AGENDA
SPECIAL MEETING / BOARD STUDY SESSION
SAN MATEO COUNTY TRANSIT DISTRICT BOARD

Due to COVID-19, this meeting will be conducted via teleconference only (no physical location) pursuant to the Governor’s Executive Orders N-25-20 and N-29-20.

Directors, staff and the public may participate remotely via Zoom at https://samtrans.zoom.us/j/95636181237?pwd=aEtOanNhCU45R25qb3IUYmVnQU5udz09 or by entering Webinar ID: 956 3618 1237, Passcode: 146287 in the Zoom app for audio/visual capability or by calling 1-669-900-9128 (enter webinar ID and press # when prompted for participant ID) for audio only. The video live stream will be available after the meeting at http://www.samtrans.com/about/boardofdirectors/video.html.

Public Comments: Members of the public are encouraged to participate remotely. Public comments may be submitted to publiccomment@samtrans.com prior to the meeting’s call to order so that they can be sent to the Board as soon as possible, while those received during or after an agenda item is heard will be included into the Board’s weekly correspondence and posted online at: http://www.samtrans.com/about/boardofdirectors/Board_of_Directors_Calendar.html

Oral public comments will also be accepted during the meeting through Zoom* or the teleconference number listed above. Public comments on individual agenda items are limited to one per person PER AGENDA ITEM. Use the Raise Hand feature to request to speak. For participants calling in, dial *67 if you do not want your telephone number to appear on the live broadcast. Callers may dial *9 to use the Raise Hand feature for public comment. Each commenter will be recognized to speak and callers should dial *6 to unmute themselves when recognized to speak for two minutes or less. The Board and Committee Chairs have the discretion to manage the Public Comment process in a manner that achieves the purpose of public communication and assures the orderly conduct of the meeting.

OCTOBER 12, 2020
9:00 am – 12:30 pm

1. Call to Order/Pledge of Allegiance/Roll Call

2. Public Comment
   Comments by each individual speaker shall be limited to two (2) minutes. Items raised that require a response will be deferred for staff reply.

3. Reimagine SamTrans

Note: All items appearing on the agenda are subject to action by the Board. Staff recommendations are subject to change by the Board.
Break at 10:40 am

4. Innovative Clean Transit

5. Adjourn
INFORMATION FOR THE PUBLIC

If you have questions on the agenda, please contact the District Secretary at 650-508-6242. Agendas are available on the SamTrans website at. Communications to the Board of Directors can be emailed to board@samtrans.com.

Free translation is available; Para traducción llama al 1.800.660.4287; 如需翻译 请电1.800.660.4287

Date and Time of Board and Citizens Advisory Committee Meetings
San Mateo County Transit District Committees and Board: First Wednesday of the month, 2:00 pm; SamTrans Citizens Advisory Committee (CAC): Last Wednesday of the month, 6:30 pm. Date, time and location of meetings may be changed as necessary. Meeting schedules for the Board and CAC are available on the website.

Location of Meeting
Due to COVID-19, the meeting will only be via teleconference as per the information provided at the top of the agenda. The Public may not attend this meeting in person.

*Should Zoom not be operational, please check online at http://www.samtrans.com/about/boardofdirectors/Board_of_Directors_Calendar.html for any updates or further instruction.

Public Comment
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Accessible Public Meetings/Translation
Upon request, SamTrans will provide for written agenda materials in appropriate alternative formats, or disability-related modification or accommodation, including auxiliary aids or services, to enable individuals with disabilities to participate in and provide comments at/related to public meetings. Please submit a request, including your name, phone number and/or email address, and a description of the modification, accommodation, auxiliary aid, service or alternative format requested at least at least 72 hours in advance of the meeting or hearing. Please direct requests for disability-related modification and/or interpreter services to the Title VI Administrator at San Mateo County Transit District, 1250 San Carlos Avenue, San Carlos, CA 94070-1306; or email titlevi@samtrans.com; or request by phone at 650-622-7864 or TTY 650-508-6448.

Availability of Public Records
All public records relating to an open session item on this agenda that are not exempt from disclosure pursuant to the California Public Records Act and that are distributed to a majority of the legislative body will be available for public inspection at 1250 San Carlos Avenue, San Carlos, CA 94070 at the same time that the public records are distributed or made available to the legislative body.
The Board will gather virtually on October 12, 2020 for a workshop so staff can update you and get your valuable input as we resume the Reimagine SamTrans project. During this agenda item, we will seek to fulfill the following objectives:

- Update you on the state of SamTrans before and during the Covid-19 pandemic, including the challenges and opportunities looking ahead
- Receive policy guidance from you on how we want to define effectiveness, how we should use our values and priorities to balance demands for our resources
- Establish a set of shared assumptions for managing ongoing uncertainty

Importantly, at the end of this workshop, we’re going to ask you to help us develop good policy on balancing priorities as we move forward over the next 90 days with designing our bus network alternatives.

The presentation slides for next week’s workshop can be found as Attachment A, beginning on Page 6 of this PDF. We will follow-up with you separately regarding technology we will ask you to use to participate in a ranking exercise during the workshop.

**Our Approach to Managing Uncertainty & Responding to Change**

Moving forward, the Reimagine SamTrans project must establish a set of working assumptions for a new target implementation date of **August 2022**. Likewise, we must continue to monitor and build in flexibility for a set of “known unknowns.”

What conditions can we reasonably assume will be in place at implementation?

- Vaccine (or other health solution) in place & riders feel physically safe on transit
- The max loads on SamTrans buses have returned to pre-Covid levels
- Schools (K-12 and colleges) have returned to full-time in-person learning
- Core local bus network still essential to those who use it
- Revenue and available bus operators at least in line with FY19-20 levels
- Fleet is fully connected via cellular
What conditions do we need to continue to track closely?
- Remote working trends
- Development trends
- Ridership by trip purpose and time of day
- Regional trip-making patterns and regional connectivity (e.g., relationship with future Caltrain)
- Major infrastructure projects (e.g., express lanes) & technology advances
- Funding levels (e.g., sales tax) and bus operator levels as they relate to the opportunity to grow our system

Public Input and Market Research Findings
To ensure we have time for robust discussion with you during the workshop, findings from the project’s extensive public outreach and market research process have been included as an attachment to this cover letter for your background reading and will not be discussed in complete detail during the workshop. Please see Attachment B of this PDF (page 55).

