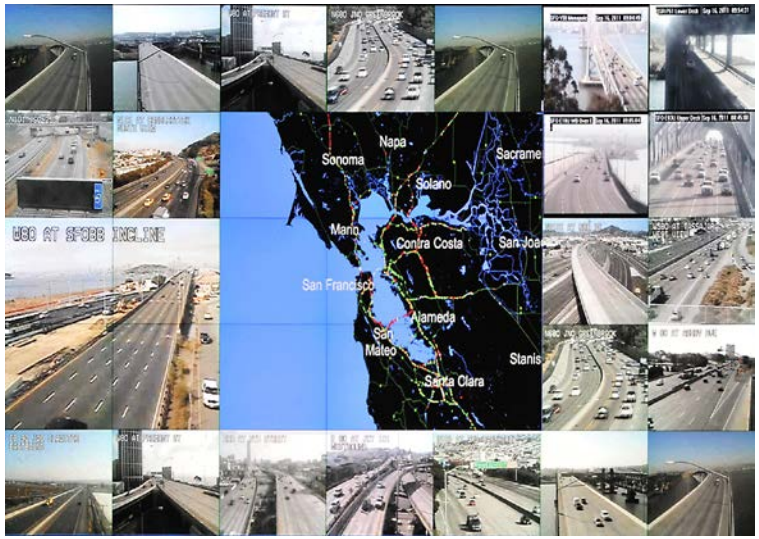
State Smart Transportation Initiative

Department of Transportation's Perspective on Intelligent Transportation Systems

Caltrans – Past – Present – Future



Presented by:
Malcolm Dougherty,
Acting Director
California Department of Transportation
(Caltrans)

SSTI State Smart Transportation Initiative

April 23 – 24, 2012
Detroit, Michigan

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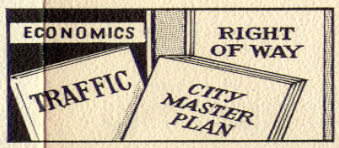
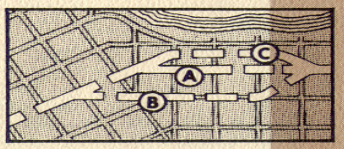
PROBLEM

Freeway Planning Steps-

1. Advance consultation with local government. Study local master plans.

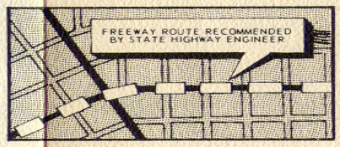


2. Careful studies to get engineering, traffic, right of way and economic data.



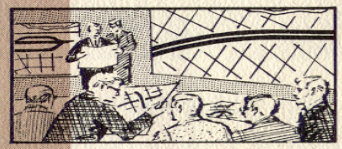
3. Possible alternate routes laid out and analyzed.

4. Facts presented at public hearings. Public views expressed. Added study follows.



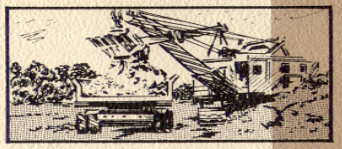
5. Studies completed. Route recommended to Highway Commission.

