Des Moines Metropolitan Area Integrated Corridor Management Peer Exchange

ICM Evolution and Emerging Trends

June 3, 2021

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INTEGRATED CORRIDOR MANAGEMENT–
DES MOINES METRO AREA

Agenda

- ICM concept development
- Pioneer demonstration corridors
- Broadening beyond the demonstrations
- Emerging concepts and trends

ICM Concept Development

- Foundational research and concept
  - Addressed separation of responsibilities and control of various parts of the transportation network
  - Emphasis in major incidents and events – unusual conditions
    - Independent operation of portions of the transportation network is not effective
  - Example included:
    - Implementing special signal timing plans
    - Coordinating ramp metering and signal operations
    - Disseminating traveler information about the entire network
    - Changing parking restrictions
    - Changing or adding bus service

ICM Concept Development - Strategic Areas

- Demand management
- Balancing travel demand across the network (all modes)
- Event/incident response
- Capital improvement

ICM Concept Development

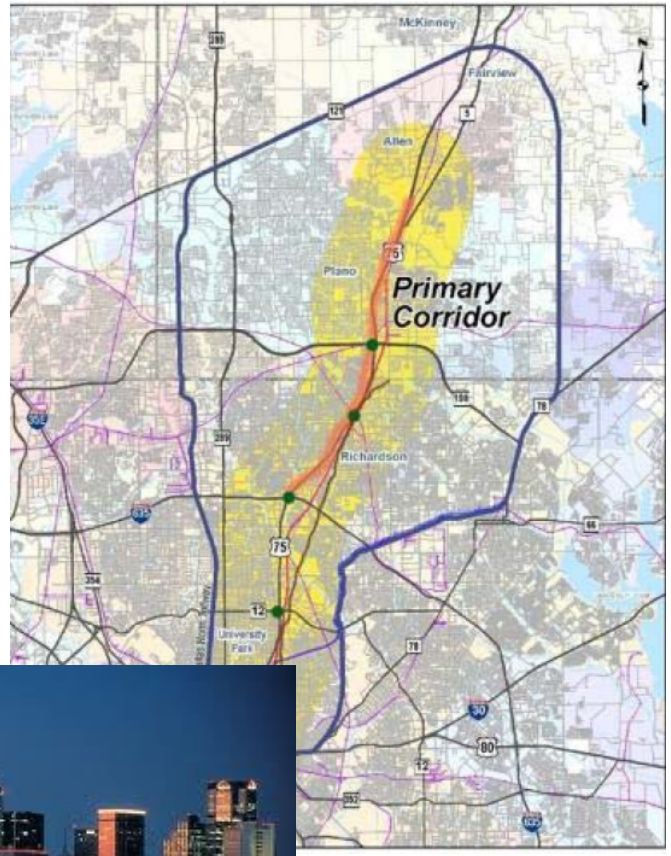
- Conceptual Levels
  - Physical
  - Information processing
  - Execution or decision-making
- Networks
  - Freeways
  - Arterials
  - Public transportation

