TORRANCE CITY COUNCIL
TRANSPORTATION COMMITTEE
AGENDA

TUESDAY, AUGUST 6, 2024
REGULAR MEETING
3:30 PM

MARY K. GIORDANO REGIONAL TRANSIT CENTER
MEETING ROOM, 2ND FLOOR
465 CRENSHAW BOULEVARD
TORRANCE, CA 90503

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the City Manager's office at (310) 618-5880. Notification 48 hours prior to the meeting will enable the City to make reasonable arrangements to ensure accessibility to this meeting. [28CFR35.102-35.104 ADA Title II] Direct questions or concerns to the City Council at (310) 618-2801, City Manager at (310) 618-5880, or the individual department head prior to submission to the City Council Transportation Committee. Parties will be notified if the complaint will be included on a subsequent agenda.
PARTICIPATE BEFORE THE MEETING by emailing CHuizar@TorranceCA.Gov and write "Public Comment" in the subject line. In the body of the email include the item number and/or title of the item with your comments. All comments emailed before **5:30 p.m.** on **Monday, August 5, 2024** will be included as a "Supplemental" on the City's website prior to the meeting. Comments received after 5:30 p.m., but prior to the adjournment of the meeting will be added to the record.

1. CALL TO ORDER *Councilmember Mattucci, Chair*

ROLL CALL: Councilmembers Lewis, Kalani and Chair Mattucci

2. PLEDGE OF ALLEGIANCE *Councilmember Lewis*

3. WELCOME AND INTRODUCTIONS *Councilmember Mattucci, Chair*

4. REPORT OF STAFF ON THE POSTING OF THE AGENDA *C. Huizar, Mgt. Associate*

The agenda was posted on the Public Notice Board at 3031 Torrance Boulevard and on the City of Torrance webpage on Thursday, August 1, 2024.

5. ADMINISTRATIVE MATTERS

5A. City Manager and Transit – Accept and File Transit Department Updates on the Mary K. Giordano Regional Transit Center Parking Structure Project.

RECOMMENDATION:
Recommendation of the City Manager and Transit Director that the City Council Transportation Committee accept and file the report on the Mary K. Giordano Regional Transit Center Parking Structure Project.

5B. City Manager and Transit – Accept and File Report on the Connect Torrance Microtransit Demonstration Pilot Program.

RECOMMENDATION:
Recommendation of the City Manager and Transit Director that City Council Transportation Committee accept and file report on the Connect Torrance Microtransit Demonstration Pilot Program.

5C. City Manager and Transit – Accept and File Report on the Red Car Rubber Wheel Trolley Project.

RECOMMENDATION:
Recommendation of the City Manager and Transit Director that the City Council Transportation Committee accept and file report on the Red Car Rubber Wheel Trolley Project.

5D. City Manager and Transit – Accept and File Report on the Torrance Transit Fleet Modernization Plan.

RECOMMENDATION:
Recommendation of the City Manager and Transit Director that the City Council Transportation Committee accept and file report on the Torrance Transit Fleet Modernization Plan.

5E. City Manager and Transit – Accept and File the Report on Transit's Digital Signage at Bus Shelter and Transit Center.

RECOMMENDATION:
Recommendation of the City Manager that the City Council Transportation Committee accept and file the report on Transit's Digital Signage at Bus Shelter and Transit Center.

6. PUBLIC COMMENT

This portion of the meeting is reserved for comment on items not on the agenda that are topics of general interest to the public that are within the subject matter jurisdiction of the City Council Transportation Committee. Under the Ralph M. Brown Act, City Council Transportation Committee cannot act on items raised during public comment but may respond briefly to statements made or questions posed; request clarification; or refer the item to staff.

7. CLOSING REMARKS

8. ADJOURNMENT

AFFIDAVIT OF AGENDA POSTING

STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES) ss
CITY OF TORRANCE)

I, Crystal Cammarota, in compliance with Government Code 54954.2(a) DO HEREBY AFFIRM that a copy of the agenda for the regular meeting of the **City Council Transportation Committee** of the City of Torrance for **August 6, 2024,** was conspicuously posted on the City Clerk's bulletin board, 3031 Torrance Boulevard, Torrance, California at the time and date indicated below.

POSTED:

Time: 5:15 p.m. Date: 08/01/2024

By: _____

Crystal Cammarota
Deputy City Clerk I

City of TORRANCE California

Date: August 6, 2024

To: Members of the City Council Transportation Committee

From: Kim Turner, Transit Director | KTurner@TorranceCA.gov

Aram Chaparyan, City Manager

Subject: City Manager and Transit – Accept and File Transit Department Updates on the Mary K. Giordano Regional Transit Center Parking Structure Project.

RECOMMENDATION

Recommendation of the Transit Director and City Manager that the City Council Transportation Committee accept and file the report on the Mary K. Giordano Regional Transit Center Parking Structure.

FUNDING

There is no funding required for this action.

DISCUSSION

The Mary K. Giordano Regional Transit Center (MKG RTC) has been in operation for just over one year and community awareness and the popularity of this facility is growing. The present surface level parking at the MKG RTC can accommodate up to 250 vehicles. Parking capacity has been reached or exceeded on several occasions due to the Los Angeles Philharmonic Hollywood Bowl Shuttle Service and the Torrance Transit Line 10X SoFi Stadium Service during the National Football League regular season. Additionally, Transit staff is exploring the possibility of bringing a long-distance charter provider, such as FLIX Bus, to provide intercity bus service, and developing a partnership with Los Angeles World Airport's Fly Away program to bring the service to Torrance.

Transit Department staff is ready to move forward with the second phase of construction to expand the MKG RTC in anticipation of future growth and demand. Transit staff previously competed for and was awarded $35 Million in funding through the Los Angeles County Metropolitan Transportation Authority (Metro) and the South Bay Cities Council of Government's (SBCCOG) Measure R South Bay Highway Transit Capital Program to develop a multi-level parking structure that would expand onsite parking to approximately 1,000 vehicles.

Staff will return to Your Honorable Body at a later time as this project progresses to solicitation, evaluation and award for construction phases.

Date: August 6, 2024

To: Members of the City Council Transportation Committee

From: Kim Turner, Transit Director | KTurner@TorranceCA.gov

Aram Chaparyan, City Manager

Subject: City Manager and Transit – Accept and File Report on the Connect Torrance Microtransit Demonstration Pilot Program.

RECOMMENDATION

Recommendation of the City Manager and Transit Director that City Council Transportation Committee accept and file report on the Connect Torrance Microtransit Demonstration Pilot Program.

FUNDING

There is no funding required for this action.

BACKGROUND

As part of an evaluation of existing transit service provided by Torrance Transit to improve delivery, increase ridership and to supplement the Torrance Community Transit Program (TCTP), staff conducted research on innovative technologies and new transit solutions such as “microtransit” to complement the existing Transit’s service.

Microtransit, also known as on-demand transit, is transportation technology that captures trip requests and groups passengers into shared rides, in real-time. Microtransit is best described as a hybrid model between individual private transportation (Uber/Lyft), and public transit. It allows agencies to offer passengers an on-demand options that is more flexible than traditional fixed-route bus service and appointment-based paratransit.

On March 8, 2023, Metro announced the availability of up to $3 million in this grant cycle to fund up to six (6) innovative pilot projects that test and assess strategies that return ridership to pre-COVID levels and beyond. Metro, municipal transit operators, and local transit operators were eligible to apply for these funds, but applicants were also allowed to partner team with private, public, and nonprofit agencies to deliver their proposed pilot projects.

Applicants were required to include at least one independent research partner and identify one or more research questions that the proposal sought to answer. The City of Torrance, Transit

Department (dba as the Torrance Transit System), partnered with Via and CALSTART to develop and submit a grant application for this opportunity.

The intent of LA Metro's Visionary Seed Fund was to help spark and develop innovative mobility concepts in Los Angeles County. In the end, Metro choose to fund only three projects, with Torrance Transit selected to launch its Microtransit pilot program called "Connect Torrance".

DISCUSSION:

Microtransit is powered by innovative technology that uses algorithms to route and schedule trips in real-time. The routing software uses live, on-the-ground information to add people traveling in the same direction into the same vehicle, allowing passengers to be picked up and dropped off in a continuous stream that translates into a ride system that is highly efficient and environmentally friendly.

