






# Measure RR Bond Implementation



BART Board  
May 11, 2017



# Investment Summary

	\$ Millions	% of Total Bond	Benefits		
			 Safety	 Reliability	 Crowding + Traffic Relief
<b>REPAIR AND REPLACE CRITICAL SAFETY INFRASTRUCTURE</b>	<b>\$3,165</b>	<b>90%</b>	✓	✓	✓
Renew track	\$625	18%	✓	✓	
Renew power infrastructure	\$1,225	35%	✓	✓	
Repair tunnels and structures	\$570	16%	✓	✓	
Renew mechanical infrastructure	\$135	4%	✓	✓	
Replace train control and other major system infrastructure to increase peak period capacity	\$400	12%	✓	✓	✓
Renew stations	\$210	6%	✓	✓	✓
<b>RELIEVE CROWDING, REDUCE TRAFFIC CONGESTION, AND EXPAND OPPORTUNITIES TO SAFELY ACCESS STATIONS</b>	<b>\$335</b>	<b>10%</b>	✓	✓	✓
Expand opportunities to safely access stations	\$135	4%	✓	✓	✓
Design and engineer future projects to relieve crowding, increase system redundancy, and reduce traffic congestion	\$200	6%		✓	✓
<b>TOTAL</b>	<b>\$3,500</b>	<b>100%</b>			



# Near Term Project Delivery Criteria

- Urgent Fix-it-First Needs
- Critical Path Activities on Major Core Capacity Improvement Projects
- Shovel Ready Projects
- Early Engineering on Long Lead Projects



## Bond Project Selection Criteria

- Started with our Risk Register using industry Asset Management principles
- Created a Capital Needs Inventory (CNI)
- Evaluated risks in CNI relative to:
  - Safety, likelihood, impact, reliability, efficiency, regulation compliance, human interface, sustainability, and time criticality
- Identified Scope/Schedule/Estimate



Renew Track – \$625 Million



# Renew Track



## Scope:

- Replace 90 miles of track
- New Wheel Profile Interface
- Rebuild Inter-lockings

**Total Program: \$625 M**

## Measure RR Cashflow Forecast (\$ Millions)

Project	Thru FY18	FY19	Total
Rail Replacement	\$35.9	\$28.3	\$64.2
New Wheel Interface	\$1.5	\$2.5	\$4.0
M03 Interlocking	\$4.5	\$3.0	\$7.5
C55 Interlocking	\$2.0	\$9.5	\$11.5
C35 Interlocking	\$2.0	\$4.0	\$6.0
<b>Total</b>	<b>\$45.9</b>	<b>\$47.3</b>	<b>\$93.2</b>



Renew Power – \$1.225 Billion



# Renew power – Cable replacement



**Scope:** Replace 34.5 kV Cable system-wide

**Total Program:** \$488 M

## Measure RR Cashflow Forecast (\$ Millions)

Project	Thru FY18	FY19	Total
M-Line Cable Replacement	\$29.7	\$47.9	\$77.6
A-Line Cable Replacement	\$4.5	\$0.0	\$4.5
C-Line Cable Replacement	\$5.5	\$3.0	\$8.5
R-Line Cable Replacement	\$1.6	\$7.0	\$8.6
Total	\$41.3	\$57.9	\$99.1



