



King County

KING COUNTY AUDITOR'S OFFICE

JUNE 11, 2024

Zero Emissions: Metro Transit Working to Mitigate Risks to County's Ambitious 2035 Goal

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EXECUTIVE SUMMARY

King County Metro Transit is making substantial efforts toward achieving King County's goal of a zero-emission fleet by 2035, improving collaboration and planning needed to complete the transition. It also faces significant risks that may impede reaching the goal, including a declining number of bus manufacturers and technology limitations. In response to these risks, Metro Transit is considering zero-emission options beyond battery-electric buses. We found that Metro Transit could improve communication about its efforts to diversify propulsion systems, establish emergency plans, and formalize existing efforts within its Capital Division to improve project processes and the use of collaborative delivery. This audit answers questions posed to us by the King County Council in Ordinance 19546 and makes recommendations for ways Metro Transit can improve the likelihood it will reach the 2035 goal.

Proviso Index

This audit report is a response to a proviso in King County Ordinance 19546. The table below indicates where in the report to find the information requested. The report also builds on our 2020 report [Metro Transit Bus Electrification: Best Practices Review](#) and our 2023 audit report [Metro Transit: Strengthening Data, Communication, and Continuous Improvement Processes Could Help Reduce Project Delays](#).

Proviso Element	Report Location
<p>A. A review of the timeline, delivery status, and risks for Metro Transit Department transit electrification capital projects, based on information provided under King County Code 4A.100.100.A.4. as well as additional information that the auditor may request and receive from the Metro Transit department.</p>	<ul style="list-style-type: none"> • Section 3 • Appendix 2
<p>B. A summary of the national trends in zero-emission transit technology, market, or supply chain issues that could affect the Metro Transit Department in the management and delivery of its transit electrification capital projects.</p>	<ul style="list-style-type: none"> • Section 1
<p>C. Recommendations for the Metro Transit Department on the efficiency and effectiveness of its management and delivery of transit electrification capital projects.</p>	<ul style="list-style-type: none"> • Section 3 • Appendix 1

REPORT HIGHLIGHTS

What We Found

Metro Transit has devoted substantial resources to organizing its department to transition to a zero-emission bus fleet by 2035, through improving the planning and collaboration efforts needed for this goal. It also faces significant risks that may impede reaching the goal, including the loss of bus manufacturers, technology limitations, sufficient electricity supply in the future, and lagging battery-electric bus performance. Metro Transit is exploring other propulsion systems, such as hydrogen fuel cell buses, to mitigate some of these risks, but it has not yet communicated this shift in strategy to the King County Council, missing opportunities to help ensure decision-makers are informed. It has also not yet adapted its emergency response role to a zero-emission fleet, increasing safety risks if Metro Transit is not able to fulfill anticipated roles in a disaster.

Metro Transit has planned extensive capital work through 2038 to build the infrastructure needed to support zero emissions operations, including work at all eight of its bases. The Metro Transit Capital Division is working to improve planning and use collaborative delivery methods that could save time on projects, but it has not developed a strategy to maximize efficiency and other benefits. We also found that capital project teams do not yet consistently engage central procurement or Metro Transit's government relations and safety staff early in projects. As a result, teams might not address risks that cause delays or safety and security issues.

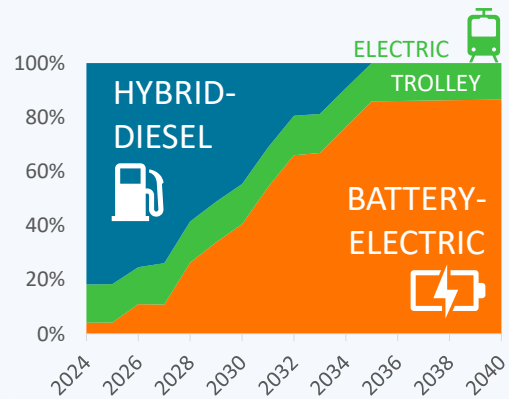
What We Recommend

We recommend that Metro Transit improve communication about its efforts to diversify propulsion systems and establish emergency plans. We also recommend the agency implement a strategy to make best use of collaborative delivery methods and take steps to formalize procurement, safety collaboration, and government relations in capital projects.

Why This Audit Is Important

Metro Transit's bus operations create 43 percent of King County government's greenhouse gas emissions, providing the single biggest opportunity to reduce King County's carbon footprint. As directed by the County Council, Metro Transit is working to transition its revenue bus fleet to zero emissions by 2035. This goal is one of the most ambitious in the nation, requiring Metro Transit to compress timeframes for planning, stakeholder engagement, and capital project delivery. The accelerated pace compounds risks associated with the unknowns of emerging technology and supply chain challenges. Metro Transit will need to improve its ability to complete capital projects to stay on schedule and avoid costly changes to projects.

As of April 2024, Metro Transit planned to reach zero emissions through electric buses and trolleys.



Source: King County Auditor's Office analysis of Metro Transit data

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Section 1: Positive Progress Amid Market Risks

SECTION SUMMARY

Metro Transit is working to meet King County’s ambitious zero emissions goal amid many risks, including limited bus manufacturing capacity, limited electric utility capacity, and changing technology. Metro Transit has devoted resources to organize the department to fully transition the bus fleet to zero emissions by 2035.¹ Staff are engaged with other jurisdictions pursuing zero emissions to share information and lessons learned. However, zero-emission bus manufacturers are leaving the market, posing challenges for jurisdictions hoping to buy buses. In Metro Transit’s experience, hardware and software technology to support base operations and fleet charging capacity is developing but does not work reliably yet. Further, Metro Transit estimates utility companies need six- to eight-year lead times on the installation of a new power infrastructure. And the department does not have sufficient data on future energy needs based on actual bus performance to offer utility providers, hindering Metro Transit’s efforts to ensure there is sufficient electricity to charge coaches in the future. Zero emissions staff are tracking these risks and Metro Transit is continuing to strategize ways to mitigate them. This section summarizes some of the positive steps Metro Transit has taken toward transitioning to a zero-emission fleet, capturing national trends in zero-emission transit technology, market, and supply chain issues that could affect its ability to complete that transition. Section 2 addresses two areas we found where specific improvements could help Metro Transit manage its efforts to respond to the issues identified here.

Metro Transit has focused efforts on zero emissions

Metro Transit established a zero emissions strategic management team, engaging department-wide to organize the zero emissions effort, improving necessary collaboration and planning measures for managing the significant workload vital to fully transitioning operations. In 2022, Metro Transit hired new staff to set up a team in the general manager’s office to coordinate the zero emissions effort, providing infrastructure to coordinate work across the department. In 2023, the team led a department-wide collaborative effort to map the internal and external dependencies required for achieving zero emissions goals. This “systems

¹ “Zero emissions” is the term Metro Transit uses to refer to the bus fleet transition effort previously referred to as “electrification.” While Metro Transit still plans to primarily use battery-electric buses to achieve its goal, zero emissions is inclusive of other emerging technologies and refers to the climate objective of reducing King County’s greenhouse gas emissions.

map” provides guidance for Metro Transit staff to proactively engage with internal and external partners to mitigate challenges and increase efficiency.

Metro Transit’s zero emissions leaders indicated that they believe one of the primary successes of these efforts has been better change management. Transitioning to a zero-emission fleet requires all aspects of the organization to participate and adapt work to support new technology and workflows. Leaders stated they are working on developing the agency’s culture to support collaboration and decision-making despite many unknowns, and their approach is intended to encourage action and communication while also moving quickly to reach the 2035 goal. Metro Transit created and maintains a zero emissions work plan and risk register.

The Metro Transit Capital Division retained a consultant (Parametrix) for a multi-phase planning effort to identify needed capital work, assess the path to zero emissions, and help Metro Transit identify where it needs to make changes to reach its goal. The consultant drafted a baseline road map for actions Metro Transit would need to take to reach zero emissions under current technology constraints. Capital Division staff, along with its consultant, led a series of meetings that brought together department and procurement staff to work together on the plan and identify risks and strategies, which staff we interviewed described as a useful and helpful process.

Metro Transit exchanges lessons learned with other jurisdictions pursuing zero-emission fleets

Metro Transit staff are active in national transit organizations, which facilitates staff sharing experiences and learning lessons from other jurisdictions working on zero emissions. Metro Transit staff participate in national transit organizations working on electrification, such as the American Public Transportation Association (APTA), where a staff member serves as chair of the Zero Emission Fleet Committee, and the Zero Emission Bus Resource Alliance (ZEBRA). Participating in these groups allows Metro Transit to benefit from other jurisdictions’ lessons learned, share its own experiences, and stay updated on industry developments. Metro Transit staff receive requests for information from other jurisdictions exploring converting their bus fleets.

King County’s zero emissions goal is more

King County’s 2035 goal for transitioning its bus fleet to zero emissions is at least five years sooner than comparable jurisdictions in North America. King County Ordinance 19052 established a goal for Metro Transit to complete the transition to a zero-emission bus fleet by 2035.² Many other jurisdictions have zero

² Metro Transit has almost 1,400 coaches in its fleet, including buses and electric trolleys.

ambitious than goals of peers emissions goals of 2040 or later, as shown in exhibit A. To get to zero emissions, Metro Transit plans to transition its hybrid-diesel fleet to battery-electric buses and will maintain or expand its electric trolley bus system. We discuss the possibility of additional propulsion systems in section 2.

