



Board Report

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Agenda Number: 44.

**EXECUTIVE MANAGEMENT COMMITTEE
JUNE 17, 2021**

SUBJECT: CHARGING INFRASTRUCTURE LIFE OF PROJECT BUDGET ADOPTION

ACTION: APPROVE RECOMMENDATIONS

RECOMMENDATION

- A. APPROVE Life of Project (LOP) budget of \$50.0M commencing FY22 for Phase 1 for the Charging Infrastructure Program alongside the J Line (Silver) supporting the Zero Emission Bus Program;
- B. APPROVE amending the FY22 Budget for \$34.0M for charging infrastructure; and
- C. CONSIDER finding that authorization of the use of alternative delivery methods pursuant to Public Utilities Code Section 130242 will achieve integration of design, project works, and other components in an efficient manner at Metro bus facilities.

(REQUIRES 2/3 VOTE OF THE BOARD)

ISSUE

In April 2016, Metro's Board of Directors passed a motion to convert Metro's bus operations from CNG to Zero Emissions by 2030. Subsequently, in December 2018 the California Air Resources Board (CARB) issued the Innovative Clean Transit (ICT) regulation which requires all California public transit agencies to transition from conventional fueled buses to zero emission buses by 2040. Given the adoption of the Board motion and CARB regulation, it is critical that Metro adopt procurement and installation plans that commit funding and personnel to deliver ZEB services by 2030.

The 2030 ZEB conversion goal is desired to expedite the clean air goals for Los Angeles County. This reduces the carbon impacts along the services routes where Battery Electric Buses (BEB) can be provided. BEBs operate at noticeably lower decibel level than comparable CNG buses which results in reduced noise levels particularly benefitting residential areas. Ultimately the conversion to ZEBs provides reduced noise levels and improves air quality where Metro provides its BEB services.

In March 2021, staff presented the ZEB Rollout Plan (item 2020-0636), which demonstrated a phased implementation plan for the Battery Electric Buses to meet a 2030 ZEB conversion goal.

With this goal, bus deliveries and expenditures are compressed resulting in expenditure demands exceeding available constrained funding sources. Additionally, accelerated bus deliveries may exceed fleet needs starting 2027 and beyond. To mitigate the potential implications of the Rollout plan, early adoption of the recommendations are essential to reduce potential delay risks due to limited budget allocations, constrained funding, limited personnel to manage the work, and long construction lead times.

BACKGROUND

Metro currently operates a fleet of approximately 2,400 CNG buses of various lengths from ten (10) divisions. To transition to 100% Zero Emissions Bus operations Metro will have to address several challenges.

Charging Infrastructure and Utility Upgrades

Overnight charging at Metro Divisions and en-route charging installations are needed to successfully deploy Battery Electric Bus services by 2030. Each of Metro's divisions will need to be upgraded to provide the anticipated power levels. To optimize available power and minimize the scale of the required upgrades, staff and its consultants are modeling numerous charging strategies to reduce peak demand and maintain acceptable service levels. It is anticipated that this approach will result in reduced risk to the construction schedule and savings in Life Cycle Costs.

Also, Metro's bus divisions are currently under the jurisdiction of two utilities; each have their own protocols for rate structures, application for upgrades, and construction activities. These nuances will make syncing activities between divisions under different jurisdictions challenging. During the pandemic, Metro Transit services was qualified as Emergency services for which Metro will continue to pursue preferential rates and top tier support services as part of the system resiliency requirements.

Performance Limitations

Despite all the advances in the last five years since April 2016 when the Board adopted the motion to convert to ZEB operations, the range of BEB's is still not close to that of CNG buses. The performance limitations may be addressed with a range of strategies, including adding en-route chargers at strategic locations, adjusting the time and distance of the operational assignments (service blocks), and increasing fleet size. Each strategy comes with its own set of risks and costs.

Coordination with Construction and NextGen

BEB deliveries must be synchronized with the charging infrastructure construction schedules to ensure that BEBs are delivered as each construction phase is completed. Further, BEB deliveries should be synchronized with service requirements. Failure to properly coordinate may result in a surplus of buses being delivered. This in turn will result in perfectly good buses being parked or underused while the warranty clock expires.

Currently, there are sufficient buses to support anticipated service needs for the coming years. The biggest risk is having a surplus of buses in the later years as the rate of BEB deliveries required to meet the 2030 goal exceeds the rate at which buses are retired. The risk of surpluses may be addressed with a range of strategies, including early retirement, or selling of CNG buses or converting them to BEB's. Each strategy comes with its own set of risks and costs.