In Fall 2019, the Reimagine SamTrans project undertook a three-pronged public outreach and feedback campaign:
- Public outreach, in the form of dozens of in-person events, tabling, bus stop engagement, and a community survey which garnered more than 2,700 responses.
- Market research, which included three focus groups and a statistically-significant survey which reached more than 1,800 San Mateo County residents.
- Bus operator outreach, in the form of on-site tabling events and a bus operator survey which generated more than 50 survey responses and 120 comments.

Key Themes and Takeaways:
- In focus groups and on surveys, riders made positive mention of the speed of the new FCX route, safety and cleanliness of vehicles, and an overall appreciation for SamTrans.
- Top areas for improvement include:
  - Frequency, connections to rail, and real-time information (among riders)
  - Real-time information, faster routes, and connections to rail (non-riders)
- Significant overlap exists in the desires and interests of riders and non-riders.
  Riders and non-rider groups expressed desire for:
  - Faster buses, even if it means more walking between stops
  - Real-time information
  - Connections to regional rail services
- Riders, more than non-riders, are seeking more off-peak service, such as in the midday, and more frequent service on major streets and key routes.

Prepared by: Christy Wegener, Director of Planning, and Millie Tolleson, Principal Planner
Resuming Reimagine SamTrans:
Where we’ve been and where we’re going

SamTrans Board of Directors Workshop

October 12, 2020
Agenda

- Project Goals, timeline and assumptions
- State of SamTrans
- Service Policy Framework
  - Trade-offs and public input
  - Proposed guiding principles
- Envisioning a Future SamTrans
- Looking Ahead
Objectives of Today's Meeting

- Update you on:
  - State of SamTrans before and during Covid-19
  - Challenges and opportunities we have now
  - The resilience of the underlying SamTrans rider market

- Receive policy guidance on:
  - What our priorities are and how we define effectiveness
  - Balancing demands for our resources

- At the conclusion of this workshop, Board members will be asked to provide input on resource allocation and service priorities to guide next steps in designing our bus network.
Introduction of the Project Team

SamTrans

- Christy Wegener, Director of Planning
- Millie Tolleson, Principal Planner

Nelson\Nygaard

- Thomas Wittmann, Principal
Project Background (10 min)

- Goals
- Updated project timeline
- Working assumptions and managing unknowns
The goals of Reimagine SamTrans are to …

- Improve the experience for existing SamTrans customers
- Grow new and more frequent ridership on SamTrans
- Build SamTrans’ efficiency and effectiveness as a mobility provider
Updated Project Timeline

Jun – Oct 2019
Existing Conditions
Market Research

Sept – Nov 2019
Phase One Outreach
ECR Analysis

Dec 2019 – Mar 2020
Service Standards
Service Framework and
Policy Guidance

Mar 2020 – Sept 2020
Project Paused for
Acute Covid-19
Planning/Response

May 2021 – July 2021
Preferred Alternative Development
Phasing Plan

Mar 2021 – April 2021
Phase Two Outreach

Dec 2020 – Feb 2021
Alternatives Development

Sept 2020-Nov 2020
Framework for Advancing Project
Service Policy Framework

Aug 2021 – Sept 2021
Phase 3 Outreach

Oct 2021 – Jan 2022
Public Comment Period,
Public Hearing, Title VI
Analysis

Feb 2022
Board Action on Service Plan

August 2022
Implementation
Principles for Resuming Reimagine

Existing conditions
How does SamTrans perform?

Public outreach
What are the community’s priorities for SamTrans?

Market research
What are rider and non-rider perceptions and desires?

COVID-19 has implications for many elements

- Ridership
- Economy
- Travel patterns
- Bus operations
- Health and safety
- Recruitment
- Revenue streams
- Equity
- Perceptions
Baseline Assumptions

What conditions can we reasonably assume when we implement in August 2022?

- Vaccine in place and riders feel physically safe on transit
- Max loads on buses back to pre-Covid-19 levels
- Schools (K-12 and community colleges) have returned to full-time in-person learning
- Core local bus network still essential to those who use it
- Revenue and available bus operators at least in line with FY19-20 levels
- Fleet is fully connected via cellular
Managing Unknowns

What conditions do we need to continue to track closely?
• Remote working trends
• Development trends
• Ridership by trip purpose and time of day
• Regional trip-making patterns and regional connectivity (relationship with future Caltrain)
• Major infrastructure projects (e.g., express lanes) & technology advances
• Funding levels (e.g., sales tax) and bus operator levels
State of SamTrans (10 min)

- Prior to Covid-19 and during Covid-19
- Ridership, reliability, service allocation
Strongest Ridership Pre-Covid-19

- ECR corridor
- North County communities
- South County transfer points, such as Redwood City Transit Center
Covid-19 Ridership Comparison

Average Weekday Ridership

February

August

Average Weekday Ridership

≤10 ≤100 ≤1,000 ≤2,000 SamTrans Route
Ridership by Time of Day

SamTrans Ridership Distribution

Source: SamTrans APC Data

Aug-19  Aug-20
Transfers

- Understanding how passengers use the system is critical to the system redesign
- Nearly half of SamTrans riders transfer to another bus or rail line to complete their trip (pre-Covid)
  - 19% transfer to another SamTrans bus
Service Reliability

- Pre-Covid-19, many routes suffered from unreliability due to traffic congestion
- In March-May 2020, on-time performance exceeded 85% goal
- Real time information is not always available or reliable
  - Late buses feel 4x longer to customers when waiting at a stop without shelter or bench
Existing Service Allocation

Some of our route categories require a larger share of peak period buses than proportion of ridership generated, some smaller share.
Existing Conditions and Covid-19 Impacts

- Opportunities exist to improve efficiency and customer satisfaction
- White collar and tech markets have changed, but core market of SamTrans remains unchanged
- Opportunities to capitalize on travel time savings
- Combined loss of ridership generated by K-12 and community colleges is substantial
- Today's riders should be strong focus of future service improvements and investments
Service Policy Framework (45 min)

- Revisiting project goals
- Components of a service policy framework
- Public input on planning trade-offs
- Draft guiding principles
Revisiting Our Project Goals

The goals of Reimagine SamTrans are to...