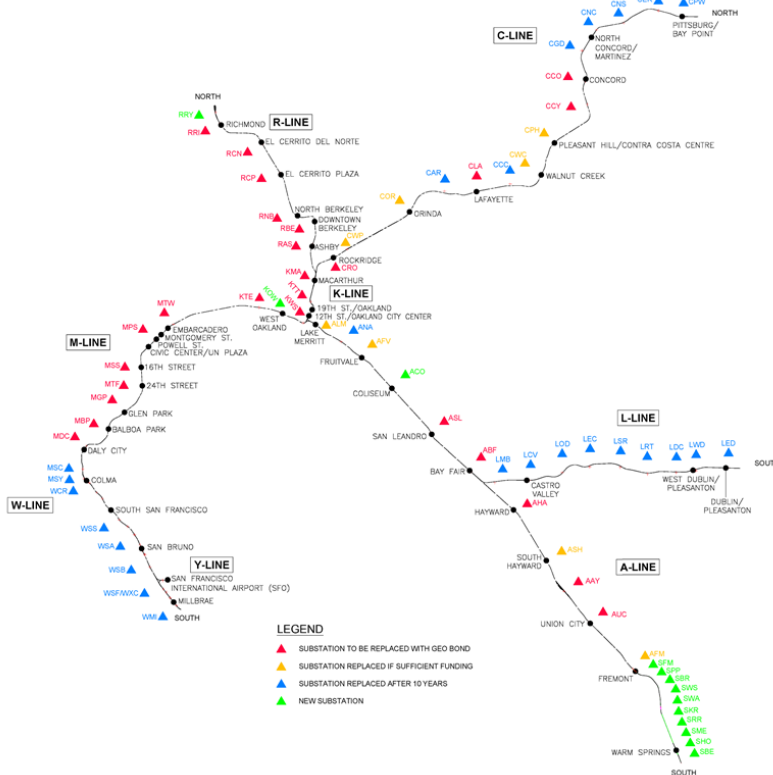


# Renew power – Substation replacement

## Scope:

Replacement 28 Substations

Total Program: \$301 M



## Measure RR Cashflow Forecast (\$ Millions)

Project	Thru FY18	FY19	Total
ASL/KTE Substations	\$7.1	\$10.4	\$17.5
Design/Engineering	\$11.6	\$6.3	\$16.9
<b>Total</b>	<b>\$18.7</b>	<b>\$16.7</b>	<b>\$35.4</b>



# Renew power – New Substations



## Scope:

2 New added capacity substations

- Civic Center
- Montgomery

**Total Program:** \$41.90 M

## Measure RR Cashflow Forecast (\$ Millions)

Project	Thru FY18	FY19	Total
Civic Center-Design	\$3.5	\$2.9	\$6.4
Mont.-Design	\$3.5	\$2.9	\$6.4
Total	\$7.0	\$7.0	\$12.8



# Renew power – Electrical Systems



### Scope:

- TBT Generator & switchgear replacement
- Uninterruptible Power Supply (UPS) Train Control
- Tunnel Lighting
- Station Fire Alarm replacement
- Station Emergency Lighting

**Total Program: \$225 M**

### Measure RR Cashflow Forecast (\$ Millions)

Project	Thru FY18	FY19	Total
TBT Generator	\$6.5	\$12.5	\$19.0
UPS Train Control Room	\$4.0	\$5.5	\$9.5
Tunnel Lighting	\$3.0	\$13.0	\$16.0
Station Lighting	\$4.0	\$5.0	\$9.0
Design/Engineering	\$1.6	0.0	\$1.6
Total	\$19.1	\$36.0	\$55.1



Renew mechanical infrastructure –  
\$135 Million



# Renew mechanical infrastructure – Mechanical Infrastructure



## Scope:

- Storm Water Treatment
- Fire services at Yards
- Replace HVAC in Facilities
- Fire suppression at Lake Merritt Admin building
- Replace Lake Merritt Computer Room Cooling Unit

**Total Program: \$135 M**

## Measure RR Cashflow Forecast (\$ Millions)

Project	Thru FY18	FY19	Total
Storm Water	\$0.2	\$0.0	\$0.2
Yard Fire Services	\$3.5	\$3.5	\$7.0
Backflow Preventers	\$0.5	\$1.0	\$1.5
LMA Cooling	\$0.4	\$0.0	\$0.4
Coverboard Replacement	\$0.5	\$1.0	\$1.5
Design/Engineering	\$1.9	\$0.0	\$1.9
<b>Total</b>	<b>\$7.0</b>	<b>\$5.5</b>	<b>\$12.5</b>



Repair tunnels & structures –  
\$570 Million





# Repair tunnels and structure – Structures



## Scope:

- Replace TBT Cross Passage Doors
- Waterproof Tunnels & Structures
- Fall Protection
- Wayside Regulatory Signage
- Platform Edge Structure Renewal

**Total Program: \$451.2 M**

## Measure RR Cashflow Forecast (\$ Millions)

Project	Thru FY18	FY19	Total
TBT Cross Passage	\$7.6	\$1.5	\$9.1
Waterproof Tunnels & Structures	\$2.5	\$2.0	\$4.5
Fall Protection	\$1.6	\$2.7	\$4.3
Wayside Signage	\$0.5	\$0.7	\$1.2
Platform Edges	\$0.3	\$0.3	\$0.6
Total	\$12.5	\$7.2	19.7



# Repair tunnels and structure – Transbay Tube (TBT) Retrofit options



## Scope:

Full retrofit of 7 additional TBT sections

**Total Program: \$53.75 M**

## Measure RR Cashflow Forecast (\$ Millions)

Project	Thru FY18	FY19	Total
TBT Retrofit Options	\$1.6	\$8.7	\$10.3





# Repair tunnels and structure – Upper A-Line Seismic Operability Upgrade



## Scope:

Preliminary engineering of the Upper A-Line retrofit (from Lake Merritt to Coliseum)