6. Public hearing if felt advisable by local government or Highway Commission.

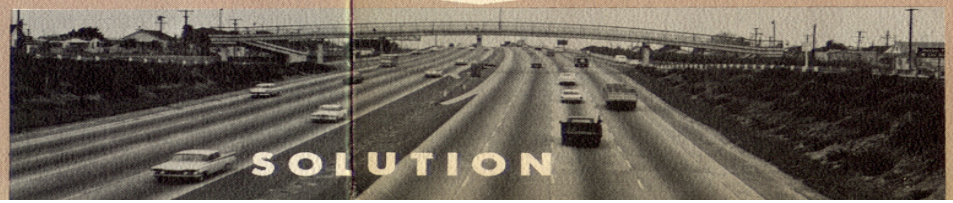


7. Commission considers all data, including public views, then adopts route.

8. Freeway agreement with local government spelling out street adjustments.



9. Design completed. Commission budgets right of way and construction funds.



CALIFORNIA'S FREEWAY PLANNING TEAM

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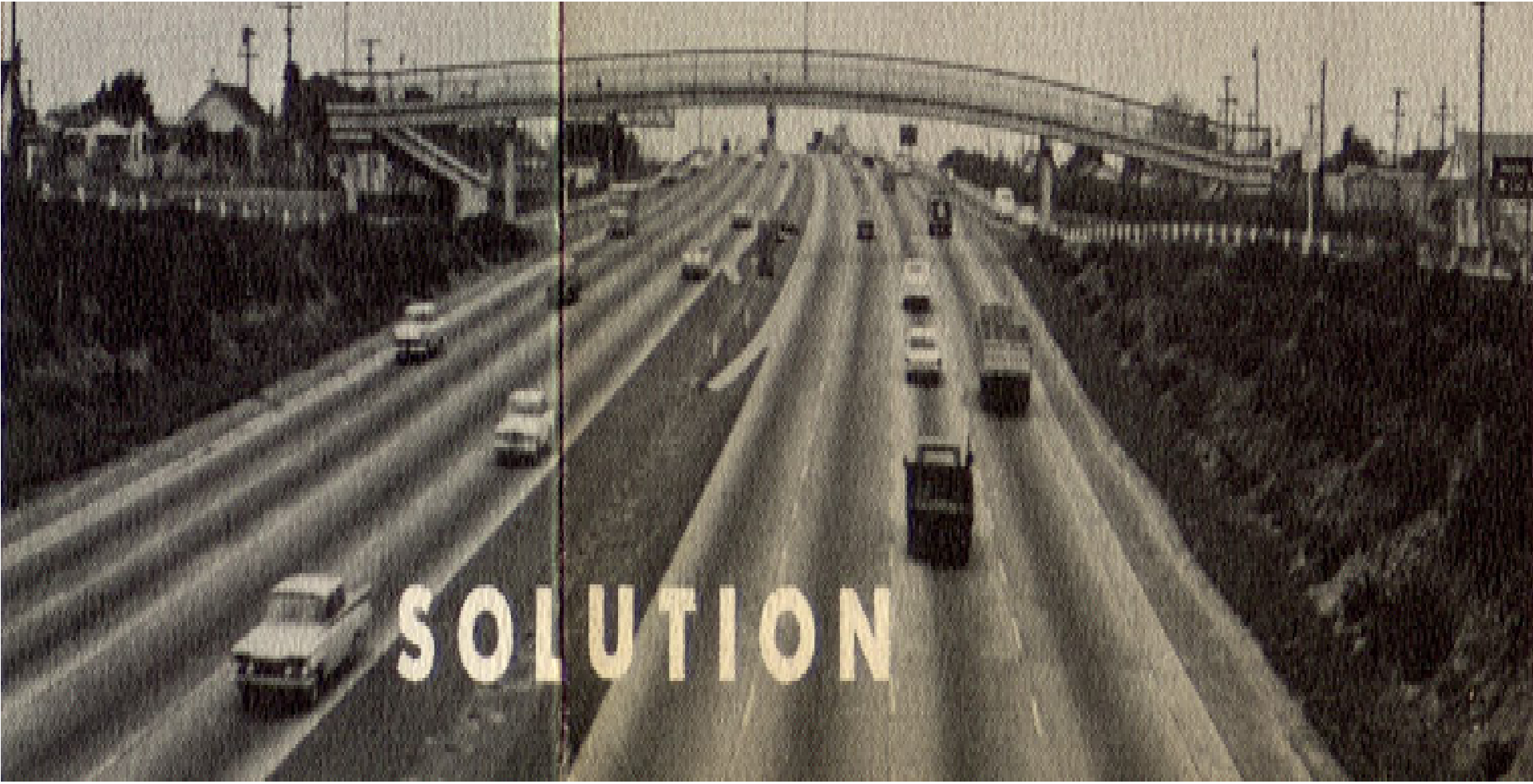
SOLUTION