Pioneer Demonstration Sites

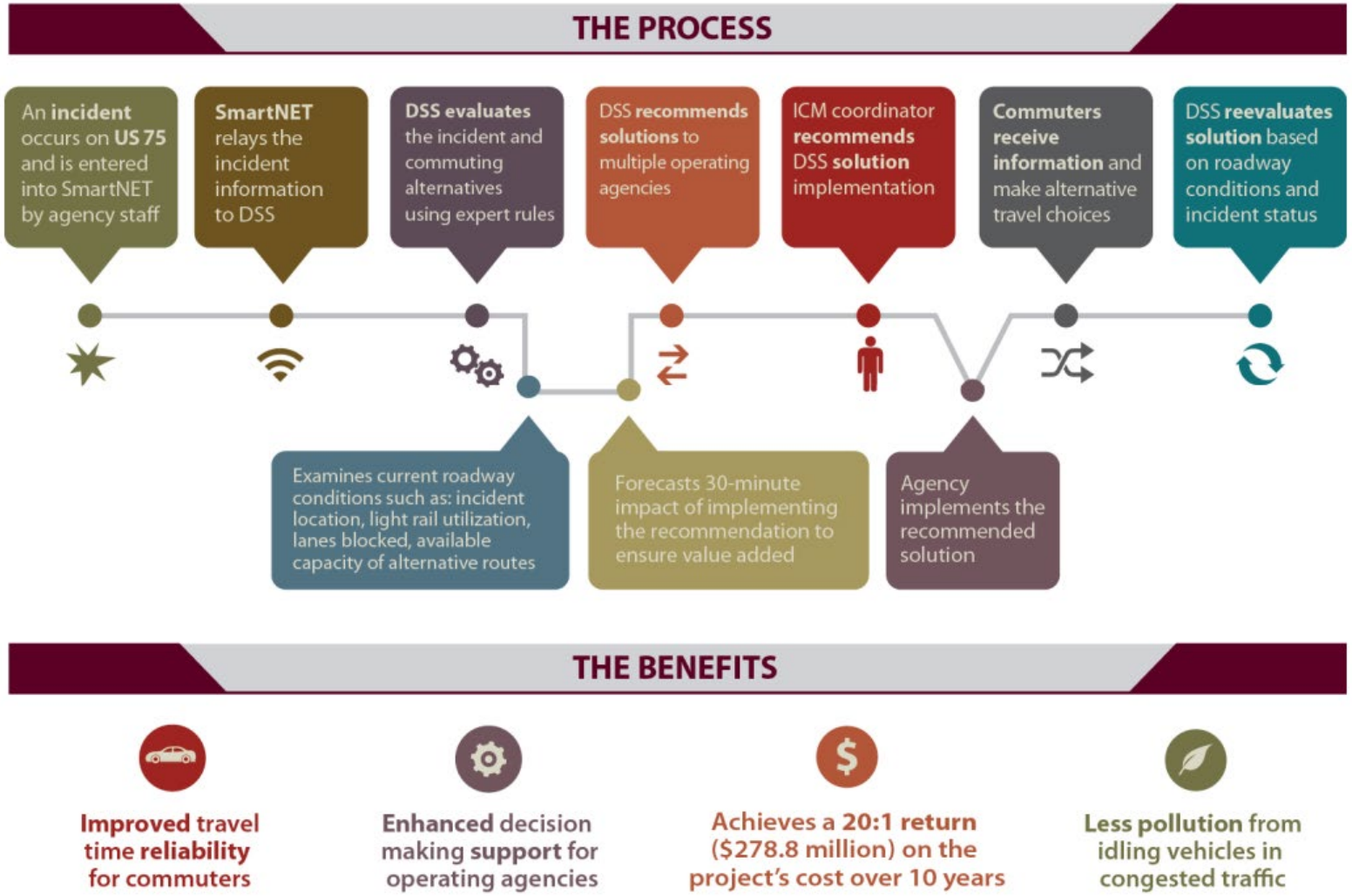
- USDOT initially identified eight sites
  - Helped to focus the operational concept
    - Manage the corridor as a system rather than individual assets
    - Enable travelers to make informed travel decisions and dynamically shift modes
    - Reduce travel delays, fuel consumption, emissions, and incidents
    - Improve travel time reliability and predictability
    - Optimize existing transportation infrastructure
- Selected 2 corridors for demonstration implementation
  - US 75 in Dallas
  - I-15 in San Diego

Dallas US-75 ICM

- Freeway with continuous frontage roads
- Managed high occupancy vehicle lanes
- Dallas North Tollway
- Arterials
- Bus Network, Light Rail
- Approx. 900 traffic signals
- Multiple transportation management centers
- Regional 511