- Improve the experience for existing SamTrans customers
- Grow new and more frequent ridership on SamTrans
- Build SamTrans' efficiency and effectiveness as a mobility provider

How does Covid-19 impact our project purpose?

More important than ever

New is harder than before — uncertainty around this market

More frequent still possible

More important to be efficient and effective with resources — has effectiveness changed?

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Components of a Service Policy Framework

- High level principles feed into more specific guidelines for:
  - how routes are designed
  - how resources are allocated (service quality and service levels)
  - how we measure success (service standards/metrics)

Guiding Principles
- What objectives we are trying to achieve
- Purpose transit serves

Service Design Guidelines
- Statements of service design, such as "routes should be simple and consistent"

Service Allocation Guidelines
- Guidelines for headways, service span, etc

Service Standards / Metrics
- Metrics for ongoing evaluation, such as boardings per service hour
Why Adopt a Service Policy Framework?

- Sets the values and principles from which we make decisions
- Supports staff in making day-to-day decisions and in emergency or crisis response
- Consistency and Board-approved rationale for how decisions are applied to each route or community
- Rooted in best practices and reflective of community input
Service Planning Trade-Offs

**FREQUENCY AND SPAN**
- **Provide more frequent service for a shorter time**
- **Provide less frequent service for a longer time**

**COVERAGE**
- **Provide less frequent service to more areas**
- **Provide more frequent service to fewer areas**

**DAYS OF SERVICE**
- **Provide less weekday service and more weekend service**
- **Provide more weekday service and less weekend service**

**TRANSFERS**
- **Provide more routes with less frequent service but fewer transfers**
- **Provide fewer routes with more frequent service but more transfers**

**DIRECTNESS**
- **Provide slower and less direct service with shorter walks to stops**
- **Provide faster, more direct service with longer walks to stops**

**STOP SPACING**
- **Serve many stops that make service slower but reduce walking distance**
- **Serve fewer stops to speed service up but increase walking distance**

**SERVICE TYPE**
- **Improve the local bus network**
- **Improve the commuter bus network**

**SERVICE DISTRIBUTION**
- **Provide service in areas in proportion to funding**
- **Provide service to areas with the most need**

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Tradeoff: Coverage vs. Frequency

Survey says: Riders want more frequent service on major streets, while non-riders want service to more places.
Tradeoff: Peak vs. Off Peak Service

Survey says: Riders more likely to want more service outside of peak periods, in the midday or later in the evening.
Tradeoff: Improvement vs. Expansion

Survey says: Riders want the existing system improved; non-riders more interested in expanded options, such as express.

Expanding the bus system to go more places or provide different types of bus services, like express.

- All Respondents: 46%
- Riders: 36%
- Non-Riders: 58%

Improving existing routes by addressing late buses and adding things like real-time information and better amenities at stops.

- All Respondents: 54%
- Riders: 64%
- Non-Riders: 42%
Survey says: Riders and non-riders both want faster buses, even if it means more walking to stops.
Tradeoff: One-Seat Ride vs. Transfer

Survey says: Riders and non-riders both preferred frequent and direct routes that may necessitate a transfer.

Coverage: Bus routes are not frequent or direct, but provide stops very close to the starting point and ending point of your trip.

- All Respondents: 38%
- Riders: 37%
- Non-Riders: 40%

Frequency: Bus routes are direct and frequent but may require a transfer to another SamTrans route to complete your trip.

- All Respondents: 62%
- Riders: 63%
- Non-Riders: 60%
Proposed Guiding Principles

- Employ **customer-focused** decision-making
- Design service that can be reasonably delivered by our **workforce**
- Be an **effective** mobility provider
- Provide transportation services that support principles of social **equity**
Proposed Guiding Principles

Employ **customer-focused** decision-making.

- Enhance customer safety, security and comfort.
- Routes should be simple and easy to understand.
- Conduct transparent and empowering community engagement.
- Adopt new tools and technologies that improve customer experience.
Proposed Guiding Principles

Design service that can be reasonably delivered by our workforce.

- Support the recruitment and retention of our workforce.
- Prioritize providing a “feedback loop” for the workforce, letting them know the ways in which their feedback was utilized.
Proposed Guiding Principles

Be an **effective** mobility provider.

- Build ridership.
- Provide fast or time-competitive bus transportation.
- Provide reliable bus transportation.
- Integrate into the larger county and regional transportation network.
- Expand services to accommodate new transit markets.
- Utilize public funds responsibly and efficiently.
Proposed Guiding Principles

Provide transportation that supports principles of social **equity**.

- Direct resources to provide high-quality service in communities with greatest transportation disparities and mobility needs.
- Prioritize communities with transit supportive factors: low-income, zero car households, ethnic and racial minorities, and population density.
- Support access to jobs and workforce development opportunities.
What is Transportation Equity?

- An equitable transit system engages and serves its core ridership—the most vulnerable populations taking essential trips—with affordable, reliable, environmentally sustainable and high-quality service they desire, and connects all riders to opportunities so they can thrive and prosper.

- Data-wise, race is often the greatest indicator and predictor of outcomes and disparities.
People need and want social connectivity and quality of life.

Transportation equity is environmentally sustainable.

Access to transportation is largest predictor of ability to move out of poverty.

I need SamTrans to visit my mother and see friends.

My bus reduces how often I use my family’s car.

The bus helps me access job opportunities.
Elements of Transit Equity

Processes

- Policies
- Engagement
- Investments

Outcomes

- Access
- Opportunity

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Case Study: SF Muni Equity Strategy

Ensure equity neighborhoods see equal or better service improvements within the context of the entire system.

