

November 2012

BART Metro: Sustainable Communities Operational Analysis





Study Purpose

- Meet the transit needs for the region
 - *Tailor service, schedules and investments to meet future ridership demands*
 - *Reduce vehicle miles travelled through land-use and transportation coordination*
- Provide transit services that successfully and economically deliver the access required for the region's future land use growth assumptions
- Allow the system to capture reverse commute trips and greater share of off peak travel
- Identify necessary service and operational improvements and associated capital program critical to implementation.



Travel Markets

Metro Core – All Day Trips

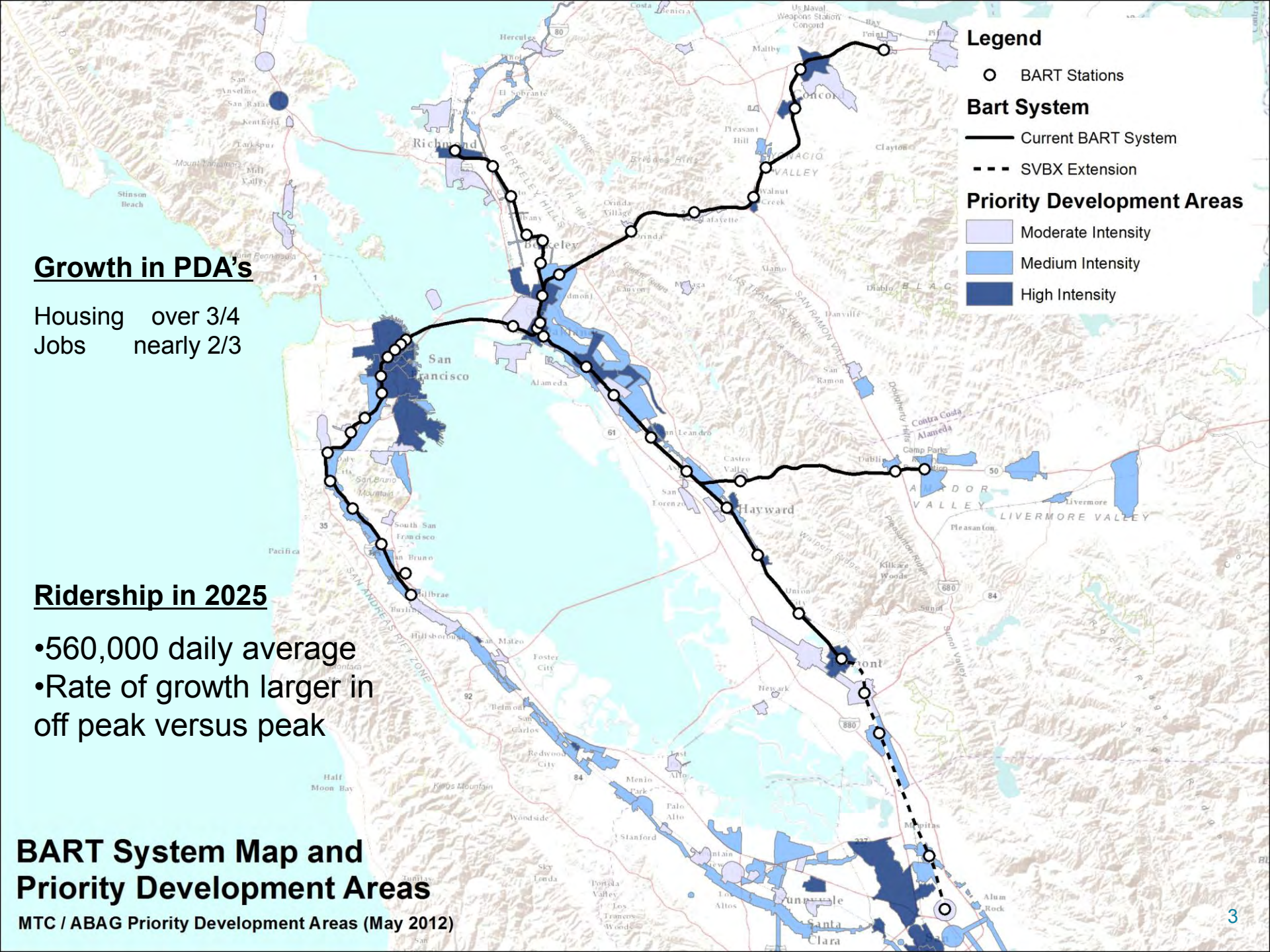
- **Provide more “show up and go” service**