**Total Program: \$5 M**

## Measure RR Cashflow Forecast (\$ Millions)

Project	Thru FY18	FY19	Total
Upper A-Line Retrofit PE	\$2.0	\$2.0	\$4.0



# Repair tunnels and structure – Berkeley Hills Tunnel (BHT) Creep



## Scope:

- Excavate interior lining of BHT tunnel
- Realign the trackway

**Total Program: \$60 M**

## Measure RR Cashflow Forecast (\$ Millions)

Project	Thru FY18	FY19	Total
BHT Creep Repair	\$3.0	\$7.8	\$10.8



Replace train control and other infrastructure to increase peak capacity – \$400 Million



# Train control and other major system infrastructure – Train Control Modernization Program (TCMP)



Up to 25% Increase in Train Capacity

**Fixed-Block Signaling System:** Existing Train Control Technology



**Communications-Based Train Control:** Needed to Increase Capacity and Assure Reliability



... along with BART Fleet of the Future and Enhanced Traction Power

## Scope:

Upgrade Legacy train control system to Communication-Based Train Control (CBTC)

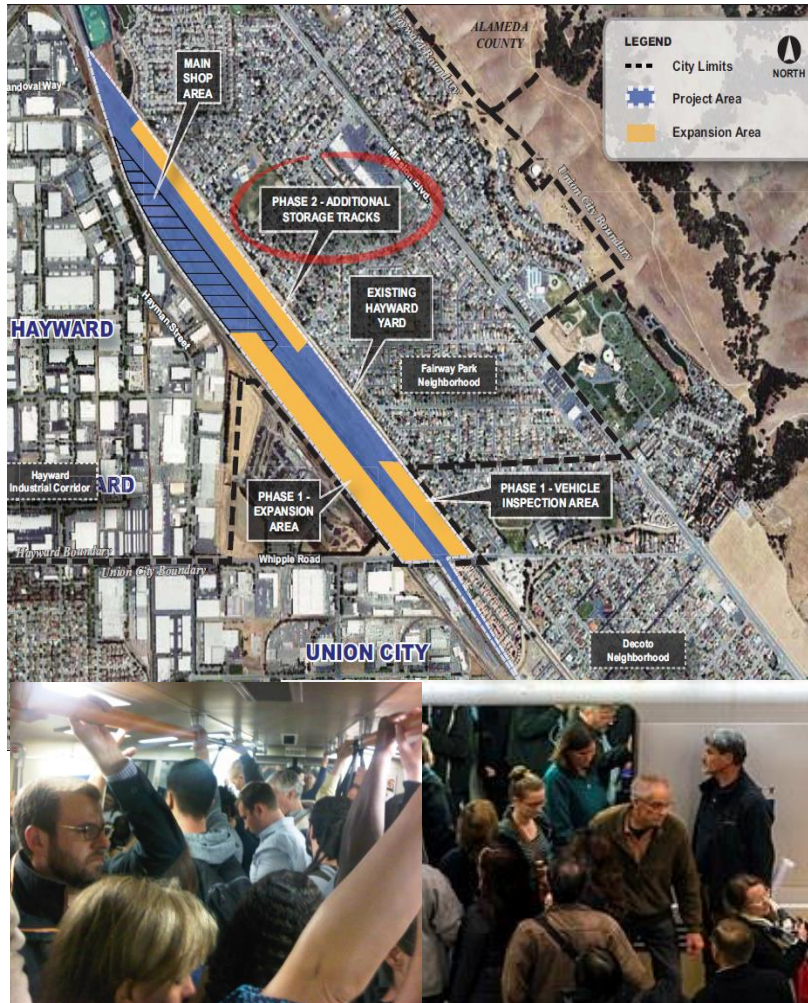
**Total Program:** \$396M (BART share of \$915M Total project)

## Measure RR Cashflow Forecast (\$ Millions)

Project	Thru FY18	FY19	Total
TCMP	\$0.0	\$2.0	\$2.0



# Other major system infrastructure – New Starts (Core Capacity)



## Scope:

- Design/Engineering for expanded yard storage for increased fleet (HMC – Phase II)
- Design/Engineering for new traction power (TP) substation at Richmond Yard, Pleasant Hill (Minert Ave.), and Oakland 34th St.