Approach:
1. Identify top 2-3 needs based on data analysis and community outreach
2. Tailor strategies to address key needs
3. Identify funding needs for 2-yr budgets
4. Monitor yearly progress with annual report

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SamTrans Equity Indicators

Census Tracts evaluated for:

- Non-white households
- Low-income households
  (<$75,000 for family of 3)
- Zero-vehicle households

SamTrans currently provides all-day service in many census tracts with equity need indicators.
Transit Use Likelihood Index

Areas of high transit propensity:
- Daly City
- South San Francisco
- San Bruno
- San Mateo
- Foster City
- Redwood City
- East Palo Alto
- Other smaller pockets along ECR corridor

Factors:
- Population density
- Zero car households
- Low income households
- Racial and ethnic minorities
- Age (youth and seniors)
Discussion | Guiding Principles

- Anything to add or modify on the proposed four guiding principles (customer, workforce, effectiveness, and equity)?
- Are the proposed equity indicators (non-white, low-income, and zero vehicles) right for SamTrans?
- In the context of health, economic and social crises, might we broaden our definition of effectiveness beyond ridership and productivity?
  - Supply and quality of service to "essential riders"
  - Level of service to equity need and transit supportive areas
  - Transit travel times
  - On-time performance
Envisioning a Future SamTrans (25 min)

- Themes of recent successful COAs
- Exercise: Ranking Priorities
- Discussion:
  - How should we distribute our resources?
  - What does success look like?
Themes of Recent Successful COAs

- Added resources where the riders are (and removed service where they’re not)
- Seven-day-a-week frequent network
- Improved route directness and speeds (serve arterials, not neighborhood streets)
- Prioritized bus speed/reliability through infrastructure
- Partnerships with employers / schools
- Innovative solutions for low density areas / lower demand times
- Match service plan to resources available
How do we allocate resources?

- More lines on the map (more coverage)
- More ridership (more frequency on productive routes in transit supportive areas)
- More service to those who need it most (equity need areas)

...Or most likely, some combination of these

What would this mean?

- Baseline service on routes that aren't productive
- Double down on productive routes, like the ECR and Route 120
- Improve frequency on Route 280
Ranking Priorities

Rank the relative importance of potential priorities

- Geographic coverage / balance
- Productivity and ridership
- Access to major destinations
- Service to low-income and non-white populations
- Access to jobs
- Express service
- Addressing reliability and on-time performance
- Service to schools
Discussion | Ranking Priorities

Ranking the relative importance of potential priorities

- Are there any surprises?

- Do these results match your thoughts? What's different?
Looking Ahead (5 min)

- Network alternatives
- Upcoming schedule milestones
Network Alternatives

- To be developed by staff Nov 2020-Feb 2021
- Incorporate lessons learned from Covid-19 core fixed route network
- Alternatives will be nimble to respond to trends and demand
- Alternatives will be constrained to FY20 resources
  - May include growth scenarios for phased implementations
Looking Ahead

- **December 2020**
  - Final Service Policy Framework, including service design guidelines and standards

- **January 2021 (ad-hoc committee)**
  - Comment on draft network alternatives

- **March/April 2021**
  - Public outreach phase 2 on network alternatives
  - Planning Covid-friendly outreach, leaning heavily on digital engagement
Final Questions/Discussion
Reimagine SamTrans
Board of Directors Workshop

Background Materials:
Market Research & Public Outreach

October 12, 2020
Market Research

- Three focus groups held (rider English, non-rider English, rider/non-rider Spanish)
- Countywide Transportation Survey (statistically-significant)
  - Survey closed, 1,883 responses received
  - 10% ride SamTrans weekly, 9% monthly
    - 10% use Uber/Lyft once a week
  - 83% drive car BUT 62% would like to drive less and 67% say it’s the most stressful thing they do all day
  - 70% said bus takes too long and 68% said it’s not flexible enough
There is a significant increase in negative ratings of travel in the area. A fifth of residents rate their local travel experience as “poor,” compared to only 5% in 2014. Frequent SamTrans users are more likely to rate their travel experience positively than residents in general, although their positive rating over time has followed the overall downward trend.

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<thead>
<tr>
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<th>Excellent/Good</th>
<th>Not sure</th>
<th>Only Fair/Poor</th>
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<tbody>
<tr>
<td><strong>Overall</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2019</td>
<td>43%</td>
<td>56%</td>
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</tr>
<tr>
<td>2014</td>
<td>69%</td>
<td>0%</td>
<td>30%</td>
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<tr>
<td><strong>Frequent SamTrans Riders</strong> (n=154)</td>
<td></td>
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<tr>
<td>2019</td>
<td>64%</td>
<td>0%</td>
<td>36%</td>
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<tr>
<td>2014</td>
<td>72%</td>
<td>1%</td>
<td>27%</td>
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Millennial men are the most likely age/gender group to use transit frequently. Millennial women, Gen X men and women, and Baby Boomer men use transit with similar frequencies. Hispanic residents are more likely to use transit frequently, as are residents in the Northern part of the county.
This segmentation is based on cluster analysis of the transportation attitudes and barriers batteries and is further defined on the following slide.

**Likely Current Transit Riders:** Are already using public transit, or are already inclined to use public transit.

**Yearning for New Options:** Have a push factor (would love to drive less) towards transit but see structural barriers to taking it, like the speed of transit and the flexibility of schedules.

**Transit-Supportive Driver:** Like the idea of public transit in general, but would not take it themselves, despite not liking traffic. They see both structural barriers (speed, flexibility) and societal ones (safety on bus, bus isn’t for them).

**Drivers with Inertia:** Don’t mind driving and like having access to a car, but do not see barriers towards taking transit. They are less likely than Transit-Supportive Drivers to say they want to drive less.

**Lost and Disengaged:** Have contradictory attitudes towards transit and driving.

**Drivers Forever:** Do not value public transit, and are most likely to have pro-car attitudes.

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Likely Current Transit Riders</td>
<td>15%</td>
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<tr>
<td>Yearning for New Options</td>
<td>21%</td>
</tr>
<tr>
<td>Transit-Supportive Driver</td>
<td>22%</td>
</tr>
<tr>
<td>Drivers with Inertia</td>
<td>22%</td>
</tr>
<tr>
<td>Lost and Disengaged</td>
<td>5%</td>
</tr>
<tr>
<td>Drivers Forever</td>
<td>14%</td>
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### Service Changes by Select Rider Segments

Those who ride SamTrans monthly or more are most likely to prioritize improved connections, real-time bus tracking on an app, additional express service, and improved stop amenities. The Yearning for New Options group is most likely to prioritize dedicated bus infrastructure, improved connections, and reliable real-time bus location tracking.