Funding

As detailed in Figure-1, below, the Rough Order of Magnitude (ROM) cost to transition to 100% ZEB Operations is approximately \$3.5B. Over a 10-year period, this is an average of \$350.0M per year. In recent years Metro’s bus capital expenditures have averaged approximately \$190.0M per year. Therefore, Metro will need to identify funding sources to close the approximately \$160.0M annual gap. This is a significant challenge and staff must formally start the funding identification processes. Even as more monies become available, there is growing competition for new and existing funds.

Figure-1

Division	Bus Qty	Infrastructure		En-Route	Buses	Total ²
		Min ¹	Max ²			
1	171	\$70.9M	\$100.1M	\$14.2M	\$150.8M	\$265.1M
2	169	\$67.3M	\$95.1M	\$16.8M	\$149.0M	\$261.0M
3	151	\$62.6M	\$88.4M	\$13.0M	\$133.2M	\$234.6M
5	167	\$66.5M	\$94.0M	\$8.4M	\$147.3M	\$249.6M
7	240	\$101.4M	\$143.3M	\$11.1M	\$211.6M	\$366.1M
8	358	\$134.0M	\$189.3M	\$16.7M	\$315.7M	\$521.7M
9	176	\$65.9M	\$93.1M	\$17.8M	\$155.2M	\$266.1M
10	175	\$65.5M	\$92.5M	\$4.5M	\$154.3M	\$251.4M
13	316	\$123.4M	\$174.3M	\$7.1M	\$278.7M	\$460.1M
15	245	\$93.7M	\$132.3M	\$17.6M	\$216.0M	\$366.0M
18	185	\$70.7M	\$99.9M	\$27.4M	\$163.1M	\$290.4M
Totals	2,353	\$921.9M	\$1.30B	\$154.7M	\$2.07B	\$3.53B

- 1. Baseline BEB Infrastructure Only
- 2. Baseline Infrastructure + On-Site Storage + Solar

DISCUSSION

Approval of the recommendations ensures that the 2030 resolution for the ZEB Program remains a priority for the agency.

Recommendation A: Approve \$50.0M LOP Ph 1 J Line (Silver) Charging Infrastructure

With current BEB deliveries under contract to be completed by 2022, a focus on completing the Phase 1 Charging Infrastructure is the next step to provide more capacity for BEB service. Figure 2 describes the phases of the ZEB Master Plan.

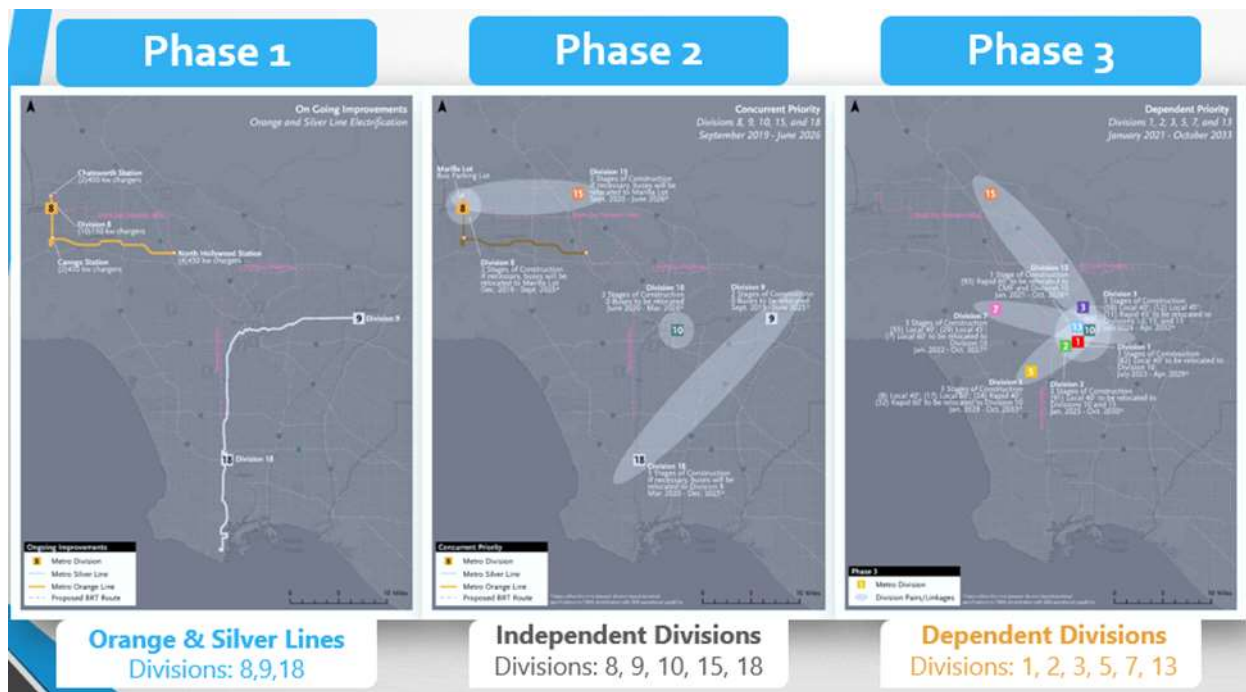
The \$50.0M LOP budget recommendation for charging infrastructure will be used to fund the Metro facility conversion plan to install depot chargers, at Division 9 in El Monte and add en-route chargers along the J Line (Silver). Approval to

