

BART Capacity Overview for UCLA Lake Arrowhead Conference

October 18, 2010



BART Basics



- 360,000 daily riders
- 104 miles
- 43 stations
- 1.3 billion annual passenger miles



Transit's Green Challenge



- Regional planning focus on smart growth/sustainable communities
- Expectation that transit ridership will increase as a result
- Many rail systems are already experiencing capacity problems
- Rail transit infrastructure requires long lead times to implement, and substantial investment to build, maintain and operate



Downtown SF Capacity Outlook



- BART not out of capacity today
- Near-term growth can be managed:
 - service adjustments
 - station crowd management
 - targeted ticket pricing measures
- Long-term growth requires major capital improvements
- Investments require substantial lead time
- Capacity improvements unfunded
- State-of-Good Repair largely unfunded

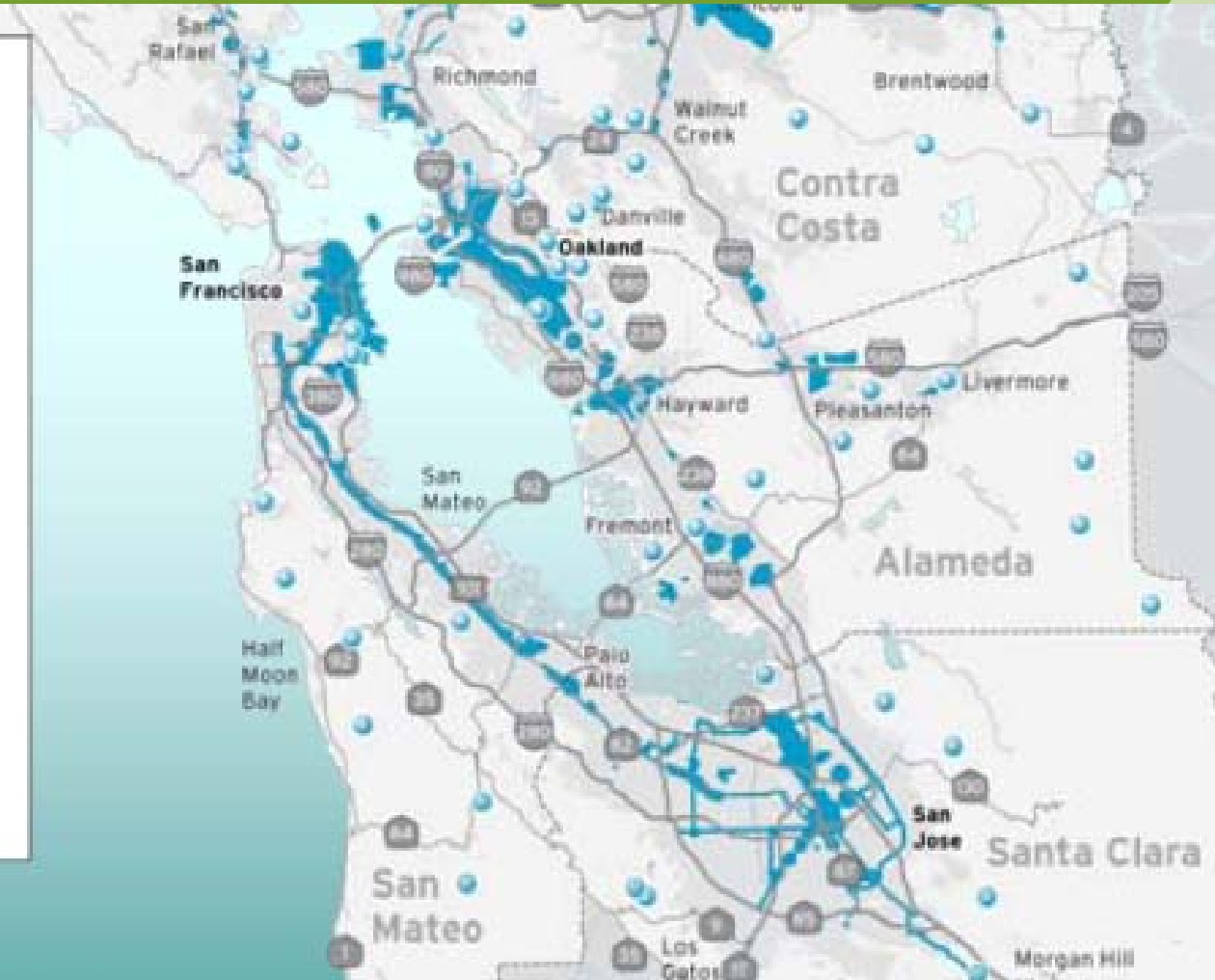


Priority Development Areas

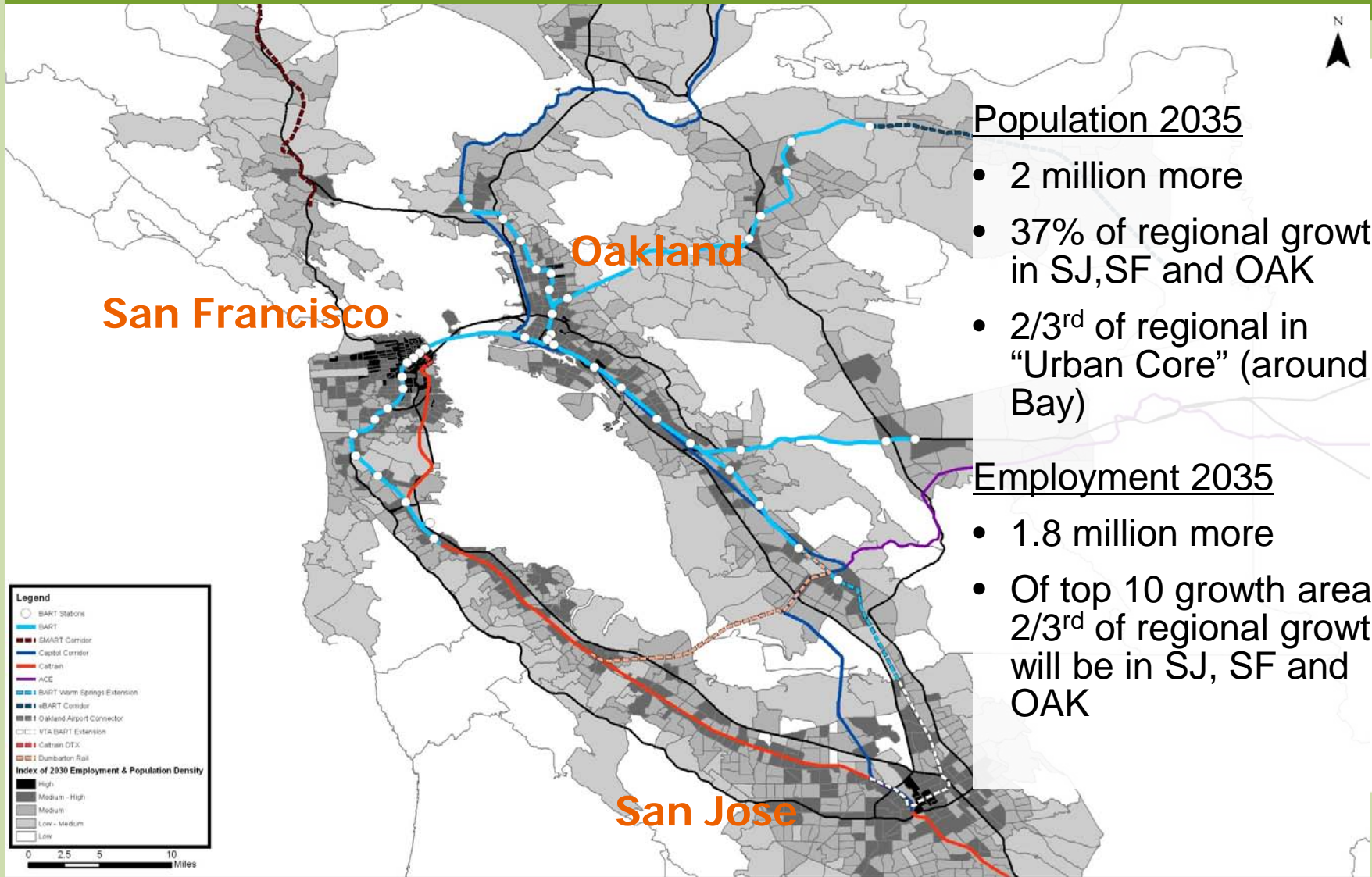


Priority Development Areas and Priority Conservation Areas

-  Priority Development Area
-  Priority Conservation Area
-  Freeway
-  Highway
-  Local Road