EXHIBIT A: King County Metro Transit’s zero emissions goal is more ambitious than most similar jurisdictions.

TRANSIT AGENCY	LOCATION	ZERO EMISSIONS GOAL
Los Angeles County Metropolitan Transportation Authority*	Los Angeles, CA region	2030
King County Metro Transit	King County, WA	2035
Chicago Transportation Authority	Chicago, IL region	2040
Massachusetts Bay Transportation Authority	Greater Boston, MA region	2040
Metropolitan Transportation Authority	New York City, NY region	2040
San Francisco Municipal Transportation Agency	San Francisco, CA	2040
TriMet	Portland, OR region	2040
Washington Metropolitan Area Transit Authority	Washington, DC region	2042
TransLink	Vancouver, BC, Canada region	2050

Source: King County Auditor’s Office

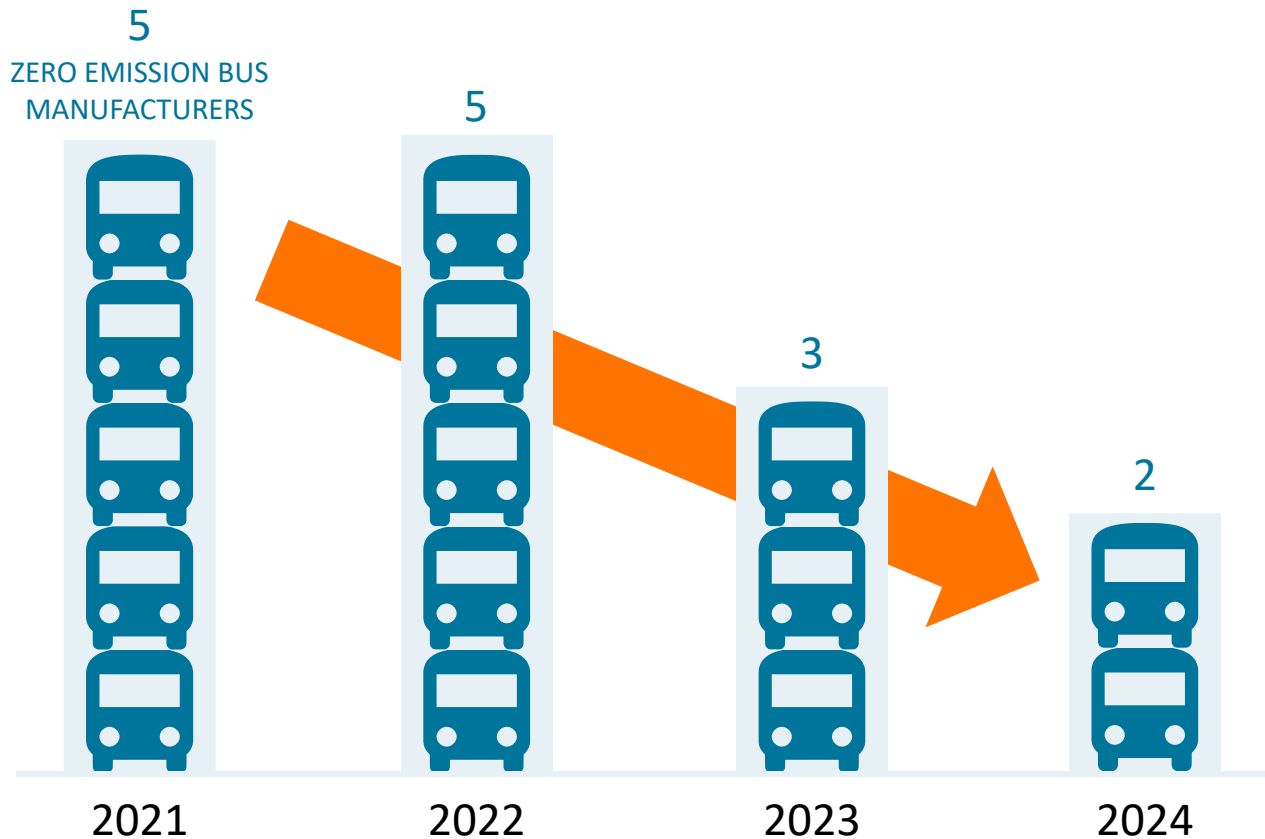
*News articles published around May 2024 — as this audit was being completed — indicate that agency staff said the 2030 goal is not achievable in the current market context. The articles report that the Los Angeles County Metropolitan Transportation Authority Board is discussing whether to move the goal.

Market supply does not currently meet demand for zero-emission buses

The number of zero-emission bus manufacturers is dwindling while demand for supply is rising, hindering agencies' ability to purchase the number of buses they need. In 2020, there were five companies that manufactured heavy-duty zero-emission transit buses.³ As shown in exhibit B, that number dropped to two by 2024. Manufacturers cited supply chain disruption and inflation as factors in their decisions to leave the United States market.

In 2022, the five existing bus manufacturers produced a combined total of 504 battery-electric buses, but market capacity has dropped below that now that there are only two manufacturers. This means that US transit agencies seeking to transition their fleets to battery electric zero emissions may not be able to find enough buses to purchase. Metro Transit staff indicated that additional European manufacturers may establish a presence in the US, but they have not committed to this as of April 2024.

EXHIBIT B: As of May 2024, the number of zero emissions bus manufacturers had dropped from five to two.



Source: King County Auditor's Office analysis

³ As of March 2024, New Flyer was the only manufacturer in the United States that builds hydrogen fuel cell transit buses.

Further exacerbating market limitations, Metro Transit experienced reliability problems with test buses it purchased from New Flyer, one of the two remaining manufacturers. In March 2024, Metro reported that roughly 50 percent of the New Flyer battery-electric buses were out of service on any given day. Metro Transit procurement staff will need to continue to evaluate manufacturers in the future to see if they are able to meet Metro Transit’s requirements.

Federal grants likely increased demand for buses

Federal funding encouraged growth in demand for low- and zero-emission buses, creating more competition for limited manufacturing capacity. In 2022, the US Federal Transit Administration’s (FTA) Low or No Emission grant program provided \$5.5 billion in funding to help transit agencies buy US-built low- or no-emission vehicles.⁴ The FTA reported that federal funds will support agencies in doubling the number of zero-emission buses in the US. According to a November 2023 APTA presentation, North American transit agencies will need more than 60,000 battery-electric buses by 2035.

Ensuring sufficient electric power by 2035 may be difficult

Metro Transit estimates it will need additional electric utility infrastructure to provide sufficient electricity at three bus bases — and the long lead times needed by utility companies to build infrastructure create risk of not achieving sufficient electricity for a full transition. Ensuring sufficient electricity to charge battery-electric coaches is on Metro Transit’s risk register. Staff are working with local utilities, Puget Sound Energy and Seattle City Light, to discuss building additional power infrastructure. Metro Transit has determined that it will need additional utility infrastructure at Bellevue, East, and North bases.⁵ New substations take six to eight years to reach completion, in part because of the complexity of projects and permitting requirements. Metro Transit plans to begin operations using its battery-electric buses at East Base in 2030, meaning the process for additional utility infrastructure would need to begin in 2024. While Metro Transit is in discussions with Puget Sound Energy, at the time of this report, it has not been able to secure an agreement to provide enough power for East Base’s current projected needs.⁶

Because the technology is still evolving, Metro Transit has limited ability to project its electricity demands, hindering negotiations for new utility

⁴ King County Metro Transit received \$33 million in funds in fiscal year 2023 to buy battery-electric buses and charging equipment through this program.

⁵ Bellevue, East, and North bases are scheduled for conversion to zero emissions between 2030 and 2035.

⁶ Projected electricity needs are based on existing data and will almost certainly change as technology improves.

infrastructure. Zero emissions staff indicated that the utilities want to have firm numbers for how much electricity Metro Transit will need for its battery-electric buses. The fact that battery power technology is still evolving makes it difficult for Metro Transit to accurately project how much electricity it will need in 2035. Staff stated that until the bases open and Metro Transit has more experience running a largely electric fleet, it won't have more accurate data to provide the utilities. By that time, if Metro Transit needs additional electrical capacity, it may encounter long delays to get it. Best practices suggest that jurisdictions start working with their utility partners early in the process of transitioning to zero emissions. Metro Transit is doing this, but risk remains because the department has limited leverage to compel utilities to develop additional infrastructure.

Existing technology does not meet all service needs

At the time of this report, battery-electric bus technology does not meet all of Metro Transit's service needs. Using conservative assumptions about outdoor temperatures, hills, and capacity of bus batteries currently available, Metro Transit's technical consultant reported that 60 layover charging stations would be necessary to provide the 2023 level of service. These stations could require negotiation with host jurisdictions, permitting, and maintenance, which would be costly in terms of both time and money. Metro Transit leaders stated that they must find efficiencies and creative solutions to reduce the number of layover stations needed.

Battery-electric buses also have lower passenger capacity than diesel hybrids (see exhibit C), and Metro Transit has experienced reliability problems with its New Flyer battery-electric test buses. Metro Transit plans to purchase future battery-electric buses from Gillig to mitigate some of the problems with reliability and lower rider capacity, but even Gillig buses hold almost 20 percent fewer people than the standard hybrid-diesel buses Metro Transit is currently operating.

EXHIBIT C: Metro Transit plans to purchase future battery-electric buses from Gillig to mitigate problems with lower rider capacity as compared to the hybrid-diesel buses that are used on many of its routes.

