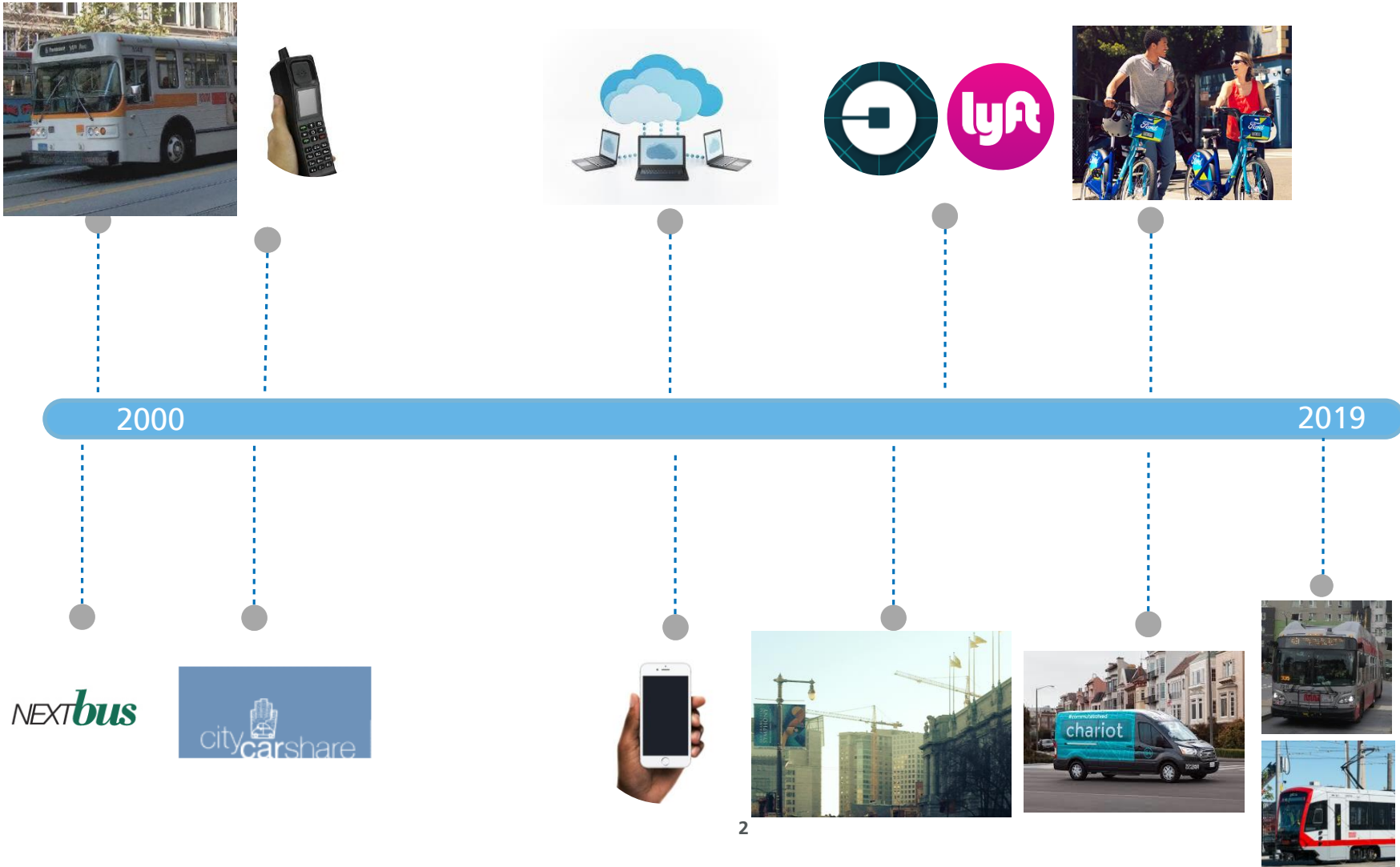# Next Generation Customer Information System

