IN THE UNITED STATES BANKRUPTCY COURT
FOR THE DISTRICT OF DELAWARE

In re:	Chapter 11
Prodigy Investment Holdings, Inc.,[1]	Case No. 23-11120 (BLS)
Reorganized Debtor.	Jointly Administered

THE DISTRIBUTION TRUSTEE'S OBJECTION TO THE MOTION OF SANTA CLARA VALLEY TRANSPORTATION AUTHORITY FOR LEAVE TO AMEND CLAIM NO. 1113

Steven Balasiano, in his capacity as the distribution trustee (the "Distribution Trustee") of the PTRA Distribution Trust (the "Distribution Trust") established in the above-captioned chapter 11 case (the "Chapter 11 Case") of the reorganized debtor (the "Reorganized Debtor"),[2] by and through his undersigned counsel, hereby files this objection (the "Objection") to the *Motion of Santa Clara Valley Transportation Authority for Leave to Amend Claim No. 1113* [D.I. 1663] (the "Motion"), filed by Santa Clara Valley Transportation Authority ("SCVTA"). In support of this Objection, the Distribution Trustee submits the *Declaration of Farzan Sabzevari in Support of the Distribution Trustee's Objection to Santa Clara Valley Transportation Authority's Motion for Leave to Amend Claim No. 1113* (the "Sabzevari Declaration"), attached hereto as **Exhibit 1**, and respectfully states as follows:

[1] The Reorganized Debtor in this Chapter 11 Case (defined herein), along with the last four digits of the Reorganized Debtor's federal tax identification number, is: Prodigy Investment Holdings, Inc. (9565). The location of the Reorganized Debtor's service address is: 3350 Virginia St., 2nd Floor, Miami, FL 33133.

[2] For the avoidance of doubt, references to the Debtors (defined herein) and the Chapter 11 Cases (defined herein) pertain to the time before the entry of the Case Closing Order (as defined in the Objection), while references to the Reorganized Debtor and the Chapter 11 Case pertain to the period after the Effective Date (defined herein) and entry of the Case Closing Order, as applicable.

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PRELIMINARY STATEMENT[3]

1. In November 2023, SCVTA filed Claim No. 1113 for $880,786.98. The claim attached documentation from a single contract—Contract No. 2—and concerned five electric buses in the 9500 series, one of which had caught fire. That claim sat on the Claims Register, unchanged, for more than two years while the Distribution Trust reconciled nearly 1,800 proofs of claim and prepared for unsecured creditor distributions. Only in January 2026—in response to the Distribution Trust's efforts to fix Claim No. 1113 at its face amount—did SCVTA assert for the first time that its claim should be increased to more than $8.5 million. The Motion followed.

2. The proposed amendment does not relate back to Claim No. 1113 because it is not fairly encompassed in that claim. It seeks total-loss damages for ten buses, not the five identified in Claim No. 1113's supporting documentation. It advances breach-of-contract and negligence theories not articulated in the claim and applies a full-contract-price damages measure bearing no resemblance to the filed claim. And nearly half of the expanded demand—$3,653,934.90—relates to Contract No. 1, which was not mentioned in Claim No. 1113 or the supporting documentation.

3. The Motion acknowledges that SCVTA knew of both contracts—yet it never explains why SCVTA elected to file Claim No. 1113 without reference to Contract No. 1. Nor does the Motion explain how a claim under Contract No. 1, which was not filed before the applicable Bar Date, can survive the Plan's express terms disallowing such a claim. No relation-back doctrine can resurrect a claim that was never filed.

4. SCVTA's explanation for its yearslong delay—that it did not determine the fleet was a total loss until "early 2026"—is contradicted by its own contemporaneous record. In

[3] Capitalized terms used but not defined herein shall have the meanings ascribed to them herein or in the Sabzevari Declaration, as applicable.

February 2024, SCVTA's Board of Directors (the "Board") acknowledged that the Proterra fleet was grounded and that the manufacturer was bankrupt. By October 2024, the Board's safety and transit operations committee reported that the manufacturer "was unable to provide an adequate repair." Yet for years, SCVTA still asserted only an $880,786.98 claim. SCVTA ultimately waited nineteen months after the Fire Cause Report before first raising these new claims and the $8.5 million amount—albeit in a procedurally improper way—and over two years before filing the Motion to amend its claim. That delay is inexcusable.

5. Likewise, the Motion's argument that the Cure Objection put creditors on notice of a potential fleet-wide loss fails.[4] One month after the Cure Objection, SCVTA elected to file a proof of claim relating to just five buses, all under Contract No. 2, asserting no fleet-wide loss—and SCVTA did not seek to amend that claim until the filing of the Motion in August 2026.

6. SCVTA also fails to satisfy the heightened standard for amending claims after plan confirmation—a standard the Motion ignores. More than two years have passed since the Effective Date. The Distribution Trust is preparing to make distributions to unsecured creditors. Amendments at this late stage require "compelling reasons," and the Motion offers no analysis of why SCVTA's request qualifies.

7. Nor does the Motion address the prejudice that would result from a near-tenfold claim expansion, including upsetting the Distribution Trustee's and the public's reliance on the Claims Register; delaying the final administration of the Chapter 11 Case and distributions to creditors; imposing the administrative burden of litigating a multi-million dollar disputed claim; and inviting others to seek late amendments if SCVTA's eleventh-hour "amendment" is permitted.

[4] Indeed, the Cure Objection was only served on the U.S. Trustee, counsel for the Debtors, and counsel for the Committee. *See* Cure Objection, Certificate of Service [D.I. 415-3].

8. Finally, the Motion makes no attempt to satisfy Bankruptcy Rule 9006(b)(1)'s excusable neglect standard for the Contract No. 1 claim that was never filed. When assessed for what it is—a late new claim, not an amendment—SCVTA cannot satisfy that standard either. Accordingly, for the reasons set forth herein, the Motion should be denied.

RELEVANT BACKGROUND

A. The Chapter 11 Cases

9. On August 7, 2023 (the "Petition Date"), Proterra Inc. ("Proterra") and its affiliate, Proterra Operating Company, Inc. (together with Proterra, the "Debtors") filed voluntary petitions for relief in the United States Bankruptcy Court for the District of Delaware (the "Court"), commencing the Chapter 11 Cases.

10. On September 5, 2023, the Court entered the bar date order [D.I. 187], establishing November 13, 2023 as the General Bar Date and February 3, 2024 as the Governmental Bar Date.

11. On January 25, 2024, the Court entered an order [D.I. 951] approving the Debtors' *Third Amended Disclosure Statement for Joint Chapter 11 Plan of Reorganization for Proterra Inc and its Debtor Affiliate* [D.I. 944].

12. On March 6, 2024, the Court entered the confirmation order [D.I. 1180] confirming the Debtors' chapter 11 plan [D.I. 1154] (the "Plan"), and on March 13, 2024, the Plan went effective (the "Effective Date") [D.I. 1208]. Pursuant to the Plan, the Distribution Trust was established to provide distributions to its beneficiaries, and the Distribution Trustee is authorized to pursue objections to, and estimation and settlements of, all Disputed Claims. Plan Art. IV.D.7.

13. The Plan provides that proofs of claim not filed by the applicable bar date "shall be deemed expunged without further action[.]" Plan Art. I.A.6. The Plan also provides that any executory contracts not assumed by the Effective Date "shall be deemed rejected as of the Effective

Date," and claims arising from such rejection must be filed within thirty days of the Effective Date or "will be forever barred." Plan Arts.V.A, V.C.

B. SCVTA's Contracts and Claim No. 1113

14. Prior to the Petition Date, SCVTA entered into two separate contracts with Proterra for the purchase of electric buses:

a. Contract No. P16265 ("Contract No. 1"),[5] effective September 20, 2017, for five buses (*i.e.*, bus numbers 7501–7505). *See Response of Santa Clara Valley Transportation Authority to Ninth Omnibus (Substantive) Objection to Certain Claims* [D.I. 1611] (the "Response"), Exhibit 2.

b. Contract No. P16130 ("Contract No. 2"), effective October 18, 2018, for five additional buses (*i.e.*, bus numbers 9501–9505). *See* Claim No. 1113 at 6–26, attached hereto as **Exhibit 2**.

15. On September 25, 2023, the Debtors filed a *Notice of Assumption and Assignment of Certain Executory Contracts and Unexpired Leases and Proposed Cure Amounts* [D.I. 279] (the "Cure Notice"), identifying both contracts with a proposed cure amount of $11,571.25. On October 16, 2023, SCVTA filed an objection to the Cure Notice [D.I. 415] (the "Cure Objection"), referencing both contracts, all ten buses, the Bus No. 9505 fire, and damages of at least $880,786.98—totaling, with the scheduled trade amount, a cure amount of at least $892,358.23. Cure Objection ¶ 8.

16. One month later, however, on November 13, 2023, SCVTA filed Claim No. 1113 only in respect of Contract No. 2 and the five buses purchased thereunder. *See* Claim No. 1113, at 8–26. The claim did not mention Contract No. 1, did not assert damages for all ten buses, and did not assert a total-loss theory. *See id.* Although Claim No. 1113 stated that the claim amount was "still under investigation," it contained no reservations of rights to amend the claim (or of any

[5] The Motion and the Cure Objection use inconsistent defined terms for the two contracts. *Compare* Motion ¶ 2 (defining Contract No. P16130 as "Contract No. 1" and Contract No. P16265 as "Contract No. 2"), *with* Cure Objection ¶ 1 (defining Contract No. P16265 as "Contract No. 1" and Contract No. P16130 as "Contract No. 2").

other kind) and attached only Contract No. 2 and documents related thereto, including a project schedule for the five 9500-series buses. *See id.*

C. The September 1, 2023 Bus Fire and Subsequent Investigation

17. On September 1, 2023—months before SCVTA filed Claim No. 1113—Bus No. 9505, one of the Contract No. 2 buses, caught fire at an SCVTA maintenance facility while undergoing inspection of its battery-coolant system. Motion ¶ 4; Singh Decl., Ex. 2 (Fire Cause Report) at 1. The bus had already been out of service since March 2023 "due to ongoing issues, including a failure to hold a charge in the battery." Singh Decl. ¶ 4.

18. On January 4, 2024, a preliminary Fire Cause Analysis was conducted (the "Initial Report"). *See* Singh Decl., Ex. 2 at 2. A further evidence examination was conducted on April 2, 2024, at Fire Cause Analysis's laboratory in Santa Clara, California. *See id.* A supplemental Fire Cause Analysis report (the "Fire Cause Report") was issued on May 28, 2024, concluding that the fire likely originated from a thermal event in the bus's defroster unit. Singh Decl. ¶ 7; Singh Decl., Ex. 2 (Fire Cause Report) (noting that the Fire Cause Report supplemented the Initial Report and "covere[d] the findings from additional examinations of defroster units that failed, which includes the defroster from the subject bus"). The Fire Cause Report also documented a separate thermal event on Bus No. 9502. Singh Decl. ¶ 5. Despite knowing no later than May 2024 that a component in a Proterra bus likely caused the fire, SCVTA did not for more than two years file the Motion to amend Claim No. 1113 to assert a claim for fire-related damages.

D. SCVTA's Grounding of the Proterra Fleet

19. As a result of the September 2023 fire, SCVTA immediately grounded all Proterra buses. SCVTA's Board Secretary emailed the Board to inform them that "[t]he bus that caught fire was one of [SC]VTA's fleet of 10 battery electric Proterra buses, all of which have now been taken out of service pending an investigation of the fire." *See* Board Secretary Correspondence at 3 (Sept.

1, 2023 at 2:15 PM), https://www.vta.org/sites/default/files/2023-09/0901_board_correspondence.pdf?.[6]

20. When SCVTA filed its Cure Objection six weeks later, it confirmed that the fleet remained out of service, that it was "not yet able to ascertain" whether the other buses were affected, and that "it is not presently clear if all the Proterra buses are a complete loss." Cure Objection ¶ 5. The fleet remained out of service thereafter.

21. In February 2024, SCVTA's Board received materials stating that "[t]he active fleet is currently reduced by ten due to the grounding of the nine remaining Proterra battery-electric buses following a fire that destroyed one of those buses" and that "Proterra entered Chapter 11 bankruptcy and their bus business line has been sold to Phoenix Motorcars as of January 2024" with an "unclear" future. *See* Board Information Item 8956, *Zero-Emission Bus Transition Discussion* at 4, 8 (Feb. 16, 2024), https://santaclaravta.iqm2.com/Citizens/FileOpen.aspx?Type=30&ID=33556.[7]

22. By October 2024, SCVTA's Safety, Security, and Transit Planning and Operations Committee stated that "the manufacturer, having declared bankruptcy, was unable to provide an adequate repair" and "[t]he nine remaining buses have since been removed from service." *See* Oct. 17, 2024 SCVTA Safety, Sec. & Transit Planning & Operations Comm. Agenda Packet, Agenda Item No. 7, *Zero-Emission Bus Blueprint* at 2, 19 (noting Proterra Fleet was inactive) (Oct. 17, 2024), https://santaclaravta.iqm2.com/Citizens/FileOpen.aspx?Type=1&ID=4045&Inline=True.[8]

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[6] Attached hereto as **Exhibit 3** (the "September 2023 Board Correspondence").

[7] Attached hereto as **Exhibit 4** (the "February 2024 Board Memorandum").

[8] The link above is to the full October 17, 2024 agenda packet. The materials accompanying Agenda Item No. 7, including the memorandum and attach*ed Zero-Emission Bus Bluepr*int, are attached hereto as **Exhibit 5** (the "October 2024 Committee Memorandum").

23. SCVTA repeated this description when the full Board adopted the Zero-Emission Bus Blueprint in January 2025. *See* Jan. 9, 2025 Board Agenda Packet, Agenda Item No. 7.1, *Action Item to Adopt the Zero-Emission Bus Blueprint* at 2, 19 (Jan. 9, 2025) https://santaclaravta.iqm2.com/Citizens/FileOpen.aspx?Type=1&ID=4092&Inline=True[9]; *see also* Board Action 9294 (Jan. 9, 2025) https://santaclaravta.iqm2.com/Citizens/Detail_LegiFile.aspx?Frame=&MeetingID=4053&MediaPosition=&ID=9294&CssClass= (approving the Zero-Emission Bus Blueprint).

E. The Distribution Trustee's Claims Objections and SCVTA's Subsequent Claim Expansion

24. In November 2024, the Distribution Trust filed its *Second Notice of Claims Previously Satisfied Through Assumption and Assignment of Contracts* [D.I. 1462] (the "Second Notice of Satisfied Claims"), which identified claims—including Claim No. 1113—that the Trust initially treated as satisfied through the assumption and assignment of the underlying contracts. At this time, the Distribution Trust mistakenly believed these contracts had been assumed, thus satisfying Claim No. 1113.

25. SCVTA filed a response [D.I. 1475] (the "November 2024 Response"), referencing both contracts and all ten buses, but continuing to assert damages of only "no less than $892,358.23."[10] November 2024 Response ¶ 7. The Distribution Trustee subsequently filed an *Amended Notice of Claims Previously Satisfied Through Assumption and Assignment of Contracts* [D.I. 1560] that removed Claim No. 1113 from the satisfied-claims notice.

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[9] The link above is to the Board's full January 9, 2025 agenda packet. The materials accompanying Agenda Item No. 7, including the memorandum and attached *Zero-Emission Bus Blueprint*, are attached hereto as **Exhibit 6** (the "January 2025 Action Item").

[10] Amount is inclusive of SCVTA's scheduled claim amount. *See* November 2024 Response ¶¶ 4, 6.

26. In September 2025, as part of claims reconciliation and distribution planning, counsel for the Distribution Trustee contacted SCVTA's counsel seeking the "final liquidated amount" of SCVTA's claim. *See* **Exhibit A** to the *Declaration of Jason S. Levin in Support of the Distribution Trustee's Objection to Santa Clara Valley Transportation Authority's Motion for Leave to Amend Claim No. 1113* (the "Levin Decl.") filed contemporaneously herewith (the "September–October 2025 Correspondence").[11] Despite the Distribution Trustee's continued efforts, no final liquidated amount was provided before the Distribution Trustee filed its claims objection several months later.

27. On December 12, 2025, the Distribution Trustee filed the *Ninth Omnibus (Substantive) Objection to Certain Claims* [D.I. 1608] (the "Ninth Omnibus Objection"), seeking to fix Claim No. 1113 at the full $880,786.98 filed amount. On January 2, 2026, SCVTA filed its *Response of Santa Clara Valley Transportation Authority to Ninth Omnibus (Substantive) Objection to Certain Claims* [D.I. 1611] (the "Response"), asserting damages of $8,506,160.24 for the first time—calculated as: (a) $3,653,934.90 for Contract No. 1; (b) $4,840,654.08 for Contract No. 2; and (c) $11,571.26 for a scheduled trade claim. Response ¶ 10.

28. Counsel for the Distribution Trustee reached out to discuss the purportedly expanded claim and sought information supporting the new amount. The Distribution Trustee removed Claim No. 1113 from the proposed order on the Ninth Omnibus Objection and agreed to adjourn the February, March, and May 2026 hearings to allow those discussions to continue. *See* [D.I. 1619, 1620, 1628, 1639]. Those efforts did not resolve the dispute.

[11] Exhibit 3 to the Harrington Declaration does not include the complete e-mail chain. A more complete version of the September–October 2025 Correspondence is attached as **Exhibit A** to the Levin Declaration.

29. On June 19, 2026, the Distribution Trustee filed the *Reply in Support of Ninth Omnibus (Substantive) Objection to Certain Claims with Respect to Claim No. 1113* [D.I. 1644] (the "Reply"), which argued, among other things, that SCVTA was required to seek leave of Court before amending its claim. At the June 25, 2026 status conference, the Court directed the parties to resolve the threshold amendment question through motion practice before considering the substantive merits. *See* Tr. of June 25, 2026 Status Conf. at 7:14–20, 10:14–11:7.

30. The parties entered into a *Stipulation and Order Regarding Briefing Schedule for Santa Clara Valley Transportation Authority's Motion for Leave to Amend Claim No. 1113 and Hearing Thereon* [D.I. 1660] (the "Stipulated Scheduling Order"), which the Court entered on July 28, 2026. Pursuant to that order, SCVTA filed the present Motion on August 7, 2026.[12]

F. SCVTA's Motion to Amend

31. On August 7, 2026, SCVTA filed the Motion seeking to increase its claim from $880,786.98 to $8,506,160.24—a nearly tenfold increase—and to add claims under Contract No. 1, which had never been the subject of any proof of claim.

32. SCVTA's explanation rests on its contention that its investigation was ongoing. Motion ¶ 25. According to SCVTA, after the September 2023 fire, it continued investigating whether the buses could safely return to service or had any residual value. SCVTA argues, without any documentary support, that it "finally determined in early 2026, that none of the Proterra Buses could be returned to service" and that it "investigated whether the Proterra Buses had any scrap value, and determined they did not." *See id.* at ¶ 20; *see also* Singh Decl. ¶ 10. Although the Fire Cause Report was issued in May 2024, SCVTA further contends that coordinating the April 2024

[12] In accordance with the Stipulated Scheduling Order, the parties agreed to extend the Distribution Trust's response deadline to the Motion from August 21, 2026 through and including August 25, 2026 via e-mail correspondence.

evidence examination with multiple parties (including counsel for the Distribution Trustee)[13] and evaluating whether the defroster defect could be remediated also accounts for the delay. Motion ¶ 7; *see also* Singh Decl. ¶ 8.

ARGUMENT

I. SCVTA'S PROPOSED MULTIMILLION DOLLAR INCREASE IS NOT FAIRLY ENCOMPASSED BY CLAIM NO. 1113

33. Once "the bar date passes, a proof of claim typically cannot be amended to seek recovery of new or different amounts that were not fairly encompassed in the original (timely-filed) proof of claim." *In re Maxus Energy*, No. 16-11501 (CTG), 2023 WL 5543612, at *3 (Bankr. D. Del. Aug. 28, 2023). Post-bar-date amendments are limited to "fleshing out the details" of the timely-filed claim—"curing defects," "describing a claim with greater particularity," or "pleading new theories of recovery on facts set forth in the original claim." *In re Ben Franklin Hotel Assocs.*, 186 F.3d 301, 309 (3d Cir. 1999). And to file a new claim after the bar date, one must satisfy Bankruptcy Rule 9006(b)'s "excusable neglect" standard. *Id.* (citing *Pioneer Inv. Servs. Co. v. Brunswick Assocs. Ltd. P'ship*, 507 U.S. 380 (1993)).

34. "[T]he bar date is important to the administration of the case as it brings certainty to a debtor's case by enabling the debtor and its creditors to know the amount of claims which exist." *In re Exide Techs.*, 601 B.R. 271, 293 (Bankr. D. Del. 2019) (quoting *In re Nortel Networks Inc.*, 573 B.R. 522, 527 (Bankr. D. Del. 2017)). After plan confirmation—and here, more than two years after the Effective Date—courts apply heightened scrutiny to proposed amendments. *See In re G-I Holdings, Inc.*, 514 B.R. 720, 756 (Bankr. D.N.J. 2014), *aff'd*, 654 F. App'x 571 (3d Cir.

[13] The Motion states that there was "significant delay" in scheduling the evidence examination because of various representatives who were "required to attend," including counsel to the Distribution Trustee. Motion at ¶ 7. Counsel for the Distribution Trustee was looped into these scheduling discussions on March 22, 2024 and clarified ***that day*** that the Distribution Trust had not asked to reschedule or delay the process. *See* Evidence Examination Correspondence, attached to Levin Declaration as **Exhibit B**.

2016) (considering whether the proposed amendment would prejudice the estate, other creditors, or the administration of the case).

A. Claim No. 1113 Objectively Asserted a Narrow Claim Under Contract No. 2 for the Five 9500-Series Buses

35. Courts look to what an objective reader of the original claim would understand to be within its scope, not to what the creditor later says it intended to preserve. *See In re Maxus Energy*, 2023 WL 5543612, at *8 ("[T]he standard for granting leave to amend a proof of claim turns on an objective reading of the original proof of claim"). "If the initial proof does not give fair notice of the conduct, transaction or occurrence that forms the basis of the claim asserted in the amendment then the amendment asserts new claims and will not be allowed." *In re Ben Franklin Hotel Assocs.*, No. 93-17088 SR, 1998 WL 94808 (E.D. Pa. Mar. 4, 1998), *aff'd on other grounds*, 186 F.3d 301 (3d Cir. 1999). An objective reading of Claim No. 1113 and the proposed amendment demonstrates that the purported amendment is a new claim.

36. ***First, the proposed amendment adds an entirely new contract that was excluded from Claim No. 1113.*** Contract No. 1 accounts for nearly half of the new proposed total. Motion ¶ 10; Singh Decl. ¶ 11. Yet Claim No. 1113 attached only Contract No. 2 and related documentation, including a five-bus schedule. Claim No. 1113, at 8–26. SCVTA was aware of Contract No. 1; yet it elected to file a claim that omitted it entirely. *Compare* Cure Objection ¶ 1, Ex. 1 (copy of Contract No. 1), *with* Claim No. 1113. An objective reader of Claim No. 1113 would not understand it to encompass damages under a contract that was neither attached nor mentioned. *See In re Maxus Energy*, 2023 WL 5543612, at *1 ("Changing a proof of claim to add amounts that were outside the scope of the original proof of claim is treated as the filing of a new claim.").

37. ***Second*, *the proposed amendment changes the scope of the buses and the nature of the damages.*** Claim No. 1113 attached supporting documentation concerning only the five

9500-series buses under Contract No. 2. *See* Claim No. 1113, at 25–26 (Project Schedule listing buses 9501–9505). The proposed amendment now seeks total-contract-price damages for all ten buses based on a "fleet-wide total loss" determination. Motion ¶¶ 10, 24; Singh Decl. ¶ 11. Moreover, the proposed amendment changes the damages measure: Claim No. 1113 asserted $880,786.98 in damages, while the proposed amendment seeks the full purchase price of both contracts. *See In re Ben Franklin Hotel*, 186 F.3d at 309 (amendment must rest "on facts set forth in the ***original claim***") (emphasis added).

38. ***Third, the proposed amendment asserts legal theories that appear nowhere in the original claim.*** Claim No. 1113 stated only "[d]amages arising from sale of defective buses." Claim No. 1113, at 2. The Motion now asserts breach of contract and negligence theories—alleging that Proterra "owed a duty of care to [SC]VTA" and "breached that duty of care by providing buses that were unreliable, routinely out of service, and which posed an extreme risk to [SC]VTA personnel and the public due to the risk of fire." Motion ¶ 28.

39. These new assertions justify denial of leave to amend. *See, e.g.*, *In re Charge Enters., Inc.*, No. 24-10349 (TMH), 2024 WL 5112999, at *6 (Bankr. D. Del. Dec. 13, 2024) (denying leave to amend where the proposed amendment asserted a new legal theory requiring facts not set forth in the original proof of claim); *see also In re Mallinckrodt Plc*, No. 20-12522-JTD, 2022 WL 3545583, at *3–4 (D. Del. Aug. 18, 2022) (denying amendment where proof of claim did not sufficiently allege facts under new legal theory); *In re FTX Trading Ltd.*, 2024 Bankr. LEXIS 3024, at *16 (Bankr. D. Del. Dec. 18, 2024) ("[T]he fact that a creditor does not need to have the same level of detail in a proof of claim as it would in a complaint does not alter the fundamental requirement that the creditor provide enough information to notify the debtor about the nature of the claim and the facts on which such claim is based.").

B. The "Under Investigation" Language Did Not Preserve Unasserted Claims Related to Contract No. 1 for the Five 7500-Series Buses

40. SCVTA contends that Claim No. 1113's notation that the "total amount is still under investigation" preserved the right to expand its claim tenfold. *See* Motion ¶ 17. But the claim stated a specific dollar amount—$880,786.98—and attached documents only related to Contract No. 2 and the five 9500-series buses. An objective reader would understand that SCVTA was claiming $880,786.98 in damages under Contract No. 2, with the specific final calculation subject to further review. Nothing in the original claim suggested that SCVTA reserved the right to assert a claim tenfold in amount based on a different contract, different buses, or new legal theories.

41. This type of vague investigative language may preserve the ability to refine the amount of the claim actually asserted, within reason, but it cannot provide "fair notice of the conduct, transaction or occurrence" underlying a totally different claim. *See In re Ben Franklin Hotel*, 1998 WL 94808, at *3; *see also In re FTX Trading Ltd.*, 2024 Bankr. LEXIS 3024, at *10–11 (Bankr. D. Del. Dec. 18, 2024) (a creditor's statement that it was "investigating causes of action" against the debtors "does not provide the Debtors or the Court with notice of either the nature or amount of such claims"); *see In re Charge Enters.*, 2024 WL 5112999, at *6 ("The purpose of a proof of claim is to put the debtor on notice of the nature and basis of the claim.").

42. Even if SCVTA could not yet articulate its legal theories, "its failure to explain the nature of the claim and include facts on which the claim would be based is detrimental." *See In re Charge Enters.*, 2024 WL 5112999, at *6 ("Not knowing the law does not excuse a deficient filing.") (citing *In re Nortel*, 573 B.R. at 528 ("The law is clear: ignorance is not a sufficient reason to permit amendment.")). SCVTA had ample opportunity to file a claim that encompassed Contract No. 1 and the 7500-series buses but deliberately filed a narrower claim. That election cannot now be undone by characterizing its omission as uncertainty.

C. The Cure Objection Cannot Expand the Scope of the Formal Proof of Claim SCVTA Later Chose to File

43. SCVTA asserts that the Cure Objection qualifies as an informal proof of claim. *See* Motion ¶ 30 (merely stating that the Cure Objection meets the standard for an informal proof of claim because it attached Contract Nos. 1 and 2 and "advising that all 10 buses ***could be*** a total loss" for which SCVTA would seek compensation) (emphasis added). That argument fails.

44. In the Third Circuit, an informal proof of claim must, among other things, "contain[] a demand by the creditor on the debtor's estate" and "evidence an intent to hold the debtor liable for the debt." *Hefta v. Official Comm. of Unsecured Creditors (In re Am. Classic Voyages Co.)*, 405 F.3d 127, 130, 132 (3d Cir. 2005).[14] The Cure Objection, by contrast, demanded a cure amount payable only if the contracts were assumed—it did not demand payment of an $8.5 million unsecured claim against the estate upon rejection, and it disclaimed the ability to determine whether a fleet-wide total-loss claim even existed. *See* Cure Objection ¶¶ 8–11.

45. A filing that expressly states the claimant cannot yet ascertain whether a claim exists does not "evidence an intent to hold the debtor liable" for that claim. *See In re Am. Classic Voyages*, 405 F.3d at 130 (holding that "[m]ere notice of a claim alone is not to be called an informal proof of claim" and that the demand must be "sufficient to put the debtor and/or the court on notice as to the existence, nature and amount of the claim (if ascertainable)"); *see also In re FTX Trading*, 2024 Bankr. LEXIS 3024, at *12, *14 (holding that a protective proof of claim "should comply with the same standards" as a formal one and "must be sufficient to put a debtor and the court on notice as to the existence, nature and amount (if ascertainable) of a claim").

[14] An informal proof of claim exists only if the document is in writing, demands payment from the bankruptcy estate, evidences an intent to hold the debtor liable, and is filed with the bankruptcy court. *See id.* at 131. If those requirements are satisfied, the court must then determine whether the surrounding facts and equities justify treating the document as a proof of claim. *See id.*

46. Even assuming the Cure Objection could be characterized as an informal proof of claim in some respect, SCVTA subsequently filed Claim No. 1113 approximately one month later. That formal proof of claim identified only Contract No. 2, attached only documents related to (and including) Contract No. 2 and the five 9500-series buses, and asserted $880,786.98—consistent with the total loss amount of Bus No. 9505 asserted in the Cure Objection. *Compare* Claim No. 1113 at 8 – 26, *with* Cure Objection ¶¶ 4, 8 ("Bus No. 9505 delivered by Proterra is a total loss and the damage suffered by VTA ***as a result of the Bus Fire*** is at least $880,786.98.") (emphasis added). Whatever notice the earlier Cure Objection may have supplied, SCVTA cannot use that earlier filing to enlarge the formal proof of claim it subsequently filed beyond the scope that a reasonable reader would objectively understand from Claim No. 1113. *See In re Maxus Energy*, 2023 WL 5543612, at *8 ("The creditor's subjective intent to assert a broad claim is beside the point if the proof of claim, read objectively and fairly, is a narrower one.").

i. The Cure Objection's Reservation of Rights Did Not Preserve Unasserted Claims Related to Contract No. 1 for the Five 7500-Series Buses

47. Amended claims do not relate back merely because a creditor reserves rights. "A reservation of rights to present a claim is not itself a claim." *In re Jackson*, 482 B.R. 659, 667 (Bankr. S.D. Fla. 2012). Notice that an investigation might later reveal a broader claim amount is not the same as assertion of that broader claim. To allow creditors to assert new claims under the guise of an amendment, after the bar date, because of non-applicable preservation language would render the bar date "meaningless." *See In re Calpine Corp.*, No. 05-60200 (BRL) 2007 WL 4326738, at *5 (S.D.N.Y. Nov. 21, 2007) ("Bar dates would be rendered meaningless if creditors were granted leave to amend to assert new novel claims based on broad language in a timely-filed Proof of Claim."); *D&K Props. Crystal Lake v. Mut. Life Ins. Co. of N.Y.*, 112 F.3d 257, 261 (7th Cir. 1997) ("A blanket reservation that seeks to reserve all causes of action reserves nothing.").

