



SFMTA

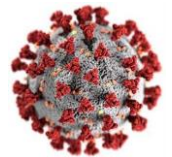
# Next Generation Customer Information System

Presentation to the SFMTA Board of Directors

June 16, 2020

# Background

- In 1999, San Francisco piloted the first U.S. real-time information system
- Since then, the technology and transportation landscape has rapidly evolved
- Signs have reached the end of their useful lives and are not replaceable
- Planned with these changes in mind, the Customer Information System is also flexible to meet the challenges of the COVID-19 crisis and recovery



2000

2020

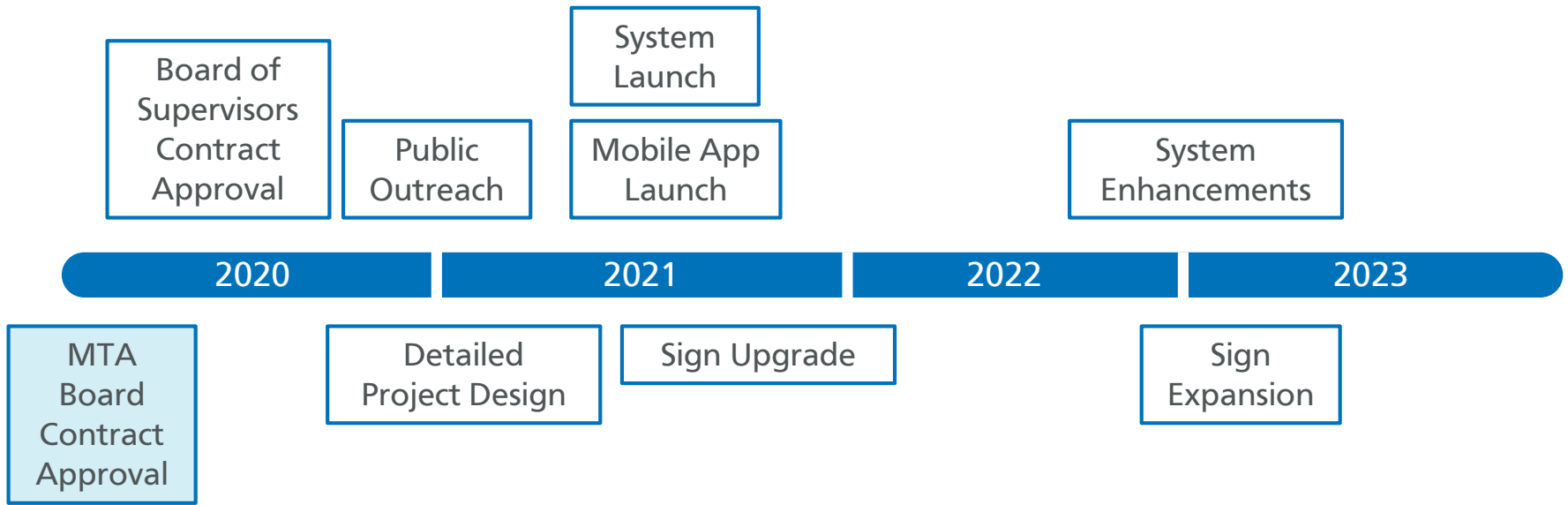
NEXTbus



# Project Goals

- 1 Ensure a positive customer experience
  - 2 Increase equitable access to information
  - 3 Reduce waiting and total travel time
  - 4 Shift people towards more sustainable transportation options
  - 5 Help customers make better travel decisions, particularly when faced with service disruptions and gaps
  - 6 Rebuild transit ridership as San Francisco recovers from the COVID-19 crisis and increase discretionary travel over the long-term
-

# Project Milestones



| Proposer            | Score  |
|---------------------|--------|
| Cubic               | 902.88 |
| Intersection Parent | 543.74 |
| B&C Transit Inc     | 506.55 |
| Pulsar              | 472.68 |
| Strategic Mapping   | 446.20 |
| DoubleMap           | 369.62 |

**Phase I**  
(1-for-1 replacement)

**Phase II**  
(Enhancements)

# Shaping the Project through Public Outreach

## Quantitative

Comprehensive Survey  
(Available in English, Chinese and Spanish;  
online and paper upon request)  
5,800+ complete responses;  $\pm 1.3\%$  margin  
of error at a 95% confidence level

