



Solano County Transit

SOLTRANS PUBLIC ADVISORY COMMITTEE (PAC) AGENDA

Public Advisory Committee

5:30 PM,

Tuesday, August 29, 2023

Conference Room

1850 Broadway Street, Vallejo, CA 94589

Public Comment: Pursuant to the Brown Act, the public has an opportunity to speak on any matter on the agenda or, for matters not on the agenda, issues within the subject matter jurisdiction of the agency. Comments are limited to no more than 3 minutes per speaker unless modified by the Board Chair, Gov't Code § 54954.3(a). By law, no action may be taken on any item raised during the public comment period although informational answers to questions may be given and matters may be referred to staff for placement on a future agenda of the agency.

Americans with Disabilities Act (ADA): This agenda is available upon request in alternative formats to persons with a disability, as required by the ADA of 1990 (42 U.S.C. §12132) and the Ralph M. Brown Act (Cal. Govt. Code §54954.2). Persons requesting a disability related modification or accommodation should contact Suzanne Reyes, Transit Board Administrator/Office Manager, at (707) 736-6993 during regular business hours at least 72 hours prior to the time of the meeting.

Staff Reports: Staff reports are available for inspection at the SolTrans office, during regular business hours, 8:00 a.m. to 5:00 p.m., Monday-Friday. You may also contact the Transit Board Administrator/Office Manager via email at Suzanne@soltransride.com. **Supplemental Reports:** Any reports or other materials that are issued after the agenda has been distributed may be reviewed by contacting the SolTrans Transit Board Administrator/Office Manager and copies of any such supplemental materials will be available on the table at the entry to the meeting room.

Agenda Times: Times set forth on the agenda are estimates. Items may be heard before or after the times shown.

1. **CALL TO ORDER**
(5:30 p.m.)
2. **CONFIRM QUORUM/ STATEMENT OF CONFLICT**
3. **APPROVAL OF AGENDA**
4. **OPPORTUNITY FOR PUBLIC COMMENT**
5. **ACTION ITEMS**
- 5.A. **Fares and Fare Payment Options**

Suggested Action: Provide feedback to Staff and recommendations to the Board regarding the following fare items: 1) Increase in Express fares, 2) Elimination of paper fare media, 3) Allow youth under 18 to ride free on local routes, and 4) Open loop payment as a fare payment option on the buses. (PRESENTER: Kristina Botsford, Deputy Director)

[RPT-Fares.pdf](#)

[ATCH A-Fares Table.pdf](#)

NON-ACTION/ INFORMATIONAL

6. DISCUSSION ITEMS

6.A. Service Changes 101

Suggested Action: Informational. (PRESENTER: Mandi Renshaw, Senior Analyst)

[Cvr Memo-Service Changes 101](#)

[ATCH A-Service Change 101](#)

6.B. Systemwide Comprehensive Operational Analysis

Suggested Action: Informational. (PRESENTER: Mandi Renshaw, Senior Analyst)

[Cvr Memo-Systemwide COA.pdf](#)

[ATCH A-Systemwide COA](#)

6.C. August Service Realignment Update

Suggested Action: Informational. (PRESENTER: Mandi Renshaw, Senior Analyst)

[Cvr Memo-August Service Realignment Update.pdf](#)

7. NON-DISCUSSION ITEMS

7.A. System Performance Report

Suggested Action: Informational. (PRESENTER: John Sanderson, Transit Services Manager)

[Cvr Memo-Sys Performance Rpt.pdf](#)

[ATCH A-Sys Performance Rpt](#)

7.B. SolTrans Transition to Zero-Emissions Plan

Suggested Action: Informational. (PRESENTER: Patricia Carr, General Services Manager)

[RPT-Zero Emissions Plan.pdf](#)

[ATCH A-SolTrans' ZEB Rollout Plan.pdf](#)

[ATCH B-Reso No. 2023-09](#)

7.C. Clipper START Pilot Fare Program and Expanded Fare Discount

Suggested Action: Informational. (PRESENTER: Mandi Renshaw, Senior Analyst)

[RPT-Clipper START, Fare Discount.pdf](#)

8. ADJOURNMENT



PUBLIC ADVISORY COMMITTEE
Scope and Membership

SolTrans promotes an open and inclusive public involvement process.

Each Member Agency will appoint three members of the public with demonstrated expertise or special interest in transit issues, and who reside within the boundaries of the agencies that they represent, to serve on a Public Advisory Committee (PAC). This will include representatives selected by each Member Agency.

The PAC will serve as an advisory committee to the SolTrans Board and will review and comment to the SolTrans Board on the following matters:

1. Service and fare adjustments,
2. Development of Short Range Transit Plans, and
3. Review SolTrans' annual work plan. (SolTrans JPA, pg. 6)

The PAC typically meets quarterly, or as needed.

City of Benicia Representatives
Ginger Burnett <i>(term expires 7/31/2023)</i>
Daniel Smith
<i>Vacant</i>
Solano Transportation Authority Representatives
Tom Bartee
Cynthia Tanksley <i>(term expires 5/8/2022)</i>
Adjoa McDonald <i>(term expires 4/13/2025)</i>
City of Vallejo Representatives
Richard Burnett <i>(term expires 6/30/2022)</i>
Andrea Germaine <i>(term expires 12/31/2026)</i>
Helen Marie "Cookie" Gordon <i>(term expires 12/31/2026)</i>

Appointments shall continue until a successor is duly appointed by the representing agency unless a term expiration is specified above. Some agencies also permit members with expired terms to continue serving until a successor is appointed.

Interested citizens may contact the Clerk's offices of the representing agencies above if they wish to apply to fill one of the current or upcoming vacancies.

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SOLTRANS ACRONYMS LIST OF TRANSPORTATION TERMS

Last Updated: April 13, 2021

Solano County Transit

A		MOU	Memorandum of Understanding
ABAG	Association of Bay Area Governments	MPO	Metropolitan Planning Organization
ADA	Americans with Disabilities Act	MTC	Metropolitan Transportation Commission
APC	Automatic Passenger Counter	N, O, & P	
APTA	American Public Transit Association	NEXT	National Express Transit
AVL	Automated Vehicle Location System	NTD	National Transit Database
B		O&M	Operations and Maintenance
BAFO	Best and Final Offer	PAC	Public Advisory Committee
BART	Bay Area Rapid Transit	PARS	Public Agency Retirement Services
C		PCC	Paratransit Coordinating Council
CAD	Computer-Aided Dispatch	PNR	Park & Ride
CalACT	California Association for Coordinated Transportation	PPP (3P)	Public Private Partnership
		PY	Prior Year
CalOES	California Office of Emergency Services	R & S	
CalSTA	California State Transportation Agency	RFP	Request for Proposals
Caltrans	California Department of Transportation	RM2	Regional Measure 2 Funds
CAM	Cost Allocation Model	RM3	Regional Measure 3 Funds
CARB	California Air Resources Board	RVH	Revenue Vehicle Hours
CNG	Compressed Natural Gas	RVM	Revenue Vehicle Miles
COA	Comprehensive Operational Analysis	SRTPE	Short Range Transit Plan
COV	City of Vallejo	STA	Solano Transportation Authority
CTA	California Transit Association	STAF	State Transit Assistance Fund
CTC	California Transportation Commission	T	
CTSA	Consolidated Transportation Services Agency	TAC	Technical Advisory Committee
		TCP	Transit Capital Priorities
D		TDA	Transportation Development Act
DAR	Dial-a-Ride	TIP	Transportation Improvement Program
DBE	Disadvantaged Business Enterprise	TNC	Transportation Network Company
DOT	Department of Transportation	U, V, W, Y	
E & F		UA or UZA	Urbanized Area
FAST	Fairfield and Suisun Transit	VMT	Vehicle Miles Traveled
FAST Act	Fixing America's Surface Transportation Act	VTC	Vallejo Transit Center
FHWA	Federal Highway Administration	WETA	San Francisco Bay Area Water Emergency
FTA	Federal Transit Administration		Transportation Authority
FY	Fiscal Year	YTD	Year to Date
G, H, I, & J			
GFI	Gen-fare Industries Farebox		
GPS	Global Positioning System		
HOV	High Occupancy Vehicle		
IFB	Invitation for Bid		
JPA	Joint Powers Authority		
L & M			
LCTOP	Low Carbon Transit Operations Program		
LoNo	Low or No Carbon emissions		
MCI	Motor Coach Industries		
MOD	Mobility on Demand		

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Solano County Transit

TO: PUBLIC ADVISORY COMMITTEE
PRESENTER: KRISTINA BOTSFORD, DEPUTY DIRECTOR
SUBJECT: FARES AND FARE PAYMENT OPTIONS
ACTION: MOTION

ISSUE:

Under the Board-approved Fare Policy, Staff is required to present an annual fare analysis. Typically, this is done as part of the budget forecast presented in March, but the pandemic caused an economic upheaval, and a fare analysis was not advisable. SolTrans increased local fares in 2019, but express fares have not increased in over a decade and in fact have decreased for some routes. SolTrans is also reviewing its fare payment options and is considering discontinuing paper fare media and implementing an open loop payment option. Additionally, Staff is considering offering free fares to youth on our local routes. We are asking the committee for feedback on these considerations.

DISCUSSION:

Fares

SolTrans has different fare structures for local, within Solano County and out-of-county travel. Additionally, we have different fares for adults, youth, and senior/disabled riders. We have one of the most complex fare structures in the Bay Area (see Attachment A for the current SolTrans fare structure). As part of the Regional Fare Integration Working Group, SolTrans has been working with the other Solano County operators to streamline fares in the county.

Local Adult Fare: SolTrans, Fairfield (FAST), and Suisun have a \$2 adult fare; Vacaville City Coach is at \$1.50 and working towards \$2, though a timeline has not been identified. Dixon and Rio Vista do not have local fixed routes. Local fare revenue only accounts for 23% of total SolTrans fare revenue and 2% of the FY 2022-23 operating revenue. An increase in local fare revenue is not recommended in order to keep a consistent local fare with our peer agencies. A fare increase of \$.25 - \$.50 would not result in a material increase in fare revenue and would be detrimental to our low-income, transit dependent riders who already absorbed an increase in 2019.