BUS TYPE	TOTAL			DIFFERENCE
	RIDERS	SEATED	STANDING	FROM HYBRID
Metro Transit's standard 40' hybrid-diesel bus	77	38	39	
New Flyer 40' battery-electric bus (current)	56	38	18	27%
Gillig 40' battery-electric bus (future)	64	34	29	17%

Source: King County Auditor's Office analysis of Metro Transit data

At the time of this report, battery and charging technologies are not sufficient to meet service needs for Metro Transit's RapidRide routes because distance per charge is too short and charging time is too long. RapidRide routes require continuous operation, long distances, and high passenger capacity, so buses cannot go offline to charge for several hours when they run out of power. Metro Transit's 2017 Zero Emissions Feasibility Study found that even with anticipated technological advancements, around 10 percent of routes would require service adjustments to be suitable for battery-electric buses. At the time of this report, battery-electric technology has not improved enough to accommodate RapidRide service needs. Improvements in battery-electric technology that could address these issues might be available in the next two years, but manufacturers have not yet brought these improvements to market.

Hydrogen fuel cell technologies might be able to meet RapidRide needs once regional infrastructure is in place. Manufacturers are working on improving other zero-emission bus technologies such as hydrogen fuel cell propulsion systems, but Metro Transit staff stated fueling infrastructure is not yet available. In October 2023, the US Department of Energy selected the Pacific Northwest as one of seven winners of \$1 billion in funding for a regional clean hydrogen hub. This means hydrogen fuel could be locally available for Metro Transit to use in its buses.



Section 2: Diversifying Propulsion Systems

SECTION SUMMARY

In response to the issues identified in section 1, Metro Transit is exploring diversifying its zero-emission bus fleet to include hydrogen fuel cell propulsion, but it has not yet completed some elements of planning for communication and emergency preparedness, missing opportunities to keep decision-makers informed and ensure it can fulfill its role in emergency response. In spring 2024, Metro Transit made more formal efforts to plan a pilot for hydrogen fuel cell buses to diversify its zero-emission fleet and test the technology to see if it could support its service needs. Metro Transit communicated these plans to its staff and County Executive leadership and included a request for funds for the pilot in a budget communication to Council. This communication might meet requirements in code to provide written communication to Council upon initiating alternative propulsion systems. However, improving clarity and planning could help ensure county decision-makers are informed about how Metro Transit is approaching the zero emissions goal. In addition, Metro Transit has not incorporated its potential emergency responsibilities in its planning to shift from diesel-hybrid coaches to electric or other propulsion systems, which could hinder King County's disaster response.

Metro Transit needs to clarify reporting requirements for changes to its zero emissions plan

In fall 2023, Metro Transit began exploring diversifying propulsion systems to meet its zero emissions goal and submitted a budget request to County Council in 2024 for a pilot project, but the department has not yet identified ongoing steps for communicating changes to its plans with the County Council. County code allows Metro Transit to pursue alternative approaches to reaching a zero-emission bus fleet but specifies that the County Executive should notify the County Council and provide descriptive information in writing prior to initiating the alternative approach.⁷ Although Metro Transit plans to use primarily battery-electric buses and electric trolleys to fulfill its zero emissions goal, in fall 2023, managers began internal discussions about potentially supplementing the battery-electric buses with hydrogen fuel cell electric buses.⁸ Metro Transit stated this decision will

⁷ King County Code 28.94.085.B

⁸ Fuel cell technology combines hydrogen and oxygen to produce electricity, heat, and water. The electricity created powers the bus's electric motor. Fuel cell buses are refueled at hydrogen fueling stations using a flexible hose and nozzle, just like at a gas station.

be informed by the outcome of pilot testing. Fuel cell buses can go longer distances before refueling than battery-electric buses, which is important for some of Metro Transit's routes.⁹ The zero emissions team noted that plans for reaching zero emissions by 2035 will need to continuously adapt in response to issues like market and technology changes, and the team communicates these issues and plan changes regularly to department and executive leadership. Metro Transit included a budget request for the pilot in a May 2024 communication to Council. This might meet the code requirement. However, we found that greater clarity about the code requirement could help Metro Transit better plan for future communication with Council under the continuously changing risks of zero emission technology. This will help ensure Metro Transit is meeting code requirements and communicating with decision-makers on a key strategic goal for the County.

Zero emissions staff also indicated that they are researching renewable diesel to determine whether it could be an option to reduce greenhouse gas emissions from the existing hybrid fleet prior to full conversion to zero emissions, but formal plans to pursue it had not been made at the time of this report.

Recommendation 1

Metro Transit should work with the King County Council to clarify and document both its reporting requirements in King County Code 28.94.085.B and ongoing communication steps to meet King County Council needs for information on the zero emissions goal.

Metro Transit has not yet planned for its emergency role using zero-emission buses

Metro Transit has not planned how it will fulfill its potential emergency responsibilities with its zero-emission fleet, increasing safety risks in an emergency if Metro Transit is not ready or able to fulfill anticipated roles. Metro Transit's emergency responsibilities include providing buses for evacuation and general movement of people, both within and outside of King County. With a battery-electric bus fleet, Metro Transit may not be able to fulfill its emergency responsibilities if electricity is not available and it does not have back-up plans with other propulsion systems. This could hinder the County's ability to respond to a disaster.

⁹ Hydrogen fuel cell electric buses may be able to go around 30% further than battery-electric buses on a single charge or tank of fuel. The biggest savings is in terms of time: battery-electric buses require hours to charge at a station, while hydrogen fuel cell buses can be refueled in ten minutes and can resume routes thereafter.

Metro Transit will need to work with emergency response leaders to clarify its role using zero-emission propulsion systems and work with any internal groups, like the Capital Division, to ensure needed infrastructure is incorporated into capital project design. Metro Transit will need to work with relevant emergency response leaders, like the Office of Emergency Management, to clarify expectations for Metro Transit’s potential role in emergencies. National studies recommend that agencies transitioning to zero-emission bus fleets should consider having a reserve of coaches that run off fuel other than electricity to provide resiliency if electricity is unavailable. Staff noted there are options for how the agency could fulfill emergency roles, like providing evacuation, including keeping a reserve of hybrid buses or contracting with other transit agencies. Metro Transit’s zero emissions consultants reported that a reserve fleet of hydrogen fuel cell electric buses could provide a similar level of resiliency to a hybrid-diesel fleet, and with no emissions. However, these options might require additional physical infrastructure as well as safety equipment and procedures. This is important because some base conversion projects are already underway and late design changes to accommodate emergency plans could be costly and frustrating for staff. Incorporating plans for Metro Transit’s emergency responsibilities earlier can help ensure clarity and allow groups within Metro Transit, such as the Capital Division, enough time to incorporate any infrastructure needs into project plans in a timely way.

Recommendation 2

Metro Transit should document how it plans to clarify and fulfill its emergency responsibilities as it transitions to a zero-emission fleet and incorporate emergency contingency strategies into capital project planning as needed.



Section 3: Improving Capital Project Planning and Delivery

SECTION SUMMARY

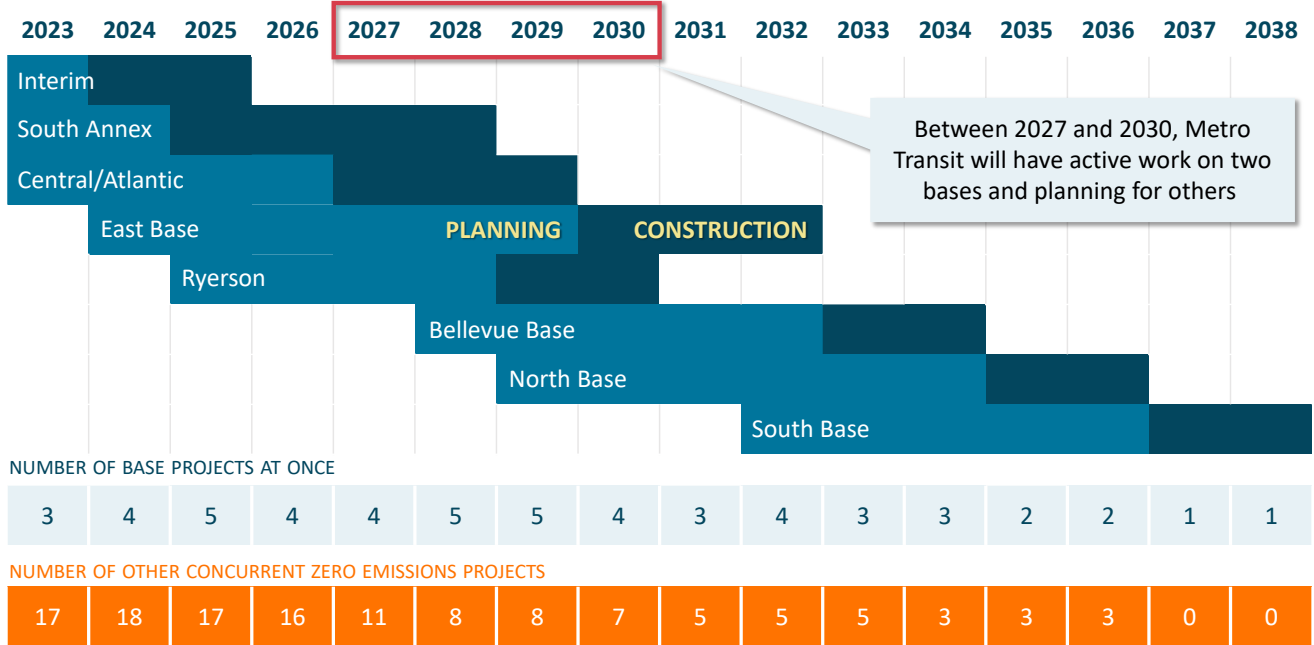
Metro Transit’s Capital Division is working to increase its capacity to complete projects more effectively and efficiently by using collaborative delivery methods and involving key subject matter experts earlier in project design. Formalizing these efforts and completing them in a timely way will help ensure the division is able to meet King County’s ambitious zero emissions goals. The Capital Division has a substantial workload to support Metro Transit’s transition to a zero-emission fleet. As of March 2024, the division anticipates that some project timelines will exceed the 2035 goal. Staff have taken some steps to manage this workload. For example, responsive to the recommendations in our 2023 capital delivery audit, [*Metro Transit: Strengthening Data, Communication, and Continuous Improvement Processes Could Help Reduce Project Delays*](#), the Capital Division has made improvements by customizing its project management framework and using lessons learned (see appendix 2 for progress on select recommendations). The division has also taken steps such as working with a consultant to identify potential collaborative delivery methods for electrification projects, building staff expertise, and discussing efforts to incorporate procurement, safety, and government relations feedback into project plans. Metro Transit is early in its efforts to implement these steps. Formal plans to complete some of these efforts would improve the division’s ability to realize the intended benefits of its efforts and complete the large body of capital work required to support battery-electric buses.