With the "Connect Torrance" Microtransit program, passengers can book a trip using a smartphone application or by calling the program's call center. In addition, riders can request trips on-demand for travel within minutes of requesting a ride, in advance for travel at a future date or time, and riders can sign up for subscription rides. Passengers who use a smartphone to book a ride can track their vehicle in real-time, similar to what individuals experience when using a rideshare service like Uber or Lyft. LA Metro, Orange County Transportation Authority, and the City of San Gabriel are some local agencies that have recently launched a microtransit program with positive results.

Project Partners:

Via will deploy a turn-key microtransit shuttle service with on-demand shared rides that will be dynamically routed in response to demand. The service includes operations, vehicles, technology, data analytics for reporting and customer support all in one package.

CALSTART is a recognized authority in conducting rigorous performance analysis and impact evaluations of clean transportation initiatives. CALSTART's role in this project is to provide comprehensive data analysis and reporting based on the services provided by Via and Torrance Transit and on the results and impact of the project. The goal of this research will be to assess the effect that the new service has on Torrance residents and transit riders along with cost effectiveness and rider satisfaction.

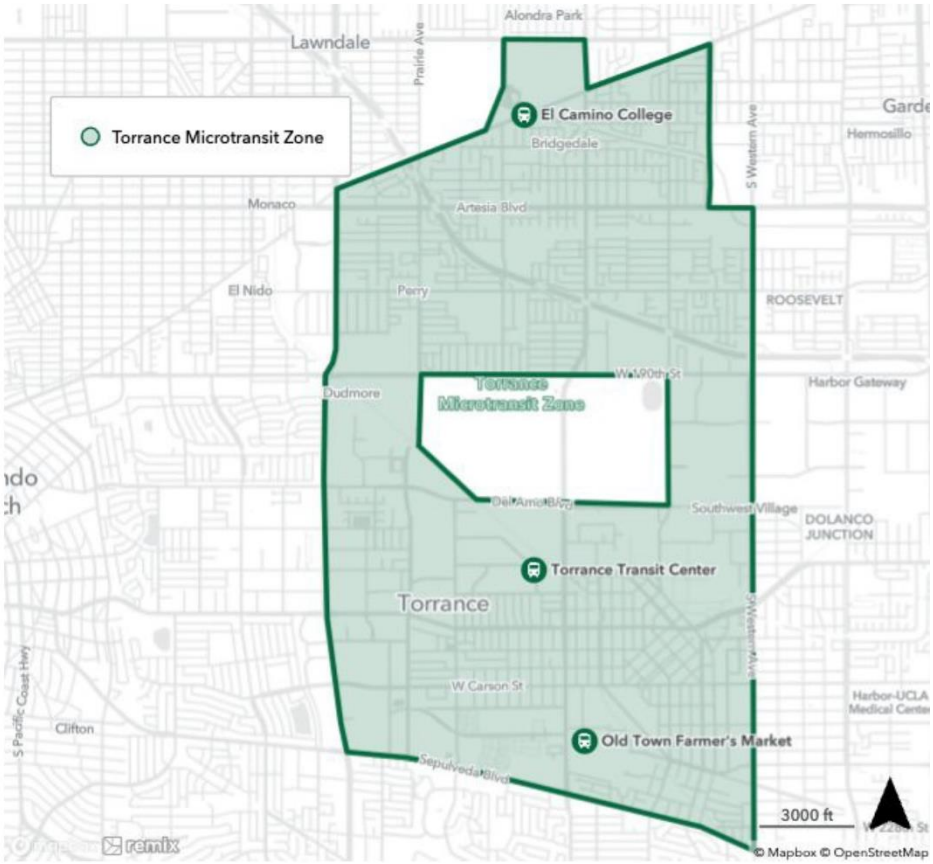
"Connect Torrance" will deploy eight (8) conventional fully electric vehicles, of which four vehicles will be wheelchair-accessible and equipped with lifts. Minivans offer an ideal balance between having enough capacity for ride aggregation and being a smaller, nimble vehicle that can easily traverse residential areas. Each vehicle is wrapped with Connect Torrance microtransit service branding so that riders can easily identify the vehicles. Individuals living and working in the zone will be able to order on-demand trips to anywhere within the designated zone including El Camino College, the Mary K. Giordano Regional Transit Center, Old Town Torrance, Del Amo Mall, and many other destinations.

Priority populations living in Torrance (including older adults and individuals living with disabilities) will not be limited to the microtransit zone or the three priority destinations. Rather, they will be able to access the service for pickups and drop-offs at any location throughout the city limits. The

hours of operation for all individuals will be Monday - Friday 7am-7pm and Saturday / Sunday 9am-5pm with hours extended up to 12am (midnight) for special events. The fare proposed for those who are within the Connect Torrance service zone is $7 flat rate for each trip. This will help the agency maintain a low cost of operating and ensure that the service is competitive with other on-demand services like Uber and Lyft. Individuals who are part of the Torrance Community Transit Program (TCTP) can utilize this service as a supplement to their existing taxi vouchers. This microtransit service will not affect the existing TCTP program.

Pilot Program Duration	**12 months**
Operating Days per Week	**7 days a week Mon-Fri: 7am-7pm, Sat-Sun: 9am-5pm (can be extended up to 12am for special events)**
Total Active Vehicles in Fleet	**8**
-Non-Wheelchair Accessible Vehicles	**4**
-Wheelchair Accessible Vehicles	**4**
Total Number of Vehicle Hours	**19,568**

The project boundary borders Hawthorne Boulevard on the west and Western Boulevard. on the East. On the north end of the project, it borders Manhattan Beach Boulevard (El Camino College) and Sepulveda Boulevard on the south end.



The estimated timeline to launch the program is twelve (12) weeks from execution of the Service Agreement with Nomad/Via. Staff is scheduled to bring this item before the Torrance City Council on August 20, 2024.

Proposed Fare:

Staff is recommending $7 per trip fare for the duration of the pilot program for the members of public utilizing Connect Torrance. This pricing allows the service to be competitive with Uber/Lyft while remaining affordable for many residents. Participants of the TCTP may use their taxi vouchers to pay for trips on Connect Torrance without additional cost. For reference, types of service and fare for the Torrance Transit are shown below.

Torrance Transit Service				
Type	**Service Day**	**Description**	**Frequency**	**Fare**
Fixed Route Bus Service	7 days a week	Everyone	15 - 60 minutes	$0.25-$2
Torrance Community Transit Program (TCTP)/Taxi	7 days a week	(Torrance residents only)	Advance Reservation	
-Seniors Taxi				$1-$5
-People with Disabilities				$1
Connect Torrance Microtransit Pilot Program	7 days a week Mon-Fri: 7am-7pm, Sat-Sun: 9am-5pm (can be extended up to 12am for special events)	Anyone who travels within defined zone	On-demand/flexible within 15 minutes	$7
-Existing TCTP Participants	7 days a week Mon-Fri: 7am-7pm, Sat-Sun: 9am-5pm (can be extended up to 12am for special events)	Anywhere within Torrance City limits	On-demand/flexible within 15 minutes	$1-5

Staff will continue to seek funding from various sources such the State of California's Transit Intercity Rail Capital Program (TIRCP), LA Metro ExpressLanes Grant, and Federal Grant for Advanced Transportation Technology and Innovation Program (ATTAIN).

City of TORRANCE California

Date: August 6, 2024

To: Members of the City Council Transportation Committee

From: Kim Turner, Transit Director | KTurner@TorranceCA.gov

Aram Chaparyan, City Manager

Subject: City Manager and Transit – Accept and File Report on the Red Car Rubber Wheel Trolley Project.

RECOMMENDATION

Recommendation of the City Manager and Transit Director that the City Council Transportation Committee accept and file report on the Red Car Rubber Wheel Trolley Project.

FUNDING

There is no funding required for this action.

DISCUSSION

To enhance connectivity and public transportation service within the City of Torrance, Transit staff previously competed for and was awarded funding through the Los Angeles County Metropolitan Transportation Authority (Metro) and the South Bay Cities Council of Government's (SBCCOG) Measure R South Bay Highway Transit Capital Program to develop an urban circulator service. Known as "The Return of the Red Car Trolley", this service would be operated utilizing a smaller 20' to 25' vehicle and compliment Torrance Transit's existing fixed route bus service by being able to operate in areas that would prove challenging for a 40' bus.