Citizens' Advisory Council

December 5, 2019

# Background

- In 1999, San Francisco piloted the first U.S. real-time information system
- Since then, technology and transportation choices have changed rapidly
- For the first time in 2 decades, we have a chance to do a refresh



2000

2019

2

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# Project Goals

1. Ensure a positive customer experience

2. Reduce waiting and total travel time

3. Shift people towards more sustainable transportation options

4. Help customers make better travel decisions, particularly when faced with service disruptions and gaps

5. Increase ridership through discretionary travel

# Project Milestones

| Milestone |
|---|
| **Project Requirements Gathering**<br>Request for Information<br>Research & Internal Stakeholder Engagement |
| **Procurement**<br>Request for Proposals<br>Proposals Evaluation<br>Contract Negotiations ← **We are here** |
| **Project Planning**<br>Project Design |
| **Implementation**<br>Phase I (1-for-1 replacement)<br>Phase II (enhancements) |

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# Public Outreach

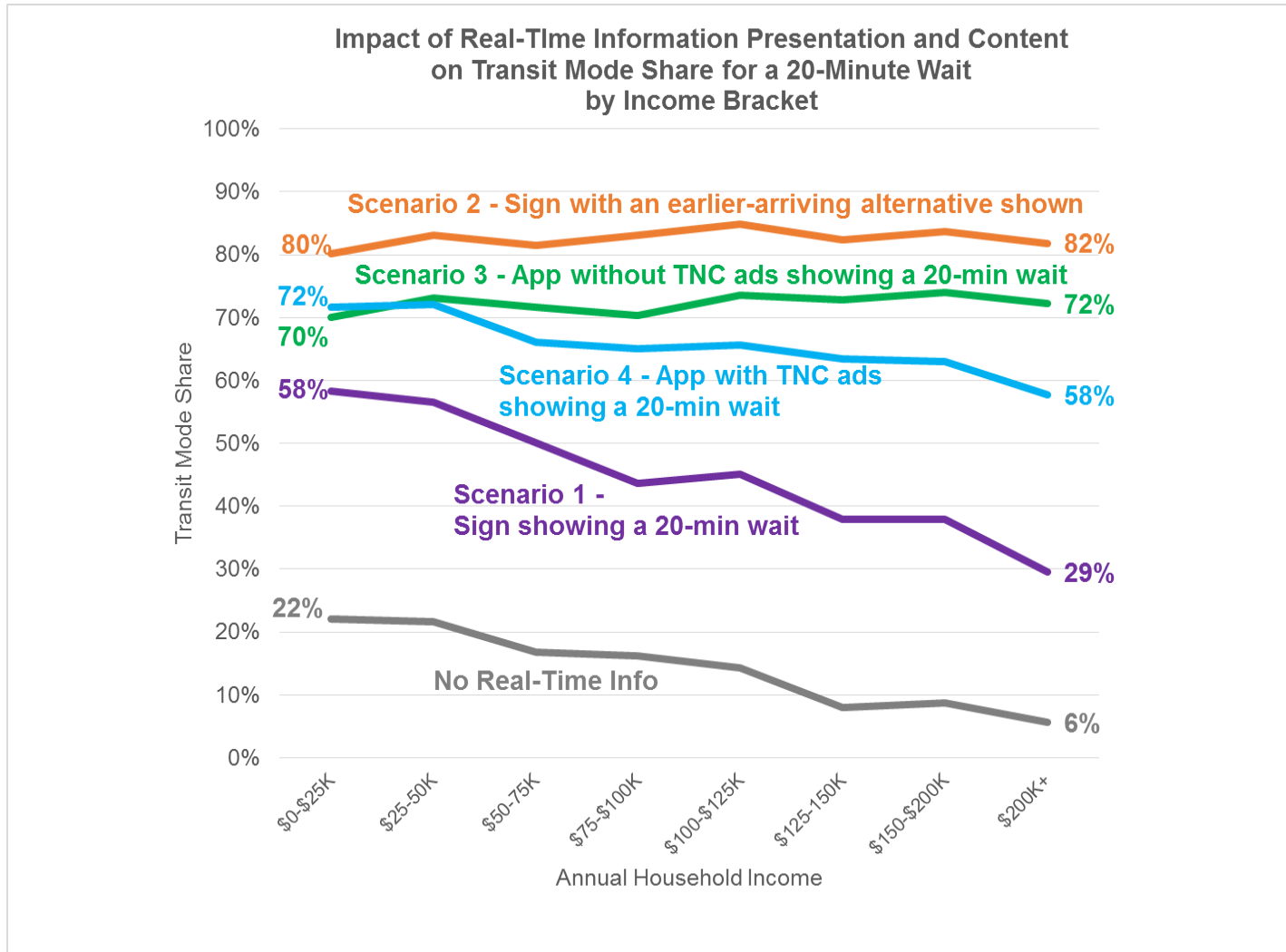| Quantitative |
|---|
| **Comprehensive Survey**<br>(Available in English, Chinese and Spanish; online and paper upon request)<br>5,700+ complete responses; ±1.3% margin of error at a 95% confidence level |

