

Planning a Regional Express Lane Network – Lessons from the Bay Area



Don Hubbard, PE, AICP
Parsons Brinckerhoff

Lisa Klein, Metropolitan
Transportation Commission

Topics

- **Reasons for the Study**
- **Initial assessment**
- **Working through the details**
- **Lessons Learned**
- **Questions & Answers**





Reasons for the Study

An Intractable Problem ...

Congestion continuing to despite all efforts

- California population continues to rise
- Current policies do not stem projected growth

... but adding freeway capacity is disappearing as an option

- Environmental & community opposition to expansion
- State & federal funds drying up

So why go for HOT lanes?

- Fits the Policy Climate
 - National and international trend to user fees
 - Emphasis on optimizing use of existing capacity
 - Could accelerate completion of the HOV network
 - One of the few project types still being funded
- Pilot Projects Seem Encouraging
 - Proving to be an effective corridor/system management tool
 - Popularity of pilot projects reduces political risk

So why go for HOT lanes?



- Partner Agencies are Interested
 - Two counties have already initiated pilot projects under existing state law
- Fits MTC's Regional Planning Role
 - The regional congestion problem cannot be successfully addressed at the local level
 - Avoids the driver confusion & inefficiencies that would result in many system operated separately

Why a *Regional* Network?



Most existing express lanes were developed on a corridor-by-corridor basis. Why try doing many corridors at once?

- Allows for rational prioritization of corridors based on relative costs and benefits
- Offers a seamless system and provides more benefits to travelers
- Offers efficiencies for toll operators
- Network is a stronger financial entity than individual corridors for bond financing

Initial Assessment:

Is there any potential for this
concept in the Bay Area?

(2005 - 2007)

Basic Design Assumptions

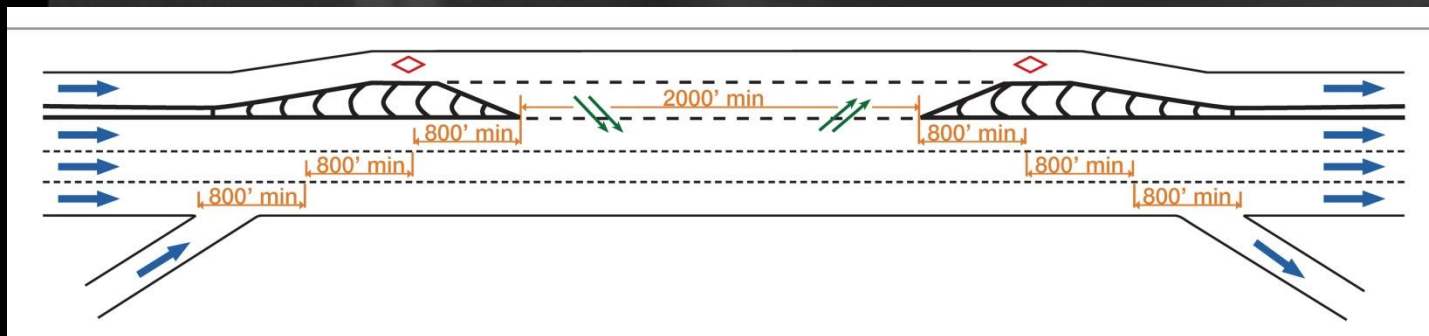
- Needed a conceptual design to serve as the basis of cost estimates
- Caltrans' *HOV Guidelines* were the starting point, with tolling equipment added
- Quickly ran into problems:
 - Caltrans' guidelines were disconnected from actual police enforcement practices
 - Needed to introduce a limited access design to convert continuous access HOV lanes