The initial award was $4.5 Million for this project and staff had intended to fabricate six (6) all-electric trolleys. However, in our research and planning, staff discovered that no all-electric trolleys are presently certified for sale and operation in the United States. Prototype vehicles are currently being tested and evaluated in Altoona, Pennsylvania, but actual Federal certification is not anticipated for at least another 24 to 36 months. However, staff did identify one manufacturer, Hometown Trolley, from the State of Wisconsin who specializes in the fabrication of gasoline-powered Rubber Wheel Trolleys.

In place of conducting our own Request for Proposals (RFP), staff requested and was granted procurement options from the State of Georgia Department of Administrative Services who previously conducted an RFP in which Hometown Trolley and other vehicle manufacturers were evaluated and deemed to be eligible for inclusion in their state list for purchase. Other cities and municipal transit operators nationwide can utilize these options in which to procure vehicles.

Therefore, in order to maintain the project timeline and avoid loss of funding, Transit staff elected to procure gasoline powered vehicles that are certified for operation in California. Staff consulted

with Metro and the SBCCOG who awarded the funding, and both concurred with the change in vehicle type, as the project was awarded based upon the creation of an urban circulator service and not the vehicle's propulsion system. Additionally, gasoline powered vehicles cost less than an all-electric vehicle, allowing Transit to increase the number of vehicles procured to 10 trolleys. This in turn will allow for greater service delivery and frequency.

Date: August 6, 2024

To: Members of the City Council Transportation Committee

From: Kim Turner, Transit Director | KTurner@TorranceCA.gov

Aram Chaparyan, City Manager

Subject: City Manager and Transit – Accept and File Report on the Torrance Transit Fleet Modernization Plan.

RECOMMENDATION

Recommendation of the City Manager and Transit Director that the City Council Transportation Committee accept and file report on the Torrance Transit Fleet Modernization Plan.

FUNDING

There is no funding required for this action.

DISCUSSION

The Transit Department is currently undertaking a Fleet Modernization Project in which we plan to replace all of our current vehicles and begin the transition to a zero-emission fleet by 2040. This is planned to be a five-phased project beginning in Calendar Year 2024 and running through 2038 when the last vehicles will be purchased. The first three procurements will replace the existing fleet, while the remaining two will complete the full transition to a zero-emission bus fleet by 2040 as mandated by the State of California. A copy of the Torrance Transit Zero-Emission Roll-Out Plan is included in this item as Attachment 1.

The first phase purchase will be brought before the Torrance City Council on August 13, 2024, in which Transit will request Council's approval to purchase 24 new buses. Purchasing two battery electric and two hydrogen fuel cell buses at this time will allow Torrance Transit to test these vehicles in real world operation and help us determine which zero-emission technology is the most appropriate for our fleet and service area. Torrance Transit will then publish the data and our findings and share it with other municipal transit operators in the State who are also beginning their transition to a zero emission fleet.

In turn, Compressed Natural Gas (CNG) buses are still eligible for purchase in the State of California until 2028, and can be operated up until December 31, 2039. Given their reliability and proven operation, Torrance Transit will continue to purchase CNG buses until the 2028 cutoff.

Each subsequent bus order that will come before the Torrance City Council will have a higher ratio of zero-emission vehicles.

ATTACHMENTS

1. Torrance Transit Zero-Emission Bus Rollout Plan

TORRANCE TRANSIT SYSTEM

ZERO EMISSION BUS ROLLOUT PLAN 2023

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ROLL OUT PLAN SUMMARY

SECTION A: AGENCY'S BACKGROUND

Transit agency's name (Required)	Torrance Transit System (TTS)
Mailing address	20500 Madrona Ave., Torrance, CA. 90503
Transit agency's Air District	South Coast AQMD
Transit agency's Air Basin	South Coast Air Basin
Total number of buses in annual maximum service	44 buses in 2019, 32 buses in 2023
Urbanized area	Los Angeles County
Population of urbanized area	10.4 Million
Contact information of General Manager	Kim Turner Transit Director 310-618-6245 KTurner@TorranceCA.gov
Is Your transit agency part of a joint group? (Required)	No

SECTION B: ROLLOUT PLAN GENERAL INFORMATION

Does the Rollout Plan have a goal of full transition to ZE technology by 2040 that avoids early retirement of conventional transit buses? (Required)	Yes
The ICT regulation requires 100% ZEB purchase in 2029. Conventional transit buses that are purchased in 2028 could be delivered in or after 2029. Please explain how your transit agency plans to avoid potential early retirement of conventional buses in order to meet the 2040 goal	Torrance Transit System (TTS) will begin purchasing zero-emission buses (ZEB) in the first quarter of 2023, and gradually purchase additional ZEBs through 2040. This purchasing strategy will coincide with the disposition of conventional transit buses at the end of their life cycle expectancy. TTS does not intend to acquire additional non-ZEBs after year 2028
Rollout Plan's approval date	
Board Resolution number	
Is a copy of Board-approved resolution attached to the Rollout Plan? (Required)	Yes
Contact for Rollout Plan follow-up questions	James Lee, Administration Manager 310-618-6924 JamesLee@TorranceCA.gov
Who has created the Rollout Plan?	Torrance Transit System Staff
What was the cost for the creation of the Rollout Plan?	None. Only staff time
How many person-hours did it take to create the Rollout Plan	30-40 hours including research and analysis

INTRODUCTION

Torrance Transit System (TTS) currently operates twelve (12) fixed routes within our service area. Of the twelve (12) fixed routes, there are 10 local service routes, one Rapid route and one limited stop express service route. The fixed-route system operates routes that run along the major traffic corridors and provides access to major transit hubs and connection points in the South Bay area. Some of the major cities served include downtown Los Angeles, Downtown Long Beach, Carson, Redondo Beach, Compton, and Gardena, with expansion soon coming to Inglewood. Due to the impact of Covid-19 and challenges from staffing shortage, service on some of the routes have been affected.

TTS operates at 44 peak buses in maximum service. Currently, TTS is operating at 34 peak buses and continues to increase as hiring efforts increase. As a regional provider, TTS has a service area of 108 square miles. Our agency has roughly 800 bus stops in our service area. 320 of these stops are located in the City of Torrance. Additionally, TTS has a brand new state of the art Transit Center called the Mary K. Giordano Regional Transit Center located in the City of Torrance. The new Regional Transit Center will serve as a terminus for L.A. Metro's C-Line (Green) Extension to Torrance and will also provide charging station for opportunity charges mid-route for future zero emission buses. TTS also has a bus operation facility located in the City of Torrance, where buses are stored overnight and recharge. All TTS bus lines now accept the regional Transit Access Pass (TAP) Card and continues to accept cash payment. TTS currently operates seven days a week, with schedules running on Saturdays and Sundays. All routes run Monday to Friday, with Lines 1, 3, 8, and 13 also running on Saturdays and Sundays. TTS's shortest route is our Line 9 at approximately 8.5 miles in one direction while our longest route is Line 4X at approximately 24.5 miles in one direction. Our weekday service span is from 4:45am until 11:00pm while our weekend service span is 5:15am until 10:30pm.

Torrance Transit System utilizes a variety of buses to operate our service. Our agency currently operates ten (10) 2010 New Flyer GE40LFR Gas Electric Hybrids, twenty (20 New Flyer C40LFR Compress Natural Gas (CNG) Buses, nine (9) 2012 New Flyer XN40 CNG Excelsior, and twenty-four (24) New Flyer XN40 CNG Excelsior, for a total of sixty-three (63) operational buses. As contingency, TTS maintains five (5) 2002 Gillig/Low-Floor diesel buses.

CARB'S INNOVATIVE CLEAN TRANSIT REGULATION

The California Air Resource Board's (CARB) Innovative Clean Transportation (ICT) regulation requires all public transit agencies in the State of California to transition from conventional buses (compressed natural gas, diesel, etc.) to zero-emission buses (battery-electric or fuel cell electric) by 2040. The regulation requires a progressive increase in new bus purchases to be zero-emission buses (ZEBs) based on the transit agency's fleet size. By 2040, CARB expects all transit agencies in the state to be operating only ZEBs.

