



ITEM ID: 2026-254-0

TRANSMITTAL DATE: October 16, 2026

MEETING DATE: October 23, 2026

TO: Board of Directors

FROM: Paul Hubler, Chief Strategy Officer
Justin Fornelli, Chief, Program Delivery

SUBJECT: Fleet Modernization Path Analysis

Issue

During the due diligence phase of the Tier 4 procurement which included an independent market survey conducted by consultant staff, direct engagement with locomotive manufacturers, and consultation with peer rail agencies, it was determined that parts and lifecycle maintenance costs for Tier 4 locomotives, regardless of manufacturer, are significantly higher than the Authority's legacy Tier 2 locomotives. To provide a decision framework, staff have prepared a strategic analysis over a 30-year time horizon comparing a Fleet Modernization Plan with three distinct paths for consideration.

The 30-year total cost of ownership under the Tier 4 procurement path (Path A) is estimated at \$1.047 billion, compared to an overhaul path retaining the existing Tier 2 fleet (Path B) with a cost of \$375 million – a difference of approximately \$671 million. Meanwhile a third option of 12 Diesel Battery-Hybrid locomotives (Path C) is estimated at \$471 million which is \$95 million more than Path B. The Board is asked to consider this recommendation and provide direction on the preferred strategic path forward. This item was presented at the MAAC meeting on June 10, 2026, and the CEO meeting on June 12, 2026.

Recommendation

It is recommended that the Board approve suspending a prior initiative to replace existing Tier 2 locomotives with Tier 4 locomotives (Path B of the attached strategic analysis). Upon this approval, staff will request the transfer of Member Agency capital funding allocated for the purchase of replacement Tier 4 locomotives, totaling \$10.7 million, to the refurbishment of existing Tier 2 or lower locomotives. Staff will also initiate the process of voluntary remittance of the Tier 4 procurement grant funds.

Strategic Commitment

This report aligns with the Strategic Business Plan commitment of:

- **Advancing Key Regional Goals:** We will grow the role of regional rail in addressing climate change, air quality, and other pressing issues by advancing toward zero emissions, making rail a compelling alternative to single-occupant automobiles and advancing equity-focused opportunities for all communities throughout Southern California.

Background

The Authority's current rolling stock fleet consists of 40 F125 Tier 4 locomotives, 15 MP36 Tier 2 locomotives, 5 F59PHR Tier 2 locomotives and 1 F59PH Tier 0 locomotive.

The Authority's commitment to emissions reduction is a central pillar of its operational and capital planning strategy. In April 2021, the Board adopted the recommended staff plan to apply for grant funding for the purchase of new Tier 4 locomotives to replace a portion of the legacy lower-tier locomotive fleet. The number of Tier 4 locomotives to be purchased would be dependent on the Authority's service plan, demand for trainsets, and grant funding availability.

For the period of 2021 through 2024, several grant application requests were submitted for applicable programs at the state and federal level. The South Coast Air Quality Management District (South Coast AQMD) Governing Board unanimously approved up to \$87.4 million in contingency grant funds to replace 12 Tier 2 locomotives with lower-emission Tier 4 locomotives. In addition, on November 19, 2024, SCAG, as an eligible agency, submitted an application on Metrolink's behalf to the California Transportation Commission (CTC), requesting \$52.6 million for the SB 1 Solutions for Congested Corridors Program (SCCP). The state grant funds were awarded on June 26, 2025. Finally, the Member Agencies allocated \$10.7 million as part of the FY23 and FY24 Capital Budgets for the purchase of replacement Tier 4 locomotives. The combined funding contributions received total \$150,753,233. However, despite the combined fund awards received, an unfunded procurement gap remains of \$33,120,908. This gap is attributed to equipment cost escalations as well as grant constraints that fund only a portion of each locomotive procurement cost.

Discussion

The Authority retained Jacobs Engineering to conduct a comprehensive survey of current Tier 4 passenger locomotive manufacturers operating within the North American market. The objective of the survey was to assess available options, Buy America compliance, and long-term viability of prospective vendors.

Survey Findings-Market Landscape: While several manufacturers were evaluated, the survey reached a clear conclusion regarding market availability under federal procurement requirements:

- **Buy America Compliance:** Siemens Mobility is the only Tier 4 passenger locomotive

manufacturer with a qualifying domestic manufacturing presence (Sacramento, CA). All other evaluated manufacturers lack U.S.-based production facilities sufficient to meet FTA/FRA Buy America thresholds applicable to federally funded procurements.

