the effort in backend processing, backhaul communications, and development of traveler information applications for the VII test bed. PB Farradyne, under contract with MTC, will design backhaul communications and handle collection, processing, and archiving of data. Caltrans and MTC have each committed $1.5 million ($3 million total) to the VII California program. Caltrans and MTC are also providing access to public rights-of-way and data at no cost.

DaimlerChrysler Research & Technology NA, Volkswagen of America, and Toyota InfoTechnology Center USA are the private sector participants with the responsibility of providing vehicles equipped with technology to communicate with the RSEs.

In addition to the automakers that have joined the partnership and are providing equipped vehicles, MTC and Caltrans are seeking to expand the program through a Call for Submissions (VIICA CFS), which was issued July 2006. Similar to the ICI CFS, the VIICA CFS does not award any funds, but Caltrans and MTC could provide access to state or locally-owned facilities, including rights-of-way, cabinets, call boxes, light poles, traffic signal controllers, ramp meters,

electrical service, or telecommunications assets. [b] Currently, Caltrans and MTC are engaged in negotiations with two private sector entities that responded to the VIICA CFS.

The goal of VIICA is to gain a better understanding of how VII can support the deployment and operation of system management tools, such as ramp metering, electronic toll collection, and advanced traveler information. Caltrans and the MTC have identified the following public sector VII applications as priorities for testing: traveler information, ramp metering, electronic payment (tolling), intersection safety, and curve overspeed warning.

Michigan[18]

The Michigan Department of Transportation (MDOT) has made a commitment to the future and potential of the national VII effort, including research, development, evaluation, deployment and the publication of results. In the early stages of the VII program, MDOT and its partners are developing and deploying a number of VII test beds to support National VII efforts.

Michigan's VII effort assigns the State responsibility for infrastructure, the telecom industry responsibility for information infrastructure, and the automotive industry responsibility for equipped vehicles. Public sector stakeholders include MDOT, FHWA, the Road Commission for Oakland County (RCOC), the Road Commission of Macomb County (RCMC), and the Cities of Detroit and Wales. Private sector stakeholders include General Motors, DaimlerChrysler Corporation, Ford Motor Company, Nissan Motors North America, Motorola, and Azulstar Networks (i.e., Ottawa Wireless).

The private sector role is to develop applications and components, both for in-vehicle and along the roadway, including development, testing, and evaluation. The MDOT concept of operations indicates that the private sector will be responsible for the planning, design, implementation, integration, testing, and operations and maintenance of the following elements for all of the VII test beds[19]:

[b] Access to these resources will be determined on a case-by-case basis. Use of state or local facilities may be subject to successful application for an encroachment permit issuance and any other applicable statutes and regulations.

- Vehicle fleet (including any vehicle-to-vehicle communications hardware),
- Cellular, or other non-roadside based, communications systems,
- Test bed participant facilities/servers,
- Test bed participant Internet connection and security systems and protocols,
- Infrastructure installed on private property,
- In-vehicle communications and processing (including data packetization and sending/unwrapping data),
- Advising MDOT as to the desired communications infrastructure to be tested at each location, and
- Anonymizing and disseminating the data collected to MDOT via the Internet.

The role of the public sector is to support the private sector by providing infrastructure on the roadside, coordinating activities, and funding some of the less commercially viable yet operationally critical components, such as the safety applications.[20] According to an RFP for services issued by MDOT in Spring 2006, the public sector is responsible to:[21]

- Implement a wireless network on I-696, M-5 Connector and 12 Mile Road;
- Develop, engineer, install, optimize, and integrate a system to provide mobile broadband data connectivity between equipped vehicles and the Internet; and
- Provide data connectivity between traffic control signals on 12 Mile Road and establish a dedicated short-range communications (DSRC) environment through the use of appropriate surrogate technology for development and exploration of application use cases.

The structure of the VII research managed by MDOT is based on a PPP concept with both the public and private sectors sharing costs, risks, and benefits.

Table 2 - VII Summary

State	**Project Description**	**Public Partners**	**Private Partners**
California	VII application priorities for testing include: traveler information, ramp metering, electronic payment (tolling), intersection safety, and curve overspeed warning	Caltrans and MTC	DaimlerChrysler, Volkswagen, Toyota Possible additional partners from the VIICA CFS
Michigan	Work zone safety, in-vehicle signing, and lane departure warning systems are priorities. The three key subsystems of this program are the on-board equipment, road-side equipment, and the network subsystem.	Michigan DOT, FHWA, Road Commission for Oakland County, Road Commission of Macomb County, City of Detroit, Wales	General Motors, DaimlerChrysler, Ford, Nissan, Motorola, Azulstar Networks

Overview of Traffic.com, Inc.[c]

Traffic.com, Inc. (Traffic.com) deploys a traveler information system that monitors and reports traffic conditions to enhance the quality, availability, and accessibility of transportation data. Traffic.com provides customized reports to radio, television, Internet, and in-vehicle navigation system users in 40 of the largest metropolitan areas in the United States. Traffic.com operates through establishing PPPs with State DOTs to access the rights-of-way for their sensors. In return for access to the rights-of-way, Traffic.com provides the public agencies with real-time and archived data for operations, reporting, and planning purposes. Under the agreement with the FHWA, which provided seed funding for project start-up in 50 metropolitan areas, data are provided to the public agencies for internal use at no cost.