D. The Plan Likewise Bars the New Claim Because of SCVTA's Failure to File a Proof of Claim or a Rejection Damages Claim for Contract No. 1

48. Under the Plan, claims for which no proof of claim was timely filed are deemed expunged—including SCVTA's claim under Contract No. 1. *See* Plan Art. I.A.6 ("Any Claim . . . for which no Proof of Claim is or has been Filed, is not considered Allowed and shall be deemed expunged without further action by the Debtors and without further notice to any party or action, approval, or order of the Bankruptcy Court."). Moreover, Contract No. 1 was not assumed by the Effective Date and therefore was "deemed rejected as of the Effective Date" under the Plan. *See* Plan Art. V.A. Under the Plan, claims arising from the rejection of executory contracts must be filed within thirty days of the Effective Date—*i.e.*, by April 12, 2024—or they "will be forever barred." Plan Art. V.C. SCVTA never filed any proof of claim asserting rejection damages under Contract No. 1—not by the Rejection Bar Date, and not at any time thereafter. Sabzevari Decl. ¶ 6. SCVTA's belief that the full extent of its damages was uncertain does not excuse this failure. *See, e.g.*, *In re Maxus Energy*, 639 B.R. 51, 64 (Bankr. D. Del. 2022) (rejecting the argument that a creditor need not file a proof of claim where, despite receiving notice of the applicable bar date, it believed its claim was merely "theoretical" because it was contingent and unliquidated at the time) (citing *In re SunCruz Casinos LLC*, 342 B.R. 370, 379 (Bankr. S.D. Fla. 2006)).

49. A cure objection seeking amounts payable upon assumption of an executory contract is not a proof of claim under 11 U.S.C. § 502(g). *See* 11 U.S.C. § 502(g)(1) ("A claim arising from the rejection . . . of an executory contract . . . shall be determined . . . as if such claim had arisen before the date of the filing of the petition."); *see also* Plan Art. V.C (requiring "[p]roofs of [c]laim" for rejection damages to be filed by the Rejection Bar Date); *In re Maxus Energy*, 639 B.R. at 57 (denying creditor's motion to amend an informal claim where creditor failed to file a proof of claim by the rejection bar date).

II. EVEN IF THE PROPOSED CLAIM COULD RELATE BACK, SCVTA'S INEXCUSABLE DELAY AND THE RESULTING PREJUDICE WARRANT DENIAL OF THE AMENDMENT

50. Even if SCVTA could satisfy the threshold requirement that its amendment relates back to a timely filed proof of claim—which it does not—the Court should deny amendment as a matter of equitable discretion. Courts consider "undue delay, bad faith, or dilatory motive." *See In re Mallinckrodt Plc*, No. 20-12522-JTD, 2022 WL 3545583, at *3 (D. Del. Aug. 18, 2022).

51. A creditor's explanation for delay is critical. *Id.*; *see also In re Nortel*, 573 B.R. at 527–28. Where—as here—delay was "entirely avoidable and within [the movant's] control," that circumstance "strongly disfavors" the claimant. *In re Am. Classic Voyages*, 405 F.3d at 134.

A. SCVTA's Delay Was Within Its Control and Is Contradicted by Its Own Contemporaneous Records

52. SCVTA asserts that it "finally determined, in early 2026, that none of the Proterra Buses could be returned to service and, as such, all of the buses are a total loss." Singh Decl. ¶ 10. The contemporaneous record tells a different story. The Fire Cause Report was completed on May 28, 2024. Singh Decl. ¶ 7. From that point forward, the remaining work—determining whether the buses could safely return to service and whether they had residual value—was within SCVTA's control. Singh Decl. ¶¶ 9–10. Yet SCVTA's Board materials and filings demonstrate that it had recognized the practical loss of its Proterra fleet two years before "early 2026":

- By February 2024, SCVTA's Board materials reflected an operational understanding that the Proterra fleet would not return to service. Specifically, SCVTA's Board materials stated that the fleet was "reduced by ten" due to the grounding of the Proterra buses, that Proterra's bus business had been sold to Phoenix Motorcars, and that its future was "unclear." *See* February 2024 Board Memorandum at 4, 8.

- By October 2024, SCVTA more definitively stated that "the manufacturer, having declared bankruptcy, was unable to provide an adequate repair" and "[t]he nine remaining buses have since been removed from service." *See* October 2024 Committee Memorandum at 2, 19.

- On November 26, 2024—six months after the Fire Cause Report—SCVTA filed the November 2024 Response asserting damages of "no less than $892,358.23," the same figure from October 2023. *See* November 2024 Response at 4.

- On January 2, 2026—nineteen months after the Fire Cause Report—SCVTA first asserted an $8,506,160.24 claim, in response to the Ninth Omnibus Objection.

53. SCVTA relies extensively on the evidence examination requiring coordination among other parties to justify its delay. However, that coordination was completed and the findings were issued by May 28, 2024, when the Fire Cause Report was issued. *See* Singh Decl., Ex. 2 Fire Cause Report at 1. SCVTA identifies no third-party constraint, no external dependency, and no excusable circumstance explaining the intervening years of inaction. *See In re Charge Enters.*, 2024 WL 5112999, at *5 ("[I]f the party requesting amendment unduly delays in seeking that amendment, a court may deem such delay preclusive.") (citations omitted).

54. *In re FTX Trading Ltd.*, 669 B.R. 298 (Bankr. D. Del. 2025), is distinguishable. There, the court permitted an amendment where the debtors had withheld information critical to the creditors' ability to quantify their claims. *See id.* at 306–08. Here, no such circumstances exist. SCVTA possessed the buses, controlled the investigation, commissioned the evidence examination, received the Fire Cause Report, and made the fleet decisions. The Distribution Trust did not withhold information from SCVTA.

55. The Distribution Trustee does not dispute SCVTA's good faith, but SCVTA has not provided a compelling explanation for waiting until January 2026 to assert an $8.5 million claim, and its contemporaneous filings and operational record undermine the assertion that the expanded claim resulted from a newly completed "early 2026" investigation. *See In re Am. Classic Voyages*, 405 F.3d at 134.

B. Permitting a Nearly Tenfold Claim Expansion Now Would Prejudice the Distribution Trust and Disrupt a Substantially Completed Claims-Reconciliation Process

56. The Plan became effective on March 13, 2024. More than two years have elapsed. During that period, the Distribution Trust has reconciled all but a handful of claims out of nearly 1,800 proofs of claim and is now establishing reserves for distributions. Sabzevari Decl. ¶¶ 7, 12, 14. Throughout this process, Claim No. 1113 has shown on the filed Claims Register at $880,786.98. *Id.* ¶ 5; *see, e.g.*, *Claims Register Date Range: 08/07/2023–07/08/2026* [D.I. 1655]. The Claims Register is publicly available and consistently updated, enabling creditors and other market participants to obtain information regarding the total allowed amount of the unsecured claims pool. *See id.* ¶ 11. The Distribution Trust has relied on this claims universe in reconciling claims, evaluating creditor recoveries, and preparing for distributions. *Id.* ¶¶ 8, 10. Permitting SCVTA's requested tenfold expansion would require additional claims administration—potentially including contested litigation concerning breach, causation, and damages—that the Distribution Trust reasonably did not anticipate based on the claim SCVTA actually filed. *See id.* ¶¶ 14–16; *see also In re Majestic Holdco, LLC*, No. 09-14142, 2013 WL 653091, at *3 (Bankr. D. Del. Feb. 21, 2013) (finding prejudice where late claims "would require litigation over the claims' validity" and observing that "the proceedings are at their waning stage").

57. Fiduciaries and stakeholders must be able to rely on the claims register. The bar dates aid this function by enabling the parties "to identify with reasonable promptness the identity of those making claims against the bankruptcy estate, and the general amount of the claims." *In re Energy Future Holdings Corp.*, 619 B.R. 99, 108 (Bankr. D. Del. 2020) ("It is akin to a statute of limitations, and must be strictly observed.") (citations omitted).

58. Permitting a creditor to expand a filed claim nearly tenfold, years after the applicable bar dates, would undermine the certainty those deadlines are intended to provide and

has the potential to open the "floodgates of other similar claims." *See In re Am. Classic Voyages*, 405 F.3d at 133 (considering "whether allowing the claim would open the floodgates to other similar claims" among factors bearing on prejudice); *see also* Sabzevari Decl. ¶ 16.

III. SCVTA CANNOT SHOW THE COMPELLING JUSTIFICATION REQUIRED TO EXPAND ITS CLAIM MORE THAN TWO YEARS AFTER CONFIRMATION

59. Even if SCVTA could satisfy the ordinary standards to amend its claim, SCVTA must also satisfy the even higher showing of a "compelling reason" required for leave to amend a proof of claim after plan confirmation. It fails. The Plan was confirmed on March 6, 2024, and became effective on March 13, 2024. Approximately two years later, the Distribution Trust has substantially completed claims reconciliation. Sabzevari Decl. ¶¶ 5, 7, 10, 12; *see also Holstein v. Brill*, 987 F.2d 1268, 1270 (7th Cir. 1993) ("Confirmation of the plan of reorganization is a second milestone, equivalent to final judgment in ordinary civil litigation. Once that milestone has been reached, further changes [to claims] should be allowed only for compelling reasons.").

60. SCVTA has not established a "compelling reason" for its delay. SCVTA's proffered justification—that it did not reach its total-loss determination until "early 2026"—is inconsistent with the record. By early 2024, SCVTA had ample information to assert a claim for both contracts and for all ten buses. The Fire Cause Report was completed in May 2024; the remaining analysis was entirely within SCVTA's control. Yet SCVTA continued to assert only $880,786.98 until January 2026, when it responded to the Distribution Trustee's objection.

61. None of this is a "compelling reason." *See In re Exide Techs.*, 601 B.R. at 294 (denying post-confirmation amendment where the record did "not establish any compelling reason [t]o allow such drastic amendment after the confirmation and effective date of the Plan"); *see also Matter of Highland Capital Mgmt. LP*, 102 F.4th 286, 291 (5th Cir. 2024) (affirming denial of

post-confirmation amendment where unexcused delay "would have been sufficient by itself" to deny the motion).

IV. SCVTA CANNOT ESTABLISH EXCUSABLE NEGLECT FOR ASSERTING NEW CLAIMS YEARS AFTER THE APPLICABLE BAR DATES

62. "The 'excusable neglect' standard of [Bankruptcy] Rule 9006(b)(1) governs late filings of proofs of claim in Chapter 11 cases." *Pioneer*, 507 U.S. at 389. As courts recognize, the excusable neglect analysis "closely resembles" the equitable analysis of belated amendments. *In re Enron Corp.*, 419 F.3d 115, 133 (2d Cir. 2005). For the same reasons that an amendment would be inequitable, as discussed above, SCVTA cannot satisfy the *Pioneer* factors.

63. ***First,*** permitting a nearly tenfold claim expansion would prejudice the Distribution Trust's administration where it has nearly completed its claims reconciliation process. *See* Sabzevari Decl. ¶¶ 10, 12. Injecting an additional $7.6 million in disputed liability at this juncture would disrupt that substantially completed process. *See In re Majestic*, 2013 WL 653091, at *3 (finding prejudice where late claims would require litigation over the claims' validity at "the waning stage" of proceedings); *see also* Sabzevari Decl. ¶ 15.

64. ***Second,*** SCVTA waited more than two years to assert the expanded claim. While the passage of time alone may not be dispositive, delay, such as here, eventually "become[s] 'undue,' placing an unwarranted burden on the court, or . . . 'prejudicial,' placing an unfair burden on the opposing party." *In re SemCrude, L.P.*, 443 B.R. 472, 482 (Bankr. D. Del. 2011) (quoting *Adams v. Gould Inc.*, 739 F.2d 858, 868 (3d Cir. 1984)).

65. ***Third,*** "the excuse for a late filing is most important." *In re Nortel*, 573 B.R. at 528 (citing *In re Midland Cogeneration Venture Limited Partnership v. Enron Corp.* (*In re Enron Corp.*), 419 F.3d 115 (2d Cir. 2005)). SCVTA possessed the buses, controlled the investigation, and received the Fire Cause Report by May 2024. No third-party constraint, no external

dependency, and no debtor misconduct explains the multiyear gap. *Cf. In re FTX Trading*, 669 B.R. at 307–08 (noting that "the evidence suggests that the delay in filing the Amended POC was, in large part, caused by the Debtors themselves"). As discussed at length above, SCVTA's delay was "entirely avoidable and within [its] control," a circumstance that "strongly disfavors" a finding of excusable neglect. *In re Am. Classic Voyages Co.*, 405 F.3d 127, 134 (3d Cir. 2005).

66. ***Fourth,*** while the Distribution Trustee does not dispute SCVTA's good faith, good faith alone cannot carry the Motion. When the other *Pioneer* factors weigh against the movant, good faith does not rehabilitate the claim. *See In re Am. Classic Voyages Co.*, 405 F.3d at 134 (explaining that while there was no reason to believe the creditor acted in bad faith, the creditor could not overcome the weight of the previous three factors, especially delay).

CONCLUSION

67. For the foregoing reasons, the Distribution Trustee respectfully requests that the Court deny the Motion and enter an order: (a) denying SCVTA leave to amend Claim No. 1113 to add claims under Contract No. 1; (b) denying SCVTA leave to amend Claim No. 1113 to expand the claim amount from $880,786.98 to $8,506,160.24; and (c) fixing Claim No. 1113 at its filed amount of $880,786.98, subject to resolution of any remaining substantive objections.

RESERVATION OF RIGHTS

68. Nothing in this Objection constitutes an admission that Claim No. 1113 is allowed, valid, enforceable, or payable in any amount. The Distribution Trustee expressly reserves all rights, claims, objections, defenses, and arguments with respect to Claim No. 1113, including the right to assert additional or alternative objections—whether substantive or procedural—relating to breach, causation, damages, mitigation, offset, or any other defense available under applicable law, in the event that any ground set forth herein is withdrawn, overruled, or otherwise not sustained.

Dated: August 25, 2026
Wilmington, Delaware

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Counsel to the Distribution Trustee

EXHIBIT 1

Sabzevari Declaration

IN THE UNITED STATES BANKRUPTCY COURT
FOR THE DISTRICT OF DELAWARE

In re:	Chapter 11
Prodigy Investment Holdings, Inc.,[1]	Case No. 23-11120 (BLS)
Reorganized Debtor.	Jointly Administered

DECLARATION OF FARZAN SABZEVARI IN SUPPORT OF THE DISTRIBUTION TRUSTEE'S OBJECTION TO THE MOTION OF SANTA CLARA VALLEY TRANSPORTATION AUTHORITY FOR LEAVE TO AMEND CLAIM NO. 1113

Pursuant to 28 U.S.C. § 1746, I, Farzan Sabzevari, hereby declare under penalty of perjury that the following is true and correct to the best of my knowledge and belief:

1. I am an associate at Province, LLC ("Province"), a nationally recognized restructuring and financial advisory firm that has its principal office at 2360 Corporate Circle, Suite 340, Henderson, Nevada, 89074. Province serves as financial advisor to the PTRA Distribution Trust (the "Distribution Trust") established in the above-captioned chapter 11 case (the "Chapter 11 Case") of the reorganized debtor (the "Reorganized Debtor").

2. I submit this declaration (the "Declaration") in support of *The Distribution Trustee's Objection to the Motion of Santa Clara Valley Transportation Authority for Leave to Amend Claim No. 1113* (the "Objection") filed contemporaneously herewith.

3. Except as otherwise indicated, all statements in this Declaration are based upon (i) my personal knowledge, and/or (ii) my review (or the review of persons under my supervision)

[1] The Reorganized Debtor in this chapter 11 case, along with the last four digits of the Reorganized Debtor's federal tax identification number, is: Prodigy Investments Holdings, Inc. (9565). The location of the Reorganized Debtor's service address is: 3350 Virginia St., 2nd Floor, Miami, FL 33133.

[2] All capitalized terms used and not defined herein shall have the meanings ascribed to them in the Objection.

of the Books and Records, the Schedules filed in the Chapter 11 Cases, the relevant proofs of claim, and the claims register ("Claims Register") maintained by Verita Global (f/k/a Kurtzman Carson Consultants LLC) ("Claims Agent"), as well as relevant documents and other information prepared or collected by the Debtors' former employees or professionals, and/or the Distribution Trustee's and the Reorganized Debtor's consultants or professionals.

4. I have reviewed, or caused persons under my supervision to review, Claim No. 1113 and the supporting documentation annexed to it, as well as the *Motion of Santa Clara Valley Transportation Authority for Leave to Amend Claim No. 1113* [D.I. 1663] (the "Motion"), the *Response of Santa Clara Valley Transportation Authority to Ninth Omnibus (Substantive) Objection to Certain Claims* [D.I. 1611] (the "Response"), and the supporting declarations attached thereto, to determine the bases upon which liability was asserted against the Debtors and the Reorganized Debtor.

5. I have also reviewed, or caused persons under my supervision to review, the Claims Register. Claim No. 1113 was filed by SCVTA on November 13, 2023, asserting a claim in the amount of $880,786.98. The claim attached supporting documentation concerning only Contract No. P16130 ("Contract No. 2") and the five 9500-series buses. Throughout the claims reconciliation process, Claim No. 1113 has remained on the Claims Register at the filed amount of $880,786.98.

6. I have also reviewed, or caused persons under my supervision to review, the docket in this Chapter 11 Case. SCVTA did not file any proof of claim asserting damages under Contract No. P16265 ("Contract No. 1") by the General Bar Date of November 13, 2023, by the Governmental Bar Date of February 3, 2024, or by the Rejection Bar Date of April 12, 2024. No proof of claim for Contract No. 1 appears on the Claims Register.

7. Since the Plan went effective on March 13, 2024, the Distribution Trust has been engaged in an ongoing claims reconciliation process, reviewing and reconciling filed proofs of claim (including any supporting documentation) with the Schedules, the Claims Register, and the Debtors' Books and Records. As of the date of this Declaration, more than two years have elapsed since the Effective Date.

8. Bar dates are critical to the orderly administration of a bankruptcy case. Throughout the claims reconciliation process, the Distribution Trust has relied on the bar dates—and the claims universe they established—in analyzing creditor recoveries, calculating reserves for disputed claims, and planning for distributions. The Trust has conducted its claims administration and distribution planning based on the reasonable expectation that filed proofs of claim represent the scope and amount of each creditor's asserted claim against the estate.

9. As part of the claims reconciliation process, the Distribution Trustee has filed multiple omnibus claims objections, including the *Ninth Omnibus (Substantive) Objection to Certain Claims* [D.I. 1608] (the "Ninth Omnibus Objection"), filed on December 12, 2025, which sought to fix Claim No. 1113 at its filed amount of $880,786.98 to finalize the claims universe as the Trust established reserves and prepared for distributions.

10. The Distribution Trustee relies on the Claims Register—including the amounts and scope of filed proofs of claim—in analyzing creditor recoveries, calculating reserves for disputed claims, and assisting the Distribution Trustee in planning distributions to holders of allowed claims. Throughout this process, the Trust has relied on Claim No. 1113 being carried at its filed amount of $880,786.98.

11. The Claims Register is also made available publicly on the docket. Creditors and others in the market are able to review the Claims Register in order to obtain information regarding

the total allowed amount of the unsecured claims pool. That information provides valuable information to creditors and others in the market regarding the ultimate distribution percentages in the Chapter 11 Case.

12. The Distribution Trust has completed its reconciliation of all but a handful of claims out of a total of nearly 1,800 proofs of claim. During that multi-year effort, numerous creditors have settled with the Distribution Trustee.

13. On January 2, 2026, in response to the Ninth Omnibus Objection, SCVTA asserted damages of $8,506,160.24 for the first time—seeking to increase its claim from $880,786.98 to $8,506,160.24, a nearly tenfold increase. Nearly half of this expanded demand—$3,653,934.90—is attributable to Contract No. 1, which was not even the subject of any proof of claim.

14. The Distribution Trustee is now in the process of establishing reserves for final distributions. Permitting SCVTA to increase its claim from $880,786.98 to $8,506,160.24 at this juncture would inject material uncertainty into the claims reconciliation and distribution process. Such an expansion would require substantial additional claims administration—potentially including contested litigation concerning breach, causation, and damages—that the Trust reasonably did not anticipate based on the claim SCVTA actually filed. The Trust has relied on the filed Claims Register and asserted claims, including Claim 1113, in connection with the claims reconciliation process, including in connection with evaluating creditor recoveries and preparing for distributions.

15. Permitting a claim expansion of this magnitude at this late stage would require the Trust to revisit its claims analysis, revise its reserve calculations, and potentially delay distributions to the holders of allowed claims—all based on a claim that SCVTA could have asserted more than two years ago.

16. If the Court were to permit a creditor to expand a filed claim nearly tenfold at this stage—years after the applicable bar dates and more than two years after the Plan became effective—it could invite other creditors to seek similar late expansions of their claims. Based on my work on this Chapter 11 Case, I am aware that the Trust has resolved or is in the process of resolving claims with numerous creditors.

17. I declare under penalty of perjury that the foregoing information is true and correct to the best of my knowledge, information, and belief.

Dated: August 25, 2026

/s/ Farzan Sabzevari
Farzan Sabzevari

EXHIBIT 2

Claim No. 1113

Claim #1113 Date Filed: 11/13/2023

Fill in this information to identify the case:

Debtor Proterra Inc

United States Bankruptcy Court for the: _____ District of Delaware (State)

Case number 23-11120

Official Form 410
Proof of Claim

04/22

Read the instructions before filling out this form. This form is for making a claim for payment in a bankruptcy case. Do not use this form to make a request for payment of an administrative expense. Make such a request according to 11 U.S.C. § 503.

Filers must leave out or redact information that is entitled to privacy on this form or on any attached documents. Attach redacted copies or any documents that support the claim, such as promissory notes, purchase orders, invoices, itemized statements of running accounts, contracts, judgments, mortgages, and security agreements. **Do not send original documents;** they may be destroyed after scanning. If the documents are not available, explain in an attachment.

A person who files a fraudulent claim could be fined up to $500,000, imprisoned for up to 5 years, or both. 18 U.S.C. §§ 152, 157, and 3571.

Fill in all the information about the claim as of the date the case was filed. That date is on the notice of bankruptcy (Form 309) **that you received.**

Part 1: Identify the Claim

1. **Who is the current creditor?**
   Santa Clara Valley Transportation Authority
   Name of the current creditor (the person or entity to be paid for this claim)
   Other names the creditor used with the debtor _____

2. **Has this claim been acquired from someone else?**
   ☑ No
   ☐ Yes. From whom? _____

3. **Where should notices and payments to the creditor be sent?**
   Federal Rule of Bankruptcy Procedure (FRBP) 2002(g)

Where should notices to the creditor be sent?	**Where should payments to the creditor be sent?** (if different)
See summary page	See summary page
Contact phone 415-516-5200	Contact phone _____
Contact email mharrington@greenfieldlaw.com	Contact email greg.richardson@vta.org

   Uniform claim identifier for electronic payments in chapter 13 (if you use one):
   _

4. **Does this claim amend one already filed?**
   ☑ No
   ☐ Yes. Claim number on court claims registry (if known) _____ Filed on _____ MM / DD / YYYY

5. **Do you know if anyone else has filed a proof of claim for this claim?**
   ☑ No
   ☐ Yes. Who made the earlier filing? _____

2311120231113000000000037

Part 2: Give Information About the Claim as of the Date the Case Was Filed

6. **Do you have any number you use to identify the debtor?**

☑ No

☐ Yes. Last 4 digits of the debtor's account or any number you use to identify the debtor: ___ ___ ___ ___

7. **How much is the claim?** $ 880,786.98 . **Does this amount include interest or other charges?**

☑ No

☐ Yes. Attach statement itemizing interest, fees, expenses, or other charges required by Bankruptcy Rule 3001(c)(2)(A).

8. **What is the basis of the claim?**

Examples: Goods sold, money loaned, lease, services performed, personal injury or wrongful death, or credit card.

Attach redacted copies of any documents supporting the claim required by Bankruptcy Rule 3001(c).

Limit disclosing information that is entitled to privacy, such as health care information.

See summary page

9. **Is all or part of the claim secured?**

☑ No

☐ Yes. The claim is secured by a lien on property.

Nature or property:

☐ Real estate: If the claim is secured by the debtor's principle residence, file a *Mortgage Proof of Claim Attachment* (Official Form 410-A) with this *Proof of Claim*.

☐ Motor vehicle

☐ Other. Describe: _____

Basis for perfection: _____

Attach redacted copies of documents, if any, that show evidence of perfection of a security interest (for example, a mortgage, lien, certificate of title, financing statement, or other document that shows the lien has been filed or recorded.)

Value of property: $_____

Amount of the claim that is secured: $_____

Amount of the claim that is unsecured: $_____ (The sum of the secured and unsecured amount should match the amount in line 7.)

Amount necessary to cure any default as of the date of the petition: $_____

Annual Interest Rate (when case was filed)_____%

☐ Fixed

☐ Variable

10. **Is this claim based on a lease?**

☑ No

☐ Yes. **Amount necessary to cure any default as of the date of the petition.** $_____

11. **Is this claim subject to a right of setoff?**

☑ No

☐ Yes. Identify the property: _____

23111202311130000000000037

12. **Is all or part of the claim entitled to priority under 11 U.S.C. § 507(a)?**

A claim may be partly priority and partly nonpriority. For example, in some categories, the law limits the amount entitled to priority.

	Amount entitled to priority
☑ No	
☐ Yes. *Check all that apply:*	
☐ Domestic support obligations (including alimony and child support) under 11 U.S.C. § 507(a)(1)(A) or (a)(1)(B).	$_____
☐ Up to $3,350* of deposits toward purchase, lease, or rental of property or services for personal, family, or household use. 11 U.S.C. § 507(a)(7).	$_____
☐ Wages, salaries, or commissions (up to $15,150*) earned within 180 days before the bankruptcy petition is filed or the debtor's business ends, whichever is earlier. 11 U.S.C. § 507(a)(4).	$_____
☐ Taxes or penalties owed to governmental units. 11 U.S.C. § 507(a)(8).	$_____
☐ Contributions to an employee benefit plan. 11 U.S.C. § 507(a)(5).	$_____
☐ Other. Specify subsection of 11 U.S.C. § 507(a)(__) that applies.	$_____

* Amounts are subject to adjustment on 4/01/25 and every 3 years after that for cases begun on or after the date of adjustment.

13. **Is all or part of the claim entitled to administrative priority pursuant to 11 U.S.C. 503(b)(9)?**

☑ No

☐ Yes. Indicate the amount of your claim arising from the value of any goods received by the debtor within 20 days before the date of commencement of the above case, in which the goods have been sold to the Debtor in the ordinary course of such Debtor's business. Attach documentation supporting such claim.

$_____

Part 3: Sign Below

The person completing this proof of claim must sign and date it. FRBP 9011(b).

If you file this claim electronically, FRBP 5005(a)(2) authorizes courts to establish local rules specifying what a signature is.

A person who files a fraudulent claim could be fined up to $500,000, imprisoned for up to 5 years, or both. 18 U.S.C. §§ 152, 157, and 3571.

Check the appropriate box:

☐ I am the creditor.

☑ I am the creditor's attorney or authorized agent.

☐ I am the trustee, or the debtor, or their authorized agent. Bankruptcy Rule 3004.

☐ I am a guarantor, surety, endorser, or other codebtor. Bankruptcy Rule 3005.

I understand that an authorized signature on this *Proof of Claim* serves as an acknowledgement that when calculating the amount of the claim, the creditor gave the debtor credit for any payments received toward the debt.

I have examined the information in this *Proof of Claim* and have reasonable belief that the information is true and correct.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on date 11/13/2023
MM / DD / YYYY

/s/Maureen A. Harrington
Signature

Print the name of the person who is completing and signing this claim:

Name: Maureen A. Harrington
First name Middle name Last name

Title: Attorney for Creditor Santa Clara Valley Transportation Authority

Company: Greenfield LLP
Identify the corporate servicer as the company if the authorized agent is a servicer.

Address

Contact phone _____ Email _____

23111202311130000000000037

KCC ePOC Electronic Claim Filing Summary

For phone assistance: Domestic (888) 251-3076 | International (310) 751-2617

Debtor:
23-11120 - Proterra Inc
District:
District of Delaware

Creditor:
Santa Clara Valley Transportation Authority
Maureen A. Harrington, Esq.
Greenfield LLP
55 South Market Street
Suite 1500
San Jose, CA, 95113
United States
Phone:
415-516-5200
Phone 2:
408-995-5600
Fax:
Email:
mharrington@greenfieldlaw.com

Has Supporting Documentation:
Yes, supporting documentation successfully uploaded
Related Document Statement:

Has Related Claim:
No
Related Claim Filed By:

Filing Party:
Authorized agent

Disbursement/Notice Parties:
Santa Clara Valley Transportation Authority
Greg Richardson
Assistant GM/Chief Financial Officer
3331 North First St., C-2
San Jose, CA, 95134
Phone:
Phone 2:
Fax:
E-mail:
greg.richardson@vta.org
DISBURSEMENT ADDRESS

Other Names Used with Debtor:

Amends Claim:
No
Acquired Claim:
No

Basis of Claim:
Damages arising from sale of defective buses to creditor, total amount is still under investigation.

Last 4 Digits:
No

Uniform Claim Identifier:

Total Amount of Claim:
880,786.98

Includes Interest or Charges:
No

Has Priority Claim:
No

Priority Under:

Has Secured Claim:
No
Amount of 503(b)(9):
No
Based on Lease:
No
Subject to Right of Setoff:
No

Nature of Secured Amount:
Value of Property:
Annual Interest Rate:
Arrearage Amount:
Basis for Perfection:
Amount Unsecured:

VN: 8B1714AE57B887913C651436CF4635CB

Submitted By:

Maureen A. Harrington on 13-Nov-2023 1:40:08 p.m. Eastern Time

Title:

Attorney for Creditor Santa Clara Valley Transportation Authority

Company:

Greenfield LLP

Santa Clara Valley Transportation Authority

Solutions that move you

CONTRACT No. P16130

THIS CONTRACT ("Contract") is between **Proterra, Inc.** (Contractor) and the **Santa Clara Valley Transportation Authority** (VTA). This Contract expresses the terms and conditions for the purchase of: (i) 5 Forty Foot Low Floor Full Battery Electric Transit Buses and Charging Equipment; (ii) an option to purchase up to 2 automatic conductive en route chargers; and (iii) an option to purchase up to 25 additional buses of the same configuration to be exercised no later than five (5) years from the Effective Date (as defined below in the signature block).