- **Siemens Charger Platform:** The Siemens Charger (SC-44 and variants) entered the market with first deliveries in 2016 and commenced revenue service in 2017. With over 400 units ordered and/or delivered, the platform has accumulated hundreds of millions of cumulative revenue miles across agencies in every North American climate zone.
- **Market Position:** Siemens has become the dominant provider in the North American passenger rail market, with its Sacramento facility representing the highest-volume Tier 4 passenger locomotive manufacturing operation in the country.
- **Service Proven Record:** The Charger platform is currently in active service across multiple Class II and commuter rail operators, including Amtrak, Illinois Department of Transportation, Washington State Department of Transportation, Colorado Department of Transportation, and others — providing a broad operational reference base for performance and maintenance experience.

Implication of a Single Source Market: The practical absence of Buy America-compliant competition for this procurement category has significant implications:

- The Authority has no meaningful leverage to negotiate pricing through competitive solicitation, coupled with a low quantity unit need.
- Long-term parts availability, Technical Support & Spares Supply Agreement (TSSSA) pricing, and technical support terms are subject to Siemens' discretion.
- Future equipment manufacturer business decisions (facility closures, product line discontinuation, corporate restructuring) could materially impact fleet support.

Unit Acquisition Pricing: A central finding of the market survey is that procurement volume - not technical specifications - is the primary driver of per-unit cost in the Tier 4 passenger locomotive market. This has significant implications for the Authority's 12- to 15-unit procurement need:

- **Multi-State Procurements:** Collaborative multi-state procurement consortia (e.g., Midwest Interstate Passenger Rail Commission) have successfully driven unit costs down by aggregating orders across multiple agencies, substantially increasing total volume. While the 2014 multi-state locomotive procurement contract administered by Illinois DOT could have offered more competitive pricing, it expired in 2024, prior to the full commitment of grant funding to Metrolink.
- **Large Independent Orders:** Amtrak's 125-unit ALC-42 procurement achieved competitive pricing through sheer order scale.
- **Authority's Position:** At 12 to 15 units, the Authority's procurement falls well below the volume threshold for advantageous pricing. The most recent Siemens cost estimate provided to the Authority is more than \$15 million per locomotive, inclusive of an initial spare parts package. This figure does not include the TSSSA service contract (referenced below) or long-term lifecycle maintenance costs.

Technical Support and Spares Supply Agreements (TSSSA): Meetings with Siemens directly as well as other rail agencies currently operating the Charger locomotives, brought into focus that the Chargers are equipped with highly sensitive, computerized components which are much more technical to operate, especially when compared to older Tier 2 models and even the Authority's current fleet of F125 Tier 4 locomotives. Recent updated research findings indicate that Charger locomotives have a similar lifecycle cost compared to the F125s (which are significantly more costly than Tier 2 models).

Given the challenges the Authority has faced with sourcing parts for the regular maintenance of the F125 fleet, a Parts & Maintenance contract option with the locomotive vendor should be considered as integral to the Tier 4 locomotive procurement. The Siemens TSSSA is routinely purchased by agencies procuring Charger locomotives and is considered a near-essential component of the fleet management strategy given the proprietary nature of the platform software and systems. It is estimated to cost \$1,000,000 per locomotive annually. With a procurement of 12 locomotives, TSSSA would cost \$360 million over a 30-year lifecycle. Based on our discussions with peer agency Capitol Corridor staff currently operating Siemens Charger locomotives, the TSSSA does not include subsystem overhauls, which come at significant additional cost.

Diesel Battery-Hybrid Locomotive – Technical Analysis

Swiss firm Stadler manufactures Diesel Battery-Hybrid locomotives that combine a clean Tier 4 diesel engine with high-capacity onboard battery storage. This system automatically captures and stores energy during braking, reusing it to assist with acceleration and to power onboard systems. This significantly reduces fuel and wear compared to standard diesel engines. Jacobs Engineering was also retained to provide a market analysis of this Stadler equipment as part of the comparative fleet analysis.

Procurement:

The supplier provided an estimated cost per locomotive of \$17 million which includes 5% allowance for the acquisition of spare parts, contingency and staff time totaling \$205 million for 12 locomotives. While this cost estimate seeks to incorporate a Buy America compliance requirement, it explicitly excludes unpredictable potential impacts from tariffs and escalations.

Technical Support and Spares Supply Agreements (TSSSA):

The TSSSA scope includes provision of maintenance materials, spare parts for all scheduled and unscheduled maintenance, two truck overhauls, two main-engine overhauls, and one battery replacement. The specified overhauls include the associated parts and labor with a total TSSA estimated cost of \$300 million for the 12-locomotive fleet over a 30-year period, which is approximately \$833,000 per locomotive per year.

