APPENDIX I-8: TREND ANALYSIS – HIGHWAY AND RAIL INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

Trend Statement

California faces significant transportation capacity challenges to meet current goods movement demand and to expand the state's central role in the US expansion of global trade. Historically, the state has focused its Intelligent Transportation System (ITS) initiatives on Traffic Management Systems and Traveler Information Systems. Regional initiatives are emerging to extend ITS to demand management and real-time trip routing. Growing congestion on the rails and parallel highways is forcing California to consider ITS that better integrate highway and rail networks. The State has an opportunity to more aggressively lead ITS network initiatives throughout the state through private-public partnerships and by providing regulations and funding of open-standards technology and data source integration. This leadership role is important since statewide environmental and sustainability policies rely on the continued development of reliable and cost-effective demand management and system management tools that can be implemented seamlessly across modes throughout the state.

Background

ITS has become one of the ubiquitous enablers of global trade. For railroads there is a benefit to rail projects that are integrated with highway investments as part of a national freight policy. Railroads serving West Coast ports learned that the international transportation system can become congested when the rail and highway networks and intermodal connectors don't keep pace with the growth in freight. In response, multi-modal business-related proprietary systems have been implemented for global logistics, security of goods, and resource allocation and management. However, proprietary ITS technologies and proprietary data that provide a potential competitive advantage have created barriers to sharing that have slowed industry-wide implementation.

Public sector initiatives have typically focused on standards development and demonstration studies. The private sector views many of these public initiatives as unfunded governmental mandates that do little to improve safety of their operations and require capital and operating investments that likely would not have been justified on a cost-effectiveness basis absent federal regulation. To date, public agencies have not been able to provide sufficient incentives to attract industry-wide partnerships with the private shippers, truckers or rail operators. Without strategic leadership and investment at the federal and state level, it is likely that incompatible, proprietary niche solutions will continue to dominate the market. As a consequence, significant public sector sustainability, energy conservation, and congestion reduction goals will continue to be difficult to achieve.

Freight System Implications

The trucking industry is currently coping with a range of regulations that apply ITS to safety. The industry is being forced to document "total" costs and benefits of the required adoption of electronic on-board logging devices for compliance with federal hours of service tracking requirements. The same is true of

training and educating costs tied to the requirements of the Federal Motor Carrier Safety Administration's 2010 Compliance, Safety, Accountability program. Beyond regulatory compliance, the industry is seeking to improve existing real-time routing and scheduling information to help trucks avoid congested areas and peak travel periods. In addition to real-time information that includes incidents and work zones, the American Transportation Research Institute (ATRI), the American Trucking Associations' (ATA) not-for-profit research organization, published the 2011 Freight Performance Measures Congestion Monitoring Report that details congestion severity at 250 freight-significant locations.[1] ATRI is also mapping Large Truck Rollovers using spatial data analysis to identify and propose mitigations at high frequency rollover locations. ATRI's first phase produced a database of locations which covers 31 states (not including California). The organization also is studying the efficacy, use, benefits and risks of standalone global positioning system (GPS) navigation units for commercial motor vehicles (CMV). ATRI also surveys the trucking industry annually to update a Top -10 list of issues and strategies. Onboard Truck Technologies first surfaced in 2007 as a top ten issue; it has fluctuated since among the lowest three positions in the Top 10 annual survey to as of 2013, ranking fifth. The impetus for opportunities arises from onboard safety technology benefits, while concerns generally stem from efforts by the U.S. and Canada to mandate the use of both Electronic Logging Devices (ELDs) for Hours of Service compliance and speed limiters/governors for speed management.

Resources for railroad ITS business initiatives are also being stretched by recent federal rail safety regulations. Although railroads spend more than $300 million per year on their fully-integrated sophisticated business systems to support their global business and operations, recent regulations related to improve railroad safety have required significant re-direction of freight and passenger rail capital programs and budgets. For example, the federal Rail Safety Improvement Act of 2008 requires railroads to implement positive train control (PTC) on their equipment and main lines that carry passenger trains and/or poison inhalation hazard (PIH) commodities by December 31, 2015. Compliance will cost the railroads across North America an estimated $9.5-$13.2 billion.[2] UP and BNSF railroads are each spending more than $335-$350 million per year to comply. Metrolink is spending $211 million in Southern California to install PTC by 2014.[3] Coaster, Sprinter, Amtrak and Short Line locomotives that operate on the Southern California main railroad lines will also have to be equipped. In 2011, the GAO issued a report that noted PTC would only address 30 percent of train accidents. And in 2012, the AAR initiated a legislative campaign to reduce the 63,000 track miles of the national system and 15,000 miles of the regional PTC network and extend the deadline.[4]

Typical public sector highway ITS programs include traffic management centers, closed circuit TV, permanent and portable dynamic message signs and video detection systems with fiber optic cable or cellular communications networks, synchronized signals using adaptive signal control, emergency vehicle and transit signal priority systems, reversible lanes, high occupancy vehicles/high occupancy toll lanes, ramp meters, traveler information via highway advisory radio, 511 automated voice recognition and the internet, and traffic control/incident management systems. Recent technology innovations

[1] American Transportation Research Institute (ATA) 2011 survey – http://atri-online.org/2011/10/17/critical-issues-in-the-trucking-industry-2011/

[2] HNTB Positive Train Control White Paper, http://news.hntb.com/images/bulk_media_upload/docs/FINAL_PositiveTrainControl_2_0711_(2)_0.pdf

[3] Metrolink May 2013 PTC factsheet, http://www.metrolinktrains.com/content/media/03/files/2013%2005%20PTC%20Fact%20Sheet_Updated%20June%202013.pdf

[4] American Association of Railroads PTC factsheet https://www.aar.org/safety/Pages/Positive-Train-Control.aspx

include: real-time adaptive signal control, photo detection to replace loop detectors embedded in the roadway, active Doppler radar sensors to detect highway delays and BlueTooth travel time and delay reporting using data from mobile devices and moving vehicles. Yet integration of these systems has eluded the state and regional agencies that are implementing the systems since integration of these systems to improve accuracy and timeliness of the data for the end user has customarily been beyond the scope of the individual ITS initiatives. To fulfill requirements in Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), FHWA issued a Final Rule in November 2010 to establish the Real-Time System Management Information Program. The rule contains minimum requirements for states to make information on traffic and travel conditions available through real-time information programs and to share this information. Funding the operation and maintenance of installed systems is also a significant challenge for over-stretched state and local agencies.