In 1999, following a pilot program in Philadelphia and Pittsburgh, the USDOT provided $10 million to Mobility Technology (now Traffic.com) to install a network of sensors in four

[c] Mobility Technologies changed their name to Traffic.com, Inc. in March 2005. For the purposes of this report, Traffic.com will be used at all times, even when referring to the company before March 2005.

metropolitan areas. In 2001, with the passage of TEA-21[d], an earmark was set aside for a program called the Intelligent Transportation Infrastructure Program (ITIP). At that time, up to $50 million dollars was made available by the Federal government for Traffic.com to provide real-time traffic information to USDOT, and the state DOTs, as well as to the public, at up to $2 million per metropolitan area. TEA-21 Section 5117(b)(3) provides the details of the agreement, which state that the main purpose of the program is to advance the deployment of an operational ITS system to aid in transportation planning and analysis and to contribute to the national ITS program. [22] Under the agreement, Traffic.com is to build an infrastructure to gather real-time traffic information via a wireless network to aid state DOTs in planning, analysis, and maintenance including infrastructure, maintenance, and operation. Structured with an 80/20 match, the agreement provides for $2 million per metropolitan area, with $500,000 in local funds. The agreement requires metropolitan areas to have a population larger than 300,000 and must meet additional criteria to be eligible for this program. There is a provision for revenue sharing with the states.

In 2004, congress passed the next major transportation bill, SAFETEA-LU, which included Transportation Technology Innovation and Demonstration (TTID). This was a direct extension of TEA-21's ITIP program. TTID has two parts: Part 1, which began in 2004, provides for the selection of up to 11 additional metropolitan areas to receive federal grants of no more than $2 million each (with $500,000 local match). Part 2, which began in 2006, expands the program and begins awarding contracts on a competitive basis for the deployment of systems in selected congested areas, with consent and coordination from the affected state DOTs.[23]

Under the arrangement with the FHWA, Traffic.com is responsible for deploying, operating, and maintaining the sensor network without government funding beyond the initial payments received for each metropolitan area. Traffic.com retains exclusive right to market the traffic flow data for commercial purposes.Traffic.com has committed to share up to 10 percent of the

[d] Section 378 of the FY 2001 Transportation Appropriations Act provided $50M for ITIP. Section 1101 of the FY 2002 Defense Appropriations Act amended section 5117(b)(3) of TEA-21

revenue from the sale of data with state or local governmental agencies or reinvest an equivalent amount in technology systems.

Traffic.com is currently operating in the following metropolitan areas:[24]

Albany	Indianapolis	Pittsburgh
Atlanta	Jacksonville	Portland
Austin	Kansas City	Providence
Baltimore	Las Vegas	Raleigh-Durham
Birmingham	Los Angeles	Richmond
Boston	Louisville	S. F. Bay Area
Charlotte	Miami	Sacramento
Chicago	Milwaukee	Salt Lake City
Cincinnati	Mpls. - St. Paul	San Antonio
Cleveland	Nashville	San Diego
Columbus	New Orleans	Seattle
Dallas - Ft Worth	New York	St Louis
Denver	Norfolk	Tampa Bay
Detroit	Oklahoma City	Tucson
Greensboro	Orlando	Tulsa
Hartford	Philadelphia	Washington
Houston	Phoenix	

Section IV: Caltrans' Mechanisms for Private Sector Interaction

Caltrans has numerous mechanisms for interacting with the private sector that could influence the character and outcome of public-private partnerships for ITS technology deployments. These can be broadly separated into granting access to rights-of-way, known as encroachment, and procurement of goods and services. Encroachment governs private sector access to the public rights-of-way, while procurement governs the mechanisms and methods by which the public sector purchases goods and services from the private sector. The CFS and future CFS-style solicitations touch on both of these processes. For the ICI, CFS industry partners were offered a streamlined encroachment process and normal encroachment fees were waived.

Encroachment Permit Overview

Caltrans has standard procedures to grant access to public rights-of-way. These include encroachment permits for utility and other private parties that require access to the rights-of-way, as well as procedures for cellular communication towers and fiber optics installations. While some of these users pay fees for usage, others pay just the cost of Caltrans staff time for processing the permits.

Caltrans' mission includes the goals of safety, mobility, delivery, flexibility, and stewardship. Encroachment permits touch on each of these goals. When processing encroachment requests, Caltrans is responsible to ensure that the public safety and the State's assets are not compromised, and mobility is minimally reduced from a temporary or permanent encroachment. The most sensitive areas to encroach upon are the controlled access rights-of-way where there are limited access points, high speed, and heavy traffic flow.