+

## Qualitative

Concept Testing

Stakeholder Interviews

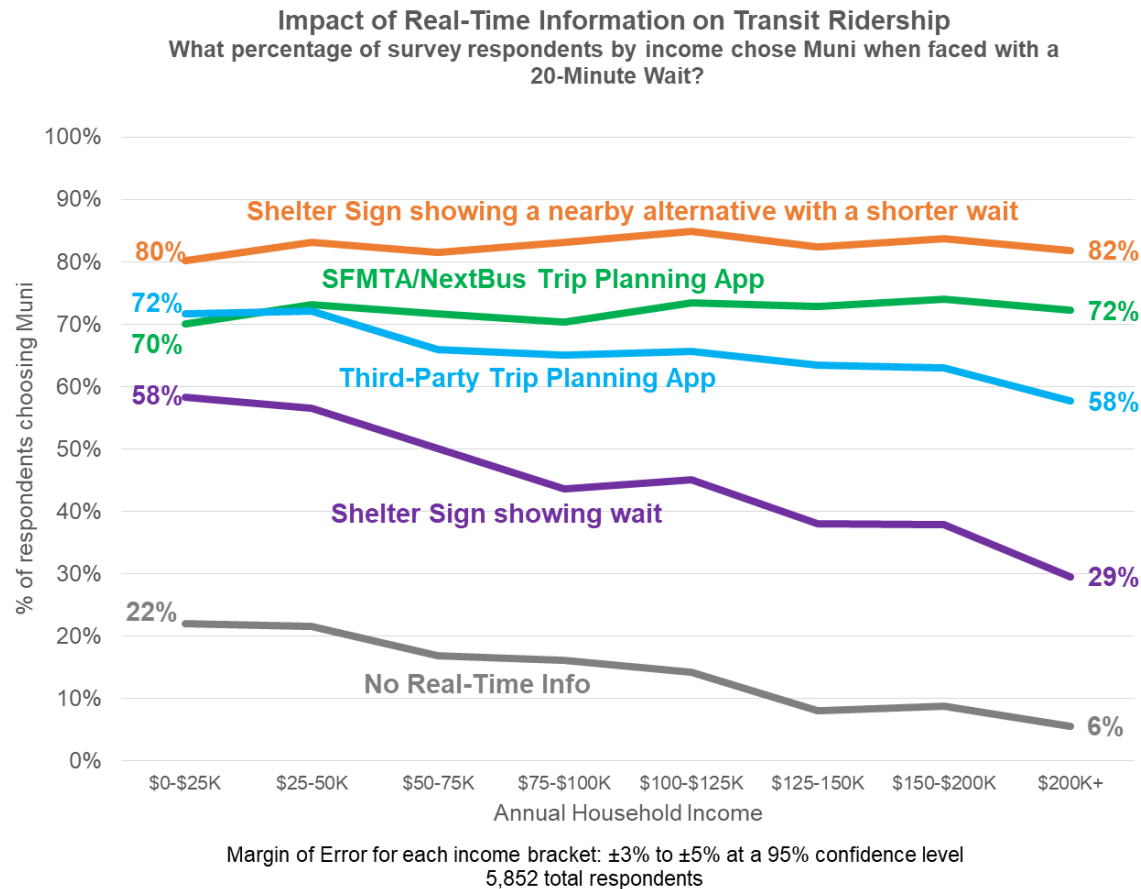
Ride-alongs

## External Stakeholder Examples

|   |  |
|---|--|
| 311   | SF Board of Supervisors                                  |
| BART and other transit agencies               | SF Travel  |
| Chamber of Commerce                           | SFMTA Citizens' Advisory Council (CAC)                   |
| Chinatown Community Development Center (CCDC) | SFMTA Multimodal Accessibility Advisory Committee (MAAC) |
| Chinatown Tenants Association                 | SFMTA Policy and Governance                              |
| Hotel Council                                 | SFUSD-Access   |
| Independent Living Resource Center            | Senior Action and Disability Network                     |
| LightHouse for the Blind                      | SF Transit Riders  |
| Rebuild Potrero                               | Transbay Joint Powers Authority                          |
| Save Muni                                     | Youth Commission   |

- The SFMTA conducted extensive quantitative and qualitative research to identify customer requirements for the new system
- The SFMTA will continue outreach efforts in project design and implementation

# NextBus Real-Time Information Increases Transit Ridership



- With growing inequality, there is a risk of intensifying a two-tiered, income-based transportation system
- The availability, content and presentation of real-time information could dramatically influence transit mode share across all income levels – in some cases virtually eliminating differences in ridership patterns based on income

# Flexibility to Meet COVID-19 Crisis and Recovery

## Service Awareness

- Communicates rapidly-changing transit service plans
- Shows dynamic maps on signs indicating temporary routes and vehicle locations
- Displays nearby alternative routes on signs at temporarily-discontinued stops
- Promotes seamless regional connectivity by displaying predictions for partner transit agencies