US 75 ICM Decision Support



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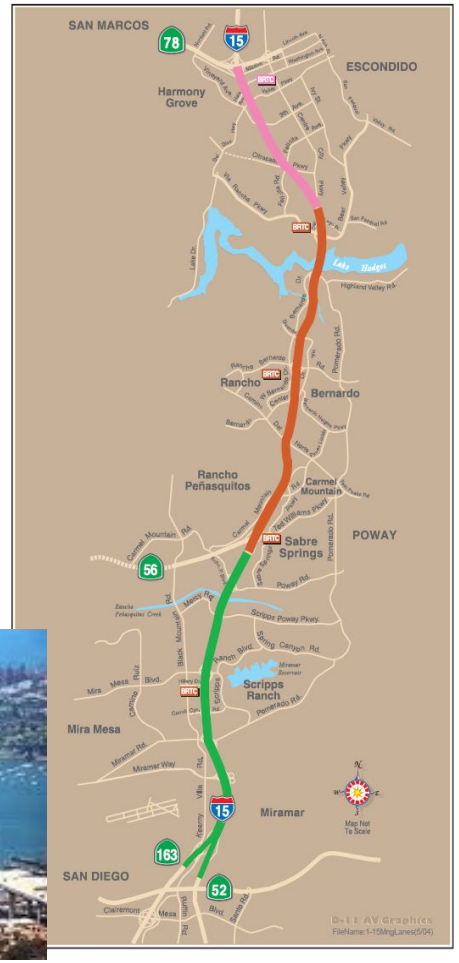
SANDAG I-15 ICM

- Primary travel artery from the North to Downtown
- I-15 Managed Lanes System
- Multi Institutional Cooperation/ Partnerships
- Multi-modal Transportation Improvement Strategies and Mode Shift
  - Bus rapid transit
  - Transit signal priority
- 511, including transit information



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I-15 ICM Decision Support "Response Postures"

Response Posture	Event Impact (congestion, construction, incident, etc.)		
	Low	Medium	High
Demand on Network: Light	Conservative	Conservative	Moderate
Demand on Network: Moderate	Conservative	Moderate	Aggressive
Demand on Network: Heavy	Moderate	Aggressive	Aggressive

Event Impact

Low
- Incident closing freeway shoulder or one lane
- Construction closing one lane of primary arterial
- Breakdown of transit vehicle

Medium
- Incident closing 1 freeway lane
- Closure of Express Lanes
- Construction on Pomerado reducing NB and SB to one lane each direction

High
- Major incident at intersection of primary arterials
- Closure of two or more lanes of the freeway
- Combination of low and medium incidents

Demand

Light
- Weekends
- Holidays

Moderate
- Off-peak weekday
- Minor weekend special event

Heavy
- Peak-hour weekday traffic

Response Posture

Conservative
- Example – Provide slight increase to ramp metering rate

Moderate
- Example – Provide additional green-time to favor northbound traffic while still providing adequate cross-street timing

Aggressive
- Example – Display alternate route for freeway traffic on CSM, such as "INCIDENT AHEAD NB USE POMERADO"

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Demonstration Corridors

- San Diego and Dallas went “live” in early 2013
- Independent evaluations
- Early lessons:
  - Agreements are tough. Most challenging part of ICM.
  - Data integration from multiple systems and multiple networks
  - Determining mode shift is difficult, working through how to evaluate effectiveness
  - Combinations of strategies also are challenging to evaluate