Access Point Design

**Southern California
Limited Access, full time**



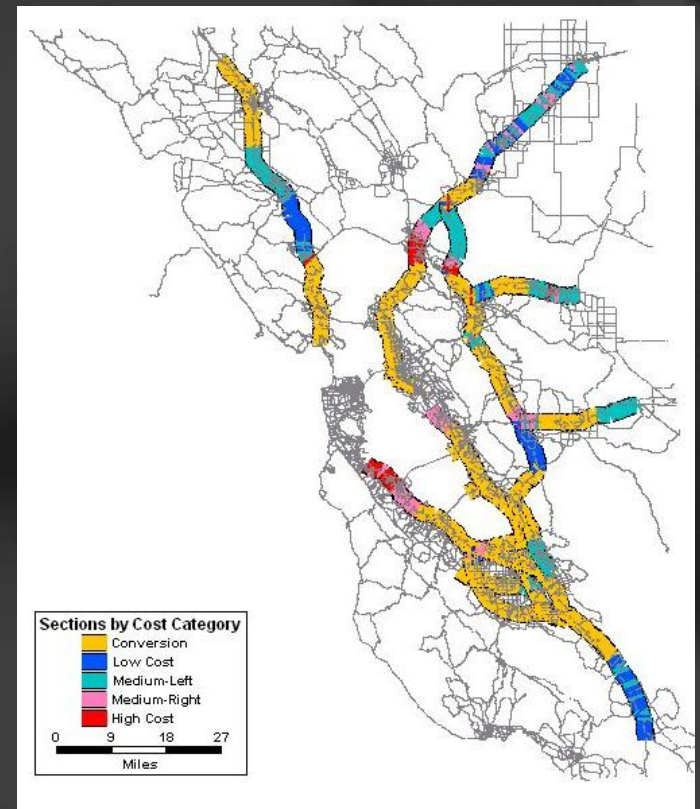
**Northern California
Continuous Access, part time**



Transition lane design favored by some Caltrans staff

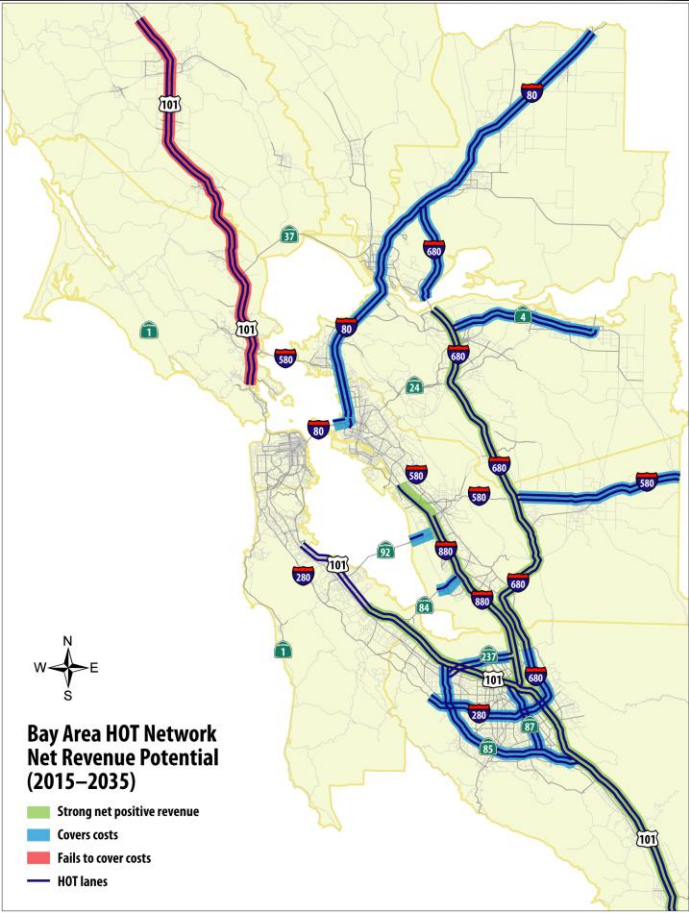
Sketch-Level Cost Estimates

- Network was divided into five situation types
 - conversion of HOV lanes
 - low-cost new lanes
 - medium cost, widen to inside
 - medium cost, widen to outside
 - high cost
- Per-lane-mile costs were developed for each type
- Total cost found by multiplying unit cost by number of lane-miles



Planning-Level Revenue Estimates

- Focused on traveler benefits rather than revenues; key to securing political support
- Revenues were also estimated on a very basic level:
 - The regional travel demand model was poorly suited to revenue analysis; too coarse, not enough time periods, pricing handled in a very abstract manner, etc.
 - Extensive post-processing was required and analysis, which covered a large number of corridors, was coarse.
 - Best used for comparisons of the relative potential of different corridors



Source: Bay Area High Occupancy Toll (HOT) Network Study (December 2008 Update)

Some useful indicators ...