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 ("Joint Group"), to submit a ZEB Rollout Plan ("Rollout Plan") before purchase requirements take effect. The Rollout Plan is a living document that guides the implementation of ZEB fleets and helps transit agencies work through many of the potential challenges and explore solutions. Each Rollout Plan must include several required components (as outlined in the Rollout Plan Guidelines) and approved by the transit agency's governing body through the adoption of a resolution, before submission to CARB.

Torrance Transit System must comply with the following requirements under the ICT regulation for small agencies (operate in the South Coast or San Joaquin Valley Air Basin with 65 or less buses in annual maximum service):

- **October 31, 2023**: Board-approved Rollout Plan submitted to CARB
- **January 1, 2026:** 25 percent of all new bus purchases must be zero-emission
- **January 1, 2027:** 25 percent of all new bus purchases must be zero-emission
- **January 1, 2028:** 25 percent of all new bus purchases must be zero-emission
- **January 1, 2029**: 100 percent of all new bus purchases must be zero-emission
- **January 1, 2040**: 100 percent of the system fleet must be zero-emission
- **March 31, 2021 – March 31, 2050**: Annual compliance report due to CARB

SECTION C: TECHNOLOGY PORTFOLIO

According to the ICT regulation, a ZEB is a bus with zero tailpipe emissions and is either a battery-electric bus (BEB) or a fuel cell electric bus (FCEB). BEBs depend on a system to store and retrieve energy much as cars and trucks need fuel. BEBs have multiple battery packs that power an electric motor, resulting in ZE. Similar to many other battery-powered products, BEBs must be charged for a period of time to be operational. Currently, BEBs can be charged at the facility or in-service (on-route charging) via a number of connectors and dispensers.

A FCEB uses hydrogen and oxygen to produce electricity through an electrochemical reaction to power the propulsion system and auxiliary equipment. This ZE process has only water vapor as a byproduct. FCEBs can replace diesel or compressed natural gas (CNG) fuel buses without significant changes to operations and service and functions as a resilient backup alternative in case of natural disaster. The fuel cell is generally used in conjunction with a battery, which supplements the fuel cell's power during peak loads and stores electricity that is recaptured through regenerative braking, allowing for better fuel economy.

Torrance Transit System has also conducted a technology analysis that assessed the state of existing zero-emission bus technology and included visits to other California transit operators to learn about their experience deploying battery-electric and hydrogen fuel cell buses. Those transit operators include:

- Montebello Transit (hydrogen fuel cell)
- Orange County Transportation Authority (hydrogen fuel cell)
- Santa Monica Big Blue Bus (depot-charged battery-electric)
- Foothill Transit (on-route battery-electric)
- L.A. Metro (on-route and depot-charged battery-electric)

In that effort, Torrance Transit System collaborated with Cal Poly Pomona's Master of Urban and Regional Planning Student Research Program to evaluate capital, operation and lifecycle costs for each technology strategy, energy management strategies as well as impacts to TTS's labor, maintenance and facility needs and the quantity of service that TTS can operate. The analysis informs a recommendation for a fleet-wide zero-emission bus technology strategy to TTS's Board of Directors. **The study finds that a battery electric bus (BEB) technology strategies is most cost-effective. However, it recommends that TTS should continue to explore and pilot competing technology (Hydrogen Fuel Cell) to identify and maximize the benefits of zero-emission bus technology**.

Torrance Transit System's past and ongoing ZEB analysis has found that Battery Electric Bus adoption is the ZEB technology that best aligns with TTS's 2040 ZEB goals. This is in a large part due to the market of BEBs in terms of technological advancement, costs, and availability. In addition, BEB technology is operationally flexible in terms of range for many of TTS's bus routes. While FCEBs are promising and have many

potential benefits (as compared to both CNG and BEB), unpredictability in operation costs and a limited supply chain makes it an unviable option at this time, especially considering TTS's ZEB goals. However, TTS will look to procure a FCEB for a pilot program in order to gather more data and create a comparison. If battery technology and real-life experienced mileage does not improve over time, fuel cell electric buses or an alternative future ZEB technology may need to be considered in the outer years of the fleet replacement plan to ensure a 100% ZEB fleet transition.

SECTION D: TORRANCE TRANSIT SYSTEM BUS FLEET COMPOSITION AND FUTURE BUS PURCHASES

Table 1. Currently Bus Fleet Composition

Year	Manufacturer	Quantity	Bus Type	Fuel Type
2010	New Flyer GE40 LFR Hybrid	10	Standard	Gasoline-Electric Hybrid
2011	New Flyer C40LFR CNG	20	Standard	Compressed Natural Gas
2012	New Flyer XN40 CNG	9	Standard	Compressed Natural Gas
2016	New Flyer XN40 CNG Excelsior	24	Standard	Compressed Natural Gas
Contingency Fleet				
2002	Gillig/Low-Floor	5	Standard	Diesel

Torrance Transit System operates 44 blocks during weekdays in 2019. Since the onset of COVID-19 Pandemic and staffing shortage experienced throughout the nation, TTS is currently operating at 32 blocks during weekdays. Many of these blocks are longer than 100 miles. TTS' longest block is approximately 175 miles. Depending on operational parameters, including operator behavior, ambient temperature, traffic, and ridership, these ranges may be unattainable or difficult to achieve on certain days. Based on existing routes, TTS will be able to support BEB on a 1:1 ratio until 2028 (pending advancements in the technology). If vehicle manufacturers cannot meet these range requirements after 2028, TTS will consider a number of strategies to supplement onboard battery storage, including additional buses, midday charging, battery/charging management systems, and solar and battery storage. As mentioned, in future ZEB applications, TTS will also consider FCEBs, especially if battery technology doesn't advance as forecasted.

Future Bus Procurement

Over the next ten years, TTS will be proactively applying for federal, state, and local funding in order to replace 63 buses that will reach their useful life of 14 years. These potential funding sources include FTA's Buses and Bus Facilities Program, Low-No Zero-Emission Bus Program, and others.

Based on an electric fleet analysis conducted by Southern California Edison, the agency could save up to $8,138,000 in fuel costs by transitioning towards an all-electric fleet over the next 14 years. TTS is pursuing the grant SCE's Charge Ready Transport grant program this year.

Table 2. Future Bus Purchases

Year	Total Purchase	Total ZEB	% of Buy	Fuel Type	Non-ZEB	% of Buy	Bus Type	Required Range
2024	20	0	0%	CNG	10	50%	Standard	154 - 200+
		5	25%	Electric	0	0%	Standard	
		5	25%	Hydrogen Fuel Cell	0	0%	Standard	
2025	20	15	75%	ZEB	5	25%	Standard	200+
2026	9	7	78%	ZEB	2	22%	Standard	200+
2029	12	12	100%	ZEB	0	0%	Standard	200+
2030	12	12	100%	ZEB	0	0%	Standard	200+
2031	10	10	100%	ZEB	0	0%	Standard	200+
2032	10	10	100%	ZEB	0	0%	Standard	200+
2035	10	10	100%	ZEB	0	0%	Standard	200+
2038	10	10	100%	ZEB	0	0%	Standard	200+
2039	5	5	100%	ZEB	0	0%	Standard	200+
2040	2	2	100%	ZEB	0	0%	Standard	200+

SCHEDULE OF CONVERTING SOME OF THE CONVENTIONAL BUSES IN SERVICE TO ZERO-EMISSION BUSES

Torrance Transit System is not considering converting any of the conventional buses in service to zero-emission buses. This is because based on FTA's regulation, conversion of any existing FTA funded buses will add on additional years to the lifecycle of those buses.

SECTION E: FACILITIES AND INFRASTRUCTURE MODIFICATIONS

Torrance Transit System bus yard has parking for up to 80 revenue vehicles. The planned 8 plug-in dual-port fast DC chargers will not take away any vehicle parking. These charging stations will not result in any loss of parking. The first phase of the infrastructure build-up will include charging up to 16 buses overnight. In 2035, the capacity will be increase to 24 BEB buses.

The Mary K. Giordano Regional Transit Center planned for 4 plug-in dual-port fast DC chargers along the South Wall where buses layover during service hours. These charging stations will not result in any loss of parking. The first phase of the infrastructure build-up will include charging up to 8 buses overnight. In 2035, the capacity will be increase to 12 BEB buses.

Torrance Transit System is in the process of planning and designing a new bus facility to store and re-fuel future Zero-Emission Buses.

