



Administrative Report

N.3., File # 23-6867

Meeting Date: 10/3/2023

To: MAYOR AND CITY COUNCIL

From: CAMERON HARDING, COMMUNITY SERVICES DIRECTOR

TITLE

DISCUSSION AND POSSIBLE ACTION ON THE RESULTS OF THE TRANSIT OPERATIONS ANALYSIS REGARDING THE CONVERSION OF THE BEACH CITIES TRANSIT FLEET TO ZERO EMISSION BUSES

EXECUTIVE SUMMARY

On April 25, 2023, as part of the strategic planning process, the City Council directed staff to provide a report on the conversion of the Beach Cities Transit (BCT) bus fleet from CNG to Zero Emission Buses (ZEB). The City's consultant has completed review of the ZEB conversion options for BCT, and recommends the City implement a plan that supports the future purchase of Battery Electric Buses (BEBs) rather than Hydrogen Fuel Cell Buses (FCEBs).

On February 15, 2022, the City Council approved the agreement with Stantec Consulting Services, Inc. to perform the Beach Cities Transit Services Study. The scope of work included the analysis and recommendation of the best ZEB type for the BCT system, analysis of the related operations and maintenance facility infrastructure needs, associated driver and maintenance staff training requirements, and recommendations for possible funding sources. This report is focused strictly on the portion of the study dealing with the conversion of the BCT bus fleet. The complete study findings will be presented to the City Council in the next few months.

As mentioned above, the Stantec report recommends the conversion of the BCT bus fleet to BEBs. The study considered the City approved ZEB Rollout Plan, which was required by the California Air Resources Board (CARB) as part of the Innovative Clean Transit (ICT) regulation as the first step in the process, and was approved by the City Council on May 16, 2023. The administrative report for the BCT Rollout Plan included ZEB fuel type comparisons, and also recommended BEBs for the BCT fleet.

Any effort to transition to a ZEB fleet will require significant infrastructure upgrades by the City, and support from several City Departments. A ZEB Multi-Department team that includes representatives from the City Manager's Office, Finance Department, Community Development Department, Public Works Department, and the Community Services Department will be created at the appropriate time to help implement the Rollout Plan. Staff also recommends the Public Works & Sustainability Commission provide input on the ZEB conversion process.

BACKGROUND

In December 2018, the CARB adopted the ICT rule that requires all public transit operators in California to transition to 100 percent ZEB fleets by 2040. The City submitted the BCT Zero Emission Roll Out Plan and Resolution to CARB in June 2023. The CARB Rollout Plan Guidance (attachment) defines the required transition milestones that include the following:

- July 1, 2023: Deadline to provide a "ZEB Rollout Plan"
- 2026: 25% of new bus purchases must be ZEB
- 2029: All buses purchased must be ZEB
- 2040: All buses must be ZEB

The BCT Rollout Plan identified the proposed roadmap to transition the BCT and WAVE Dial-A-Ride transit fleet to a full deployment of a ZEB fleet by 2040 and start the ZEB bus procurements for transition in calendar year 2029. A new Transit Operations and Maintenance Facility will need to begin construction by 2027 to have the necessary infrastructure ready in time to support bus maintenance and charging.

BCT Service Description

The BCT system consists of the operation of the fixed routes BCT Lines 102 and 109; the WAVE senior/disabled dial-a-ride service (WAVE); dispatch and scheduling functions; maintenance of the BCT fleet comprised of 20 Compressed Natural Gas (CNG) vehicles); and management, oversight, and reporting of BCT operations and vehicle maintenance. The transit operations, maintenance and administration is contracted out to Transportation Concepts, Inc.

The city-owned transit operations and maintenance facility is located at 1519 Kingsdale Avenue, adjacent to the Redondo Beach Transit Center and parking facility. CNG transit vehicles are fueled off-site at the Gertruda CNG station, and at Clean Energy stations located near LAX, and at the City of Torrance Madrona station.

BCT has 14 fixed route buses, 12 are 32-foot EZ Riders, and 2 are 25-foot cutaways. Five of the six dial-a-ride buses are 25-foot cutaways, and 1 vehicle is a minivan. BCT operates in the beach cities' residential areas, on narrow streets, some major/minor arterial streets, and in low density communities with fewer transit dependent riders. The BCT buses are smaller capacity, shorter length buses to accommodate these service characteristics and ridership needs. BCT is often used to transfer to and from other transit agencies' buses at regional rail stations, the Redondo Beach Transit Center, LAX Bus Center, and at major arterial shared bus stops. It is anticipated that the BCT fleet would maintain the same number of buses (20) as the current fleet, unless Council directs staff to adjust service.