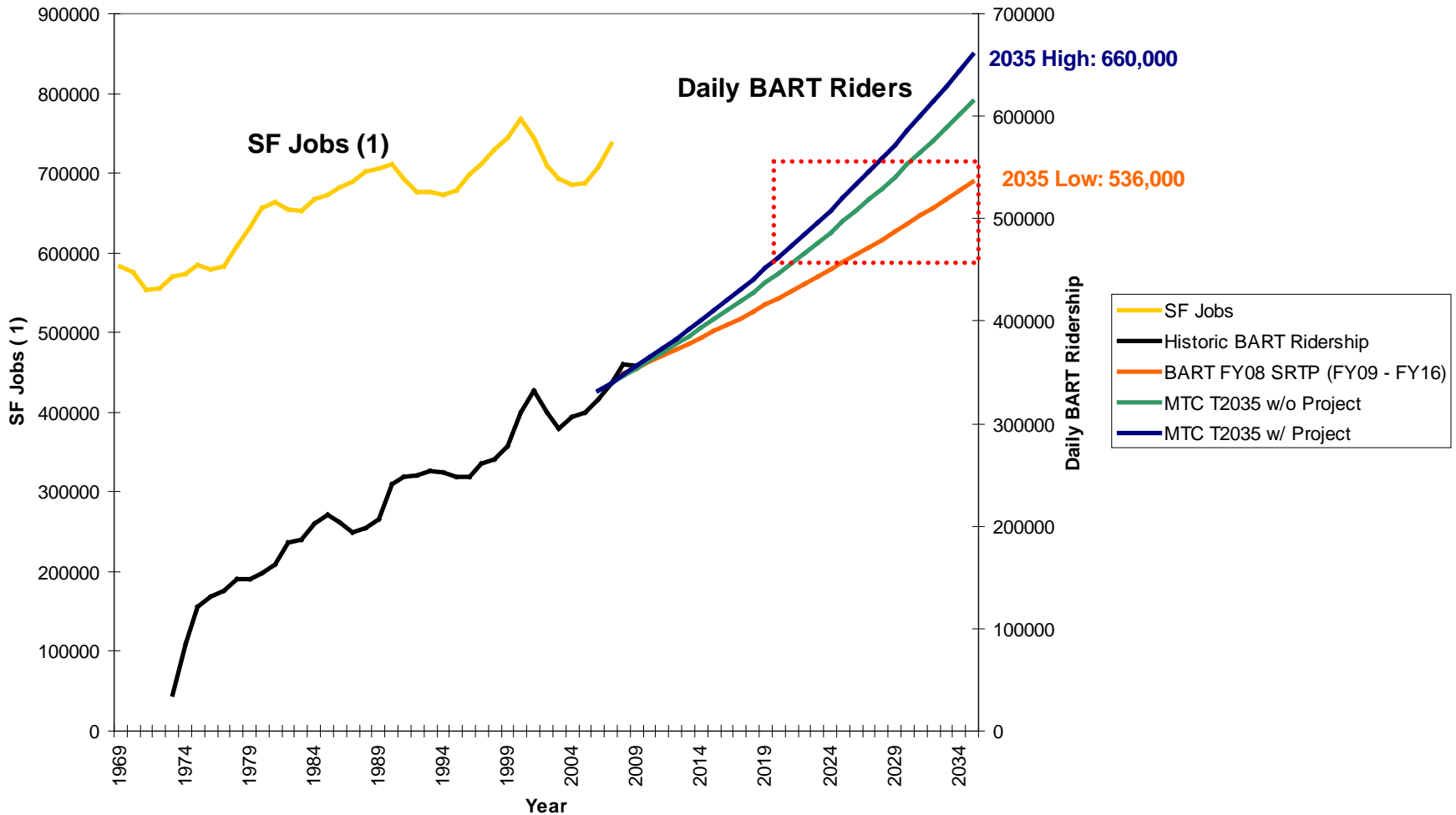
Forecast Growth



BART Average Daily Ridership Historic Trends and Projections



BART Ridership and SF Job Growth



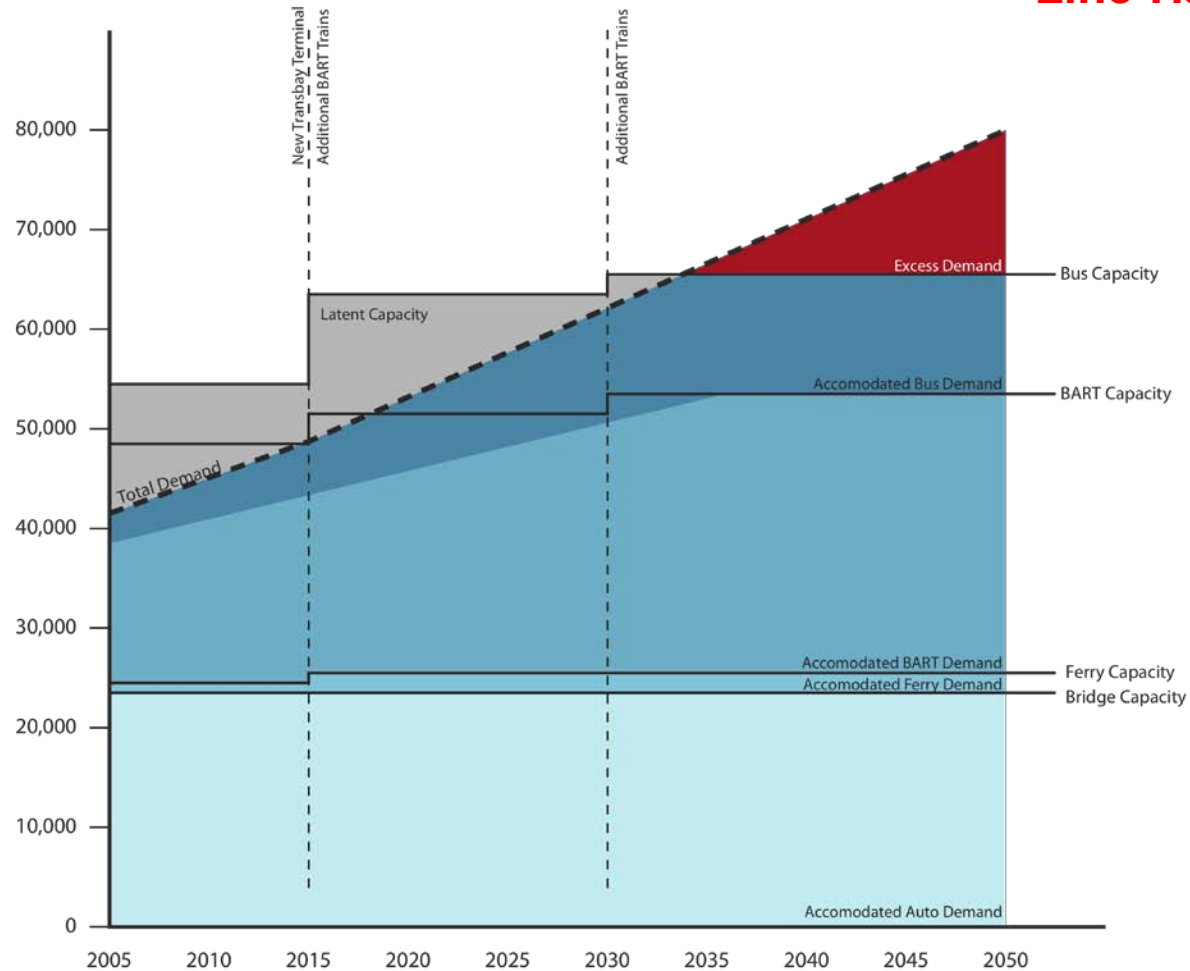