Intelligent Transportation Systems & TSM Make Mobility

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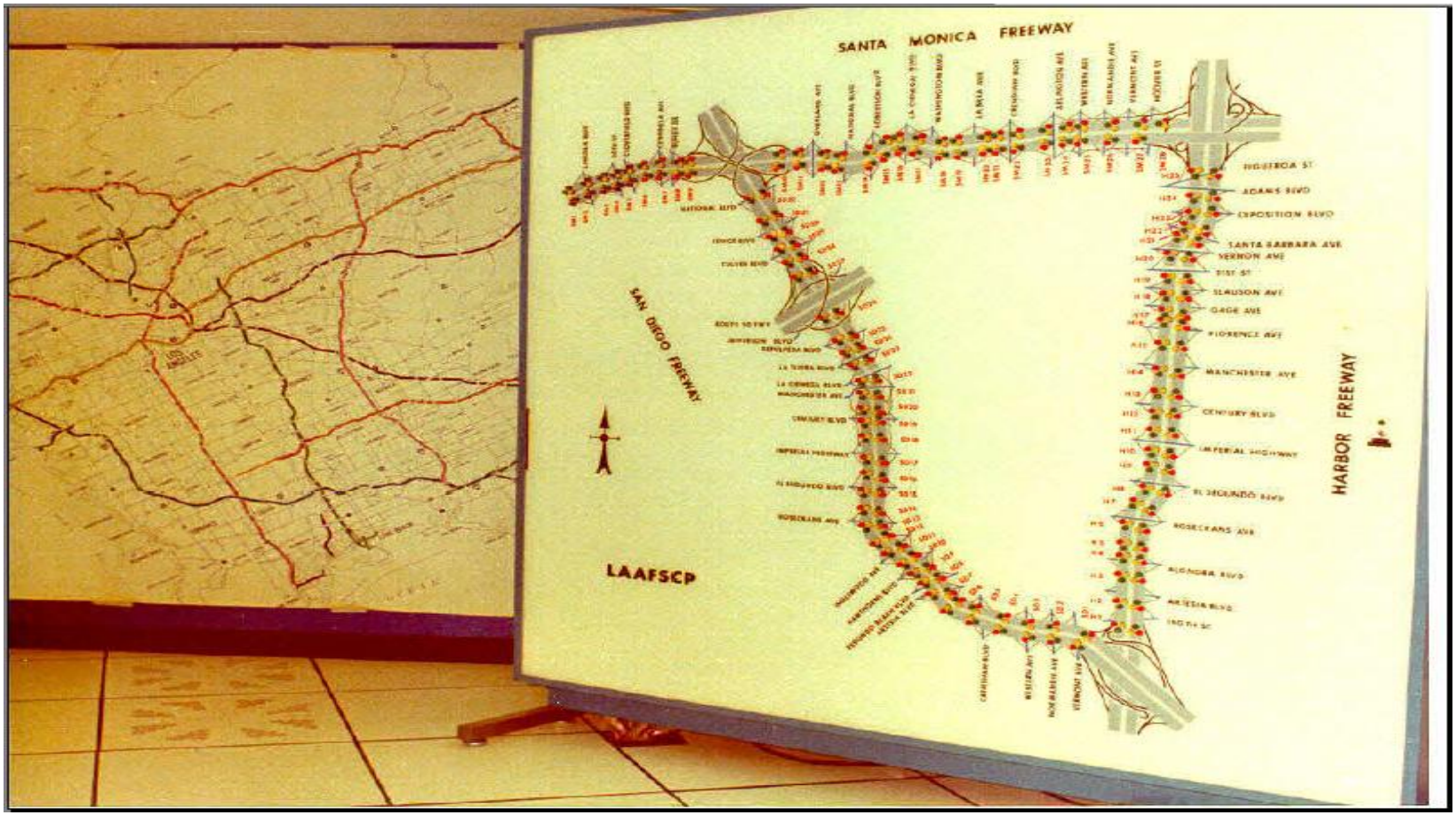
Caltrans 1st TMC Interactive ITS Information Board - 1971



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.