Metro Commute – Heavy Peak Trips

- **Maintain frequent base service**
- **Improve peak service to major destinations**

All

- **Maintain 95% on-time performance**
- **Contain operating costs**
- **Improve efficiency and comfort**



Legend

- BART Stations

Bart System

- Current BART System
- - - SVBX Extension

Priority Development Areas

- Moderate Intensity
- Medium Intensity
- High Intensity

Growth in PDA's

Housing over 3/4
Jobs nearly 2/3

Ridership in 2025

- 560,000 daily average
- Rate of growth larger in off peak versus peak

BART System Map and Priority Development Areas

MTC / ABAG Priority Development Areas (May 2012)



Objectives / Criteria

- 8 service objectives to guide and evaluate service planning scenarios
 - *Safety*
 - *Reliability*
 - *Market Driven*
 - *Forward Thinking*
 - *Effectiveness*
 - *Efficiency*
 - *Customer Service*
 - *Equity*
- Key Performance Indicators (KPI's) used to measure service effectiveness
 - *Peak Fleet Requirement*
 - *Revenue per vehicle mile*
 - *Passengers per revenue vehicle mile*
 - *Capacity Utilization (pax miles/seat miles)*
 - *Annual CO² Reduction*
 - *Total Fleet Size Required*
 - *Cost per seat mile*
 - *Farebox Recovery Ratio*
 - *Peak capacity*
 - *Annualized Cost per Passenger*



Service Concepts Considered

- *Skip Stop / Limited Stop*
- *Short Line*
- *Zone Based*
- *Coupling*
- *Service Re-configuration*
- *Express Service*
- *Reverse Express*
- *Leap-frog Express*
- *Timed Transfers*



Capital Projects for Consideration

- Key Investments
 - *Fleet expansion, future automatic train control (FATC), power supply upgrades, station expansion, yards and shop expansion, etc.*
- 3 Tiers of Investment
- Projects provide the following function
 - *Increase in off peak railcar storage capacity (predominantly in the West Bay)*
 - *Improve service turn-back locations to tailor service to demand*
 - *Increase track operating capacity*
 - *Increase operating speeds in key locations*
 - *Minimizing non revenue car miles/hours*
 - *Match passenger load with car miles (i.e. BART's capacity utilization ratio of 35%)*



Preliminary Study Recommendations, by Phase

- **Phase 1 – SCOA Study Recommendations**
 - *15 minute base service peak and midday*
 - *20 minute base service nights and weekends*
 - *24 trains Transbay, peak hour, peak direction*
 - *Additional peak period service on Yellow and Green Lines*
 - *Extend Red and Green Line service nights and weekends*
- **Phase 2 - SCOA Study Recommendations**
 - *12 minute base service peak*
 - *15 minute base service midday, nights and weekends*
 - *27 trains Transbay, peak hour, peak direction*
 - *Coupling of Blue / Green service evenings and weekends, Bay Fair to Daly City*
- **Phase 3 – BART (Future BART)**
 - *Findings from BART Metro Vision Study*