establish the infrastructure LOP will enable staff to develop funding for the J Line (Silver) ZEBs for FY23.

Recommendation B: Approve Amending FY22 Budget

Approval of Recommendation B allows for the addition of \$34.0M in FY22 budget for this program. At this time, the proposed FY22 Budget is constrained which limits the completion of J Line (Silver) Charging infrastructure installations in phase 1 locations. Additional FY22 funds are needed to progress infrastructure efforts and fully equip J Line (Silver) with Zero Emission Bus operations.

Figure 2 - ZEB Master Plan Phases



Phase 1: \$444.2M

Phase 2: \$246.9M (DIV. 10, 15)

Phase 3: \$765.8M

Preliminary ZEB Program Grand Total: \$1,456.9M

Recommendation C: Authorization for Alternative Delivery Methods

Metro may use this procurement authority to explore alternative delivery approaches for the ZEB program. To date, Metro has received two Unsolicited Proposals from private sector companies that are interested in a delivery model that would combine design, construction, vehicle delivery, charger management, energy management, and financing services. Metro staff have determined that such a model would provide value to the broader ZEB program and ensure Metro can provide the best possible transit service. Staff are now thoroughly evaluating all elements of the delivery model and developing a procurement that would guarantee infrastructure performance, minimize future operational needs, be flexible and scalable, provide cost certainty, and deliver other benefits to the ZEB program.

It is in the public's and Metro's best interest to utilize the best value competitive negotiation method rather than a sealed bid process to consider factors other than price in the award of contracts for vehicles as allowed under Public Utilities Code 130242. The best value competitive negotiation process allows consideration of factors other than price that could not be adequately quantified or considered in low bid procurement.

By establishing explicit factors that identify Metro's definition of Best Value, the solicitation can use important evaluation criteria to augment price considerations such as past performance related to schedule adherence, quality, reliability, maintainability and vehicle performance.

Equity Assessment

As presented on March 21, 2021, Executive Management Committee Meeting, the adoption of ZEB program includes a strategy to prioritize Disadvantage Communities (DACs). Specifically, 73 percent of Metro's divisions are located in communities that are classified as "disadvantaged" (CalEnviroScreen). The conversion of existing CNG operations to BEB operations will directly benefit the communities in the vicinity of these divisions by way of reduction in noise and local emissions. These divisions also serve multiple routes that traverse multiple DACs across Los Angeles County. Since ZEB's cannot operate unless infrastructure is in place to charge buses, Metro's transition largely focuses on division electrification and not individual routes. Once divisions are electrified, buses will be strategically deployed to routes and service blocks with a priority of DAC. In addition to prioritizing DACs, Metro staff has completed the Rapid Equity Assessment tool and preliminary information suggests that a significant ratio of the ZEB program will benefit DACs and Equity Focused Communities (EFCs) by a reduction in noise, local emissions and result in a better quality of life.

Failure to implement this action will not only result in a non-compliance with a State requirement but will continue to impact DACs and EFCs, which are most frequently exposed to harmful emissions, and pollutants that result in negative health outcomes. Metro will continue to work with the Office of Equity and Race to mitigate any concerns or negative consequences that are identified with the implementation of this decision. Metro will continue to use the Rapid Equity Assessment tool if a change is required to address equitable outcomes during all program phases.

Conclusion

Ultimately, Metro is leading the nation in the largest and most aggressive BEB fleet conversion. The technology for battery capacity and charging infrastructure are embryonic with anticipated cost volatility as technology evolves. Approval of these recommendations allows Metro to continue with ZEB implementation while maintaining responsible fiscal flexibility when service demands, and financial conditions improve.