Facility Modification:

The new hybrid locomotive is assumed to use a platform similar to the Metrolink's F125 locomotives, so significant modifications to existing infrastructure should not be required. Existing lifting equipment, inspection facilities, and many special tools will largely remain the same. The primary new considerations are expected to include battery handling and storage, Energy Storage System (ESS) diagnostic equipment, environmental storage requirements, fire and emergency-response provisions, and potential battery charging equipment. A \$10M infrastructure-upgrade contingency was allocated for potential infrastructure and equipment upgrades.

Strategic Analysis: During the due diligence phase of the Tier 4 procurement, it was determined that parts and lifecycle maintenance costs are much higher than legacy Tier 2 locomotives. In addition, unit costs for locomotive procurement increased after grant awards were received, totaling a new funding gap of \$33M. Staff conducted a comprehensive 30-year strategic analysis comparing three distinct fleet management paths (Path A, Path B and Path C). The analysis encompasses capital acquisition, grant funding offsets, TSSSA service agreements, and all anticipated lifecycle maintenance costs. Path C is estimated to have a

procurement funding gap of \$54M.

Path A — Tier 4 Procurement

Path A proceeds with procurement of 12 new Siemens Charger Tier 4 locomotives, utilizing the \$150.8 million in secured grant funding and Member Agency contributions while retaining 9 of the existing Tier 2 locomotives. This path delivers meaningful emissions reductions and replaces aging Tier 2 equipment.

Key Decision Points:

- Total 30-year cost burden of ~\$1.047 billion, with the TSSSA alone representing ~\$360 million of that total
- Sole-source dependency on Siemens for parts, software, and technical support over 30 years
- Precedent of parts availability challenges with existing F125 Tier 4 fleet suggests Path A amplifies known risks
- Tier 4 locomotives carry a 30- to 40-year useful life. Path A ends the 30-year term with a modern, high-value fleet
- Tier 4 engines meet current EPA and CARB standards

Path B — Fleet Retention and Overhaul

Path B bypasses Tier 4 procurement and instead retains the existing 21 Tier 2/Tier 0 locomotives, incorporating planned overhaul cycles necessary to extend service life and maintain operational reliability.

Key Decision Points:

- Total cost of \$375 million over 30 years — a \$671 million savings compared to Path A
- Avoids sole-source TSSSA exposure and proprietary platform dependency
- Maintenance history and operational experience is well documented with a readily available market for parts and supplies
- Overhaul costs are known, competitive, and can be planned for within existing capital programs
- Allows the Authority to preserve financial flexibility for future zero emission vehicle transition planning by not locking into 30-year diesel commitments
- CARB and SCAQMD are tightening rail emission standards. Tier 2 and lower locomotives face a credible future risk of operational restriction

Path C - Diesel Battery-Hybrid Locomotive Procurement

Path C proceeds with procurement of 12 new Stadler Diesel Battery-Hybrid locomotives, utilizing the \$140.1M in secured grant funding while retaining 9 of the existing Tier 2 locomotives. While there is an initial procurement funding gap of \$54M, this path delivers meaningful emissions reductions and replaces aging Tier 2 equipment.

Key Decision Points:

- Total 30-year cost burden of ~\$471M, with the TSSSA representing ~\$300M of that total
- Sole-source dependency on Stadler for parts, software, and technical support over 30 years
- Tier 4 locomotives carry a 30–40-year useful life. Path C ends the 30-year window with a modern, high-value fleet
- Tier 4 engines meet current EPA and CARB standards
- Battery-Hybrid provides for additional fuel savings and emission reduction with

regenerative braking technology

Budget Impact

There is no budget impact and staff will coordinate with Member Agencies for the reallocation of \$10.7M grant match funds to other capital projects.

Next Steps

Upon Board approval, staff will implement Path B, retain existing Tier 2 fleet and perform scheduled maintenance overhauls. Staff will advise the grantors and initiate the process of voluntary remittance of grant funds. Additionally, staff will initiate the Project Budget Revision (PBR) process with Member Agencies for the reallocation of \$10.7M in grant match funds to other capital projects.

An in-depth fleet management study is scheduled to commence in FY28, building on prior detailed data of fleet propulsion technologies and simulations as well as incorporating findings from this current fleet analysis. Concurrently, staff will monitor the zero-emissions market as it matures and evaluate grant funding opportunities for pilot demonstration projects.

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Attachment(s)

[Presentation - Fleet Modernization Path Analysis](#)