Zero-emission bus fleet will require significant capital investment

Metro Transit must complete significant capital work to transition to zero emissions by 2035, with the pace and complexity of this work increasing over time. Metro Transit’s transition to zero emissions will require capital work on all eight of its bases as well as developing infrastructure for layover charging. Exhibit E shows that, starting in 2028, the Capital Division could have active construction work on at least two bases at once as well as planning work for two or three other bases at the same time. Additionally, although the current plan includes twelve layover projects, the Capital Division’s work with its consultant indicates there is potential for the need to significantly increase the number of layover projects, depending on factors such as coach performance. Lastly, Metro Transit’s current capital project plans are based on pursuing a battery-electric bus fleet. The potential for additional propulsion systems,

as discussed in section 2, could require a shift of focus and add complexity to these project plans.

EXHIBIT E: Metro Transit is planning for capital work on all eight of its bases through 2038 to support the transition to zero emission buses.



Note: Types of other projects include layover charging, trolley-related projects, and planning projects. This graphic is based on estimates created in 2024. It is subject to change as Metro Transit continues to refine its planning.

Source: King County Auditor’s Office based on estimates from King County Metro Transit’s Capital Division.

Significant workload emphasizes need for action now

Since the work required to transition the bases will increase significantly starting in 2028, formalizing agency process improvement efforts now will help the Capital Division achieve the most benefit, including timelier project delivery and improved project design. The Capital Division is taking multiple steps to improve its project planning and implementation activities to achieve its zero emissions workload. This includes efforts to respond to recommendations from our 2023 capital audit and from its business transformation consultant. Appendix 2 includes a status update on the efforts Metro Transit anticipated finishing by early 2024, which include the Capital Division’s progress on four audit recommendations. In addition, the Capital Division is working to better understand the potential for collaborative delivery methods to help improve project efficiency and timely delivery. The Capital Division is also identifying opportunities to better incorporate key staff inside and outside of Metro Transit into its planning and monitoring processes. This provides assurance that staff can help Metro Transit ensure it can efficiently work

with other jurisdictions on tasks like permitting and procuring the goods and services it needs to deliver projects in a timely manner. However, as of March 2024, some of the efforts are still early and lack formal plans to implement, which could reduce their effectiveness. We discuss project planning and process improvement efforts in the rest of this section. And we make recommendations to develop more formal plans to implement improvements so benefits can be realized in time to positively impact the zero emissions transition.

Capital Division has already taken some steps to be able to use collaborative delivery

The Capital Division has been building elements of its capacity to implement collaborative delivery methods for its projects. Collaborative delivery (also called alternative delivery) includes alternative public works contracting procedures instead of the traditional process of awarding contracts in lump sum to the lowest responsible bidder. Collaborative delivery methods can save time and help mitigate some project risks. To build its capacity to implement these methods, the Capital Division started to incorporate collaborative delivery into its project management processes. We made a recommendation in our 2023 capital delivery audit that Metro Transit complete its efforts to customize its framework for capital project management to accommodate collaborative delivery methods. Metro Transit has made progress on this effort (see appendix 2 for more detail). Capital Division staff also state they have hired more project managers with collaborative delivery experience and have been working with other subject matter experts in the County to develop training for division staff. However, existing Capital Division staff have not yet implemented many projects using collaborative delivery methods and staff noted that the division continues to face unfilled positions and hiring challenges.

A strategic approach could help mitigate the lack of experience and help achieve the most benefits

Metro Transit does not yet have a formal strategy to deliver collaborative delivery projects and potentially achieve Washington state certification for collaborative delivery, increasing the risk that capital projects will take more time and effort. Washington state governs the use of collaborative delivery methods by public entities. The state either approves individual or groups of projects that apply to be able to use collaborative methods or certifies agencies to be allowed to use those methods at will. Obtaining state certification would eliminate the approval process and the need for owner advisers to meet approval requirements for two delivery methods: General Contractor/Construction Manager (GC/CM) and Design-Build (DB). This would potentially save time on projects needed for electrification, which could be crucial in the context of their volume and tight timeframes. State requirements include elements that Metro Transit has started implementing but has

not created a strategy for fully achieving. For example, the state requires the agency to demonstrate that it has:

- the necessary qualifications and experience among its staff with alternative project delivery and construction
- a management plan and rationale for collaborative delivery projects
- demonstrated success in managing collaborative delivery projects, including at least one GC/CM or DB project within the past five years.

The Wastewater Treatment Division (WTD) hired a consultant to help the agency create a plan to get to certification by 2026. This plan allowed WTD to develop strategies, timeframes, and metrics to build internal experience, develop a training program, and improve internal policies, roles, and procedures to be able to meet certification requirements within that timeframe. Metro Transit is working on elements needed to create a plan, but it has not created one yet.

By not organizing its efforts to use collaborative delivery methods, Metro Transit may be missing opportunities to build its internal capacity more effectively and achieve state certification, thus reducing the effectiveness of a strategy Metro Transit staff believe will be crucial to timely delivery of capital projects for electrification.

Recommendation 3

Metro Transit should develop, document, and implement a strategy to maximize the benefits of using collaborative delivery methods, which could include pursuing the Washington State Project Review Committee certification for collaborative delivery methods.

Capital Division has improved engagement, but lacks formal plans for involving other groups early in projects

Although engagement has improved, the Capital Division has not yet created formal steps for ensuring procurement, safety, and government relations staff are routinely brought in early on projects, reducing opportunities to manage some risks. The Capital Division has been engaging with staff in other Metro Transit divisions and county agencies as part of Metro Transit's work to map out the system of dependencies for its zero emissions transition needs and to plan for all capital projects needed for battery-electric buses. These steps have led to more collaboration on capital projects than in the past, but procurement, safety, and government relations staff told us that making a more routine practice providing early engagements and continuous updates about capital plans will help ensure that project needs can be met effectively by staff.

Ensuring early and consistent engagement can help mitigate risks and known causes of project delays

Staff from the Finance and Business Operations Division (FBOD); Metro Transit’s government relations group; and the Safety, Security, and Quality Assurance Division all noted that when they are engaged in a timely way, it can help lead to positive outcomes. For example, Capital Division staff reported that, through grant requirements, Safety, Security, and Quality Assurance Division staff have a formal review role in RapidRide projects — as mandated by the FTA. Staff said this led to the design changes that improved safety and security features in projects at an early stage, avoiding late changes that can lead to delays or cost increases.

Inclusion of these staff is important as they can help mitigate known risks, such as:

- **Procurement delays:** Delays in the procurement of goods and services for capital projects can contribute to delays in project schedules, and Metro Transit has included procurement issues in several zero emission project risk registers (see Appendix 1). FBOD staff stated that in the past, Metro Transit’s more ad hoc approach to engaging them has generally not led to enough lead time to be responsive to project needs. Procurement staff also stated the impacts of late engagement could worsen in the next ten years because their workload will increase as the County will have significant capital procurement needs for large projects like Health for Housing, Harborview Medical Center, Northeast Transfer Station, and WTD facility improvements.
- **Delays from other jurisdictions:** The Zero Emission team currently includes permitting as a likely and significant risk to timely completion of capital work. Metro Transit has some dedicated government relations staff who work with other jurisdictions to help ensure involved agencies have their needs met. For zero emissions capital projects, Metro Transit will need to work with other jurisdictions to help ensure that it is able to do things like acquire the correct permitting in a timely fashion, find opportunities in project design to increase the mutual benefits of infrastructure, and share information on the plans to get to zero emissions. In 2022, Metro Transit’s electrification planning consultant, Parametrix, identified dependencies on external relationships to be a major risk area for capital projects in meeting the 2035 goal and recommended an early, close, and continued coordination approach to engagement between capital and government relations staff, particularly in preliminary design, for best efficiency.
- **Safety and security elements in project designs:** Safety, Security, and Quality Assurance Division staff noted that not engaging with them in a project can lead to unsafe design elements. Electrification will mean installing

new infrastructure and redesigning bases in a way that supports the workflow needed for battery-electric buses, which might mean different safety and security risks than Metro Transit staff are used to — risks that they might not think about without purposeful consideration.