Solano Express Out-of-County Adult Fare: The current fare is \$5 on all routes, except Route 82 to San Francisco which is \$6. The Solano Express fare of \$5 has been in effect for over 12 years. In 2005, Solano Express had zone fares ranging from \$3.75 to \$5.50 and when the zone fare was streamlined to one fare it was at \$4.50, subsequently increasing to \$5. Bridge tolls in 2009 were \$4, increasing to \$5 in 2010. Since then, bridge tolls have increased twice to \$7 with the toll set to increase to \$8 on January 1, 2025. Additionally operating costs have continued to increase, reducing the farebox recovery ratio from 45% pre pandemic to an estimated 13% for FY 22-23. To maintain the viability of the service and meet required farebox recovery ratios, a fare increase is necessary for Solano Express.

MTC and the Fare Integration Task Force have been piloting the Clipper BayPass and plan to expand the program, giving transfer discounts to riders who take multiple forms of transit. This will

be beneficial to the Solano Express riders who transfer from our buses to BART. Additionally, MTC also has a program for low-income riders to enroll in Clipper START that allows qualified riders to receive discounts of 20-50% off fares, with all agencies offering the 50% discount effective January 1, 2024. These programs will offset the cost of any future fare increases for the riders who could be financially impacted by a fare increase.

Staff will be working with the Solano Express funding partners on a Solano Express fare increase and a timeline for the public input process and possible implementation.

Paper Fare Media

SolTrans currently sells paper fare media to riders to use as payment on the bus. The paper fare media has a magnetic strip that allows the farebox to read the pass to determine the type of rider, and the type of pass being used (Day Pass, 31-Day Pass, etc.). SolTrans is considering discontinuing paper fare media effective June 30, 2024, as our current inventory of passes expires at that time. There are a variety of reasons for this proposal detailed below; magnified by the fact that we have 11 different types of passes. Day passes are printed by the farebox on the bus.

1. The cost to purchase and maintain fare media is costly. There is only one vendor who produces the magnetic strip fare media that can be read by our fareboxes. We attempt to estimate how much fare media we need and order for two years. The last procurement cost us \$10,000.
2. The fare media ordering process is time consuming, taking up to six months from initial order to delivery.
3. The staff time to maintain the inventory, distribute it to the ticket office or sell it by mail is extraordinary. It is time intensive to count and reconcile the pass inventory, and to monitor the inventory balance to ensure we have enough of each type of pass.
4. The ticket office has a point-of-sale system to sell passes. There is a cost to subscribe to the software as well as staff time to program and maintain the system.
5. Each bus has a farebox that needs a fare media trim unit to read the fare media. The addition of the trim unit on the farebox costs an additional \$5,000 for each farebox. While this is now a sunk cost, we can eliminate purchasing the trim unit for any new fareboxes. With 21 Gillig buses being ordered over the next three years, this would save us over \$100,000. The current fareboxes are past their life, are no longer supported by Genfare and will need to be replaced when we order the buses.
6. Paper fare media pass sales have been steadily declining for several years, even prior to the pandemic as more riders move to using Clipper or the Token Transit mobile app.
7. Clipper 2.0 is projected to go live in mid-2024. The new version of Clipper will include Solano County fares which are currently not available on the current Clipper system.

Many agencies have already eliminated paper fare media for all the same reasons we listed. BART and County Connection eliminated paper fare media a few years ago. FAST is eliminating paper fare media effective July 1st. Riders still have the option for discount pricing by purchasing 31-day passes on Clipper or via the Token Transit mobile app. Day passes would continue to be issued on the bus for now; However, we would eliminate 10-ride passes which were only available on local routes. We are considering options for a paratransit pass for those riders who do not handle cash and are unable to use the mobile app option. Concurrently, we would introduce alternatives such as open loop payment that we discuss in the next section for all service modes.

If we are to move forward with this plan, we will develop a robust public outreach plan to ensure riders are aware of the change and their options. A decision needs to be made by December on this issue as the fare media procurement would need to begin in January 2024 if we are to continue using paper fare media.

Youth Fares on Local Routes

SolTrans is considering offering free fares to youth on our local routes. Kids five and under already ride free with a paying adult, and youth aged 6-18 currently receive a discounted fare. For FY 22-23

we collected approximately \$83,000 in fare revenue from youth riding our local routes. This equates to 7% of our current fare revenue.

Open Loop Payment

Staff has been looking at other fare payment options to give our riders choices. Open loop payment systems allow riders to board the bus and tap any chip-enabled credit or debit card and digital wallets to pay their fare. This is not only very convenient for many riders, but it also has multiple benefits to bus operations. The primary benefit is less cash used to pay fares. Cash fares are expensive to process; from purchasing and maintaining the costly farebox, the vault and probe system to empty the fareboxes, the armored car service to collect the vaults, to then count and deposit the cash. Multiple employees must spend time managing the process and reconciling fare revenue. Going cashless would be a cost savings, as would moving traditional cash users to credit/debit payments or utilizing digital wallets and payment apps to pay fares. Additionally, when riders use any other form of payment besides cash, it leads to much faster loading times especially at the peak commute times.

As part of our research, Staff has been speaking with State of California staff involved with the California Integrated Travel Project (Cal-ITP) on our options for installation and integration of an open-loop payment system. Other agencies in California outside of the Bay Area have already implemented this or are currently working on it. SolTrans may have the opportunity to pilot the system for the Bay Area and are negotiating with Cal-ITP on doing so.

This idea was presented as an information item to the Board in July and was well received. Staff is seeking feedback from the PAC on this option before we proceed with a full analysis of the cost and an implementation plan.

FISCAL IMPACT:

There is no fiscal impact associated with this report.

PERFORMANCE GOAL:

Goal 2: Financial Performance – Optimize fiscal health and sustainability.

RECOMMENDATION:

Provide feedback to Staff and recommendations to the Board regarding the following fare items: 1) Increase in Express fares, 2) Elimination of paper fare media, 3) Allow youth under 18 to ride free on local routes, and 4) Open loop payment as a fare payment option on the buses.

Attachment:

- A. SolTrans Fare Table

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Fare Table

A ADULT	CASH	DAY PASS	10-RIDE PASS	31-DAY PASS
	LOCAL	\$2.00*	\$4.50	\$18.00
SOLANO COUNTY EXPRESS	\$2.75	\$5.50	N/A	\$70.00
OUT OF COUNTY EXPRESS	\$5.00*	\$10.00	N/A	\$114.00*
ROUTE 82	\$10.00*	1 Pass Swipe +Upcharge	N/A	1 Pass Swipe +Upcharge
Y YOUTH (6-18)	CASH	DAY PASS	10-RIDE PASS	31-DAY PASS
	LOCAL	\$1.75*	\$3.50	\$15.00
SOLANO COUNTY EXPRESS	\$2.00	\$4.00	N/A	N/A
OUT OF COUNTY EXPRESS	\$4.00*	\$8.00	N/A	N/A
ROUTE 82	\$8.00	1 Pass Swipe +Upcharge	N/A	1 Pass Swipe +Upcharge
R REDUCED (Senior 65+ / Disabled / Medicare)	CASH	DAY PASS	10-RIDE PASS	31-DAY PASS
	LOCAL	\$1.00*	\$2.25	\$9.00
SOLANO COUNTY EXPRESS	\$1.35	\$2.75	N/A	\$35.00
OUT OF COUNTY EXPRESS	\$2.50*	\$5.00	N/A	\$57.00
ROUTE 82	\$6.00	1 Pass Swipe +Upcharge	N/A	1 Pass Swipe +Upcharge
PARATRANSIT (ADA CERTIFICATION REQUIRED)	\$4.00	N/A	\$40.00	N/A

*Available on Clipper (If you plan on traveling on both SolTrans and FAST systems please purchase a paper pass from SolTrans ticket office, interagency passes are not available on Clipper.)

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Solano County Transit

TO: PUBLIC ADVISORY COMMITTEE
PRESENTER: MANDI RENSHAW, SENIOR ANALYST
SUBJECT: SERVICE CHANGES 101
ACTION: INFORMATIONAL

COVER MEMO:

A verbal report on Service Changes 101 will be provided at the PAC meeting.

RECOMMENDATION:

Informational.

Attachment:

- A. Service Change 101

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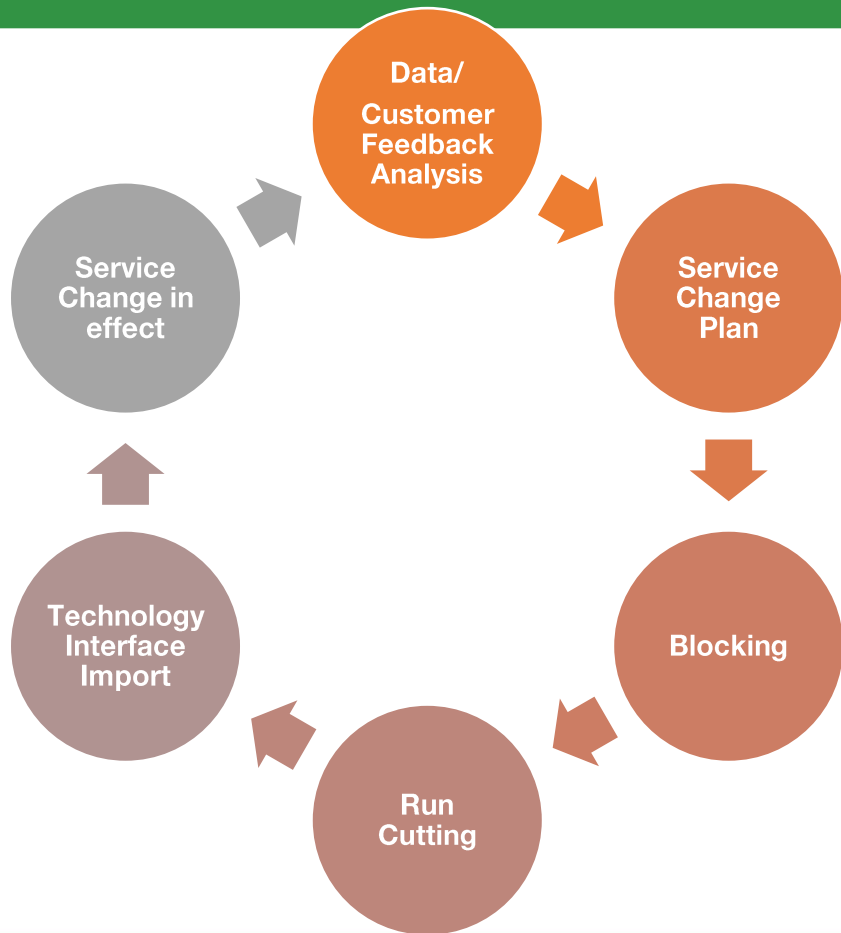
Service Change 101