An encroachment is defined in the California Streets and Highways Code as: "Any tower, pole, pole line, pipe, pipeline, fence, billboard, stand or building or any structure, object of any kind or character not particularly mentioned in this section, or special event which is in, under, or over any portion of the highway." "Special event" means any street festival, sidewalk sale,

community-sponsored activity, or community-sponsored activity."[25] According to Caltrans' Encroachment Manual, encroachment permits are necessary for Caltrans to:

- Protect, maintain, and enhance the quality of the State highway system during and after permitted work;
- Ensure the safety of both the traveling public and the permit holders;
- Ensure that the proposed encroachment is compatible with the primary uses of the State highway system;
- Protect the State's and public's investment in the highway facility; and
- Ensure that temporary uses of State highway rights-of-way for special events, filming, etc. are conducted safely and with minimum inconvenience to the traveling public.[26]

An encroachment permit is a contract between the Department and an encroachment permit holder, that describes the terms and conditions under which they are granted authority to enter the rights-of-way to perform the specified activity. Anyone that wants to conduct an activity within State highway rights-of-way or conduct an activity that may encroach on State property may be required to obtain an encroachment permit. The encroachment permit application can be obtained online from the Internet or at any of the twelve district permit offices statewide. The permit holder must be in compliance with all applicable Federal, State, and local laws and regulations and with the Department's Encroachment Permits Manual and Encroachment Permit. Future highway construction or maintenance may require the removal or relocation of the encroachment entirely at the permit holder's expense.

The Department processes a complete encroachment permit application within 60 days after it has been received. Incomplete applications are returned and result in a new 60-day review period when the completed application is resubmitted. The Department has an appeal process in the event an applicant chooses to contest the denial of an encroachment permit.

The risks that Caltrans undertakes when issuing encroachment permits include: staff time being used to review and approve applications, the safety of the motoring public, valuable real estate

being occupied by equipment, and that the project may not be aligned with the Caltrans mission to improve mobility across California.

Risks taken by industry include time and efforts spent in the application process, the ability to meet all safety, environment, and insurance requirements and the impact on a business that is dependent on access to the rights-of-way.

Permitting for General Business and Public Access

For general business and public access to the rights-of-way the encroachment permit costs are billed to the permit holder at the time of the application. The monies received from the encroachment permit process are viewed as a self-recovery type of income. Thus, these fees are used to cover the staff time involved with reviewing and approving the permits. Permit fees are calculated based on the time spent reviewing the application and inspecting the work. The more complex the project, the more expensive the permit will be. Review and inspection time is billed at $82 per hour. [27]

Permitting for Public Utilities

The most common utility facilities are water, cable television, sewer, electrical, natural gas, telephone, and common-carrier petroleum pipelines. The Streets and Highways Code (Section 117) allows utility owners to use public property, including state highway rights-of-way (with approval from the Department), for transmitting and distributing products and services. Procedures for determining and collecting permit fees for utility facility encroachments owned by utility companies differ from encroachment permits for general business and public access. Typically, utility companies providing utility facility service to the public are billed for application and inspection fees (rather than paying at the time of applications).

Permitting for Cellular Communication Towers

Cellular communications towers are handled by Caltrans as a unique type of encroachment in both controlled and non-controlled access rights-of-way. Cellular communications follow the

rules and regulations that a typical utility would follow, but with additional regulations and fees because these businesses are part of a competitive market instead of a regulated one. The primary goal for cellular communication tower permits is the improvement of public telecommunication services along highways, which is especially important during emergencies. To reduce visual impact, Caltrans manages the number of facilities built by erecting the towers through centralized planning of tower locations and shared use of the towers. Another goal is to generate additional revenues for statewide transportation projects. Furthermore, cellular towers improve Caltrans' communication systems through sharing wireless facilities with carriers and improving services available to the traveling public.

The authority to operate these towers is held by the State of California, acting by and through its Department of Transportation, Division of Right of Way. In 1996, and Executive Order was issued to all Departments and Agencies in State Government to help facilitate and develop policies to improve telecommunications within California. As a result of that order, the Department of Transportation's Division of Right of Way, with guidance from the Airspace Advisory Committee (AAC), and approval from the California Transportation Commission (CTC), developed the Wireless Licensing Program as a part of the existing Airspace Program.

Pricing of individual cell sites is calculated using a formula based on the following criteria: location (rural, urban, and prime urban); size of the facility or "footprint;" and number of antenna. Prices are increased annually at approximately 3.5 percent or higher if the Consumer Price Index rises above 3.5 percent but not to exceed 5 percent. Effective July 1, 2003, for Marin, San Francisco, San Mateo, Santa Clara, Alameda and Contra Costa Counties add 25 percent to the Prime Urban price. In 2006, the pricing for Macrocell for Prime Urban, Urban and rural respectively was $28K, 16K, and 13K. Minicell: $24K, 20K, 13K. Microcell: $20K, 16K, and 11K. There is also a one-time charge of $1,000 when applying for a site license. The income from the Wireless Licensing Program is deposited into the State Highway Account, and once a year, it is transferred into the Public Transportation Account for transportation projects statewide.

Permitting for Fiber Optic Installations

Fiber optics installations are relatively new to the Department and appear to fall into a grey area between utilities and cellular communications carriers. Caltrans policy is to consider any proposal to install communication lines in controlled-access rights-of-way as long as the proposal meets all safety and engineering standards and requirements and will be processed through the appropriate District Encroachment Permit Office.[28] Caltrans' goal for facilitating the installation of fiber optics is similar as for cellular communications towers, including the improvement public telecommunication services along highways, which is especially important during emergencies and to generate additional revenues for statewide transportation projects. Fiber optics has the potential to generate greater revenue for the state than cellular towers depending on the pricing structure.

The process to install fiber optic lines is treated the same as other encroachments into the rights-of-way and follows the same permitting procedure and regulations. Additionally, the permit can have "rider" provisions specifying the annual compensation due, and if applicable, any other "in lieu" conditions (e.g., fiber, equipment, etc. dedicated for public use).