Formalizing collaborative practices will improve consistency and effectiveness

The Capital Division stated it intends to create more formal steps to engage with procurement, government relations, and safety staff. Completing this effort will help ensure that Metro Transit realizes the intended benefits of improved

collaboration. For example, Metro Transit and FBOD have been in early discussions about ensuring that central procurement has information at the earliest possible stage so staff can be proactive about planning their workload and prioritizing project needs. But staff have not formalized what this collaboration or its processes would look like. Metro Transit has also developed more processes for escalating issues internally within the Capital Division and has begun to incorporate the department's government relations lead when issues arise in projects. But the agency has not formalized or documented processes for early, proactive government relations work. Lastly, through the zero emissions planning effort, the Capital Division and Safety, Security, and Quality Assurance Division staff have been discussing ways to better incorporate safety reviews and feedback in capital project design but have not yet decided on what that role should be. One method to create that role is through the Joint Task Force on Safety and Security Certification, established between the FTA and APTA. Capital Division and Safety, Security, and Quality Assurance Division staff believe this could be an appropriate method for Metro Transit to reduce risks, but Capital Division managers cite staff capacity limitations in being able to fully implement it. The Safety, Security, and Quality Assurance Division is planning to request funding to hire a consultant to help Metro Transit figure out how to roll out a certification program at a manageable pace, given these limitations.

Completing these efforts will help the Capital Division address project risks that might cause delays and would help other Metro Transit and county divisions manage their workload and provide effective assistance to the Capital Division.

Recommendation 4

To continue its work to ensure better collaboration between the Finance and Business Operations Division and the Capital Division, Metro Transit should develop, document, and implement a structure for working with Procurement and Payables to ensure timely planning for procurement needs over the course of its zero emissions transition.

Recommendation 5

To continue its work to ensure better collaboration between government relations staff and the Capital Division, Metro Transit should develop, document, and implement a plan for a proactive government relations approach, such as the one detailed in the Parametrix Stakeholder Management Plan.

Recommendation 6

To continue its efforts to ensure increased collaboration between the Capital Division and the Safety, Security, and Quality Assurance Division, Metro Transit should develop, document, and implement a plan to formally incorporate the Safety, Security, and Quality Assurance Division into capital project design and implementation, such as through a safety and security certification program.

CONCLUSION

Metro Transit faces significant risks to its efforts to transition to a zero-emission fleet, including fewer battery-electric bus manufacturers, performance issues with coaches, and extensive capital needs to support zero-emission operations. It is making large-scale efforts to manage these risks and reach King County's goal of zero emissions by 2035. Many of these efforts focus on making sure the department is more aligned and collaborative so decisions can be made quickly as it learns more about operating a zero-emission fleet while external factors change. These efforts will become increasingly important as those risks change over time: some risks could reduce, such as better battery performance on coaches, but some could persist, such as a lack of manufacturer capacity to meet demand. There are many unknowns, and Metro Transit states it will likely need to make decisions that result in unnecessary redundancy or capacity based on the existing technology and market in order to meet the 2035 timeline. To manage decision-making in the face of uncertainty, Metro Transit will need to continue its current

work to be able to learn and adapt quickly. This audit report outlined some of those challenges and makes recommendations to build on Metro Transit's efforts and intentions to be more coordinated and proactive to meet the 2035 goal.



Appendix 1: Capital Projects Status Update

This appendix reports on the statuses, active as of April 2024, of Metro Transit capital projects intended to support its transition to a zero-emission bus fleet, as requested in King County Ordinance 19546. These updates provide abbreviated snapshots of key information for these projects based on a high-level review of project documents and monitoring data. For its zero emissions effort, Metro Transit has four base projects, six layover charging projects, and several trolley-related projects. Metro Transit also has an electrification planning project not included below. The current total estimated cost for these projects is \$782 million. All projects are still in process and the figures are subject to change.

South Base Test Facility

PROJECT SCOPE:

This project will build infrastructure to support nine battery-electric bus (BEB) chargers at Metro Transit's South Base. The purpose of this facility is to: test connection types, Electric Vehicle Supply Equipment (EVSE) manufacturers, model base, depot and layover, and on-route charging, and to better understand optimal equipment placement and be able to train staff and learn lessons before larger deployments. It includes a new multi-charger site area and new power service to the site. It does not include charging heads, but it may in the future, so Metro Transit can charge long-range BEBs that it plans to test, as well as placing long-range BEBs into revenue service, consistent with its fleet plan.

STATUS UPDATE AND RISKS:

Metro Transit is already using this facility for the purposes described above. The project is nearing the end of the implementation phase, which means there is still active work to install some of the charging infrastructure that was delayed due to one manufacturer not completing its order to the County and another manufacturer having long lead times to build and deliver the replacement equipment. The project team cites technology issues and continuing issues with vendors and contractors as potential risks to the project's schedule and budget.

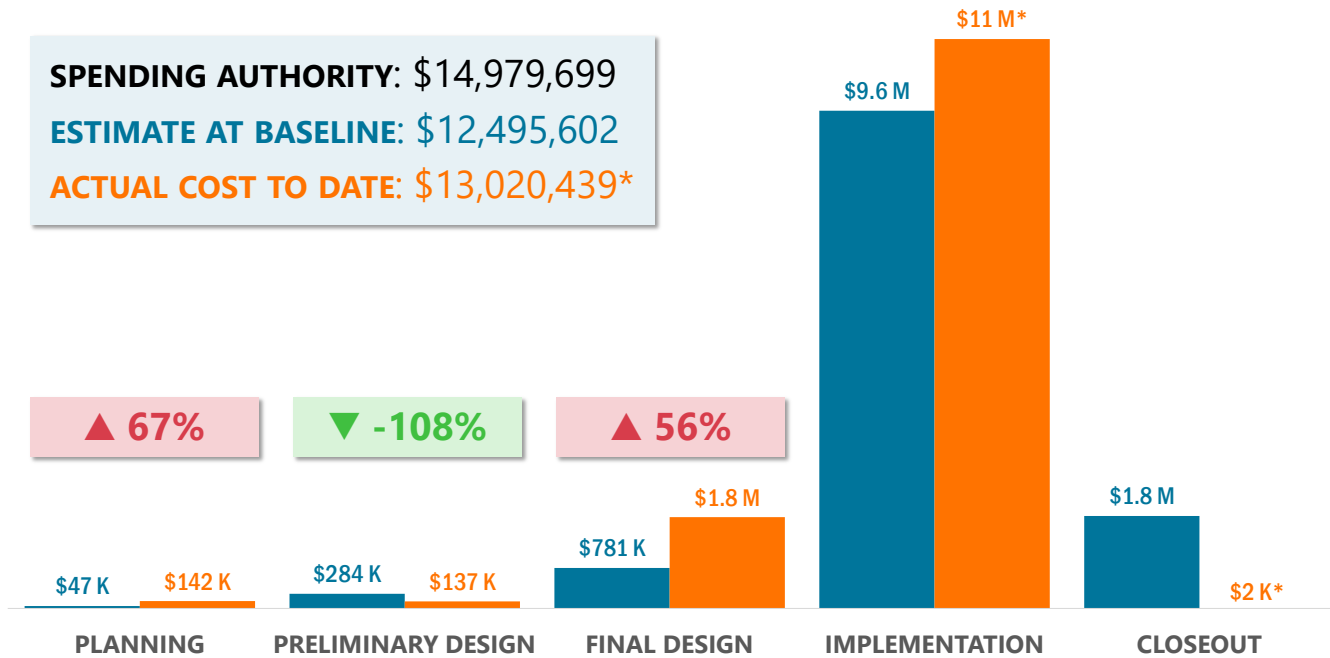
EXHIBIT 1: Project schedule for South Base Test Facility.



Source: King County Auditor's Office based on estimates from King County Metro Transit's Capital Division

EXHIBIT 2: Cost by project phase for South Base Test Facility.

SPENDING AUTHORITY: \$14,979,699
ESTIMATE AT BASELINE: \$12,495,602
ACTUAL COST TO DATE: \$13,020,439*



*These phases are either in progress or not yet started.

Source: King County Auditor's Office based on estimates from King County Metro Transit's Capital Division

Interim Base Battery-Electric Bus Charging Depot

PROJECT SCOPE:

This project will develop electrical and charging infrastructure, along with other features needed to convert Interim Base to operations for 120 BEBs. The project includes design features to meet the requirement for Platinum status on King County’s Sustainable Infrastructure Scorecard. Interim Base will also include parking for zero-emission non-revenue vehicles. Metro Transit intends to use Interim Base as a prototype for future base conversions and BEB operations.

STATUS UPDATE AND RISKS:

Interim Base is early in the implementation phase, meaning active construction work has started at the base location and will continue through 2026. The project team will also continue working through the final design work through early 2025. The project team has identified permitting, procurement, and delays by vendors as potential risks that could cause project delays or increase costs. Metro Transit started implementing this project through a collaborative delivery method known as Progressive Design-Build, where a design-build firm is awarded the project and then progresses through an initial preconstruction services phase to establish a Guaranteed Maximum Price (GMP). However, citing issues with the contractor, including lack of desired transparency, late deliverables, and a proposal that was unable to achieve the desired project schedule, Metro Transit decided to stop using the Progressive Design-Build method after preliminary design and shifted to an Energy Savings Performance Contracting (ESPC) method, where Metro Transit chose a contractor from an existing state contractor list for energy-related projects in Washington state. This helped Metro Transit still use completed design work.