<table>
<thead>
<tr>
<th>Service Change</th>
<th>Overall</th>
<th>Likely Current Transit Rider</th>
<th>Yearning for New Options</th>
<th>Transit-Supportive Driver</th>
<th>Drivers with Inertia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved connections to regional rail services such as Caltrain and BART</td>
<td>5.50</td>
<td>5.93</td>
<td>6.10</td>
<td>5.81</td>
<td>5.09</td>
</tr>
<tr>
<td>Reliable, real-time bus location tracking information, available on an app or online</td>
<td>5.36</td>
<td>5.92</td>
<td>5.68</td>
<td>5.60</td>
<td>5.21</td>
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<tr>
<td>Bus routes that make fewer stops in between key destinations for a faster trip</td>
<td>5.07</td>
<td>5.48</td>
<td>5.42</td>
<td>5.26</td>
<td>4.99</td>
</tr>
<tr>
<td>Dedicated bus infrastructure on major thoroughfares where buses have priority at intersections and passengers board from station platforms, enhancing the speed of service</td>
<td>5.01</td>
<td>5.39</td>
<td>5.71</td>
<td>5.13</td>
<td>4.73</td>
</tr>
<tr>
<td>On-demand vans or shuttles that can transport people within a defined geographic area and to and from centralized bus stops, transit centers, and train stations, available through a smartphone app</td>
<td>4.99</td>
<td>5.09</td>
<td>5.30</td>
<td>5.25</td>
<td>4.81</td>
</tr>
<tr>
<td>Additional express bus service between residential and employment centers</td>
<td>4.97</td>
<td>5.35</td>
<td>5.42</td>
<td>5.34</td>
<td>4.70</td>
</tr>
<tr>
<td>Improved bus stop amenities and features, such as real-time information screens and shelters with seating</td>
<td>4.87</td>
<td>5.46</td>
<td>5.01</td>
<td>5.09</td>
<td>4.73</td>
</tr>
<tr>
<td>A seamless payment and scheduling smartphone app that would call a ride-hail service to pick you up or drop you off from a transit stop or center</td>
<td>4.70</td>
<td>4.78</td>
<td>4.96</td>
<td>5.10</td>
<td>4.49</td>
</tr>
<tr>
<td>Shared or pool rides using ride-hail services like Lyft or Uber that are subsidized, or discounted, by SamTrans</td>
<td>4.35</td>
<td>4.49</td>
<td>4.56</td>
<td>4.79</td>
<td>4.30</td>
</tr>
<tr>
<td>Increased bike share availability at major bus stops, transit centers, and train stations</td>
<td>3.39</td>
<td>3.65</td>
<td>3.87</td>
<td>3.57</td>
<td>3.25</td>
</tr>
</tbody>
</table>
Two-thirds of respondents said they would go to a transit agency website for information on their area’s public transportation services. Three-fifths said they would go to non-transit agency specific app like Google Maps, Apple Maps, or Transit App.

Where would you go if you needed information about how to ride your area’s public transportation services? (Up to three responses accepted)

- Transit agency website: 67%
- A navigation app like Google Maps, Apple Maps, or Transit App: 59%
- An app directly from the transit agency: 34%
- Printed schedules: 21%
- Call the transit agency's customer service phone line: 7%
- Call or text 511: 6%
- Somewhere else: 3%
- Don't know: 2%
Statistical Survey Results – Travel Barriers

- I have a credit and/or debit card: Yes 98%, Not sure 2%, No 0%
- I have a current driver’s license: Yes 93%, Not sure 6%, No 0%
- I have access to a working motor vehicle: Yes 89%, Not sure 1%, No 11%
- I have a ride hall account: Yes 74%, Not sure 24%, No 25%
- I have a Clipper Card: Yes 59%, Not sure 14%, No 37%
- I have limited access to a data plan on my phone: Yes 22%, Not sure 3%, No 75%
- My ability to walk is limited: Yes 14%, Not sure 1%, No 85%
- I have a bike share and/or scooter share account: Yes 14%, Not sure 2%, No 85%
- I use a mobility aid in order to get around: Yes 5%, Not sure 1%, No 94%
Public Outreach: Events by the Numbers

- 19.. Bus stops/onboard pop ups
- 18.. Presentations to groups with varying interests: Youth, Labor, Business, Disability advocacy, environmental, more!
- 9… On-base bus operator outreaches: SamTrans and CUB
- 7… Community event/Community College pop ups
- 1… Virtual Town Hall (110+ views)

Total = 54
Responses by the Numbers

- 2,700+ public surveys completed
- 300+ dot exercise takers
- 1/3 of bus operators took operator specific survey
- Thousands of comments submitted through the survey, post it notes at events, emails, and in conversations with staff

samTrans
Direct Rider Communications

- 18 external (side of bus) ads
- 16 bus shelter ads
- On-board ads on all buses
- Take-one on every bus
- Digital scroll advertising
- SamTrans App push (2X)

All printed material in English, Spanish, and Simplified Chinese
Digital/Media Communications

Media:
- Paid and organic social media (English and Spanish)
- Radio (English and Mandarin)
- TV (Mandarin)
- Digital display ads (English)
- Print advertisements (English, Spanish and Simplified Chinese)
- Press release, SamTimes, SamTrans Blogs, Podcasts, and Newsletter

E-Blast:
- SAG/TAG networks
- 4,500+ engaged stakeholders
- 160+ school contacts
- 30+ senior group contacts
- 70+ Community Based Organizations/1 immigrant services organization list serve

Website:
- www.reimaginesamtrans.com
Prioritizing Investments

- Dot exercise asked: how should SamTrans invest in better bus service?
  - 10 choices, four dots
  - More than 380 people participated
  - Results vary by event location, time of day, audience
Public Outreach: Community Survey

- Community survey generated 2,700+ responses
  - 51% current riders, 49% non-riders/future riders

- Forced trade-off questions to help guide our decision-making
Tradeoff: Coverage vs. Productivity

Survey says: riders want more frequent service on major streets, while non-riders want service to more places.
Survey says: Riders more likely to want more service outside of peak periods, in the midday or later in the evening.