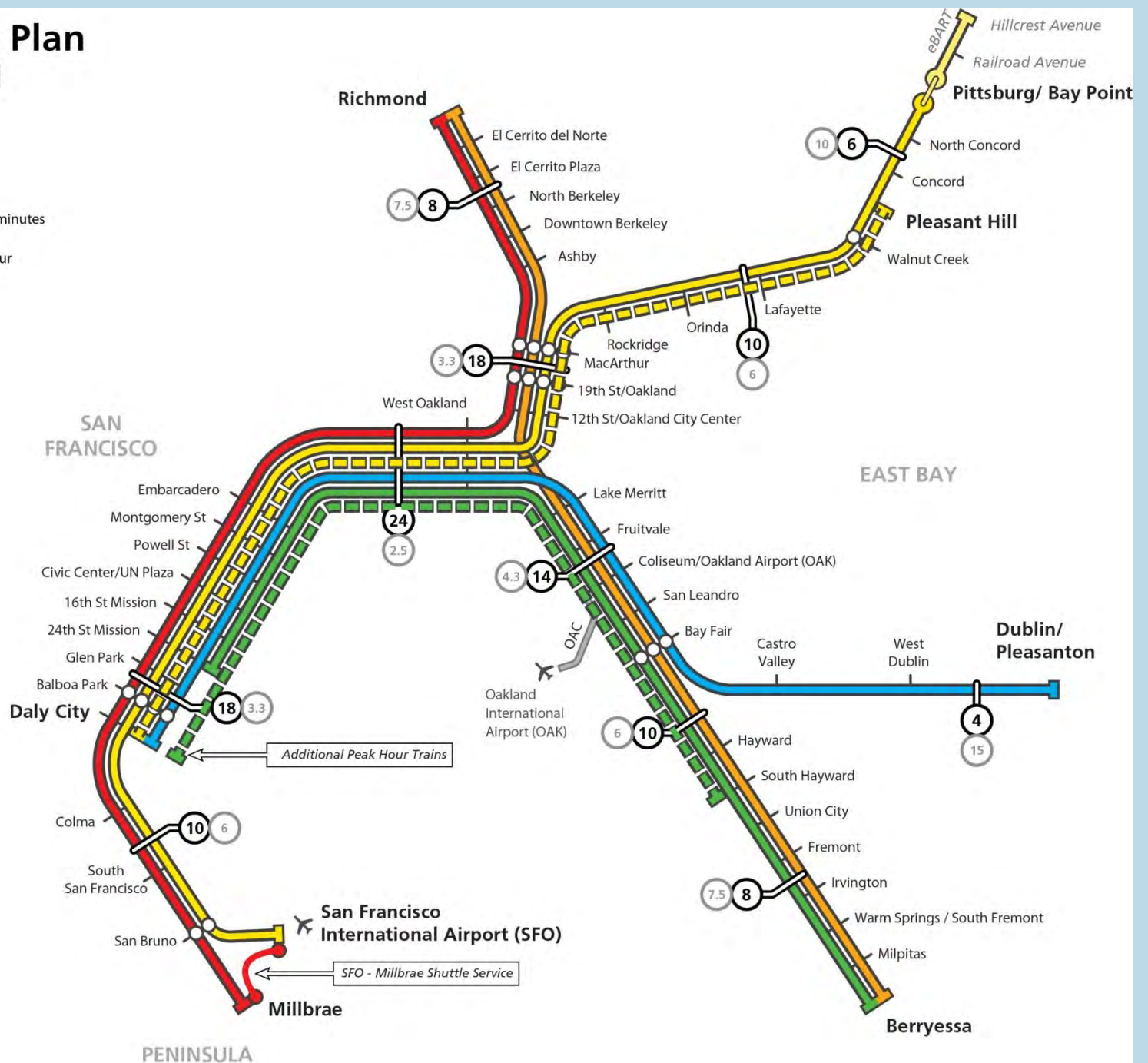
Phase 1 Service Plan

Peak Commute Period

Legend

3.8 Segment headway in minutes

16 Segment trains per hour

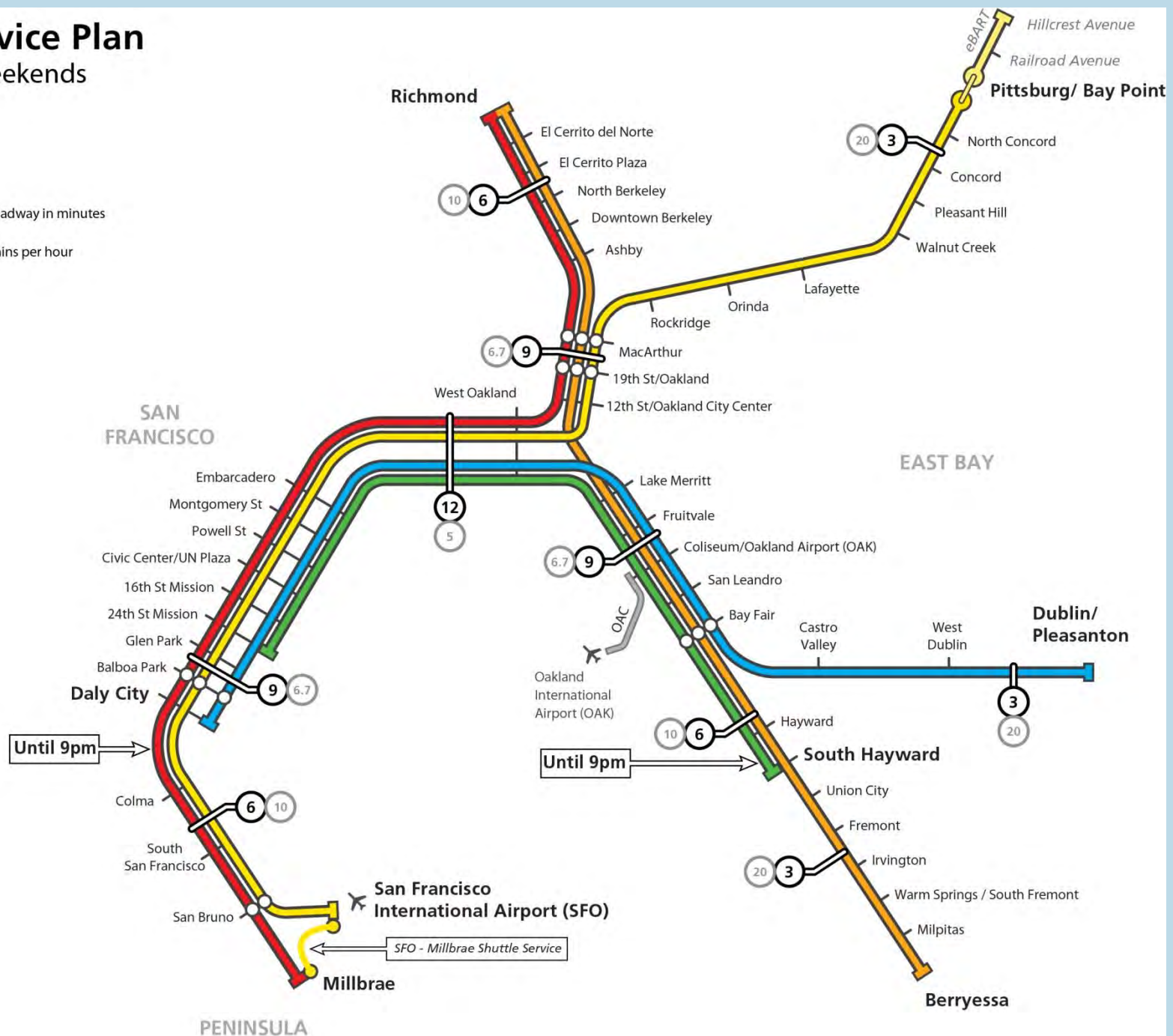


Phase 1 Service Plan

Evenings and Weekends

Legend





- 3.8 Segment headway in minutes
- 16 Segment trains per hour

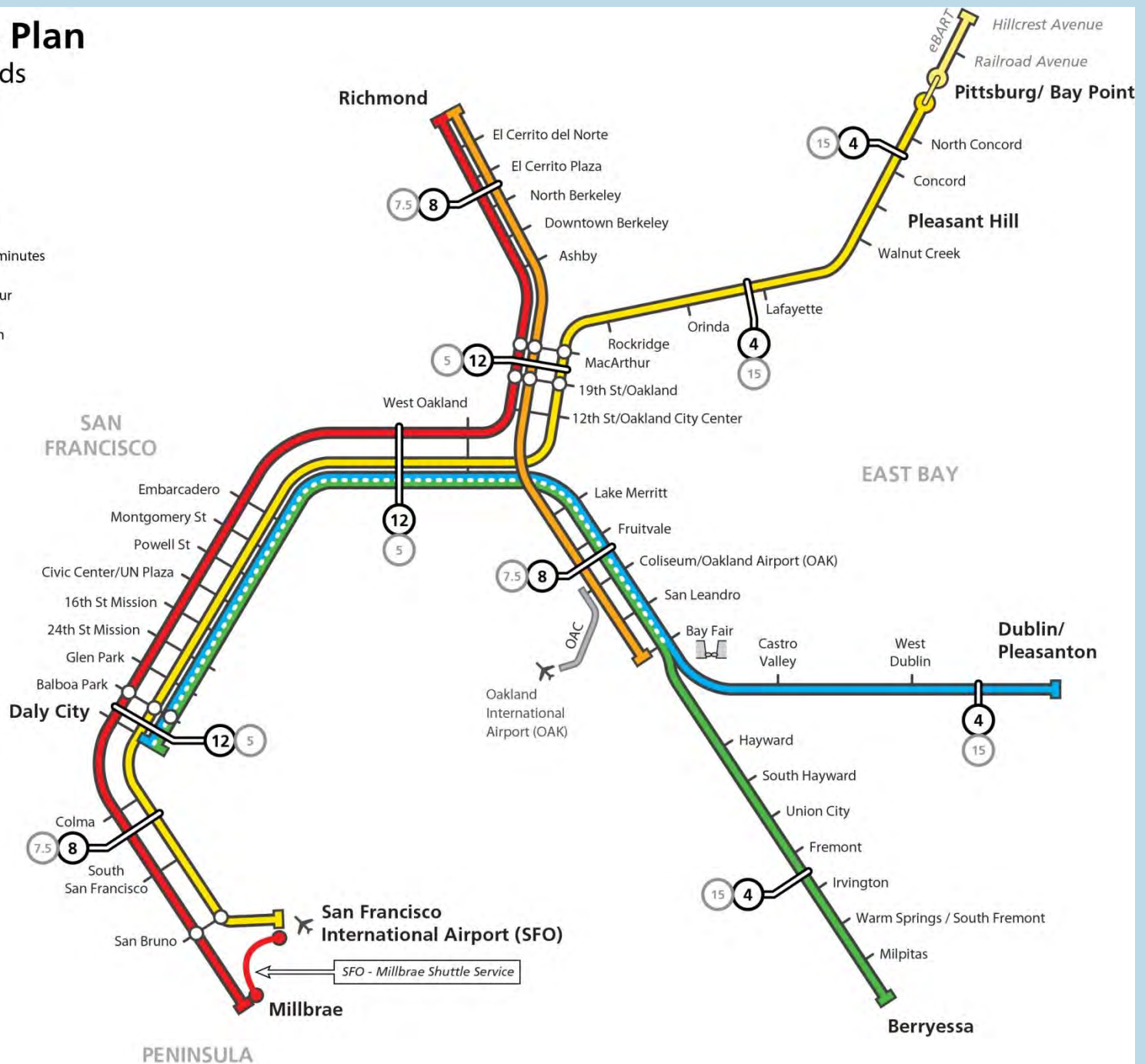


Phase 2 Service Plan

Evenings and Weekends

Legend

-  Express Train Service
-  Segment headway in minutes
-  Segment trains per hour
-  Train coupling location





Total Fleet Size Required

- Baseline
- Phase 1
- Phase 2

Year 2012
669 revenue vehicles

Year 2025
900 revenue vehicles
880 revenue vehicles
980 revenue vehicles

Average Passengers per Car (peak hour/Transbay direction)

- Baseline
- Phase 1
- Phase 2

105 passengers per car

112 passengers per car
112 passengers per car
100 passengers per car

Headways during the Peak Period

- Baseline
- Phase 1
- Phase 2

15 minutes

15 minutes
15 minutes
12 minutes

Trains per Hour/Peak Direction – Transbay

- Baseline
- Phase 1
- Phase 2

23 trains

24 trains
24 trains
27 trains

Decrease in Total Annual Car Miles Compared to 2025 Baseline