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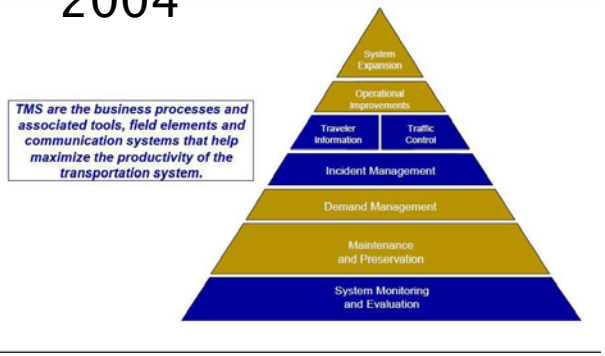
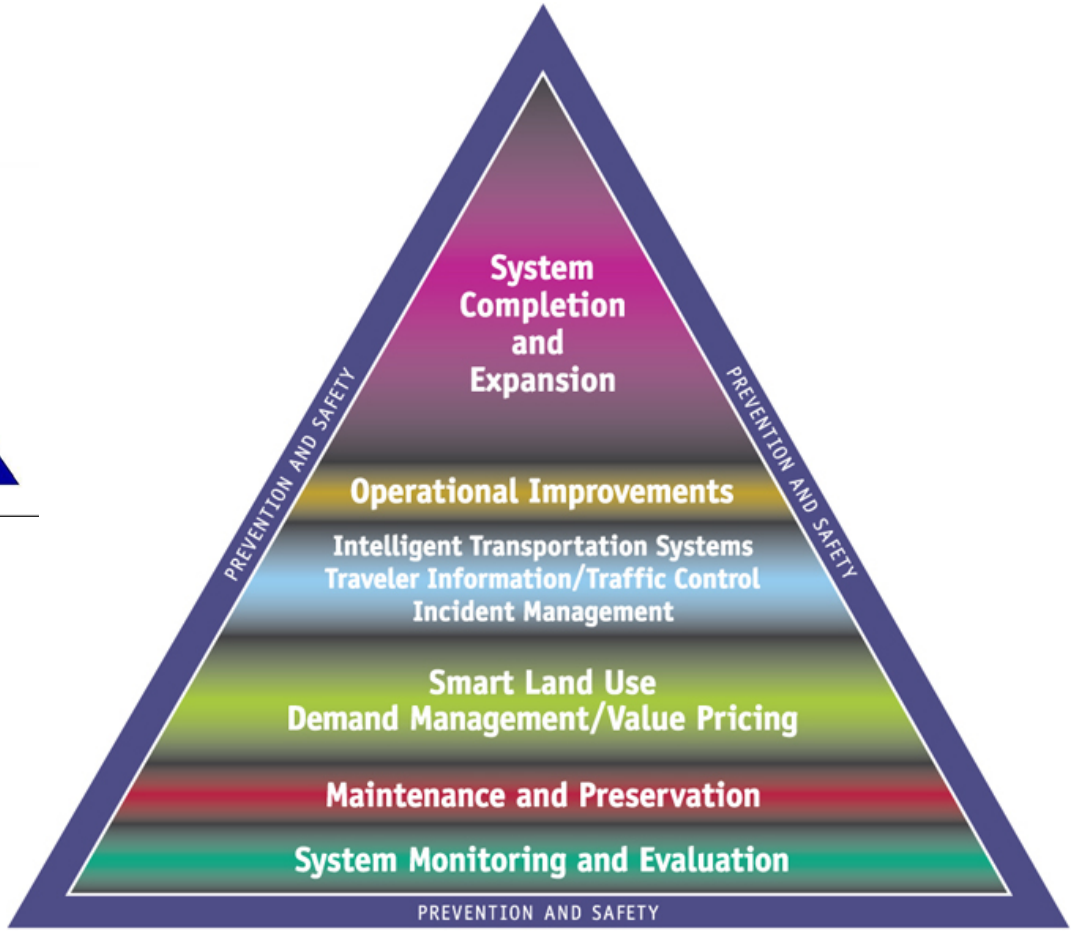
Mobility Pyramid 2006-present

2004





Transportation Investments have more impact if built upon this foundation

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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