In the peak period on certain popular routes:
- All respondents: 46%
- Riders: 41%
- Non-Riders: 50%

Outside of the peak periods, such as early morning, midday, or later in the evening:
- All respondents: 54%
- Riders: 59%
- Non-Riders: 50%
Tradeoff: Improvement vs. Expansion

Survey says: Riders want the existing system improved; non-riders more interested in expanded options, such as express.

- Expanding the bus system to go more places or provide different types of bus services, like express:
  - All Respondents: 46%
  - Riders: 36%
  - Non-Riders: 58%

- Improving existing routes by addressing late buses and adding things like real-time information and better amenities at stops:
  - All Respondents: 54%
  - Riders: 64%
  - Non-Riders: 42%
Survey says: Riders and non-riders both want faster buses, even if it means more walking to stops.
Tradeoff: One Seat Ride vs. Transfer

Survey says: Riders and non-riders both preferred frequent and direct routes that may necessitate a transfer.

Coverage: Bus routes are not frequent or direct, but provide stops very close to the starting point and ending point of your trip.

- All Respondents: 38%
- Riders: 37%
- Non-Riders: 40%

Frequency: Bus routes are direct and frequent but may require a transfer to another SamTrans route to complete your trip.

- All Respondents: 62%
- Riders: 63%
- Non-Riders: 60%
Tradeoff: Equality vs. Equity

Survey says: Non-riders slightly prefer providing service to communities with most need

Evenly throughout the County
- All Respondents: 53%
- Riders: 57%
- Non-Riders: 48%

To the communities with the most socioeconomic need
- All Respondents: 47%
- Riders: 43%
- Non-Riders: 52%
Tradeoff Summary

- **Service Tradeoffs**
  - Preferences for faster buses with longer distance between stops
  - Preference for direct routes even if a transfer is needed
  - Rider v. Non-Rider differences
    - Improve existing system (rider) v. expand to new places (non-rider)
    - More off peak service (rider) v. peak service (non-rider)

- **Service Improvements Requested**
  - Better connection to other transit (BART / Caltrain)
  - Faster bus services (limited stop routes, bus priority)
  - Better real-time arrival information
Bus Operator Outreach

- Held listening sessions at all bases
  - Three on-site events at both North Base and South Base
  - One on-site event at CUB bases in SF and Redwood City

- More than 50 surveys & 120 comments collected

- Feedback loop is important – we are triaging operator comments by when they can be addressed:
  - near-term/before 2021
  - with Reimagine implementation/2021
  - longer-term ideas/need separate exploration
Bus Operator Outreach

What we heard:

Operator Comment Breakdown

- Layover/breaks: 39%
- Passenger comments: 13%
- Road/route/congestion issues: 16%
- Safety/vehicle issues: 12%
- General service comments: 19%

Words associated with comments:
Innovative Clean Transit (ICT) Strategy
October 12, 2020

Board Workshop Item #4
Agenda

- ICT – Background
- Climate Adaptation and Resilience Planning
- Hydrogen Fuel Cell vs Battery Electric
- Peer Agencies’ Experiences with ZE
- Implementation Strategies
- Life-cycle costs of the options and funding requirements
- Board Comments and Recommendations (Next Steps)
ZERO EMISSION BACKGROUND AND ICT REGULATION
ZERO Emission Background

- State of California goal to have zero emission transportation by 2040
- District zero emission initiatives since late 1990’s
  - Installed (264) PM (particulate matter) traps (2002-2004)
  - Partnership with VTA (3) fuel cell buses (2004-2006)
  - ZEBA (zero emission bay area) Partnership with AC Transit, VTA, SFMTA, and Golden Gate; (12) hydrogen-hybrid fuel cell buses (2007-2016)
ICT Background


- CARB’s - Fleet Rule for Transit Agencies. The regulation that required all public transit agencies to gradually transition to a 100 percent zero-emission bus fleet.

- The Fleet Rule was substituted in Dec 2018 with Innovative Clean Transit (ICT) Regulation – established the (incremental) approach to 100 percent zero-emission fleet by 2040.
The ICT regulation includes the following:

- A ZEB Rollout Plan; approved by its Board, agencies have to submit their Rollout Plan by January, 2021
- ZEB purchases with various exemptions and compliance options to provide safeguards and flexibility to transit agencies;
- Low NOx engine purchases, unless the transit buses are dispatched from NOx Exempt areas;
- Use of renewable diesel or renewable natural gas for large transit agencies, and
- Reporting and record keeping requirements.
ICT

- Innovative Clean Transit (ICT) Roll-out Plan elements
  - Sec. A: Transit Agency Information
  - Sec. B: Rollout Plan General Information
  - Sec. C: Technology Portfolio
  - Sec. D: Current Bus Fleet Composition and Future Bus Purchases
  - Sec. E: Facilities and Infrastructure Modifications
  - Sec. F: Providing Service in Disadvantaged Communities
  - Sec. G: Workforce Training
  - Sec. H: Potential Funding Sources
  - Sec. I: Start-up and Scale-up Challenges
CLIMATE ADOPTION AND RESILIENCE PLANNING
Climate Adaptation and Resilience Planning

- Study currently underway to determine the likely climate impacts to SamTrans facilities.

- In the **likely climate scenario**, where sea level could rise approximately a foot in the Bay Area, both Bases would require some type of hardening by 2050, described in the following slides.

- To prepare for the **less likely but more severe scenario**, additional hardening would likely be required.