	Torrance Transit Yard 20500 Madrona Ave. Torrance, CA.	**Mary K. Giordano Regional Transit Center - 465 Crenshaw Blvd., Torrance, CA.**
Current Status	In design and agreement with SCE for Charge Ready Infrastructure	In Design and agreement with SCE for Charge Ready Infrastructure
Service Date	June 2024	June 2024
Type of Fuel	Electric	Electric
Technology	Distributed Charging	Distributed Charging
Core Hardware	Ultra-high current of 375 A per individual power cabinet Dynamic DC functionality: 500 A per charge post	Ultra-high current of 375 A per individual power cabinet Dynamic DC functionality: 500 A per charge post
Related Hardware	4 Dual Port Dispenser with Charge Management System Will expand to 8 by 2040	2 Dual Port Dispenser with Charge Management System Will expand to 4 by 2040
Fueling Location	South and West Side of Transit Building	South Wall
Needs Upgrade?	Yes	Yes
System Capacity	175 - 350 kW per pair	175 - 350 kW per pair
Estimated Construction Timeline	July 2025	July 2025


Reservoir
Torrance Transit System
Proposed are for Charging infrastructure
Torrance Transit System
Bus Yard
20500 Madrona Ave.
Torrance, CA.


Proposed are for Charging infrastructure
Mary K. Giordano
Regional Transit Center
465 Crenshaw Blvd.
Torrance, CA.

SECTION F: FLEET DEPLOYMENT AND PROVIDING SERVICE IN DISADVANTAGED COMMUNITIES

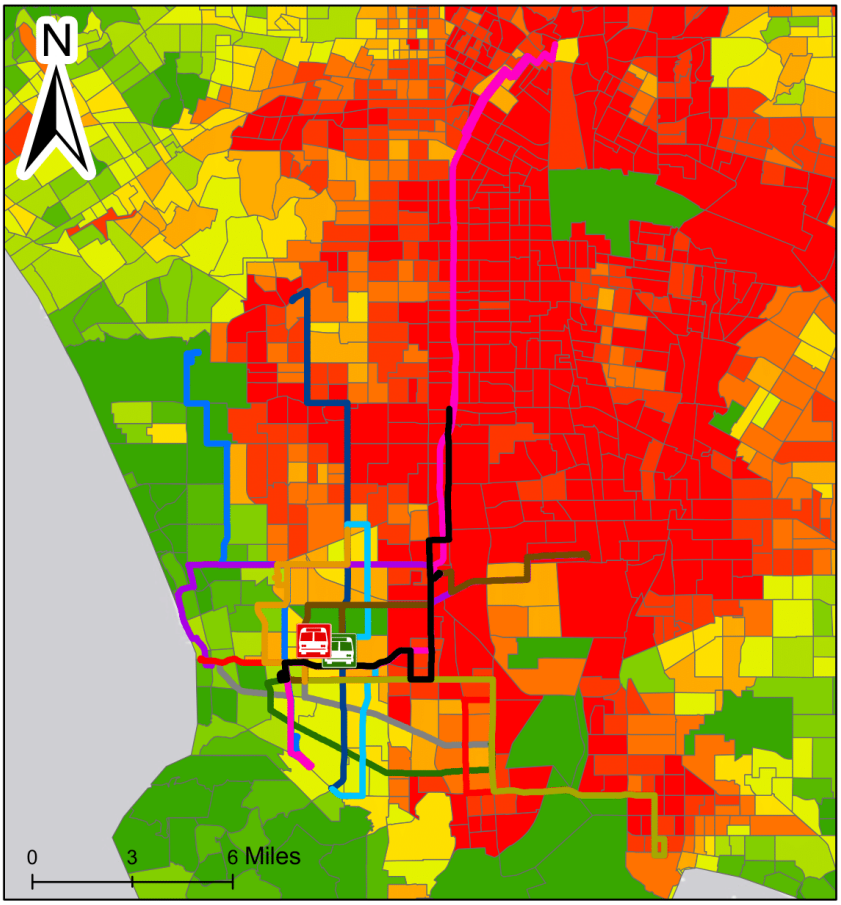
The seven zero emission electric buses aim to bridge the gap of service for the majority of the AB 1550 disadvantaged community residents and low-income communities. Torrance Transit System serves more than 635,000 people of minority populations and over 231,000 people with incomes lower than 150% of the federal poverty level in the agency's service area. 117 square miles of SB 535 communities are located within a half-mile radius of TTS. Furthermore, 111 square miles of AB 1550 communities are located within a half-mile radius of TTS. Our Lines 1, Rapid 3, 4X, 6, and 10 connecting at the Mary K. Giordano Regional Transit Center will serve many priority populations in our service area. The electric buses will be circulating throughout all of our routes to ensure that there are no disparities in service reliability and amenities for disadvantaged and low-income populations. Line 9 expansion as part of the TTS Bus Service Enhancement Program will provide new access to Kaiser Permanente South Bay Medical Center, one of the largest medical centers in the South Bay region. This new route expansion will help bridge the shortage of access to this facility for low income and disadvantaged families. Currently, there is a lack of transit service between the City of Torrance and City of Inglewood in terms of moving people of color, low-income residents to jobs and new opportunities. Line 10 – Torrance to Florence service expansion help bring people of disadvantaged and low-income communities to more jobs and destinations with the new SoFi Stadium Hollywood Park Entertainment District, YouTube Theater, The Kia Forum and the future Intuit Dome. In addition, the new service will help alleviate congestion on major arterials like Crenshaw Boulevard and the 110 Freeway going into Inglewood and the new Entertainment District. Increasing service also provide positive impacts the disadvantaged communities TTS serves by improving access and mobility for residents of Torrance that depend on public transportation. The Line 10 – Torrance to Florence will also help connect to the new LA Metro's K-Line (Crenshaw/LAX) Station in Downtown Inglewood. Our routes do not compete with, duplicate or infringe upon the service routes of other neighboring transit agencies, rather they are designed to enhance the regions overall ability to provide safe and reliable public transit. Approximately 60% of our routes travel outside of city boundaries to service other communities in the South Bay Region, serving more than 78% of the minority population in the area.

The project will enhance mobility and further support the economic recovery from the pandemic for these disadvantaged and low-income communities by providing key connections to express and commuter bus routes, Metro light rail, Amtrak, and Metrolink for regional travel to jobs and basic needs. This project will decrease greenhouse gas emissions caused by diesel and gas powered buses for residents of the disadvantaged communities TTS serves. Acquiring electric buses for our fleet will improve the air quality in the City of Torrance, as well as the neighboring cities we operate in including Compton, El Segundo, Hawthorne, Lawndale, Lomita, Manhattan Beach, and the unincorporated areas of Los Angeles County. Many disadvantaged and

low-income communities reside along the 110 Freeway, where congestion and bad air quality create constant health problems.

As Torrance Transit System begins implementing our service enhancement, we will meet with members of AB 1550 and SB 535 communities to go over the service changes, obtain feedback, and gather additional concerns. Many TTS bus stops are directly within or located within close proximity to AB 1550 and SB 535 communities based on CalEnviroScreen. As a result of providing better service through our service enhancement, vehicles along the entire corridor will be removed, alleviating traffic congestion along the 110 Freeway, Crenshaw Boulevard, Lomita Street, 190th Street, the most congested freeway and arterials within the South Bay region. The distance of passenger bus trip made and the fact that the automobile is often the only other mode of travel between more distant origin and destination points is equally a factor – with access to/from passenger bus station being a contributing factor for those communities and households. By reducing VMT through increased ridership, the project will contribute to reductions of critical pollutant levels both in proximity to the bus stations, those communities that the bus routes pass through, and, for communities that are much further afield than either bus stations or the bus routes would suggest. Based on CARB's Priority Population Benefit Criteria for Disadvantaged Communities, TTS provides at least 250 stops within our system that service these communities.