Legal & Governance Issues



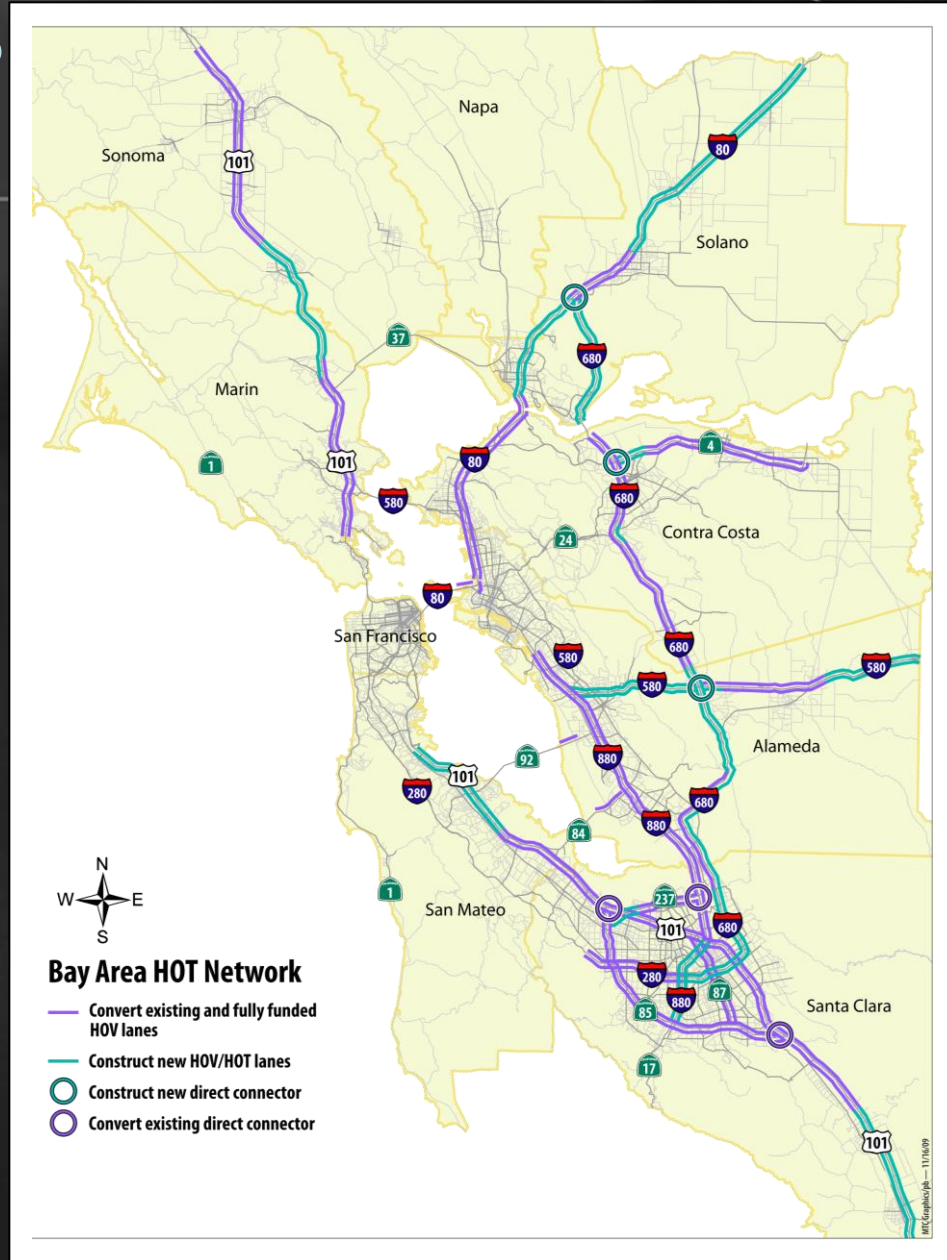
- State law required all electronic tolling to be inter-operable, which limits options
- Local concerns about revenues collected in one county being used to fund improvements in another county
- Who owns liability?