**+**

| 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

# Public Outreach - Research Findings



Impact of Real-TIme Information Presentation and Content
on Transit Mode Share for a 20-Minute Wait
by Income Bracket

- Scenario 2 - Sign with an earlier-arriving alternative shown: 80% ... 82%
- Scenario 3 - App without TNC ads showing a 20-min wait: 70% ... 72%
- Scenario 4 - App with TNC ads showing a 20-min wait: 72% ... 58%
- Scenario 1 - Sign showing a 20-min wait: 58% ... 29%
- No Real-Time Info: 22% ... 6%

Transit Mode Share (y-axis: 0% to 100%)

Annual Household Income (x-axis: $0-$25K, $25-50K, $50-75K, $75-$100K, $100-$125K, $125-150K, $150-$200K, $200K+)

- Outreach found the availability and content of real-time information could dramatically influence transit mode share across all income levels

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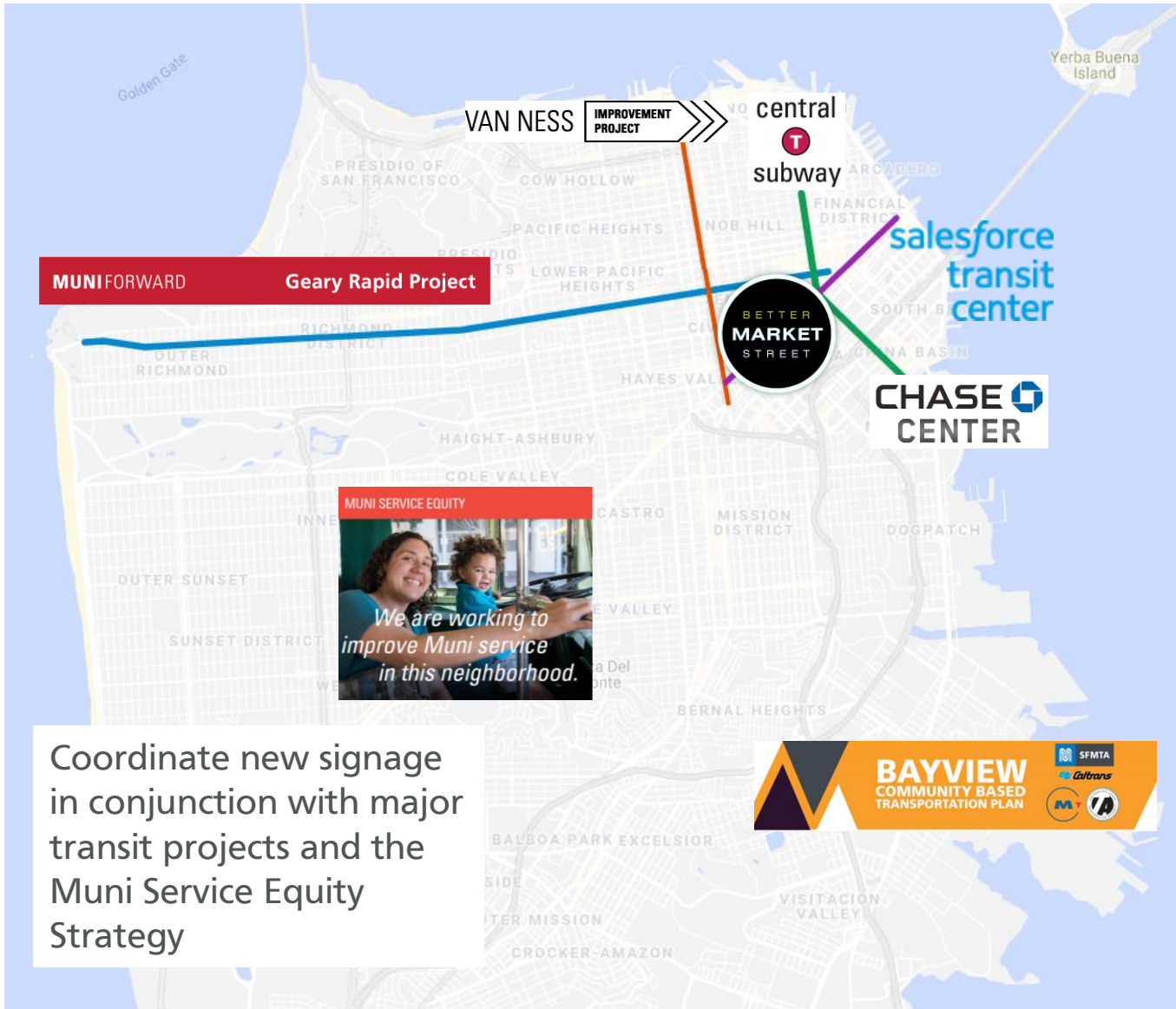# Public Outreach – Research Findings