DETERMINATION OF SAFETY IMPACT

Board approval of these recommendations will permit the expedient transition to Zero Emission Bus operation. This will directly contribute to improving the air quality in the Los Angeles basin.

FINANCIAL IMPACT

Approval of recommendation A (\$50.0M LOP) and B (\$34.0 FY22 budget amendment) will identify

available funding to enact Phase 1 activities. The funds associated with the FY22 budget amendment will enable staff to continue procurement activities, design and construction activities. Financial planning for future fund applications will be more clearly defined and adopted as part of the planned 2021 Short-Range Transportation Plan (SRTP). Staff will program future State and Federal funding into the SRTP, and when made available, pursue grant applications like Low Carbon Transit Operations Program (LCTOP) and Transit and Intercity Rail Capital Program (TIRCP) to accumulate funding resources to support the Board's 2030 motion for the ZEB Program.

The Phase I Infrastructure projects will require over \$444.0M in the next five (5) years to complete. Additionally, staff has reviewed the 2030 ZEB program goal compared to average annual bus acquisition budgets. Historically bus acquisitions alone average \$190.0M per year; however, this program requires a \$350M average per year to enact the \$3.5B plan commencing from FY20. The ZEB Program carries a premium price tag for BEB's to replace CNG buses. It is an operational necessity that charging infrastructure be installed in advance of bus deliveries to charge BEB's during service. The ZEB Program funding needs are out of balance by \$160M per year on average for the next five (5) years.

Multi-Year Impact

Approval of funding for the recommended project LOPs will result in the incorporation of the cost of this program into the SRTP financial forecast. Staff will identify available funding for the cost of the charging infrastructure, en-route charging, and BEBs. As the cost, schedule, and implementation plan are updated, the funding plan will be revised.

Future State or Federal Funding

Metro's Government Relations team is working with members of the House, Senate and the Biden/Harris Administration to ensure that ample funds are provided for these initiatives. Specifically and consistent with our Board-approved 2021 Federal Legislative Program, Metro is actively working to support the American Jobs Plan that was unveiled earlier this year in Pittsburgh, Pennsylvania by President Biden. The American Jobs Plan seeks to provide over \$160B for vehicle electrification. The plan, as outlined by the Biden/Harris Administration to congressional stakeholders, would include \$15B for vehicle electrification, \$100B for consumer rebates for the purchase of electric vehicles, \$25B for zero emission transit vehicles and \$20B for school bus electrification.

At the same time, Metro is working with the Los Angeles County Congressional Delegation to ensure that the multi-year surface transportation authorization bill that Congress is seeking to adopt this year to replace the FAST Act - includes billions of dollars for charging infrastructure and electric bus procurements. Government Relations staff are encouraged that both the House Committee on Transportation and Infrastructure and the Senate Banking Committee (which has jurisdiction over the transit title) have indicated a strong interest in providing robust funding for zero emission transit vehicles. While the final version of these bills have yet to be unveiled, staff will remain engaged - consistent with Board policy - to ensure that the final surface transportation authorization bill signed into law by President Biden includes funds to back our charging infrastructure and electric bus procurements.

Impact to Budget

Upon approval, the recommendations will be funded with a combination of Federal, State and Local

funds including Green Funds. Staff will continue to pursue additional grants and funding opportunities such as FAST Act, annual federal 5307 discretionary funding. If there is a Federal funding award shortfall after receiving funding sources like American Jobs Plan, alternative grant funding options will be employed to close the gap. Other funding such as utility rebates and the like will be applied as they materialize.

Since this is a multi-year effort, the Cost Center Manager, Project Manager and Chief of Operations will be responsible for future fiscal year budgeting.

IMPLEMENTATION OF STRATEGIC PLAN GOALS

This item supports the following Strategic Goals: 1) Provide high-quality mobility options that enable people to spend less time traveling, 2) Provide responsive, accountable, and trustworthy governance within the Metro organization, 3) Enhance communities and lives through mobility and access to opportunity, and 4) Transform LA County through regional collaboration and national leadership.

ALTERNATIVES CONSIDERED

Staff considered several alternatives, including:

- Request approval to complete the conversion of those divisions supporting the Orange and Silver Lines, Divisions 8, 9, and 18, with an associated preliminary LOP of \$994M for the phase 1 infrastructure and 500 battery electric buses. To date, the work at those divisions has been limited to only what is needed to convert those BRT's to zero emission operations. Approval of this recommendation would allow for the conversion that had been started at those divisions to be fully completed. Once the conversion is completed, Operations would gain valuable experience operating zero emission service from three divisions.
- Request approval to complete the conversion of those divisions, including battery electric buses, supporting the J Line (Silver), Divisions 9 and 18, with an associated LOP of approximately \$556M.
- Request approval to complete the conversion of Division 9, including battery electric buses, with an associated LOP of approximately \$266M.