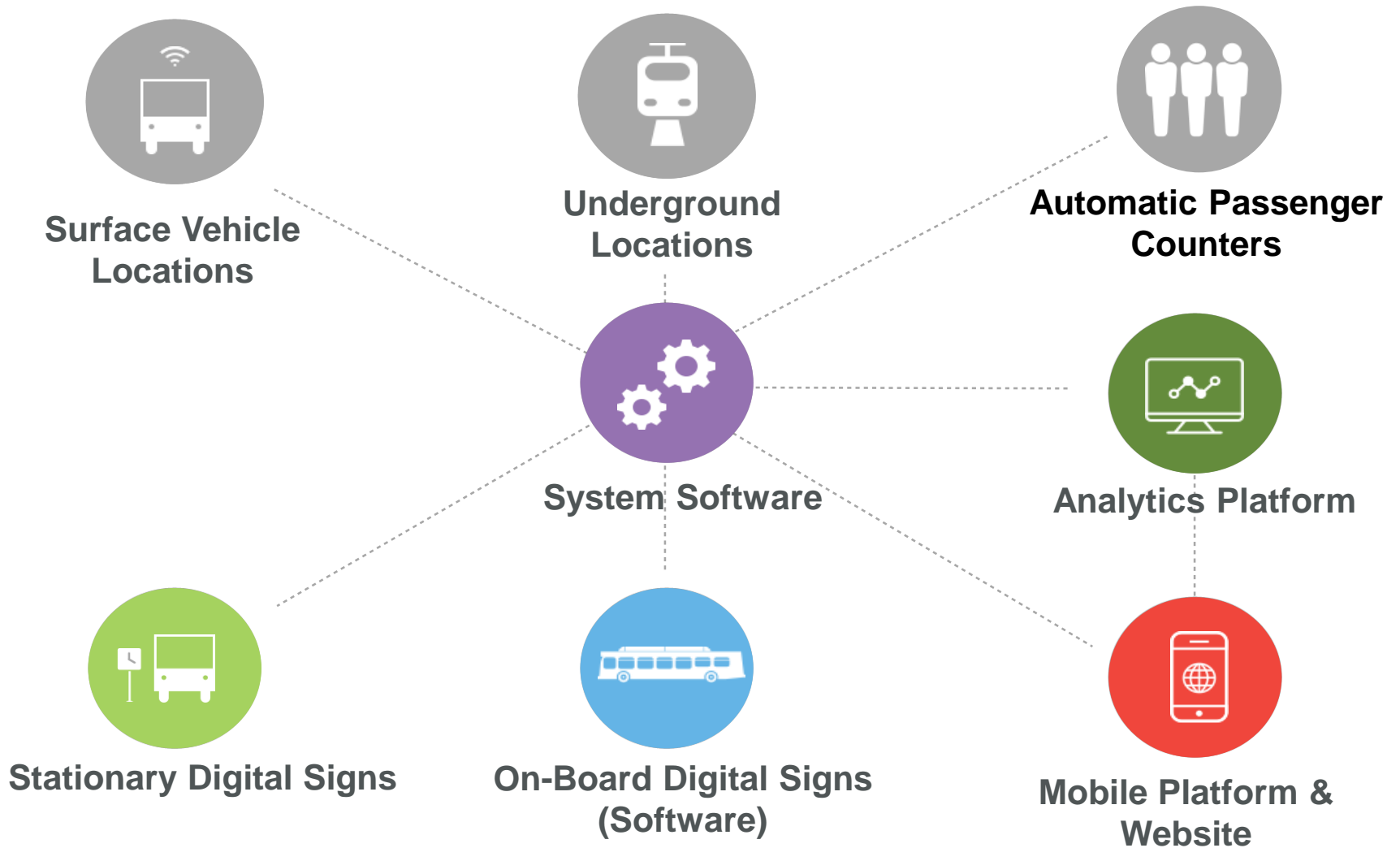
## Public Safety

- Indicates vehicle occupancy levels to encourage social distancing
- Implements double-sided shelter signs to allow customers to view information from a distance outside the shelter
- Communicates alerts and public safety announcements in multiple languages

## Responsive Planning

- Offers MuniMobile customer survey and incident reporting capabilities to receive public feedback on service changes
- Provides an Analytics Platform to monitor ridership patterns and determine how to restore routes and close service gaps
- Improves spacing between vehicles by providing field supervisors with a mobile tool showing vehicle positions

# Next Generation Customer Information System







# Element 1: System Software

## New and Improved Customer Information

- More accurate vehicle arrival predictions
- Vehicle locations
- Transfer connection predictions
- Alternative routes
- Vehicle occupancy
- Accessibility information
- Real-time service detours and delays
- Regional transit connections
- Public announcements in multiple languages

The screenshot displays a transit application interface. At the top left is the SFMTA logo. The top right shows the time 08:16 PM, weather 58° Cloudy, and date Sat, Dec 29. The main area features a map of Richmond, CA, with a blue route line. Below the map, a list of stops is shown: 1-California, California & 4th, California & 6th, California & 8th, California & 10th (10 more stops), and Geary & 33rd. A red banner at the bottom right contains an accident alert: 'Accident at California & 10th Expect delays until 09:12PM'. At the bottom left, a section titled 'Next three buses' shows arrival times: 08 min, 17 min, and 24 min, each with a corresponding bus icon.