Contractor and VTA, for the consideration hereinafter named, agree as follows:

1. CONTRACT COMPONENTS

All the documents listed below are either attached hereto or deemed incorporated by reference as if fully set forth herein. The documents below constitute the entire agreement between the parties hereto and are collectively referenced as "Contract P16130."

1) This document (hereinafter "Short Form Contract") and any amendments thereto.

a. Exhibit 1 – Price Schedule, Proterra Best and Final Offer, dated April 3, 2017
b. Exhibit 2 – Project Schedule, dated June 12, 2018
c. Exhibit 3 – Key Personnel, dated October 27, 2017
d. Exhibit 4 – Warranty Coverage Schedule, dated April 4, 2017
e. Exhibit 5 – VTA RFP No. P16130, dated May 31, 2016
f. Exhibit 6 – (i) RFP Addenda Numbers 1 through 15, and (ii) Questions and Answers I through V, Pre-Offer Change Requests, and Requests for Proposed Deviations or Approved Equals:
    - Addendum No. 1, dated June 1, 2016
    - Addendum No. 2, dated June 24, 2016
    - Addendum No. 3, dated July 15, 2016
    - Addendum No. 4, dated August 5, 2016
    - Addendum No. 5, dated August 12, 2016
    - Addendum No. 6, dated August 17, 2016
    - Addendum No. 7, dated August 18, 2016
    - Addendum No. 8, dated August 24, 2016
    - Addendum No. 9, dated September 1, 2016
    - Addendum No. 10, dated September 29, 2016
    - Addendum No. 11, dated September 29, 2016

- Addendum No. 12, dated October 19, 2016
- Addendum No. 13, dated March 20, 2017
- Addendum No. 14, dated March 27, 2017
- Addendum No. 15, dated April 10, 2017
- Questions and Answers Part I, dated August 5, 2016
- Questions and Answers Part II, dated October 6, 2016
- Questions and Answers Part III, dated January 4, 2017
- Questions and Answers Part IV, dated March 20, 2017
- Questions and Answers Part V, dated April 11, 2017
- VTA's Answers to Vendor Request for Pre-Offer Change CER 3s, submitted for RFP No. P16130 dated August 5, 2016
- VTA's Answers to Vendor Request for Proposal Deviation or Approved Equal to CER 6s, submitted for RFP No. P16130 dated October 6, 2016, January 4, 2017, and March 15, 2017 with VTA's final response dated April 6, 2017

2) Proterra Best and Final Offer, dated April 3, 2017 (not appended to the Contract, but incorporated by reference herein)

3) Proterra Proposal, dated September 15, 2016 (not appended to the Contract, but incorporated by reference herein)

2. CONTRACT ORDER OF PRECEDENCE

In case of any conflict among these documents where the parties' intended resolution is not clear, the order of precedence shall be:

1) Short Form Contract No. P16130 and any amendments thereto

2) Proterra Updated Proposal, dated March 17, 2017

3) Proterra's Clarification for their Updated Proposal, dated March 13, 2017

4) Proterra Proposal, dated September 15, 2016

3. SCOPE OF WORK

Contractor shall furnish all necessary qualified personnel, labor, materials, tools, equipment, technical expertise, services and incidentals to furnish 5 Forty Foot Low Floor Full Battery Electric Transit Buses and Charging Equipment as described in RFP No. P16130 Forty Foot Low Floor Full Battery Electric Transit Buses Scope of Work (dated May 31, 2016) and any addenda thereto.

4. TERM OF CONTRACT

This Contract is effective as of the Effective Date (as defined below in the signature block). The Contractor shall commence work after the effective date of

the Contract. The Contract completion date shall be 15 days after the final delivery and acceptance of all Contract deliverables.

The base Contract contains orders for 5 Forty Foot Low Floor Full Battery Electric Transit Buses and Charging Equipment. The Contract delivery date for the 5 buses shall be no later than August 4, 2019.

VTA may exercise the options by written notice ("Notice of Exercise of Option") to Proterra at any time on or before five (5) years following the Effective Date. If an option is exercised, the option vehicles or the option items shall be delivered in accordance with the schedule contained in the Notice of Exercise of Option.

5. CHARGER PROJECT DELAY:

If completion of the charger portion of the project is delayed (regardless of the which party is responsible for the delay), but VTA otherwise finds the buses themselves acceptable, VTA may apply a retention of 10% of the total Contract price for the buses until the chargers are installed and fully functional in accordance with TS 18 et seq.

6. CONTRACT PRICE

VTA shall pay Contractor at the rates stated in Exhibit 1 – Price Schedule, Proterra Best and Final Offer, dated April 3, 2017.

7. COMPREHENSIVE BUS PARTS LIST

Contractor shall provide VTA with a comprehensive parts list in an editable Microsoft Excel format. The comprehensive parts list shall include descriptions, the Original Manufacturer Name, and Manufacturer Part Number for each part used in this bus build. Contractor must submit this comprehensive parts list with its submission of the Bus Parts Manuals, both of which are due 60 calendar days after VTA's receipt of the first production bus.

8. CONTRACT COVENANT:

If Proterra files for bankruptcy or becomes insolvent (as reasonably determined by Proterra), Proterra shall, within thirty (30) calendar days of either such occurrence, provide VTA with the following:

1. Battery field rebuild, training and service information;
2. Traction motor field rebuild, training and service information; and
3. Training information and manuals on various security sensitive items.

In connection with such, Proterra shall reasonably cooperate with VTA's transition to another provider and shall pay VTA up to, but not exceeding, ten thousand dollars ($10,000) in amounts actually and reasonably incurred by VTA in connection with VTA's transition to another provider. Proterra shall make any

such payments within forty-five (45) days after receipt of a valid and undisputed invoice.

9. ENTIRE AGREEMENT

This Contract constitutes the complete and entire agreement between VTA and the Contractor and supersedes any prior representations, understandings, communications, commitments, agreements or Proposals, oral or written, which are not incorporated as a part of the Contract.

10. GOVERNING LAW

The laws of the State of California will govern these terms and conditions, as well as any claim that might arise between Contractor and VTA, without regard to conflict of law provisions.

11. FORUM SELECTION

Contractor will resolve any claim, cause of action or dispute (hereinafter a "Claim") that Contractor has with VTA arising out of or related to this Contract in a state or federal court located in Santa Clara County, California. Contractor agrees to submit to the personal jurisdiction of the courts located in Santa Clara County, California for the purpose of litigating all such Claims.

12. COUNTERPARTS

This Contract may be executed in counterparts, each of which shall constitute an original, but all of which constitute one instrument.

13. AUTHORIZED REPRESENTATIVES, NOTICES AND POINTS OF CONTRACT:

The Authorized Representatives identified below, or assigned designees, have authority to authorize changes to the scope, terms and conditions of this Contract, as set forth herein.

A. AUTHORIZED REPRESENTATIVES:

Santa Clara Valley Transportation Authority
Mr. Thor Vue
Chief Procurement Officer
3331 N. First Street, Building A
San Jose, CA 95134-1906
thor.vue@vta.org

Proterra
Mr. Ryan Popple
President and CEO
1815 Rollins Road
Burlingame, CA 94010
rpopple@proterra.com

B. NOTICES: Notices shall be in writing and addressed to the Authorized Representatives at the address set forth above.

C. POINTS OF CONTACT: The Points of Contact listed below are authorized to communicate regarding contract matters, except in the case where the correspondence regarding legal notices must be addressed to the Authorized Representatives.

VTA:
Ms. Keisha Carnahan
Sr. Contract Administrator
3331 N. First Street, Building A
San Jose, CA 95134-1906
keisha.carnahan@vta.org

Mr. James Wilhelm
Sr. Mechanical Engineer
3331 N. First Street, Building B
San Jose, CA 95134-1906
james.wilhelm@vta.org

Proterra:
Mr. Ethan Carbaugh
Bid and Proposal Manager
1 Whitlee Court
Greenville, SC 29607
ecarbaugh@proterra.com

Mr. T.J. Nass
Customer Program Manager
383 Cheryl Lane
Walnut, CA 91789
tnass@proterra.com

D. WRITTEN NOTIFICATION: Written notification to the other party shall be provided, in advance, of changes in the names or addresses of the designated Authorized Representatives or Points of Contact stated above.

14. SERVICE OF NOTICE

Any notice required or permitted to be given by this Contract shall be deemed given when personally delivered to recipient thereof or mailed by registered or certified mail, return receipt requested, postage prepaid, to the appropriate recipient thereof.

In witness whereof, VTA and CONTRACTOR have executed this Contract No. P16130 as of the last date set forth below ("Effective Date").

SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Nuria I. Fernandez 10.18.18
Nuria I. Fernandez Date
General Manager/CEO

PROTERRA

9-27-18
Ryan Popple Date
President and CEO

Approved as to Form:

10/16/2018
Caroline Kim Date
Assistant Counsel

Santa Clara Valley Transportation Authority

AMENDMENT NO. 1
TO CONTRACT
BETWEEN
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY
AND
PROTERRA, INCORPORATED
FOR
40' FULL BATTERY ELECTRIC TRANSIT BUSES AND CHARGING EQUIPMENT, WITH AN OPTION TO PURCHASE UP TO 2 AUTOMATIC CONDUCTIVE IN ROUTE CHARGERS AND UP TO 25 ADDITIONAL TRANSIT BUSES OF THE SAME CONFIGURATION

CONTRACT NO. P16130

This Amendment No. 1 ("**First Amendment**") to the Contract No. P16130 between VTA and Contractor, dated October 18, 2018, (the "**Contract**") is executed for the purpose of changing the Technical Specifications due to bus pre-production changes, and updating the Price Schedule to include both the bus pre-production changes and the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) credits. This First Amendment is agreed to as follows:

1. Effective March 1, 2020 the Contract is hereby amended as follows:

A. The Technical Specifications of RFP P16130 ("**Technical Specifications**") are hereby amended as follows:

(1) **Section TS 5.11**, Fire Suppression is deleted.

(2) **Sections TS 18, Charging Station**, and **TS 18.1, Charging Station Requirements** are amended to add the following as a stand-alone paragraph at the end of each section:

"The requirements of this section will not apply to the base order."

(3) **Section TS 72, Exterior Lighting** is amended to add a new sentence at the end that states:

Cornering Lights will be placed one at each wheel end to illuminate when the turn signal is activated.

(4) **Section TS 77.1, Arrangements and Seat Style (Transit Coach),** is hereby amended to add a new stand-alone, paragraph at the end of the section that reads as follows:

Contractor will install a total of twenty-two (22) functional USB ports for charging customer's electronic devices at seating positions. USB port locations must be approved by VTA.

(5) **Section TS 84.1, Camera Surveillance System,** is amended to replace any references to "Safety Vision" with "March Networks" and replace the **Basic Equipment List** with the following:

March Networks Ridesafe GT20 mobile digital video recorder (MDVR)

Cam 1 Forward Facing	March Mobile High Dynamic Range Forward Facing Camera -4.0mm Fixed Lens, 3MP, IP67, IK10, SAE J1455, PoE, RJ45 connector.
Cam 2 Operator	C2401A ME4 IR Micdome 2.8MM RJ45
Cam 3 Front Door	C2401A ME4 IR Micdome 2.8MM RJ45
Cam 4 Mobility Impaired Seating	C2401A ME4 IR Micdome 2.8MM RJ45
Cam 5 Rear Door	C2401A ME4 IR Micdome 2.8MM RJ45
Cam 6 Rear	C2401A ME4 IR Micdome 2.8MM RJ45
Cam 7 Curb Side Rear Door	C2701A HDR Wedge 3.6MM RJ45 WHT
Cam 8 Street Side	C2701A HDR Wedge 3.6MM RJ45 WHT

Wi-Fi Connection:

- Existing one already installed on buses will be re-used.

Motion Detector:

- Module Motion Detector 360 Degree Digital
- Aux MDL 5 Minute Timer

(6) The text of **Section TS 84.5, Wi-Fi System**, is hereby amended to add the following sentence at the end of the section as a separate, stand-alone paragraph:

For the base order only, all necessary wiring for the specified Wi-Fi system must be provided and an Icomera Moovbox supplied by VTA must be installed.

(7) **Section TS 84.6, AVL Radio System,** is amended and restated in its entirety to read as follows:

The CAD/AVL version is based on the Clever Devices IVN4 vehicle logic unit. To accommodate the system, the following hardware must be provided (except as noted).

1) For the equipment enclosure ("Radio box") the minimum volume must be 10,000 cubic inches with minimum dimensions in each plane of 18 inches wide, 20 inches deep and 12 inches high. The enclosure must be located directly behind the operator's area on the street side. The enclosure must be as large as practical to facilitate future expansion of radio equipment. The enclosure must be splash proof and properly ventilated when the service door is secured. It must include modular

slide out or fold down trays which are removable and can be repositioned to accommodate changes in equipment position as needed. Slide out trays must incorporate heavy-duty slide or roller mechanisms to support a minimum of 150 lbs. of loading and must be able to withstand the normal shock and vibration, (under full load) experienced in revenue service, without damage to the slide or roller mechanisms.

Trays must be located to be easily accessible by a 50th percentile female for all component change outs.

Service light(s) with suitable switch must be provided within the enclosure, exact locations will be subject to VTA approval.

2) The OEM must work with Clever Devices to determine the appropriate signals to be brought into the radio box.

The OEM must bring the following Main Power Requirement (from the vehicle's main power bus at the battery source) into the equipment enclosure:

- Red Wire Color unless otherwise specified, fused at source – (20 AMP for 12 Volt).
- Black Wire Color, unless otherwise specified, 24 and 12 VDC Return to Battery Ground (Chassis Return not acceptable), #6 AWG cable terminated at an accessible terminal block.
- 12V 15 Amp from the operator master switch providing power in Day (Run), Night and Park modes. #8 AWG wire minimum (Circuit breaker protected).

The power cables must be run from a power distribution panel and terminated at an accessible terminal strip in the radio box.

3) The OEM will install a Radio Antenna ground plate in the roof section as required.

Cable distance from the radio GPS antenna (see below) to the radio box must be less than 25 feet.

The location of the antennas must not be more than 10 degrees from horizontal.

NOTE: The GPS antenna / receiver location must be coordinated with Clever Devices and approved by VTA. This antenna must be appropriately separated from other transmitting antennae.

4) Cable conduits must be routed at the discretion of the transit organization to ease in cable replacement. Since cables are being installed during the bus build, the conduits should be considered on a case-by-case basis. These conduits should be 3/4" ID or larger and be routed in a continuous fashion.

The conduit must have bend radiuses that will permit the ease of pulling cables (no sharp or right angles).

Conduit must be routed as follows:

From	Termination
Antenna, GPS Receiver	Radio Box Enclosure
Antenna, Radio Transceiver	Radio Box Enclosure

5) The GPS and radio antenna cables must be routed from the antenna mount location to the radio box.

6) Switches for controlling the exterior annunciator included with the Clever Devices system must be provided:

   A push button switch must be provided to allow the operator to repeat the message. The operator must be able to repeat the announcement at any time while the bus is running. A speaker for the external annunciator, Mobilepage Model 1180 or approved equivalent with 8 ohm impedance and all-weather rating, which may be combined with the P/A speaker (section 5.4.9.5), must be located so that the Decibel level as measured on the 'A' scale is 5 dB lower at the operator's ear than at a spot 1.2 meters (4 feet) outboard of the entry door and 1.5 meters (5 feet) above the ground. The signal for initiating annunciation must be activated by the Operator's door control switch.

7) Removable fuses must be provided on the radio box tray to allow disconnection of switched and constant power to the radio system for ease of servicing.

   All routing of cables, in conduit or otherwise, must observe minimum bend radius requirements of the cable manufacturer. Any cable installed must be serviceable for maintenance purposes. A given cable will be deemed serviceable if it can be accessed, removed and inspected with the aid of simple hand tools such as those necessary to remove panels or service covers.

   The Automatic Passenger Counter (APC) system must include a timer so that the APC continues to accurately calculate all boardings and de-boardings for 20 minutes after the bus ignition is turned off.

   A public address system must be provided that complies with the ADA requirements of 49 CFR, Part 38.35 and enables the operator to address passengers either inside or outside the bus. A sufficient number of interior speakers, each 8 ohms and wired in parallel to present an impedance load between 8 and 16 ohms to the amplifier, must broadcast, in a clear tone, announcements that are clearly perceived from all seat positions at approximately the same volume level. All speaker wiring will terminate in the radio control box. An all-weather rated speaker must be provided outside the bus so that announcements can be clearly heard by passengers

standing near the front door. The PA system must be arranged so that it cannot override the annunciator system. Switching the PA from inside to outside speakers must not require volume adjustment. The system must be muted when not in use. The microphone must be a hand-held style with an On-Off switch on the hand-held unit. The switch must be spring loaded to be in the Off position whenever the operator is not pushing on it. The plug-in connection for the hand- held microphone must be located to be easily accessible and to allow the microphone cable to be routed so that no interference with the operation of the bus will occur.

- Amplifier - The amplification will be controlled through the Clever Devices CAD/AVL system. Volume control will also be through the system controls. The unit must be of sufficient power to drive the speakers providing clear and audible communication, without damage, for sustained periods of time. At full volume, the system must produce 95 dBA or greater exterior announcements measured 6 feet from the front door of the bus, and 88 dBA or greater interior announcements measured at any seating position.

- Microphone - The hand-held Microphone must be from Midwest Electronics with a Midwest Electronics #195 control box or an approved equal system having equal or superior durability and ease of use.

B. Exhibit 1, Price Schedule is hereby replaced in its entirety with Price Schedule – Revision 1, attached hereto.

C. Paragraph 6, "Contract Price" is hereby amended to decrease the maximum Contract value by $1,025,795.72 from $4,679,730.62 to $3,653,934.90.

D. Exhibit 2, Project Schedule is hereby replaced in its entirety with Project Schedule, Revision 1, attached hereto.

2. Any exhibits or attachments referenced in, and/or attached to this First Amendment are incorporated into the Contract by this reference.

3. Unless specifically defined herein, the capitalized terms used in this First Amendment have the meanings as defined in the Contract.

4. Except as herein modified, all other provisions of the Contract, including any exhibits and subsequent amendments thereto, remain in full force and effect. All references to the Contract in this First Amendment refer to the Contract as amended (including by this First Amendment) unless otherwise specifically set forth or otherwise indicated by context.

5. In the event of any conflict between the provisions of this First Amendment and the provisions of the Contract, the provisions of this First Amendment will prevail. Whether or not specifically amended by this First Amendment, all of the terms and provisions of the Contract are hereby amended to the extent necessary to give effect to the purpose and intent of this First Amendment.

6. If any provision of the Contract, as amended by this First Amendment, is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remaining provisions will continue in full force without being impaired or invalidated in any way.

In witness whereof, VTA and Contractor have executed this First Amendment as of the last date set forth below.

Santa Clara Valley Transportation Authority

DocuSigned by:
Nuria I. Fernandez 11/18/2020
E4CE93FA2C8C410...

Nuria I. Fernandez Date
General Manager/CEO

Proterra, Incorporated

DocuSigned by:
Jack Allen 11/10/2020
6BF3A09D1B53440...

Jack Allen Date
Chief Executive Officer

Approved as to Form

DocuSigned by:
11/16/2020
E97ED245320343F...

Victor Pappalardo Date
Senior Assistant Counsel

CER 1. Price Schedule – Revision 1

VTA #P16130 40' LOW FLOOR FULL BATTERY ELECTRIC TRANSIT BUSES

BASE ORDER

Item #	Quantity	Item Description	Unit Price	Total
1	5	40' Battery Electric Transit Bus	$791,850.00	$3,959,250.00
2	5	Electric Bus Chargers: Chargepoint Express Plus 62.5kW plug-in charger, Pricing includes 3 years of warranty as required by RFP Section 7, WR 1.1.10 Charging Systems and 3 years of CP Express Plus Cloud Services – Power Management Plan. VTA HAS ELECTED TO REMOVE THESE CHARGERS FROM THIS CONTRACT WITH AMENDMENT No. 1 $40,000.00 credit per charger	$0.00	$0.00
3	5	Delete Fire Suppression $4,180.00 credit per bus	($4,180.00)	($20,900.00)
4	5	Delete Tire Sets $2,940.00 credit per bus	($2,940.00)	($14,700.00)
5	5	Prewire only for WIFI in place of full installation $1,629.00 credit per bus	($1,629.00)	($8,145.00)
6	5	Prewire only for Clever Device CAD/AVL in place of Xerox CAD/AVL install, $5,622.00 credit per bus	($5,622.00)	($28,110.00)
7	5	Xerox CAD/AVL System replaced with Clever Device CAD/AVL system, no cost change	$0.00	$0.00
8	5	Safety Vision CCTV system replaced with March Networks CCTV system, no cost change	$0.00	$0.00
9	5	Add USB ports at seating positions, $2,562.00 up charge per bus	$2,562.00	$12,810.00
10	5	Add cornering lights, $975.00 up charge per bus	$975.00	$4,875.00
11	1	Specialty Tool Package-VTA elected not to purchase the Specialty Tool Package)	$0.00	$0.00
12	1	Training Aids Package-VTA elected not to purchase the Training Aids Package)	$0.00	$0.00
13	1	Spare Parts Package-VTA elected not to purchase the Spare Parts Package)	$0.00	$0.00
		SUBTOTAL TAXABLE ITEMS	**$781,016.00**	**$3,905,080.00**
		***City of San Jose Sales Tax 9.25%**	**$72,243.98**	**$361,219.90**
		SUBTOTAL INCLUDING SALES TAX	**$853,259.98**	**$4,266,299.90**
Sales Tax shall not be applicable to wheelchair ramp and accessories as required for the disabled, including restraints, additional barriers and flip-up seats.				
14	5	Passenger Ramps	$6,900.00	$34,500.00
15	5	Replace Ricon Wheelchair Ramp with Lift-U LU18 Wheelchair Ramp $377.00 up charge per bus	$377.00	$1,885.00
16	5	Flip Up Seats	$2,328.00	$11,640.00
17	5	Wheelchair Restraint Systems	$1,879.00	$9,395.00
18	5	Annunciator Systems	$5,218.00	$26,090.00
19	5	Destination Sign Systems	$8,325.00	$41,625.00
20	1	Training Labor (VTA has elected not to purchase the Training Labor Package)	$0.00	$0.00
21	5	Delivery Costs	$2,500.00	$12,500.00
		SUBTOTAL, NON-TAXABLE ITEMS	$27,527.00	$137,635.00
		SUBTOTAL PRICE, INCLUDING NON-TAXABLE ITEMS	**$880,786.98**	**$4,403,934.90**
	5	**LESS HVIP VOUCHER PER BUS CREDIT**	**($150,000.00)**	**($750,000.00)**
		TOTAL PRICE	**$730,786.98**	**$3,653,934.90**

CER 1. Price Schedule – Revision 1

VTA #P16130 40' LOW FLOOR FULL BATTERY ELECTRIC TRANSIT BUSES

SPECIALTY TOOL PACKAGE (sublist) per TS 5.6.4

VTA has elected not to purchase the Specialty Tool Package

Item #	Quantity	Item Description	Unit Price	Total
1	1	Digital Multi-meter (Fluke 88V and TLK282)	$793.50	$793.50
2	1	Digital Current Clamp (Fluke 375)	$460.00	$460.00
3	1	4-Channel Scope (PicoScope Advanced Kit)	$2,759.00	$2,759.00
4	1	PLC Logic Tester and Interface	N/A	$0.00
5	1	Special ESS Diagnostics and Software	$5,052.00	$5,052.00
6	1	ESS Module Stand	$1,150.00	$1,150.00
7	1	Laptop (Durabook S15AB)	$2,500.00	$2,500.00
8	1	Battery Analyzer (Fluke BT521)	$5,175.00	$5,175.00
9	1	Thermal Imager (Fluke Ti400)	$9,200.00	$9,200.00
10	1	Electric Driver Diagnostics and Software	N/A	$0.00
11	1	Electric Drive Adapters for Overhaul	N/A	$0.00
12	1	Electric Drive Dyno Connection	N/A	$0.00
13	1	Motor Power Quality Analyzer (Fluke 438-II)	$10,637.50	$10,637.50
14	1	Insulation Tester (Fluke 1550C)	$5,175.00	$5,175.00
15	1	RF Spectrum Analyzer (Tektronics RSA306)	$4,013.50	$4,013.50
16	1	Brake System Diagnostics and Software	N/A	$0.00
17	1	ABS Sensor R&R Kit	$180.00	$180.00
18	1	Disc Brake Repair Kit	$10,000.00	$10,000.00
19	1	Differential and Propeller Maintenance Tools	$12,195.00	$12,195.00
20	1	Differential Overhaul Tool Sets	N/A	$0.00
21	1	Hub Repair Kit	$3,196.92	$3,196.92
22	1	Pinion Seal Repair Kit	N/A	$0.00
23	1	Special Steering Tools/Pullers	N/A	$0.00
24	1	Destination Sign Diagnostics Software	N/A	$0.00
25	3	Tow Adapters (if required)	$225.00	$675.00
26	1	Body Dimension Analysis Tool	N/A	$0.00
27	1	Metal Analysis Tool	N/A	$0.00
28	1	Ultra Sonic Weld Analysis Tool	N/A	$0.00
29	1	Advanced Noise/Sound Analysis Tool	N/A	$0.00
30	1	Composite Structure Analysis Tool	N/A	$0.00
		SUBTOTAL TAXABLE ITEMS	**$72,712.42**	**$73,162.42**
		***City of San Jose Sales Tax 9.25%**	**$6,725.90**	**$6,767.52**
		SUBTOTAL INCLUDING SALES TAX	**$79,438.32**	**$79,929.94**

CER 1. Price Schedule – Revision 1

VTA #P16130 40' LOW FLOOR FULL BATTERY ELECTRIC TRANSIT BUSES

SPARE PARTS PACKAGE (sub-list) Per TS 5.6.3

VTA has elected not to purchase the Spare Parts Package

Item #	Quantity	Item Description	Unit Price	Total
1	1	Electric Drive System*	$38,118.00	$38,118.00
2	1	Electric Air Compressor System	$5,175.00	$5,175.00
3	1	Electric Hydraulic Pump System	$2,795.00	$2,795.00
4	1	Lo-Voltage Converter (DC-DC)* *2 each if more than one is used on coach	$4,495.00	$4,495.00
		SUBTOTAL TAXABLE ITEMS	**$50,583.00**	**$50,583.00**
		***City of San Jose Sales Tax 9.25%**	**$4,678.93**	**$4,678.93**
		SUBTOTAL INCLUDING SALES TAX	**$55,261.93**	**$55,261.93**

CER 1. Price Schedule – Revision 1

VTA #P16130 40' LOW FLOOR FULL BATTERY ELECTRIC TRANSIT BUSES

TRAINING AIDS PACKAGE (sub-list) Per TS 5.6.3

VTA has elected not to purchase the Training Aids Package

Item #	Quantity	Item Description	Unit Price	Total
1	1	PLC Training Board	$30,000.00	$30,000.00
2	1	Standalone Destination Sign System	$12,239.00	$12,239.00
3	1	ESS Module (without Battery Cells)	$2,000.00	$2,000.00
		SUBTOTAL TAXABLE ITEMS	**$44,239.00**	**$44,239.00**
		***City of San Jose Sales Tax 9.25%**	**$4,092.11**	**$4,092.11**
		SUBTOTAL INCLUDING SALES TAX	**$48,331.11**	**$48,331.11**

CER 1. Price Schedule – Revision 1

VTA #P16130 40' LOW FLOOR FULL BATTERY ELECTRIC TRANSIT BUSES

TRAINING LABOR (sub-list) Per TS 5.6

VTA has elected not to purchase the Training Labor Package

Item #	Quantity in Days	Item Description	Unit Price	Total
1	1	Mechanics Training Orientation Included in Base Order	$0.00	$0.00
2	55	Mechanics Training-Technical* *55 days of Maintenance Training-Technical is included free of charge, any days beyond the initial 55 days are $2,000 per day	$2,000.00	$0.00
3	13	Mechanics Training/Stand Alone Classes	$2,000.00	$26,000.00
4	1	Stores Training Included in Base Order	$0.00	$0.00
5	3	Operator Training Included in Base Order	$0.00	$0.00
Item #	**Quantity in Classes**	**Item Description**	**Unit Price**	**Total**
6	6	Train the Trainer Training	$4,000.00	$24,000.00

CER 1. Price Schedule – Revision 1

VTA #P16130 40' LOW FLOOR FULL BATTERY ELECTRIC TRANSIT BUSES

BUS OPTIONS

Item #	Quantity	Item Description	Unit Price	Total
1	25	40' Battery Electric Transit Bus	$791,850.00	$19,796,250.00
2	25	Electric Bus Chargers: Chargepoint Express Plus 62.5kW plug-in charger, Pricing includes 3 years of warranty as required by RFP Section 7, WR 1.1.10 Charging Systems and 3 years of CP Express Plus Cloud Services – Power Management Plan.	$40,000.00	$1,000,000.00
3	25	Delete Fire Suppression $4,180.00 credit per bus	($4,180.00)	($104,500.00)
4	25	Delete Tire Sets $2,940.00 credit per bus	($2,940.00)	($73,500.00)
5	25	Prewire only for WIFI in place of full installation $1,629.00 credit per bus	($1,629.00)	($40,725.00)
6	25	Prewire only for Clever Device CAD/AVL in place of Xerox CAD/AVL install, $5,622.00 credit per bus	($5,622.00)	($140,550.00)
7	25	Xerox CAD/AVL System replaced with Clever Device CAD/AVL system, no cost change	$0.00	$0.00
8	25	Safety Vision CCTV system replaced with March Networks CCTV system, no cost change	$0.00	$0.00
9	25	Add USB ports at seating positions, $2,562.00 up charge per bus	$2,562.00	$64,050.00
10	25	Add cornering lights, $975.00 up charge per bus	$975.00	$24,375.00
		SUBTOTAL TAXABLE ITEMS	**$821,016.00**	**$20,525,400.00**
		***City of San Jose Sales Tax 9.25%**	**$75,943.98**	**$1,898,599.50**
		SUBTOTAL INCLUDING SALES TAX	**$896,959.98**	**$22,423,999.50**
Sales Tax shall not be applicable to wheelchair ramp and accessories as required for the disabled, including restraints, additional barriers and flip-up seats.				
11	25	Passenger Ramps	$6,900.00	$172,500.00
12	25	Replace Ricon Wheelchair Ramp with Lift-U LU18 Wheelchair Ramp $377.00 up charge per bus	$377.00	$9,425.00
13	25	Flip Up Seats	$2,328.00	$58,200.00
14	25	Wheelchair Restraint Systems	$1,879.00	$46,975.00
15	25	Annunciator Systems	$5,218.00	$130,450.00
16	25	Destination Sign Systems	$8,325.00	$208,125.00
17	25	Delivery Costs	$2,500.00	$62,500.00
		SUBTOTAL, NON-TAXABLE ITEMS	$27,527.00	$688,175.00
		SUBTOTAL PRICE, INCLUDING NON-TAXABLE ITEMS	$924,486.98	$23,112,174.50
		TOTAL PRICE	**$924,486.98**	**$23,112,174.50**

CER 1. Price Schedule – Best and Final Offer (BAFO) – Revision 1

VTA #P16130 40' LOW FLOOR FULL BATTERY ELECTRIC TRANSIT BUSES

CHARGING SYSTEM AND STATION OPTIONS

Item #	Quantity	Item Description	Unit Price	Total
1	5	Inductive Charging System (on bus per TS 17.3.3)	N/A	$0.00
2	5	Conductive Charging System (on bus per TS 17.3.2) - Included in Base Price	$0.00	$0.00
3	2	Automatic Inductive Charger (in route per TS 18.3.3)	N/A	$0.00
4	2	Automatic Conductive Charger (in route per TS 18.3.2)	$349,000.00	$698,000.00
		SUBTOTAL CHARGING SYSTEM & STATION OPTIONS	**$349,000.00**	**$698,000.00**
		City of San Jose Sales Tax 9.25%	**$32,282.50**	**$64,565.00**
		SUBTOTAL INCLUDING SALES TAX	**$381,282.50**	**$762,565.00**
		VTA MAY PURCHASE ALL OR PART OF THE OPTIONAL CHARGING SYSTEMS & STATIONS QUOTED		

EXHIBIT 2

PROJECT SCHEDULE

REVISION 1

	Ship	Deliver
Bus #1	7/23/2020	7/24/2020
Bus #2	8/20/2020	8/21/2020
Bus #3	11/19/2020	11/20/2020
Bus #4	11/18/2020	11/19/2020
Bus #5	9/20/2020	9/21/2020

EXHIBIT 3

September 2023 Board Correspondence

From: VTA Board Secretary
Sent: Friday, September 1, 2023 11:18 AM
To: VTA Board of Directors
Subject: VTA Reschedule Meeting Notice - September 22, 2023 Board of Directors Workshop Meeting

Board of Directors:

Please be advised that the Board of Directors Workshop meeting scheduled for September 22, 2023, at **9:00 a.m**. has been rescheduled **to a date and time to be determined.**

You may access the Reschedule Meeting Notice on our agenda portal.