Torrance Transit System Routes and CalEnviroScreen 4.0 Results



Legend

- Line 1
- Line 2
- Line 3
- Rapid 3
- Line 4X
- Line 5
- Line 6
- Line 7
- Line 8
- Line 9
- Line 10
- Line 13

CalEnviroScreen 4.0 Percentile

- 90 - 100%
- 81 - 90%
- 71 - 80%
- 61 - 70%
- 51 - 60%
- 41 - 50%
- 31 - 40%
- 21 - 30%
- 11 - 20%
- 0 -10%

- Torrance City Yard
- Mary K Giordano Regional Transit Center

Prepared July 7, 2023 by Torrance Transit Planning & Design.
Data Source: Torrance Transit System, California OEHHA CalEnviroScreen 4.0

SECTION G: WORK FORCE TRAINING

ZEBs have unique systems like electric drivetrains, batteries, fuel cells, and hydrogen storage tanks that require specialized training to service effectively and operate with maximum performance. Identify the skills, training and credentials required to maintain and operate the proposed fleet and associated infrastructure. This may be vehicle-specific, and some elements may not be able to be determined until the Transit Vehicle Manufacturer (TVM) is selected. Most of the bus operations and maintenance work for Torrance Transit System fleet are performed in-house, and TTS is responsible for providing trained bus drivers and maintenance staff. In addition, our transit agency will need to conduct maintenance on bus infrastructure.

BEBs are designed to be driven in a certain manner, and bus operators must receive driver training to properly drive the buses. Deviations from this training will impact the bus's performance.

Bus Operator Training

Bus operators will need training to drive and operate ZEBs. ZEBs need to be driven in a certain manner to optimize performance and bus range. Typically, electric buses maximize their range when accelerated slowly. Poor driver behavior, such as rapidly accelerating from a stop, can reduce bus range by up to 25 percent. As a result, ensuring the bus operators drive the buses in the correct manner is vital to maximizing the benefits of ZEBs. Range anxiety, where the driver fears that they do not have enough charge to complete their route, has also been widely documented. This fear has resulted in operators prematurely ending their route and returning to the depot to charge the bus. To avoid this problem, bus operators need to understand the range and capabilities of the bus. Bus operators also need to learn how to correctly use technologies such as regenerative braking.

Fleet Technician Training

ZEBs have different maintenance needs and operation best practices than traditional internal combustion engine buses. ZEBs replace the internal combustion engine with an electric drivetrain, which changes the maintenance needs of the bus. While maintaining a traditional bus, a maintenance technician needs to have expertise in maintaining and repairing internal combustion engines and moving parts like belts, alternators, and pumps. In addition, expertise in mechanical systems such as steering, HVAC, and suspension is vital. However, with ZEBs, the vast majority of the moving parts are replaced with electric components, such as batteries, DC-to-DC converters, and electric motors. Since there are few moving parts on a ZEB, the majority of the maintenance tasks relate to preventative maintenance. As a result, the most vital skills for maintenance technicians to become proficient in are high voltage safety and proper use

of personal protective equipment to minimize the risk of electrical shocks and arc flashes. Mechanics should consider obtaining the NFPA 70E: Standards for Electrical Safety in the Workplace and High Voltage OSHA 1910.269 8 Hour Qualified Training Course certificates. Maintenance technicians will also need to become proficient in bus inspection, preventative maintenance, and how to handle removed battery systems to effectively maintain the buses. Knowledge of standard bus mechanical systems is also important. If a fleet has hydrogen FCEBs, the maintenance technicians need additional skills. Hydrogen is a highly flammable gas, meaning that it requires specialized skills. Technicians working on hydrogen buses need training in high pressure gases and hydrogen safety. Local first responders need to receive training in EV and hydrogen safety so they can effectively respond in the event of an accident.

Identifying the skills needed for technicians to safely repair and maintain ZEBs is a first step to transitioning from more traditional buses. Mastering basic electrical/electronic (E/E) skills becomes a foundation for all other ZEB skills to follow. The learning objectives contained in the American Public Transportation Association's (APTA) recommended training practice entitled Training Syllabus to Instruct/Prepare for the Automotive Service Excellence (ASE) Transit Bus Electrical/Electronics Test represents an industry consensus for those basic but essential E/E skills. For example, before technicians can work on the high voltage aspects of ZEBs, upwards of 800 volts, they must first acquire the skills associated with 12 and 24 volts. Foundational skills include:

- the ability to read basic wiring diagrams,
- safely handle low-voltage batteries,
- troubleshoot and repair basic circuit faults,
- inspect and test relays,
- demonstrate proficient use of digital multi-meters (DMM), and
- repair wiring and terminals among other tasks.

Once basic electrical skills have been mastered, the next set of skills address the basic aspects of multiplexing, a more advanced and streamlined structure that essentially controls the vehicle's electrical system, replacing an extensive system of electrical hard wiring. Multiplexing skills include the ability to:

- read and interpret ladder logic diagrams,
- use LED indicator lights to troubleshoot the system, and
- identify symbols used for input and output electrical signals.

The next set of skills pertain to electronics, the branch of physics that deals with solid state devices using transistors, microchips, and other such components. Virtually every bus system is now controlled by electronic devices, which has increased significantly with the introduction of ZEBs. Electronic skills include:

- the ability to inspect and test capacitors, diodes, capacitors, and other electronic modules;

- differentiate between analog and digital signals;
- the ability to describe the purpose of data communication protocols CAN/SAE J1939 and SAE J1708;
- differentiate between direct current (DC) and alternating current (AC);
- demonstrate use of an oscilloscope and a graphing multimeter; and
- inspect and troubleshoot gateway modules.

Technicians receive their training through a variety of sources, which usually starts in an automotive program at either a community college or trade school. While at community college/trade school, technicians are introduced to automotive safety, vehicle systems, engines, and mechanical systems. Many students will also learn about electric and hybrid drivetrains. Many community colleges such as El Caminio College, Rio Hondo College and San Bernardino Valley College have devoted EV Associate of Sciences programs.

After completing community college/trade school, technicians are then hired by a fleet or a transportation services company. Technicians usually receive on-the-job training after they are hired. Their employer often provides one-on-one training so the technician can work on real-life maintenance and repair issues. Bus OEMs (Original Equipment Manufacturer) also provide training to technicians. This training typically begins one week before the bus is delivered.

The OEM will send a field service representative to provide bus operator training to the contractor's drivers. The field service representative provides safety, preventative maintenance, and diagnostic/troubleshooting training to the mechanics. Since this training is specific to the buses and is generally at a more advanced level, it is important that the technicians have some experience with the basics of zero-emission vehicle maintenance before attending the OEM's training. Our agency will purchase training packages from the OEM. OEM-provided training teaches maintenance staff how to operate and maintain a zero emission drivetrain system. The OEM-provided training begins about a week before the delivery of the buses. The OEM sends a field service representative to provide bus operator training to the contractor's drivers. The field service representative will also train the maintenance staff. Since there are few moving parts on a zero emission bus, the majority of the maintenance tasks relate to preventative maintenance. As a result, the field service representative provides safety, preventative maintenance, and diagnostic/troubleshooting training to the contractor's mechanics. The field service representative is also vital for training mechanics on more advanced maintenance tasks. During the warranty period, if repairs or troubleshooting beyond preventative maintenance are needed, the contractor may call out the field service representative to fix the issue and teach the mechanics how to fix it. Using the warranty period to provide on-the-job training to the mechanics is vital to developing the skills of the maintenance staff. Overtime the maintenance staff will accrue enough knowledge to work independently from the field service representative.

This knowledge can be institutionalized by pairing more experienced maintenance staff with junior staff and new hires to teach them maintenance best practices. OEM-provided training can also be supplemented with training provided by other organizations such as the Southern California Regional Transit Training Consortium (SCRTTC), the California Transit Association, American Public Transportation Association, CalACT, and the National Transit Institute.

There are other avenues for obtaining maintenance technician training. SunLine Transit in Thousand Palms, California, is currently operating the **West Coast Center of Excellence in Zero Emission Technology (WCCoE)**. The WCCoE offers workforce development training for transit agencies. As a part of this training, the WCCoE offers technician training in multiple formats, including on-site at the WCCoE, virtual training, and webinars. On-site training at the WCCoE includes hands-on lab work with actual buses.

The Southern California Regional Transit Training Consortium (SCRTTC) also offers training for ZEB technicians. SCRTTC is a membership-based organization that counts many Southern California transit agencies as members. SCRTTC works with OEMs to provide training in a wide range of zero-emission technologies and bus mechanical systems. This organization works with the OEMs to provide train-the-trainer programs, including classroom and hands-on training.