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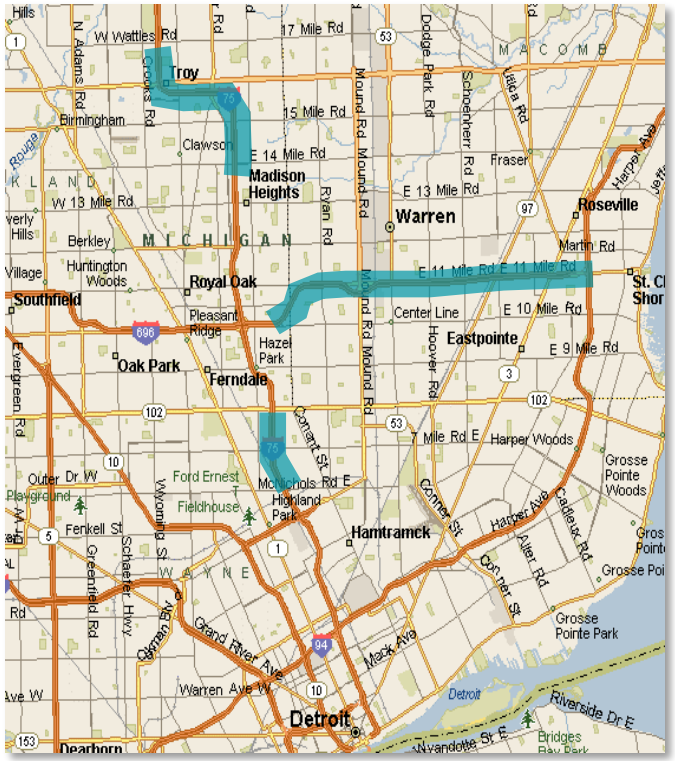
Beyond the Demonstration Corridors

- Many other agencies have developed ICM programs
- Focus varies
  - Traffic incident/event management only
  - Broader utilization of network on a daily basis
  - Emphasis on demand management concepts vary

Michigan DOT ICM Pilot Corridors

- 2 Pilots on I-75 (Wayne and Oakland Counties); I-696 in Macomb
- Event-based
  - Improve response to major incidents
  - Traffic rerouting on arterials
- ITS equipment upgrades and infill
- Signal timing on alt routes
  - Models show freeway recovery times increasing by 15-30 minutes



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I-80 Smart Corridor

- 20 mile segment of I-80
- Led by Alameda County Transportation Commission (CTC)
  - Caltrans
  - Metropolitan Transportation Commission
  - Local Counties and Cities
- Adaptive ramp metering, incident management, active traffic management (variable speed signs, lane use signs)
- Improvements to arterials
- Operations & Maintenance Memorandum of Understanding with
  - Alameda CTC
  - Caltrans
  - Contra Costa Transportation Authority
  - 9 cities
  - 2 transit agencies

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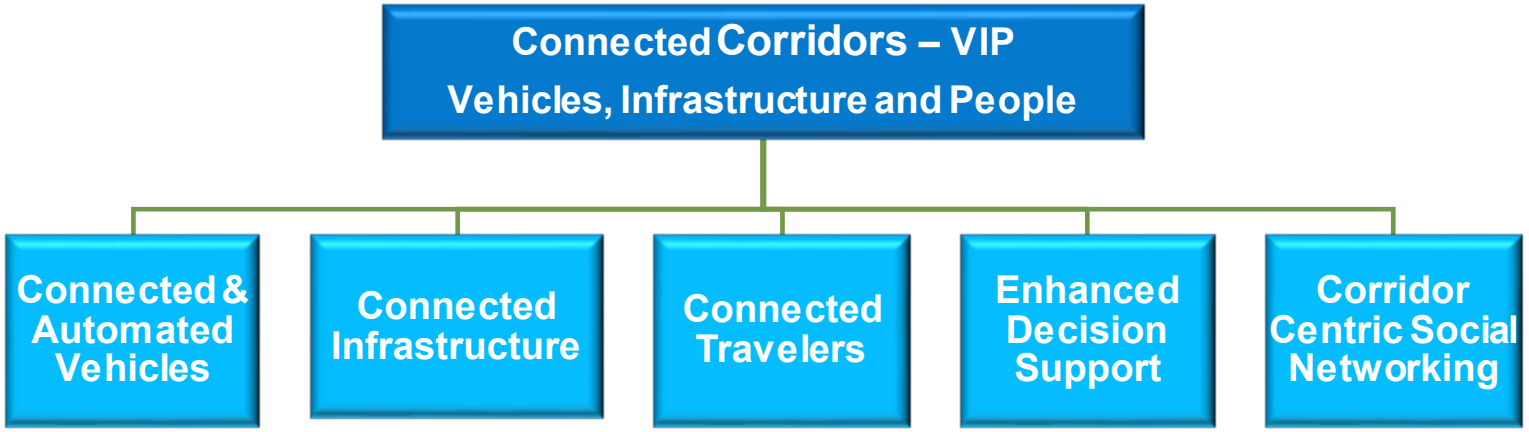
California Connected Corridors