## Element 2: Stationary Digital Signs

- Provide sign hardware, installation and maintenance services
- Ensure uninterrupted service during transitions
- Ensure full ADA-compliance, including text-to-speech

### Existing System

Light Emitting Diode (LED) screens



### Next Generation System

Over 5 times larger, Liquid Crystal Display (LCD) screens display:

- Graphics
- Maps with the real-time vehicle positions
- Maps with directions to nearby routes
- Letters and characters in other languages



Up to one-third of signs may be double-sided to improve visibility

Durable to elements and resistant to vandalism

# Shelter Sign Size Comparison

Existing NextBus Sign



**1 California**  
**8 min & 17 min**

Next  
Generation  
System Sign



08:16 PM 58° Cloudy Sat, Dec 29

1-California

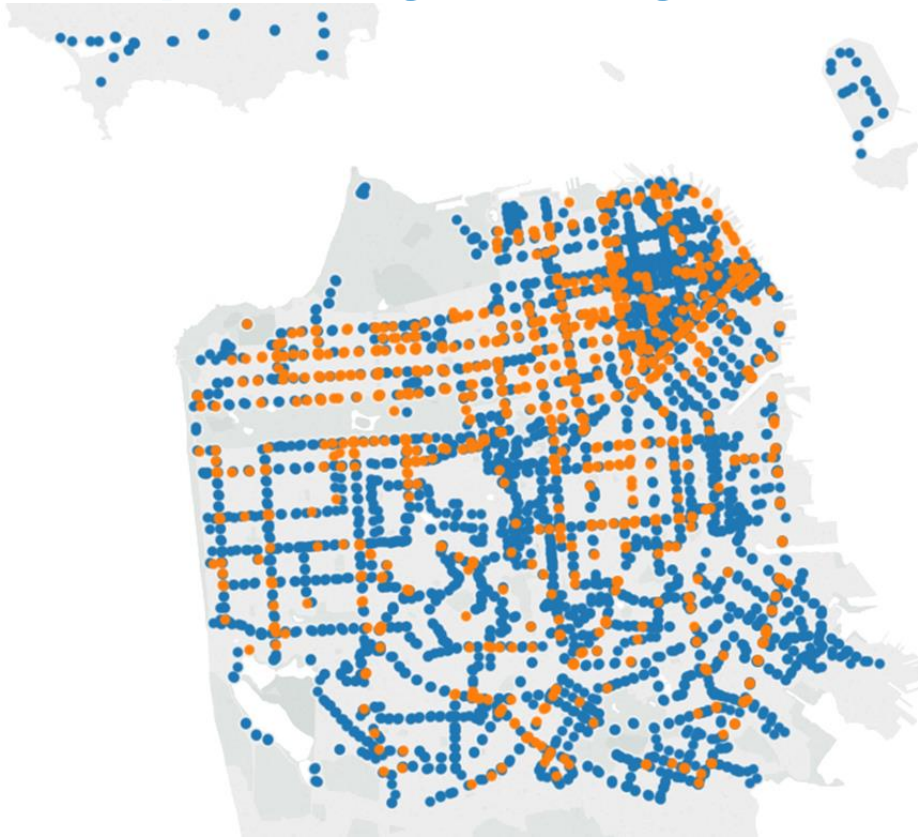
- California & 4th
- California & 6th
- California & 8th
- California & 10th (10 more stops)
- Geary & 33rd

Next three buses



|        |        |        |
|--------|--------|--------|
| 08 min | 17 min | 24 min |
|        |        |        |
|        |        |        |

⚠️ Accident at California & 10th  
Expect delays until 09:12PM

# Increasing Equitable Access to Information by Expanding the Sign Network to Unpowered Stops



## Existing Powered Signs

-  Shelter with Existing Sign (~750)
-  Candidate for future Solar-Powered Sign



## Future Solar-Powered Signs

Up to 800 new locations, including:

- Equity Neighborhoods and other historically-underserved communities
- Lower-frequency routes where vehicle arrival predictions are essential to minimizing wait times