- Study will be complete in early 2021 and the Board will receive a briefing on findings and recommendations.
North Base- 2050 Likely Scenario

- Portion of access road could be permanently flooded up to ~1 foot by 2050
- Parts of North Base may could be temporarily flooded up to 3 feet
- A levee is an alternative studied by HDR as a solution to erosion issues at North Base. This option is currently under consideration by staff. Though meant to address erosion at North Base, a horizontal levy would probably secure North Base through the 2050 likely scenario, though the access road would still need to be addressed
- SFO, is in the process of planning a seawall and levee for its property, participates on the SamTrans study’s external advisory team. Our organizations are coordinating as planning proceeds to address the access road between the two properties which both entities rely upon for access.
North Base 2050 Flooding Scenarios

Extent of flooding during 100-year storm event under baseline, mid-level and high-end scenarios
South Base – 2050 Likely Scenario

- South Base is protected by the existing Redwood City levee.
- During storms South Base could experience temporary flooding by 2030 from water overtopping Phelps Slough, a small waterway just north of South Base.
- Phelps Slough is in the County’s right of way and will require a solution led by the County to prevent its flooding from disrupting South Base operations.
Flooding at South Base under the 2050 likely scenario is anticipated as a result of a 100-year rainfall event, which would overtop Phelps Slough.
Hydrogen Electric vs. Battery Electric

- Cost for a Hydrogen Fuel Cell Bus (FCEB) is approximately $200,000 more than a Battery Electric Bus (BEB).
- Costs for supporting charging/fueling infrastructure of BEBs are higher than for FCEBs; however, there is a significant need for additional real estate, power, and water to process/reform hydrogen.
- Hydrogen fueling facilities are more complex; FCEBs are more complicated since they have two separate major components (hydrogen and battery storage).
- Based on 170 buses (about ½ of SamTrans fleet), the cost for charging BEBs was estimated at $2.1 million per year, transported liquid hydrogen at $4.3 million per year, and on-site hydrogen generation at $2.7 million per year.
Hydrogen Electric vs. Battery Electric

- FCEB have greater range than BEBs (approx. 300 vs. 150 miles/tank or charge)
- FCEB will have a higher learning curve for staff and first responders
- Hydrogen is projected to have higher vehicle maintenance and fueling facility costs.
- Fuel costs are not stable (low volume)
Hydrogen Fueling Footprint (FCEBs)

- Truck-in Hydrogen (~60 buses) 40’ X 85’
- Reforming Hydrogen – Phased (~110 buses) 235’ X 70’
- Reforming Hydrogen – Full Integration (~250 buses) 275’ X 140’

Hydrogen uses 2 to 3 times more physical space than electric charging stations; ~62 parking stalls vs. 28
Electric Charging Infrastructure (BEBs)

PREVIOUS TOTAL
= 272 BUSES

REDUCTION OF 24 BUSES
= 8.8% REDUCTION

VEHICLE COUNT

<table>
<thead>
<tr>
<th>TYPE</th>
<th>COUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>24' BUS</td>
<td>53</td>
</tr>
<tr>
<td>40' BUS</td>
<td>170</td>
</tr>
<tr>
<td>60' BUS</td>
<td>25</td>
</tr>
<tr>
<td>TOTAL</td>
<td>248</td>
</tr>
</tbody>
</table>
Electric Charging Infrastructure (BEBs)

CHARGER GROUPING
w/ TRANSFORMER
3 BUSES / 250Kw
CHARGER

GROUP OF 3
DISPENSERS
PEER AGENCIES’ EXPERIENCES WITH ZE
## Peer Agencies

<table>
<thead>
<tr>
<th>Bay Area / California</th>
<th>Southern California</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alameda Contra Costa Transit District (AC Transit)</td>
<td>City of Santa Monica (Big Blue Bus)</td>
</tr>
<tr>
<td>Central Contra Costa Transit Authority (County Connection)</td>
<td>Foothill Transit, Long Beach Transit (LBT)</td>
</tr>
<tr>
<td>Golden Gate/Marin Transit (GGT)</td>
<td>San Diego Metropolitan Transit System (MTS)</td>
</tr>
<tr>
<td>Santa Clara Valley Transportation Authority (VTA)</td>
<td>Santa Barbara Metropolitan Transit District (Santa Barbara MTD)</td>
</tr>
<tr>
<td>Sacramento Regional Transit District (SacRT),</td>
<td>Yolo County Transportation District (YoloBus)</td>
</tr>
<tr>
<td>San Joaquin Regional Transit District (RTD)</td>
<td>Antelope Valley Transit Authority (AVTA)</td>
</tr>
<tr>
<td></td>
<td>Los Angeles County Metropolitan Transportation Authority (LA Metro)</td>
</tr>
</tbody>
</table>
# Peer Agencies

<table>
<thead>
<tr>
<th>National</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional Transportation Commission of Washoe County (Reno RTC)</td>
<td>Regional Transportation District (RTD-Denver)</td>
</tr>
<tr>
<td>Duluth Transit Authority (DTA), Southeastern Pennsylvania</td>
<td>Transportation Authority (SEPTA)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Airports</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>San Francisco International Airport (SFO)</td>
<td>Norman Y. Mineta San Jose International Airport</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Canada</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Toronto Transit Commission (TTC)</td>
<td></td>
</tr>
</tbody>
</table>
## Peer Agencies ZEV Programs

<table>
<thead>
<tr>
<th>Agency Name</th>
<th>No. of ZEV</th>
<th>FCEB</th>
<th>BEB</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTA</td>
<td>10</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>AC Transit</td>
<td>28</td>
<td>22</td>
<td>5</td>
</tr>
<tr>
<td>County Connection</td>
<td>8</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>GGT/Marin</td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Sacramento RT</td>
<td>15</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>San Joaquin RTD</td>
<td>17</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>Foothill Transit</td>
<td>34</td>
<td></td>
<td>34</td>
</tr>
<tr>
<td>Long Beach Transit</td>
<td>10</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>San Diego MTS</td>
<td>6</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Santa Barbara MTD</td>
<td>14</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Yolo County Transp. District (YoloBus)</td>
<td>6</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Antelope Valley (AVTA)</td>
<td>49</td>
<td></td>
<td>49</td>
</tr>
<tr>
<td>LA Metro</td>
<td>4</td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>
Peer Agencies’ Experiences with ZE

- **Fleet Reliability**
  - New technology is not as robust as conventional buses
  - Down-time of ZE buses is longer (troubleshooting, parts availability)

- **Steep Learning Curve**
  - Despite training provided by the manufacturers, maintenance manuals are not fully developed and personnel require new skills sets

- **Higher Operating Costs**
  - Fuel costs and/or rates are higher than anticipated. Price guarantees and/or incentives have been removed
  - Cost of components (i.e. fuel cell, battery packs)
Peer Agencies’ Experiences with ZE

- **Infrastructure**
  - Unfunded mandate (small start-up – limiting number of ZEBs)
  - Challenges with charging equipment (reliability, not standardized)
  - Long lead-time (environmental, permits, construction, and testing)