"Have signs that work at every stop, update outages and line delays, and provide visual information on board vehicles to show transfers available at each stop...bring this very dated system into the 21st century. We live in a city of innovation...utilize it!"

"Announce expected arrival times of intersecting routes at each stop."

"I do not own a smartphone. Please do not make the system so dependent on owning one"

"On board screens that show arrival times of connecting bus, MuniMetro, BART and Caltrain lines would be helpful. Sometimes it's not always convenient to check times on a phone when standing on a crowded bus or holding bags/handrails/kids, etc. "

# Coordination with Other Projects



VAN NESS · IMPROVEMENT PROJECT ⟫

central T subway

salesforce transit center

MUNI FORWARD · Geary Rapid Project

BETTER MARKET STREET

CHASE CENTER

MUNI SERVICE EQUITY
We are working to improve Muni service in this neighborhood.

BAYVIEW COMMUNITY BASED TRANSPORTATION PLAN

Coordinate new signage in conjunction with major transit projects and the Muni Service Equity Strategy

# System Elements

**Surface Vehicle Locations**
Gathers vehicle locations from CAD/AVL System

**Underground Locations**
Gathers vehicle locations from Automatic Train Control System

**Automatic Passenger Counters**
Gathers real-time ridership loads

**System Software**
Generates real-time vehicle predictions, monitors system status through a System Administration Tool, and displays information on customer interfaces through a Content Management System

**Analytics Platform**
Provide insights and continual improvement of SFMTA services

**Stationary Digital Signage**
Displays real-time arrivals, alternatives and other valuable info at rail stations, transit shelters and selected transit stops without power

**On-Board Digital Signage**
Provides back-end capability to display service updates, transfer connection times and other information on separately-procured on-board vehicle signs

**Mobile Platform & Website**
Delivers travel information in mobile and online formats; Mobile App features an enhanced Trip Planner

# Element 1: System Software

1. **Customer Information**
- Generate customer information outputs based on a set of inputs
- Output examples include vehicle arrival predictions, terminal departures, transfers, trip planner itineraries, route alternatives, etc.
- Pushes customer information to a variety of customer interfaces

2. **System Administration Tool**
- Allows SFMTA staff to interface with, configure and query the system

3. **Content Management System**
- Create and layout informational content that can be pushed out to customer interfaces