California's pricing plan and agreements for fiber optic installations is highly controversial. A high profile court case from 2002 to 2005 between SBC and the State of California over the price of placing fiber optics in the rights-of-way concluded with the U.S. District Court upholding Caltrans' right to keep their pricing structure. The wireless carriers continue to oppose the pricing structure and requested the governor to intervene. As of August 2006, the pricing policy for fiber optics has been suspended by the Administration. [29]

The primary risk industry is taking by entering into an agreement with the State for fiber optics is the cost. Additional risks such as damage to the line from digging or other construction in the rights-of-way are also possible although there are processes set in place to prevent these kinds of mishaps. As with all encroachment permits there is also the risk of time and cost being spent to apply for permits with the risk of being rejected by the Department.

State Procurement Overview

Caltrans procurement procedures are governed by the California Government code, which requires the purchase of all services, supplies, and equipment in excess of $100 for any State agency to be made by, or under the supervision of, the Department of General Services, Procurement Divisions. The Department contracts with both the public and private sector for a wide variety of services. All service contracts and construction contracts (less than $120,000) are written and processed by the Division of Procurement and Contracts staff located in Sacramento and the Irvine satellite office. Construction contracts, more than $120,000, are processed by the Department's Engineer Office. The contract managers and service contract analysts work closely together and are responsible for the successful execution of each contract. The Division of Procurement and Contracts uses primarily three procurement methods to competitively award contracts for services: Invitations for Bid (IFB), Request for Proposal (RFP), and Request for Qualifications (RFQ). With few exceptions, the majority of contracts are written as a result of such competitive documents.[30] An important principle of state purchasing is to promote and provide for open and fair competition when competition is known to exist. There is a non-competitive purchasing process for purchases of $25,000 or less where no competition exists.

California Multiple Awards Schedules

California Multiple Award Schedules (CMAS) offers an opportunity to negotiate prices in advance for a wide variety of commodity, non-IT Services, and information technology products and services at prices, which have been assessed to be fair, reasonable, and competitive. The CMAS program was established in May 1994, and incorporated in PCC sections 10290 et. seq. and 12101.5. CMAS contracts are established for IT and non-IT products and services that have been competitively assessed, negotiated, or bid primarily, but not exclusively, by the Federal General Services Administration. The program enables State departments under the purchasing authority granted by the Department of Government Services (DGS) to streamline purchases by removing repetitive, resources intensive, costly, and time-consuming bid processes. Caltrans adds California contract terms, conditions, procurement codes, and policies to the GSA pricing and establishes an independent California contract.

The CMAS program does not reduce or relieve California State agencies of their responsibility to meet statewide requirements, guidelines, procedures or policies regarding contracts or procurements. Departments must make a valid attempt to secure offers from viable contractors who are able to supply the goods and/or provide the services. Neither a lack of sufficient CMAS contractors nor the use of restrictive requirements meets the intent for achieving offers.

The CMAS process may be appropriate for some companies at the close of a CFS-style project with Caltrans. However, the company would need to follow all CMAS applications guidelines regardless of status as a CFS partner.

Feasibility Study Report (FSR)

Section 13070 of the Government Code gives the Department of Finance general powers of supervision over all matters concerning the financial and business policies of the State. This includes the procedures for obtaining Finance approval of proposed information technology expenditures. The mechanism for approving information technology projects is the Feasibility Study Report (FSR). The FSR establishes the business case for investment of state resources in the project by setting out the reasons for undertaking the project and analyzing its costs and benefits. An FSR must be approved for every information technology project prior to the encumbrance or expenditure of funds on the project, including the use of staff resources, beyond the feasibility study stage. The FSR is directed at all expenditures and staff time for software development.

The FSR represents the first opportunity for agency management to assess the full implications of a proposed information technology project. The FSR is also the means of linking a specific information technology project to the agency's strategic business plans and information technology plans and to ensure that the proposed project makes the best use of the agency's information technology infrastructure.

In general, a key feature of CFS-style solicitations is that no public funds are to be expended. This means that even if software development is required the cost would be absorbed by the

industry partner and an FSR would not be required. However, at the close of the CFS demonstration projects if Caltrans were interested in a continued relationship with the industry partner, an FSR may become necessary. This would be determined on a project-by-project basis based on the expenditure of funds for software development

Section V: CFS-Style Solicitation Policy and Planning Recommendations

The ICI CFS, as well as the three case studies examined in Section III demonstrated that there is great potential for PPPs to accelerate the deployment of ITS technologies on public roadways. CFS-style solicitations as a mechanism to recruit industry partners, has many advantages for public agencies, including low cost and controlled risks with potential high gain. However, implementing a new way of doing business requires careful consideration to ensure that all legal and procedural requirements are followed. The following policy and planning recommendations are provided to assist Caltrans in preparing to issue CFS-style solicitations. Important areas for consideration include: 1) the authority for CFS-style solicitations and subsequent PPPs; 2) the long-term agency-industry relationship; and 3) the goals, purpose, and partners for the solicitation. As discussed in Section II of this report, the two primary business models that result from CFS-style solicitations are the self-sustaining model and the procurement model. Each business model has different strengths and challenges from the PPP perspective.