The Electric Vehicle Infrastructure Training Program (EVITP) provides training to electricians on how to install EV charging infrastructure. Electricians who complete this program can receive EVITP certification. This certification is accepted as industry-standard, and some California Energy Commission (CEC) grants even require that a certain percentage of electricians working on EV charging infrastructure have EVITP certification. EVITP also provides training on maintaining, troubleshooting, and commissioning EV chargers. It is recommended that maintenance staff who work on chargers obtain EVITP certification.

International Transportation Learning Center is the only national organization that focuses on the frontline workforce in public transportation and transportation in general. It is the only organization funded by the Federal Transit Administration, the US Department of Labor, and the Transit Cooperative Research Program to develop and support technical training partnerships for today's and tomorrow's front-line work force.

Through Clean Transportation Program investments, Torrance Transit System can also receive assistance for workforce development to support employees with pathways to sustained clean-transportation job opportunities, and help to achieve the state's greenhouse gas reduction goals. The Energy Commission's public partners include the California Community Colleges Advanced Transportation and Logistics program (ATL), California Community Colleges Chancellor's Office, Employment Development Department, and Employment Training Panel.

SECTION H: POTENTIAL FUNDING SOURCES

California Senate Bill (SB) 101 (Skinner) and Assembly Bill (AB) 101 (Ting), propose significant funding for transit capital and operations above the Governor's proposed FY 2023-24 budget.

These bills would restore $2 billion in General Fund support to the Transit and Intercity Rail Capital Program (TIRCP), returning General Fund investment in the program to $4 billion total for FY 2023-24 and FY 2024-25. As specified in the FY 2022-23 budget, this funding would flow to regions on a population-based formula for investment in transit and rail capital projects; however, regions would receive new flexibility to direct up to 100% of this funding to meet the operational needs of agencies in their jurisdiction.

These bills would also appropriate $811 million in new and previously appropriated transit funding for the newly created Zero-Emission Transit Capital Program. This funding would flow through a yet-to-be-determined formula. While the funds allocated for the Zero-Emission Transit Capital Program are proposed for capital projects, these funds will also be flexible and may be applied to operations.

The following is a breakdown for sources of Zero-Emission Transit Capital Program funding through the State of California:

- $331 million - Allocated from the Greenhouse Gas Reduction Fund (GGRF)
    - Zeroes out the Governor's proposed GGRF funding for zero-emission buses and infrastructure, which would be administered by the California Air Resources Board (CARB) and California Energy Commission (CEC), for FY 2022-23 through FY 2025-26, and shifts this funding to the Zero-Emission Transit Capital Program ($111 million).
    - Includes new GF investment for the Zero-Emission Transit Capital Program ($220 million).

- $280 million - Allocated from the Public Transportation Account (PTA)
    - Zeroes out the previously appropriated PTA funding for Zero-Emission Rail and Transit Demonstrations Projects, administered by the California State Transportation Agency (CalSTA), and shifts this funding to the Zero-Emission Transit Capital Program ($280 million).

- $200 million - Allocated from the General Fund
    - Zeroes out the previously appropriated General Fund support for Zero-Emission Rail and Transit Demonstrations Projects, administered CalSTA, and shifts this funding to the Zero-Emission Transit Capital Program ($100 million).
    - Zeroes out previously appropriated General Fund support for zero-emission buses and infrastructure, administered by CARB and CEC, for FY

2022-23 through FY 2025-26, and shifts this funding to the Zero-Emission Transit Capital Program ($100 million).

- $300 million - Proposed for Investment in Future Years

Funding for Zero-Emission Bus Technology from the State of California

The Clean Transportation Program (also known as Alternative and Renewable Fuel and Vehicle Technology Program) invests up to $100 million annually in a broad portfolio of transportation and fuel transportation projects throughout the state. The Energy Commission leverages public and private investments to support adoption of cleaner transportation powered by alternative and renewable fuels. Through Clean Transportation Program investments, the California Energy Commission (CEC) helps workforce development and training entities to expand their current programs, and develop new programs to support workers in California's zero-emission vehicle and zero-emission vehicle infrastructure sectors. These investments support the state's transition to clean transportation, provide pathways to sustained clean-transportation job opportunities, and help to achieve the state's greenhouse gas reduction goals.

California Air Resources Board - The Carl Moyer Program provides grant funding for engines, equipment, and other sources of air pollution that exceed CARB's regulations for on-road heavy-duty vehicles. The Carl Moyer Program is managed by CARB in collaboration with local air pollution control districts and air quality management districts. ZEBs with a GVWR of greater than 14,000 pounds are eligible for funding under Carl Moyer. The air pollution control districts and air quality management districts are the entities that issue the grants and determine funding for the program.

California's Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) plays a crucial role in the deployment of zero-emission and near-zero-emission technologies. HVIP accelerates commercialization by providing point-of-sale vouchers to make advanced vehicles more affordable. Launched by the California Air Resources Board in 2009, the project is part of California Climate Investments. HVIP is the earliest model in the U.S. to demonstrate the function, flexibility, and effectiveness of first-come first-served incentives that reduce the incremental cost of commercial vehicles. On November 17, 2022, the California Air Resources Board approved the FY22-23 Funding Plan for Clean Transportation Incentives, which includes policy changes and an allocation of over $1.7 billion to be administered by HVIP. Total FY22-23 Funding – Available NOW for transit is $65 Million.

The Transit and Intercity Rail Capital Program (TIRCP) provides grants from the Greenhouse Gas Reduction Fund (GGRF) to fund transformative capital improvements that will modernize California's intercity, commuter, and urban rail systems, and bus and ferry transit systems, to significantly reduce emissions of greenhouse gases, vehicle miles traveled, and congestion. Through the six cycles of TIRCP funding, the California State Transportation Agency (CalSTA) has awarded $9.8 billion in funding to

125 projects throughout the state. CalSTA awarded $2.54 billion of this funding to existing projects as the first grants of TIRCP Cycle 6 on January 31, 2023, and awarded $690 million to new projects on April 24, 2023.

The Low Carbon Fuel Standard (LCFS) is one of the nine discrete early action measures to reduce California's greenhouse gas (GHG) emissions that cause climate change. The LCFS is a key part of a comprehensive set of programs in California to cut GHG emissions and other smog-forming and toxic air pollutants by improving vehicle technology, reducing fuel consumption, and increasing transportation mobility options. The LCFS is designed to decrease the carbon intensity of California's transportation fuel pool and provide an increasing range of low-carbon and renewable alternatives, which reduce petroleum dependency and achieve air quality benefits.

Low Carbon Transit Operations Program (LCTOP) is one of several programs that is funded by the GGRF, which is funded by revenues from the state's cap-and-trade system. The LCTOP was created to provide operating and capital assistance for transit agencies to reduce greenhouse gas emission and improve mobility, with a priority on serving disadvantaged communities. Approved projects in LCTOP will support new or expanded bus or rail services, expand intermodal transit facilities, and may include equipment acquisition, fueling, maintenance and other costs to operate those services or facilities, with each project reducing greenhouse gas emissions. For agencies whose service area includes disadvantaged communities, at least 50 percent of the total moneys received shall be expended on projects that will benefit disadvantaged communities. Senate Bill 862 continuously appropriates five percent of the annual auction proceeds in the Greenhouse Gas Reduction Fund (Fund) for LCTOP, beginning in 2015-16.

Energy Infrastructure Incentives for Zero-Emission Commercial Vehicles, also known as EnergIIZE - In April 2021, the California Energy Commission (CEC) announced "Energy Infrastructure Incentives for Zero-Emission Commercial Vehicles (EnergIIZE Commercial Vehicles)", a first-of-its-kind project that will provide funding for electric vehicle charging and hydrogen refueling infrastructure for zero-emission trucks, buses, and equipment in California. This project will leverage large amounts of funding in order to rapidly deploy medium- and heavy-duty (MD/HD) zero-emission vehicle (ZEV) refueling infrastructure in a streamlined manner to address critical barriers and gaps to the deployment of MD/HD ZEV infrastructure. EnergIIZE will provide $50 million of funding to entities to help finance the purchase of charging and hydrogen infrastructure. The program is intended to primarily benefit communities with disproportionately high levels of air pollution and will only cover a part of the infrastructure hardware and software costs.