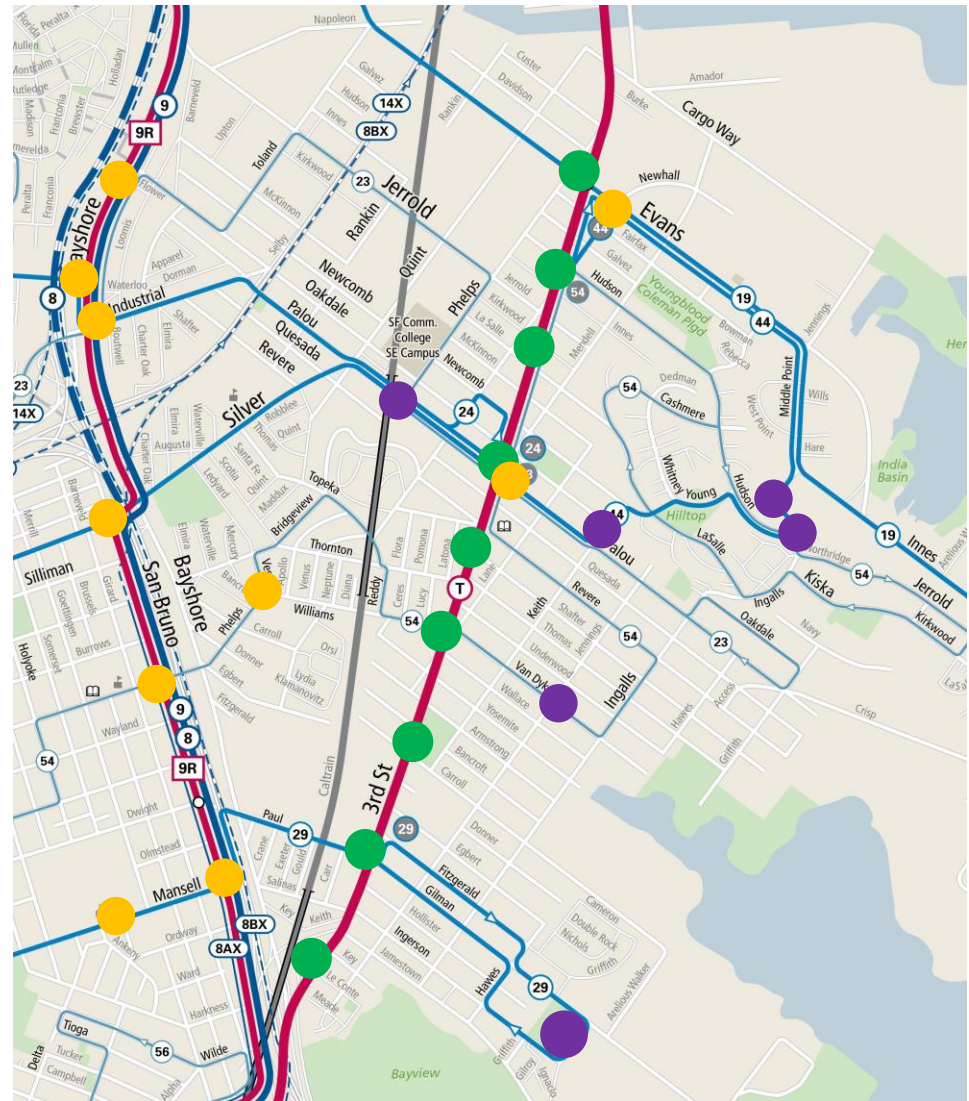


# Bayview Signage Expansion



- Sign upgrades at existing shelters
- New signs for tentative shelter locations (Bayview Community Based Transportation Plan Priority Projects)
- Double-sided sign upgrades at T Third stations

All stops without shelters will be candidates for Solar-Powered Signs





# Element 3: On-Board Digital Sign Software

## 1. Sign Content

- Generate customer information (e.g., reroutes, transfer connections) for display on future signs

## 2. Text-to-Speech Functionality

- Enable vehicle's public announcement system to voice customer information

## 3. Integration with Future On-Board Signs

- Able to push content to future on-board signs, including those on the pilot battery electric buses





# Element 4: Mobile Platform & Website

## 1. Trip Planner

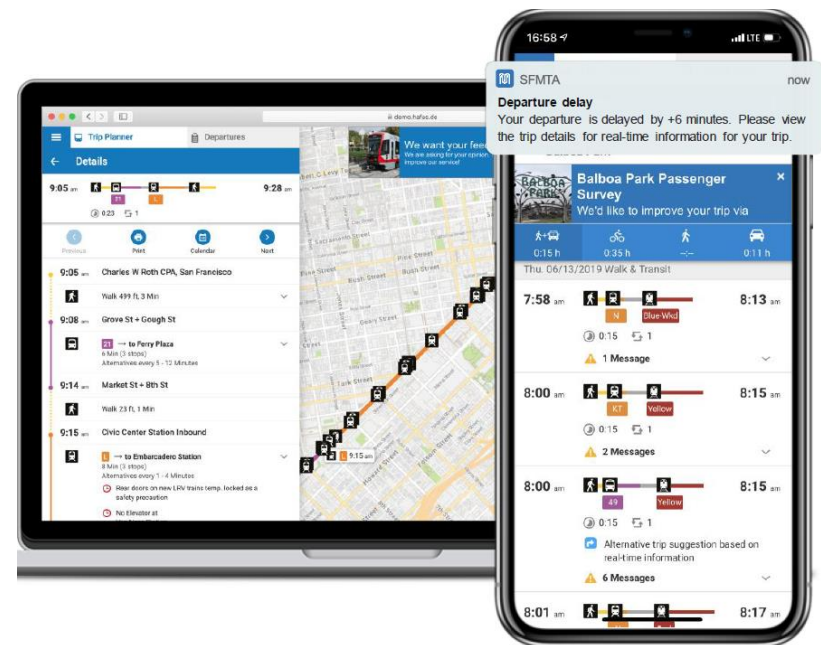
- Point-to-point directions, vehicle arrival times and other new customer information
- Live trip tracking to inform customer of changes in journey
- Opt-in features for customers to save trips and profile
- Customer configurable for language, accessibility and service preferences
- Multimodal trip quotes