- Initiated in 2011 – Statewide Framework
- Focus on planning, implementation, O&M
  - Implement TSM&O on their most congested corridors (50)
  - Evolve Caltrans to real-time operations and management
  - Enhance partnerships
  - Optimize infrastructure and capacity
  - Improve overall corridor performance



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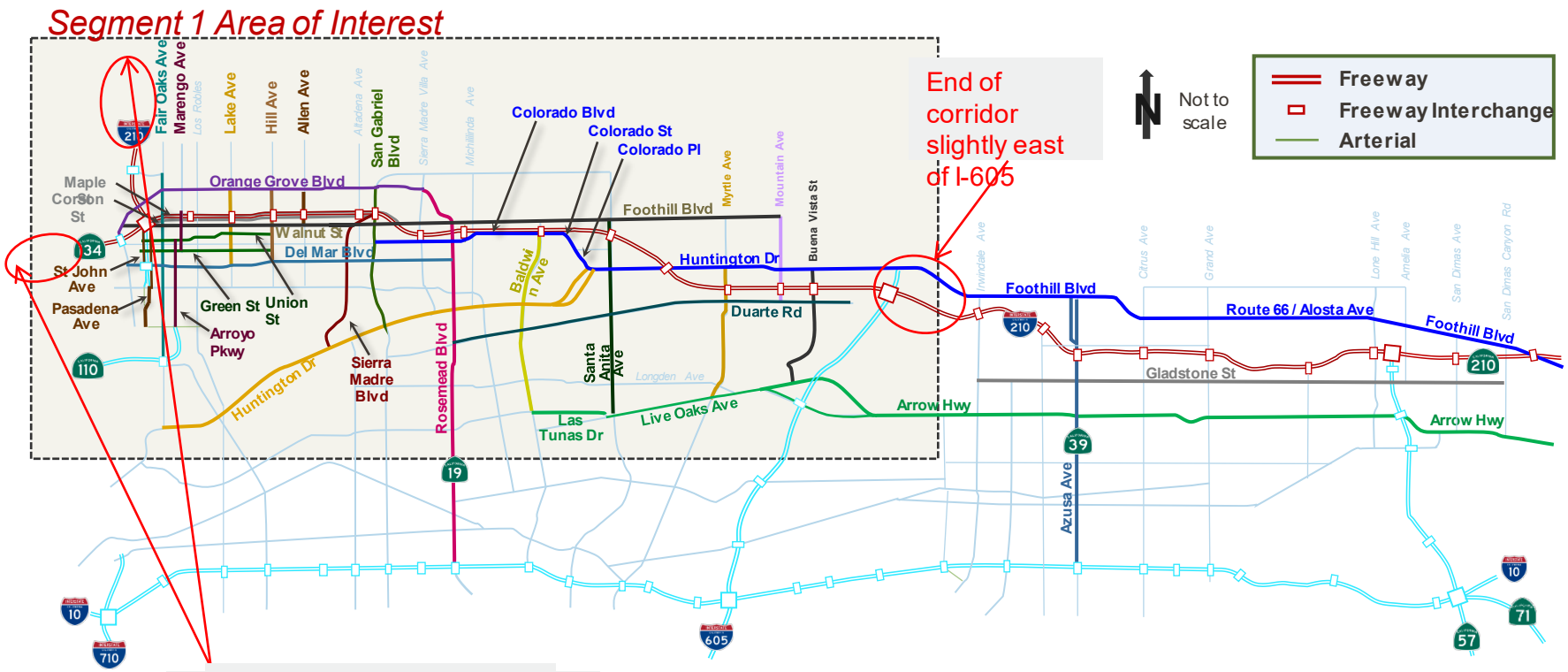
I-210 Project Corridor (Pilot)