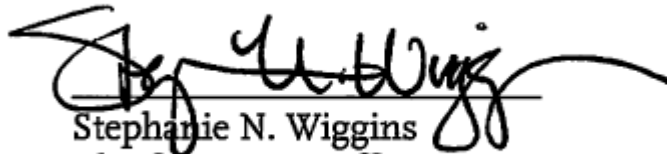
These alternatives were not considered at this time as funding constraints to the overall agency budget and financial plan makes alternatives unfeasible in the near term. Staff will utilize a small portion of the proposed \$50M recommendation to investigate other means to bridge the funding gap to meet the 2030 goal.

NEXT STEPS

Upon approval of the recommendations, staff will commence specification updates and advanced conceptual design efforts to produce solicitation documents. Staff will work within the authorized Life of Project budgets to enact the recommendations. The Board shall be updated with any significant cost or schedule impacts to the projects as they progress. Contract award authorization remains with the Board and it shall be presented for contract award approval(s) as individual contractors / vendors are selected.

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ZEB Program

Charging Infrastructure & Electric Bus Procurements

Introduction

Mission:

Transition to Zero Emission Bus Operations by 2030 in accordance with July 2017 Metro Board Motion 2017-0524

Background:

Three Phase Approach has been developed

- Phase 1 – Electrify BRT's
- Phase 2 – Electrify Divisions without space impacts
- Phase 3 – Electrify All Remaining Divisions

Considerations:

- Implementation requires approval of multi-year programmatic strategy & funding
- Current LRTP & SRTP include CNG replacement, however Battery Electric Bus procurement Charging infrastructure are excluded

Recommendations

- A. Approve Life of Project (LOP) budget of \$50M commencing FY22 for Phase 1 for the Charging Infrastructure Program for the Silver Line
- B. Approve FY22 Budget amendment for charging Infrastructure
- C. Consider that authorization of the use of alternative delivery methods, pursuant to PUC Code Section 130242, will achieve integration of design, project works, and other components in an efficient manner at Metro bus facilities

Approval of the above recommendations ensures the ZEB Program:

- 2030 Resolution remains a priority
- Focus on completing the Phase 1 Charging Infrastructure
- Allows for the addition of \$34M in FY22 funding for this program
- Metro may use this procurement to explore alternative delivery approaches

Phase 1: BRT Conversion Status

Orange (G) Line:

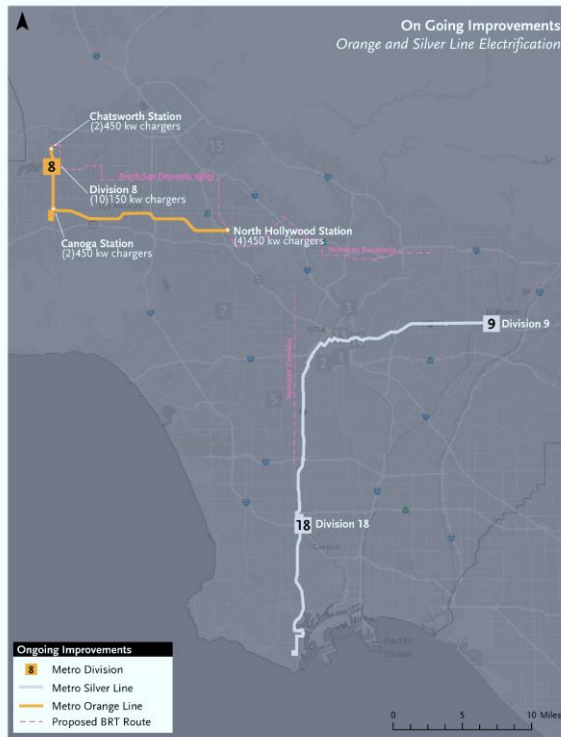
- Complete

Silver (J) Line:

- Contract executed for sixty (60) battery electric buses
- Board approved change order to BTD for Division 9 depot chargers
- Board approved SCE contract to upgrade utilities
- Still Required:
 - Complete design from 30%
 - Construction contract for Division 9 Depot charger installations
 - Construction contracts for en-route chargers and Installations at El Monte and Harbor Gateway Transit Centers