For: SolTrans Public Advisory Committee



Presented by: Mandi Renshaw
Senior Analyst

Service Change Cycle



Major vs. Minor Change

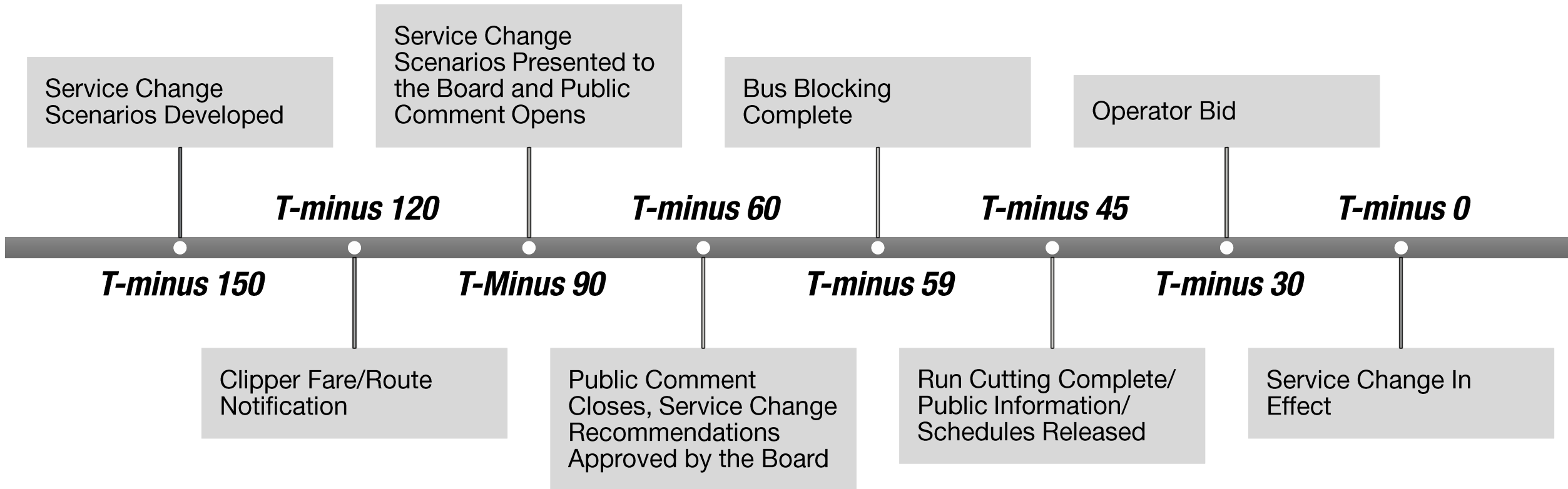
A **major service change** is any action that increases or reduces service hours and/or service miles by 10 percent of the entire system, one that entirely eliminates an existing route, or one that creates a new route.

A **minor service change** is defined as any change that:

- Reduces 25 percent or more of the number of transit route miles of a single route or combination of closely related routes; or
- Reduces 25 percent or more of the number of daily revenue vehicle miles of a single route or combination of closely related routes for the day(s) of the week for which the change is made.



Major Service Change Timeline



Questions?

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Solano County Transit

TO: PUBLIC ADVISORY COMMITTEE
PRESENTER: MANDI RENSHAW, SENIOR ANALYST
SUBJECT: SYSTEMWIDE COMPREHENSIVE OPERATIONAL ANALYSIS
ACTION: INFORMATIONAL

COVER MEMO:

A verbal report on SolTrans' Systemwide Comprehensive Operational Analysis will be provided at the PAC meeting.

RECOMMENDATION:

Informational.

Attachment:
A. Systemwide COA

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SYSTEMWIDE COMPREHENSIVE OPERATIONAL ANALYSIS

Presented to: The Solano County Transit
Public Advisory Committee
on Tuesday, August 29, 2023
By: Mandi Renshaw, Senior Analyst



Challenges

New ridership trends

New and changing traffic patterns

Ridership destination demands, work
from home options

National operator shortage

Fiscal responsibility



Draft Scope of Work



- Explore markets for one seat rides to new destinations within the bay area
- Evaluate duplicated services for opportunities to streamline
- Evaluate the current Local and Express systems for the transition to zero-emission operations
- Explore expanding local service to major destinations
- Explore the demand for a within county connection service
- Develop system plans for agency growth and financial stability

Questions?

Thank you.





Solano County Transit

TO: PUBLIC ADVISORY COMMITTEE
PRESENTER: MANDI RENSHAW, SENIOR ANALYST
SUBJECT: AUGUST SERVICE REALIGNMENT UPDATE
ACTION: INFORMATIONAL

COVER MEMO:

A verbal update on the August Service Realignment will be provided at the PAC meeting.

RECOMMENDATION:

Informational.

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Solano County Transit

TO: PUBLIC ADVISORY COMMITTEE
PRESENTER: JOHN SANDERSON, TRANSIT SERVICES MANAGER
SUBJECT: SYSTEM PERFORMANCE REPORT
ACTION: INFORMATIONAL

COVER MEMO:

The PAC is being provided with a system performance report presented to the Board of Directors at the July 20, 2023 Board meeting.

RECOMMENDATION:

Informational.

Attachment:

- A. System Performance Report

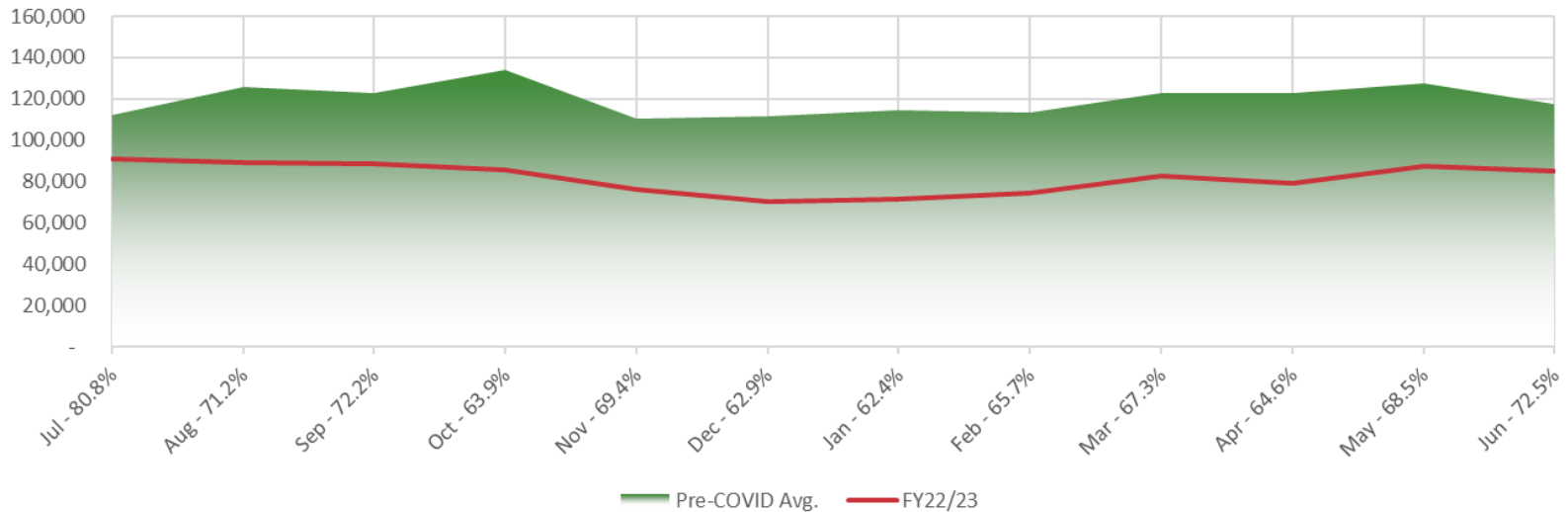
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System Performance Report

Presented to: The Solano County Transit
Public Advisory Committee
on August 29, 2023
By: John Sanderson,
Transit Services Manager



Systemwide Ridership by Month



- Seasonal ridership variation returning to historical pattern, but at lower numbers
- Ridership has leveled off at ~70% of pre-COVID average
- Post-COVID return to “New Normal” appears largely complete
- Future growth will have to come from “new” riders, rather than workers & employers returning to in-person work → COA needed to guide SolTrans’ near-term strategy



Spotlight: Ed Alarcon, Driver

- ▶ At about 1:30 PM on Thursday June 22, Bus Operator, Edmund Alarcon, was approaching Fairfield Transit Center when he noticed a small grassfire along the fence line between FTC and West Texas St.
- ▶ Ed immediately stopped his bus, grabbed his on-board fire extinguisher and put out the fire! Ed's bravery and quick thinking likely prevented a major fire from occurring.



Spotlight: Shaska Robison, Road Sup.



- ▶ Road Supervisor, Shaska Robison, manages the training and schedules for SolTrans' Paratransit drivers and recently led the roll-out of the new tablets on SolTrans' paratransit fleet, which is expected to save hundreds of hours in staff time and make our paratransit data even more accurate.
- ▶ Shaska has also gone above and beyond on countless occasions by working overtime driving paratransit customers when no regular driver was available.

Spotlight: Customer Service Reps

- ▶ In April, the main point of contact for paratransit customers contacting the SolTrans call center was moved from Dispatch to the Customer Service department.
 - ▶ Response has been overwhelmingly positive from customers due to shorter hold times and friendly staff.
 - ▶ The change has relieved significant strain on Dispatchers & the Dispatch operation, which were previously overextended.
 - ▶ The Customer Service team have embraced their new duties and quickly become very proficient at taking customer reservations and booking paratransit rides.
- ▶ Having dedicated staff answering paratransit calls and booking trips will allow system improvements in the future.