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# Temporary Service Changes



## Existing System
- Requires significant preparation and lead time to communicate temporary service changes
- Existing system limited to text messages

## Next Generation System
- Provide more flexibility for pre-planned and unplanned service changes
- Can archive templates for common (e.g., closing Market Street) and large-scale disruptions (e.g., Bay to Breakers) for future use
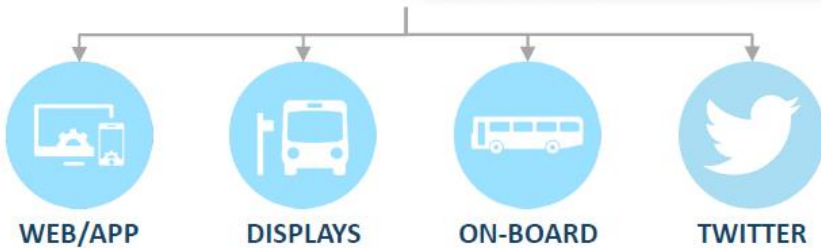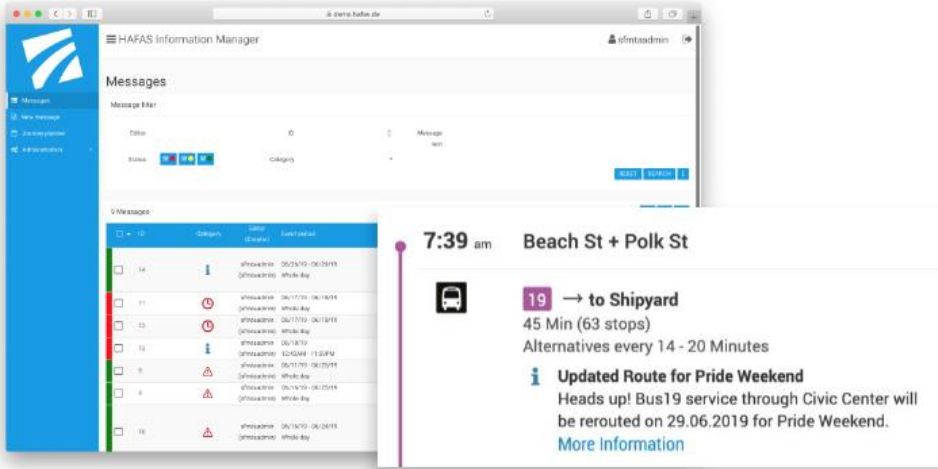
# Element 2: Stationary Digital Signage

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

1. **Powered Shelter Signage**
- Replace ~850 existing LED signs at powered shelters

2. **Powered Signage at Outdoor Rail Platforms**
- Replace ~50 existing LED signs at outdoor rail platforms

3. **Powered Signage at Underground Stations**
- Replace existing LCD signs at subway stations and install new LCD signs at Central Subway stations (~30 total)