Transition Phasing

Phase 1



Orange & Silver Lines
Divisions: 8,9,18

Phase 2



Independent Divisions
Divisions: 8, 9, 10, 15, 18

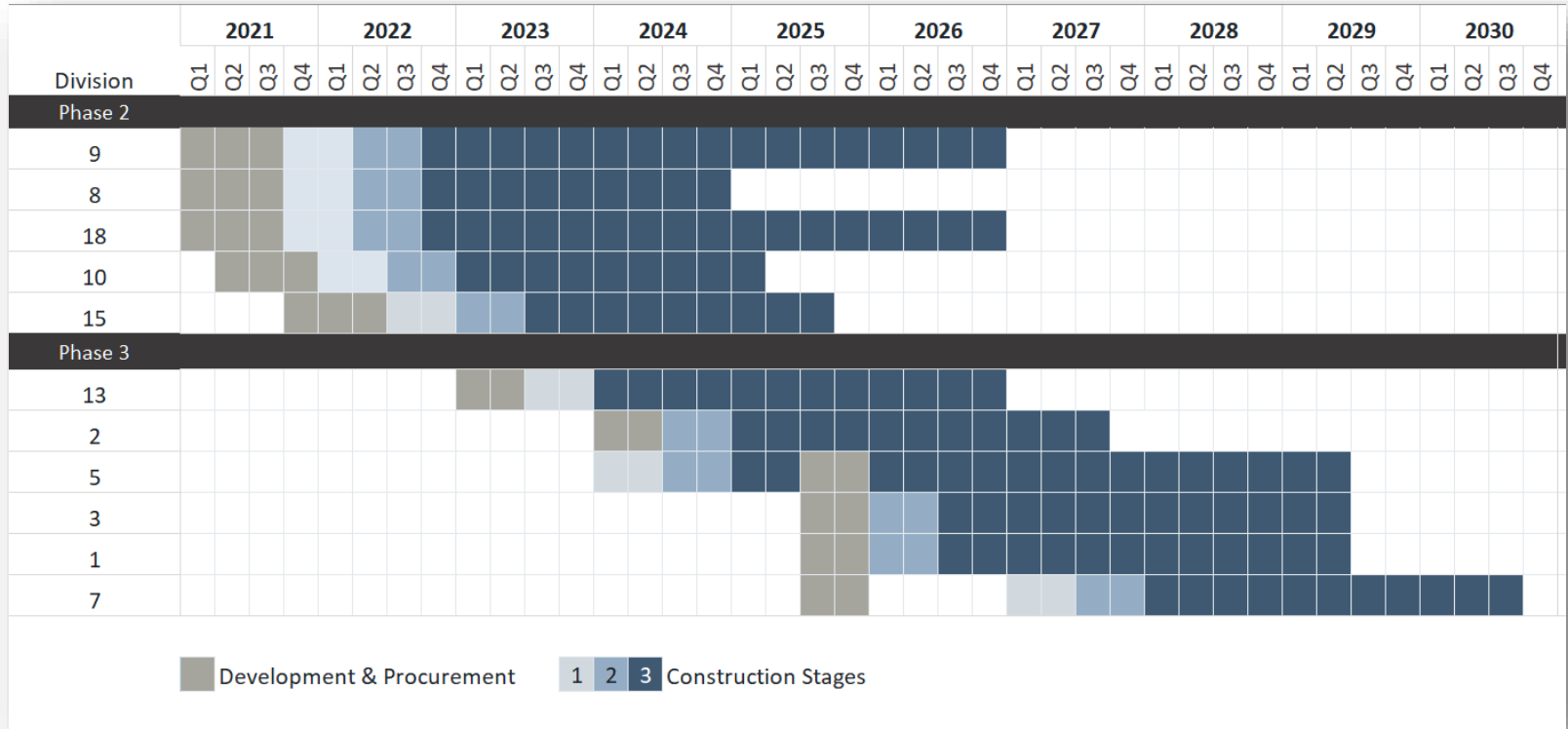
Phase 3



Dependent Divisions
Divisions: 1, 2, 3, 5, 7, 13