Legal & Governance Issues

- Respective roles of different agencies:
 - Counties entities have authority for initial projects under state law and have experience in project delivery
 - Caltrans remains the owner/operator for the state highway system
 - Bay Area Toll Authority (BATA) and Golden Gate Bridge Highway and Transit District are the only existing toll operators in the region

Regional Express Lane Network

- Included in Transportation 2035 Plan
- 800 miles total
- 500 miles of converted HOV
 - 400 existing
 - 100 fully funded
- 300 miles of new lanes
 - 60% are “gap closures”
 - 5% increase in freeway lane-miles



Initial Assessment Conclusions



- “Rapid Delivery Approach” to speed delivery and reduce costs
- The existing toll tag technology does not adequately address enforcement issues; need to coordinate with other agencies to upgrade to something better



Working through the details

(2008 - 2009)

In-Depth Analysis of Sample Corridors

- Design & operational concepts were applied to a sample of five corridor case studies (20% of total network)
- The corridor case studies identified some key findings to consider as moving forward with a regional network
- Also served to refine cost assumptions





Principal Findings

Consistency is a Major Issue



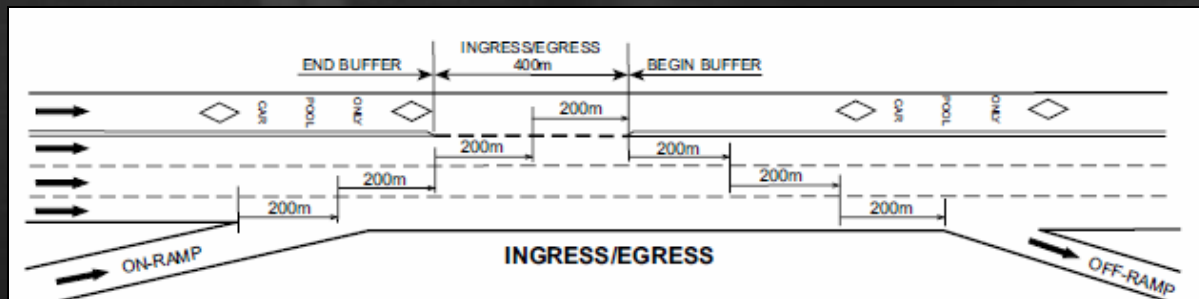
- Drivers make split-second decisions; for safety reasons road design must be somewhat consistent
- This conflicts with the concept of optimization:
 - Set standards too high and express lanes will be prohibitively expensive; you will forego potential benefits
 - Set standards too low and you forego the opportunity for best-practice design in places where it can be provided
- Most practical approach is to develop a small number of standard designs for use under different circumstances

Conversion of Existing HOV Lanes Will Raise Policy Issues

- Where there are existing lanes, there are existing users whose interests must be taken into account.
- Existing users will lose their current right to enter and leave the lanes wherever they choose
- They may also find the HOV lane more crowded than it is now, even though speeds may not change much.
- Program must provide benefits for current users, such as a more extensive network, new transit options, or pavement rehabilitation

There is a High Cost to Providing Transition Lanes

- The physical dimensions of transition lanes impose several types of costs on the program:
 - direct costs of constructing the facility
 - difficulty in finding suitable sites; consequently fewer provided and less well-located (indirect costs)
 - likely not be doable in some locations
- Further analysis of costs & benefits is required



Enforcement Raises IT Issues

- CHP needs a practical way of knowing whether drive-alone vehicles have paid a toll
- Existing FasTrak transponders lack the newer features that would help with enforcement
- MTC is one of several agencies looking into the possibility of upgrading transponders to facilitate enforcement



Feasibility is Problematic for Portions of the Network

- There are serious physical constraints in some parts of the network.
- These sites often correspond with areas of high demand (i.e. where potential benefits and revenues are highest).
- Allowing some design flexibility greatly improves feasibility, but some places not feasible in near term