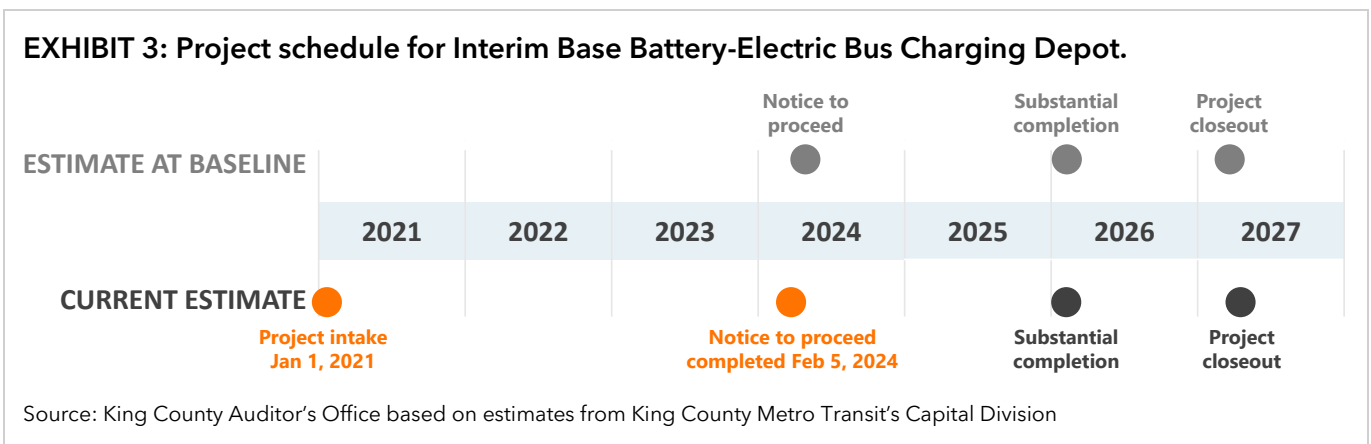
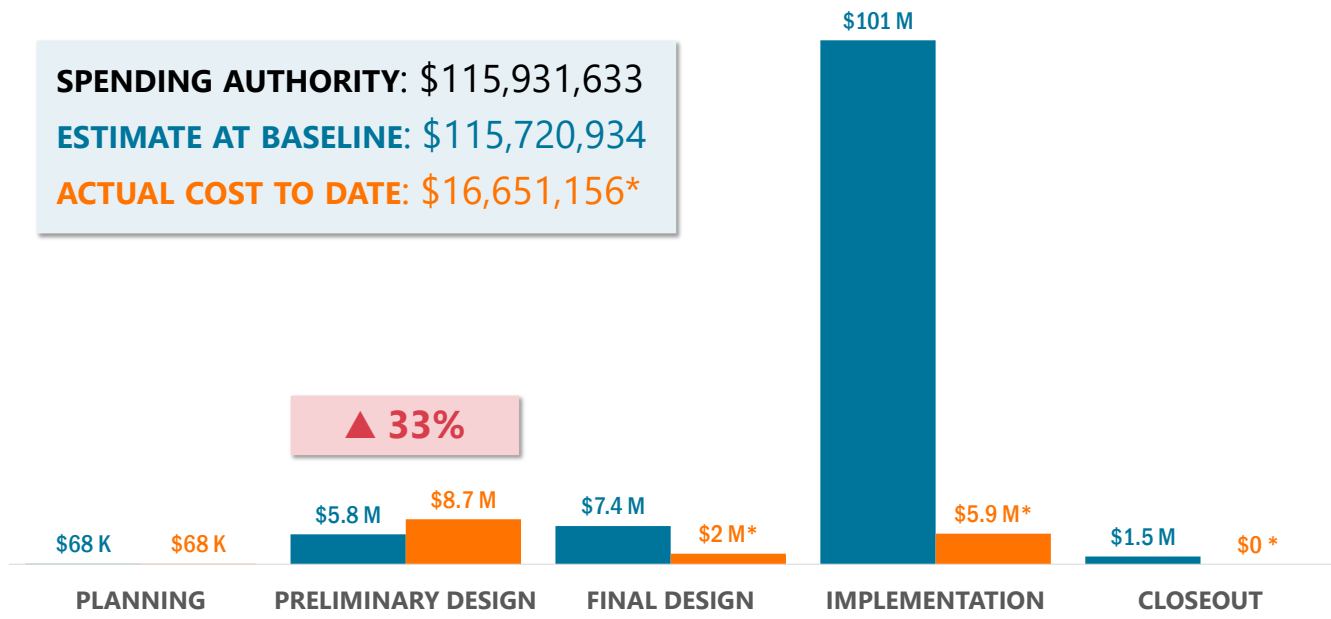


EXHIBIT 4: Cost by project phase for Interim Base Battery-Electric Bus Charging Depot.

SPENDING AUTHORITY: \$115,931,633
ESTIMATE AT BASELINE: \$115,720,934
ACTUAL COST TO DATE: \$16,651,156*



*These phases are either in progress or not yet started.

Source: King County Auditor’s Office based on estimates from King County Metro Transit’s Capital Division

South Annex Base

PROJECT SCOPE: This project includes construction of a 250-bus transit base on Metro Transit-owned property called the South Annex. This is intended to support the capacity needed for the 70-percent service increase described in Metro Connects, Metro Transit’s long-range service and capital vision. The project will include vehicle maintenance bays, one steam bay, one inspection bay, three bus exterior wash bays, two bus interior wash bays, charging infrastructure, operational spaces, and spaces for other functions required for base operations (safety, health and wellness, etc.).

STATUS UPDATE: This project is in the final design phase with implementation planned to start in late 2024. The project team cites procurement needs, utility construction delays, external review and permitting, and technical limitations as potential risks to the project’s schedule and costs.

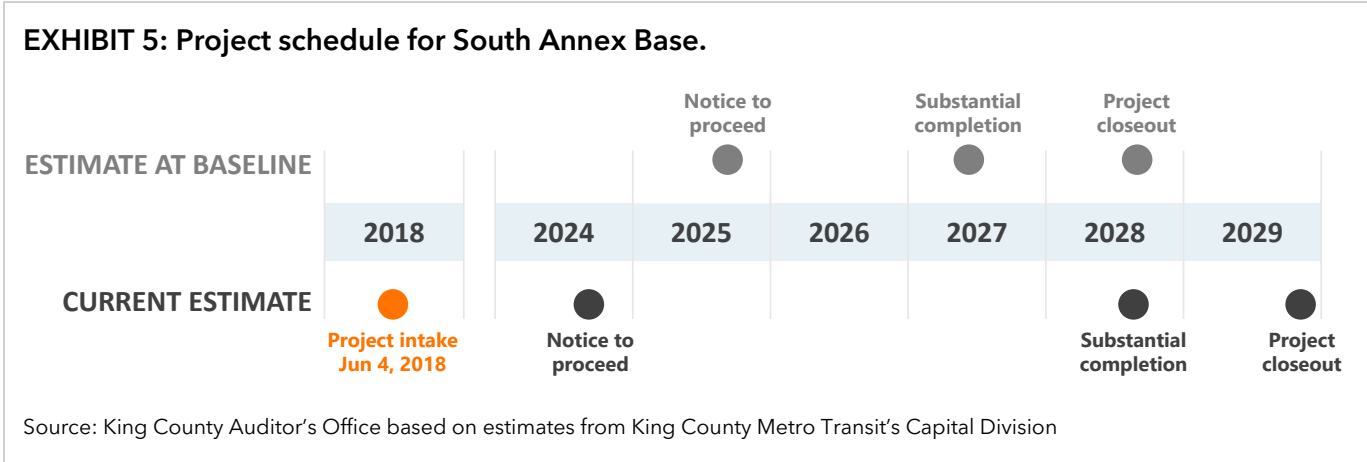
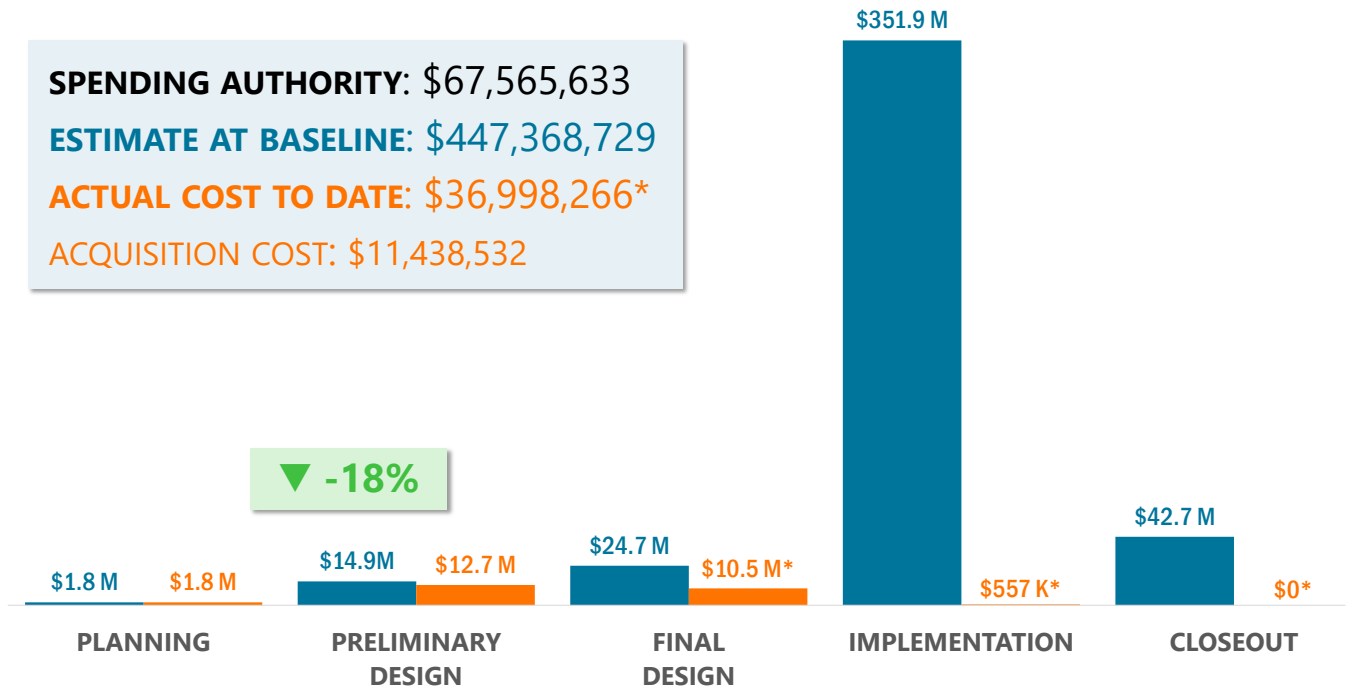