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Solano County Transit

TO: PUBLIC ADVISORY COMMITTEE
PRESENTER: PATRICIA CARR, GENERAL SERVICES MANAGER
SUBJECT: SOLTRANS TRANSITION TO ZERO-EMISSIONS PLAN
ACTION: INFORMATIONAL

ISSUE:

To ensure that transit agencies have a strategy to comply with the California Air Resources Board (CARB) 2040 Innovative Clean Transit (ICT) requirement, SolTrans must submit a Zero-Emission Bus (ZEB) Rollout Plan before purchase requirements deadlines take effect. The rollout plan is considered a living document and is meant to guide the implementation of ZEB fleets and help transit agencies work through many of the potential challenges and explore solutions. Each rollout plan must include several required components and be approved by the transit agency's governing body through the adoption of a resolution, prior to submission to California Air Resources Board (CARB). The Board approved Resolution No. 2023-09 adopting the SolTrans ZEB Rollout Plan as an Agency guideline to transition to a ZEB fleet at the July 20, 2023 meeting.

DISCUSSION:

The CARB ICT regulation requires that SolTrans (as a "Small Transit Agency") ensures that 25% of all new bus purchases are zero-emission beginning 2026, and 100% by 2029. Based on the planned procurement schedule, as outlined in the plan, SolTrans does not intend to buy any internal combustion engine buses (ICEBs) moving forward, thus complying with the CARB requirements.

The SolTrans Board approved the Fuel Roadmap in 2016 that outlined a plan to transition the fleet from diesel buses to BEBs (battery-electric buses) with supporting charging infrastructure. The plan was updated in 2020 to procure and support a 100% zero-emission fleet by 2032, eight years ahead of the ICT requirement.

This rollout plan provides the framework to transition SolTrans' transit fleet pursuant to the CARB ICT requirements and milestones. In accordance with CARB's requirements, SolTrans' Rollout Plan includes additional elements that complement the Fuel Roadmap. The required elements and corresponding sections included in the completed plan are:

- Agency information and service area,
- Fleet procurement plan,
- Facilities and infrastructure modifications to support a zero-emission (ZEB) fleet including total energy needs for the future fleet,
- Equitable deployment of future zero-emission buses in disadvantaged communities (DACs) of which 24% of SolTrans' local fixed-route fleet operate,
- Workforce development and training for current staff and future employees in all aspects of operating and maintaining a ZEB fleet,
- Funding the estimated costs for SolTrans' full fleet transition expected to fluctuate over time with consideration to inflation and economies of scale for ZEB technologies; and
- Start-up and scale-up challenges, including but not limited to, uncertain ridership, BEB performance and range, large capital and operating costs, managing power consumption, and navigating transition complexity.

FISCAL IMPACT:

There is no fiscal impact related to approval of the plan.

PERFORMANCE GOAL:

Goal 4: Capital/IT Service – Ensure vehicles, buildings and related infrastructure are maintained and long-term plans and strategies are considered **Objective A:** Invest resources into future endeavors/capital infrastructure/ongoing projects.

RECOMMENDATION:

Informational.

Attachments:

- A. SolTrans' ZEB Rollout Plan
- B. Resolution 2023-09 Approving the SolTrans ZEB Rollout Plan

Solano County Transit **Zero Emission Bus Rollout Plan**



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Appendix

Appendix A - Board Resolution

Acronyms and Terms

Acronym/Term	Description
AC	alternating current
BART	Bay Area Rapid Transit
BE	battery-electric
BEB	battery-electric bus
BESS	battery energy storage system
CARB	California Air Resources Board
CNG	compressed natural gas
DAC	Disadvantaged Community
DC	direct current
dHEB	diesel hybrid electric bus
EV	electric vehicle
FCEB	fuel cell electric bus
FTA	Federal Transit Administration
ICEB	internal combustion engine bus
ICT	Innovative Clean Transit
kV	kilovolt
kVA	kilovolt-ampere
kW	kilowatt
kWh	kilowatt-hour
MW	megawatt
NRV	non-revenue vehicle
OEM	original equipment manufacturer
O&M	operations and maintenance
PG&E	Pacific Gas & Electric
PV	photovoltaic
SolTrans	Solano County Transit
STA	Solano Transportation Authority
VTC	Vallejo Transit Center
ZE	zero-emission
ZEB	zero-emission bus

7 Rollout Plan Summary

Transit Agency's Name	Solano County Transit
Mailing Address	311 Sacramento St., Vallejo, CA 94590
Transit Agency's Air District	San Francisco Bay Area
Transit Agency's Air Basin	San Francisco Bay
Total No. of buses in Annual Maximum Service	30
Urbanized Area	Vallejo, California
Population of Urbanized Area	165,074
Contact information of general manager, chief operating officer, or equivalent	Beth Kranda, Executive Director
Is your transit agency part of a Joint Group	No
Is your transit agency submitting a separate Rollout Plan specific to your agency, or will one Rollout Plan be submitted for all participating members of the Joint Group?	N/A

Please provide a complete list of the transit agencies that are members of the Joint Group (optional)	N/A
Contact information of general manager, chief operating officer, or equivalent staff member for each participating transit agency member	N/A
Does Rollout Plan have a goal of full transition to ZE technology by 2040 that avoids early retirement of conventional transit buses?	Yes
Rollout Plan's approval date	June 15, 2023
Resolution Number	2023-09
Is a copy of Board-approved resolution attached to the Rollout Plan?	Yes
Contact for Rollout Plan follow-up questions	Kristina Botsford, Deputy Director
Who created the Rollout Plan	Consultant
Consultant	WSP

2 Introduction

In accordance with the California Air Resources Board’s (CARB) Innovative Clean Transit regulation (ICT regulation), the following report serves as Solano County Transit’s (SolTrans) Rollout Plan to transition its fleet to 100 percent zero-emission buses (ZEB) by 2040.

2.1 BACKGROUND

2.1.1 CALIFORNIA AIR RESOURCES BOARD’S INNOVATIVE CLEAN TRANSIT REGULATION

Effective October 1, 2019, the ICT regulation requires all public transit agencies in the state to transition from internal combustion engine buses ([ICEBs] also referred to “conventional buses” hereinafter) to ZEBs, such as battery-electric buses (BEB) or fuel cell electric buses (FCEB), by 2040. The regulation requires a progressive increase of an agency’s new bus purchases to be ZEBs based on its fleet size.

To ensure that each agency has a strategy to comply with the 2040 requirement, the ICT regulation requires each agency, or a coalition of agencies, to submit a ZEB Rollout Plan before purchase requirements take effect. The Rollout Plan is considered a living document and is meant to guide the implementation of ZEB fleets and help transit agencies work through many of the potential challenges and explore solutions. Each Rollout Plan must include several required components and must be approved by the transit agency’s governing body through the adoption of a resolution, prior to submission to CARB.

This Rollout Plan provides the framework to transition SolTrans’ transit fleet pursuant to the CARB ICT requirements and milestones. In accordance with CARB’s Rollout Plan Guidance, SolTrans’ Rollout Plan includes all required elements. The required elements and corresponding sections are detailed below:

- » **Section A:** Transit Agency Information (Rollout Plan Summary)
- » **Section B:** Rollout Plan General Information (Rollout Plan Summary)
- » **Section C:** Technology Portfolio (Section 3.2 Service Requirements and Preferred ZEB Technology)
- » **Section D:** Current Bus Fleet Composition and Future Bus Purchases (Section 3: Fleet and Acquisitions)
- » **Section E:** Facilities and Infrastructure Modifications (Section 4: Facilities and Infrastructure Modifications)
- » **Section F:** Providing Service in Disadvantaged Communities (Section 5: Equity Considerations)
- » **Section G:** Workforce Training (Section 6: Workforce Development and Training)
- » **Section H:** Potential Funding Sources (Section 7: Costs and Funding)
- » **Section I:** Start-up and Scale-up Challenges (Section 8: Start-up and Scale-up Challenges)

Due to the rapidly evolving nature of ZEB technologies, it is likely that the recommended approaches in this Rollout Plan will be adjusted and changed over time. Areas that are currently under study will be indicated, where applicable. The information presented in this Rollout Plan is largely derived from several documents published in 2022, including the Solano Countywide Electrification Transition Plan, SolTrans Short Range Transit Plan (2022 Update), and the SolTrans Federal Transit Administration (FTA) Electrification Transition Plan.

2.1.2 SOLANO COUNTY TRANSIT

Until 2011, the service operated as SolTrans was operated independently as two separate services by the cities of Benicia and Vallejo. A Joint Powers Agreement (JPA) between the cities of Benicia and Vallejo and the Solano Transportation Authority (STA) combining Vallejo Transit and Benicia Breeze was approved by all parties in November 2010. This established Solano County Transit and the SolTrans brand, with SolTrans assuming management of transit operations for both cities on July 1, 2011.

SERVICE AREA

SolTrans provides local service to the Solano County cities of Vallejo and Benicia, with express service providing intercounty connections to the transit centers in Fairfield and Vacaville, the Suisun City Amtrak Station, and the park and ride in Dixon. Express bus service provides regional connections between Solano County and four neighboring counties which include: the Contra Costa County communities of El Cerrito and Walnut Creek, which serve as regional connections to the Bay Area Rapid Transit (BART) train and the Contra Costa local bus systems; the Yolo and Sacramento County communities of Davis and Sacramento, including the Sacramento Train Station; and direct service between Vallejo and San Francisco which complements the Vallejo to San Francisco ferry service.

The City of Vallejo is approximately 50 square miles and has a population of 121,275, and the City of Benicia is approximately 16 square miles and has a population of 28,158. Benicia has a slightly higher rate of commuters driving alone or riding public transit compared to California at-large, while a lower percentage of commuters drive alone and a higher percentage ride public transit in Vallejo. Residents of Benicia have greater access to vehicles than Vallejo and California at-large, and Benicia has a lower poverty rate (6.8 percent) than Vallejo (11.7 percent) and California at-large (12.6 percent).

Figure 2-1. SolTrans Service Area



Source: SolTrans (2022)

UTILITY PROVIDER

Pacific Gas & Electric (PG&E), one of the largest combined natural gas and electric energy companies in the United States, serves SolTrans and all of Solano County. SolTrans will continue to coordinate with PG&E to assess infrastructure needs, explore incentives and programs, and install and connect power.

ENVIRONMENTAL FACTORS

Solano County has a Mediterranean climate of warm, dry summers and mild, rainy winters. The average temperature can be as low as 39 degrees in the winter and as high as 89 degrees in the summer.¹ However, Solano County, as with other areas in California have been impacted by the effects of global warming. For example, in the past five years, temperatures have reached as high as 116 in Vacaville, 110 in Fairfield, and 103 in Vallejo.²

1 NOAA

2 Daily Republic

Solano County has a minimum elevation of 72 feet³ and a maximum of 2,818 feet.⁴ This wide range in elevation affects the relative humidity and air circulation within the county. The average rainfall ranges between 13 inches near the coast and 22 inches inland.⁵ The varied landscapes of waterfront cities to more rural and agricultural areas also relate to the creation of microclimates.