Lessons Learned

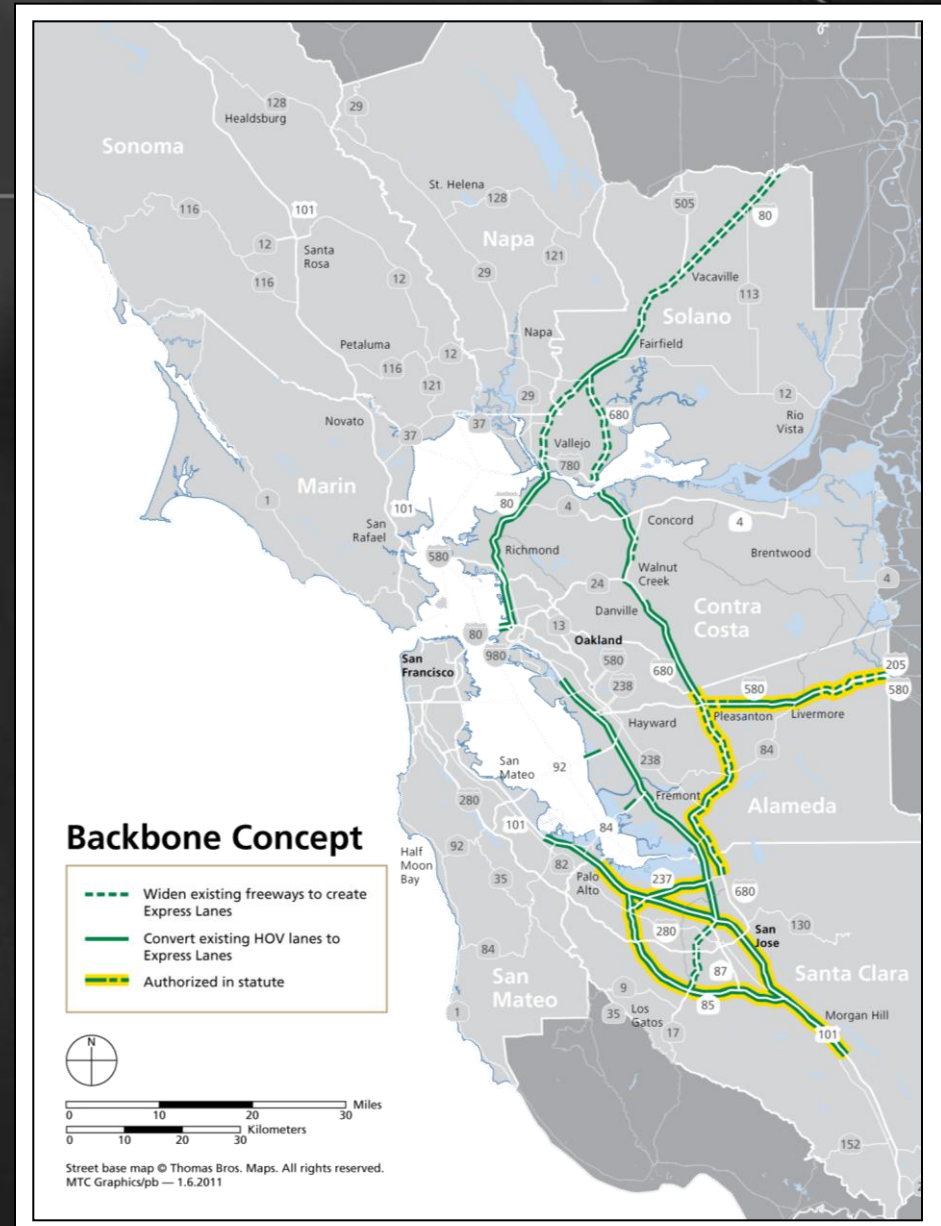
Lessons Learned



- Express lanes are complex projects, and doing many at once compounds the complexity
- Express lanes touch on a wide range of issues any of which could potentially derail the program
- Make sure that your plan leaves plenty of time for consensus-building
- At a network level, it is hard to shift from a planning to an implementation focus
- It is helpful to have more than one sponsoring agency
- Funding is needed to cover a long start-up period

Current Status (2011)

- Revising the plan based on updated costs and revenues
- Probably looking at a reduced “backbone” network
- Seeking authority under existing state law





Questions & Answers

Don Hubbard, PE, AICP
Senior Planning Manager
Parsons Brinckerhoff
(916) 567-2555
HubbardD@pbworld.com