EXHIBIT 6: Cost by project phase for South Annex Base.

SPENDING AUTHORITY: \$67,565,633
ESTIMATE AT BASELINE: \$447,368,729
ACTUAL COST TO DATE: \$36,998,266*
ACQUISITION COST: \$11,438,532



*These phases are either in progress or not yet started.

Source: King County Auditor’s Office based on estimates from King County Metro Transit’s Capital Division

Central Base Electrification

PROJECT SCOPE:

This project is intended to build BEB charging infrastructure for the non-trolley fleet at Metro Transit’s Atlantic or Central Base. This project will also support the capital cost related to shutting down the base during construction and relocating of service from the base during that time. Lastly, it will support incurred cost from utility providers to build additional utility-provided infrastructure.

STATUS UPDATE:

Metro Transit started planning work for this project in 2024. Implementation work on the base is not anticipated to start until 2025, and this date will likely change as planning progresses.

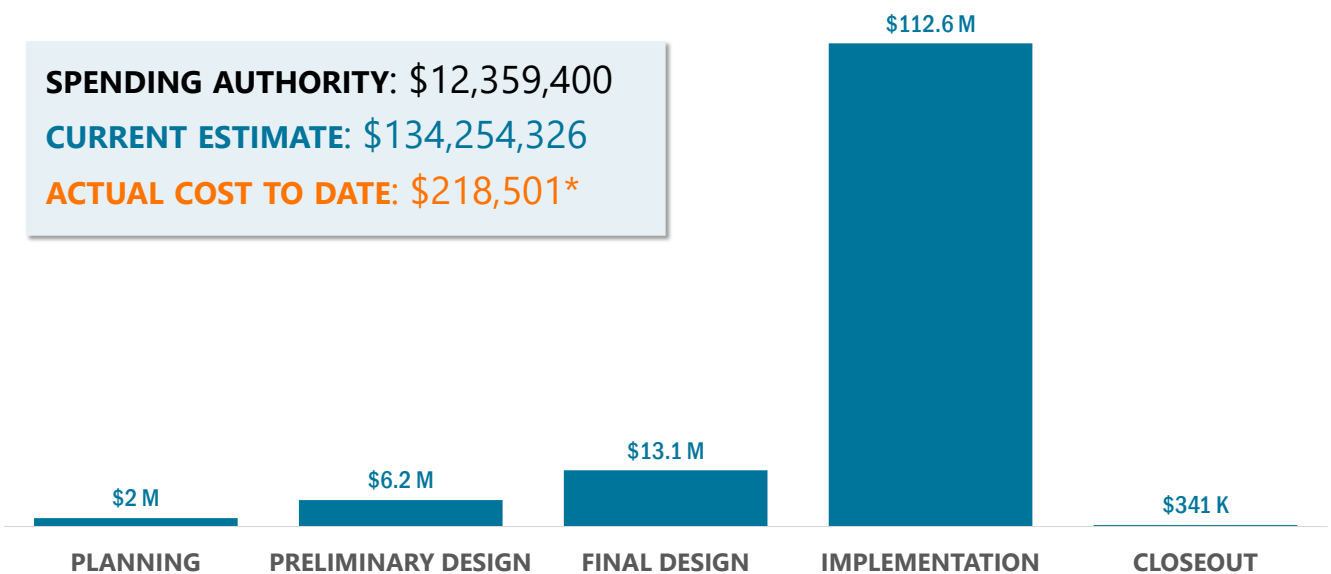
EXHIBIT 7: Project schedule for Central Base Electrification.



Note: These estimates are preliminary as this project has not yet reached baseline

Source: King County Auditor’s Office based on estimates from King County Metro Transit’s Capital Division

EXHIBIT 8: Cost estimates by phase for Central Base Electrification.



Note: These estimates are preliminary and subject to change as this project has not yet reached baseline

Source: King County Auditor’s Office based on estimates from King County Metro Transit’s Capital Division

Layover Charging Stations

PROJECT SCOPES: These projects will result in rapid-charging stations for BEBs at the locations listed below. Staff noted that risks to the scope, schedule, and costs of these projects include issues like long lead times for procuring equipment and electrical gear, delays in procurement of transformers, coordination with utility companies, permitting, and coordinating with other transit agencies.

Location	Schedule status	Estimated cost
Auburn Transit Center	Phase: In planning Estimated notice to proceed: 11/2027 Estimated substantial completion: 04/2028	\$8,646,383
Burien Transit Center	Phase: In design Estimated notice to proceed: 07/2025 Estimated substantial completion: 03/2026	\$10,270,881
Federal Way Transit Center	Phase: In design Estimated notice to proceed: 03/2026 Estimated substantial completion: 01/2027	\$19,563,775
Kent Transit Center ¹⁰	Phase: In design Estimated notice to proceed: 03/2026 Estimated substantial completion: 08/2026	\$16,113,814
Kent Des Moines Transit Center	Phase: In design Estimated notice to proceed: 06/2026 Estimated substantial completion: 01/2027	\$11,890,618
South Renton Transit Center	Phase: In design Estimated notice to proceed: 05/2025 Estimated substantial completion: 12/2026	\$5,897,788

¹⁰ Metro Transit is merging this project with other projects at the Kent Transit Center. Estimates will likely change as the projects merge.

Trolley Projects

Metro Transit considers trolleys to be a critical piece of its zero emissions transition. It has several projects to improve or expand its trolley system, including installing improved battery technology on trolleys, supporting changes to the overhead contact system, and improving system planning. Its fleet plan includes potential for trolley expansion in 2027, but these plans are still preliminary.

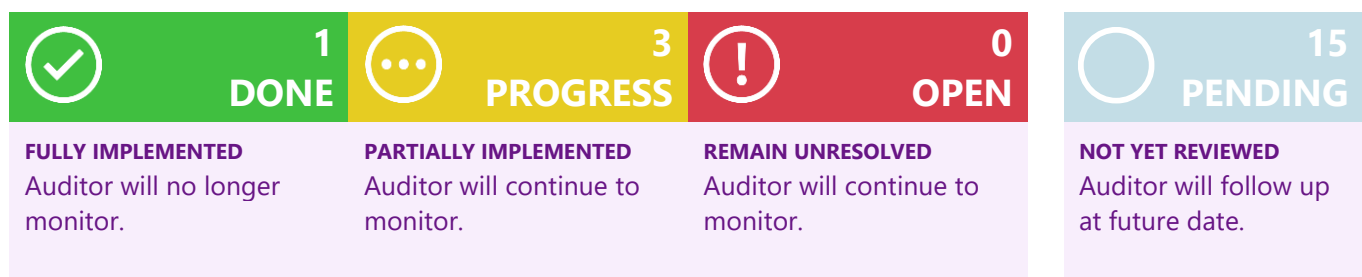
Appendix 2: Metro Transit Capital Delivery Audit Follow-up on Selected Recommendations

We completed an audit of Metro Transit’s capital project planning and delivery — [Metro Transit: Strengthening Data, Communication, and Continuous Improvement Processes Could Help Reduce Project Delays](#) — in July 2023, in which we made 19 recommendations. This appendix reports on the implementation progress for four of the 19 recommendations.

Metro Transit has made progress on better capturing and incorporating lessons learned into capital project management, improving its ability to identify and mitigate risks that might lead to issues like schedule delays. For example, Metro Transit’s Capital Division built a spreadsheet to gather lessons learned from project teams about experiences that led to problems like schedule delays and cost increases or positive outcomes like improved relationships and successful mitigation of risks. The Capital Division also incorporated steps in its project management framework for teams to utilize and contribute to this spreadsheet, helping ensure a more consistent practice of reviewing and incorporating lessons learned into project planning and implementation. Lastly, Metro Transit’s Capital Division senior leadership team holds a quarterly lessons learned meeting where division leads bring themes from the lessons learned spreadsheet for discussion.