## 2. Upgraded MuniMobile App

- Provides all-in-one mobile ticketing and trip planning functionality for transit and multimodal services
- Automatically reflects real-time service changes
- Facilitates opt-in two-way communications with customers

## 3. Website Integration

- Integrate trip planning functionality into SFMTA website





# Element 5: Analytics Platform

Provide insights and continual improvement of SFMTA services

## 1. Analytics Platform

- Create reporting tools and dashboards

## 2. Data Interpretation

- Analysis will help improve service quality and reliability to enhance the customer experience



### Performance Management

- On-Time Performance
- Vehicle Travel Time Variation
- Predictions Accuracy
- Interval Reliability
- Stop-to-stop travel times

### Customer Engagement

- Usage
- Satisfaction
- A/B Testing

### Service and Operational Planning

- Service Interventions Effectiveness
- Transfer Reliability
- Network Connectivity
- Stop Consolidation Impacts

### Customer Experience

- Wait Times
- Crowding
- Travel Time Reliability
- Mode Choice
- Internal and External Transfers
- Unserved or Underserved Travel Needs



# Accessibility Features

## System Software

- Accessibility information for stops and vehicles
- Planned or real-time elevator and escalator outages

## Stationary Digital Signage

- LCD screens accommodate larger text
- Push-to-talk

## On-Board Digital Signage

- Accessibility information for upcoming transit stops and connecting routes

## Mobile Platform & Website

- Personalized trip planner enables configuration of accessibility preferences (e.g., elevator access, ramps, maximum grade)
- Itineraries provide accessible trips configurable to customer needs



# Projected Costs

| Item                              | Total Capital Costs | Total Operating Costs *   |                                  |                                  | Total Capital & Operating Costs |
|-----------------------------------|---------------------|---------------------------|----------------------------------|----------------------------------|---------------------------------|
|                                   |                     | Initial Term ** (5 Years) | 1st Optional Extension (5 Years) | 2nd Optional Extension (5 Years) |                                 |
| Base System                       | \$18,750,552        | \$12,621,722              | \$17,819,238                     | \$19,050,012                     | \$68,241,524                    |
| System Options                    | \$4,371,844         | \$1,978,550               | \$2,921,688                      | \$3,377,855                      | \$12,650,182                    |
| <b>Total</b>                      | <b>\$23,122,396</b> | <b>\$14,600,517</b>       | <b>\$20,740,926</b>              | <b>\$22,427,867</b>              | <b>\$80,891,706</b>             |
| <b>Total with 10% contingency</b> | <b>\$25,434,635</b> | <b>\$16,060,569</b>       | <b>\$22,815,018</b>              | <b>\$24,670,654</b>              | <b>\$88,980,877</b>             |

\* Operating costs phased in as the contractor initially deploys different system elements over several years. As a result, total operating costs increase as system elements become fully deployed. Optional extensions include inflation-adjusted escalation and reflect the full deployment of all system elements.

\*\* Operations expected to begin following 1 year of system implementation.