(1) US Bureau of Labor Statistics

East Bay Commute is the Most Constrained



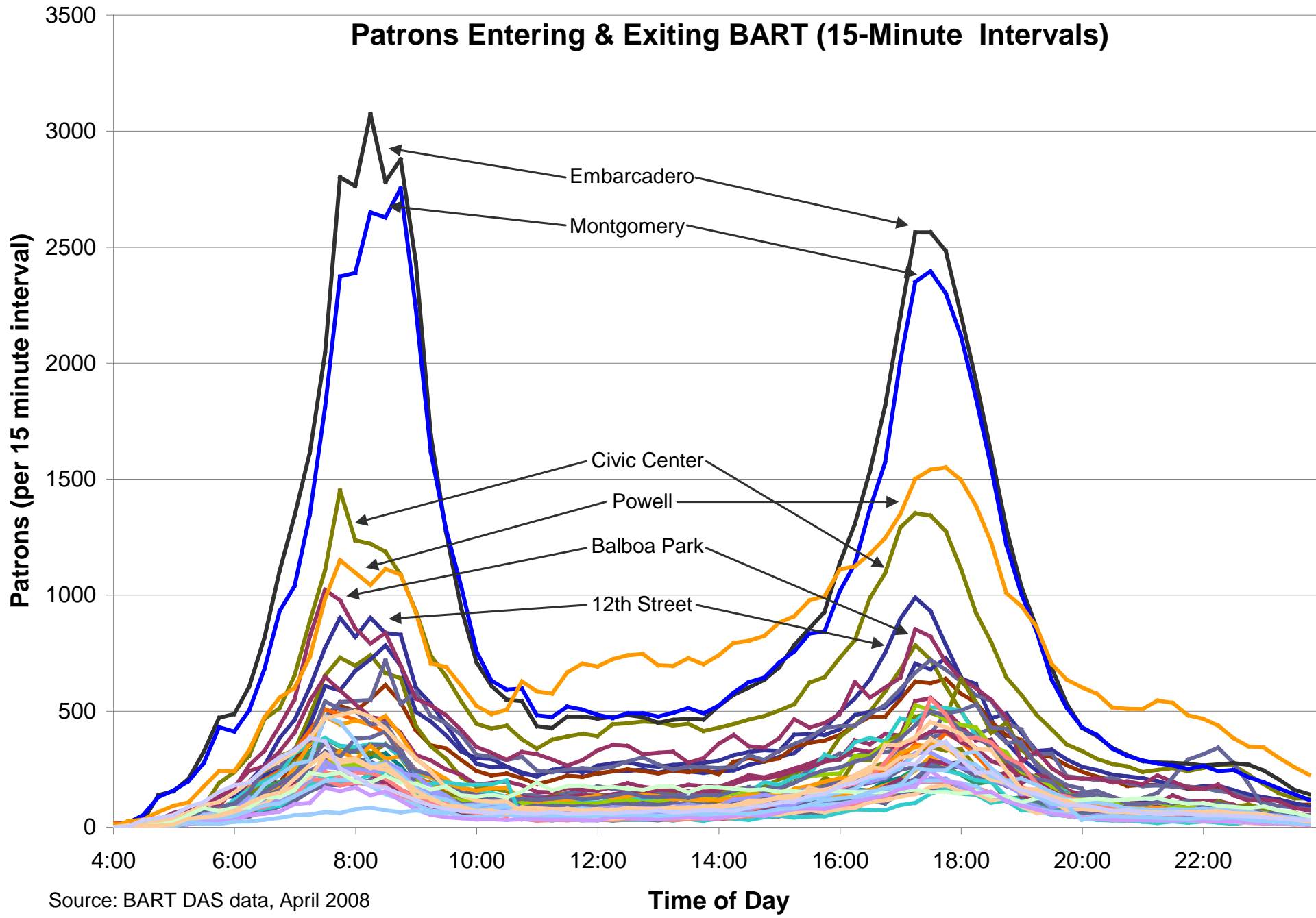
EASTBOUND PM PEAK HOUR BAY BRIDGE CORRIDOR DEMAND/SUPPLY

Line-Haul Only



Source: Cambridge Systematics & Arup
CalTrain Downtown Extension & Transbay Ridership Analysis

Patrons Entering & Exiting BART (15-Minute Intervals)