Similar to transit agencies nation-wide, BCT ridership is still in recovery after the Coronavirus 2019 (COVID-19) pandemic. BCT ridership trends were increasing prior to March 2019, with more students, commuters and community members riding the buses. Fiscal Year 2022-23 ridership improved on BCT fixed route and dial-a-ride services to approximately 76% and 72% of pre-COVID-19 ridership, respectively. Students and commuters are the predominant riders, however the BCT Services Study results indicate increases in mid-day and weekend ridership.

ZEB Bus Fleet Options

As part of the BCT Service Study, Stantec Consulting Services compared the BEB and Hydrogen Fuel Cell Electric Bus (FCEB) vehicle options, evaluating their possible operation within the BCT

service area, the vehicle types and mileage range of ZEB vehicles currently available, and the operations facility site requirements to be constructed within the existing transit operations and maintenance area footprint.

The majority of BEB buses in the market range from 27' up to 60'. FCEB buses in the market are primarily either 40' or 60'. The typical fully-charged vehicle mileage range of BEB buses is 75 - 230 miles and the FCEB buses is over 350 miles. Early ZEB Transit agency adopters are using BEB and FCEB in all bus lengths.

Transit agencies that have high ridership demands use higher passenger capacity buses that are 40 to 60 feet in length. Most Los Angeles area transit agencies operate BEB buses, and a few transit agencies with longer distance routes are testing FCEB. Statewide, the majority of transit agencies that are testing and plan to procure FCEB buses are larger agencies with experienced fleet maintenance staff, and facilities and infrastructure that can accommodate both a BEB and FCEB system.

Bus Length	Seating Capacity	BEB Mileage Range	FCEB Mileage Range
27'	12	75-150	NA
30'	20-23	120-200	NA
32'	23	120-150	NA
35'	25-35	200-240	NA
40'	37	200-240	300-340
45"	57	172	NA
60" Articulated	47	200-230	280-370

The cost to transition to the ZEB fleet will be estimated in the future nearest to the bus procurement phase. Currently 30' BEB buses cost over \$1.1 million per bus, more than \$500,000 higher than the cost of a CNG bus, so the City will need to apply for State and Federal grants to supplement existing Federal capital funding, as well as increase Local Return allocations to satisfy the Local Match requirements.

Stantec ZEB Recommendation

Stantec recommends that the BCT fleet convert to BEB based on the following factors:

- BCT has shorter distance routes. Most BCT buses travel approximately 170 miles/day on the fixed routes and the dial-a-ride services.
- BCT ridership does not support the need for larger buses (40'/60').
- There are more BEB shorter length vehicle options available in the market
- Most of BCT's operations can be converted to BEBs in a 1:1 manner
- Many regional peers are operating or plan to operate BEB fleets
- BEBs have a proven track record, as they are more deployed than FCEB
- FCEB vehicles have a minimum length of 40 and 60 feet
- FCEBs are preferable for longer distance routes
- BCT's small fleet would translate to low hydrogen fuel demand resulting in a more expensive per-bus cost compared to BEBs, particularly if onsite hydrogen fueling station is constructed

- FCEB/BEB's current 40-foot bus cost is approximately \$1.2M, at least 50% higher than CNG buses
- BCT's current and planned facility footprint lacks the space to accommodate large buses, or the infrastructure required for a hydrogen fueling station
- FCEBs are fueled via a hydrogen fueling station - BCT would either need to construct one (high upfront capital costs and large footprint) or consider alternative onsite or offsite fueling locations
- FCEB fueling onsite presents higher up-front capital costs than BEBs (buses and charging/fuel station)

New Transit Operations and Maintenance Facility

In order to operate, charge and maintain ZEB buses, a new Transit Operations and Maintenance Facility will need to be constructed. To support the successful deployment of the ZEB fleet, significant upgrades and facility modifications are necessary, including installation of BEB chargers and dispensers, a new transformer and switchgear, the addition of a completely new building for operations and maintenance support and reorganization of the bus yard.

The current facility, built by the General Telephone company in 1966, was purchased by the City in 2004 with the intent to use it as a City yard for transit operations and public works. The facility in its current condition is not suitable for upgrades or renovation, as it is not designed, nor was it built for a ZEB fleet operations. For example, the current facility:

- Lacks space for offices, storage, general amenities, and infrastructure for bus operations and maintenance services
- The Bus Bays are not high enough to perform ZEB maintenance
- The Maintenance Bays lack the required safety systems to perform ZEB maintenance

Construction of the new facility will need to begin by 2027 and is expected to be constructed at the current operations facility site located at 1519 Kingsdale Avenue, adjacent to the Transit Center.