Thank you,

Office of the Board Secretary
3331 North First Street
San Jose, CA 95134-1927
Phone 408-321-5680

Santa Clara Valley Transportation Authority
Solutions that move you

From: VTA Board Secretary
Sent: Friday, September 1, 2023 2:15 PM
To: VTA Board of Directors
Subject: From VTA: Two VTA Mechanics Injured After Heroic Attempt to Extinguish Bus Fire

Contact: VTA Media
Relations
Media.Relations@VTA.org
408-464-7810 (no texts)

September 1,2023

Two VTA Mechanics Injured After Heroic Attempt to Extinguish Bus Fire

SAN JOSE, CA – Two VTA mechanics suffered smoke inhalation Friday, September 1, 2023, after heroically trying to extinguish a fire the ignited on a battery electric bus. The bus was at VTA's Cerone maintenance yard for repairs at the time, and there were no passengers on board.

After initial failed attempts to put the fire out, the two mechanics pushed the bus out of the maintenance bay to avoid further damage to the building. Nearby employees were evacuated, and emergency responders arrived moments later and extinguished the flames. The two mechanics were taken to a local hospital for treatment.

The bus that caught fire was one of VTA's fleet of 10 battery electric Proterra buses, all of which have now been taken out of service pending an investigation of the fire. Employees returned to their normal workstations after the fire was extinguished. The bus that caught fire was damaged beyond repair.

VTA's Cerone Bus Yard is on Zanker Road near SR 237, and houses more than 400 VTA employees including bus operators, mechanics, dispatchers and other administrative staff.

About VTA
VTA is an independent special district responsible for bus and light rail operations, congestion management, specific highway improvement projects and countywide transportation planning. As such, VTA is both an accessible transit provider and multi-modal transportation planning organization involved with transit, highways, roadways, bikeways, and pedestrian facilities.

Santa Clara Valley Transportation Authority
3331 North First St. San Jose, CA 95134
24 Hr. Media line: 408-464-7810

Valley Transportation Authority

From: VTA Board Secretary
Sent: Friday, September 1, 2023 3:59 PM
To: VTA Board of Directors
Subject: VTA Information: September 7, 2023 Board of Directors Meeting Agenda Packet

Board of Directors:

You may now access the September 7, 2023 Board of Directors Meeting Agenda Packet on our agenda portal.

Thank you,
Office of the Board Secretary
3331 North First Street
San Jose, CA 95134-1927
Phone: **408-321-5680**

Santa Clara Valley Transportation Authority
Solutions that move you

From: VTA Board Secretary
Sent: Friday, September 1, 2023 4:34 PM
To: VTA Board of Directors
Cc: VTA Board Secretary
Subject: VTA Information: Ridership for July 2023

VTA Board of Directors:

Attached is a memorandum from Derik Calhoun, Chief Operating Officer, regarding VTA ridership for July 2023.

Thank you.

Office of the Board Secretary
Santa Clara Valley Transportation Authority
3331 N. First Street
San Jose, CA 95134
408.321.5680
board.secretary@vta.org

Santa Clara Valley Transportation Authority
Solutions that move you

Santa Clara Valley Transportation Authority

Date: August 31, 2023
Current Meeting: NA
Board Meeting: September 7, 2023

BOARD MEMORANDUM

TO: Santa Clara Valley Transportation Authority Board of Directors

THROUGH: Carolyn Gonot, General Manager/CEO

FROM: Derik Calhoun, Chief Operating Officer

SUBJECT: VTA Ridership – July 2023

Policy-Related Action: NA **Government Code Section 84308 Applies: No**

INFORMATION ITEM

EXECUTIVE SUMMARY:

To present the bus and light rail ridership performance of the Santa Clara Valley Transportation Authority.

STRATEGIC PLAN/GOALS:

The report is an information item only.

BACKGROUND:

This report is routinely produced after each month. This report is for the month of July 2023.

CLIMATE IMPACT:

The report is an information item and will have no impact on climate change.

DISCUSSION:

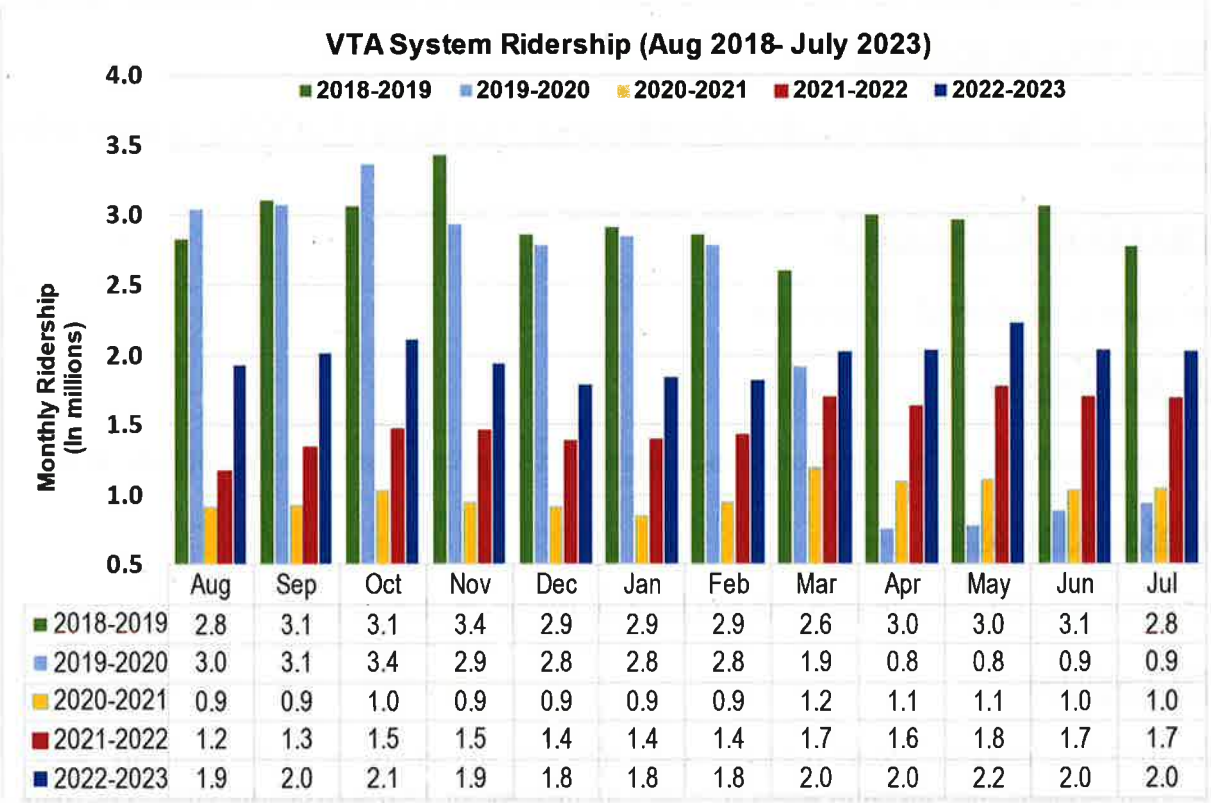
July 2023 total monthly system ridership was 2,019,322, an increase of 19.8% over July 2022. The total monthly bus ridership was 1,635,265, an increase of 19.0% over July 2022. The total monthly light rail ridership in July 2023 was 384,057, an increase of 23.3% over July 2022. July 2023 monthly system ridership decreased by less than 1.0 % compared to June 2023. The system ridership (bus and light rail) in the calendar year through July 2023 is about 30% less compared to a similar period prior to the pandemic.

During the month of July, the OCS (Overhead Catenary System) had overhead wire replacement on sections of the light rail system. This required a light rail shut down for affected sections for a major portion of the month. Bus bridges were in place to minimize impacts on the riding public.

Levi's Events: There were three major events at Levi's stadium in July 2023. The average ridership from the events was about 15,000 riders. The events included a double-header soccer game and two Taylor Swift concerts that averaged over 20,000 riders per event.

Ridership	July-23	Compared to:				CYTD				
		July-22	Percent change	Jun-23	Percent change	Current 2023	Prior 2022	Percent change	Pre-Pandemic 2019	Percent change
						Jan-Jul	Jan-Jul		Jan-Jul	
Bus	1,635,265	1,373,664	19.0%	1,694,902	-3.5%	11,513,373	9,458,126	21.7%	15,323,126	-24.9%
Light Rail	384,057	311,357	23.3%	338,750	13.4%	2,478,804	1,799,623	37.7%	4,766,267	-48.0%
System	2,019,322	1,685,021	19.8%	2,033,652	-0.7%	13,992,177	11,257,749	24.3%	20,089,393	-30.4%

The system ridership (Bus and light rail) in millions from August 2018 through July 2023 is presented in the chart below:



	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
2018-2019	2.8	3.1	3.1	3.4	2.9	2.9	2.9	2.6	3.0	3.0	3.1	2.8
2019-2020	3.0	3.1	3.4	2.9	2.8	2.8	2.8	1.9	0.8	0.8	0.9	0.9
2020-2021	0.9	0.9	1.0	0.9	0.9	0.9	0.9	1.2	1.1	1.1	1.0	1.0
2021-2022	1.2	1.3	1.5	1.5	1.4	1.4	1.4	1.7	1.6	1.8	1.7	1.7
2022-2023	1.9	2.0	2.1	1.9	1.8	1.8	1.8	2.0	2.0	2.2	2.0	2.0

Note: Pre-pandemic data reflected in the chart for the months of August 2018 through February 2020 and a few days in March 2020. Mid-March 2020 onwards had impacts from COVID-19.

The boardings per total hour and boardings per revenue hour for bus and rail for July 2023 are shown in the table below:

	Boardings per Total hour[1]			Boardings per Revenue hour[2]		
	July 2023	July 2022	Percent Change	July 2023	July 2022	Percent Change
Bus	14.4	12.4	16.2%	15.3	13.2	16.2%
Light Rail	31.1	28.6	8.7%	33.0	30.6	7.8%

Total hours – Includes revenue hours and deadhead hours (hours that a vehicle travels when out of revenue service). [2] Revenue hours - Scheduled hours of service available to passengers for transport on the routes. Includes recovery/layover time.

Santa Clara Valley Transportation Authority

MEMORANDUM

TO: Board Chairperson Pat Burt
Board Vice Chairperson Cindy Chavez

FROM: Carolyn M. Gonot, General Manager/CEO Carolyn M Gonot

DATE: August 30, 2023

SUBJECT: Out of Office Notification

I will be away from the area from Thursday, August 31 through Tuesday, September 5, 2023. I am delegating my signature authority to Greg Richardson, Assistant General Manager/CFO.

Greg may be reached on his desk phone at (408) 321-5630 or cell phone at (408) 332-0733.

cc: Executive Team

EXHIBIT 4

February 2024 Board Memorandum

Santa Clara Valley Transportation Authority

Date: February 16, 2024
Current Meeting: February 23, 2024
Board Meeting: February 23, 2024

BOARD MEMORANDUM

TO: Santa Clara Valley Transportation Authority
Board of Directors

THROUGH: General Manager/CEO, Carolyn M. Gonot

FROM: Chief Planning and Programming Officer, Deborah Dagang

SUBJECT: Zero-Emission Bus Transition Discussion

FOR INFORMATION ONLY

EXECUTIVE SUMMARY:

- The 2018 California Air Resources Board (CARB) Innovative Clean Transit (ICT) Regulation requires transit operators to fully transition to zero-emission bus (ZEB) fleets by 2040 and identifies two technologies, battery-electric buses and hydrogen fuel cell buses, as options. VTA currently operates an active fleet of about 440 buses, the vast majority of which are hybrid-diesel buses.

- The ICT Regulation is an unfunded mandate and funding for ZEB transition presently falls vastly short of funding need. Competition for state and federal grant funding is intense with less than 20 percent of applicants typically receiving funding in recent cycles. This presents a financial challenge to transitioning, despite agencies' best intentions to meet the 2040 goal.

- In 2021, VTA's Board of Directors endorsed a near-term strategy of operating battery-electric buses on shorter route assignments while retaining flexibility to change course depending on how technologies evolve. Since then, anticipated growth in the travel range of battery-electric buses has fallen short of projections, vehicle costs have increased substantially and the ability to gain requisite electrical capacity upgrades from utilities has been revealed to be uncertain. These changes warrant renewed consideration of VTA's ZEB technology strategy.

- Working with expert consultants, VTA staff are developing a tactical implementation plan called the Zero-Emission Bus Blueprint, which will guide the agency's next several transition steps. Initial analysis focused on the current state of ZEB technologies, costs,

tradeoffs and how VTA's service delivery would be impacted by different technologies. Staff now seek to present this analysis to the Board and receive guidance about how to proceed with the remaining ZEB Blueprint work, which includes identifying specific projects, facility plans, a fleet replacement plan and funding strategy.

- VTA staff and consultants advise pursuing both ZEB technologies which provides flexibility and allows VTA to maintain current service levels without increasing the fleet size. Should VTA's ability to pay for ZEB transition not keep pace with the need to replace VTA's aging fleet, a backup plan of purchasing hybrid-diesel buses to preserve the quantity and reliability of current service is advised.

- This memo provides a primer on ZEB technologies and their tradeoffs, discusses past direction from the Board, resulting ZEB projects, recent trends, and how other transit agencies are pursuing their transitions. A comparison of scenarios is presented to demonstrate technology tradeoffs.

STRATEGIC PLAN/GOALS:

VTA's ZEB transition aligns with the second business line of VTA's Strategic Plan of delivering projects and programs. Transitioning the entire fleet to zero-emission buses will require several successive projects that are well-planned and aligned with VTA's overall goals and priorities. The ZEB Blueprint seeks to set a strong direction for fleet transition that ensures near-term and long-term projects are compatible and minimizes risk and cost for VTA while ensuring quality service for VTA's riders.

BACKGROUND:

CARB Innovative Clean Transit Regulation

The CARB's 2018 ICT Regulation requires transit operators in the state to fully transition to ZEB fleets by 2040 and sets ZEB purchasing requirements: 25 percent minimum ZEB of any bus order in 2023, 50 percent minimum ZEB in 2026 and 100 percent minimum ZEB in 2029. The ICT Regulation identifies two zero-emission technologies that operators may choose from: battery-electric buses, which use an electric motor powered by large on-board batteries, and hydrogen fuel cell buses which convert compressed hydrogen gas into electricity that powers an electric motor. Each of these technologies requires expensive supporting infrastructure: chargers for battery-electric buses and fueling stations for hydrogen fuel cell buses.

The ICT Regulation does not provide any funding for agencies to pay for their zero-emission transitions. State and federal grant funding for zero-emission transition falls vastly short of need and competition for these discretionary sources is intense. A recent analysis produced by MTC found that transit agencies in the Bay Area have a collective $10 billion need for ZEB transition between now and 2040 but only projected that $2 billion may be attainable. This funding shortfall is vexing for transit agencies as their transition aspirations run into funding realities.

Recognizing that meeting the purchasing targets may be difficult, the CARB ICT Regulation

allows operators to submit annual exemption requests if meeting the target would cause negative impacts to transit service, financial hardship for the operator, or if manufacturers are unable to deliver ZEBs or supporting infrastructure on time. Bay Area transit operators increasingly view using the exemption clause as a strategy to maintain compliance with the regulation while meeting their core missions of delivering transit service to the public.

Past VTA Board Direction

In 2021, VTA's Board of Directors directed staff to pursue a near-term battery-electric bus strategy that involved charging buses overnight at each depot and deploying them on shorter route assignments. Battery-electric buses can only travel about 150 miles, making them suitable for about one-third of VTA's route assignments. The strategy was based on (1) the lower initial costs of battery-electric buses and supporting infrastructure relative to hydrogen fuel cell buses, (2) VTA's existing familiarity with battery-electric bus operation, (3) existing access to grid electricity at bus depots and (4) projections at the time that battery technology advances would result in longer travel ranges.

Decisions about how to handle longer assignments would be left to future years when VTA had gained more operating experience, had seen how technologies had advanced and learned from peer agency experiences. The Board also advised staff to pursue strategies on-route charging and hydrogen fuel cell operations to gain familiarity with them, as opportunities allowed. That direction was codified in the adoption of VTA's Zero-Emission Bus Transition Plan in 2022.

Current ZEB Transition Efforts

Following Board direction, staff began work on three battery-electric bus infrastructure projects and one battery-electric bus procurement.

Cerone Microgrid Project and Related 35-Bus Procurement

VTA is in the engineering and procurement phase of installing chargers with 34 ports for charging battery-electric buses at the Cerone Bus Depot. The project will also include a canopy over the buses covered in solar panels, and a microgrid, which contains a large backup battery that can collect solar energy and charge buses. The project is VTA's first large-scale foray into zero-emission bus operation. A corresponding RFP for the procurement of 35 battery-electric buses was released in December 2023. The project is anticipated to be completed in mid-2025, coinciding with the arrival of the new battery-electric buses. The project is partially funded by a grant from the California Energy Commission.

On-Route Charging Pilot Project

VTA was awarded a grant through the Federal Transit Administration to build on-route charging infrastructure at the Milpitas BART Station bus transit area. The project's purpose is to explore how the technology works under real-world conditions and assess whether this strategy is suitable for wider implementation. The project is in the planning phase and is targeting to be online in 2027.

Chaboya Charging Project

VTA is in the early stages of pursuing charging infrastructure for 40 buses at the Chaboya Bus Depot. An RFP for design work has been released, but funding for engineering and construction is awaiting additional funding.

Zero-Emission Bus Blueprint

The Zero-Emission Bus Blueprint will be a tactical implementation plan that guides the next several steps of VTA's zero-emission transition. VTA hired a team of zero-emission bus experts from Jacobs Consulting who have experience assisting agencies like New York MTA, MBTA (Boston) and SFMTA with their ZEB transition planning.

Initial work has analyzed the current state of ZEB technology, modeled the impacts each technology would have on VTA's service delivery model, estimated electrical needs, developed capital and operating costs, analyzed environmental impacts, and evaluated several other factors such as risk, resiliency, and reliability.

Since the ZEB transition is such a large undertaking and touches several parts of VTA-operations, budgets, service levels, sustainability, workforce and the experience of the riding public-staff seeks Board guidance to ensure the direction of the transition aligns with VTA Board priorities and values.

Upon receiving guidance, work will commence on the next steps of the Zero-Emission Bus Blueprint which include identifying specific projects and developing facility plans, a fleet transition plan and funding strategy. Staff envisions returning to the Board of Directors later in Fall 2024 with a completed Zero-Emission Bus Blueprint for adoption.

DISCUSSION:

VTA Service Delivery Model

VTA's operates an active fleet of around 440 total buses out of three depots: Cerone, Chaboya and North. The active fleet is currently reduced by ten due to the grounding of the nine remaining Proterra battery-electric buses following a fire that destroyed one of those buses. This fleet size is well-suited to meet VTA's weekday peak pullout of around 370 buses with a standard 20 percent spare ratio.

VTA's service delivery model incorporates a clever efficiency of having operators who are starting their shifts meet their buses in the field to relieve other operators who have reached the end of their shifts. This is different from many other transit operators who hold reliefs at the depot, requiring each operator to drive to and from the depot during their shift which increases the share of out-of-service miles traveled. VTA's strategy maximizes the revenue hours that are provided to the public but results in some buses being in the field upwards of 20 hours consecutively and accumulating over 300 miles before returning to the depot. These long assignments make VTA especially sensitive to the travel range limitations of zero-emission buses, particularly battery-electric buses that rely on depot-charging.

Bus Technology Overview

VTA's active fleet is powered by diesel fuel, but diesel bus operations encompass a wide range of technologies that results in widely differing emission and environmental outcomes.

Conventional Diesel Bus Operations

Conventional diesel bus operations uses petroleum-based diesel and is purely powered by an internal-combustion engine. These buses offer no technological advancements, emission filters or propulsion efficiencies and generate substantial pollution that is not captured before release. VTA has not purchased a conventional diesel bus in over two decades.

VTA's Hybrid-Diesel Bus Operations
Hybrid-diesel buses combine an internal combustion engine with an electric propulsion system, resulting in better energy efficiency and less pollution than conventional diesel buses. Smart engines that manage the temperature of combustion and advanced exhaust systems result in only a fraction of the emissions that are released by conventional diesel buses being emitted. VTA fuels its hybrid-diesel buses with renewable diesel, which is hydrolated vegetable oil, an agricultural product. VTA's hybrid-diesel fleet does not rely on fossil fuel for propulsion.

Depot-Charged Battery-Electric Bus Operations
Battery-electric buses store their energy in large battery packs located on the vehicle that power an electric motor. These buses are charged overnight at bus depots in a model known as "depot charging." Battery packs are heavy, and their energy density (the amount of energy per pound) is less than diesel fuel which results in travel limitations in the 150-200-mile range per full charge.

The range that a battery-electric bus can achieve in a day varies and is subject to several factors: (1) ambient temperature since the batteries also power the heating and cooling systems and because battery efficiency varies by temperature, (2) how much start-and-stop driving the bus experiences, which can be a function of driving style and traffic conditions, and (3) the amount of degradation the battery has experienced due to age. Day-to-day swings in mileage achieved of 30 percent are typical for battery-electric buses.

Transit operators had hoped that advancements in battery-technology would bring battery-electric bus travel ranges up to par with diesel buses, but such advancements have not occurred or have not been commercially viable for manufacturers to include in their vehicles. Consultant experts project that bus batteries may increase their efficiency by 15 percent by 2040, but much of those advancements would come through better battery architecture and temperature management rather than increases in energy density. Travel range parity with diesel buses is not expected.

Battery-electric bus manufacturers initially attempted building buses with lighter materials to increase travel range, but that strategy resulted in durability problems. More recently, manufacturers have sought to increase range by placing more battery packs in buses, but this results in heavier buses that abut California vehicle weight limits, encroach on passenger seating space and result in less-efficient energy usage.

Shorter travel ranges present a problem for VTA's long assignment operating model. Assignments shorter than 150 miles can reliably be served by a depot-charged battery-electric bus, but longer assignments would require that a second bus is swapped into service to replace the spent bus. This would increase the quantity of buses that VTA would need to purchase, maintain and store, which would increase vehicle costs and strain storage space at bus depots. An increase in fleet size of 15 to 20 percent has been typical for other transit operators using battery-

electric buses.

Battery-Electric Bus Operations with On-Route Charging
On-route charging is a strategy to increase battery-electric bus travel ranges by providing locations in the field where buses can visit a charger and receive a short-duration, high-powered infusion of electricity to partially replenish the battery. Typically, on-route chargers are located where buses layover while bus operators take breaks, like a transit center at the end of a route. VTA estimates that around 90 chargers would be needed at 35 locations within VTA's service area to operate VTA's current service plan with battery-electric buses without increasing the size of the fleet. This strategy can work, but it also poses several challenges including: (1) gaining approval from cities to install chargers, (2) gaining requisite electrical capacity from utilities at charging locations, (3) additional costs for installing and maintaining chargers, (4) additional costs from buying electricity during the day, when it is more expensive, (5) additional risk to daily transit operations as the chargers must work all the time so that buses do not run out of charge in the field, interrupting service and (6) limitations to route changes since buses are dependent on visiting chargers.

Hydrogen Fuel Cell Bus Operations
Hydrogen fuel cell buses convert compressed hydrogen that is stored onboard the bus in pressurized tanks into electricity by using a fuel cell. The fuel cell facilitates a molecular reaction between hydrogen and oxygen that produces the byproducts of electricity, water and heat. The electricity is captured in a small battery and is used to power an electric engine while the water and heat are emitted through the tailpipe as steam. Hydrogen fuel cell buses have a travel range of around 300 miles per fueling.

Hydrogen fuel cell buses have not been deployed as widely as battery-electric buses, likely due to (1) high initial costs for hydrogen fueling stations, (2) the high cost of hydrogen relative to electricity, (3) that hydrogen production is currently at a small scale, and (4) that hydrogen lacks a convenient delivery system, like the electrical grid. However, the longer travel ranges of hydrogen fuel cell buses mean transit operators can make one-for-one fleet replacements and the total infrastructure cost per bus can be less expensive than battery-electric buses at larger fleet sizes. Presently, only one bus manufacturer makes a Buy-America-compliant hydrogen fuel cell bus, leaving no vehicle choice for transit operators, nor any market competition, and exposes agencies to the risk of the product line being discontinued.

<u>ZEB Infrastructure</u>
Both ZEB technologies require supporting infrastructure for charging or fueling as well as modifications to maintenance facilities. For hydrogen operation, buildings will need to be retrofitted with special ventilation to prevent indoor hydrogen accumulation, as hydrogen is a flammable gas.

Bus Charging Infrastructure
Unlike diesel or hydrogen fueling, wherein the bus visits a fueling station for a 10 minute refueling, battery-electric buses must be charged over long periods of time, requiring that charging infrastructure is located where buses are parked. Pilot-scale battery-electric bus operation used plug-in chargers placed next to each bus, much like a gas pump, but for space-

efficient vehicle storage at scale, large chargers with multiple dispensers that deliver power via drop-down pantographs affixed to overhead canopies is preferable. Even with these space savings, about 20 percent additional bus parking space is needed.

Hydrogen Fueling Stations
Hydrogen fueling stations come in different sizes but operate like diesel pumps in that buses visit a fueling station and refills take about 10 minutes. However, hydrogen flows are based on pressure differentials between the fueling station and the tanks onboard the bus. Cryogenic compressors can bring fueling station pressures back up quickly after each fueling, allowing for efficient bus turnover.

Zero-Emission Does Not Mean Zero Environmental Impacts
Though no harmful or climate change-causing emissions are produced by zero-emission buses, transit operators should consider the environmental and human impacts of energy sourcing and vehicle production to understand their true contribution to climate change.

A battery-electric bus fleet would largely be powered by grid electricity. About half of VTA's current electrical blend comes from renewable sources. The non-renewable share of that blend is largely from burning natural gas, which results in significant carbon emissions. Moving to a more renewable blend of electricity would require a separate policy decision and likely result in a higher energy cost that would increase the transit operating cost.

Battery production bears environmental and human impacts. Battery metals like cobalt, manganese and lithium are mined in a limited number of locations, sometimes in developing nations where mining activity is unregulated, safety protocols are absent, child labor laws are lacking and where metal refining practices can be extremely polluting to surrounding communities. Verifying whether battery materials have been ethically and responsibly sourced is difficult due to the multiple hands these materials flow through from mine to factory. Bus batteries are projected to last for about 6 years, at which point the storage capacity will have depleted to about 80 percent making the battery impractical for continued use (but suitable for a second application, like backup energy storage). A bus may require battery replacement once or twice during its lifespan.

Hydrogen is available in a spectrum of "colors" that includes black, gray, blue, pink, yellow and green. Black and gray hydrogen are made from burning coal and reforming natural gas, respectively, and have considerable carbon emissions. These two colors of hydrogen account for over 99 percent of commercially available hydrogen and are the least expensive. Blue, pink and yellow hydrogen production uses electrolysis, which is a way of using water and electricity to create hydrogen, using semi-renewable energy sources and/or carbon capture strategies to reduce contributions toward climate change. Collectively, these colors of hydrogen account for less than 1 percent of hydrogen production.

Green hydrogen is the only truly renewable hydrogen and is produced through biomass gasification, which involves the degradation of natural materials, or electrolysis that uses 100% renewable energy sources. However, green hydrogen is available in very limited supply, accounting for about 0.1 percent of all hydrogen production and is expensive, typically multiples

greater than black or gray hydrogen. The Biden Administration has made investments in green hydrogen production in California that would be powered by solar energy, but these facilities are years away from being online.

Analysis finds that the production and 12 years of operation of a 40-foot battery electric bus would contribute 367 metric tons of CO2 equivalent to the environment. Production and 12 years of operation of a 40-foot hydrogen fuel cell bus would contribute 763 metric tons of CO2 equivalent if powered by gray hydrogen and 58 metric tons if powered by green hydrogen.

ZEB Transition Challenges

Rising Bus Costs

Battery-electric bus costs have increased substantially in the past year, defying transit operator hopes that an increased scale of production would bring costs into parity with hybrid-diesel buses. VTA's initial procurement of battery-electric buses in 2018 cost around $1 million each, but costs have risen since then. In 2023, Bay Area transit operators paid around $1.4 million per bus with one operator reporting paying $1.5 million. The increase in cost may be the product of multiple factors: (1) an end of introductory pricing, (2) an improvement in vehicle durability, requiring more expensive materials, (3) more batteries onboard vehicles, (4) recent, steep inflation in heavy materials like steel and (5) increasing demand for ZEBs while Buy America compliant bus manufacturers decrease.