**Total Program: \$6.2 M**

## Measure RR Cashflow Forecast (\$ Millions)

Project	Thru FY18	FY19	Total
HMC Ph II Design	\$4.6	\$1.0	\$5.6
Richmond Traction Power Design	\$0.2	\$0.0	\$0.2
PH Traction Power Design	\$0.2	\$0.0	\$0.2
Oakland Traction Power Design	\$0.2	\$0.0	\$0.2
<b>Total</b>	<b>\$5.2</b>	<b>\$1.0</b>	<b>\$6.2</b>







Renew Stations – \$210 Million



# Renew Stations – Escalator Renovation and Canopy Program



## Scope:

- Replace platform and street escalators
- Design and construct escalator/stair canopies

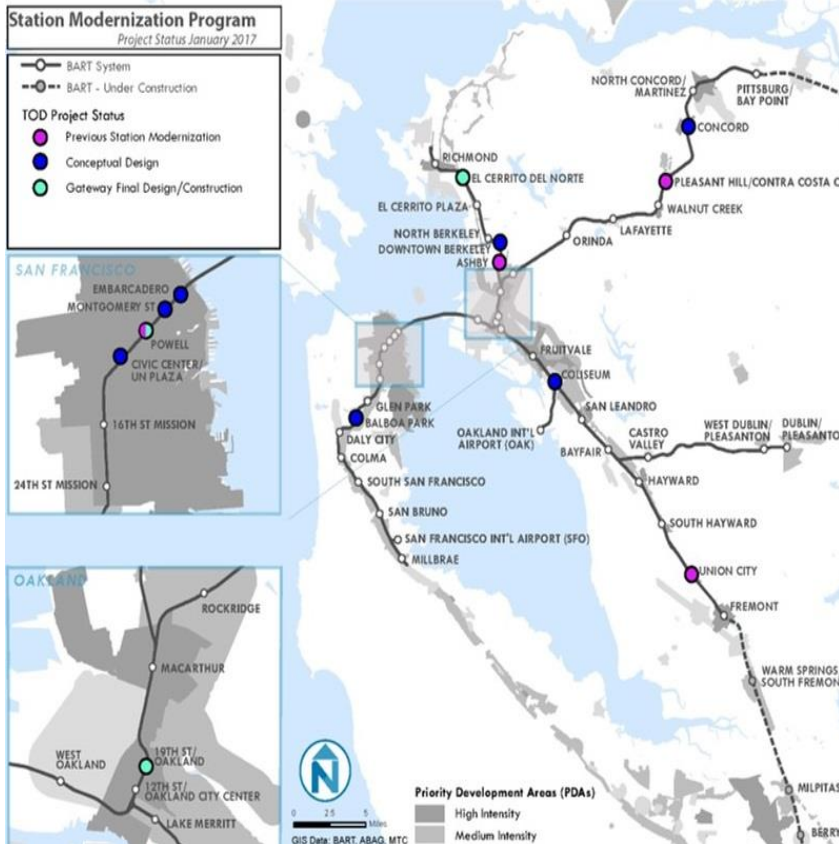
**Total Program:** \$ 190 M

## Measure RR Cashflow Forecast (\$ Millions)

Project	Thru FY18	FY19	Total
Escalator/Canopy	\$3.3	\$12.7	\$15.0



# Renew Stations – Station Modernization



## Scope:

- 4 station modernization conceptual plans
- 2 station modernization detailed design /construction

**Total Program: \$ 20 M**

## Measure RR Cashflow Forecast (\$ Millions)

Project	Thru FY18	FY19	Total
Conceptual Plans	\$1.1	\$0.4	\$1.5
Design/ Construction	\$0.2	\$0.5	\$0.7
<b>Total</b>	<b>\$1.3</b>	<b>\$0.9</b>	<b>\$2.2</b>





Station Access – \$135 Million



Measure RR: Expand Opportunities to Safely Access Stations

# BART Station Access Policy Goals



**A. Safer, Healthier, Greener.** *Advance the region's safety, public health, and greenhouse gas (GHG) and pollution-reduction goals.*



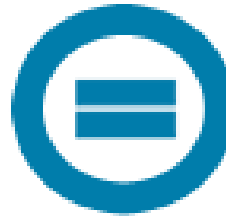
**B. More Riders.** *Invest in station access to connect more riders cost effectively, especially where and when BART has available capacity.*



**C. More Productive and Efficient.** *Manage access investments, programs, and current assets to achieve goals at the least cost.*



**D. Better Experience.** *Be a better neighbor, and strive for an excellent customer experience, including on the first and last mile of the trip to and from BART stations.*