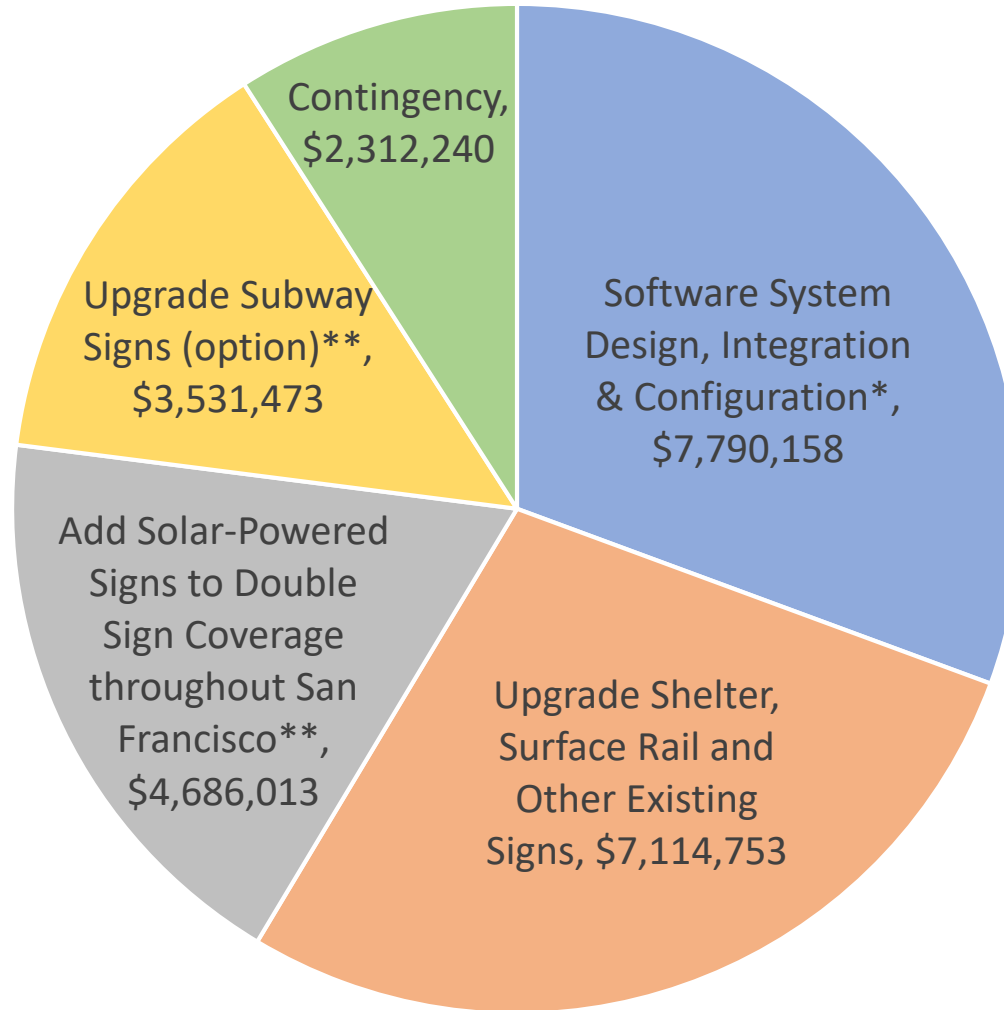
## Capital Costs

- \$25.4 million, including sales tax, options and 10% contingency

## Operating Costs

- Incremental \$47,274 monthly cost compared to existing system
- \$63.5 million for initial term and subsequent optional five-year contract extensions; total contract duration corresponds to the expected lifespan of signs
- Contract ensures cost containment by preventing future software subscription fees and operations and maintenance costs from escalating beyond inflation
- Contract includes warranty covering all parts and consumables for the equipment lifecycle

# Capital Costs



\*Includes \$808,237 in options for enhanced software features

\*\*Discretionary based on cash flow and funding availability

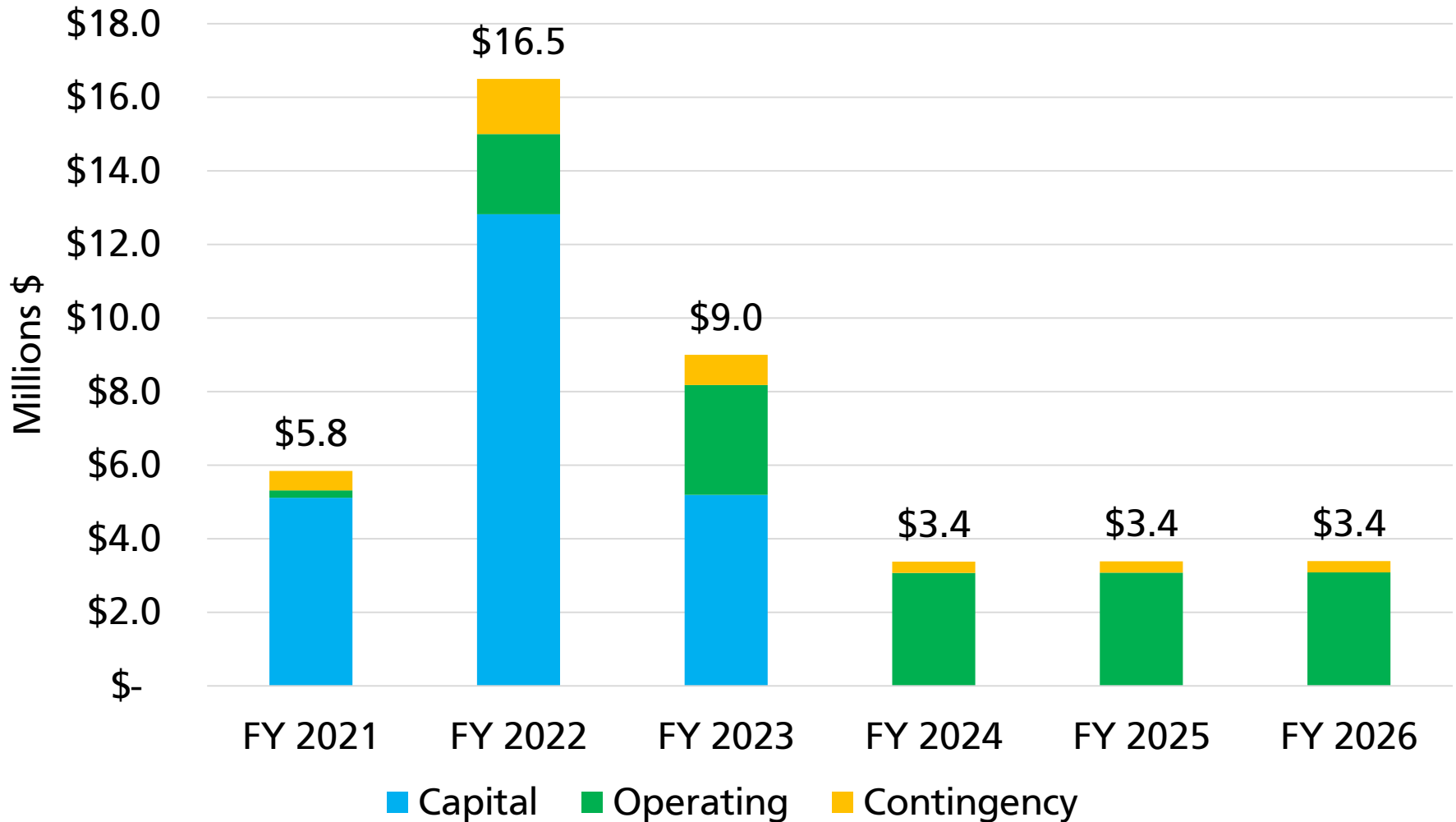
# Operations & Maintenance Cost Comparison