Authority for CFS-Style Solicitation

Implementing CFS-style solicitations will require an assessment of Caltrans' mandate and responsibilities in relation to the State Legislature, other State authorities, and the FHWA. Considerations include determining if legislative authority is necessary, the conditions that would require a FSR to meet Department of Finance (DOF) requirements, and the relationship with the FHWA. In addition, Caltrans must not provide a gift of public funds, which could include providing access to rights-of-way.

Legislative Authority

One of the defining characteristics of a CFS-style solicitation, is that no funds are exchanged between the public and private sectors. Based on this characteristic, legislative authority is not necessary for either the CFS-style solicitation or any PPP agreements that result from a CFS-style solicitation.

It is possible for a CFS-style PPP, based on the self-sustaining business model, to include revenue sharing. Under a revenue sharing scenario the private industry partner would share some of their profit with the public sector partner, in addition to the non-monetary benefit provided in exchange for access to the rights-of-way. The basic premise of the CFS-style PPP would remain the same: the public sector partner would not expend funds, and the private sector partner would base their business on equipment placed in the rights-of-way. Without specific legislative authority, revenue received from a revenue sharing arrangement would be deposited in the State general fund. If the revenue from a revenue sharing agreement were to go to Caltrans rather than the general fund, legislative authority would be required. Examples of PPPs that allow for revenue sharing include Traffic.com and some roadside rest stop WiFi arrangements.

Traffic.com's agreement with FHWA includes an option to share 10 percent of revenue with the state or local transportation authority or put this amount back into the project in the form of technology. In California, without specific legislative authority, Caltrans would not be able to accept the funds from revenue sharing. It might, however, be possible for the local metropolitan planning organization (MPO), such as MTC, to accept revenue sharing funds. This would need to be determined in consultation with the MPO. In addition, it might be possible for the DOT to accept the 10 percent revenue in the form of additional technology deployments.

Another example of revenue sharing can be found in some of the PPPs for roadside rest stop WiFi service between state DOTs and the WiFi service provider. Of the states reviewed here, Florida, Oregon, Texas, and Washington have provisions for revenue sharing from either user fees or advertising, although not all of the states had collected revenue at the time of this research.

Final determination regarding legislative authority rests with DOT legal counsel and would need to be determined on a state-by-state and project-by-project basis. If Caltrans considers potential revenue from ITS-based PPPs important, Caltrans may consider taking steps to obtain legislative approval for accepting revenue sharing from PPPs based on CFS-style solicitations. For example, an "ITS fund" could be authorized by the legislature for receipt of funds obtained from ITS-based PPPs with the private sector. Alternative solutions might include crafting PPP agreements that send the revenue to a local MPO (if allowed) or crafting PPP agreements that accept an equivalent amount of the profit sharing in a non-monetary form, such as additional technology installations.

Feasibility Study Report

An FSR is to be prepared for the California Department of Finance (DOF) in advance of all expenditures for software development for IT projects. For the ICI CFS and other CFS-style solicitations, an FSR would not be required because public funds are not being spent on the projects. However, if the industry partner were following the procurement business model they would be offering products for sale after the CFS demonstration. If Caltrans wanted to continue a relationship with an industry partner that included purchasing equipment that required software development, an FSR may be required.

For example, as part of SpeedInfo's CFS agreement, SpeedInfo provided data to Caltrans in a format compatible with the Caltrans system. Therefore, Caltrans did not need to develop software to process the data from SpeedInfo. However, if Caltrans were to purchase the SpeedInfo devices and needed to develop software to process the data, an FSR would likely be required. A similar scenario exists for Infotek Associates. Under Infotek's CFS agreement software development was not necessary because the company provided data to Caltrans for free in any data format requested. Again, if Caltrans were to purchase the Infotek Wizard devices and also needed software development to process the data, an FSR may be required. (Note: The above situations are hypothetical and do not indicate that software development would be required for the purchase of either SpeedInfo or Infotek devices.)

The ultimate decision for an FSR requirement rests with Caltrans and DOF authorities and will depend on the IT characteristics of the project. If Caltrans legal advisors did determine that an FSR was required for a specific situation, Caltrans could make sure that the project was included in and compatible with the agency's strategic and information technology plans.

FHWA Notification/Approval

Currently FHWA's jurisdiction does not include authority to approve of CFS-style projects that use the public rights-of-way. For the ICI CFS, FHWA was notified of the industry partner's projects that used the rights-of-way. However, the FHWA may be sensitive to shifts in the use of the rights-of-way and/or acceleration in the number of private parties granted access. This situation should be monitored in relation to CFS-style solicitations in the event of a change in policy at the FHWA.

Gift of Public Funds

Caltrans cannot provide a gift of public funds, and this would include providing access to the rights-of-way without gaining a benefit, for example, in the form of improved data for system management. Critical to the determination of what constitutes a gift of public property is the primary purpose of the project. Regardless of what Caltrans is receiving in exchange for granting access to rights-of-way at no cost to the private sector, the intent of the project must be for public benefit. The benefit that the private sector receives should be incidental to the benefit to the public sector. The public benefit is not defined by a monetary benchmark and is not based on the actual profit that the private sector partner generates through access to the rights-of-way. In keeping with this requirement, all CFS-style solicitations should be planned and designed to maximize benefit to the state highway system and to provide public benefit.