- Phase 1
- Phase 2

11 percent
5 percent



BART Metro: Sustainable Communities Operational Analysis

Capital Projects Phasing

BART Metro Phase	Phase 1	Phase 2	Phase 3
Timeline	Short Term	Medium Term	Future Term
Peak Period Base Headways	15 minutes	12 minutes	10 minutes
Service Innovations	Optimization of Current System - additional Turnbacks, more direct Transbay service nights and weekends in urban core	SCOA Vision - Peak period frequency increases, high frequency night and weekend service, potential express services in commute markets	Split service between two tubes and new downtown San Francisco stations
Fleet	880	980	1000+
Ridership level	Up to 500,000	500,000 to 750,000	Beyond 750,000
Component Projects			
Turnbacks	24th/Mission, Richmond Crossover, S. Hayward* & Pleasant Hill*	Glen Park Turnback, Bay Fair Connection**	
State of Good Repair (SOGR)	Traction power and cabling renovation**, communication system upgrades**	Traction power capacity upgrade	
Train Control	Initial phases of FATC	Full system wide FATC	Full system wide FATC
Stations	Downtown SF additional platform elevators & AFC, Bay Fair Connection (3rd Platform)**,	Downtown San Francisco and Oakland platform expansions, fire/life safety improvements at high volume suburban stations	
Train storage	Millbrae** and Dublin tail track extensions	Hayward Eastside Yard, Lafayette Pocket Track Upgrade,	
Trackage / ROW		Dublin Line I-580 Barrier, high speed SB crossover Daly City-Colma	Downtown Oakland 4th track and station upgrades
Maintenance Facilities	HMC shop & track work	Expansion of Millbrae transportation facilities Daly City maintenance siding extension	

*Project in place

**Potential funding identified

MAP-21 Core Capacity



Federal

- Substantial investment in existing fixed guideway corridor
- “Project” must:
 - *Corridor at or over capacity within five years*
 - *Increase capacity by 10%*

Regional

- MTC “Fund High Performers:” \$660 million in New Starts/Small Starts reserve



Next Steps

- Analyze Phase 2 service plans using Rail Traffic Controller simulation
- Outreach with key agencies / stakeholders on Concept Service Plans
- Undertake peer review with expert panel of rail industry experts
- Develop implementation plan for prioritizing key infrastructure needs
- Prepare Draft / Final Report summarizing findings