4. **Alternatively-Powered Signage**
- New signs at unpowered locations

# Stationary Digital Signage



**Existing System**
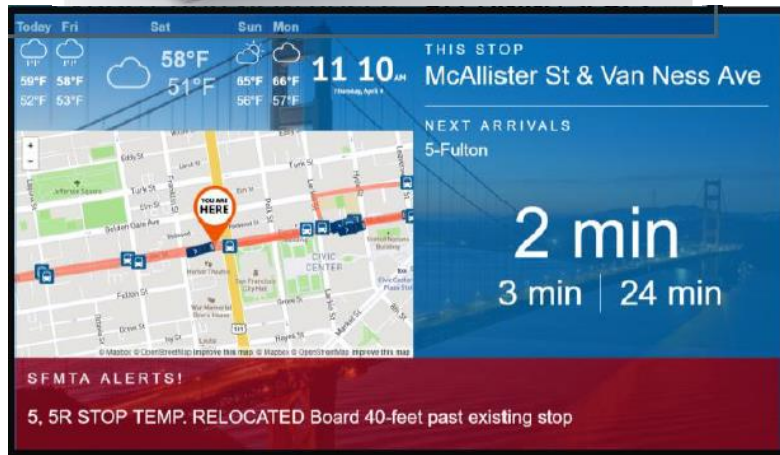Light Emitting Diode (LED) screens ▶





**Next Generation System**
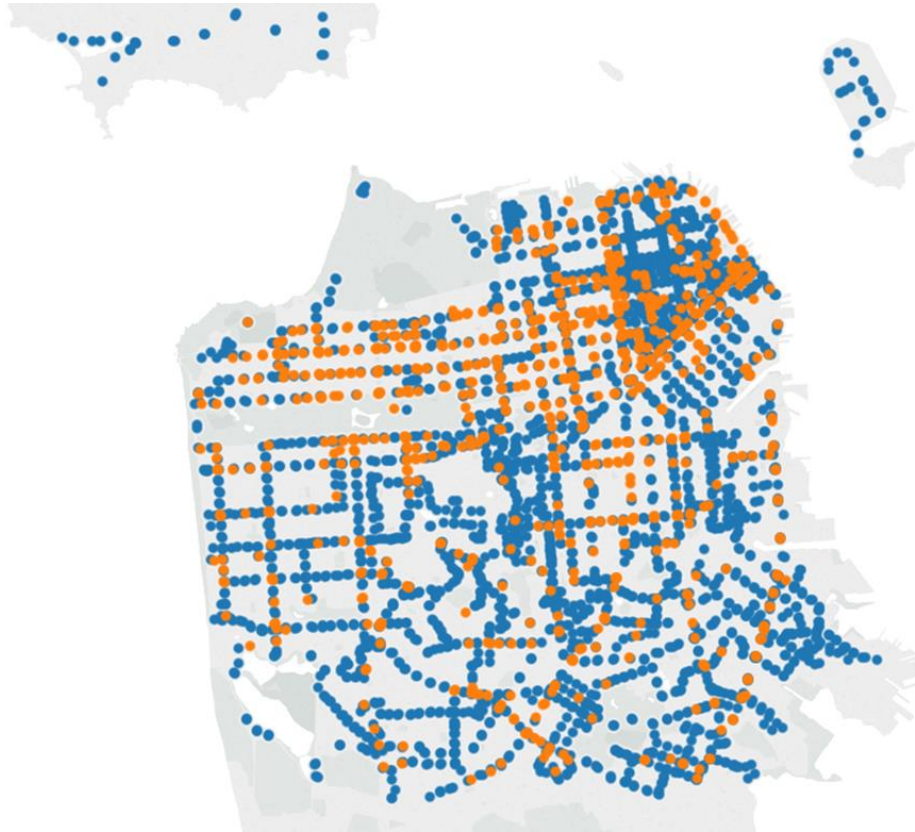Liquid Crystal Display (LCD) screens with ability to display:
- Graphics
- Maps with the real-time updates of approaching vehicles
- Maps with directions to nearby routes
- Letters and characters in other languages

Durable to the elements and resistant to vandalism

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# Expanding the Signage Network to Unpowered Stops



**Existing Powered Signage**
- Stop with Signage
- Stop without Signage



**Future Solar-Powered Signage**

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# Element 3: On-Board Digital Signage

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

2. **Text-to-Speech Functionality**
   - Enable customer information to be announced

3. **Integration with Future Signage Vendor**
   - Able to push content to a future vendor for display on on-board digital signage

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# Element 4: Mobile Platform & Website