SCHEDULE AND OPERATIONS

SolTrans operates nine local and four express bus routes. Additionally, SolTrans operates: three supplemental routes serving schools; a supplemental express bus route from the San Francisco Ferry Building to Vallejo; and ADA-complementary paratransit bus service for qualified persons with disabilities within Benicia and Vallejo. SolTrans contracts all operations to Transdev, which was selected through a competitive procurement and began operations on July 1, 2021. Transdev’s contract includes a five-year base period plus five option years through June 30, 2031. Table 2-1 summarizes all of SolTrans’ services.

Table 2-1. Service Summary

Route	Description	Service Type	Service Days
1	Vallejo Transit Center (VTC) – Rancho Square	Local	Weekday, Sat., and Sun.
2	VTC – Northeast Vallejo Corners	Local	Weekday and Sat.
3	VTC – South Vallejo	Local	Weekday and Sat.
4	VTC – Tuolumne/Sereno Transit Center	Local	Weekday and Sat.
5	VTC – Fairgrounds/Six Flags	Local	Weekday and Sat.
6	VTC – Tennessee/Hogan Middle School	Local	Weekday and Sat.
7A	Clockwise – VTC – Gateway Plaza	Local	Weekday, Sat., and Sun.
7B	Counterclockwise – VTC – Gateway Plaza	Local	Weekday, Sat., and Sun.
8	VTC – Glen Cove/Hogan Middle School	Local	Weekday and Sat.
15	Benicia Schools – Benicia HS – Benicia MS	Local	School days only
17	Benicia Schools – Benicia HS – Benicia MS	Local	School days only
38	Glen Cove – Gateway Plaza via Jesse Bethel HS	Local	School days only
Green Line	Suisun City/Fairfield – El Cerrito del Norte BRT	Express (SolanoExpress)	Weekday only
Blue Line	Sacramento – Walnut Creek BART	Express (SolanoExpress)	Weekday and Sat.
Yellow Line	Vallejo – Benicia – Walnut Creek BART – Sun Valley Mall	Express (SolanoExpress)	Weekday, Sat., and Sun.
Red Line	Suisun City/Fairfield – Vallejo – El Cerrito del Norte BART	Express (SolanoExpress)	Weekday, Sat., and Sun.
Route 82	VTC – San Francisco Ferry Building	Express	Weekday only
Para-transit Service	Within ¼-mile of local fixed routes. Requires ADA paratransit certification	Paratransit	Same as local fixed-route service

³ [Any Place America](#)

⁴ [Peak Visor](#)

⁵ [BAAQMD](#)

Source: SolTrans Short Range Transit Plan Update (2022)

2.1.3 SOLTRANS' ZEB EFFORTS

SolTrans was an early-adopter of ZEBs (two years in advance of the CARB ICT regulation) and has continued to be at the forefront of evaluating, piloting, and implementing ZEB technologies. The following summarizes SolTrans' ZEB efforts (to date) that demonstrate the agency's commitment to eventually transitioning the entire fleet to ZEBs.

- » **Developed Initial Roadmap to ZE (2017).** SolTrans partnered with the Center for Transportation and the Environment (CTE) to assess the viability of using BEBs on selected routes within the SolTrans fixed route network.
- » **Deployed BEBs into revenue service (2017).** As mentioned, SolTrans started operating BEBs in 2017. SolTrans received its first two BYD K9Ms BEBs in 2017 and another two in 2019. These four BEBs are charged and stored at the operations and maintenance (O&M) facility and are currently used for regular revenue service. In 2023, SolTrans received its first over-the-road motorcoach (motorcoach) BEB to support the SolanoExpress service. This bus is currently being commissioned and is not yet operating in revenue service. SolTrans also works with bpPulse to support charge and fuel credit management services.
- » **Designed and started construction for BEB retrofits at O&M facility (2020-present).** In 2020, SolTrans partnered with WSP to develop designs to retrofit the O&M facility to support all BEBs. In February 2023, SolTrans selected Patriot Construction to begin construction. Construction is currently ongoing and by April 2024, SolTrans expects to have sufficient power and infrastructure to charge up to 30 buses (including the five current BEBs). SolTrans is leveraging PG&E's EV Fleet program to provide the necessary power upgrades to the meter.

- » **Supported the development of the Solano Countywide Electrification Transition Plan (2022).** In 2022, STA developed a comprehensive transition plan for all agencies in Solano County, including SolTrans. The Plan consisted of many elements from SolTrans' design activities, but also included detailed cost modeling, service route modeling, and funding analysis.
- » **Constructed inductive charger at Curtola Park and Ride and planned and designed chargers for other locations (2020-present).** STA partnered with InductEV, PG&E, and WSP to design and construct a network of up to seven inductive chargers for SolTrans' SolanoExpress. The first charger (at Curtola Park and Ride) was completed in 2022. The remaining six are currently being designed with plans to start construction in 2024 of which, two are located at SolTrans' VTC. Additionally, the Curtola Park and Ride site was designed to accommodate a second charger, when needed.
- » **Actively engaged in the ZEB community.** SolTrans is a member of the Zero Emission Bus Resource Alliance (ZEBRA), and gains and shares best practices and lessons learned at industry conferences, field visits to peer agencies, and other events.

3 Fleet and Acquisitions

The following section provides an overview of SolTrans’ existing fleet, preferred ZEB technology, and proposed procurement schedule.

3.1 EXISTING FLEET

As of April 2023, SolTrans operates 65 vehicles for its service, including 26 standard buses for its local fixed routes, eight cutaway buses for its paratransit fleet, and 31 buses for the SolanoExpress service. SolTrans also has 10-vehicle support fleet that includes three maintenance trucks, five supervisor vans, and two administrative vehicles. SolTrans’ fleet is comprised of several fuel and technology types, including diesel hybrid (dHEB), compressed natural gas (CNG), gasoline, and battery-electric (BE). Table 3-1 provides a detailed overview of SolTrans’ existing bus fleet.

Table 3-1. Existing Fleet Summary (April 2023)

Make	Model	Type	Fuel	In Service	Quantity
ElDorado	E-450 Aerotech	Cutaway	Gasoline	2016	3
Glaval	Title II LF	Cutaway	Gasoline	2018	3
ARBOC	Spirit of Mobility	Cutaway	CNG	2019	2
Paratransit Subtotal					8
Gillig	Hybrid LF	Standard	dHEB	2011	21
Nova	L990	Standard	CNG	2016	1
BYD	K9M	Standard	BE	2017	2
BYD	K9M	Standard	BE	2019	2
MCI	D4500	Motorcoach	CNG	2017	6
MCI	D4500	Motorcoach	CNG	2018	4
MCI	D4500	Motorcoach	CNG	2019	6
MCI	D4500	Motorcoach	Diesel	2018	9
MCI	D4500	Motorcoach	CNG	2023	5
BYD	K9M	Motorcoach	BE	2023	1
Transit Subtotal					57
Fleet Total					65

Source: SolTrans Capital Budget Build – Fleet Replacement Plan (2032-2033)
 Note: dHEB = diesel hybrid; CNG = compressed natural gas; BE = battery-electric

3.2 SERVICE REQUIREMENTS AND PREFERRED ZEB TECHNOLOGY

As of April 2023, SolTrans operates 51 service blocks for weekday service - 21 blocks support local routes and - 30 support commuter routes (including SolanoExpress). For local routes, service blocks range in distance from 26 to 191 miles, with an average of 114 miles. For commuter routes, service blocks range from 39 to 271 miles, with an average of 183 miles. Considering that current BEBs – depending on battery capacity and performance – are expected to provide upwards of 175 miles of range, it is expected that BEBs can support the vast majority of SolTrans’ local service routes – especially with consideration to continued advances in battery technology and the relatively young age of SolTrans’ fleet.

The SolanoExpress (and other commuter services), on the other hand, have longer range requirements than the local service, but are expected to be supported by a network of opportunity chargers that will provide buses with plenty of opportunities to charge while in service.

Although some of SolTrans’ service blocks demand an amount of energy (kilowatt hours [kWh]) that is not currently supported by existing battery technology, past and ongoing analyses of SolTrans’ conditions has found that a transition to BEB technology is the most time-efficient and cost-effective strategy to comply with CARB ICT requirements. While an adoption of FCEBs would essentially eliminate the challenge of meeting range requirements, current market research indicates that the nascency of the FCEB market (vehicle availability and hydrogen suppliers), and higher initial capital costs are too much of a risk to SolTrans at this time. That said, SolTrans has not ruled out FCEB technology – especially for the SolanoExpress fleet - and as the FCEB market achieves economies of scale, SolTrans will reevaluate and considering adopting this technology in the future.

To reduce impacts to service, there are several strategies that SolTrans will continue to evaluate and consider to meet service (range) requirements, including midday charging at the bus facility, opportunity charging, additional bus purchases, and/or the integration of FCEBs. In addition, with battery technology rapidly evolving, future battery capacities and efficiencies may be sufficient to serve all blocks.

Conventional bus conversions to ZEB technologies are not currently being considered. However, SolTrans will remain open to conversions if they are deemed financially feasible and align with ZEB adoption goals.

3.3 PROCUREMENT SCHEDULE

SolTrans has developed a procurement schedule that is in alignment with ICT purchase requirements and meets the goal for a full fleet transition to ZEBs by 2040. The proposed procurement schedule is built on the assumption that BEBs and associated battery capacities will be available and sufficient to meet SolTrans’ service block demands so that a 1:1 vehicle replacement ratio is achievable. When buses have reached their end of useful life, it is expected that they will be replaced with BEBs, thus early retirement of vehicles will not be necessary. The planned procurement schedule will be reviewed and updated regularly to align with construction schedules - it is essential that ZEBs are delivered after ZE-supporting infrastructure and power are available at the bus facility.

The CARB ICT regulation requires that SolTrans (as a “Small Transit Agency”) ensures that 25% of new bus purchases are ZE in 2026 and 100% in 2029. Based on the planned procurement schedule, SolTrans does not intend to buy any ICEBs moving forward, thus, complying with the CARB requirements. SolTrans is expected to operate an all-ZE fleet by 2036 - four years in advance of the CARB ICT goal. It should be noted that SolTrans, as an early adopter of ZEBs, also has two bonus credits for the BEBs that were in service prior to January 1, 2018. These credits may be applied in the future if there are any challenges with funding or construction.