Long-Term Agency-Industry Relationship

For both the public and private sector partners of a PPP based on a CFS-style solicitation, success will be defined by the long-term relationship that develops within the partnership (self-sustaining business model) or after the close of the CFS demonstration (procurement business model). Important considerations to increase the likelihood of long-term success include; 1) maintaining a level playing field, 2) resolving procurement issues, and 3) designing PPPs under the self-sustaining business model that maximizes benefits to the public sector while allowing the private sector to conduct a successful business.

Level Playing Field

CFS-style solicitations and subsequent PPP agreements must maintain a level playing field between the industry and agency partners and between the CFS industry partners and non-CFS industry partners. CFS industry participants should not gain an advantage or realize a disadvantage through their association with the CFS. To achieve this goal: 1) the CFS should not give industry partners any advantage over non-CFS participants in future public solicitations; 2) CFS industry partners should not be treated as consultants; and 3) solicitations should be broadly disseminated. In addition, potential industry partners should be provided full disclosure of all possible consequences to the industry before agreements for partnership are executed.

The CFS agreement was designed to protect ICI CFS industry partners from gaining unfair advantage through their participation in the CFS that could prevent them from bidding on subsequent public solicitations. To achieve this goal, Caltrans legal counsel determined that the CFS industry partners must remove all of their equipment from the rights-of-way at the close of their projects. Removing the equipment serves to remove any advantage the industry partner might have gained through the CFS partnership, thus allowing them to bid on subsequent public solicitations. The ICI CFS agreements included language requiring that all equipment be removed at the close of the CFS demonstration. Similar language is recommended for future PPPs based on CFS-style solicitations.

Caltrans is not allowed to engage consultants in follow-on contracts. To prevent industry partners from being labeled as consultants, which could preclude them from further work with Caltrans, language should be included in future CFS-style agreements that clarify that the industry partner is not acting in the role of consultant and that the CFS agreement does not constitute a consultant contract. If such language is not included in future CFS-style PPP agreements, industry partners should be notified that there is the potential they could be bared from future consultant contracts with Caltrans.

Universal publication of all CFS-style solicitations will prevent the appearance that any industry partners gained an advantage through relationships with the public sector developed during execution of previous CFS agreements. Universal publication of all CFS-style solicitations is recommended.

Finally, although every effort should be made to mitigate unexpected negative consequences to the private sector participants regarding future relationships with the public sector, PPP agreements based on CFS-style solicitations should inform the private sector of all possible negative consequences.

Procurement Business Model and the Public Private Relationship

For CFS-style partnerships based on the procurement business model, the relationship between the public and private partners after the close of the demonstration period is paramount. Under the procurement business model, industry desires short-term access to rights-of-way with the potential for public procurement of goods and/or services demonstrated through the CFS. The advantage to the public sector is an opportunity to gain experience with the technologies prior to purchase and a period of time to interact with the technology provider on specifications and expectations. This style of PPP presents greater risk to the private sector because the public sector is not obligated to purchase the goods or services demonstrated.

For the public sector, there are legal requirements for fair and open bidding for all products purchased by Caltrans. Although the ICI CFS was an open solicitation and any business or entity

was allowed to submit a proposal, the process did not meet requirements for fair and open bidding. At the close of the CFS demonstrations, Caltrans was not able to purchase technology demonstrated by the industry partners. From the perspective of the private industry partner with a procurement business model, the motivation to participate in a CFS-style PPP is greatly reduced, if there is not an avenue for the public partners to purchase products after the close of the demonstrations.

For future CFS-style solicitations, potential participants should be notified in advance that all State requirements for fair and open bidding would be implemented, if Caltrans determines that the purchase of technology or a device demonstrated under the CFS was desirable. The potential industry participant cannot expect that a successful demonstration will lead to a purchase without a competitive bid. While this situation may dampen some potential industry partners' enthusiasm to participate in a CFS-style solicitation, State procurement requirements must be met. Potential industry participants will need to gauge if the benefit of working directly with Caltrans staff and installing their equipment in the rights-of-way for demonstration purposes is of high enough value to participate in a CFS-style solicitation.

Self-Sustaining Business Model Public Private Relationship

For CFS PPPs based on the self-sustaining business model, the industry partner desires long-term access to rights-of-way to establish a profitable business in return for providing data or other services to the public sector at no cost. Procurement is not relevant for the self-sustaining business model. Issues that are relevant include: 1) allowing numerous and potentially competitive companies into the rights-of-way, 2) data sharing and the exclusivity of data generated by the industry partner, and 3) the length of time for the PPP. Revenue sharing, as discussed previously, may also be an important consideration for PPPs based on the self-sustaining business model.

Allowing numerous companies with a similar business model into the same rights-of-way locations may be beneficial to the public sector but not advantageous to the private sector partners. The industry partner may want exclusive access to certain rights-of-way locations to

maintain an edge over competitors in the same space. The public interest may best be served by allowing more than one company into the rights-of-way to ensure the agency and the traveling public are gaining the best data or technology available.

Data sharing is another area where the interests of the public and private partners may diverge. The companies that respond to the CFS solicitation intend on establishing and sustaining a business based on the value of the data they collect. Providing all data to the public sector partner for unlimited usage may not be in the best interest of the private sector. This is in contrast to the public sector's goal to gain as much valuable data as possible through the partnership and could conflict with the mandate to not provide a gift of public property. If the public sector intends to use the data in a manner that would cause competition with the private sector business the conflict will be more difficult to resolve.