## 1. Trip Planner
- Point-to-Point Directions, Next Vehicle Arrival Times
- Live Trip Tracking
- Enables customers to save trips and their profile at their discretion
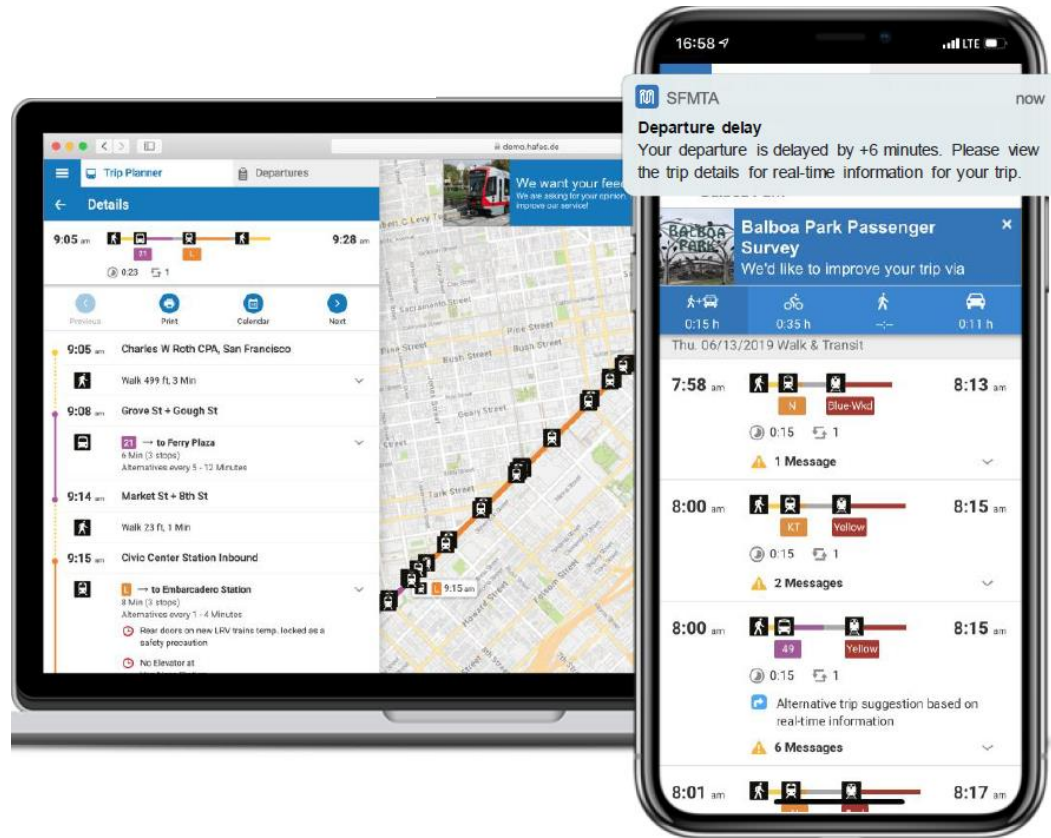- Configurable to customer preferences

## 2. Mobile App Integration
- Ensures a single MuniMobile app that manages current mobile ticketing and provides trip planning functionality
- Facilitates two-way communications with customers

## 3. Website Integration
- Integrate trip planning functionality into SFMTA website

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# Mobile Platform & Website



- Trip planner automatically accommodates real-time service changes
- Can display other transportation options
- Opportunity to keep customers informed throughout their journey and receive feedback

# 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 assist to improve service quality and reliability to enhance the customer experience
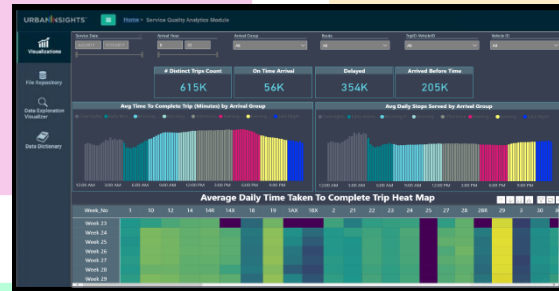
# Analytics

## 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
- Fare Affordability
- Unserved or Underserved Travel Needs

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# Accessibility Features

**System Software**
- Indicate any accessibility limitations at stops
- Indicate any accessibility limitations of vehicles
- Indicate any planned or real-time elevator and escalator outages

**Stationary Digital Signage**
- LCD screens accommodate larger text
- Push-to-talk

**On-Board Digital Signage**
- Indicates any accessibility limitations at upcoming transit stops and for 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

# System Features

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

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# Questions?

**SFMTA**