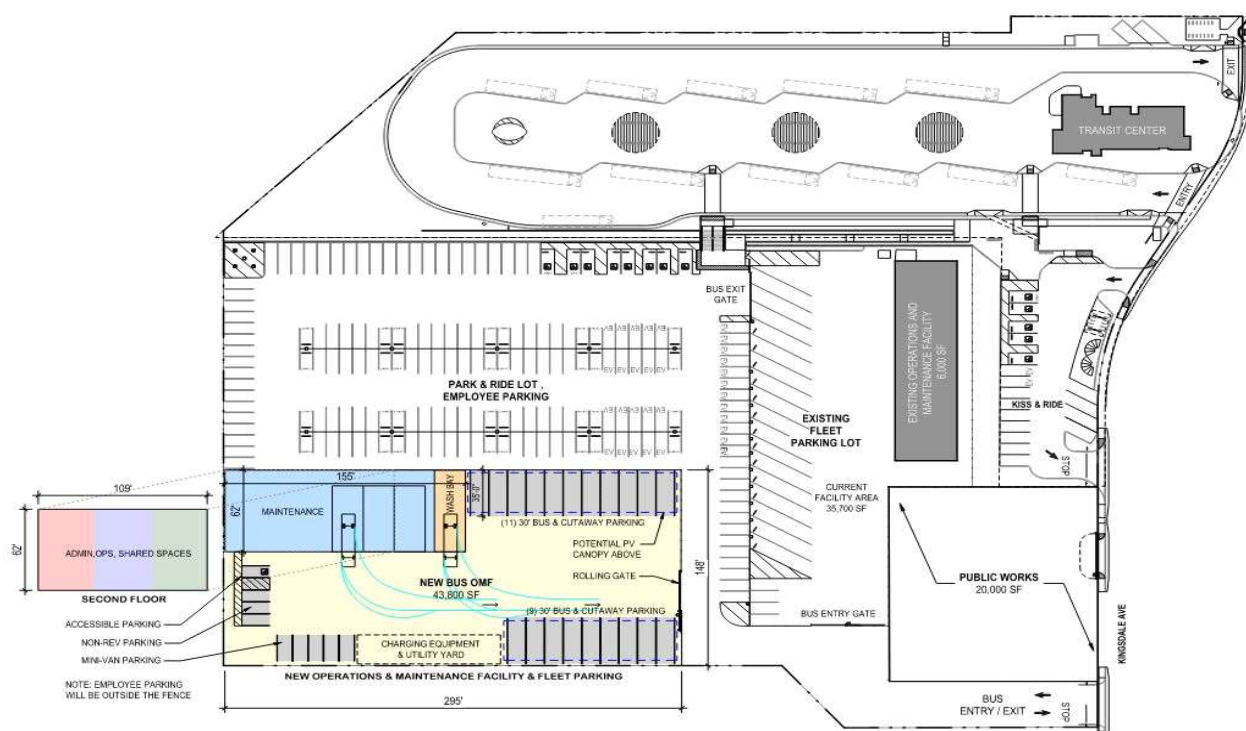
A detailed space needs program will be required in order to proceed with an actual design for a new facility. This scope can be provided either during or after the environmental review processes (California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) but is highly recommended to be completed prior to finalizing the master plan for the new facility which may ultimately impact the environmental analysis, requiring an amendment to one or both of the CEQA and NEPA reporting.

The existing operations and maintenance building and bus parking area is too small and in need of replacement to sustain the BCT operations. The primary difference between the existing and the proposed facilities is the new facility would be purpose-built for ZEB transit operations and maintenance functions - accommodating proper building systems, working clearance, and safe/efficient workspaces for all staff. The new facility would also include the administration department which is currently housed offsite from the operations and maintenance facility (OMF).

The necessary building space to perform these functions is approximately 16,264 sq. ft, and can be accommodated within a two-story building. The current facility at about 6,000 sq. ft. is undersized for the current operations. The remaining footprint of the facility will be used for bus parking, charging infrastructure and related operations functions, for a total of approximately 54,000 square ft.

(1.23 acres). Employees would use the transit center parking lot.

The proposed site plan layout of the new transit operations and maintenance facility and the following table provide the estimated square footage requirement of the relocation of the operations facility from the east side of the upper parking lot to the southwest corner.