**E. Equitable Services.** *Invest in access choices for all riders, particularly those with the fewest choices.*



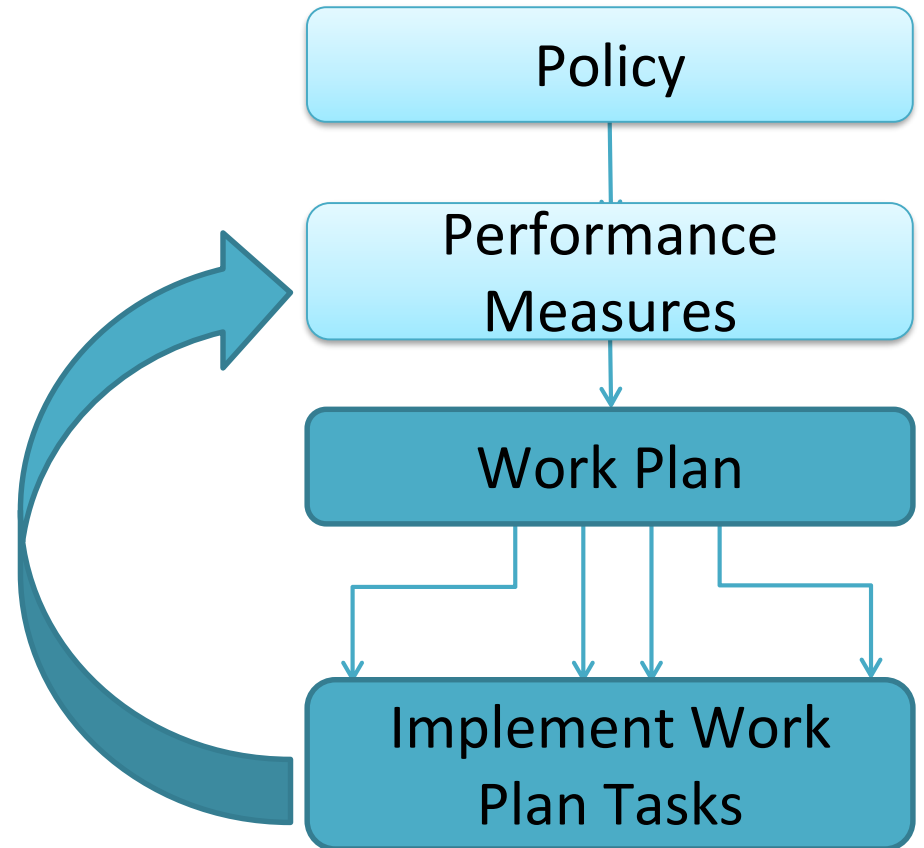
**F. Innovation and Partnerships.** *Be an innovation leader, and establish durable partnerships with municipalities, access providers, and technology companies.*



# Station Access Performance Measures

## Measures address:

- Mode-share
- Pedestrian and bicycle safety
- Ridership
- Parking access & management
- Carpool utilization
- Secure bike parking
- Intermodal access
- Collaboration
- Access for people of all abilities
- Equitable access
- Innovation

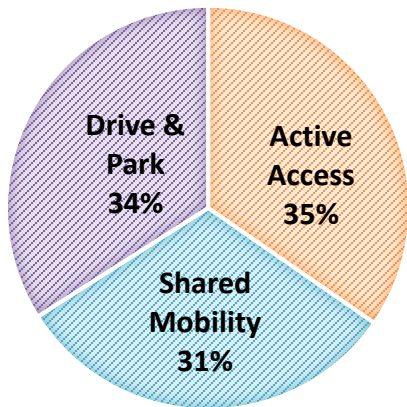




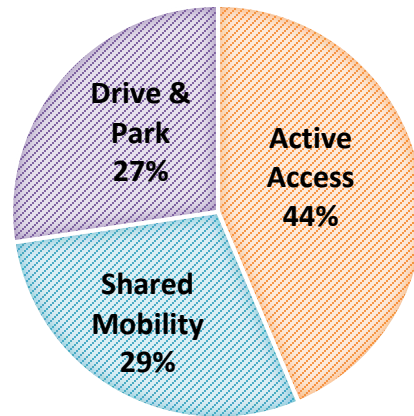
Measure RR: Expand Opportunities to Safely Access Stations