| Comparison of Operations & Maintenance Costs – Existing vs. Upgraded System   |          |                             |                                 |  |
|---|----------|-----------------------------|---------------------------------|--|
| Service   |          | Existing System Monthly Fee | New System Contract Monthly Fee | Monthly Difference for Upgrades and Enhancements |
| <b>Software Subscription Services</b>   |          |                             |                                 |  |
| System Software (more accurate predictions, route alternatives, transfer connections, real-time service changes and accessible itineraries) | Improved | \$73,900                    | \$37,508                        | \$8,242  |
| Mobile Platform & Website Trip Planner Software   | New      | Not provided                | \$27,031                        |  |
| Analytics Platform  | New      | Not provided                | \$17,603                        |  |
| <b>Sign Maintenance &amp; Communications</b>  |          |                             |                                 |  |
| Shelter & Outdoor Rail Platform Signs** (larger and more visible signs including graphics)  | Improved | \$25,843                    | \$65,967                        | \$39,033   |
| Underground Station Signs   | Improved | \$2,875                     | \$1,784                         |  |
| <b>Monthly Total</b>  |          | <b>\$102,619</b>            | <b>\$149,892</b>                | <b>\$47,274</b>                                  |
| ** Assuming one-for-one replacement of current 748 shelter signs. The above cost comparison excludes signage network expansion or options.  |          |                             |                                 |  |

Difference in operations and maintenance costs between the existing system's software and signs and its 1-for-1 upgrade in the Next Generation System: \$47,274 monthly (\$567,292 annually)

# Projected Contract Expenditures by Fiscal Year

## Projected Contract Cash Flow



# System Upgrade Provides Great Value to San Francisco

| System Features                            | Current                        | Future                    |
|--|--------------------------------|---------------------------|
| <b>System Software</b>                     |                                |                           |
| Predictions Engine                         | ✓                              | ✓ (improved)              |
| Crowding Level Alerts                      | ✗                              | ✓                         |
| Alternative Route Suggestions              | ✗                              | ✓                         |
| Real-Time Temporary Service Changes        | ✓ (limited)                    | ✓                         |
| Connections with other systems             | ✗                              | ✓                         |
| <b>Stationary Digital Signage</b>          |                                |                           |
| Powered Shelters                           | ✓ (LED)                        | ✓ (LCD)                   |
| Unpowered Shelters & Stops                 | ✗                              | ✓                         |
| <b>On-Board Digital Signage (back-end)</b> |                                |                           |
| Stop Announcements                         | ✓                              | ✓                         |
| Connection Times                           | ✗                              | ✓                         |
| Service Delay & Reroute Alerts             | ✗                              | ✓                         |
| <b>Mobile Platform &amp; Website</b>       |                                |                           |
| Mobile App                                 | ✓ (primarily mobile ticketing) | ✓ (enhanced capabilities) |
| Accessible Itineraries                     | ✗                              | ✓                         |
| <b>Analytics Platform</b>                  |                                |                           |
| Usage Trends & Analytics                   | ✓ (limited)                    | ✓ (enhanced capabilities) |