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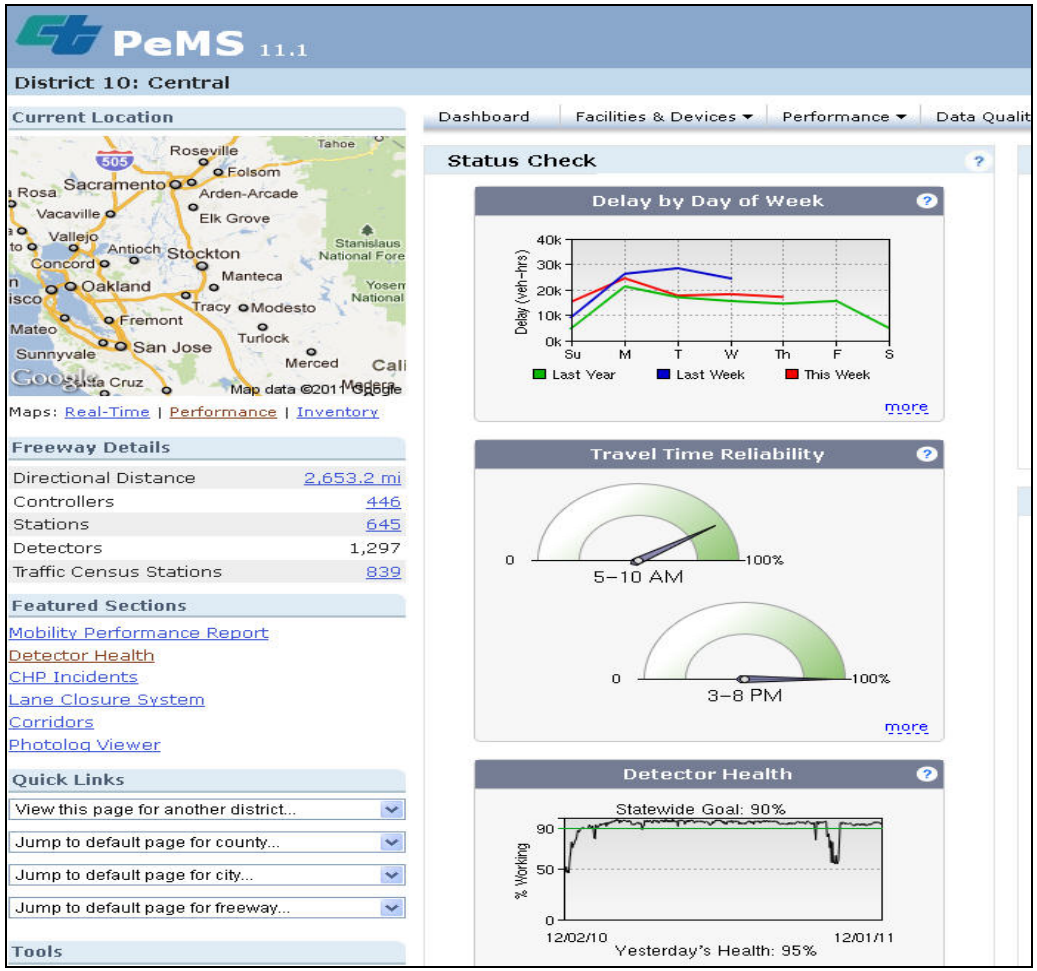
Performance Measurement System (PeMS)



- 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

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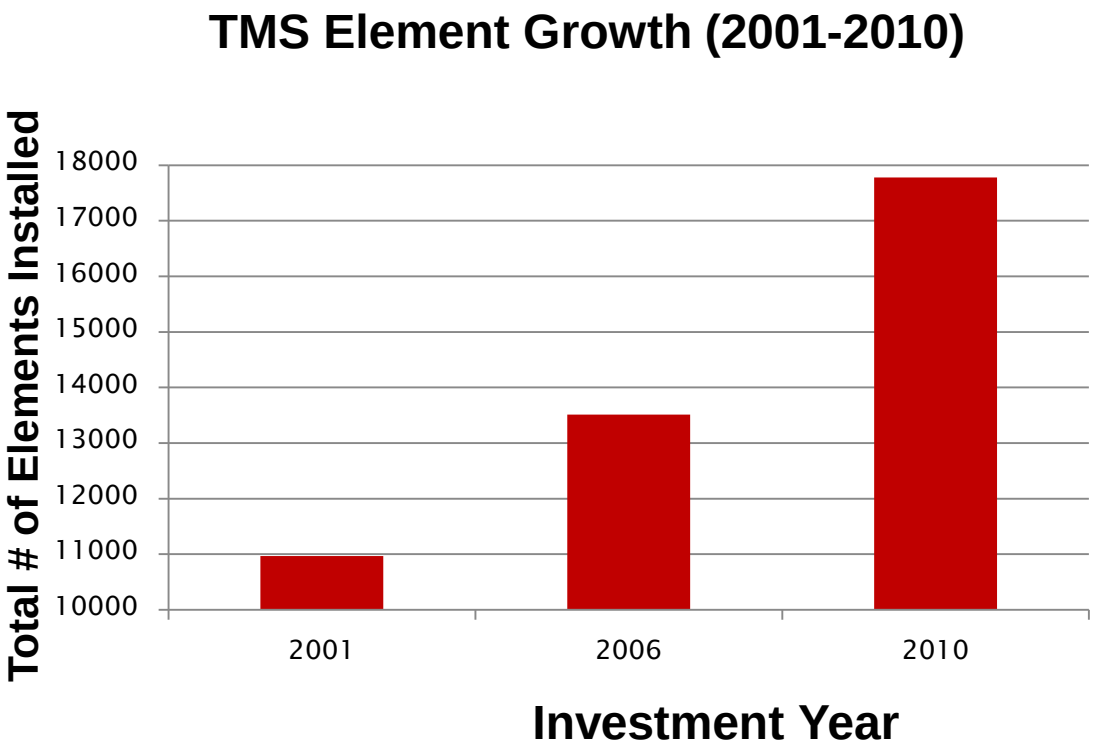
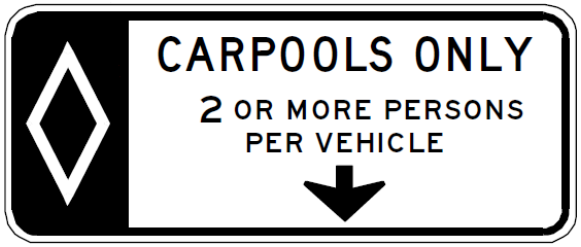
Current Investment and Challenges