# Access Mode Share Targets (home-based)

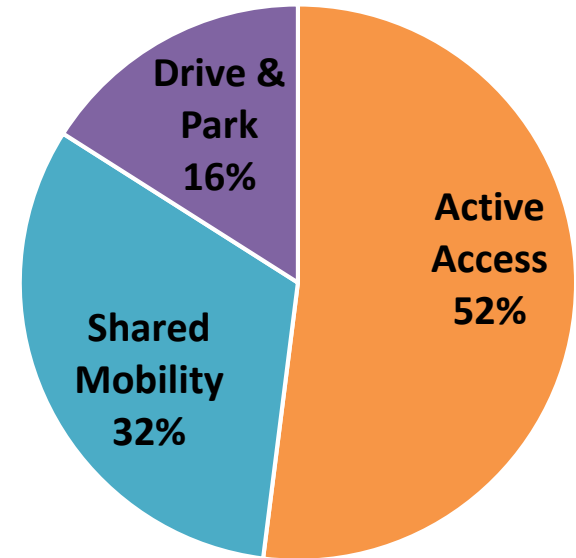
2008 ACCESS  
MODE SHARE



2015 ACCESS  
MODE SHARE\*



2025 TARGET  
ACCESS MODE SHARE



**Active Access:** Walk, Bike

**Shared Mobility:** Transit, Shuttle, TNC, Drop-Off, Carpool

**Drive & Park:** Drive Alone

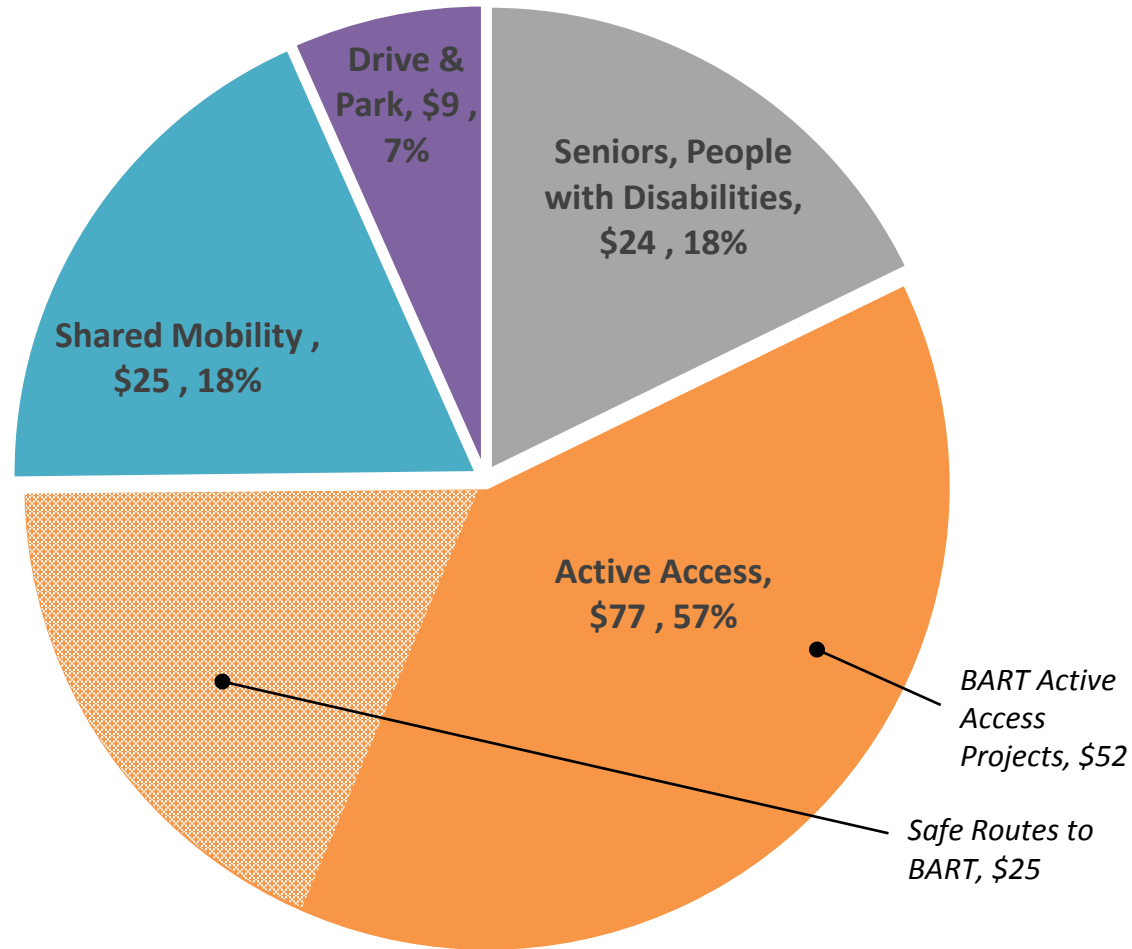
*\*Preliminary 2015 Station Profile Survey Data*



# Proposed Allocation by Mode (\$135 M)

- Invest to meet policy objectives
- Invest to meet targets

- Home-based mode-share targets require estimated:
  - **43,000** increase in active access riders
  - 22,000 increase in shared mobility riders
  - Reduction of 14,000 drive alone riders (shift to other modes, carpool)



## Active Access

- Safe Routes to BART Program\*
- Bike stations
- Bike Channels
- Regional connections
- Station Area Access:
  - Plazas, pathways, sidewalks, lighting
  - Intersection improvements
  - Placemaking / Art
- Accessible faregates
- Wayfinding

## Shared Mobility

- Comprehensive Redesign at priority stations (coordinated with TOD)
- Upgrade Transit Connections (benches, lighting, ADA improvements)