Proposed Building Areas:

Department	Proposed Area	Notes
Maintenance	7,626	Three maintenance bays, shops, storage, etc.
Operations	1,698	Ops offices, dispatch suites, operator lockers, etc.
Administration	2,116	Offices, workstations, conference room, etc.
Wash Bays	1,440	Manual wash bay
Shared Spaces	2,460	Restrooms, lockers, break room, training room, etc.
Building Utilities	924	Electrical, mechanical, IT, custodial rooms
Total:	16,264	<i>*Values are in square feet, unless noted otherwise.</i>

Proposed Site Areas:

Area	Proposed Area	Notes
Buildings Total	16,264	From Proposed Building Area Table

Transit Vehicle Parking	16,555	Parking plus 50% factor for circulation aisles, etc.
Employee Parking	16,695	Parking plus 50% factor for circulation aisles, etc.
Misc. Exterior Spaces	4,135	Estimated area includes space for future expansion.
Grand Total:	~ 54,000	= ~ 1.23 acres
		<i>Values are in square feet, unless noted otherwise.</i>

The proposed concept, shown in the facility site plan of the facility modifications for BEB implementation, has been developed proposing ground-mounted charging dispensers. There is sufficient space for ground-mounted dispensers as opposed to overhead charging dispensers for highly space constrained locations. Given the relatively small size of the facility, maximizing flexibility and avoiding conflicts on the property are critical. The charging cabinets and electrical utility equipment should be located in an aggregated area, away from bus parking and along the edge of the property. Charging dispensers would be located at the head of the parking stalls, requiring a couple of additional feet be added to each parking space.

The facility will require new electrical service connections from Southern California Edison (SCE). The utility will require that a service study be performed to identify any transmission or distribution system upgrades that may be needed to support the additional power demands from the bus chargers. It will be up to the utility to determine if the local power distribution system has the capacity to serve BCT's new charging loads as well as any other planned loads in the area.

Stantec recommends the City pursue the SCE Charge Ready Transport (CRT) program to provide funding for the installation of infrastructure supporting deployment of electric infrastructure. SCE also provides logistics support for construction including site design and permitting. This program provides funding for all infrastructure up to the charging station, utility costs, and infrastructure on the customer side up to the charging station.

The proposed improvements can provide guidance for BCT for any potential facility configuration:

- A new 1,500 kVA transformer and 2,500 A switchboard to provide adequate power to the facility, along with associated equipment pads and bollards.
- A new 1,500 kW generator with a 270 gallon belly tank for diesel fuel storage. The generator would ideally be located within the charging equipment/utility yard to be as close as possible to the electrical switchgear supporting the chargers.
- An automatic transfer switch between generator and switchgear.
- Charging equipment:
 - Option 1: A minimum of (12) 120-kW charger cabinets with a 1:2 charger-to-dispenser ratio (SAE J1772-compliant) to serve a maximum of (16) active (in revenue service) 30 ft. buses, three cutaways, and five passenger vans = (24) plug-in connectors.
 - Option 2: A minimum of (24) 60-kW charger cabinets with a 1:1 charger-to-dispenser ratio (SAE J1772-compliant) to serve a maximum of (16) active (in revenue service) 30 ft. buses, three cutaways, and five passenger vans = (24) plug-in connectors. In this approach two charging cabinets can be paired together to deliver about 120-kW to one of two buses at a time, allowing for some additional flexibility.
- Equipment pads and associated bollard protection around chargers and dispensers.
- Power main feeder and sub feeders.
- Communication system panel/distribution cabinet and conduits to each charger.

- Pavement replacement/repair for trenching associated with electrical distribution for locations where new electrical service and switchboard will be allocated will be required in portions of the site not otherwise improved with the new OMF.

At this time, staff recommends the City Council support the preferred BCT Rollout Plan for BEBs and direct the Public Works & Sustainability Commission to provide input on next steps and associated policy considerations as the City moves forward with Plan implementation.

COORDINATION

The ZEB operations and maintenance facility concepts have been reviewed by staff in the City Manager's Office and the Public Works Department.

FISCAL IMPACT

The City has been awarded approximately \$32.1M in Subregional Measure R Funding from the South Bay Cities Council of Governments to fund the construction of the new ZEB transit operations and maintenance facility. The City's Local Match for these funds is \$1.2M. Other transportation restricted funds will be available in future years to cover the local match. Additional capital funding may be necessary after determining final construction costs.

APPROVED BY:

Mike Witzansky, City Manager

ATTACHMENTS

- Deploying Charging Infrastructure For Electric Transit Buses by Atlas Public Policy- July 2022
- Zero-Emission Bus Deployment Guidebook by Zero Emission Bus Resource Alliance
- Beach Cities Transit Zero Emission Bus Rollout Plan
- California Air Resources Board Rollout Plan Guidance, January 9, 2020