Finally, the timeline for a PPP based on the self-sustaining business model is significantly longer than the timeline for the procurement business model. For the self-sustaining business model to be successful, access to the rights-of-way over multiple years is necessary. While granting long-term access to the rights-of-way in return for data is not necessarily bad for the public sector, a longer agreement may carry greater risk.

One approach that Caltrans might try for future CFS-style solicitations targeting self-sustaining business model participation would be to open all of its available rights-of-way to all entities with proposals for innovative ITS technologies with the following three conditions:

1) The private sector partner would need to be able to meet all requirements for obtaining an encroachment permit.
2) If two or more private sector partners wanted access to the same stretch of rights-of-way, a random lottery system would be used to determine which partner would be granted access to which rights-of-way.
3) The private sector partner would need to share data with the Caltrans and other potential public sector participants, such as MPOs, with consideration given to

protecting the private sector partner's ability to make a profit based on the data they generate.

Goals, Purpose and Partners for the Solicitation

Advance planning for CFS-style solicitations requires the careful assessment of a number of factors that will shape the PPPs that result from the solicitation. Some of these factors will impact the legal authority for such projects as well as the structure of the CFS agreements and the long-term public private relationships that result from both the self-sustaining and the procurement business models. Important factors for advance planning include:

- Determine the goals and purpose for the solicitation and confirm that the CFS-style is the best mechanism to achieve the goals. For example, is the purpose of the CFS-style solicitation to gain experience with new technology, reduce costs for the government, obtain improved data, or to solve a limited technology challenge?

- Determine a timeline for the projects in advance. A shorter-term deployment may result in reduced risk to the public sector and more limited requirements, while a longer-term deployment may be more beneficial to the potential industry partners. Deployment duration should be aligned to fit with the goals of the solicitation and the expected resultant business model arrangement (self-sustaining or procurement).

- The ICI CFS solicitation was designed with multiple agency partners and multiple private sector partners. In advance of issuing a CFS-style solicitation, a determination should be made regarding the number and type of public sector partners to be involved. For example, the lead could be the DOT headquarters, District offices, MPOs, or even local governments. To a great extent the answer to this question will depend on the purpose and goals for the solicitation, including the problem to be solved, the public assets being offered, and if the CFS is targeting PPPs based on the procurement or self-sustaining style business model.

- For the private sector to participate there must be a profit motive. If a project or problem statement is defined to provide a benefit to the public sector, but it does not leave room for private sector profit the private sector will have no motivation to participate. This is especially relevant for the self-sustaining style of PPP.

- For the self-sustaining style of PPP, determine if generating revenue for the State general fund or a DOT controlled fund is desired. If generating revenue for the DOT is a goal, legislative authority may be necessary.

- While the ICI CFS did not distinguish between procurement and self-sustaining business models for the PPPs that would result from the solicitation, for future CFS-style solicitations it may be beneficial to determine in advance the desired style of PPP. Each has different characteristics that would impact the scope and nature of the CFS agreement, as well as the long-term relationship between the public and private sectors.

Section VI: Conclusion

The ICI CFS demonstrated a new style of public-private partnership that could accelerate the deployment of ITS technologies for private and public sector benefit, as well as for the traveling public. In addition, PPPs for roadside rest stop WiFi access, Vehicle Infrastructure Integration, and Traffic.com's business model all point towards increasing interest in PPPs for ITS that could provide benefits to the public and private sectors, as well as risk sharing. This analysis indicates that limited access to public rights-of-way has value to the private sector, provides benefits to the public sector, and could be beneficial to the traveling public.

CFS-style solicitations do not involve the exchange of funds and thus it does not appear that legislative authority or an FSR would be required. However, if a self-sustaining business model were developed that included revenue sharing, legislative authority might be beneficial. Under the procurement style business model an FSR may be required before the public sector could purchase technology or equipment that was showcased during the a demonstration. The ultimate

decision regarding legislative authority and FSR requirements rests with agency legal counsel and would need to be determined based on the characteristics of the particular PPP.

The style of business model as well as decisions made during the planning phase pertaining to the goals, purpose, and partners for the CFS solicitation are important to determining the legal requirements and post-CFS considerations.

The two business models for the private sector participating in a CFS-style solicitation are the self-sustaining model and the procurement business model. For the self-sustaining business model, the industry partner gains long-term access to the rights-of-way to generate data that they can sell. Key issues for the self-sustaining business model include: 1) creating a level playing field for potentially competitive private sector participants, 2) determining a length for the CFS agreement that provides the longer-term access required by the private sector while minimizing risk for the public sector, and 2) designing data sharing agreements that maximize public benefit by providing the public sector with the greatest possible access to data, while preserving the private sector profit motive.

For the procurement business model, the industry partner desires short-term access to the rights-of-way to showcase their technology with the goal of selling the technology to the agency after the close of the CFS demonstration. Key issues for the procurement business model include: 1) maintaining a level playing field such that the private sector participants are allowed to continue bidding on public sector solicitations after the close of the CFS demonstration, and 2) notifying the potential private sector partners that any State purchase of their products or technology after the close of the CFS demonstration will be conducted under State mandated fair and open bidding processes.