- 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



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Express Lanes

New I-680 HOT Lanes not only move more people than mixed flow lanes, but will expand into a larger high occupancy toll lane network in the San Francisco Bay Area.

- **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.**

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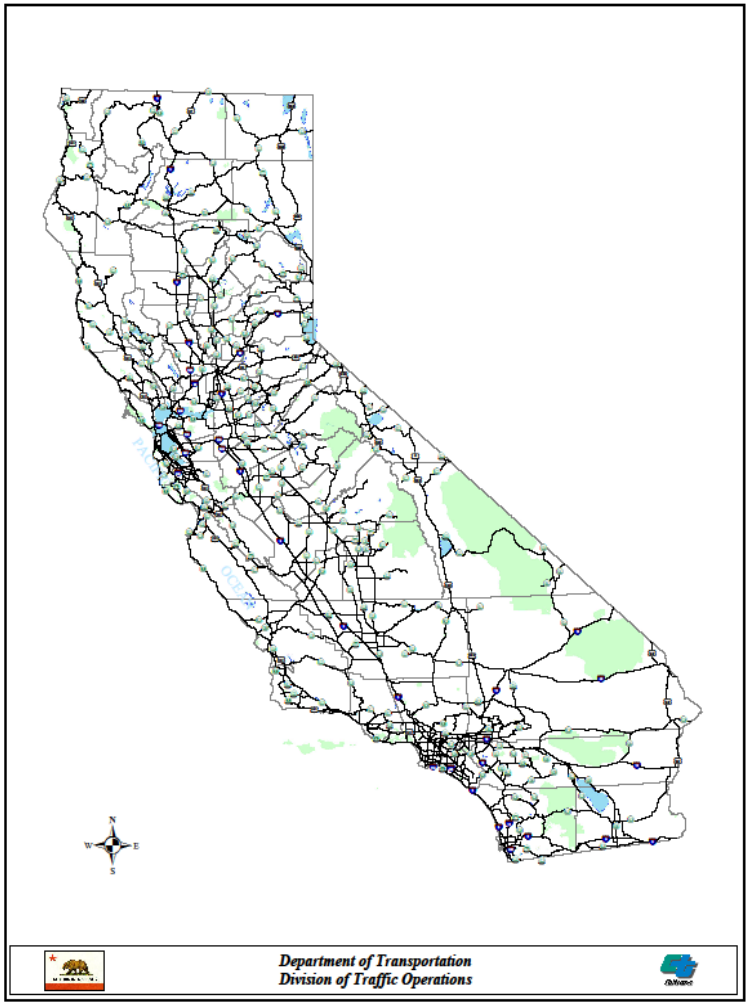
Traveler Information

- 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 Meter 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.