Manufacturers Disappearing

In the past year, three Buy America compliant bus manufacturers have disappeared. Nova Bus chose to leave the US market. Proterra entered Chapter 11 bankruptcy and their bus business line has been sold to Phoenix Motorcars as of January 2024. It is unclear what the future of that franchise is regarding transit bus production. The REV Group, parent company of El Dorado National, a bus manufacturer, announced that they would stop producing transit buses as they find other heavy duty vehicle markets more appealing. This leaves Gillig and New Flyer as the established Buy America compliant bus manufacturers. The Chinese bus manufacturer, BYD, has developed a California-based subsidiary called RIDE that recently became Buy America compliant.

Energy Supply

Concerns exist around the energy supply for both ZEB technologies. Electrifying bus depots to support charging battery-electric buses requires electrical capacity that is multiples greater than exists today. It is uncertain whether PG&E can provide that upgraded connection. Some transit operators have pivoted strategies after being informed that PG&E cannot deliver the electrical capacity they requested. Furthermore, PG&E cannot reliably determine whether capacity exists in the present moment, as records are not always current, without doing an in-person site evaluation which they will not do until transit agencies have done some design work.

The hydrogen market is currently small, and questions exist around whether sufficient supply exists to meet growing demand from transit operators. Since hydrogen must be transported by truck from refineries, sourcing hydrogen from distant locations is cost-prohibitive, leaving customers dependent on local sources. Whether local producers can meet transit operator

demand or continue providing demand if they incur disruptions to their ability to produce hydrogen is unclear. The small scale of the market can also lead to price volatility.

Inadequate Funding Availability
Nationally, the collective need for zero-emission transition funding is outpacing the amount of funding available by a ratio of around 5 to 1. Competition for federal funding is especially fierce as California transit operators are under a transition requirement and compete against each other for a fixed California-designated share of funds. As more agencies scale up their transitions, competition for grant funds is expected to increase.

The Federal Transit Administration's Low/No Emission Bus and Bus Facilities Grant Program (Low/No) is the largest funding source for zero-emission transition. $1.7 billion was offered for each of the 2022 and 2023 cycles, but the award has been decreased to $1.5 billion in 2024. Funding for Low/No is only programmed through 2025 and the future of this program may depend on the outcome of the 2024 presidential election. In the 2023 cycle, 490 applications amounting to $8.8 billion were received and 430 applications, including VTA's, were recommended for funding. However, only 80 applicants received funding, and VTA was not selected. The 2023 cycle represented a doubling in transit agency request from 2022 and the 2024 cycle is expected to be more competitive.

At the state level, competition for grants is strong and opportunities for large awards that would fund the scale of infrastructure VTA aspires to build are few. VTA is ineligible to apply for some at the moment due to being in receipt of a 2021 grant award from the California Energy Commission. A recently created Zero-Emission Transit Capital Program comprised of $1.1 billion in state funding was made available for fiscal years 2024 and 2025. These funds were eligible to be used for ZEB transition and addressing transit operating budget shortfalls. MTC committed the $233 million Bay Area share to the latter cause, directing the funds to other agencies.

Space Constraints at Bus Depots
Three factors contribute to storage space concerns:

1. As VTA transitions to a zero-emission fleet, it will operate diesel fueling alongside battery-electric bus charging and potentially hydrogen fueling. Accommodating this infrastructure will require additional space within the depot. Furthermore, safety considerations may limit how close these facilities can be to other elements of the bus depot, requiring more space for buffer zones.
2. Battery-electric buses cannot be stored as densely as hybrid-diesel buses or hydrogen fuel cell buses as they require charging infrastructure to be interspersed throughout the bus parking area. An increase of about 20 percent in space need is estimated for each battery-electric bus.
3. Pursuing a depot-charged battery-electric bus scenario is estimated to increase the fleet size by 76 buses. Pursuing an on-route charged battery-electric bus scenario would increase the fleet size by 9 buses.

VTA strives to fit its ZEB operations within the existing footprint of its three bus depots and facility planning work that will be undertaken for the ZEB Blueprint later this year will yield a

sense for whether that is achievable. If not, VTA would look to acquire more land to expand depots or build vertical storage facilities for buses, both additional costs, into its transition plan.

Reliability and Safety
Both technologies have had their share of safety incidents. One of VTA's battery-electric buses caught fire while undergoing maintenance at the Cerone Depot in 2023. Foothill Transit (Inland Empire) experienced a bus fire in 2020 while the bus was in revenue service at the Pomona Transit Center. Large batteries like those found in battery-electric buses can experience thermal runaway events that result in the battery smoldering for hours and causing dangerous sparking explosions. Similarly, large on-site batteries used for backup energy storage can experience such events, such as occurred at the PG&E's Elkhorn Plant in Moss Landing in 2022. Golden Empire Transit (Bakersfield) experienced a fire in 2023 during fueling of a hydrogen fuel cell bus, destroying the bus, and causing damage to the fueling station. AC Transit experienced a hydrogen fire at their Emeryville Depot in 2012 when a hydrogen incompatible valve failed. Lessons can be learned from these incidents and designs can be improved, but these technologies are still evolving and require a special measure of safety consideration.

Four ZEB Scenarios
To illustrate the tradeoffs between different technologies, Jacobs modeled how VTA's current service model would be impacted by different technologies. This included extremely detailed analysis of how each bus assignment could be completed including time for charging or fueling buses as well as allowances for mileage variation due to temperature, traffic and battery-degradation. Outputs included changes in fleet size, the amount of additional energy needed at each depot or at on-route chargers, quantity of on-route chargers, total capital costs for vehicles and infrastructure and operating costs for fuel and maintenance. These are presented in **Attachment A**.

Capital costs in these projections represent the cost in 2024 dollars to completely transition VTA's entire bus fleet and build supporting infrastructure. Capital costs are rounded to the nearest $50 million so as not to imply precision since the costs of these technologies continue to evolve. Rather, costs should be evaluated proportionally among scenarios.

Peer Agency Transition Strategies
Every transit agency faces unique constraints such as service model, terrain, budget situation, utility situation and depot configuration as well as differing priorities on environmental impacts, service impacts, equity impacts, resiliency and risk that inform which transition strategy is most appropriate. VTA's peer agencies are pursuing different balances of ZEB technology and differing ranges of urgency for their transitions.

AC Transit is pursuing an eventual fleet balance that is 70 percent hydrogen and 30 percent battery electric, which reflects the need to serve their long route assignments, their struggles with PG&E to increase electrical capacity at depots, and a priority for resiliency since hydrogen operations involves storing several days of fuel reserves. SamTrans is similarly pursuing a mixed fleet, though their recent decision to lean into hydrogen fuel cell buses has been informed by discontent with an initial battery-electric bus approach. SFMTA is pursuing an all-electric fleet that is built on familiarity with electric trolley bus operations and a service model that has shorter

route assignments that fit within battery-electric bus travel ranges. Santa Cruz Metro is pursuing only hydrogen fuel cell buses, which best meet their travel range concerns and operate better in hilly terrain. Though they will initially use gray hydrogen, they plan to transition to green hydrogen as supply grows.

Some transit agencies are aiming to meet or exceed the 2040 transition goal while others question whether transitioning is in the best interest of their riders or the environment. The high costs of transition must be funded somehow and with inadequate grant funding, some agencies are faced with the decision of whether to cut service levels and divert funds from the transit operating budget to fund ZEB transition. Cutting transit service has equity impacts and would result in former riders making trips through other means, likely with internal combustion engine vehicles, that could lead to greater contributions toward climate change and worse air quality than continuing diesel-powered bus operations at current service levels. The majority opinion among transit operators appears to be that the core mission of providing mobility services should be prioritized over zero-emission transition and that transition should occur as funding allows.

VTA Staff Position

Past Board direction emphasized a flexible approach that would allow VTA to consider changing technology strategies as staff gained experience with battery-electric buses, saw how technology and costs evolved and learned from peer agency experiences. Given the rapid cost increases of battery-electric buses, present expectation that battery technology will not advance to achieve range parity with diesel- or hydrogen-powered buses and uncertainty around gaining electrical capacity upgrades, staff advises diversifying VTA's technology strategy to pursue a mixed fleet with an initial aim toward 70 percent hydrogen fuel cell buses and 30 percent battery-electric buses.

Approximately 30 percent of VTA's bus assignments are shorter than 150 miles and can be served with battery-electric buses. The remaining assignments can fit within the 300-mile range of hydrogen fuel cell buses, with small adjustments to scheduling. Such a blend would provide the following benefits:

- Allows VTA to maintain the same fleet size of 440 buses.
- Not require an increase in the quantity of service hours (time when the bus is moving) needed to provide the same quantity of revenue hours (time when the bus is open for riders).
- Limit the amount of charging infrastructure that must be installed within bus parking areas, allowing for greater flexibility of depot use and more space-efficient bus parking than a 100% battery-electric fleet.
- Provide a measure of resiliency by diversifying energy sources. Should access to grid electricity or hydrogen supply become a temporary challenge, VTA could still roll out a portion of service.
- Give VTA options for dispatching buses for emergency responses as different fueling/charging options will exist where VTA buses are sent.
- Provide a pathway to the least carbon-intensive ZEB operations with green hydrogen.
- Maintain flexibility to change the balance of hydrogen fuel cell buses and battery-electric buses as these technologies, costs and vehicle availabilities evolve.

This strategy also comes with some concerns:

- Presently, only gray hydrogen is viable as an energy source for a transit fleet, resulting in higher carbon emissions until green/yellow/pink/blue hydrogen can become more available.
- Only one Buy America compliant hydrogen fuel cell bus manufacturer exists (New Flyer). This limits market choice and competition for hydrogen fuel cell buses and exposes transit agencies to the risk of the product line being discontinued.
- A mixed fleet would require simultaneous operation of diesel fueling, hydrogen fueling and electric charging, which would require more space at bus depots than operating just two technologies.

Next Steps

After receiving Board guidance, staff will commence work on the remaining tasks to develop the ZEB Blueprint. Specific projects will be identified, and facility plans will be developed. Capital costs for projects will be developed and their benefits will be calculated. A fleet replacement plan and funding strategy will be developed. Altogether, a completed ZEB Blueprint will provide strong direction for the future of VTA's ZEB transition which will help VTA become more competitive for grants. Staff estimates that a completed ZEB Blueprint will be brought to the Board for adoption in Fall, 2024.

CLIMATE IMPACT:

The climate impact of zero-emission bus operation depends on the technology operated and how renewable the source of energy is. VTA's 2020 Sustainability Plan identifies transitioning the fleet to zero-emission bus as the main way to decrease VTA's locally released greenhouse gas emissions and advocates for moving toward more renewable sources of energy to reduce greenhouse gas emissions overall. The urgency with which VTA progresses with its ZEB transition and moves toward more renewable energy sources depends on policy decisions set by the Board of Directors.

Prepared By: Adam Burger
Memo No. 8956

EXHIBIT 5

October 2024 Committee Memorandum

Santa Clara Valley Transportation Authority

Date: October 10, 2024
Current Meeting: October 17, 2024
Board Meeting: November 7, 2024

BOARD MEMORANDUM

TO: Santa Clara Valley Transportation Authority
Safety, Security, and Transit Planning and Operations Committee

THROUGH: General Manager/CEO, Carolyn M. Gonot

FROM: Chief Planning and Programming Officer, Deborah Dagang

SUBJECT: Zero-Emission Bus Blueprint

Policy-Related Action: No **Government Code Section 84308 Applies: No**

ACTION ITEM

RECOMMENDATION:

Recommend that the VTA Board of Directors adopt the Zero-Emission Bus Blueprint.

EXECUTIVE SUMMARY:

- The Zero-Emission Bus (ZEB) Blueprint is VTA's latest and most detailed plan for zero-emission fleet transition and combines extensive analysis with an implementation plan.
- The ZEB Blueprint builds on guidance received at the February 2024 Board Workshop to pursue a mixed fleet of battery-electric buses and hydrogen fuel cell buses and to take a flexible, appropriately paced transition that avoids negative impacts to transit service.
- Cautions are raised about reliability, safety, rising costs, funding availability and risk and how statewide transit agencies are approaching these challenges.
- Overall, the ZEB Blueprint builds on current efforts, identifies next steps, demonstrates an intent to meet the 2040 transition requirement and places the agency well to compete for funding.

STRATEGIC PLAN/GOALS:

VTA's ZEB transition aligns with the second business line of VTA's Strategic Plan of delivering projects and programs. Transitioning the entire fleet to zero-emission buses will require several successive projects that are well-planned and align with VTA's overall goals and priorities. The ZEB Blueprint seeks to set a strong direction for fleet transition that ensures near-term and long-term projects are compatible and minimizes risk and cost for VTA while ensuring quality service for VTA's riders.

FISCAL IMPACT:

There is no financial impact associated with adopting the Zero-emission Bus Blueprint.

BACKGROUND:

All transit operators in California are required to fully transition to zero-emission bus fleets by 2040 per a regulation passed by the California Air Resources Board (CARB) in 2018. The regulation sets escalating annual purchasing targets for zero-emission buses that guide agencies toward meeting the 2040 goal. The targets started at 25 percent of a fleet procurement in 2023, will rise to 50 percent in 2026, and rise again to 100 percent in 2029. Buses purchased prior to 2029 would have reached the end of their expected 12-year lifespans and be retired from the active fleet by 2040. The regulation identifies battery-electric buses and hydrogen fuel cell buses as eligible zero-emission technologies. The zero-emission designation refers only to vehicle emissions and not emissions that may occur upstream in electricity or hydrogen production.

VTA presently operates a fleet of around 430 diesel-powered buses (420 hybrid diesel and 10 conventional diesel) out of three depots. A previous test of 10 battery-electric buses was paused after one bus caught fire and the manufacturer, having declared bankruptcy, was unable to provide an adequate repair. The nine remaining buses have since been removed from service.

To keep on track to meet the 2040 goal, VTA will need to increase the pace of its transition and near-term work reflects that urgency. An installation of 34 chargers and a complementary procurement for 35 battery-electric buses are underway and on track to be operational in 2026. Design work for a 55-charger addition has begun, funding has been secured for an on-route charging pilot, and VTA is exploring an opportunity to test a small fleet of hydrogen fuel cell buses. Collectively, these efforts will build VTA's zero-emission operations expertise and inform future projects.

However, this is a challenging time to take big steps forward. Transit agencies across the nation are struggling with zero-emission bus reliability problems and a few agencies have lost buses due to fires. Zero-emission buses cost 50 to 100 percent more than diesel buses and state and federal funding is vastly inadequate to cover these costs or the costs of new charging or fueling infrastructure. Some agencies face the difficult choice of cutting transit service to pay for these higher costs-a solution that may make negative progress toward emission reduction goals if it induces more private vehicle driving by displaced transit riders.

Meanwhile, the bus manufacturing industry has undergone contraction with three Buy America compliant zero-emission bus manufacturers (Nova, Proterra and El Dorado) leaving the market in the past year. The two that remain (Gillig and New Flyer) are facing cashflow struggles caused by COVID demand decreases and recent inflation in heavy materials. Transit agencies are left with less choice, higher bus costs, longer production timelines and uncertainty about the manufacturers' ability to honor parts and warranty support over the lifetime of the bus.

Due to these concerns and the impending 2026 purchasing requirement increase, the statewide conversation around zero-emission transition among transit agencies has shifted from cautious optimism to serious concern. Appeals to delay the 2026 purchasing requirement have been rebuffed by CARB which has instead advised agencies to request exemptions to meeting the

purchasing targets. Exemption requests are allowed by the regulation, if complying would result in financial hardship or a negative impact to transit service, and some agencies already intend to pursue them.

Nevertheless, zero-emission fleet transition is a worthwhile objective and is the biggest change VTA can make toward achieving the emission reduction goals set in VTA's 2020 Sustainability Plan. The ZEB Blueprint (attached) is guided by direction provided at the February 2024 Board Workshop that endorsed a flexible approach that pursues a mixed fleet of both battery-electric and hydrogen fuel cell buses and identifies a contingency plan to purchase more hybrid-diesel buses should that be in the agency's best interest. Overall, the ZEB Blueprint demonstrates VTA's intent to meet the 2040 transition goal, identifies upcoming transitions steps, and positions the agency well to compete for discretionary funding.

DISCUSSION:

ZEB Blueprint Development and Contents

The ZEB Blueprint is the product of a year-long planning effort that featured two stages. The first stage focused on information gathering and included a detailed analysis of the state of battery-electric and hydrogen fuel cell bus technologies, their capital and operating costs, risks, environmental impacts of bus operation and production, and impacts to VTA's service delivery model. This analysis was aided by subject matter experts at Jacobs Consulting, who were hired to assist with this effort.

That analysis led to a staff recommendation that was presented at the February 2024 Board Workshop to pursue a mixed fleet strategy of roughly 30 percent battery-electric buses and 70 percent hydrogen fuel cell buses. Battery-electric buses would be used for short route assignments and hydrogen fuel cell buses for long route assignments. The mixed fleet strategy would allow for 1-for-1 replacement of hybrid-diesel buses which would minimize costs by maintaining the same size fleet and by avoiding acquiring additional land to store buses. That strategy would also provide a pathway to operating the fleet entirely from fully renewable electricity and green hydrogen and provide a measure of resiliency by diversifying energy sources.

Additionally, VTA staff sought support for a contingency plan that would preserve an option to buy hybrid-diesel buses, which are less expensive than zero-emission buses and do not require new infrastructure, if fleet replacement is needed and VTA is not ready to purchase zero-emission buses due to lack of funding or if supporting infrastructure is not ready. In such case, the agency would exercise the exemption option of the CARB regulation. The Board of Directors indicated support for the staff recommendation which guided the second stage of developing an implementation plan.

The implementation plan consists of several elements:

- A facility assessment that identifies electric charging and hydrogen fueling infrastructure needs, electrical capacity upgrades, facility safety improvements and topics for further evaluation
- An implementation timeline that aligns infrastructure, facility improvements and utility capacity upgrades with VTA's fleet replacement plan

- Layouts for each of VTA's three bus depots that ensure near-term efforts support overall transition and avoid conflicts with future efforts
- An energy strategy that helps VTA manage energy loads, energy costs and provide advance notice to PG&E of VTA's future capacity needs
- Prioritization guidance for how to balance equity goals with factors like funding availability, fleet replacement needs, workforce development and utility constraints
- A funding strategy informed by detailed cost estimates

Overall, the ZEB Blueprint functions as a menu of future efforts for VTA's Operations and Engineering & Project Delivery Divisions to implement fleet transition. It provides flexibility to move at a pace that is comfortable for VTA, to adjust the order of projects, and to adjust the balance between battery-electric buses and hydrogen fuel cell buses as these technologies and their costs evolve and VTA gains operating experience. It may be appropriate to update this plan between now and 2040 as VTA hones its transition strategy.

Costs and Funding

VTA's ability to acquire funding to cover the cost of transition will be a strong determinant of the pace at which transition can proceed. The ZEB Blueprint estimates that the cost of new electric charging and hydrogen fueling infrastructure, facility upgrades and purchasing the first generation of zero-emission buses (about 430) will cost $800 million more than if VTA continued hybrid-diesel bus operations. These figures are in line with other transit agencies' estimates for their fleet transitions. A recent MTC analysis estimated the nine-county Bay Area funding need for zero-emission transition to be over $7 billion ($2024).

Funding for zero-emission transition is currently insufficient to meet this need. Federal discretionary funding for zero-emission transition, which has increased 10-fold over previous funding levels by the Infrastructure Investment and Jobs Act, is highly competitive and meets only about 15 percent of the national need. State funding opportunities are also highly competitive. The timing of being awarded a grant is uncertain, making the pace of progress difficult to predict.

ALTERNATIVES:

The Board may choose not to adopt the ZEB Blueprint, but lack of an adopted detailed plan will leave the agency without a Board-supported actionable implementation plan and harm prospects for winning grant funding to pay for transition costs.

CLIMATE IMPACT:

No climate impacts are expected from adopting the plan but transitioning the fleet through subsequent infrastructure installations and zero-emission fleet purchases will reduce VTA's contributions to greenhouse gas emissions and make progress toward achieving the targets identified by the 2020 Sustainability Plan.

Prepared by: Adam Burger
Memo No. 9294

ATTACHMENTS:

- VTA_ZEB_Blueprint_Draft (PDF)
- ZEB_Blueprint_SSTPO_Presentation (PDF)

Santa Clara Valley Transportation Authority

Zero-Emission Bus Blueprint





VTA Zero-Emission Bus Blueprint

NOVEMBER 2024

About VTA

The Santa Clara Valley Transportation Authority (VTA) is an independent special district that provides fixed route public transit service and paratransit service in Santa Clara County, California. VTA operates a fleet of 430 buses out of three bus depots and 98 light rail cars out of a single light rail depot.

About the Innovative Clean Transit Regulation

The Innovative Clean Transit (ICT) Regulation passed by the California Air Resources Board (CARB) in 2018 requires all transit operators in the state to transition to fully zero-emission bus fleets by 2040. Presently, two technologies meet the zero-emission standard: battery-electric buses (BEBs) and hydrogen fuel cell buses (FCEBs).

The ICT regulation sets escalating purchasing targets. In 2023, 25 percent of buses purchased must be zero-emission. The target increases to 50 percent in 2026 and 100 percent in 2029. Internal combustion engine (ICE) buses purchased before 2029 would reach the end of their 12-year expected lifespan by 2040 and would be retired from the active fleet.

CARB recognizes that zero-emission fleet transition will bear new costs and will present new challenges to transit operators that may impact their financial health or ability to deliver transit service. If complying with the purchasing targets would result in such impacts, or if zero-emission infrastructure or vehicles cannot be procured in time, agencies may request annual exemptions to meeting the purchasing targets.

Santa Clara Valley Transportation Authority

Introduction

About the Zero-Emission Bus Blueprint

The Zero-Emission Bus (ZEB) Blueprint is a strategic implementation plan that charts a course for VTA's ZEB fleet transition by 2040. The ZEB Blueprint assesses the costs, risks, environmental impacts and service delivery impacts of zero-emission technologies and recommends a mixed fleet strategy that balances risk and builds resiliency. In addition, the ZEB Blueprint identifies future projects, energy needs and transition plans for each of VTA's depots and aligns them with new bus purchases. Lastly, guidance is provided about how to prioritize next steps that incorporate equity, funding and operational considerations.

The ZEB Blueprint provides flexibility, allowing VTA to adjust its approach as technologies, markets, funding and service needs evolve and agency staff gain operating experience. Cautions are provided about factors outside of VTA's control that may affect the pace of transition, and a contingency plan is identified so that VTA's ability to provide reliable transit service is not negatively impacted.

The ZEB Blueprint builds upon and supersedes the ZEB Transition Plan (2022) and Bus Rollout Plan (2020). It aligns with the 2020 Sustainability Plan, which identifies the zero-emission fleet transition as the most impactful change toward meeting 2040 emission reduction targets. Through thorough research and a detailed implementation plan, the ZEB Blueprint should strengthen VTA's ability to attract discretionary funding to pay for ZEB transition.

The ZEB Blueprint is the product of several analyses:

Zero-Emission Technology Assessment

An evaluation of the current state of battery-electric bus and hydrogen fuel cell bus technology, potential for technology advancement, potential applications to VTA service model, costs and risks.

Service Modeling Analysis

An analysis of sixty-four scenarios that evaluated different implementations of zero-emission technologies, their impacts to fleet size, service complexity and service levels.

Capital and Operating Cost Estimates

To define the financial impact and inform the development of a funding strategy.

Well to Wheels Environmental Analysis

An analysis of the carbon impacts of production and a lifetime of operation of each zero-emission technology.

Equity Analysis

An analysis of depot routes serving communities that experience disproportionately high levels of disadvantage, pollution burden, and respiratory health ailments – to determine which depots should be transitioned first to benefit those communities.

Facility Assessment

An assessment of VTA facilities and identification of facility improvements, electric charging projects, hydrogen fueling projects, electrical capacity upgrades and areas for future analysis.

Depot Layouts and Transition Strategy

A series of depot layouts showing sequential steps for transition to ensure near-term efforts supported long-term efforts, that no efforts were in conflict and that VTA's existing depots are adequate to meet future fleet storage needs.

Prioritization Guidance

Several factors will guide VTA's decisions about which projects to pursue at which depots and their timing. Those include:

- **Equity considerations –** The California Air Resources Board encourages prioritizing service to communities that experience disadvantage, higher pollution burdens and disproportionate rates of respiratory health affliction.
- **Energy considerations –** Pacific Gas & Electric (PG&E) may have limited ability to upgrade electrical capacity to depots, which could affect the pace of transition; hydrogen prices are subject to supply and demand fluctuations in the near term, as production ramps upward.
- **Fleet considerations –** Some fleets operate out of specific depots, such as the 60-foot bus fleet that operates out of VTA's North Depot. The timing of those fleet replacements will be considered.
- **Funding considerations –** State and federal funding for zero-emission is vastly inadequate and the timing of being awarded grants and their amounts are uncertain. This can affect which projects VTA pursues and when.

Zero-Emission Bus Transition Progress to Date

The ZEB Blueprint builds on planning work and a series of projects that are completed or underway.

Hydrogen Bus Pilot (Mid-2000s)

VTA tested three hydrogen fuel cell buses as part of a Federal Transit Administration (FTA) demonstration product. At the time, the limited durability of parts, high operating costs, limited travel ranges and considerable loss of hydrogen to the atmosphere indicated the technology was not ready for wider application.

Battery-Electric Bus Pilot (2018-2023)

VTA tested a fleet of ten battery-electric buses, but the pilot ran into setbacks. Durability problems, charger/vehicle incompatibility issues and poor manufacturer support led to an unacceptable level of downtime. Ultimately a fire on one bus led to the grounding of the fleet, as the manufacturer, having since declared bankruptcy, was unable to provide an adequate repair.

Bus Rollout Plan
(Adopted in 2020)

VTA adopted the Bus Rollout Plan in 2020 to satisfy a requirement of the Innovative Clean Transit Regulation. The document identified technology pathways to full fleet transition by 2040, but did not commit VTA to any action at the time.

Strategic Conversations with the Board of Directors
(2021)

VTA developed a near-term battery-electric bus strategy that would target shorter route assignments while preserving flexibility to pivot to hydrogen fuel cell buses for longer route assignments if battery technology advancement should fall short of expectations.

Zero-Emission Bus Transition Plan
(Adopted in 2022)

To be eligible to apply for federal funding through the Low & No Emission Bus and Bus Facilities Program, VTA adopted the Zero-Emission Bus Transition Plan which reflected earlier Board Direction. VTA won a federal grant later in the year.

Cerone Microgrid Project
(Started in 2022, completion estimated in 2026)

With the help of a grant from the California Energy Commission, VTA began a project to add charging for 34 buses, a microgrid (large backup battery) and solar panels at the Cerone Depot. A procurement of 35 battery-electric buses arriving in 2026 will complement this infrastructure.

On-Route Charging Pilot
(Fully funded in 2022)

VTA received a $14.4 million grant award from the Federal Transit Administration to test on-route charging, which can extend the travel range of battery-electric buses with in-the-field charging, at the Milpitas BART Transit Station and add some electric charging infrastructure at the Cerone Depot.

Chaboya Charging Project
(Started in 2024, design work underway)

Design work is underway for charging infrastructure that would support 55 battery-electric buses at the Chaboya Depot.

Maintenance Facility Safety Retrofits
(In progress)

Safety retrofits to provide safe access to the battery packs on top of buses as well as hydrogen detection improvements are underway.

Zero-Emission Bus Transition Objectives and Strategy

The flexible mixed fleet strategy and contingency plan discussed in the ZEB Blueprint is a product of several objectives:

No negative impacts to bus service

Zero-emission buses cost 50 to 100 percent more than internal combustion engine buses and require installing expensive, new, electric-charging or hydrogen-fueling infrastructure. Broadly, funding is inadequate to meet this need, and some transit agencies are faced with cutting their transit operating budgets, which results in service cuts, to cover the cost of transition. Many operators are struggling with the reliability of their zero-emission fleet resulting in more buses breaking down in the field or being unable to be put in service.

VTA's objective is to transition the fleet while avoiding any negative impacts to bus service. This may require requesting exemptions to complying with the ICT regulation purchasing targets and replacing some aging hybrid-diesel buses with new hybrid-diesel buses. CARB encourages agencies to request exemptions if transition would result in financial hardship for the agency or negative impacts to bus service.

1-for-1 fleet replacement

Most of VTA's route assignments fall into the 150-to-250-mile range and a few exceed 300 miles. That exceeds the travel ranges of battery-electric buses, which are conservatively estimated to travel 150 miles per charge. If route assignment ranges cannot be met by a single zero-emission bus, two zero-emission buses would be needed to replace some hybrid-diesel buses that are retired. That would increase fleet size, increase cost, increase operational complexity and potentially require additional land for bus storage.

VTA's strategy is to deploy battery-electric buses on route assignments that are under 150 miles, which comprise about 30 percent of VTA route assignments, and to deploy hydrogen fuel cell buses on route assignments longer than 150 miles. That strategy, combined with small scheduling changes on the longest route assignments, will allow for 1-for-1 fleet replacement.

Resiliency and emergency response

Battery-electric bus operations are vulnerable to prolonged electrical grid outages and hydrogen fuel cell bus operations are vulnerable to interruptions in hydrogen delivery. Relying on a single technology for the entire fleet would put VTA at risk for prolonged service outages that would leave VTA riders without mobility and impede VTA's ability to provide emergency transportation, shelter, heating and cooling in case of an emergency.

A mixed fleet strategy provides diversity in energy supply and insulates VTA against losing the ability to provide full service. Hydrogen fuel cell bus operations require multiple days of hydrogen supply to be stored at the bus depot, providing further resiliency.

Flexibility and adaptability

As zero-emission technologies evolve, prices fluctuate, products and vendors enter and leave the market and VTA gains operating experience and learns from peer agencies, it may be prudent to adjust the 70/30 percent hydrogen fuel cell/battery-electric bus strategy proposed in the ZEB Blueprint. By pursuing both technologies, VTA will be able to adjust the balance of fleet technologies and be selective about which projects it pursues and when. An update to the plan may be warranted as the zero-emission space matures.

Limit costs

VTA has an obligation to spend public funding cost-effectively. By taking a reasoned approach to transition that is founded upon thorough analysis, VTA can pursue strategies that are cost-effective for VTA's scale of operations and service model and avoid sunk costs.

Prioritize safety

Use of large-scale batteries and hydrogen bring unique fire safety concerns. Prevention, suppression and response should be evaluated as part of the transition work.

Blueprint Development

STAGE 1

Evaluation of 4x ZEB technology scenarios leading to the 'Mixed Fleet' recommendation in Feburary 2024

STAGE 2

Implementation Plan
- **Site Planning and Facility Assessement**
- **Fleet Planning**
- **Energy Strategy**

The ZEB Blueprint was developed through two stages. The first stage focused on information gathering and included a detailed analysis of the state of battery-electric and hydrogen fuel cell bus technologies, their capital and operating costs, environmental impacts of bus operation and production, and impacts to VTA's service delivery model.