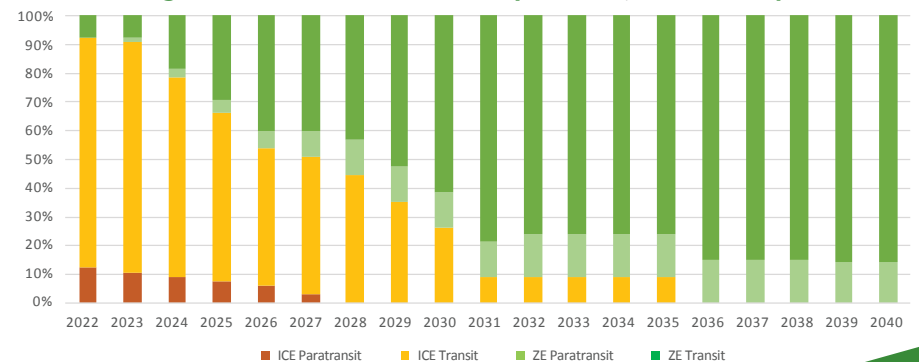
Table 3-2 summarizes SolTrans’ planned deliveries, by type, through 2040 and Figure 3-1 presents SolTrans fleet mix through 2040.

Table 3-2: SolTrans’ Procurement Schedule (2023 – 2040)

Fiscal Year	Bus Deliveries (#)			Bus Deliveries (%)			Bus Summary
	ICE	ZE	Total	ICE	ZE	Total	
2023	0	1	1	-	100%	100%	(1) PT
2024	0	8	8	-	100%	100%	(1) PT, (7) ST
2025	0	8	8	-	100%	100%	(1) PT, (7) ST
2026	0	8	8	-	100%	100%	(1) PT, (7) ST
2027	0	2	2	-	100%	100%	(2) PT
2028	0	4	4	-	100%	100%	(2) PT, (2) ST
2029	0	6	6	-	100%	100%	(6) CO
2030	0	6	6	-	100%	100%	(6) CO
2031	0	11	11	-	100%	100%	(9) CO, (2) ST
2032	0	2	2	-	100%	100%	(2) PT
2033	0	1	1	-	100%	100%	(1) PT
2034	0	1	1	-	100%	100%	(1) PT
2035	0	1	1	-	100%	100%	(1) PT
2036	0	8	8	-	100%	100%	(1) PT, (7) ST
2037	0	9	9	-	100%	100%	(2) PT, (7) ST
2038	0	9	9	-	100%	100%	(2) PT, (7) ST
2039	0	2	2	-	100%	100%	(2) ST
2040	0	8	8	-	100%	100%	(2) ST, (6) CO

Source: SolTrans Capital Budget Build – Fleet Replacement Plan (2032-2040)
 Note: PT = paratransit vehicle; ST = standard bus; CO = motorcoach

Figure 3-1: SolTrans Fleet Composition (2023 – 2040)



Source: SolTrans Capital Budget Build – Fleet Replacement Plan (2032-2040)

4 Facilities and Infrastructure Modifications

SolTrans owns several properties within the City of Vallejo, including the Curtola Park and Ride Hub (Curtola P&R), and Vallejo and Sereno Transit Centers (VTC and STC, respectively). SolTrans currently leases the fleet’s operations and maintenance (O&M) bus yard from the City of Vallejo, however, the property will transition to SolTrans ownership in 2042.

To support its future ZEB fleet, SolTrans plans to charge buses (primarily local service) at the O&M bus yard and its express buses at transit centers across the county, including its own VTC and Curtola P&R.

At the time of this writing, the O&M bus yard already has four chargers installed and construction for the full buildout of the facility commenced in April 2023. For the express routes, an inductive charger was installed at Curtola P&R in 2022, and the final designs for seven other sites, including VTC are being finalized.

The following sections provide an overview of the infrastructure modifications planned at the O&M bus yard and various transit centers and stations.

4.1 OPERATIONS AND MAINTENANCE BUS YARD

SolTrans’ O&M bus yard is located at 1850 Broadway Street in the City of Vallejo (Figure 4-1). The site consists of a joint maintenance and operations facility with five maintenance bays; a fuel island that supports diesel, CNG, and unleaded gasoline fueling; an associated CNG compression and storage yard; underground fuel tanks; a backup generator; BEB charging equipment area; employee parking; and bus parking. The site has four existing alternating current (AC) chargers in operation. Two of the chargers - 80 kilowatts (kW) per charger - are on the east side of the maintenance building and the other two (80 kW and 200 kW) are along the fence line at the southwest corner of the site near the bus entrance.

Power to the site is provided by the PG&E Highway Substation (4265) via the Highway 1106 feeder circuit. The Highway 1106 Circuit is a 12 kilovolt (kV) circuit that has a capacity of 12.8 megawatts (MW). PG&E

estimates that the projected peak load of this circuit is 9.9 MW, leaving approximately 3 MW of available capacity - the initial phase of site improvements (“Phase 1”) will require 1.9 MW of power.

4.1.1 PLANNED MODIFICATIONS

At full buildout, the O&M bus yard will have sufficient charging infrastructure and electrical capacity to charge all assigned buses. SolTrans also has aspirations to eventually integrate resilience infrastructure, such as a battery energy storage system (BESS) and photovoltaic (PV) arrays to reduce SolTrans’ demand and reliance on the power grid.

SolTrans’ transition to a ZEB fleet will require an increase in the electrical supply to the site, enhancements and expansions of electrical equipment, and the installation of chargers, dispensers, and other components. The future BEB fleet will be charged via charging cabinets and associated plug-in dispensers that will be mounted on top of a new canopy structure that will span the length of the lot (over the existing bus parking area).

Current designs are based on 150 kW DC charging cabinets in a 1:2 charging orientation (one DC charging cabinet energizes two separate dispensers/buses). This charger-to-dispenser ratio maximizes space utility, reduces capital costs, and minimizes peak electrical demand.

SolTrans intends to transition the O&M bus yard in two distinct phases. Phase 1, which is currently underway and is expected to be completed in April 2024. Phase 1, focuses primarily on constructing the canopy structure (above the parking area for the transit fleet), installing charging infrastructure to support up to 30 buses⁶, and routing power to the new charging infrastructure.

Phase 2 will focus on installing charging infrastructure to support the remaining transit fleet (approximately 27 buses), constructing another canopy and associated charging infrastructure above the paratransit parking area (for approximately eight vehicles), and the integration of a BESS and PV arrays. Phase 2 is expected to begin in 2026 depending on available technology and funding. It should be noted that SolTrans has not ruled out the use of FCEB technology for Phase 2.

⁶ The four chargers onsite will be relocated to the top of the canopy & an additional 12 new chargers will also be installed in Phase 1.

Figure 4-1 illustrates how SolTrans envisions the O&M bus yard at full buildout.

Figure 4-1. Existing Conditions and Planned ZEB Modifications



Source: SolTrans (2023)

4.2 OPPORTUNITY CHARGING LOCATIONS

To help mitigate the impact range shortfalls for the SolanoExpress, while also providing charging opportunities for its local service and peer agencies' services, SolTrans – in partnership with STA – has plans to develop several *inductive* opportunity chargers throughout the service area.

The first inductive opportunity charger is already in operation at Curtola P&R (Figure 4-2) and supports an electric motorcoach that will eventually be placed into revenue service for the SolanoExpress' Yellow Line.

Figure 4-2. Inductive Charging Plate at Curtola Park and Ride



Source: SolTrans (2022)

4.2.1 PLANNED MODIFICATIONS

The designs for several additional sites across the service area and county are currently being developed and are expected to be ready for bid (for construction) by 2024. Table 4-1 provides a summary of the status of opportunity chargers in the SolTrans service area. It should be noted that STA has plans to build out additional sites to support the SolanoExpress, but the funding for the construction (and associated buses) have yet to be identified.

Table 4-1. Opportunity Charging Summary

Location	Owner	Description/Status
Curtola P&R	SolTrans	2 Inductive Chargers Designed/ 1 Installed
VTC	SolTrans	2 Inductive Chargers/ Designed
York Street Station	City of Vallejo	1 Inductive Charger/ Designed
Walnut Creek Station	BART	1 Inductive Charger/ Designed

Source: SolTrans and STA (2023)

5 Equity Considerations

The following section provides an overview of the disadvantaged communities that SolTrans serves and its plans to prioritize equitable deployment of future ZEBs.

5.1 DISADVANTAGED COMMUNITIES

According to the California Environmental Protection Agency (CalEPA) and California’s Senate Bill 535 (SB 535), disadvantaged communities (DACs) refer to communities (census tracts) that suffer the most from a combination of economic, health, and environmental burdens⁷. While many communities are disproportionately impacted by negative externalities and poverty, the SB 535 communities are deemed the most burdened in the state.

Given that DACs are disproportionately exposed to negative externalities caused by conventional vehicles, such as noise pollution and harmful emissions, replacing SolTrans’ existing bus fleet with ZEBs will yield many benefits to the DACs and other communities that SolTrans’ buses traverse and/or serve.

Currently, approximately 24 percent of SolTrans’ local fixed-route service operates in SB 535-recognized DACs. The percentage of DACs increases to 37% when not considering school trippers (Routes 15, 17, and 38). SolTrans’ local service is the focus for initial ZE efforts. Each of SolTrans’ routes and details on the communities that they serve are summarized in Table 5-1. Figure 5-1 illustrates SolTrans’ service area and routes in relation to all DACs (not just the SB 535 communities), highlighting the positive impact that ZEBs will have on the entire service area.