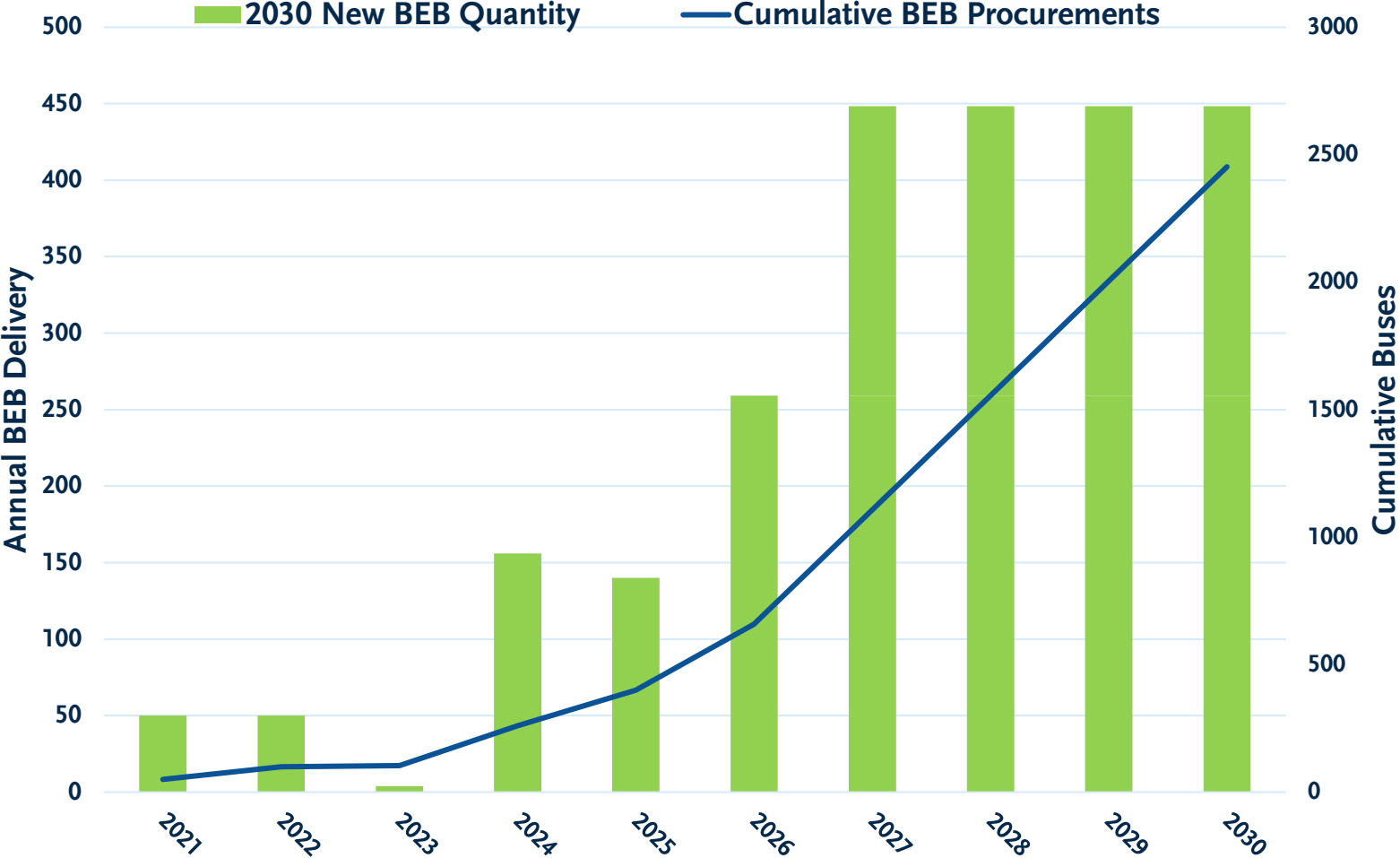
Infrastructure Phasing Schedule 2030

Division Modification and En-route Charger Installation Schedule



Bus deliveries are timed with completion of construction stages and en-route charging installations.