The Volkswagen (VW) Environmental Mitigation Trust provides about $423 million for California to mitigate the excess nitrogen oxide (NOx) emissions caused by VW's use of illegal emissions testing defeat devices in certain VW diesel vehicles. $130 million of

these funds is devoted to replacing older, high emission buses with BEBs or FCEBs. Transit, school, and shuttle buses are eligible for funding.

Federal Funding for Zero-Emission Bus Technology

Congestion Mitigation and Air Quality (CMAQ) Improvement Plan – USDOT CMAQ provides funding to state departments of transportation (DOTs), local governments, and transit agencies for projects and programs that help meet the requirements of the Clean Air Act by reducing mobile source emissions and regional congestion on transportation networks. Eligible activities include transit improvements, travel demand management strategies, congestion relief efforts (such as high occupancy vehicle lanes), diesel retrofit projects, alternative fuel vehicles and infrastructure, and medium- or heavy-duty zero emission vehicles and related charging equipment. Projects supported with CMAQ funds must demonstrate emissions reductions, be located in or benefit a U.S. Environmental Protection Agency-designated nonattainment or maintenance area, and be a transportation project. This program is primarily intended to fund projects in areas that do not meet national air quality standards. The Infrastructure Investment and Jobs Act (IIJA) provides $13.2 billion of funding over five years. Under IIJA, there are new project types that are eligible for funding under CMAQ. The purchase of medium- or heavy-duty zero emission vehicles and supporting infrastructure is eligible for funding under CMAQ. The purchase of diesel replacements, or medium-duty or heavy-duty zero emission vehicles and related charging equipment are also eligible for funding. CMAQ funds can also be used to provide operating assistance for public transportation projects.

The Grants for Buses and Bus Facilities Competitive Program (49 U.S.C. 5339(b)) makes federal resources available to states and direct recipients to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities, including technological changes or innovations to modify low or no emission vehicles or facilities. Funding is provided through formula allocations and competitive grants. With the recent changes in its guidelines, this program now requires agencies applying to provide a zero-emission transition plan to remain competitive in the process. Zero-Emission bus technology and infrastructure are often encouraged as part of project activities. This plan must demonstrate a long-term fleet management plan that addresses how the transit agency will meet the costs of transitioning to zero emission, the facilities and infrastructure that will be needed to be deployed to serve a zero emission fleet, the transit agency's relationship with their utility or fuel provider, and the impact that the transition will have on the transit agency's current workforce. Additionally, 0.5% of a request may be for workforce development training and an additional 0.5% may be for training at the National Transit Institute (NTI). Applicants proposing any project related to zero-emission vehicles must also spend 5% of their award on workforce development and training as outlined in their Zero-Emission Transition Plan, unless the applicant certifies that their financial need is less

The Low or No Emission competitive program provides funding to state and local governmental authorities for the purchase or lease of zero-emission and low-emission transit buses as well as acquisition, construction, and leasing of required supporting facilities. State and local governmental authorities can use the funding for the purchase or lease of zero-emission and low-emission transit buses. Funding can also be used to acquire charging or fueling infrastructure for the buses, pay for construction costs, or obtain or lease facilities to house a fleet. In FY2023, $1.69 billion was allocated for Low- and No-Emission and Grants for Buses and Bus Facilities project selections supporting 130 projects for people and communities in 46 states and territories. IIJA allocates an additional $5.25 billion for the Low-No program over the next five years. Similar to the Buses and Bus Facilities Program, transit agencies will need to submit a plan for transitioning to zero emission buses. This plan must demonstrate a long-term fleet management plan that addresses how the transit agency will meet the costs of transitioning to zero emission, the facilities and infrastructure that will be needed to be deployed to serve a zero emission fleet, the transit agency's relationship with their utility or fuel provider, and the impact that the transition will have on the transit agency's current workforce. Additionally, 0.5% of a request may be for workforce development training and an additional 0.5% may be for training at the National Transit Institute (NTI). Applicants proposing any project related to zero-emission vehicles must also spend 5% of their award on workforce development and training as outlined in their Zero-Emission Transition Plan, unless the applicant certifies that their financial need is less

The Rebuilding American Infrastructure with Sustainability and Equity, or RAISE Discretionary Grant program, provides a unique opportunity for the DOT to invest in road, rail, transit and port projects that promise to achieve national objectives. Previously known as the Better Utilizing Investments to Leverage Development (BUILD) and Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grants, Congress has dedicated nearly $12.1 billion for fourteen rounds of National Infrastructure Investments to fund projects that have a significant local or regional impact.

SECTION I: START-UP AND SCALE-UP CHALLENGES

Torrance Transit System faces various start-up and scale-up challenges for battery-electric bus deployment. The costs associated with battery-electric bus deployment is the greatest challenge. For large capital projects such as bus procurement and facility modifications, the agency relies on grant funding to supplement the costs. Grants can cover one-time capital costs, e.g., buses and charging equipment; however, the operational and maintenance costs associated with the adoption of battery-electric technologies, such as cost of utilities and dedicated battery-electric bus maintenance equipment, are new ongoing costs that the agency will have to consider. Cost to the agency could be reduced through a state-wide initiative to procure ZEBs in bulk on behalf of municipal agencies. This helps reduce the cost per vehicle since the price is often associated with procurement volumes. It is important that CARB support funding initiatives to reduce financial burden to agencies as we transition to zero-emission.

Deploying battery-electric buses is immensely power-intensive. The current amount of power supplied by the two feeders that serve the maintenance facility is insufficient for future needs. Therefore, partnering with Southern California Edison through their Charge Ready Program may help reduce cost of building infrastructure and cost of utility usage in the future. One potential challenge that the agency may face with is the facility upgrades timeline may not align with our fleet replacement plan. This will delay Torrance Transit System's transition to a zero-emission bus fleet.

While the agency's Roll Out Plan will serve as a useful guide for the ZEB transition, there are many unknowns that will impact our implementation. Torrance Transit System currently does not have our own ZEB in service to full understand and predict performance, reliability and quality of the new technology. We rely on data from neighboring agencies and well-known research institutions to provide insights. Access to first-hand data from our own service using ZEBs, performing under a range of conditions including high heat conditions and near end-of-life operation will help guide future purchasing decisions. TTS will track and evaluate performance of our own zero-emission buses and update our plan as necessary.

Date: August 6, 2024

To: Members of the City Council Transportation Committee

From: Kim Turner, Transit Director | KTurner@TorranceCA.gov
Aram Chaparyan, City Manager

Subject: City Manager and Transit – Accept and File the Report on Transit's Digital Signage at Bus Shelters and Transit Center.

RECOMMENDATION

Recommendation of the City Manager that the City Council Transportation Committee accept and file the report on Transit's Digital Signage at Bus Shelters and Transit Center.

FUNDING

There is no funding required for this action.

DISCUSSION

In an effort to improve the farebox recovery ratio and generate additional revenue for the Transit Department, staff conducted research and analysis on potential marketing revenue generated from utilization of existing Torrance Transit bus stops within the City of Torrance. These bus stop locations are owned by JC Decaux on City property and are utilized by the Transit Department. Many agencies including Santa Monica Big Blue Bus, Long Beach Transit, LADOT, Culver City Bus, and others have started implementing digital advertisements at their high traffic bus stops, particularly on their bus shelters.

Transit staff is finalizing our discussions and negotiations with JC Decaux to establish a long-term advertising revenue sharing agreement with JC Decaux. This agreement provides a 20% revenue share over the course of 10 years of the life of the agreement. In turn, JC Decaux will also repair, repaint and refurbish all existing bus shelters covered by this agreement. Transit will also work with JC Decaux to identify and test digital advertising screens at five (to be specified) locations throughout the City. Initially, these boards would not display moving videos, but static images that will rotate every 20 to 30 seconds, similar to information boards currently on display in front of City Hall and Wilson Park. Transit staff will also work with JC Decaux to display on bus advertisement known as "King Ads" or "Wraps".

Staff will be coming to the Torrance City Council at a later date to request the approval of the aforementioned contract service agreement with JC Decaux. The proposed agreement provides a guaranteed minimum of $187,200 per year regardless of ad sales, and an estimated maximum return of approximately $600,000 per year or $6M over the life of the agreement. These funds

will assist Torrance Transit with the ongoing maintenance, upkeep and operation of the MKG RTC, as well as provide capital funding for facility improvements such as retail space build out and adding solar power collection units on the buildings in the future.