Mixed Fleet Recommendations

That analysis led to a staff recommendation that was presented at the February 2024 Board Workshop to pursue a mixed fleet strategy of roughly 30 percent battery-electric buses and 70 percent hydrogen fuel cell buses. Battery-electric buses would be used for short route assignments and hydrogen fuel cell buses for long route assignments. The mixed fleet strategy would allow for 1-for-1 replacement of hybrid-diesel buses which would minimize costs by maintaining the same size fleet and by avoiding acquiring additional land to store buses. That strategy would also provide a pathway to operating the fleet entirely from fully renewable electricity and green hydrogen and provide a measure of resiliency by diversifying energy sources.

Contingency Plan

Additionally, VTA staff sought support for a contingency plan that would preserve an option to buy hybrid-diesel buses, which are less expensive than zero-emission buses and do not require new infrastructure, if fleet replacement is needed and VTA is not ready to purchase zero-emission buses due to lack of funding or if supporting infrastructure is not ready. In such case, the agency would exercise the exemption option of the CARB regulation. The Board of Directors indicated support for the staff recommendation and contingency plan, which guided the second stage of developing an implementation plan.

Stage 2 consists of an implementation plan that identifies specific projects and their locations and serves as a menu of next steps for VTA's Operations and Engineering Divisions to implement. Specifically, the implementation plan:

The implementation plan consists of several elements:

- A facility assessment that identifies electric charging and hydrogen fueling infrastructure needs, electrical capacity upgrades, facility safety improvements and topics for further evaluation.
- An implementation timeline that aligns infrastructure, facility improvements and utility capacity upgrades with VTA's fleet replacement plan
- Layouts for each of VTA's three bus depots that ensure near-term efforts support overall transition and avoid conflicts with future efforts
- An energy strategy that helps VTA manage energy loads, energy costs and provide advance notice to PG&E of VTA's future capacity needs
- Prioritization guidance for how to balance equity goals with factors like funding availability, fleet replacement needs, workforce development and utility constraints
- A funding strategy informed by detailed cost estimates

Stage 1

Technology Assessment

Technology Comparison

Each zero-emission technology comes with tradeoffs around vehicle cost, infrastructure cost, energy cost, travel range, space needs, impacts to operations and safety concerns. Each transit operator must identify the right technology(ies) and configuration for their unique constraints and service model. The tables below show key differences for the technologies.

Battery-electric buses are charged at bus depots in a strategy called depot-charging. On-route charging is a strategy to extend the travel range of these buses by providing a fast, high-powered charge to partially replenish the battery while the bus is in the field, typically at the end of a route.

Hydrogen fuel cell buses store their energy in the form of compressed hydrogen that is stored in onboard tanks. A fuel cell uses a chemical reaction to convert the hydrogen into electricity that is stored in a battery that powers the bus.

Technology	Energy Storage	Propulsion	Emissions
VTA Hybrid-Diesel Bus	Renewable diesel	Diesel Engine > Battery > Electric Motor	Yes
Depot Charged BEB	Large onboard batteries	Battery > Electric Motor	No
Depot Charged BEB + On-Route Charging	Small onboard batteries	Battery > Electric Motor	No
Hydrogen Fuel Cell Bus	Compressed hydrogen	Fuel Cell > Battery > Electric Motor	No

Technology	Cost Per Bus	Approx. Travel Range	Fleetwide Replacement Ratio	Storage Space Constraint?
VTA Hybrid-Diesel Bus	$800K	400 miles	1-to-1	No
Depot Charged BEB	$1.5M	150 miles	1.2-to-1*	Yes
Depot Charged BEB + On-Route Charging	$1.4M	Unlimited**	1-to-1	No
Hydrogen Fuel Cell Bus	$1.6M	300 miles	1-to-1	No

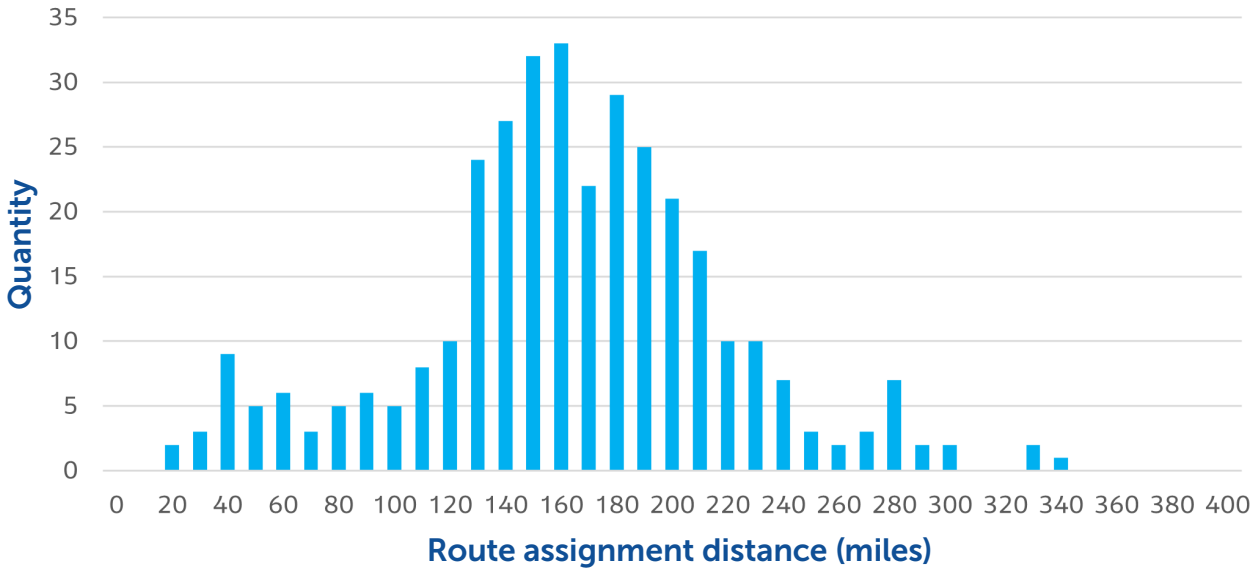
*Evaluated against VTA's service model

**Depending on on-route charging locations

Travel Range Considerations & VTA Service Model

VTA bus service employs a clever efficiency of having operators start their shift by meeting the bus along the route, relieving another operator that has completed their shift. This prevents losing time by driving back to the depot while out of service to switch drivers, which maximizes the quantity of hours VTA can provide to the public. However, this also means that VTA buses travel long distances in a day, sometimes upwards of 300 miles. Diesel-powered buses can travel 400 miles per fueling, but the shorter travel ranges of zero-emission buses, particularly battery-electric buses, make this an acute issue for VTA's transition.

August 2024 VTA Route Assignment Distances



Operational Risks

Hybrid-diesel bus operations have a track record of reliability and low risk of service interruption since transit agencies have days of fuel reserves on-site, service does not rely on in-the-field infrastructure, fueling is fast, and diesel is widely available in case buses need to travel away from depots for emergency response. Those conditions are ideal for bus operation as they provide resiliency and the ability to recover quickly if something goes wrong, but the zero-emission technologies afford less convenience or margin for error.

Battery-electric buses have shorter travel ranges and long charging times, which adds operational complexity as buses are swapped in and out of service during the day. Rigid charging schedules decrease the room for error each night to be able to provide full service to the public the following day. On-route charging adds operational risk as providing full service is reliant upon in-the-field chargers working at all times. Power outages, vandalism, behind-schedule buses and difficulty making a proper connection with pantographs can result in buses running out of charge before completing their daily service.

Hydrogen fuel cell bus operation benefits from on-site fuel reserves, and although approximately double the time for diesel fueling, hydrogen fueling can occur in a manner of minutes, allowing more recovery time in preparing buses for morning pull out. However, the potential for hydrogen supply interruptions and the general scarcity of hydrogen availability pose risks to using hydrogen-powered buses for emergency response.

Technology	Service Disruption Risk	Charging/Fueling Time	Emergency Resiliency
VTA Hybrid-Diesel Bus	Low	Fast	High
Depot Charged BEB	Medium	Slow	Medium
Depot Charged BEB + On-Route Charging	High	Slow	Medium
Hydrogen Fuel Cell Bus	Medium	Moderately fast	Medium

Service Modeling

To understand the impact each technology would have on VTA's transit operations, over sixty model runs were completed that imagined different factors like battery size, charging strategy, outside temperature and age of battery. Smaller batteries mean smaller travel ranges than large batteries. Hot or cold days will consume electricity from the battery at a greater rate to run air conditioning or heating systems, sapping travel range. A battery that is six years old and near replacement will hold about 80 percent of the charge of a new battery. VTA must plan for a worst-case scenario (extreme weather, old battery) as a default assumption.

This extremely detailed analysis yielded optimal scenarios (as shown in the table below) for depot-charged battery-electric bus operation, on-route charging aided battery-electric bus operation and hydrogen fuel cell bus operation and their fleet size requirements, change to current route assignment lengths and change in hours needed to provide equivalent revenue service as is presently provided (returning to the depot to charge adds more hours when the bus is out of service).

Table summarizing the results of service modeling across the four scenarios

Technology	Fleet Size Change	Blocks Requiring Modification	Service Hour Change to Provide Same Service as Today
Depot Charged BEB	20% Increase (+76 Buses)	71%	3% Increase
Depot Charged BEB + On-Route Charging	2% Increase (+9 Buses)	7%	<1% Increase
Hydrogen Fuel Cell Bus	No Change	7%	No Change

Wells to Wheels Emissions Analysis

The zero-emission designation refers only to vehicle emissions and does not account for any emissions that occur upstream in electricity or hydrogen production. Battery-production and battery recycling create greenhouse gas emissions as does the share of non-renewable energy associated with powering the vehicle. Presently, gray hydrogen, which is made by carbon-intensive natural gas reformation, accounts for 99 percent of commercially available hydrogen in California, but major investments in green hydrogen production are underway, including nearby production green-hydrogen production facilities.

Carbon Impacts of Bus Production and Operations
(Units are Metric Tons of CO2 Equivalent per Bus)

Technology	Battery Production	Battery Replacement	End of Life	12 Years of Operation	Total
Battery-Electric Bus	40	40	4.4	282*	**367**
Hydrogen Fuel Cell Bus + Gray Hydrogen	12	8	0.1	743	**763**
Hydrogen Fuel Cell Bus + Green Hydrogen	12	8	0.1	37	**58**

*assumes VTA's current 60/40 percent renewable/non-renewable grid energy mix

Capital and Operating Cost Analysis

A preliminary, high level vehicle, infrastructure, and maintenance cost assessment was developed for order-of-magnitude comparative purposes of each of the singular technology fleetwide scenarios. A new hybrid scenario featuring a 30 percent battery-electric buses and 70 percent hydrogen fuel cell buses was also developed as an extrapolation of depot-charged battery-electric bus scenario and hydrogen fuel cell bus scenario. That scenario envisioned using battery-electric buses on shorter route assignments and hydrogen fuel cell buses on longer routes, playing to each technology's strengths. Vehicle costs cover the first generation (around 430 buses) of zero-emission vehicles.

Technology	Vehicle Cost	Infrastructure Cost	Infrastructure + Vehicles	Annual Fuel + Maintenance
VTA Hybrid-Diesel Bus	$400M	-	$400M	$30M
Depot Charged BEB	$550M	$300M	$850M	$35M
Depot Charged BEB + On-Route Charging	$450M	$215M	$650M	$25M
Hydrogen Fuel Cell Bus	$600M	$150M	$750M	$45M
30% BEB + 70% FCEB	$550M	$150M	$700M	$40M

*Note – Estimates are for comparative purposes only. Detailed cost estimates were developed for the recommended Mixed Fleet strategy which are presented in Phase 2 of the Blueprint.

Mixed Fleet Recommendation

Past Board direction emphasized a flexible approach that would allow VTA to consider changing technology strategies as staff gained experience with battery-electric buses, saw how technology and costs evolved and learned from peer agency experiences. Given the rapid cost increases of battery-electric buses, present expectation that battery technology will not advance to achieve range parity with diesel- or hydrogen-powered buses and uncertainty around gaining electrical capacity upgrades, staff advised diversifying VTA's technology strategy to pursue a mixed fleet with an initial aim toward 70 percent hydrogen fuel cell buses and 30 percent battery-electric buses.

The 70/30 balance is based on the length of VTA's route assignments. Approximately 30 percent of VTA's bus assignments are shorter than 150 miles and can be served with battery-electric buses. The remaining assignments can fit within the 300-mile range of hydrogen fuel cell buses, with small adjustments to scheduling. Such a blend would provide the following benefits:

- Allow VTA to maintain the same fleet size of 440 buses.
- Not require an increase in the quantity of service hours (time when the bus is moving) needed to provide the same quantity of revenue hours (time when the bus is open for riders).
- Limit the amount of charging infrastructure that must be installed within bus parking areas, allowing for greater flexibility of depot use and more space-efficient bus parking than a 100% battery-electric fleet.
- Provide a measure of resiliency by diversifying energy sources. Should access to grid electricity or hydrogen supply become a temporary challenge, VTA could still roll out a portion of service.
- Give VTA options for dispatching buses for emergency responses as different fueling/charging options will exist where VTA buses are sent.
- Provide a pathway to the least carbon-intensive ZEB operations with green hydrogen.
- Maintain flexibility to change the balance of hydrogen fuel cell buses and battery-electric buses as these technologies, costs and vehicle availabilities evolve.



Stage 2

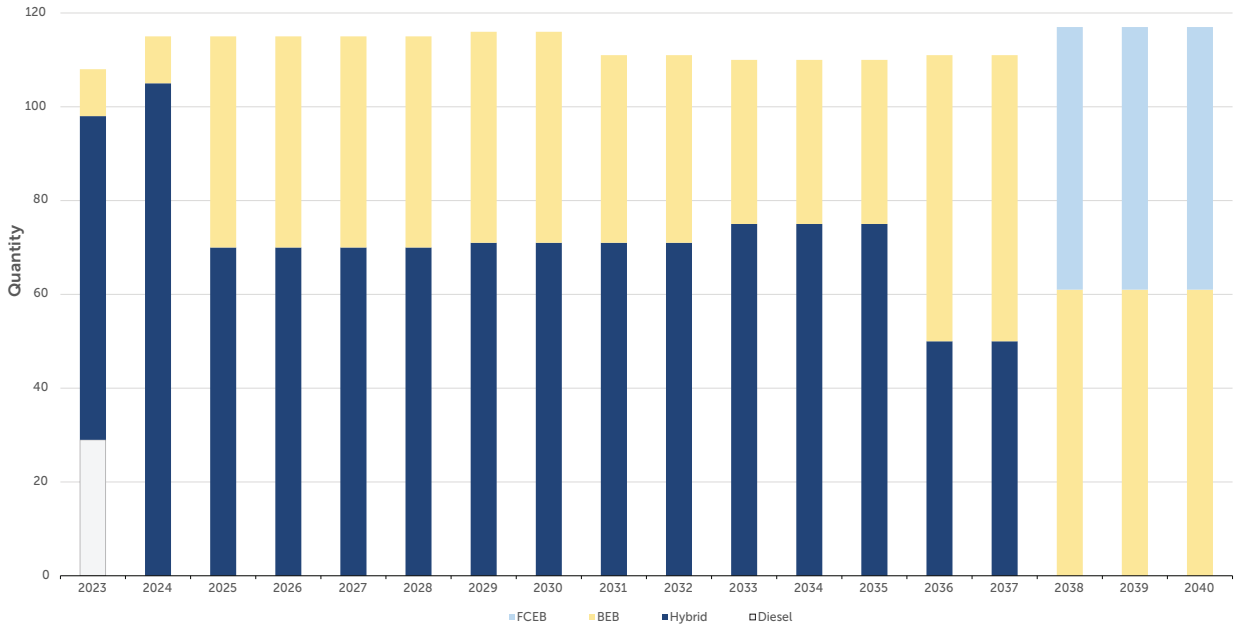
Introduction

The second stage of the ZEB Blueprint consists of an implementation plan that identifies the quantities battery-electric and hydrogen fuel cell buses that will operate out of each depot, specific facility and infrastructure projects, their location within the depots, guidance about how to prioritize implementation, capital cost estimates and areas of future analysis. Cost estimates developed during this stage employed a more detailed methodology and do not align with earlier, high-level estimates.

Cerone Depot

VTA's Cerone Bus Depot is located in North San Jose and is home to VTA's only major repair facility. The Cerone Bus Depot is envisioned to operate both battery-electric and hydrogen fuel cell buses and be transitioned over three phases.

The anticipated final fleet make-up and transition timeline is provided below.



Proposed ZEB Mix	
BEB - 40ft	61 (52%)
FCEB - 40ft	56 (48%)
Total	**117 (100%)**

Depot Phasing Layouts

The following pages show indicative changes to the layout of Cerone depot across each of the transition phases. It includes references to the infrastructure projects required to support a fully zero-emission fleet, followed by a final 'end-state' layout demonstrating what the depot could look like in 2040.

Phase 1 (2025)

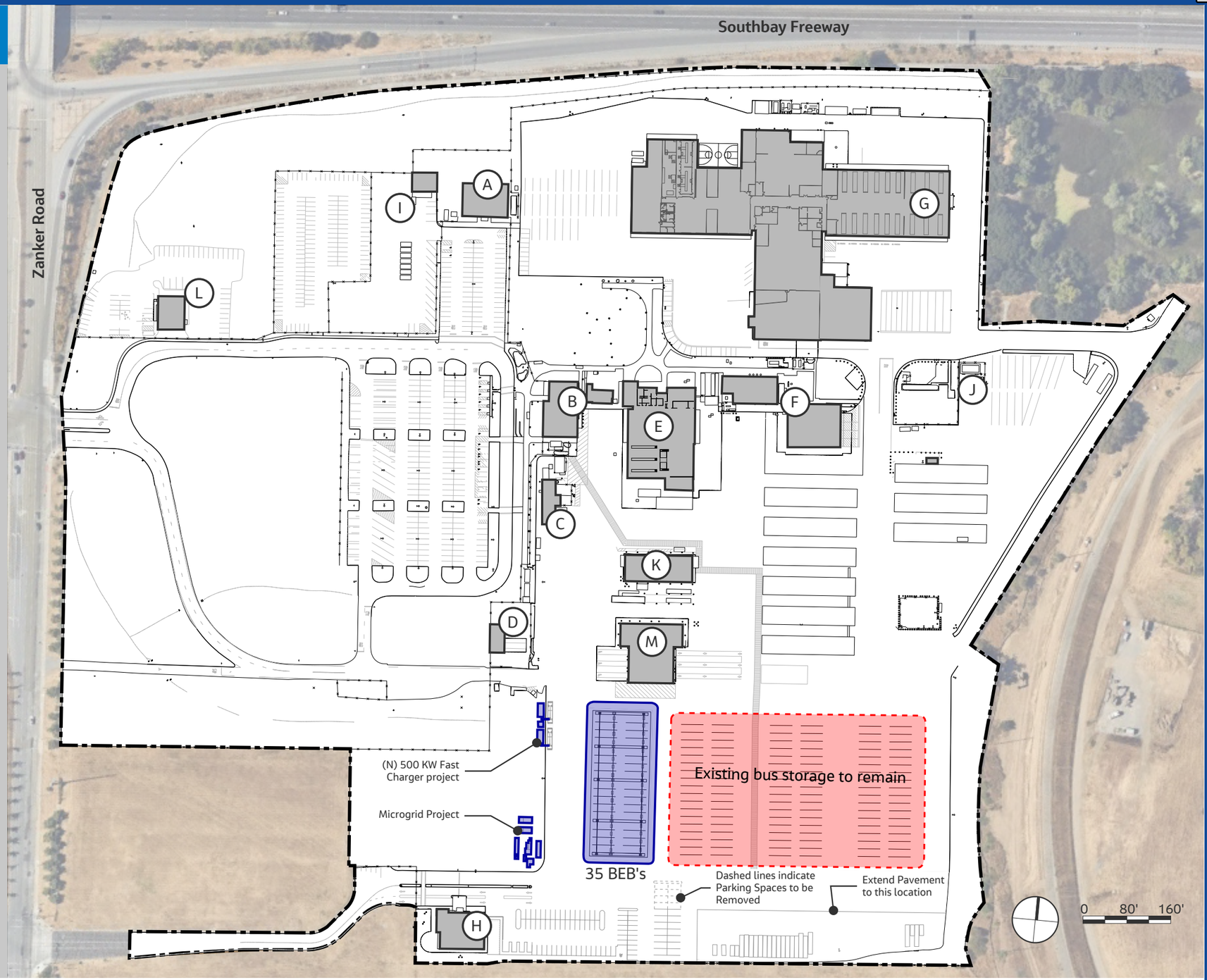
The first phase of BEB deployment and procurement is underway at Cerone.

1. Purchase of 35 40' BEBs.

2. Microgrid Project: Installation of 12 chargers with 34 dispensers, solar canopies and a microgrid, containing a large backup battery that can store solar energy and charge buses. Located in the southwest area of the Cerone bus parking area.

3. Installation of BEB fast chargers.

4. A new PG&E electric service for BEB charging is planned as part of the microgrid project which will satisfy power needs for all future zero-emission phases at Cerone.



Phase 1 Bus Storage and Charging Equipment

Existing Bus Storage to Remain

Site Boundary

Note:
Refer to facility assessment summary for detailed information on building upgrades.

Phase 1 - 2025 Fleet Counts	
(35) 40' BEB	(8) 30' Hybrid
(10) Pilot BEB Proterra - Inactive	(62) 40' Hybrid
Total = 115 Buses	

Cerone Bus Depot
ZEB Blueprint 2040 Fleet Mixed BEB and FCEB

Jacobs

Phase 2 (2036)

The second phase at Cerone will be an expansion of the the BEB deployment, as well as facility upgrades and retrofits to accommodate BEBs and FCEBs. This will include:

1. Procurement of 26 40' BEB vehicles.

2. Installation of 9 additional chargers and 26 pantograph dispensers.

3. Buildings G & E (Major and Minor Maintenance) upgrades, including fire suppression and hydrogen gas detection upgrades, a new fire pump system at building G, and improvements for bus rooftop access.

4. Addition of an on-site FCEB / BEB battery storage facility, located in the vicinity of building G.

Overall BEB requirements

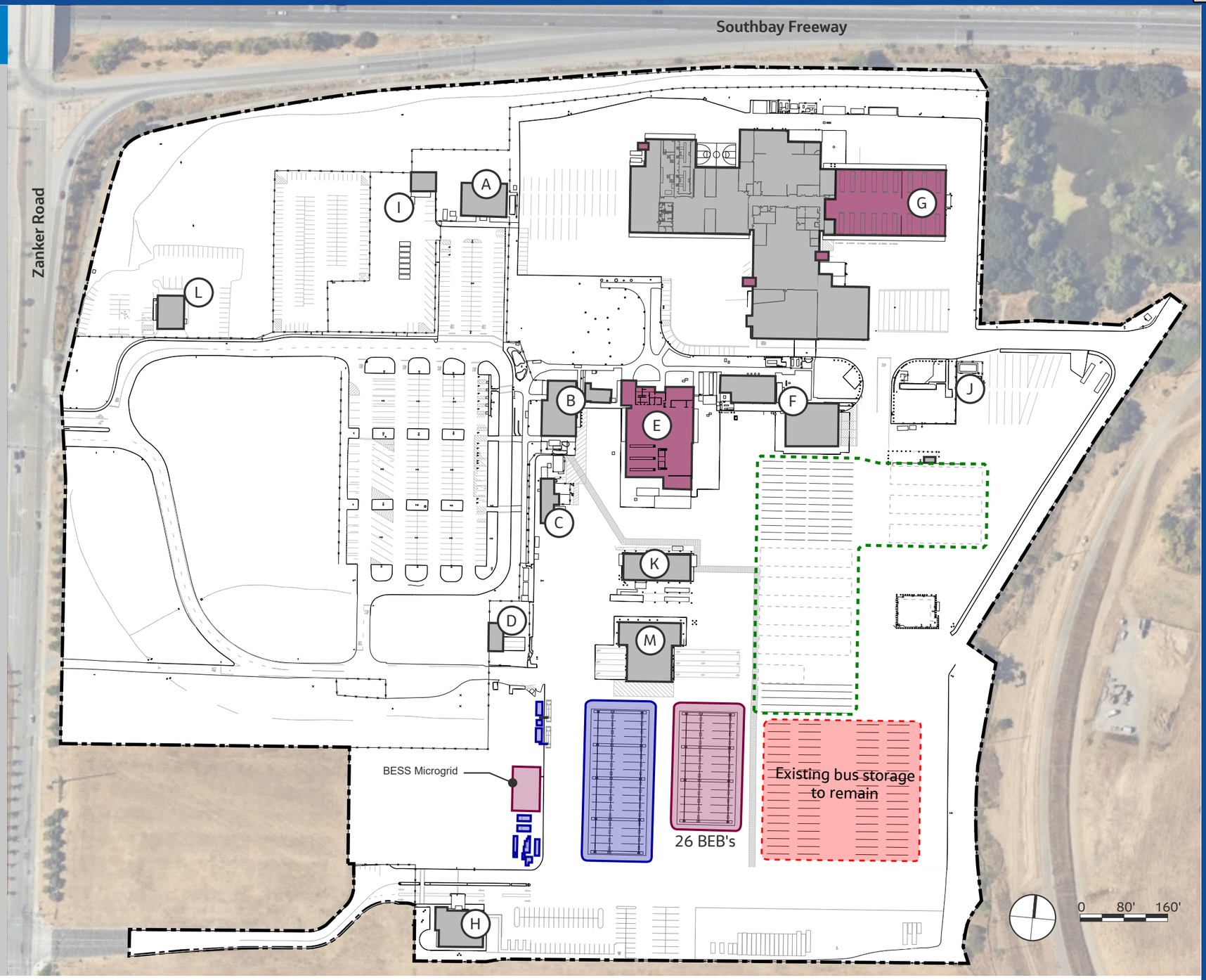
21x BEB Chargers; 61x Pantograph Dispensers

13x Maintenance Bay Plug-In Chargers

- Phase 1 Bus Storage and Charging Equipment
- Phase 2 Bus Storage and Charging Equipment
- Phase 2 Building Upgrades
- Existing Bus Storage to Remain
- Phase 2 Remove Solar Canopies and re-strip lanes for detail and stagging area
- Site Boundary

Note:
Refer to facility assessment summary for detailed information on building upgrades.

Phase 2 - 2036 Fleet Counts
(61) 40' BEB
(50) 40' Hybrid
Total = 111 Buses



Cerone Bus Depot
ZEB Blueprint 2040 Fleet Mixed BEB and FCEB

Jacobs

Phase 3 (2040)

Deployment of the central hydrogen fuel storage and dispenser facilities in one phase, with provisions for a phased expansion of dispensers as the Cerone FCEB fleet grows over time.

Hydrogen Infrastructure and Vehicles

1x Large Liquid Hydrogen Station (18k gal.) and 2x hydrogen dispensers

56 40' FCEB vehicles

Building Compliance

Building G hydrogen gas detection upgrade completed in Phase 2

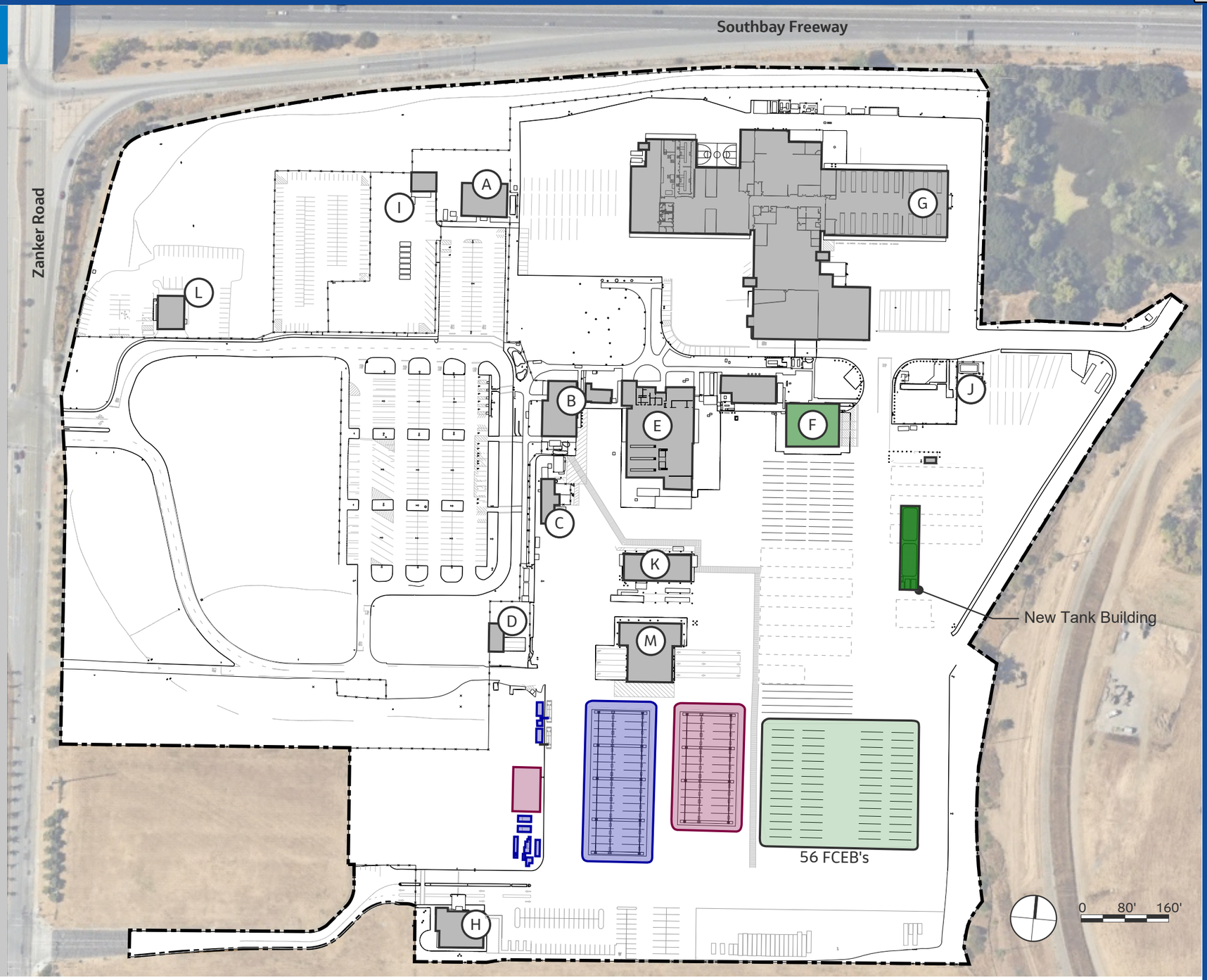
Study and potential upgrade of bus wash and fueling facilities to ensure adequate hydrogen safety systems.