Source: BART DAS data, April 2008



Current Travel Markets

2/3rds of BART trips to/from Market Street stations

Weekday Trips by Sub-Area

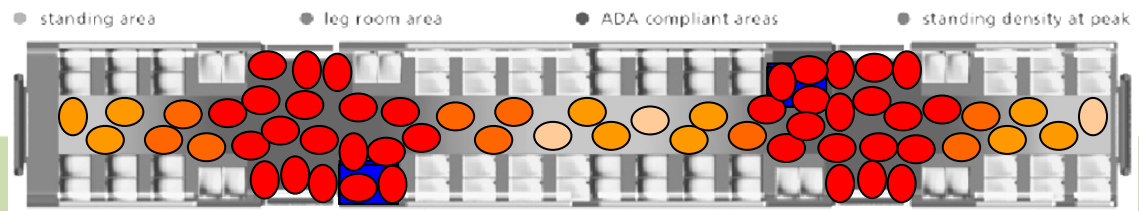
- 48%: Transbay
- 28%: intra-West Bay
- 24%: intra-East Bay



Capacity Limiters



- San Francisco station dwell times limit Transbay throughput
 - *Platform and onboard crowding*
 - *Stairs and escalators*
- Current car design – 2 doors per side
- Transbay Tube - train control system
- Oakland Wye junction – conflicting movements
- Lack of crossovers, turnback tracks, storage tracks



Transit Capacity Increases



- Easier to increase capacity on bus systems quickly, but trade-offs may be operational efficiency.
 - *Capital – buses, transit lanes/busways, bus stop improvements, maintenance facilities*
 - *Operating costs*
- Rail systems require much longer lead times to increase capacity.
 - *Capital – Additional tracks, civil structures (tunnels, elevated sections), station improvements, maintenance facilities, right-of-way, vehicles, power and signaling systems*
 - *Operating costs*