## Seniors & People with Disabilities

- Fire Alarm Strobe Lights
- Hearing Loop
- Beacons
- Braille
- Handrails
- Elevator controls/improvements

## Drive & Park

- Wayfinding
- Improve safety/security and enforcement
- Strategic Parking Expansion

# Project Examples by Mode

*\*Confirm eligible for bond funding*



Measure RR: Expand Opportunities to Safely Access Stations

# Project Delivery Approach

## Advance & Construct Pipeline Projects

- **Station Area Improvements:** MacArthur Station Access: Plaza & 40th Street Underpass Lighting, Concord Plaza, Coliseum & Fremont connections, WSX Ped Bridge, LM Plaza
- **Bike stations:** LM, D/P, Fremont, SL, 19th St, WO, NB, Rockridge, Ashby, El Cerrito del Norte
- **Regional connections:** Ohlone Greenway at El Cerrito del Norte, Iron Horse Trail at D/P
- Real-time **Parking** displays, P/BP **Drop-Off**, El Cerrito del Norte **Intermodal**

## Planning Efforts Underway

- Multimodal Design Guidelines
- N. Concord to Antioch BART Access Study
- Pedestrian and Bicycle Network Gap Closure Study
- Curb Use Study
- Bike Parking Capital Plan
- Accessibility Improvement Program

## Ongoing Planning & Project Identification

## Project Selection & Implementation

- Interdepartmental Staff Apply Board Adopted Policy to Prioritize Projects Every 6 Months
- Project Selection based on policy-based criteria



Measure RR: Expand Opportunities to Safely Access Stations

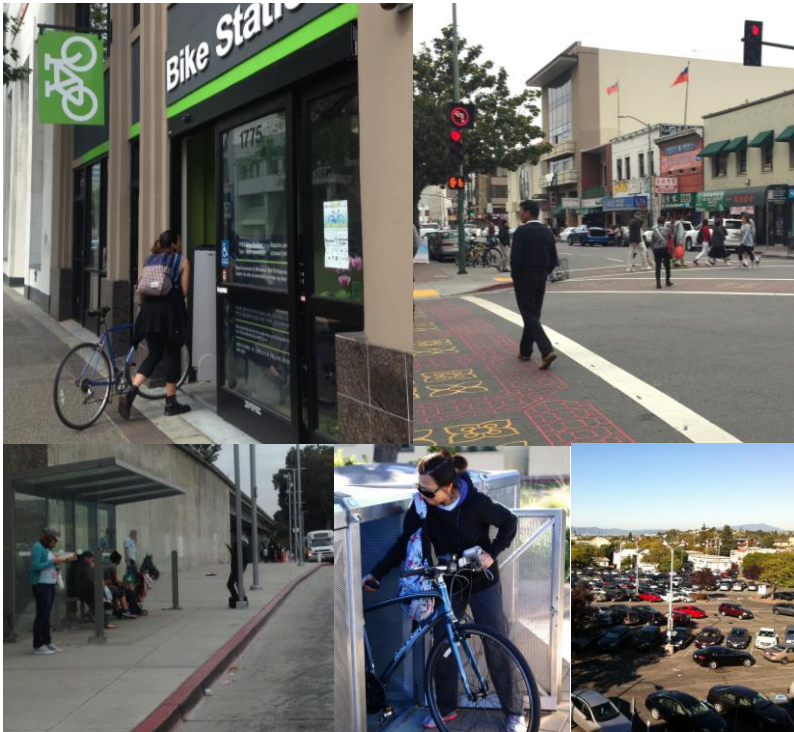
## Safe Routes to BART (SR2B)

- **Fill funding gaps in active access projects**
  - Annual Project Selection
  - Locally led projects that connect BART to other destinations/hubs
    - Regional trails
    - Job Centers
    - High-density Residential Areas
    - Planned TOD
  - Match up to 30%
  - Projects must have conceptual design completed
- **Pilot in 2018 with \$5 million program**
- **SR2B Committee Selects Projects Based on Criteria & Notifies Board of Project Selection**





# Expand Opportunities to Safely Access Stations



- **Scope:**
  - Achieve Station Access Policy Goals & Targets
  - Improve Active Transportation and enhance Access for Seniors & People with Disabilities
  - Renew Transit Transfer Facilities
  - Improve Parking Availability
- **Total Program: \$135 M**
  - Funds will leverage other sources