210 to Arroyo Blvd

134 to Figueroa St (*freeway only*)

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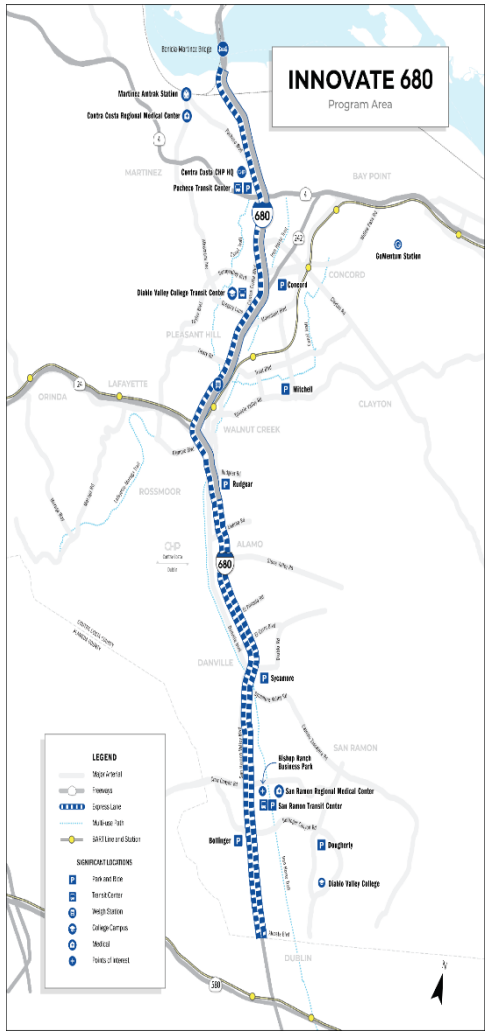
Emerging Concepts and Trends

- Broader set of strategies
  - Automated shuttles
  - Role of connected vehicles
  - Shared mobility
  - Mobility on Demand
- Broad stakeholder involvement
- Importance of partnerships
- Advanced technologies

Innovate 680 – Contra Costa County, CA

- Aim is to Address growth in the corridor
  - Without significant infrastructure expansion
- Collaborative stakeholder process
- Decision-making structure similar Des Moines
  - From the program level ConOps
- Robust set of concepts



INNOVATE 680
IMAGINE THE POSSIBILITIES

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Innovate 680 Goals

- **Improve safety, efficiency and reliability**
- **Prepare the corridor for the future**
- Enhance the ability for people to **shift travel modes**
- **Improve connectivity and services** among mobility options.
- **Provide mobility options**
- **Improve air quality**.
- **Promote equity and provide access to transportation services**

Innovate 680 Initial Strategies

1. Cool Corridor "Hot Spots"
2. Complete HOV/Express Lanes
3. Increase Bus Service Efficiency
4. Innovative Operational Strategies
5. Prepare the Corridor for the Future
6. First Mile & Last Mile Connections
7. Transportation Demand Management

Innovate 680 Current Projects

- Advanced Technologies
  - Decision support system
  - Connected data center
  - Coordinated adaptive ramp metering
- Mobility on demand
  - Traveler-oriented mobility-as-a-service platform
  - Personalized mobility options
- Shared mobility hub
  - Multimodal transportation nodes
  - Interface for micro-mobility and transit
- Part-time transit lane
- Automated driving systems
  - First/last mile, automated shuttle service, connected vehicle technology
- Complete Express Lane system