For either style of business model, the private sector partner will need to be able to meet all encroachment requirements to obtain an encroachment permit. A key determinant in issuing a CFS-style solicitation is that the public sector does not provide a gift of public funds. Thus, the primary purpose for the solicitation should be to enhance the state highway system and provide

public benefit regardless of whether the procurement-style business model or the self-sustaining style business model is the desired outcome of the solicitation.

References

[1] Finson, Rachel, McCormick, Cynthia, and Shaheen, Susan. Innovative Corridors Initiative: Call for Submissions process and Evaluation. California Center for Innovative Transportation, UC Berkeley. UCB-ITS-CWP-2007-10. Prepared for California Department of Transportation under Task Order 7. January 2007.

[2] Federal Highway Administration. Public Private Partnerships. http://www.fhwa.dot.gov/ppp. Accessed on 25 August 2006.

[3] Federal Highway Administration. Public Private Partnerships. http://www.fhwa.dot.gov/ppp. Accessed on 25 August 2006.

[4] U.S. Department of Transportation Federal Highway Administration. Public Private Partnerships. Accessed November 7, 2006. http://www.fhwa.dot.gov/ppp/defined.htm

[5] National Council for Public-Private Partnerships. How Partnerships Work. Accessed November 6, 2006. http://www.ncppp.org/howpart/index.html#define

[6] Drew, Frank. Coach Connect. Phone interview. 05 October 2006; Tanimoto, Lindsee. Phone interview and email correspondence. Oct 2006.

[7] Drew, Frank. Coach Connect. Phone interview. 05 October 2006.

[8] McMenamin, Steve. Iowa Department of Transportation. Phone interview and email correspondence 29 August 2006.

[9] Kansas DOT. Award Contract - www.da.ks.gov/purch/contracts/ContractData/08872.doc

[10] Boersma, George. Michigan Department of Information Technology. Phone interview. 05 October 2006 ;http://www.michigan.gov/wi-fi

[11] Drew, Frank. Coach Connect. Phone interview. 05 October 2006;Tutor, Craig. Phone interview. 19 August 2006.

[12] http://www.dot.state.tx.us/mnt/sra/overview.htm ; Drew, Frank. Phone interview. 05 October 2006. ; http://connect.educause.edu/blog?page=123

[13] Washington State Department of Transportation. WSDOT Provides Wireless Internet Access a Highway Safety Areas. 29 Aug 2006. Accessed December 20, 2006 ; http://www.wsdot.wa.gov/News/2006/08/28_wifiatrestareas.htm

[14] Drew, Frank. Coach Connect. Phone interview. 05 October 2006.

[15] Wenger, Joyce. Business Models for Vehicle Infrastructure Integration (VII). The Fully Networked Car, A Workshop on ICT in Vehicles. International Telecommunications Union, Geneva. March 2005.

[16] U.S. Department of Transportation, ITS. VII Overview. http://www.its.dot.gov/vii/vii_overview.htm. Accessed 30 December 2006.
[17] VII California. http://viicalifornia.org

[18] Michigan Department of Transportation. Vehicle Infrastructure Integration Data Use Analysis and Processing Request for Proposal. http://www.michigan.gov/documents/mdot/MDOT_RFP_IDS_DUAP_85094_173182_7.pdf. 25 October 2006. Accessed on 12 November 2006; Michigan Department of Transportation. VII Michigan Test Bed Program
Concept of Operations.
http://www.michigan.gov/documents/MDOT_VII_Concept_of_Operations_139651_7.pdf. 10 October 2005. Accessed 10 November 2006; Michigan Department of Transportation. The concept. http://www.michigan.gov/mdot/0,1607,7-151-9621_11041_38217-125942--,00.html. Accessed on 28 December 2006.

[19] Michigan Department of Transportation. " VII Michigan Test Bed Program Concept of Operations." 10 October 2006.
http://www.michigan.gov/documents/MDOT_VII_Concept_of_Operations_139651_7.pdf. Accessed 28 August 2006.

[20] Michigan DOT. Request for Proposal: Vehicle Infrastructure Integration (VII) Data Use Analysis and Processing (DUAP). October 2006.

[21] MDOT. RFP: Wireless Network.

[22] http://www.fhwa.dot.gov/tea21/h2400-v.htm#5117

[23] http://thefederalregister.com/d.p/2005-10-19-05-20870

[24] Traffic.com. http://www.traffic.com/allCities.html?ct=hm_map. Accessed 20 December 2006.

[25] Caltrans. Encroachment Permit Applications Guide.
http://www.dot.ca.gov/hq/traffops/developserv/permits/pdf/publications/E.P._Application_Guide_Booklet.pdf

[26] Caltrans. Encroachment Manual. Chapter 1.
http://www.dot.ca.gov/hq/traffops/developserv/permits/pdf/manual/Chapter_1.pdf. Accessed 29 August 2006.

[27] Caltrans District 6. http://www.dot.ca.gov/dist6/faq/encroachment.htm. Accessed 29 August 2006.

[28] Caltrans. Right of Way. "Communication Facilities Purchasing and Leasing." http://www.dot.ca.gov/hq/row/rps/Fiberoptic.htm. Accessed 12 August 2006.

[29] Schultze, Peter. California Airspace. Phone interview. 17 August 2006.

[30] Caltrans. How to do Business with Caltrans. http://caltrans-opac.ca.gov/business.pdf. Accessed 12 August 2006.