- Phase 1 Bus Storage and Charging Equipment
- Phase 2 Bus Storage and Charging Equipment
- Phase 3 Bus Storage
- Phase 3 Potential Building Upgrades
- Phase 3 New Tank Building

Site Boundary

Note:
Refer to facility assessment summary for detailed information on building upgrades.

Phase 3 - 2040 Fleet Counts
(61) 40' BEB
(56) 40' FCEB
Total = 117 Buses



Cerone Bus Depot
ZEB Blueprint 2040 Fleet Mixed BEB and FCEB

Jacobs

Site Layout & Circulation (2040)

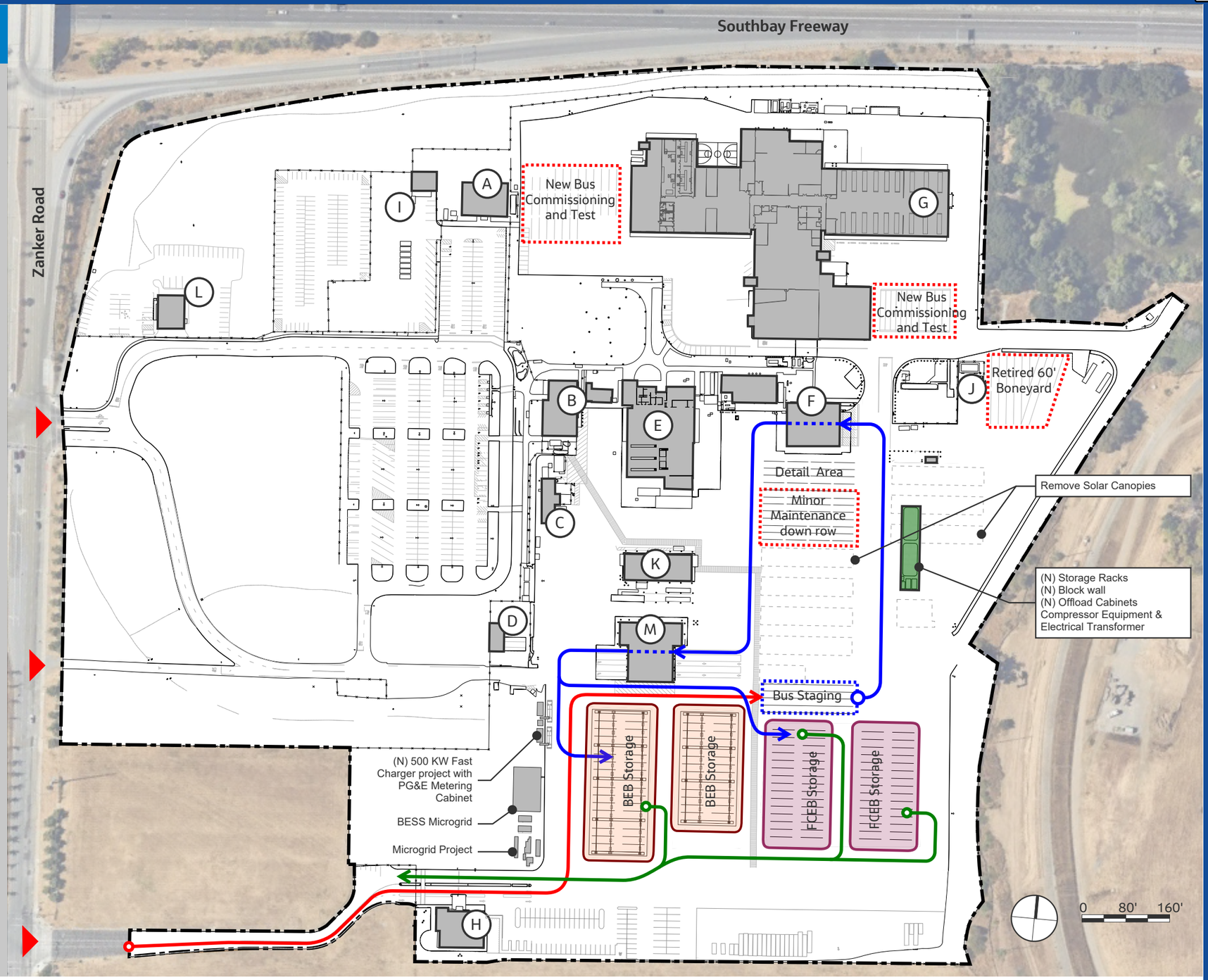
Building Function and Location

- (A) Facilities Maintenance
- (B) Bus Operations
- (C) Farebox Repair
- (D) Tire Shop
- (E) Minor Maintenance
- (F) Energy Building & Fueling
- (G) Overhaul and Repair
- (H) Guard Station, Vault Room, Dispatch & Field Ops
- (I) Bus Stop Maintenance
- (J) Communications Relay Tower
- (K) FCEB Maintenance
- (L) Paratransit Operations
- (M) Bus Wash

Operational Flow

- Pull-In
- Fueling, Wash, Store
- Pull-Out

- FCEB Bus Storage
- BEB Bus Storage
- Point of Access
- Site Boundary



Cerone Bus Depot
ZEB Blueprint 2040 Fleet Mixed BEB and FCEB

Jacobs

EXHIBIT 6

January 2025 Action Item

7.1

Santa Clara Valley Transportation Authority

Date: January 3, 2025
Current Meeting: January 9, 2025
Board Meeting: January 9, 2025

BOARD MEMORANDUM

TO: Santa Clara Valley Transportation Authority Board of Directors

THROUGH: General Manager/CEO, Carolyn M. Gonot

FROM: Chief Planning Officer, Deborah Dagang

SUBJECT: Zero-Emission Bus Blueprint

Policy-Related Action: No **Government Code Section 84308 Applies: No**

ACTION ITEM

RECOMMENDATION:

Adopt the Zero-Emission Bus Blueprint.

EXECUTIVE SUMMARY:

- The Zero-Emission Bus (ZEB) Blueprint is VTA's latest and most detailed plan for zero-emission fleet transition and combines extensive analysis with an implementation plan.
- The ZEB Blueprint builds on guidance received at the February 2024 Board Workshop to pursue a mixed fleet of battery-electric buses and hydrogen fuel cell buses and to take a flexible, appropriately paced transition that avoids negative impacts to transit service.
- Cautions are raised about reliability, safety, rising costs, funding availability and risk and how statewide transit agencies are approaching these challenges.
- Overall, the ZEB Blueprint builds on current efforts, identifies next steps, demonstrates an intent to meet the 2040 transition requirement and places the agency well to compete for funding.

STRATEGIC PLAN/GOALS:

VTA's ZEB transition aligns with the second business line of VTA's Strategic Plan of delivering projects and programs. Transitioning the entire fleet to zero-emission buses will require several successive projects that are well-planned and align with VTA's overall goals and priorities. The ZEB Blueprint seeks to set a strong direction for fleet transition that ensures near-term and long-term projects are compatible and minimizes risk and cost for VTA while ensuring quality service for VTA's riders.

FISCAL IMPACT:

There is no financial impact associated with adopting the Zero-emission Bus Blueprint.

BACKGROUND:

All transit operators in California are required to fully transition to zero-emission bus fleets by 2040 per a regulation passed by the California Air Resources Board (CARB) in 2018. The regulation sets escalating annual purchasing targets for zero-emission buses that guide agencies toward meeting the 2040 goal. The targets started at 25 percent of a fleet procurement in 2023, will rise to 50 percent in 2026, and rise again to 100 percent in 2029. Buses purchased prior to 2029 would have reached the end of their expected 12-year lifespans and be retired from the active fleet by 2040. The regulation identifies battery-electric buses and hydrogen fuel cell buses as eligible zero-emission technologies. The zero-emission designation refers only to vehicle emissions and not emissions that may occur upstream in electricity or hydrogen production.

VTA presently operates a fleet of around 430 diesel-powered buses (420 hybrid diesel and 10 conventional diesel) out of three depots. A previous test of 10 battery-electric buses was paused after one bus caught fire and the manufacturer, having declared bankruptcy, was unable to provide an adequate repair. The nine remaining buses have since been removed from service.

To keep on track to meet the 2040 goal, VTA will need to increase the pace of its transition and near-term work reflects that urgency. An installation of 34 chargers and a complementary procurement for 35 battery-electric buses are underway and on track to be operational in 2026. Design work for a 55-charger addition has begun, funding has been secured for an on-route charging pilot, and VTA is exploring an opportunity to test a small fleet of hydrogen fuel cell buses. Collectively, these efforts will build VTA's zero-emission operations expertise and inform future projects.

However, this is a challenging time to take big steps forward. Transit agencies across the nation are struggling with zero-emission bus reliability problems and a few agencies have lost buses due to fires. Zero-emission buses cost 50 to 100 percent more than diesel buses and state and federal funding is vastly inadequate to cover these costs or the costs of new charging or fueling infrastructure. Some agencies face the difficult choice of cutting transit service to pay for these higher costs-a solution that may make negative progress toward emission reduction goals if it induces more private vehicle driving by displaced transit riders.

Meanwhile, the bus manufacturing industry has undergone contraction with three Buy America compliant zero-emission bus manufacturers (Nova, Proterra and El Dorado) leaving the market in the past year. The two that remain (Gillig and New Flyer) are facing cashflow struggles caused by COVID demand decreases and recent inflation in heavy materials. Transit agencies are left with less choice, higher bus costs, longer production timelines and uncertainty about the manufacturers' ability to honor parts and warranty support over the lifetime of the bus.

Due to these concerns and the impending 2026 purchasing requirement increase, the statewide conversation around zero-emission transition among transit agencies has shifted from cautious optimism to serious concern. Appeals to delay the 2026 purchasing requirement have been rebuffed by CARB which has instead advised agencies to request exemptions to meeting the

purchasing targets. Exemption requests are allowed by the regulation, if complying would result in financial hardship or a negative impact to transit service, and some agencies already intend to pursue them.

Nevertheless, zero-emission fleet transition is a worthwhile objective and is the biggest change VTA can make toward achieving the emission reduction goals set in VTA's 2020 Sustainability Plan. The ZEB Blueprint (attached) is guided by direction provided at the February 2024 Board Workshop that endorsed a flexible approach that pursues a mixed fleet of both battery-electric and hydrogen fuel cell buses and identifies a contingency plan to purchase more hybrid-diesel buses should that be in the agency's best interest. Overall, the ZEB Blueprint demonstrates VTA's intent to meet the 2040 transition goal, identifies upcoming transitions steps, and positions the agency well to compete for discretionary funding.

DISCUSSION:

ZEB Blueprint Development and Contents

The ZEB Blueprint is the product of a year-long planning effort that featured two stages. The first stage focused on information gathering and included a detailed analysis of the state of battery-electric and hydrogen fuel cell bus technologies, their capital and operating costs, risks, environmental impacts of bus operation and production, and impacts to VTA's service delivery model. This analysis was aided by subject matter experts at Jacobs Consulting, who were hired to assist with this effort.

That analysis led to a staff recommendation that was presented at the February 2024 Board Workshop to pursue a mixed fleet strategy of roughly 30 percent battery-electric buses and 70 percent hydrogen fuel cell buses. Battery-electric buses would be used for short route assignments and hydrogen fuel cell buses for long route assignments. The mixed fleet strategy would allow for 1-for-1 replacement of hybrid-diesel buses which would minimize costs by maintaining the same size fleet and by avoiding acquiring additional land to store buses. That strategy would also provide a pathway to operating the fleet entirely from fully renewable electricity and green hydrogen and provide a measure of resiliency by diversifying energy sources.

Additionally, VTA staff sought support for a contingency plan that would preserve an option to buy hybrid-diesel buses, which are less expensive than zero-emission buses and do not require new infrastructure, if fleet replacement is needed and VTA is not ready to purchase zero-emission buses due to lack of funding or if supporting infrastructure is not ready. In such case, the agency would exercise the exemption option of the CARB regulation. The Board of Directors indicated support for the staff recommendation which guided the second stage of developing an implementation plan.

The implementation plan consists of several elements:

- A facility assessment that identifies electric charging and hydrogen fueling infrastructure needs, electrical capacity upgrades, facility safety improvements and topics for further evaluation
- An implementation timeline that aligns infrastructure, facility improvements and utility capacity upgrades with VTA's fleet replacement plan

- Layouts for each of VTA's three bus depots that ensure near-term efforts support overall transition and avoid conflicts with future efforts
- An energy strategy that helps VTA manage energy loads, energy costs and provide advance notice to PG&E of VTA's future capacity needs
- Prioritization guidance for how to balance equity goals with factors like funding availability, fleet replacement needs, workforce development and utility constraints
- A funding strategy informed by detailed cost estimates

Overall, the ZEB Blueprint functions as a menu of future efforts for VTA's Operations and Engineering & Project Delivery Divisions to implement fleet transition. It provides flexibility to move at a pace that is comfortable for VTA, to adjust the order of projects, and to adjust the balance between battery-electric buses and hydrogen fuel cell buses as these technologies and their costs evolve and VTA gains operating experience. It may be appropriate to update this plan between now and 2040 as VTA hones its transition strategy.

Costs and Funding

VTA's ability to acquire funding to cover the cost of transition will be a strong determinant of the pace at which transition can proceed. The ZEB Blueprint estimates that the cost of new electric charging and hydrogen fueling infrastructure, facility upgrades and purchasing the first generation of zero-emission buses (about 430) will cost $800 million more than if VTA continued hybrid-diesel bus operations. These figures are in line with other transit agencies' estimates for their fleet transitions. A recent MTC analysis estimated the nine-county Bay Area funding need for zero-emission transition to be over $7 billion ($2024).

Funding for zero-emission transition is currently insufficient to meet this need. Federal discretionary funding for zero-emission transition, which has increased 10-fold over previous funding levels by the Infrastructure Investment and Jobs Act, is highly competitive and meets only about 15 percent of the national need. State funding opportunities are also highly competitive. The timing of being awarded a grant is uncertain, making the pace of progress difficult to predict.

ALTERNATIVES:

The Board may choose not to adopt the ZEB Blueprint, but lack of an adopted detailed plan will leave the agency without a Board-supported actionable implementation plan and harm prospects for winning grant funding to pay for transition costs.

CLIMATE IMPACT:

No climate impacts are expected from adopting the plan but transitioning the fleet through subsequent infrastructure installations and zero-emission fleet purchases will reduce VTA's contributions to greenhouse gas emissions and make progress toward achieving the targets identified by the 2020 Sustainability Plan.

STANDING COMMITTEE DISCUSSION/RECOMMENDATION:

The Safety, Security and Transit Operations Committee reviewed this item at their October 17, 2024 meeting. The committee discussed the implementation of electric, electrified, and

hydrogen programs, Buy America restrictions, parts and components availability, and potential legislative actions to ease regulatory burdens. There were concerns raised about funding and availability of electric and hydrogen vehicles as well as challenges related to compliance with California Air Resource Board regulations. The committee requested staff present this item to the full Board in December 2024 or at a later date.

Prepared by: Adam Burger
Memo No. 9294

ATTACHMENTS:

- VTA_ZEB_Blueprint_Draft (PDF)
- ZEB_Blueprint_Board_Presentation (PDF)

Santa Clara Valley Transportation Authority

Zero-Emission Bus Blueprint





VTA Zero-Emission Bus Blueprint

NOVEMBER 2024

About VTA

The Santa Clara Valley Transportation Authority (VTA) is an independent special district that provides fixed route public transit service and paratransit service in Santa Clara County, California. VTA operates a fleet of 430 buses out of three bus depots and 98 light rail cars out of a single light rail depot.

About the Innovative Clean Transit Regulation

The Innovative Clean Transit (ICT) Regulation passed by the California Air Resources Board (CARB) in 2018 requires all transit operators in the state to transition to fully zero-emission bus fleets by 2040. Presently, two technologies meet the zero-emission standard: battery-electric buses (BEBs) and hydrogen fuel cell buses (FCEBs).

The ICT regulation sets escalating purchasing targets. In 2023, 25 percent of buses purchased must be zero-emission. The target increases to 50 percent in 2026 and 100 percent in 2029. Internal combustion engine (ICE) buses purchased before 2029 would reach the end of their 12-year expected lifespan by 2040 and would be retired from the active fleet.

CARB recognizes that zero-emission fleet transition will bear new costs and will present new challenges to transit operators that may impact their financial health or ability to deliver transit service. If complying with the purchasing targets would result in such impacts, or if zero-emission infrastructure or vehicles cannot be procured in time, agencies may request annual exemptions to meeting the purchasing targets.

Santa Clara Valley Transportation Authority

Introduction

About the Zero-Emission Bus Blueprint

The Zero-Emission Bus (ZEB) Blueprint is a strategic implementation plan that charts a course for VTA's ZEB fleet transition by 2040. The ZEB Blueprint assesses the costs, risks, environmental impacts and service delivery impacts of zero-emission technologies and recommends a mixed fleet strategy that balances risk and builds resiliency. In addition, the ZEB Blueprint identifies future projects, energy needs and transition plans for each of VTA's depots and aligns them with new bus purchases. Lastly, guidance is provided about how to prioritize next steps that incorporate equity, funding and operational considerations.

The ZEB Blueprint provides flexibility, allowing VTA to adjust its approach as technologies, markets, funding and service needs evolve and agency staff gain operating experience. Cautions are provided about factors outside of VTA's control that may affect the pace of transition, and a contingency plan is identified so that VTA's ability to provide reliable transit service is not negatively impacted.

The ZEB Blueprint builds upon and supersedes the ZEB Transition Plan (2022) and Bus Rollout Plan (2020). It aligns with the 2020 Sustainability Plan, which identifies the zero-emission fleet transition as the most impactful change toward meeting 2040 emission reduction targets. Through thorough research and a detailed implementation plan, the ZEB Blueprint should strengthen VTA's ability to attract discretionary funding to pay for ZEB transition.

The ZEB Blueprint is the product of several analyses:

Zero-Emission Technology Assessment

An evaluation of the current state of battery-electric bus and hydrogen fuel cell bus technology, potential for technology advancement, potential applications to VTA service model, costs and risks.

Service Modeling Analysis

An analysis of sixty-four scenarios that evaluated different implementations of zero-emission technologies, their impacts to fleet size, service complexity and service levels.

Capital and Operating Cost Estimates

To define the financial impact and inform the development of a funding strategy.

Well to Wheels Environmental Analysis

An analysis of the carbon impacts of production and a lifetime of operation of each zero-emission technology.

Equity Analysis

An analysis of depot routes serving communities that experience disproportionately high levels of disadvantage, pollution burden, and respiratory health ailments – to determine which depots should be transitioned first to benefit those communities.

Facility Assessment

An assessment of VTA facilities and identification of facility improvements, electric charging projects, hydrogen fueling projects, electrical capacity upgrades and areas for future analysis.

Depot Layouts and Transition Strategy

A series of depot layouts showing sequential steps for transition to ensure near-term efforts supported long-term efforts, that no efforts were in conflict and that VTA's existing depots are adequate to meet future fleet storage needs.

Prioritization Guidance

Several factors will guide VTA's decisions about which projects to pursue at which depots and their timing. Those include:

- **Equity considerations –** The California Air Resources Board encourages prioritizing service to communities that experience disadvantage, higher pollution burdens and disproportionate rates of respiratory health affliction.
- **Energy considerations –** Pacific Gas & Electric (PG&E) may have limited ability to upgrade electrical capacity to depots, which could affect the pace of transition; hydrogen prices are subject to supply and demand fluctuations in the near term, as production ramps upward.
- **Fleet considerations –** Some fleets operate out of specific depots, such as the 60-foot bus fleet that operates out of VTA's North Depot. The timing of those fleet replacements will be considered.
- **Funding considerations –** State and federal funding for zero-emission is vastly inadequate and the timing of being awarded grants and their amounts are uncertain. This can affect which projects VTA pursues and when.

Zero-Emission Bus Transition Progress to Date

The ZEB Blueprint builds on planning work and a series of projects that are completed or underway.

Hydrogen Bus Pilot (Mid-2000s)

VTA tested three hydrogen fuel cell buses as part of a Federal Transit Administration (FTA) demonstration product. At the time, the limited durability of parts, high operating costs, limited travel ranges and considerable loss of hydrogen to the atmosphere indicated the technology was not ready for wider application.

Battery-Electric Bus Pilot (2018-2023)

VTA tested a fleet of ten battery-electric buses, but the pilot ran into setbacks. Durability problems, charger/vehicle incompatibility issues and poor manufacturer support led to an unacceptable level of downtime. Ultimately a fire on one bus led to the grounding of the fleet, as the manufacturer, having since declared bankruptcy, was unable to provide an adequate repair.

Bus Rollout Plan
(Adopted in 2020)

VTA adopted the Bus Rollout Plan in 2020 to satisfy a requirement of the Innovative Clean Transit Regulation. The document identified technology pathways to full fleet transition by 2040, but did not commit VTA to any action at the time.

Strategic Conversations with the Board of Directors
(2021)

VTA developed a near-term battery-electric bus strategy that would target shorter route assignments while preserving flexibility to pivot to hydrogen fuel cell buses for longer route assignments if battery technology advancement should fall short of expectations.

Zero-Emission Bus Transition Plan
(Adopted in 2022)

To be eligible to apply for federal funding through the Low & No Emission Bus and Bus Facilities Program, VTA adopted the Zero-Emission Bus Transition Plan which reflected earlier Board Direction. VTA won a federal grant later in the year.

Cerone Microgrid Project
(Started in 2022, completion estimated in 2026)

With the help of a grant from the California Energy Commission, VTA began a project to add charging for 34 buses, a microgrid (large backup battery) and solar panels at the Cerone Depot. A procurement of 35 battery-electric buses arriving in 2026 will complement this infrastructure.

On-Route Charging Pilot
(Fully funded in 2022)

VTA received a $14.4 million grant award from the Federal Transit Administration to test on-route charging, which can extend the travel range of battery-electric buses with in-the-field charging, at the Milpitas BART Transit Station and add some electric charging infrastructure at the Cerone Depot.

Chaboya Charging Project
(Started in 2024, design work underway)

Design work is underway for charging infrastructure that would support 55 battery-electric buses at the Chaboya Depot.

Maintenance Facility Safety Retrofits
(In progress)

Safety retrofits to provide safe access to the battery packs on top of buses as well as hydrogen detection improvements are underway.

Zero-Emission Bus Transition Objectives and Strategy

The flexible mixed fleet strategy and contingency plan discussed in the ZEB Blueprint is a product of several objectives:

No negative impacts to bus service

Zero-emission buses cost 50 to 100 percent more than internal combustion engine buses and require installing expensive, new, electric-charging or hydrogen-fueling infrastructure. Broadly, funding is inadequate to meet this need, and some transit agencies are faced with cutting their transit operating budgets, which results in service cuts, to cover the cost of transition. Many operators are struggling with the reliability of their zero-emission fleet resulting in more buses breaking down in the field or being unable to be put in service.

VTA's objective is to transition the fleet while avoiding any negative impacts to bus service. This may require requesting exemptions to complying with the ICT regulation purchasing targets and replacing some aging hybrid-diesel buses with new hybrid-diesel buses. CARB encourages agencies to request exemptions if transition would result in financial hardship for the agency or negative impacts to bus service.

1-for-1 fleet replacement

Most of VTA's route assignments fall into the 150-to-250-mile range and a few exceed 300 miles. That exceeds the travel ranges of battery-electric buses, which are conservatively estimated to travel 150 miles per charge. If route assignment ranges cannot be met by a single zero-emission bus, two zero-emission buses would be needed to replace some hybrid-diesel buses that are retired. That would increase fleet size, increase cost, increase operational complexity and potentially require additional land for bus storage.

VTA's strategy is to deploy battery-electric buses on route assignments that are under 150 miles, which comprise about 30 percent of VTA route assignments, and to deploy hydrogen fuel cell buses on route assignments longer than 150 miles. That strategy, combined with small scheduling changes on the longest route assignments, will allow for 1-for-1 fleet replacement.

Resiliency and emergency response

Battery-electric bus operations are vulnerable to prolonged electrical grid outages and hydrogen fuel cell bus operations are vulnerable to interruptions in hydrogen delivery. Relying on a single technology for the entire fleet would put VTA at risk for prolonged service outages that would leave VTA riders without mobility and impede VTA's ability to provide emergency transportation, shelter, heating and cooling in case of an emergency.

A mixed fleet strategy provides diversity in energy supply and insulates VTA against losing the ability to provide full service. Hydrogen fuel cell bus operations require multiple days of hydrogen supply to be stored at the bus depot, providing further resiliency.

Flexibility and adaptability

As zero-emission technologies evolve, prices fluctuate, products and vendors enter and leave the market and VTA gains operating experience and learns from peer agencies, it may be prudent to adjust the 70/30 percent hydrogen fuel cell/battery-electric bus strategy proposed in the ZEB Blueprint. By pursuing both technologies, VTA will be able to adjust the balance of fleet technologies and be selective about which projects it pursues and when. An update to the plan may be warranted as the zero-emission space matures.

Limit costs

VTA has an obligation to spend public funding cost-effectively. By taking a reasoned approach to transition that is founded upon thorough analysis, VTA can pursue strategies that are cost-effective for VTA's scale of operations and service model and avoid sunk costs.

Prioritize safety

Use of large-scale batteries and hydrogen bring unique fire safety concerns. Prevention, suppression and response should be evaluated as part of the transition work.

Blueprint Development

STAGE 1

Evaluation of 4x ZEB technology scenarios leading to the 'Mixed Fleet' recommendation in Feburary 2024

STAGE 2

Implementation Plan
- **Site Planning and Facility Assessement**
- **Fleet Planning**
- **Energy Strategy**

The ZEB Blueprint was developed through two stages. The first stage focused on information gathering and included a detailed analysis of the state of battery-electric and hydrogen fuel cell bus technologies, their capital and operating costs, environmental impacts of bus operation and production, and impacts to VTA's service delivery model.

Mixed Fleet Recommendations

That analysis led to a staff recommendation that was presented at the February 2024 Board Workshop to pursue a mixed fleet strategy of roughly 30 percent battery-electric buses and 70 percent hydrogen fuel cell buses. Battery-electric buses would be used for short route assignments and hydrogen fuel cell buses for long route assignments. The mixed fleet strategy would allow for 1-for-1 replacement of hybrid-diesel buses which would minimize costs by maintaining the same size fleet and by avoiding acquiring additional land to store buses. That strategy would also provide a pathway to operating the fleet entirely from fully renewable electricity and green hydrogen and provide a measure of resiliency by diversifying energy sources.

Contingency Plan

Additionally, VTA staff sought support for a contingency plan that would preserve an option to buy hybrid-diesel buses, which are less expensive than zero-emission buses and do not require new infrastructure, if fleet replacement is needed and VTA is not ready to purchase zero-emission buses due to lack of funding or if supporting infrastructure is not ready. In such case, the agency would exercise the exemption option of the CARB regulation. The Board of Directors indicated support for the staff recommendation and contingency plan, which guided the second stage of developing an implementation plan.

Stage 2 consists of an implementation plan that identifies specific projects and their locations and serves as a menu of next steps for VTA's Operations and Engineering Divisions to implement. Specifically, the implementation plan:

The implementation plan consists of several elements:

- A facility assessment that identifies electric charging and hydrogen fueling infrastructure needs, electrical capacity upgrades, facility safety improvements and topics for further evaluation.
- An implementation timeline that aligns infrastructure, facility improvements and utility capacity upgrades with VTA's fleet replacement plan
- Layouts for each of VTA's three bus depots that ensure near-term efforts support overall transition and avoid conflicts with future efforts
- An energy strategy that helps VTA manage energy loads, energy costs and provide advance notice to PG&E of VTA's future capacity needs
- Prioritization guidance for how to balance equity goals with factors like funding availability, fleet replacement needs, workforce development and utility constraints
- A funding strategy informed by detailed cost estimates

Stage 1

Technology Assessment

Technology Comparison

Each zero-emission technology comes with tradeoffs around vehicle cost, infrastructure cost, energy cost, travel range, space needs, impacts to operations and safety concerns. Each transit operator must identify the right technology(ies) and configuration for their unique constraints and service model. The tables below show key differences for the technologies.

Battery-electric buses are charged at bus depots in a strategy called depot-charging. On-route charging is a strategy to extend the travel range of these buses by providing a fast, high-powered charge to partially replenish the battery while the bus is in the field, typically at the end of a route.

Hydrogen fuel cell buses store their energy in the form of compressed hydrogen that is stored in onboard tanks. A fuel cell uses a chemical reaction to convert the hydrogen into electricity that is stored in a battery that powers the bus.

Technology	Energy Storage	Propulsion	Emissions
VTA Hybrid-Diesel Bus	Renewable diesel	Diesel Engine > Battery > Electric Motor	Yes
Depot Charged BEB	Large onboard batteries	Battery > Electric Motor	No
Depot Charged BEB + On-Route Charging	Small onboard batteries	Battery > Electric Motor	No
Hydrogen Fuel Cell Bus	Compressed hydrogen	Fuel Cell > Battery > Electric Motor	No

Technology	Cost Per Bus	Approx. Travel Range	Fleetwide Replacement Ratio	Storage Space Constraint?
VTA Hybrid-Diesel Bus	$800K	400 miles	1-to-1	No
Depot Charged BEB	$1.5M	150 miles	1.2-to-1*	Yes
Depot Charged BEB + On-Route Charging	$1.4M	Unlimited**	1-to-1	No
Hydrogen Fuel Cell Bus	$1.6M	300 miles	1-to-1	No

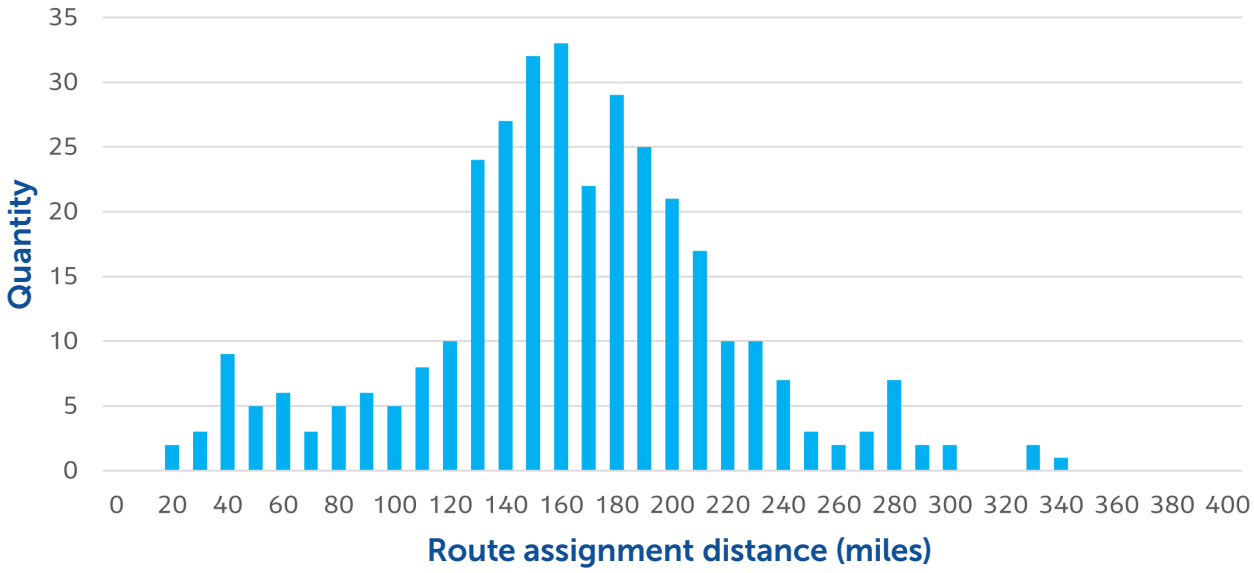
*Evaluated against VTA's service model

**Depending on on-route charging locations

Travel Range Considerations & VTA Service Model

VTA bus service employs a clever efficiency of having operators start their shift by meeting the bus along the route, relieving another operator that has completed their shift. This prevents losing time by driving back to the depot while out of service to switch drivers, which maximizes the quantity of hours VTA can provide to the public. However, this also means that VTA buses travel long distances in a day, sometimes upwards of 300 miles. Diesel-powered buses can travel 400 miles per fueling, but the shorter travel ranges of zero-emission buses, particularly battery-electric buses, make this an acute issue for VTA's transition.