Planning Considerations

Transportation planning for metropolitan areas has traditionally focused on building and maintaining basic infrastructure to ensure adequate roadway capacity. Strategically using ITS requires agencies to shift focus from planning construction and maintenance of roadways to planning the operations of the surface transportation system. ITS deployment has not always been well integrated with other transportation strategies and programs. Lack of quantifiable information about benefits can put ITS projects at a disadvantage compared with other types of hardscape transportation projects, which have more easily quantified benefits. In addition to developing a workforce skilled in ITS, transportation agencies also need leaders who support ITS.

Despite the challenges, the U.S. Department of Transportation (USDOT) is continuing research on ways to integrate new technologies with existing systems to improve safety and efficiency. For example, in the Freight Advanced Traveler Information System (FRATIS)[5] Concept of Operations study FHWA is developing two freight-specific application regional "bundles." The first will include all of the traveler information, dynamic routing, and performance monitoring elements. A second application bundle will combine container load matching and freight information exchange systems to fully optimize drayage operations.

The Idaho Transportation Department's 511 Trucker Information Service was featured in FHWA's July 2013 Talking Freight Webinar.[6] The service includes phone, low and high bandwidth web-based information. Truckers have access to road closures, road conditions, commercial restrictions, temporary axle load limits; locations of truck escape ramps, rural road camera views and weather conditions. Truckers can save specific routes to personalized accounts that are linked to real time notifications. The same site is used by the state for oversized and overweight load permitting.

The Regional Integration of Intelligent Transportation Systems (RIITS)[7] project, an upgrade of the countywide traveler information system being developed by L.A. Metro, Caltrans and other agencies throughout L.A. County, provides another example of the integration challenge. The project will use the following diverse data sources: Caltrans Quickmap, Caltrans Lane Closure System, California Highway Information Network (1800 427-ROAD) telephone line for road closures, detours, weather conditions (which Caltrans may replace with a statewide 511 system), TIP Network (Traffic Information People –

[5]Freight Advanced Traveler Information System (FRATIS), http://www.camsys.com/kb_experts_ITS_mobility.htm
[6]Idaho 511 Trucker Travel Information, http://511.idaho.gov/
http://www.fhwa.dot.gov/planning/freight_planning/talking_freight/july_2013/index.cfm
[7]Regional Integration of Intelligent Transportation Systems, http://www.riits.net/

traffic reporters), Traffic411.com, Metro.net website, 511, media and private sector service providers (Google, SigAlert, Traffic.com, etc), changeable message signs, Highway Advisory Radio (HAR), NexTrip, Facebook, Twitter, YouTube, and Caltrans freeway cameras. Metro is also developing the Archived Data Management System data warehouse to enable development of multi-modal products that mirror the USDOT's Intelligent Transportation Systems strategic plan to support the federal connected vehicle initiative and other related services to improve safety and mobility.

The Gateway Cities Council of Governments (GCCOG), a joint powers authority of local jurisdictions adjacent to the San Pedro Ports, is undertaking an ambitious freight-specific ITS integration program. The GCCOG Goods Movement Technology Plan[8] developed a concept of operations and a business plan to be completed by December 2013 containing the following highway-related elements: freeway detection, arterial travel time reporting, queue detection at port gates, truck data collection, truck fleet communications, scheduling systems, performance monitoring, truck parking management, truck platooning, autonomous freight vehicles, truck enforcement, traveler information sharing, emergency notification, weather, and accidents / detours.

Resources

FHWA Freight Advanced Traveler Information System: www.fhwa.dot.gov/freightplanning/talking.htm

Gateway Cities COG Goods Movement Technology Plan Elements: http://gatewaycog.org/publications/Gateway_Cities_Tech_Plan_overview_710%20PC%205-31-12.pdf

LA Metro's Improved Information System Initial Program Strategy: http://www.metro.net/board/Items/2012/06_June/20120620OPItem59.pdf

American Transportation Research Institute (ATA) 2011Survey: http://atri-online.org/2011/10/17/critical-issues-in-the-trucking-industry-2011/

US GAO March 2012 Report: Intelligent Transportation Systems – Transportation Systems - Improved DOT Collaboration and Communication Could Enhance the Use of Technology to Manage Congestion: http://www.gao.gov/assets/590/589430.pdf

Central Coast ITS Plan - www.ambag.org/programs/met_transp_plann/its.html

Federal Motor Carrier Safety Administration Compliance, Safety, Accountability program - http://csa.fmcsa.dot.gov/about/

"Regulators and railways spar over Positive Train Control," Matt Stroudon, theVerge.com, April 15, 2013: http://www.theverge.com/2013/4/15/4226264/positive-train-control-controversy

[8]Gateway Cities Council of Governments Goods Movement Technology Plan, http://gatewaycog.org/publications/Gateway_Cities_Tech_Plan_overview_710%20PC%205-31-12.pdf