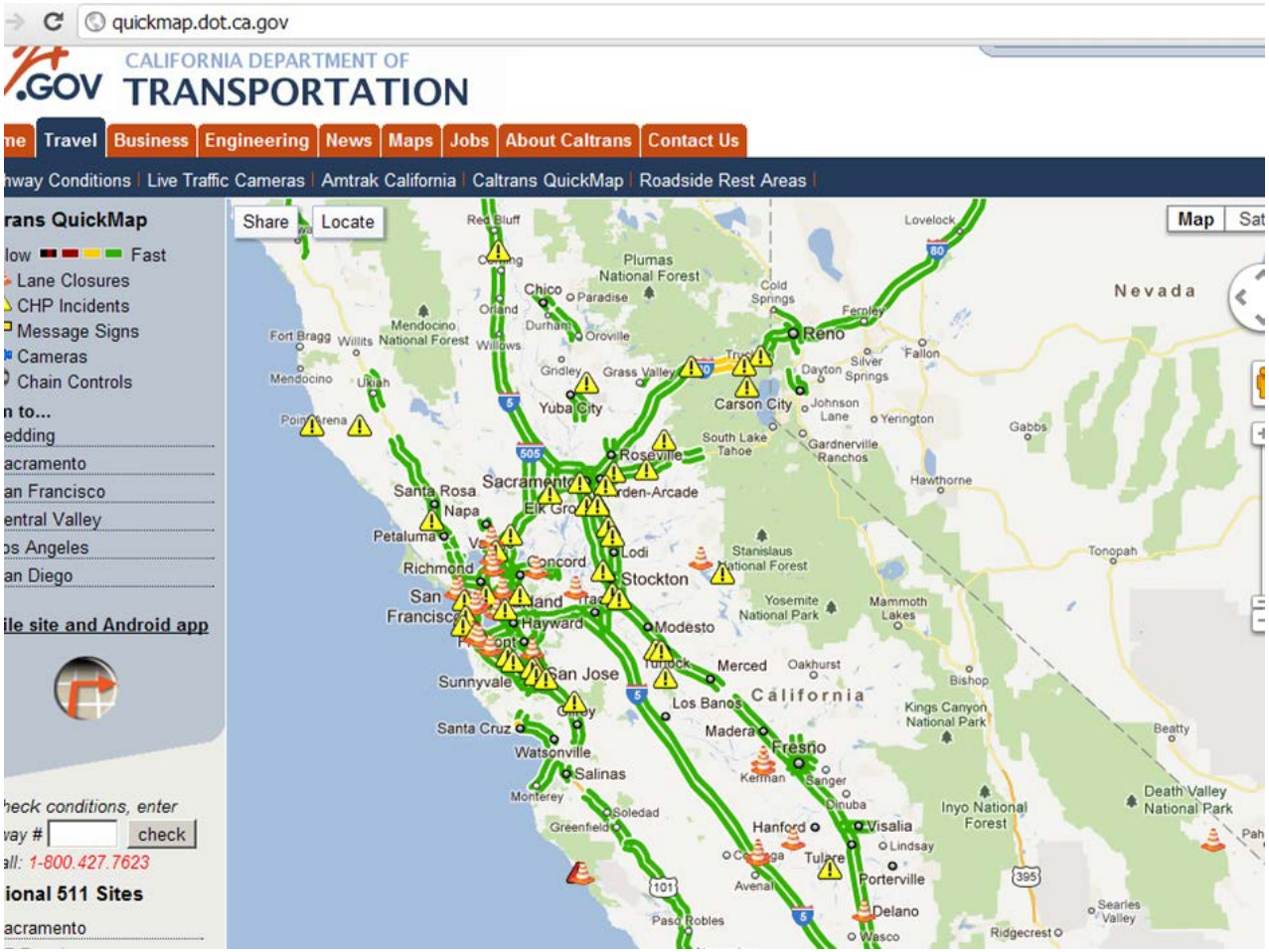
California Today



Investing in the Future – System Management

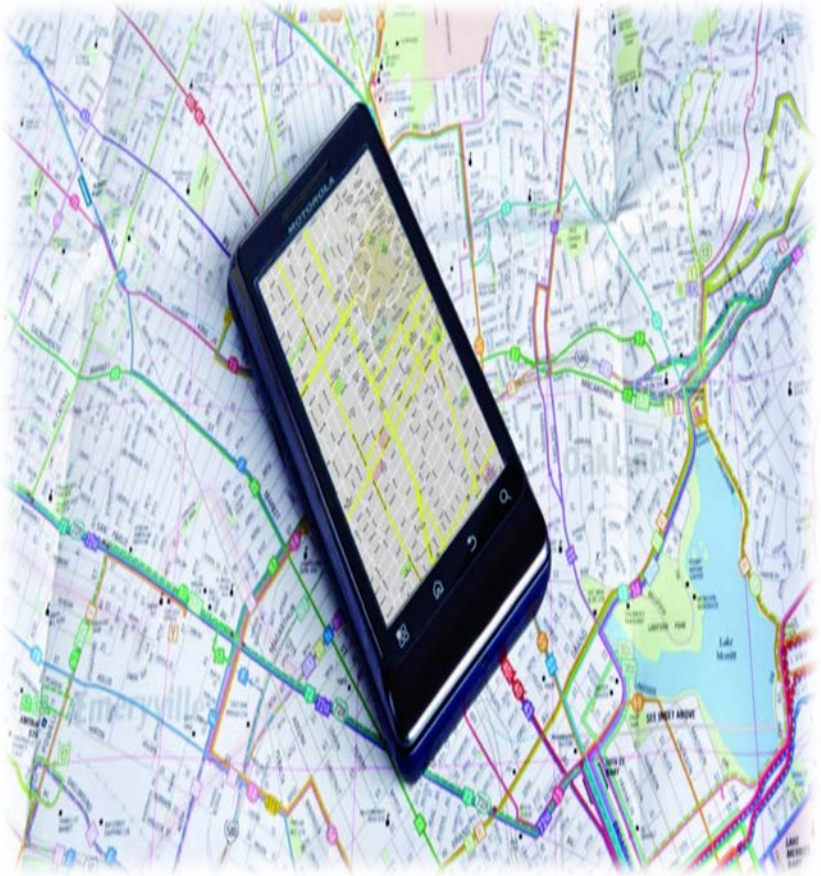
- **Extensive investments & deployments of ITS across the state. These investments include:**
  - **Coordinated signal timing**
  - **Traffic detection,**
  - **Adaptive Ramp meters and signals,**
  - **Changeable Msg Signs**
  - **Close Circuit Television**
  - **Quick Map 511**
  - **Weigh-in-motion,**
  - **Fiber optics,**
  - **TMCs**