## Measure RR Cashflow Forecast (\$ Millions)

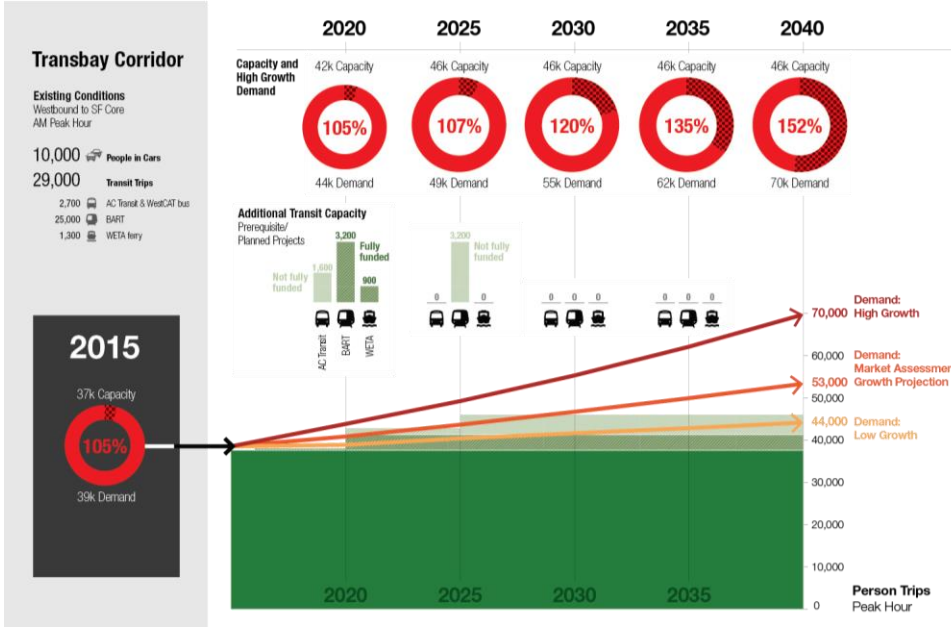
Project	Thru FY18	FY19	Total
Active Access	\$8.0	\$13.6	\$21.6
Shared Mobility	\$2.2	\$3.3	\$5.5
Drive & Park	\$2.3	\$3.1	\$5.4
Seniors & Disabled	\$1.5	\$3.0	\$4.5
<b>Total</b>	<b>\$14.0</b>	<b>\$23.0</b>	<b>\$37.0</b>



Relieve crowding/system redundancy  
– \$200 Million



# Relieve crowding/system redundancy – Transbay Crossing Phase 2



- **Scope:**
  - Partner with mainline rail agencies
  - Examine governance and funding
  - Conduct regional market analysis
  - Develop service plan for rail networks
  - Develop operations plan and detailed transportation model
  - Initiate conceptual engineering

- **Initial Phase: \$10 M**

## Measure RR Cashflow Forecast (\$ Millions)

Project	Thru FY18	FY19	Total
Transbay Crossing	\$2.9	4.0	\$6.9



# Relieve crowding/system redundancy – BART Metro/Core Capacity



- **Scope:**
  - Design / construction of BART Metro infrastructure improvements
- **Initial Phase: \$21 M**

## Measure RR Cashflow Forecast (\$ Millions)

Project	Thru FY18	FY19	Total
L-Line / I-580 Barrier	\$0.0	\$2.0	\$2.0
Embarcadero Elevator	\$1.5	\$4.3	\$5.8
Platform Screen Door Pilot	\$1.5	\$1.5	\$3.0
Lafayette Pocket Track Replace	\$0.7	\$1.3	\$2.0
Millbrae Tail Track	\$0.5	\$0.3	\$0.8
Dublin Tail Track	\$1.5	\$0.3	\$0.8
FTA Core Capacity Program Mgmt	\$1.5	\$1.2	\$2.7
Total (rounded)	\$6.2	\$11.0	\$17.1



# Cashflow Drawdown Summary thru FY19



# Measure RR Cashflow by Program Category

<b>Program</b>	<b>Thru FY18</b>	<b>FY19</b>	<b>Total</b>
Renew Track	\$45.9	\$47.3	\$93.2
Renew Power Infrastructure	\$85.2	\$117.2	\$202.4
Repair Tunnels & Structures	\$19.1	\$25.6	\$44.7
Renew Mechanical	\$7.0	\$5.5	\$12.5
Replace Train Control/Increase Capacity	\$5.2	\$3.0	\$8.2
Renew Stations	\$4.6	\$13.6	\$18.2
Expand Safe Access to Stations	\$14.0	\$23.0	\$37.0
Design/Engineer to Relieve Crowding	\$9.1	\$14.9	\$24.0
<b>Total</b>	<b>\$190.1</b>	<b>\$250.1</b>	<b>\$440.2</b>



## Implementation Next Steps – In Progress

- Establish Bond Oversight Committee
- Adopt Small Business Program Modification
- Award 6 General Engineering Service Contracts (GECs) totaling \$150 M
- Complete hiring plan
- Determine work space needs
- Develop work flow master plan