Embarcadero Capacity



BART in MTC Regional Rail Plan

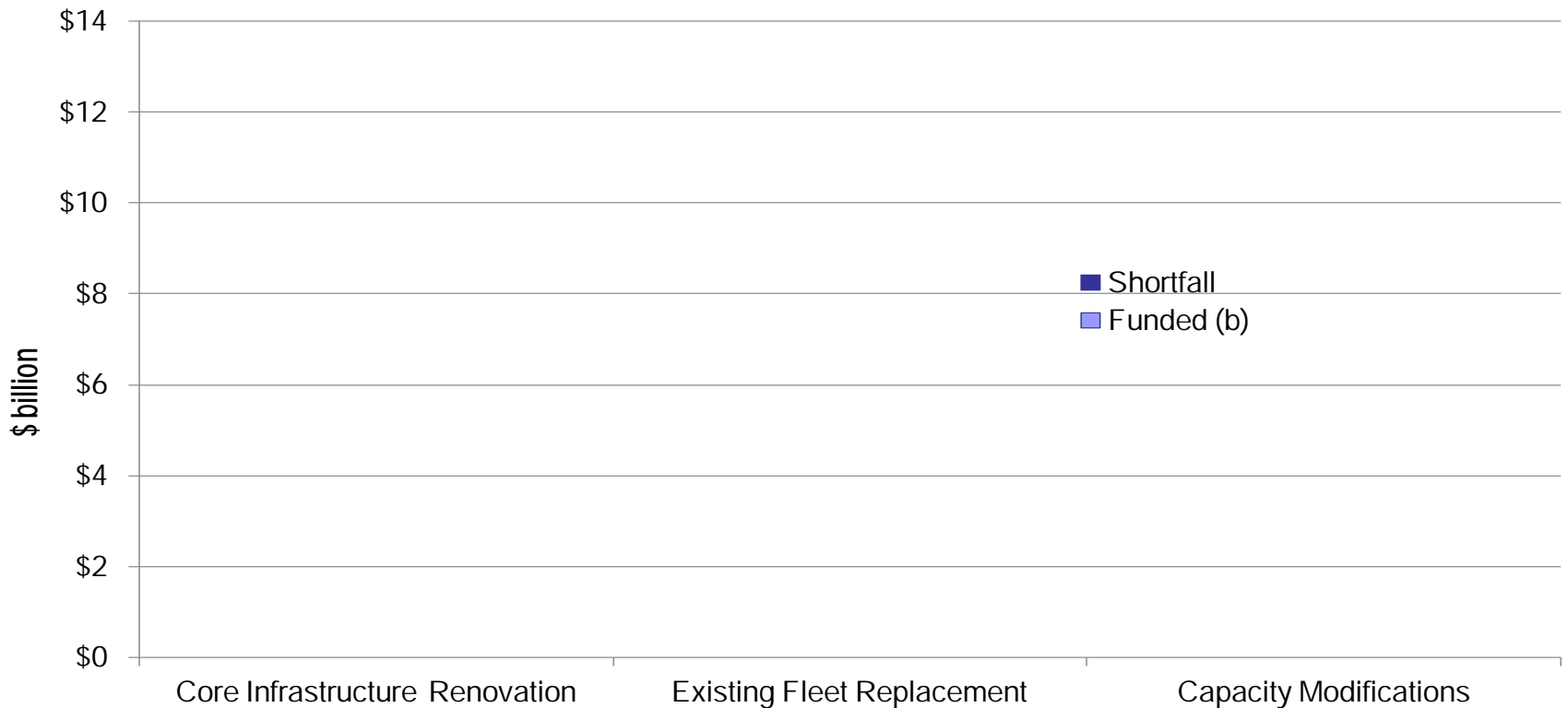


BART Capital Program for Core System

Major Funding Shortfalls



BART Capital Program (a)
(\$billion)



(a) Not shown are \$30 million in Security improvements and \$30 million in Quality Enhancements

(b) Funding as "programmed" in MTC 2035 Regional Transportation Plan

Examples from Other Cities



- Paris RER System – “Regional Express Metro” overlaid on top of Paris Metro system – 40+ years to develop
- New York Subway – major lines built originally as 4-track lines with express train capability
- US commuter rail – conversion to double deck equipment



JR Railway (Japan)
Supply-Side Strategy



Capacity Overview

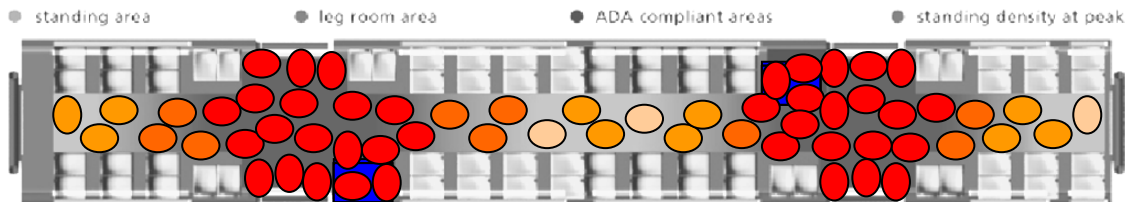


Questions?

Where Could BART See Problems in the Future?



- On-Board Train Crowding
 - Passenger per Seat or per Car (Load Factors)
 - Train Control System
 - Vehicles
- SF Downtown Stations
 - Platform Crowding (PM)
 - Stair, Escalator & Faregate Queuing (AM)
 - Emergency Exiting
- Yards & Shops
- Station Access



Transbay Corridor Management

Illustrative – Phased Improvements over 50 Years



Max. Load Point in peak direction (future peak hour <u>increase</u>)	Short < 2,500	Medium 2,500 – 7,500	Long 7,500 – 12,000
BART			
Remove Train Seats	●		
Demand Management Strategies	●	●	●
Station Access	●	●	●
Station Capacity	●	●	
3-Door Train Fleet		●	
Train Control Improvements		●	
Expand Train Fleet		●	●
Construct New Transbay Tube + Stations			●
Bus			
Transbay Terminal	●		
Bay Bridge Contra-Flow Lane		●	

Capacity Thresholds (peak hour)



Preliminary Analysis

Constraint	2009 Actual Ridership	Projected Peak Hour Future Capacity			
		Baseline (23 trains/hr) ¹	% Additional Growth	Enhanced (31 trains/hr) ²	% Additional Growth
Tube (one direction)	17,750	24,600	39%	33,150	87%
Embarcadero	10,000	13,000	30%	14,000	40%
Montgomery	9,500	14,250	50%	15,000	58%

Source: Arup, Capacity Scenarios for DMS Modeling Memo, May 19, 2009

¹ 23 trains / hr assumes No Delay scenario.

² 31 trains / hr assumes Delay scenario, and improved train control system