August 2024 VTA Route Assignment Distances



Operational Risks

Hybrid-diesel bus operations have a track record of reliability and low risk of service interruption since transit agencies have days of fuel reserves on-site, service does not rely on in-the-field infrastructure, fueling is fast, and diesel is widely available in case buses need to travel away from depots for emergency response. Those conditions are ideal for bus operation as they provide resiliency and the ability to recover quickly if something goes wrong, but the zero-emission technologies afford less convenience or margin for error.

Battery-electric buses have shorter travel ranges and long charging times, which adds operational complexity as buses are swapped in and out of service during the day. Rigid charging schedules decrease the room for error each night to be able to provide full service to the public the following day. On-route charging adds operational risk as providing full service is reliant upon in-the-field chargers working at all times. Power outages, vandalism, behind-schedule buses and difficulty making a proper connection with pantographs can result in buses running out of charge before completing their daily service.

Hydrogen fuel cell bus operation benefits from on-site fuel reserves, and although approximately double the time for diesel fueling, hydrogen fueling can occur in a manner of minutes, allowing more recovery time in preparing buses for morning pull out. However, the potential for hydrogen supply interruptions and the general scarcity of hydrogen availability pose risks to using hydrogen-powered buses for emergency response.

Technology	Service Disruption Risk	Charging/Fueling Time	Emergency Resiliency
VTA Hybrid-Diesel Bus	Low	Fast	High
Depot Charged BEB	Medium	Slow	Medium
Depot Charged BEB + On-Route Charging	High	Slow	Medium
Hydrogen Fuel Cell Bus	Medium	Moderately fast	Medium

Service Modeling

To understand the impact each technology would have on VTA's transit operations, over sixty model runs were completed that imagined different factors like battery size, charging strategy, outside temperature and age of battery. Smaller batteries mean smaller travel ranges than large batteries. Hot or cold days will consume electricity from the battery at a greater rate to run air conditioning or heating systems, sapping travel range. A battery that is six years old and near replacement will hold about 80 percent of the charge of a new battery. VTA must plan for a worst-case scenario (extreme weather, old battery) as a default assumption.

This extremely detailed analysis yielded optimal scenarios (as shown in the table below) for depot-charged battery-electric bus operation, on-route charging aided battery-electric bus operation and hydrogen fuel cell bus operation and their fleet size requirements, change to current route assignment lengths and change in hours needed to provide equivalent revenue service as is presently provided (returning to the depot to charge adds more hours when the bus is out of service).

Table summarizing the results of service modeling across the four scenarios

Technology	Fleet Size Change	Blocks Requiring Modification	Service Hour Change to Provide Same Service as Today
Depot Charged BEB	20% Increase (+76 Buses)	71%	3% Increase
Depot Charged BEB + On-Route Charging	2% Increase (+9 Buses)	7%	<1% Increase
Hydrogen Fuel Cell Bus	No Change	7%	No Change

Wells to Wheels Emissions Analysis

The zero-emission designation refers only to vehicle emissions and does not account for any emissions that occur upstream in electricity or hydrogen production. Battery-production and battery recycling create greenhouse gas emissions as does the share of non-renewable energy associated with powering the vehicle. Presently, gray hydrogen, which is made by carbon-intensive natural gas reformation, accounts for 99 percent of commercially available hydrogen in California, but major investments in green hydrogen production are underway, including nearby production green-hydrogen production facilities.

Carbon Impacts of Bus Production and Operations
(Units are Metric Tons of CO2 Equivalent per Bus)

Technology	Battery Production	Battery Replacement	End of Life	12 Years of Operation	Total
Battery-Electric Bus	40	40	4.4	282*	**367**
Hydrogen Fuel Cell Bus + Gray Hydrogen	12	8	0.1	743	**763**
Hydrogen Fuel Cell Bus + Green Hydrogen	12	8	0.1	37	**58**

*assumes VTA's current 60/40 percent renewable/non-renewable grid energy mix

Capital and Operating Cost Analysis

A preliminary, high level vehicle, infrastructure, and maintenance cost assessment was developed for order-of-magnitude comparative purposes of each of the singular technology fleetwide scenarios. A new hybrid scenario featuring a 30 percent battery-electric buses and 70 percent hydrogen fuel cell buses was also developed as an extrapolation of depot-charged battery-electric bus scenario and hydrogen fuel cell bus scenario. That scenario envisioned using battery-electric buses on shorter route assignments and hydrogen fuel cell buses on longer routes, playing to each technology's strengths. Vehicle costs cover the first generation (around 430 buses) of zero-emission vehicles.

Technology	Vehicle Cost	Infrastructure Cost	Infrastructure + Vehicles	Annual Fuel + Maintenance
VTA Hybrid-Diesel Bus	$400M	-	$400M	$30M
Depot Charged BEB	$550M	$300M	$850M	$35M
Depot Charged BEB + On-Route Charging	$450M	$215M	$650M	$25M
Hydrogen Fuel Cell Bus	$600M	$150M	$750M	$45M
30% BEB + 70% FCEB	$550M	$150M	$700M	$40M

*Note – Estimates are for comparative purposes only. Detailed cost estimates were developed for the recommended Mixed Fleet strategy which are presented in Phase 2 of the Blueprint.

Mixed Fleet Recommendation

Past Board direction emphasized a flexible approach that would allow VTA to consider changing technology strategies as staff gained experience with battery-electric buses, saw how technology and costs evolved and learned from peer agency experiences. Given the rapid cost increases of battery-electric buses, present expectation that battery technology will not advance to achieve range parity with diesel- or hydrogen-powered buses and uncertainty around gaining electrical capacity upgrades, staff advised diversifying VTA's technology strategy to pursue a mixed fleet with an initial aim toward 70 percent hydrogen fuel cell buses and 30 percent battery-electric buses.

The 70/30 balance is based on the length of VTA's route assignments. Approximately 30 percent of VTA's bus assignments are shorter than 150 miles and can be served with battery-electric buses. The remaining assignments can fit within the 300-mile range of hydrogen fuel cell buses, with small adjustments to scheduling. Such a blend would provide the following benefits:

- Allow VTA to maintain the same fleet size of 440 buses.
- Not require an increase in the quantity of service hours (time when the bus is moving) needed to provide the same quantity of revenue hours (time when the bus is open for riders).
- Limit the amount of charging infrastructure that must be installed within bus parking areas, allowing for greater flexibility of depot use and more space-efficient bus parking than a 100% battery-electric fleet.
- Provide a measure of resiliency by diversifying energy sources. Should access to grid electricity or hydrogen supply become a temporary challenge, VTA could still roll out a portion of service.
- Give VTA options for dispatching buses for emergency responses as different fueling/charging options will exist where VTA buses are sent.
- Provide a pathway to the least carbon-intensive ZEB operations with green hydrogen.
- Maintain flexibility to change the balance of hydrogen fuel cell buses and battery-electric buses as these technologies, costs and vehicle availabilities evolve.



Stage 2

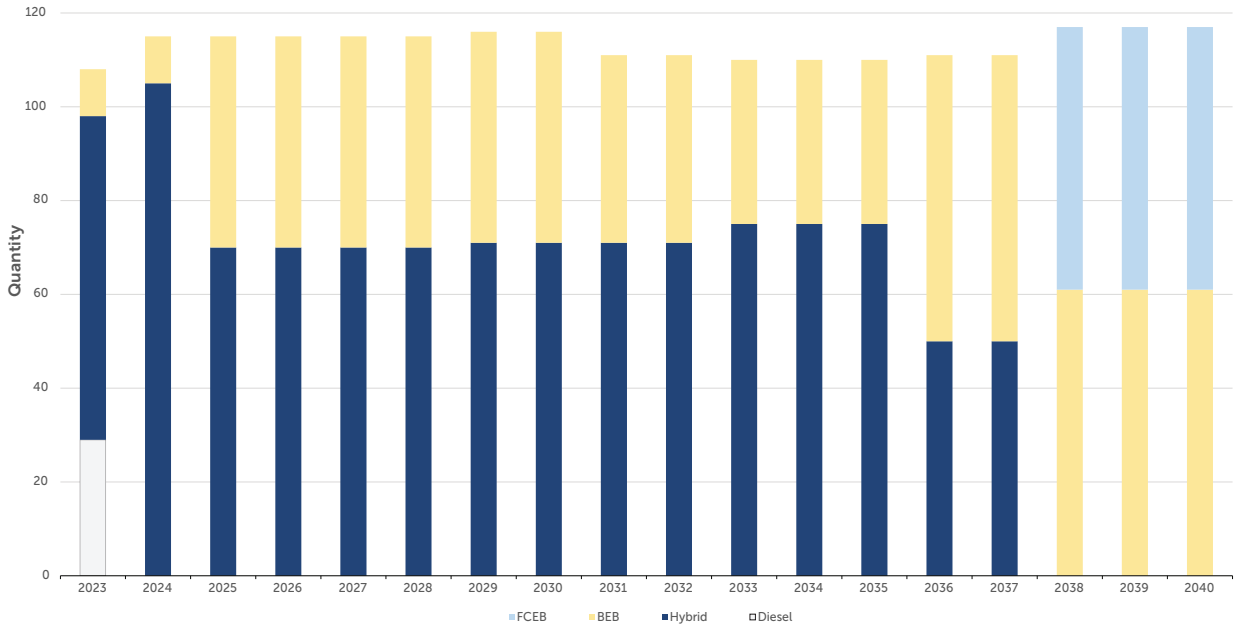
Introduction

The second stage of the ZEB Blueprint consists of an implementation plan that identifies the quantities battery-electric and hydrogen fuel cell buses that will operate out of each depot, specific facility and infrastructure projects, their location within the depots, guidance about how to prioritize implementation, capital cost estimates and areas of future analysis. Cost estimates developed during this stage employed a more detailed methodology and do not align with earlier, high-level estimates.

Cerone Depot

VTA's Cerone Bus Depot is located in North San Jose and is home to VTA's only major repair facility. The Cerone Bus Depot is envisioned to operate both battery-electric and hydrogen fuel cell buses and be transitioned over three phases.

The anticipated final fleet make-up and transition timeline is provided below.



Proposed ZEB Mix	
BEB - 40ft	61 (52%)
FCEB - 40ft	56 (48%)
Total	**117 (100%)**

Depot Phasing Layouts

The following pages show indicative changes to the layout of Cerone depot across each of the transition phases. It includes references to the infrastructure projects required to support a fully zero-emission fleet, followed by a final 'end-state' layout demonstrating what the depot could look like in 2040.

Phase 1 (2025)

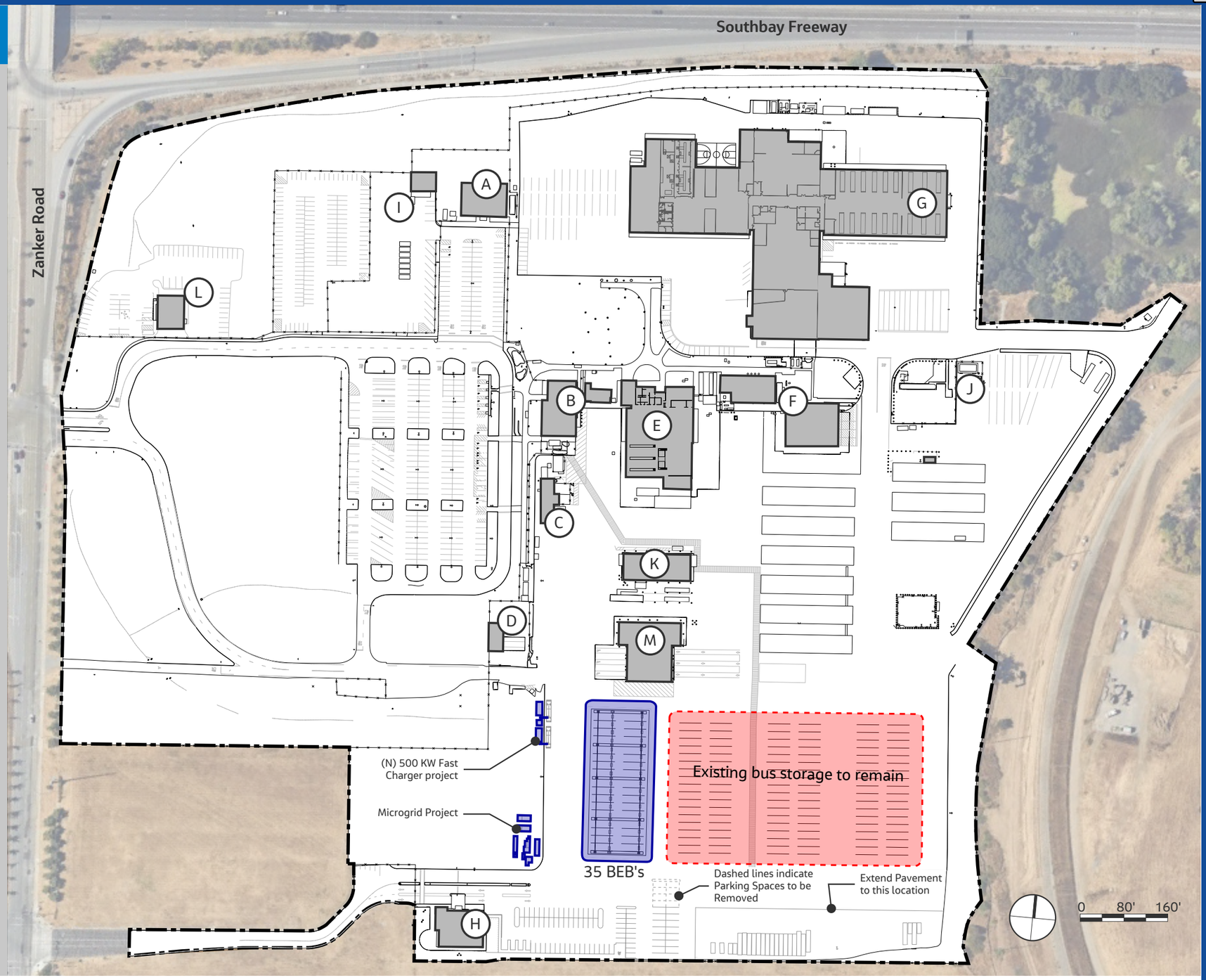
The first phase of BEB deployment and procurement is underway at Cerone.

1. Purchase of 35 40' BEBs.

2. Microgrid Project: Installation of 12 chargers with 34 dispensers, solar canopies and a microgrid, containing a large backup battery that can store solar energy and charge buses. Located in the southwest area of the Cerone bus parking area.

3. Installation of BEB fast chargers.

4. A new PG&E electric service for BEB charging is planned as part of the microgrid project which will satisfy power needs for all future zero-emission phases at Cerone.



Phase 1 Bus Storage and Charging Equipment

Existing Bus Storage to Remain

Site Boundary

Note:
Refer to facility assessment summary for detailed information on building upgrades.

Phase 1 - 2025 Fleet Counts	
(35) 40' BEB	(8) 30' Hybrid
(10) Pilot BEB Proterra - Inactive	(62) 40' Hybrid
Total = 115 Buses	

Cerone Bus Depot
ZEB Blueprint 2040 Fleet Mixed BEB and FCEB

Jacobs

Phase 2 (2036)

The second phase at Cerone will be an expansion of the the BEB deployment, as well as facility upgrades and retrofits to accommodate BEBs and FCEBs. This will include:

1. Procurement of 26 40' BEB vehicles.

2. Installation of 9 additional chargers and 26 pantograph dispensers.

3. Buildings G & E (Major and Minor Maintenance) upgrades, including fire suppression and hydrogen gas detection upgrades, a new fire pump system at building G, and improvements for bus rooftop access.

4. Addition of an on-site FCEB / BEB battery storage facility, located in the vicinity of building G.

Overall BEB requirements

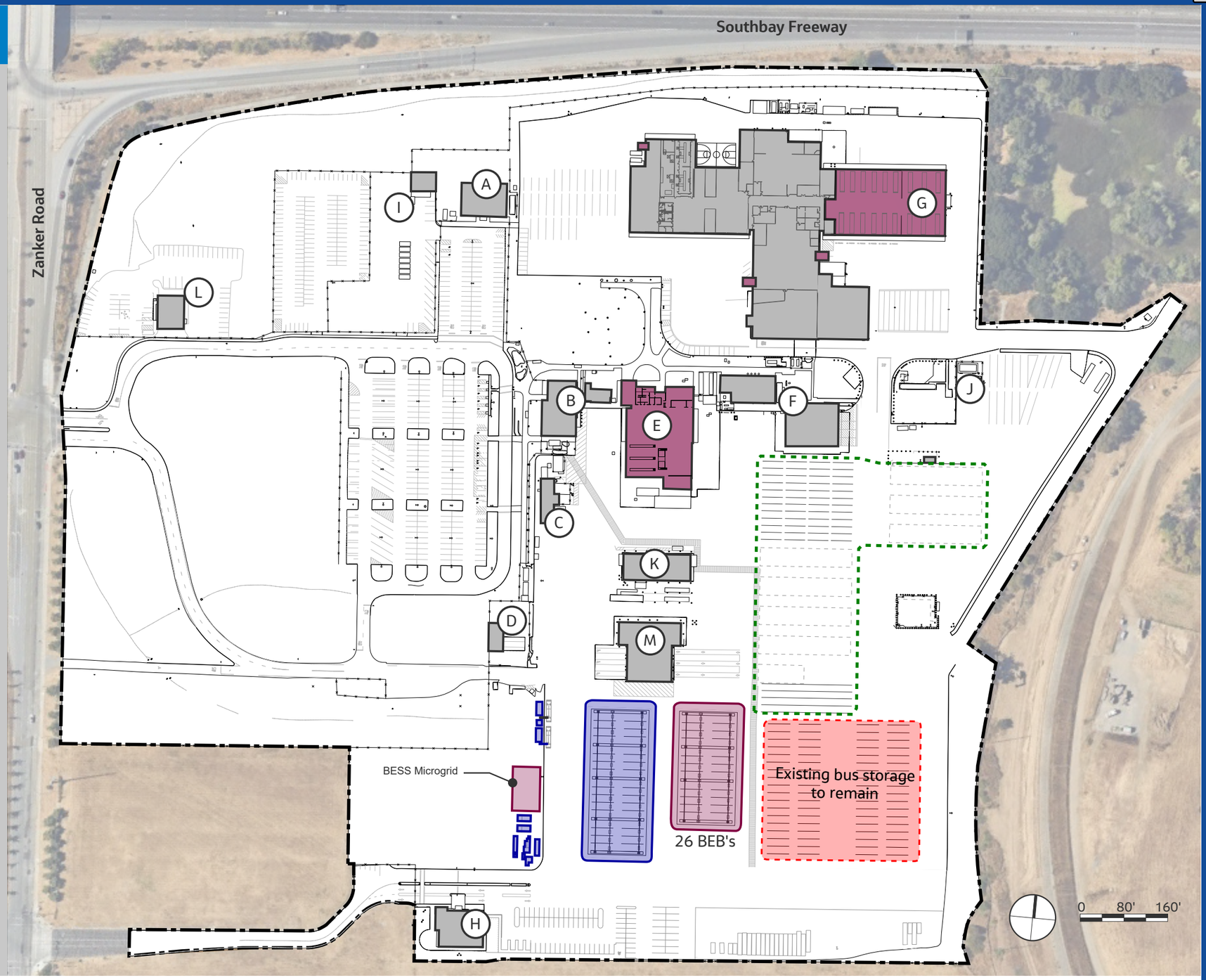
21x BEB Chargers; 61x Pantograph Dispensers

13x Maintenance Bay Plug-In Chargers

- Phase 1 Bus Storage and Charging Equipment
- Phase 2 Bus Storage and Charging Equipment
- Phase 2 Building Upgrades
- Existing Bus Storage to Remain
- Phase 2 Remove Solar Canopies and re-strip lanes for detail and stagging area
- Site Boundary

Note:
Refer to facility assessment summary for detailed information on building upgrades.

Phase 2 - 2036 Fleet Counts
(61) 40' BEB
(50) 40' Hybrid
Total = 111 Buses



Cerone Bus Depot
ZEB Blueprint 2040 Fleet Mixed BEB and FCEB

Jacobs

Phase 3 (2040)

Deployment of the central hydrogen fuel storage and dispenser facilities in one phase, with provisions for a phased expansion of dispensers as the Cerone FCEB fleet grows over time.

Hydrogen Infrastructure and Vehicles

1x Large Liquid Hydrogen Station (18k gal.) and 2x hydrogen dispensers

56 40' FCEB vehicles

Building Compliance

Building G hydrogen gas detection upgrade completed in Phase 2

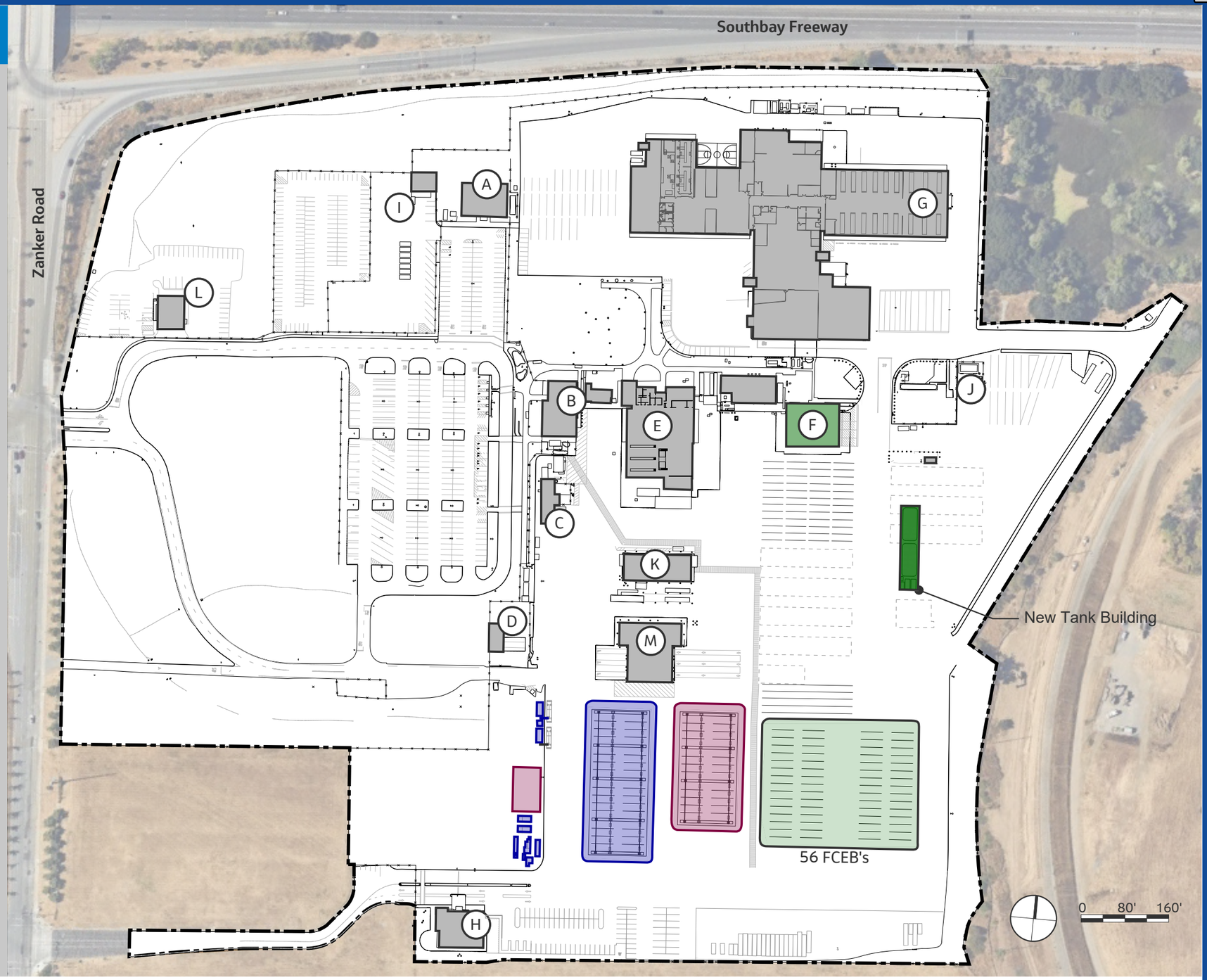
Study and potential upgrade of bus wash and fueling facilities to ensure adequate hydrogen safety systems.

- Phase 1 Bus Storage and Charging Equipment
- Phase 2 Bus Storage and Charging Equipment
- Phase 3 Bus Storage
- Phase 3 Potential Building Upgrades
- Phase 3 New Tank Building

Site Boundary

Note:
Refer to facility assessment summary for detailed information on building upgrades.

Phase 3 - 2040 Fleet Counts
(61) 40' BEB
(56) 40' FCEB
Total = 117 Buses



Cerone Bus Depot
ZEB Blueprint 2040 Fleet Mixed BEB and FCEB

Jacobs

Site Layout & Circulation (2040)

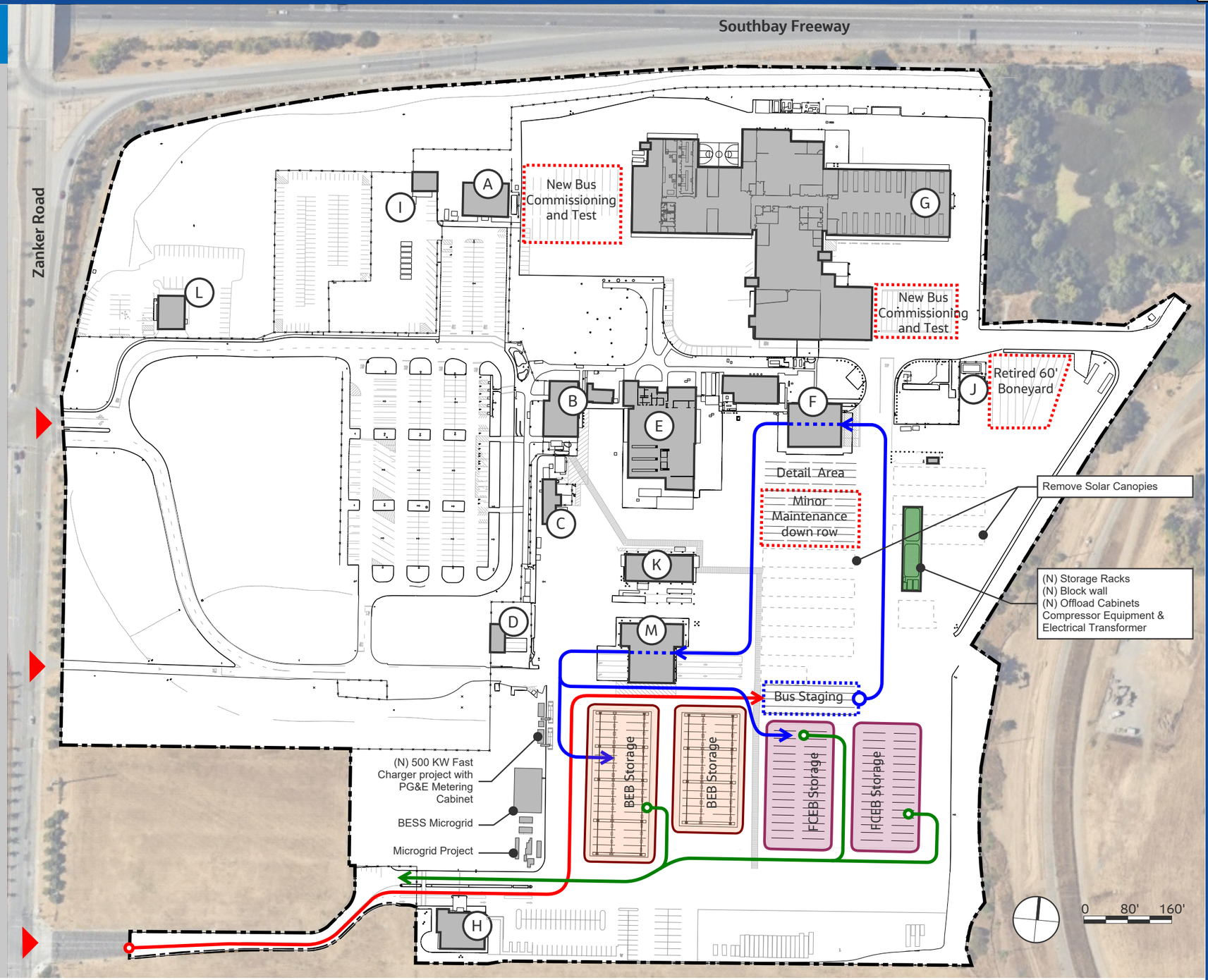
Building Function and Location

- (A) Facilities Maintenance
- (B) Bus Operations
- (C) Farebox Repair
- (D) Tire Shop
- (E) Minor Maintenance
- (F) Energy Building & Fueling
- (G) Overhaul and Repair
- (H) Guard Station, Vault Room, Dispatch & Field Ops
- (I) Bus Stop Maintenance
- (J) Communications Relay Tower
- (K) FCEB Maintenance
- (L) Paratransit Operations
- (M) Bus Wash

Operational Flow

- Pull-In
- Fueling, Wash, Store
- Pull-Out

- FCEB Bus Storage
- BEB Bus Storage
- Point of Access
- Site Boundary



Cerone Bus Depot
ZEB Blueprint 2040 Fleet Mixed BEB and FCEB

Jacobs