Caltrans Quick Map & 511



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



CALIFORNIA PATH

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What's Next ?

Connected Corridors

Smart Intersection

Ford Motor Company has a foothold in "intelligent vehicle" research with its Smart Intersection, located in Dearborn, Mich., which uses specially equipped test vehicles with cutting-edge Wi-Fi technology to advance vehicle safety. Ford's Smart Intersection project, launched in the summer of 2008, leverages GPS and wireless technologies so traffic lights can talk to vehicles, which can then warn drivers of potentially dangerous situations. This technology is expected to be a key part of vehicle-to-vehicle communications where cars talk to cars to help enhance safety, reduce congestion and improve the environment.

How it works

Ford research vehicles with active safety technologies wirelessly download information about the intersection to determine if drivers should be warned about possible hazards. The smart intersection also transmits to test vehicles a detailed digital map of the signalized intersection, six additional maps of the surrounding stop sign intersections or crosswalks, lane-specific GPS information and signal status information.

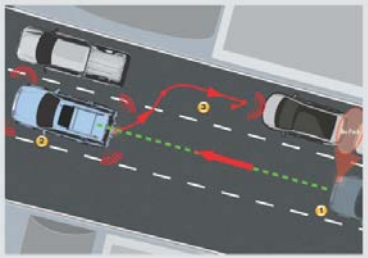
Active Park Assist

Active park assist uses an ultrasonic-based sensing system and electric power-assisted steering (EPAS) to position the vehicle for parallel parking, calculate the optimal steering angle and quickly steer the vehicle into a parking spot.

How It Works

1. The driver activates the system by pressing a center console button, which activates ultrasonic sensors that measure and identify a feasible parking space.
2. The system then prompts the driver to accept parking assistance. The steering system then takes over and steers the car into the parking space hands-free. The driver still shifts the transmission and operates the gas and brake pedals.
3. A visual and/or audible driver notification advises the driver about the proximity of other cars and objects and provides instructions.

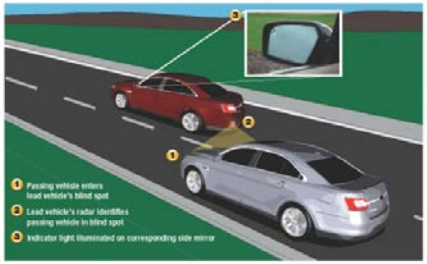
While the steering is all done automatically, the driver remains responsible for safe parking and can interrupt the system by grasping the steering wheel.



Blind Spot Information System (BLIS) with Cross-Traffic Alert

Ford's Blind Spot Information System (BLIS®) with cross-traffic alert is a feature that helps detect vehicles in blind spots during normal driving and traffic approaching from the sides when reversing out of parking spots.

BLIND SPOT INFORMATION SYSTEM (BLIS)



How It Works

- The feature uses two multiple-beam radar modules, the same used with cross-traffic alert, which are packaged in the rear quarter panels – one per side.
- The radar identifies when a vehicle enters the defined blind spot zone and illuminates an indicator light on the corresponding sideview mirror, providing a warning that a vehicle is approaching.

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Contact Information

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