State Smart Transportation Initiative
Department of Transportation’s Perspective on Intelligent Transportation Systems
Caltrans – Past – Present – Future

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April 23 – 24, 2012
Detroit, Michigan
Freeway Planning Steps:

1. Advance consultation with local government. Study local master plans.
2. Careful studies to get engineering, traffic, right of way and economic data.
3. Possible alternate routes laid out and analyzed.
5. Studies completed. Route recommended to Highway Commission.
6. Public hearing if felt advisable by local government or Highway Commission.
7. Commission considers all data, including public views, then adopts route.
8. Freeway agreement with local government spelling out street adjustments.
On November 23, 1971, President Ronald Reagan (then Governor) flipped a switch at the original Caltrans Traffic Operations Center, and thus began the initial operation of the first semiautomated, centrally controlled system of freeway transportation in California.
Caltrans 1st TMC Interactive ITS Information Board - 1971
Tools & Resources

Traffic Management Centers (TMC’s)

Caltrans/District 12 used state-of-the-art “Go Green” technology in its new Transportation Management Center, which is intended to tame Orange County’s burgeoning traffic volume.
Mobility Pyramid 2006-present

Transportation Investments have more impact if built upon this foundation
ITS Investment in California’s Future

- 2006 – Californians approve a $20B transportation bond

- The California Transportation Commission is on-board
  - They demand science based reasoning for project selection
  - They consider the use of technology as a cost effective investment
  - They allocate over $100M to ITS projects

- Infusion of Investment of performance -based, outcome driven programs
  - $4.5B for Corridor Mobility Improvement (CMIA)
  - $250M for Traffic Light Synchronization Program (TLSP)

- Corridor System Management Plans - all CMIA corridors
  - Over 50 CSMPs; over 25 use microscopic traffic simulations
  - Simulations and other scientific assessment point to most cost effective investments – typically ITS
Performance Measurement System (PeMS)

- Statewide/ Districts/ Regions/ Cities
- Real Time and Archival Data (1998-2012)
- Dashboards
  - Delay
  - Travel Time Reliability
  - Detector Health
- Lane Closures
- California Highway Patrol Incidents
- Weigh-In-Motion Data
- Vehicle Classification Data
- Roadway Inventory
- Web Accessible
- Google© Map Enabled
California’s Challenges- ITS Investment

- The lack of reliable data - Investing in data production and acquisition
  - Applied Research - Developing and deploying new tools
    - Data archiving
    - Alternative data detection
    - Mobile data source collection, storage and usage
    - Understanding, purchasing, and using 3rd party data
    - Bringing in arterial data, transit data, etc.
  - Investing in more efficient modeling tools for transportation investment planning – existing too expensive, difficult to use
  - Investing in more efficient methods for real-time operational improvements – Information Technology requirements
  - Maintaining the investment we have already made
Since 2001, California has invested approximately $4 Billion in ITS

$78 Million annually is necessary for the maintenance of ITS equipment and programs

Currently only 14% of the necessary funding is budgeted annually for life cycle replacement and upgrade of ITS investments
System Management Strategies

![Image of system management strategies]

- **Carpools Only**
  - 2 or more persons per vehicle
- **Ramp Meter**
  - ON when flashing

![Image of ramp meter sign]

![Image of freeway service patrol logo]

- **Freeway Service Patrol**
  - STA

[Caltrans Logo]
Express Lanes

- Offer drivers a reliable mobility choice
- Uses a “Value Pricing Strategy” to control demand,
- Provide consistent facilities with a coordinated, recognizable design and a seamlessly connected network,
- Uses consistent statewide measurement procedures for research, data collection and performance reporting,
- Are developed by working with partners to coordinate and establish clear lines of communication and foster mutual support.
Traveler Information

- Caltrans Highway Information Network (CHIN) includes
  - 511 phone and web access
  - Highway Advisory Radio (HAR)
  - SAFE Call Boxes
  - Commercial Wholesale Web Portal
  - Real-time Speed/Volumes via PeMS
  - Changeable Message Signs (CMS)
Ramp Metering Controls

- Currently California has 2,460 active ramp meters,
- Delay reduction of 30 – 40% in CA
- Caltrans Ramp Metering Policy
- Plans to install another 1,715 ramp meters over the next 10 years.
- Meters are controlled locally via TMCs & are responsive to local traffic demands,
- Ramp Metering Design Guidelines are part of California’s Highway Design Manual,
- Partnership is critical for successful ramp metering implementation.
California Today
Investing in the Future – System Management

- Extensive investments & deployments of ITS across the state. These investments include:
  - Coordinated signal timing
  - Traffic detection,
  - Adaptive Ramp meters and signals,
  - Changeable Msg Signs
  - Close Circuit Television
  - Quick Map 511
  - Weigh-in-motion,
  - Fiber optics,
  - TMCs
California Connected Corridors
Vehicles, Information & People (CC-VIP) Pilot

• Enable existing transportation infrastructure and vehicles to work together in a highly coordinated manner
• Deliver improved corridor performance (safety and mobility)
• Improve accountability
• Evolve Caltrans to Real-Time operations and management
• Enhance regional, local and private sector partnerships
What’s Next?

Connected Corridors

Smart Intersection
Ford Motor Company is in a "smart intersection" research with its Smart Intersection, located in Stanford, CA. The research is associated with drivers with vision impairments. This technology is designed to improve visibility and reduce blind spots, potentially reducing accidents through real-time information sharing.

How it Works
Ford Research vehicles with active safety technologies are downloaded information about the intersection. The intersection is divided into sections with various characteristics. The signals that change are shown on the overhead signal lights. The signals include: green lights, red lights, and yellow lights. The signals are displayed using lights and sounds.

Active Park Assist
Active Park Assist is a feature that allows drivers to enter or exit a parking space with ease. The system is designed to provide assistance in tight spaces, reducing the risk of damage.

How it Works
1. The system automatically adjusts the steering wheel to align with the parking space.
2. The system controls the gearshift to begin reverse or forward motion.
3. The system stops the vehicle when it is correctly aligned.

Blind Spot Information System (BLIS) with Cross-Traffic Alert
The Blind Spot Information System (BLIS) with Cross-Traffic Alert is a feature that helps drivers by alerting them to vehicles in or behind their blind spots. The system uses radar to detect vehicles and provide audible and visual alerts when necessary.

How it Works
1. The system scans the blind spots and alerts the driver to vehicles in those areas.
2. The system can alert the driver to vehicles approaching from the rear.
3. The system provides audible and visual alerts to the driver.

Caltrans
Caltrans is a significant organization responsible for the maintenance and improvement of California's state highways and roads. They are involved in the planning, design, construction, and operation of roads and highways in the state.
Contact Information

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