Table 5-1. Summary of DAC-Serving Routes

	Route	Total Communities Served by Route	Total SB 535 DACs Served by Route	Percentage of Route in DAC
Local	1	12	5	42%
	2	10	5	50%
	3	11	4	36%
	4	10	7	70%
	5	13	6	46%
	6	15	4	27%
	7A	17	7	41%
	7B	17	7	41%
	8	11	2	18%
	15*	9	0	0%
	17*	7	0	0%
	38*	14	1	7%
	Subtotal	41	10	24%
	Express	Green Line	49	10
Blue Line		53	10	19%
Yellow Line		28	5	18%
Red Line		51	15	29%
Route 82		47	13	28%
Subtotal		125	27	22%
Total	134	27	20%	

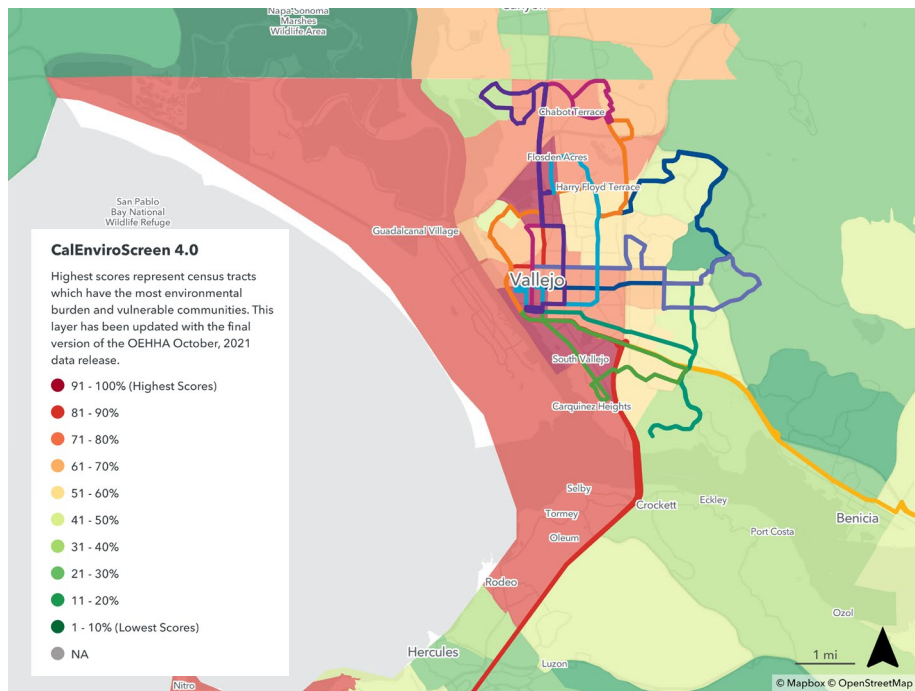
Source: WSP, CalEnviroScreen 4.0 (2021)

Note: “Communities Served” are defined as communities/census tracts that are within 500 feet of a SolTrans route’s alignment.

*Only operates on school days.

⁷ These communities are census tracts receiving the highest 25 percent of overall scores in CalEnviroScreen 4.0.

Figure 5-1. Disadvantaged Communities Served by SolTrans



Source: WSP, CalEnviroScreen 4.0 (2021)

While technological constraints (range requirements) continue to be a key element in how buses are dispatched, SolTrans acknowledges the importance of an equitable deployment and will continue to prioritize ZEB deployment on routes that operate in the communities that need them most.

6 Workforce Development and Training

The following section provides an overview of the existing staffing, required skills to train SolTrans’ staff, and the general approach to adequately training staff on the new BEB fleet.

6.1 EXISTING STAFFING

As of April 2023, SolTrans has 14 full-time staff. The operations and maintenance of the bus fleet is provided by the contractor, Transdev. As of 2022, Transdev supports SolTrans with 128 staff, summarized in Table 6-1.

Table 6-1. SolTrans’ Existing (Contracted) Fleet Staff

Role	Number of Staff
Full-Time Drivers (Fixed-Route)	66
Part-Time Drivers (Fixed-Route)	14
Full-Time Drivers (Paratransit)	6
Mechanics	9
Maintenance Utility Workers	7
Dispatchers	5
Road Supervisors	6
Customer Service and Administrative Staff	7
Managers	5
Assistant Managers	3
Total	128

Source: SolTrans SRTP (2022)

6.2 REQUIRED SKILLS AND STAFFING

SolTrans’ early adoption of BEBs (2017) has provided staff with a head start on understanding the operation and maintenance of BEBs. However, BEBs still represent a small percentage of the current fleet and have not made a significant impact on operations. Operating and maintaining a fleet that is 100 percent BEB will be a significant change. Nonetheless, there will not be any impacts to staffing as a result of the transition.

Converting to ZEBs – BEBs, in particular – will require changes to standard operating procedures and will impact all facets of the organization. It is expected that most training will be informed by service manuals and recommendations by the selected vehicle and charger OEM(s); however, there will be instances where outside training and resources will be leveraged. It should be noted that it is expected that all staff that work at or support the agency will need to take an introductory BEB course. The introductory course should inform staff on why SolTrans is transitioning its fleet, how the conversion will impact them, and how to prioritize safety when in the vicinity of these vehicles and charging equipment. Table 6-2 provides an overview of the anticipated required skills to successfully operate and maintain the future fleet, by general job classification (internal and external).

Table 6-2. Summary of Job Classifications and Required Skills

Job Classification	Description
Training Instructors and Staff	Training Instructors will be the custodians of BEB knowledge. Trainers should receive their training directly from the vehicle and charging infrastructure OEMs (original equipment manufacturer) with hands-on modules. Refresher training for Training Instructors should be completed annually at a minimum. This will include both SolTrans and any contracted staff.
Mechanics, Facility, and Management Supervision	Mechanics, Facility, and Maintenance Supervisors will need to be fully aware of resources available to them to ensure the safe operation of BEBs. The resources and information that they will need to possess, to include standard operating procedures and preventative maintenance practices, will have to be adequate and thorough to ensure that subordinate personnel are well-trained and knowledgeable of the systems.
Dispatchers and Road Supervisors	Dispatchers and Road Supervisors will need to be trained to troubleshoot service issues and assist operators while in the yard, deadheading, or while in revenue service. Additionally, Road Supervisors will need to be trained in troubleshooting to properly assist during a failure of equipment or an emergency. Dispatch staff will need to monitor the SoC of the BEB. Annual refresher training for Dispatchers and Road Supervisors, especially around emergency procedures, troubleshooting and best practices is recommended.
Operators	Operators must be trained on the operation and charging of the BEBs. The operation of the bus can have a significant impact on battery performance, and operators need to understand the impacts of the use of HVAC, regenerative braking, and how to safely charge the vehicle, if needed.
Utility Cleaners	For the cleaning staff their responsibilities on both the inside and the outside of the bus will remain the same. Not all Utility Cleaners physically operate or maintain the vehicle, which means the full operator or maintenance training program is not essential for everyone. However, since they will be working in the proximity of high voltage, it is essential that they understand the safety elements of the vehicles. In addition, any commercial driving license-holding Utility Cleaner, that maneuvers the buses within the lot or between facilities, will receive the full Operator training course.

Job Classification	Description
Facility Technicians and Maintenance Staff	Facility Technicians will be trained on all (non-bus) equipment applicable to the mechanic’s grade. Additional training in the area of the charging infrastructure will include the following: asset records, system drawings, maintenance manuals, preventive maintenance task descriptions for new equipment, PPE, high-voltage, and training provided by the charger OEM. Mechanics will be responsible for maintaining the vehicles – preventative and corrective maintenance, and mid-life overhauls. All mechanics should receive PPE and high-voltage training, training for maintenance and troubleshooting vehicles and charging infrastructure. There should be annual refresher classes as part of the training program.
Safety Staff	Safety is everyone’s job. However, Safety Staff will need to be knowledgeable of the hazards of BEB, proper PPE procedures, and any egress procedures. The safety department will also be coordinating with both PCDWP and local first responders to ensure they have the training required to perform their jobs in a safe and efficient manner.
Schedulers/Planners	With decreased range, vehicle capabilities will need to be an item that service planners consider when making schedules. Service planners need to understand vehicle procurement so that they can create schedules in advance of BEB delivery.
First Responders	Local fire station staff will need to be familiarized with the new buses and supporting facilities.
Tow Truck Service Providers	Tow truck providers will need to be familiarized with the new buses and proper procedures for towing ZEBs.

Source: SolTrans Fleet Transition Plan (2022)

6.3 TRAINING REQUIREMENTS

Training for the operation, maintenance, and handling of BEBs will be conducted after buses are procured and in advance of delivery. Specific Training courses, schedules, and equipment will be included in procurement documents, as they are with all existing procurements. It is expected that all relevant personnel will be sufficiently trained before buses arrive. If other OEM-provided buses are procured in the future and/or if new components, software, or protocols are implemented, it is expected that SolTrans staff (and contracted staff) will be trained well in advance of the commissioning of these additions. Table 6-3 provides an example of training modules and the estimated hours based off of a sample OEM course outline.

Table 6-3. Sample BEB Training Modules

Module	Hours
General Vehicle Orientation	6
Mechanic Basics	11
Air Systems and ABS	10
High Voltage System	18
DC Controller and Motors	5
HVAC and PTC Systems	4
Low Voltage Systems and Diagnosis	10
Other – Emergency, Safety, and Towing	4

Source: OEM Course Outline (2022)

6.4 INTERNSHIP/APPRENTICESHIP PROGRAM

SolTrans plans to work with Solano Community College to reestablish the maintenance internship program if there is funding awarded by any competitive grants that SolTrans applies for. Prior to the pandemic, the SolTrans contractor at the time, facilitated an internship program for community college students interested in learning how to maintain buses. SolTrans had two interns throughout the program, which resulted in permanent employment for one of them. SolTrans' contractor is also working on an apprenticeship program to work with multiple community colleges and other organizations to recruit and train future bus technicians, with specialized hands-on experience for BEBs.

7 Costs and Funding

The following section identifies the estimated (capital) costs associated with SolTrans’ full fleet transition to ZEBs and the opportunities that will be explored to fund supporting infrastructure and buses.

7.1 COSTS

The estimated costs for SolTrans’ full fleet transition are expected to fluctuate over time with consideration to inflation and economies of scale for ZE technologies. However, SolTrans has developed rough estimates for both phases of its transition to identify funding shortfalls and develop funding strategies.

For Phase 1, the construction costs (\$11.75 million) are fully funded. The costs are inclusive of the overhead canopy for chargers and the power enhancements to support the first 30 BEBs. Phase 1 will also require the purchase of 21 BEBs and 11 chargers (and associated construction costs) – all of which are largely unfunded.

SolTrans’ Phase 2 is currently unfunded. Phase 2 will focus on installing charging infrastructure to support the remaining transit fleet (approximately 27 buses), constructing another canopy and associated charging infrastructure above the paratransit parking area (for approximately eight vehicles), and the integration of a BESS and PV arrays.