- **Service Impacts**
  - Range limitations (BEBs), requires service changes inclusive of bus exchange, restricting routes, or adding en-route charging
  - Requires more personnel to operate and maintain ZE technology (infrastructure and buses)
ZEV Manufacturers

Build Your Dreams
GreenPower Motor Company
GILLIG Corporation
MOTOR COACH INDUSTRIES
NEW FLYER
PROterra
VANHOOL
IMPLEMENTATION STRATEGIES
IMPLEMENTATION STRATEGIES

- Zero Emission efforts
  - Purchased (10) Proterra BEB and charging infrastructure (2020)
  - Scheduled for purchase (7) BEB for express bus services (i.e. Palo Alto to SFO, 2023). These are expansion buses beyond the current fleet replacement
  - ZE Paratransit vehicles are scheduled to commence after 2026; based on vehicle reliability and availability. Fixed route bus infrastructure accounts for all new ZE paratransit vehicles
IMPLEMENTATION STRATEGIES

- **Option #1 – ICT Accelerated Compliance**
  - Vehicle replacements and infrastructure installation achieves full ICT compliance by 2038
  - Extends the life-cycle of the 2009 diesel subfleet up to 15-years
  - Purchase (50) diesel buses in 2023
  - Purchase (17) diesel buses and (21) BEBs in 2024
  - Purchase (34) diesel buses and (13) BEBs in 2025
  - Purchase (12) diesel buses and (13) BEBs in 2026
  - All future purchases, in 2027 and beyond will be 100% zero emission
IMPLEMENTATION STRATEGIES

- Option #1A– ICT Balanced Hybrid Accelerated Compliance
  - Vehicle replacements and infrastructure installation achieves full ICT compliance by 2038
  - Extends the life-cycle of the 2009 diesel subfleet up to 15-years
  - Purchase (15) diesel buses and (15) BEBs in 2023
  - Purchase (20) diesel buses and (20) BEBs in 2024
  - Purchase (25) diesel buses and (40) BEBs in 2025
  - Purchase (12) diesel buses and (13) BEBs in 2026
  - All future purchases, in 2027 and beyond will be 100% zero emission
IMPLEMENTATION STRATEGIES

- Option #2– ICT Advanced and Aggressive Compliance
  - Vehicle replacements and infrastructure installation achieves full compliance by 2034
  - No diesel purchases
  - Purchase (45) BEBs in 2023
  - Purchase (45) BEBs in 2024
  - Purchase (45) BEBs in 2025
  - Purchase (15) BEBs in 2026
  - All future purchases, in 2027 and beyond remain at zero emissions
## Option Comparisons

<table>
<thead>
<tr>
<th>Option</th>
<th>Option 1</th>
<th>Option 1A</th>
<th>Option 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early adoption of 100% zero emission (2034); maximum emission reduction</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>ICT compliance achieved by 2038 (initial blend of technologies)</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>ICT compliance achieved by 2038 (less ZEV initially)</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Allows for technology maturity and funding opportunities</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Less initial vehicle cost</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Allows bus manufacturers to meet demand</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Reduced impact to services due to power outage or fleet defect</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Generates Low Carbon Fuel Standard credits (LCFS) sooner</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
## Option Comparisons

<table>
<thead>
<tr>
<th>Option</th>
<th>Option 1</th>
<th>Option 1A</th>
<th>Option 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less infrastructure costs due to volume and less project phasing</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Reduced infrastructure costs due to industry product maturity</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Limited funds for infrastructure requires more up-front capital investments</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Allows for charging infrastructure and energy management systems to provide extended range and lower operating costs (fast charging)</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allows time for partnerships with BART and Caltrain for opportunity charging infrastructure</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Flexibility in a post COVID landscape (fleet make-up, Re-Imagine)</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
OPTIONS 1, 1A, and 2 - COSTS AND FUNDING REQUIREMENTS
Costs are shown thru 2049 for comparable purposes

Costs are in year of expenditure dollars
Funding Sources

- **Vehicle Funding**
  - FTA formula funding typically covers 80% of vehicle replacement costs
  - Roughly 5-10% of the cost can be covered by state formula funding
  - Remaining 10-15% of costs funded by SamTrans sales tax
  - Sufficient funds may not be available in the year needed and financing may be required

- **Infrastructure funding**
  - Few external fund sources currently available
  - Opportunities are over-subscribed and awards will be limited given all operators in California are seeking the same funding at similar times
Financing Assumptions

- 12 year debt term for vehicles, 20 year for infrastructure
- 5% interest on financing and 5% discount for NPVs
- Cash flows shown 25 years out after NB infrastructure expenditure

Information Not Included
- O&M costs for fleet/infrastructure. No disposition revenue
- Fuel or electricity costs or LCFS credits
- Photovoltaic infrastructure
Total Net Cash Flow by Year (in $ millions)

Option 1 -$80.2M to Option 2 in the first 15 years

Option 1 +$123.3M to Option 2 in the second 15 years

Option 1 +$52.8M to Option 2 in the last 13 years
Net Cash Flow by Year w/Existing Debt (in $ millions)

Option 1 is more expensive in aggregate dollars, but the lower NPV provides a structure combined w/debt that is more manageable.
<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Diesel Fleet</th>
<th>Option 2</th>
<th>Option 1a</th>
<th>Option 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Costs</td>
<td>$55.9</td>
<td>$86.9</td>
<td>$81.2</td>
<td>$78.3</td>
</tr>
<tr>
<td>Infrastructure Costs</td>
<td>0</td>
<td>217.7</td>
<td>209.3</td>
<td>222.9</td>
</tr>
<tr>
<td>NB/SB Infrastructure Costs</td>
<td>38.5</td>
<td>38.5</td>
<td>33.5</td>
<td>33.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$94.3</strong></td>
<td><strong>$343.2</strong></td>
<td><strong>$323.9</strong></td>
<td><strong>$334.7</strong></td>
</tr>
</tbody>
</table>

- The large initial cash outlay in Option 2 makes the strategy less favorable when discounted to a net present value.
Broader Financial Context

• Addressing organizational capacity and results of Reimagine SamTrans
• Expense growth outpaces revenue growth
• Funding of pension/OPEB liabilities
• Central administration building
• Volatility of sales tax revenue
• Existing debt is retired in FY34