Bus Delivery Schedule 2030

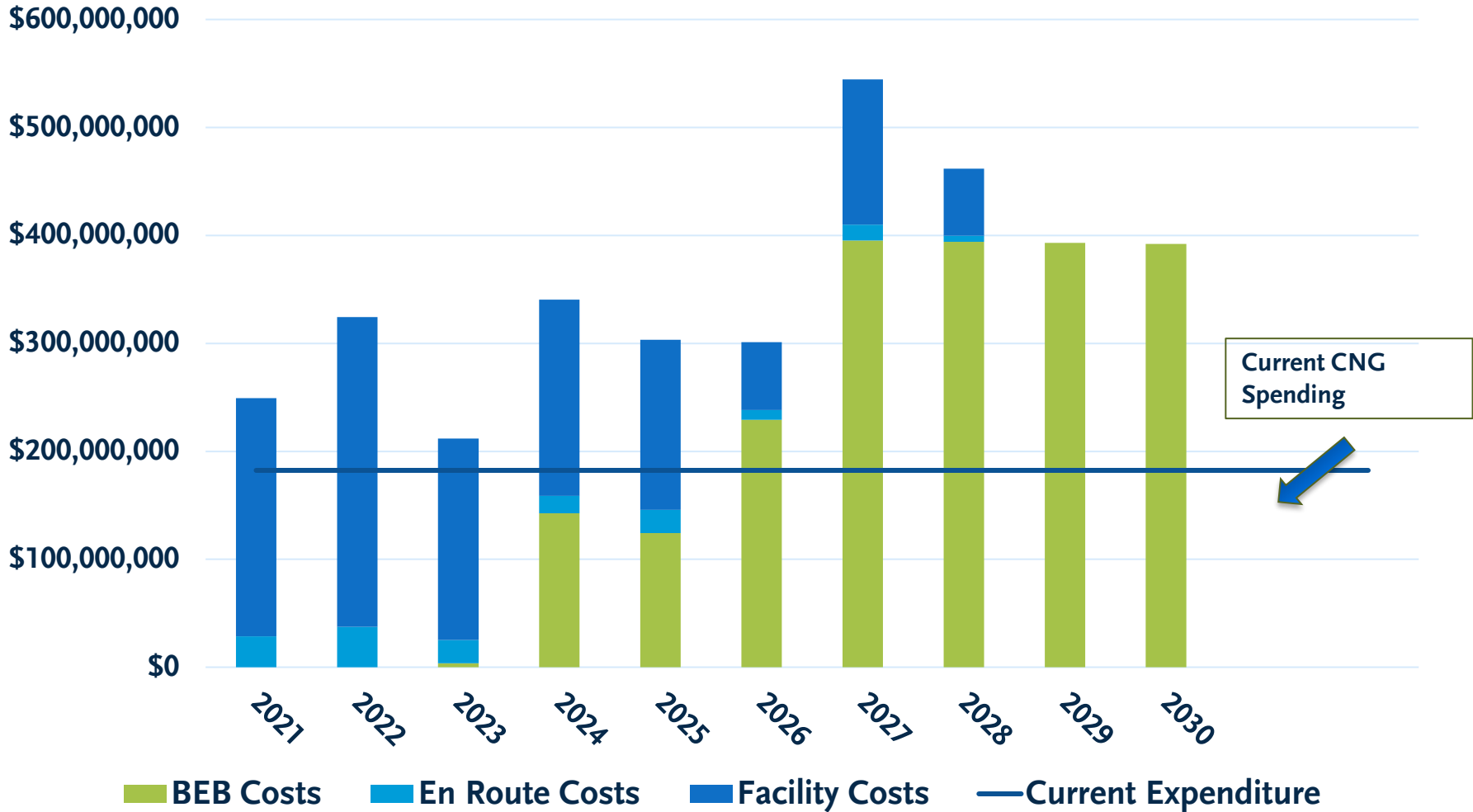


Costs by Division

Division	Bus Qty	Infrastructure		En-Route	Buses	Total ²
		Min ¹	Max ²			
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2. Baseline Infrastructure + On-Site Storage + Solar

Annual Cashflow vs. Current Spending



Phase 1: Orange Line

OEM	Length	Base Order (Option)	Battery Capacity (kW-hr)	Budget	Charging Strategy	
					Depot	En-Route
New Flyer	60'	40 (65)	320	\$80,003,282	J1772 CCS1	SAE 3105-1
BYD	60'	5	610	\$8,109,500	(150 kW)	(450 -600 kW)



Metro

Phase 1: Silver Line

- Staff has identified an optimum charging strategy
- May 2021 Metro Board approved contract with SCE to upgrade service at D9 & El Monte Transit Center
- May 2021 Metro Board approved change order with BYD for depot chargers
- Testing five of sixty (60) base order 40' BYD pilot buses for Silver only; production to start upon proof of design
- June 2021- Request Board approval for \$50M LOP to complete electrification of Silver Line:
 - Complete construction design
 - Install depot chargers
 - Procure and install en-route chargers



Next Steps

- June 2021 - Request for Board approval of LOP for \$50M to complete electrification of the Silver Line
 - Commence specification updates and advanced conceptual design efforts to produce solicitation documents for the charging infrastructure program for the Silver Line
- June 2021 - Report outlines the approach to convert Metro's CNG bus operations to zero emission by 2030
 - Continue to pursue competitive grants, identify additional funding sources, and incorporate the 2030 Zero Emissions Bus program in the SRTP and LRTP