The costs of providing opportunity charging at VTC/York Street are expected to be at approximately \$2.5 million, based on the costs of SolTrans’ Curtola opportunity charger.

7.2 FUNDING OPPORTUNITIES

It is expected that SolTrans’ required BEB infrastructure can be funded, in part, by various discretionary grants at the federal, state, and regional levels. However, there is still a significant shortfall due to the intensity of construction and infrastructure required to support the fleet.

To date, SolTrans has applied for and been awarded various grants at the federal and state level to support its ZEB transition. SolTrans’ partner, STA, also partnered with InductEV for a Transit and Intercity Rail Capital Program (TIRCP) state grant to fund the design of many of the county’s opportunity chargers – including VTC and York Street.

For federal funding programs, SolTrans will continue to rely on formula funds and discretionary grants such as the Low or No Emissions or Bus and Bus Facilities programs. For state and regional funding programs, formula funds, and various state program, such as BAAQMD, TIRCP, and LCTOP will be potential resources. SolTrans will also leverage its existing relationship with PG&E to take advantage of any cost savings and partnerships through the EV Fleet Program. Table 7-1 summarizes SolTrans’ competitive grant status over the past five years.

Table 7-1. Summary of SolTrans’ ZEB Funding Opportunities

Funding Agency + Grant	Year	Status	Award	Description
FTA Bus and Bus Facilities	2019	Committed	\$1.8M	Charging infrastructure
FTA Bus and Bus Facilities	2020	Committed	\$1.85M	Charging infrastructure
CalSTA TIRCP	2020	Planned	\$440K	Inductive chargers at VTC/York Street.
BAAQMD	2021	Expended	\$50K	Curtola inductive charger.
CEC	2021	Planned	\$486K	Inductive chargers at VTC/York Street.
BAAQMD Carl Moyer Program	2022	Committed	\$600K	Charging infrastructure

Source: SolTrans (2023)

8 Start-Up and Scale-Up Challenges

SolTrans has identified several potential challenges that will have to be mitigated or overcome to meet CARB ICT regulation requirements – many of which are out of SolTrans’ direct control. This includes, but is not limited to, uncertain lead and lag times associated with construction and vehicle deliveries, rapid fluctuations in and potential obsolescence of ZE technology, and significant capital, operational, and maintenance costs. The following list of challenges is not exhaustive; however, it summarizes some of the identified issues and uncertainties that SolTrans will continue to evaluate and consider as it plans, designs, and transitions the bus fleet to ZEBs.

- » **Uncertainty of Ridership Patterns.** SolTrans continues to observe a slow recovery to pre-pandemic ridership. Further, travel patterns have changed for many workers and SolTrans continues to evaluate and adapt service to meet these needs. Considering that service is an essential component in estimating infrastructure needs for ZEBs, it will be a challenge to ensure that decisions made today are future-ready.
- » **Rapid Technological Advancement.** While BEB technology, in particular, continues to rapidly improve, this also poses a challenge and risk to adoption. SolTrans will have to make decisions to purchase ZEBs based on what is known at the time of the contract. This exposes SolTrans to a risk of missing out on improvements - or cost savings - that come soon after contract execution, rendering purchased technologies outdated on arrival.

- » **Insufficient BEB Performance and Range.** The BEB industry is constantly innovating and developing vehicles with longer ranges and more efficient batteries. However, initial analysis indicates that some of SolTrans’ service blocks cannot be completed with existing technologies, particularly longer routes (distance and/or duration). Unless battery technologies evolve, SolTrans will have to continue to invest in range-enhancing technologies to meet requirements, such as opportunity charging.
- » **Resiliency and Emergency Response.** SolTrans is seeking solutions to address resiliency and emergency response within the context of a ZEB fleet. With BEBs, service will be dependent on electricity, this makes the service vulnerable during outages and wildfire emergencies.
- » **High Capital and O&M Costs.** SolTrans will exceed its existing rolling stock capital and operations budgets with a transition to ZEBs. Installing infrastructure onsite is expensive and will need to replace the existing fueling infrastructure - which is still within its useful life. Additionally, ZEBs are more expensive than ICEBs, and SolTrans will have to find more funding for this additional cost.
- » **Strains on Market Supply.** The ICT regulation will put a lot of pressure on OEMs to produce ZEBs at unprecedented rates. However, it is not only California that is interested in converting to ZEBs. These monumental policy changes make it challenging to meet ZEB goals for agencies if the supply of buses cannot meet demand. This may cause strains on supply, resulting in risk to meeting purchase requirement deadlines. It also makes it more challenging for competitive bids, resulting in the more usage of state contracts. Currently, BEB OEMs are quoting lead times of 18 to 24 months for delivering a custom bus.

- » **Transition Complexity.** Maintaining service and adhering to ICT regulation purchase requirements, all while managing on-site construction, a facility rebuild, temporary bus relocations, bus procurements, and utility enhancements introduces a lot of risk to SolTrans' program. Further, getting staff acclimated to and trained on the new technology will also have its challenges. If one element of this transition doesn't go as planned, there will be implications for other components of the program.
- » **Dependence on Utility Enhancements.** SolTrans' operating facility will require upgraded electrical service and infrastructure. The PG&E application and construction process is costly and will take some time.
- » **Managing Power Demand.** The transition to BEBs will require strategies to ensure that SolTrans can utilize power in the most efficient way. SolTrans is coordinating with PG&E and charge management providers to determine methods to reduce peak demands. However, managing demand may also come at a hefty capital cost, something that staff continues to analyze.

Appendix A

Board Resolution





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RESOLUTION NO. 2023-09

A RESOLUTION OF THE SOLANO COUNTY TRANSIT (SOLTRANS) BOARD OF DIRECTORS
APPROVING THE ZERO-EMISSION BUS ROLLOUT PLAN

WHEREAS California Code of Regulations Title 13, Division 3, Chapter 1, Article 4.3, Part 2023.1(d) Zero-Emissions Bus Rollout Plan Requirements state that a transit agency Zero-Emission Bus Rollout Plan must be approved by its governing Board; and


WHEREAS the Zero-Emission Bus Rollout Plan sets forth SolTrans' plan which meets the following requirements:

- a goal of full transition to zero-emission buses by 2040 with careful planning that avoids early retirement of conventional internal combustion engine buses;
- identification of the types of zero-emission bus technologies SolTrans is planning to deploy;
- a schedule for zero-emission bus purchases;
- a schedule for conversion of conventional internal combustion engine buses and CNG buses to zero-emission technologies;
- a schedule for construction of facilities and infrastructure modifications or upgrades, including charging, fueling, and maintenance facilities, to deploy and maintain zero-emission buses;
- explanation of how SolTrans plans to deploy zero-emission buses in disadvantaged communities;
- a training plan for zero-emission bus operators and maintenance and repair staff; and
- identification of potential funding sources.

NOW, THEREFORE, BE IT RESOLVED that the Solano County Transit Board of Directors hereby approves the SolTrans Zero-Emission Bus Rollout Plan as set forth in Exhibit A.

Passed by the Solano County Transit (SolTrans) Board of Directors on this 15th Day of June 2023, by the following vote:

Ayes: 5
Noes: 0
Absent: 0
Abstain: 0


Cristina Arriola, Chair,
Solano County Transit (SolTrans)

ATTEST:


Suzanne Reyes
Transit Board Administrator/ Office Manager

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Solano County Transit

TO: PUBLIC ADVISORY COMMITTEE
PRESENTER: MANDI RENSHAW, SENIOR ANALYST
SUBJECT: CLIPPER START PILOT FARE PROGRAM AND EXPANDED FARE DISCOUNT
ACTION: INFORMATIONAL

ISSUE:

In September 2021, the Board approved the extension of a means-based fare program known as "Clipper START" through June 30, 2023. The Clipper START program offers a 20% discount to qualified riders on all SolTrans Local and Solano Express Adult fares. The Metropolitan Transportation Commission (MTC) is recommending to further expand the program an additional 24 months through June 2025 and expand the fare discount to 50% for SolTrans riders.

BACKGROUND:

In May 2018, the MTC adopted Resolution No. 4320, establishing the framework for the Regional Means-Based Transit Fare Pilot Program, known as Clipper START. The primary objective of this pilot program was to enhance access to opportunities and improve transportation affordability for adult transit passengers with lower incomes. Eligible adults, whose income is below 200% of the federal poverty level, are offered a 20% or 50% discount on single-ride fares. Initially launched in mid-July 2020 with four operators, the program expanded between November 2020 and January 2021, when 17 additional operators, including SolTrans, joined with a 20% discount. The original recommendation was for an 18-month pilot program, which was set to expire in mid-January 2022. However, due to the slow recovery of transit ridership, the MTC concluded that an extension was necessary to allow sufficient time for program enrollment, alignment with the rollout of the next generation Clipper system, and comprehensive evaluation of program success. In September 2021, MTC staff requested an additional 18-month extension of the pilot program, setting the new expiration date to June 2023.

In June 2023, MTC proposed an additional extension of the program to provide more time to increase program uptake, address persistent barriers identified during the initial evaluation, implement new policies based on stakeholder feedback prior to permanent implementation, align the permanent fare structure with the rollout of the next generation Clipper system, and collaborate with operators to mitigate risks associated with offering a 50% discount across all participating transit systems. This expansion will result in a greater and consistent discount for program participants. Based on the information provided, the recommendation is to expand the Clipper START program through June 30, 2025, and increase the fare discount to 50% for SolTrans riders to align with other participating transit partners. The proposal is supported by SolTrans and other agencies in the Napa/Solano group.

Since the inception of the program, Clipper has approved just over 21,000 Clipper START applications and provided over two million rides. Of that, SolTrans has provided over 5,500 rides to Clipper START riders. Initial evaluation of the pilot has so far revealed that it has met one of the program's original goals, to make transit more affordable for transit-reliant individuals earning a lower income.

Overall, the recommendation aligns with SolTrans' goal of delivering on-time safe transit services that meet the needs of its customers, while also addressing the affordability and accessibility of public transportation for low-income individuals in the community.

FISCAL IMPACT:

The fiscal impact of this pilot program for SolTrans is estimated to be a maximum of \$42,869, which is within the capped program maximum of \$85,738. The necessary funds for the 24-month extension of subsidies and program administration expenditures are projected to be available, per MTC.

PERFORMANCE GOAL:

Goal 1: Service – Delivering on-time safe transit services which meet the needs of SolTrans' customers.

RECOMMENDATION:

Informational.