Division leadership stated these practices are still evolving and they hope to set up a more user-friendly database to further realize the benefits of using lessons learned to improve project- and agency-level practices and help avoid common problems that lead to things like schedule delays. Continuing to implement and build on this progress will allow Metro Transit to help mitigate common risks in project planning and build estimates that take common risks into account.

Of the 19 audit recommendations:



Please see details below for implementation status of each recommendation.

Recommendation 12

PROGRESS



Metro Transit should complete its efforts to customize its Get Things Built framework, including adding options for different types of projects and thresholds for project risk and complexity.

STATUS UPDATE: Metro Transit's Capital Division has completed developing its Alternative Minimum Milestones tool, which establishes processes for project teams to meet key milestone expectations when using alternative or collaborative delivery methods.

WHAT REMAINS: To complete this recommendation, Metro Transit needs to finish identifying the remaining documentation and GTB process steps. Implementing this recommendation will help Metro Transit ensure that project staff consistently follow milestone processes. This ensures appropriate oversight and communication of important decision points over the course of all capital projects. This will be especially important as Metro Transit expands its use of collaborative and alternative methods to deliver capital projects needed to support zero-emission operations.

Recommendation 17

DONE



Metro Transit should create a repository for its lessons learned from capital projects.

STATUS UPDATE: Metro Transit's Capital Division has created a spreadsheet where staff are capturing lessons learned during and after capital projects. This spreadsheet serves as its repository, although Metro Transit is looking at options for to expand the functionality of the repository.

IMPACT: Implementing this recommendation provides a necessary step in collecting and organizing project information that can inform project- or agency-level improvements and help avoid issues that lead to schedule delays or cost increases.

Recommendation 18

PROGRESS



Metro Transit should develop, document, and implement a standard practice for project teams to review lessons learned as part of developing estimates and managing projects.

STATUS UPDATE: Metro Transit's Capital Division has incorporated steps in its Get Things Built framework and workflow for teams to check and contribute to the lessons learned spreadsheet. Division leadership said that project managers are expected to use information from the lessons

learned repository in populating their project risk register. Metro Transit started implementing this process in late 2023, so it is early in its implementation.

WHAT REMAINS: To complete this recommendation, Metro Transit needs to ensure project teams continue to implement these steps consistently and integrate the lessons learned in their capital delivery processes. Completing this recommendation will help ensure project teams consistently utilize lessons learned to mitigate risks in project planning and build estimates that take risks into account.

Recommendation 19

PROGRESS



Metro Transit should develop, document, and implement mechanisms for management to review lessons learned to identify potential division- or agency-level improvements that could help address common issues on capital projects.

STATUS UPDATE: Metro Transit's Capital Division senior leadership team does a quarterly lessons learned meeting for division leads to bring themes from the lessons learned spreadsheet for discussion. Division leadership stated they want to test this management practice and potentially identify ways to improve it for broader applications of lessons learned.

WHAT REMAINS: To complete this recommendation, Metro Transit needs to finish developing its management review practices for lessons learned. Completing this recommendation will allow division leadership to facilitate broader improvements that can help capital projects enhance efficiency and mitigate project risks.

Appendix 3: Executive Response

KyMBER WalTMUNSON
King County Auditor
Room 1033
C O U R T H O U S E

Dear Ms. WalTMunson:

Thank you for the opportunity to review and comment on the proposed final report “Zero Emissions: Metro Transit Working to Mitigate Risks to County’s Ambitious 2035 Goal”. King County Metro’s conversion to zero emissions relies on emerging technology and the Audit team worked with Metro to understand the intricacies of this technology and how Metro is constantly adapting to evolving industry conditions.

The audit correctly recognizes Metro’s early adoption of full zero emissions operation by 2035 as both an opportunity and a risk. King County Metro has a long and proud history among transit agencies of being a technology leader. Metro was among the first to adopt hybrid bus technology and leveraged this experience into deep, agency wide knowledge of battery operations. Metro is now relying on this expertise to again lead the transit industry to a zero emission future.

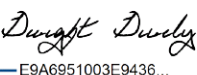
As the audit points out, there are risks associated with early adoption. With rapid change comes the need to continually communicate to both internal and external stakeholders. It also requires that Metro exercise constant vigilance as they evolve their operations to meet the demands of new technology. And this compressed development timeline also means the Metro Capital Division must adopt new and revised methods for project delivery.

Metro concurs fully with Audit Recommendations 1 through 6. Attached is our response to the recommendations. Our belief is that the recommended actions will help ensure Metro’s transition to zero emissions operations will be smooth and timely.

If you have any questions regarding our audit response, please contact Huoi Trieu, Zero Emissions Director at 206-263-1206 or htrieu@kingcounty.gov, or Mark Ellerbrook, Capital Division Director, at 206-477-6109 or maellerbrook@kingcounty.gov.

Sincerely,

DocuSigned by:



E9A6951003E9436...

Dwight Dively
Chief Operating Officer

Recommendation 1

Metro Transit should work with the King County Council to clarify and document both its reporting requirements in King County Code 28.94.085.B and ongoing communication steps to meet King County Council needs for information on the zero emissions goal.

AGENCY RESPONSE

CONCURRENCE **CONCUR**

IMPLEMENTATION DATE 6/30/2025

RESPONSIBLE AGENCY Metro

COMMENT Metro does concur with Recommendation 1 and will continue to work with Council to clarify both its reporting requirements and communication steps.

Recommendation 2

Metro Transit should document how it plans to clarify and fulfill its emergency responsibilities as it transitions to a zero-emission fleet and incorporate emergency contingency strategies into capital project planning as needed.

AGENCY RESPONSE

CONCURRENCE **CONCUR**

IMPLEMENTATION DATE 6/30/2025

RESPONSIBLE AGENCY Metro

COMMENT Metro will work with the King County Office of Emergency Management to clarify its emergency responsibilities and document how they will be fulfilled. This plan will consider capital planning contingency strategies.

Recommendation 3

Metro Transit should develop, document, and implement a strategy to maximize the benefits of using collaborative delivery methods, which could include pursuing the Washington State Project Review Committee certification for collaborative delivery methods.

AGENCY RESPONSE

CONCURRENCE **CONCUR**

IMPLEMENTATION DATE 12/31/2024

RESPONSIBLE AGENCY Metro

COMMENT Metro will continue to evaluate the benefits and challenges of using collaborative delivery methods. Our research and learnings will help inform a documented procurement strategy for zero emissions and other capital projects.

Recommendation 4

To continue its work to ensure better collaboration between the Finance and Business Operations Division and the Capital Division, Metro Transit should develop, document, and implement a structure for working with Procurement and Payables to ensure timely planning for procurement needs over the course of its zero emissions transition.

AGENCY RESPONSE

CONCURRENCE **CONCUR**

IMPLEMENTATION DATE 6/30/2025

RESPONSIBLE AGENCY Metro

COMMENT Metro will work with FBOD Procurement & Payables to finalize and implement a structure to ensure timely planning for procurement needs.

Recommendation 5

To continue its work to ensure better collaboration between government relations staff and the Capital Division, Metro Transit should develop, document, and implement a plan for a proactive government relations approach, such as the one detailed in the Parametrix Stakeholder Management Plan.

AGENCY RESPONSE

CONCURRENCE **CONCUR**

IMPLEMENTATION DATE 12/31/2024

RESPONSIBLE AGENCY Metro

COMMENT Metro will document and implement a plan to more proactively incorporate a government relations approach for our zero emissions work.

Recommendation 6

To continue its efforts to ensure increased collaboration between the Capital Division and the Safety, Security, and Quality Assurance Division, Metro Transit should develop, document, and implement a plan to formally incorporate the Safety, Security, and Quality Assurance Division into capital project design and implementation, such as through a safety and security certification program.

AGENCY RESPONSE

CONCURRENCE **CONCUR**

IMPLEMENTATION DATE 6/30/2026

RESPONSIBLE AGENCY Metro

COMMENT The Safety & Security certification program is a very large body of work within the Capital Division and is not only for zero emissions projects. An overarching Safety & Security Certification program needs to be developed and implemented for all Capital projects. Metro will document and implement a plan for incorporating the Safety & Security program into Metro's capital project development process.



Appendix 4: Statement of Compliance, Scope, Objective & Methodology

Statement of Compliance with Government Auditing Standards

We conducted this performance audit in accordance with Generally Accepted Government Auditing Standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Scope of Work on Internal Controls

We assessed the extent to which the King County Metro Transit Department (Metro Transit) designed and implemented proper controls to achieve King County’s goal of reaching a zero-emission bus fleet by 2035. In performing our audit work, we identified opportunities for improvement relating to plans, methods, procedures, and communication used to fulfill that goal.

Scope

This audit will examine Metro Transit’s planning efforts and capital projects since 2020, for the adoption of electric buses to reach a zero-emissions fleet by 2035.

Objectives

1. To what extent has Metro Transit taken steps to plan for completing its transition to battery-electric buses, including planning for supply chain, market, and technology risks, since our bus electrification interim audit report in 2020?
2. What are the timeline and delivery statuses of electrification capital projects?
3. To what extent has Metro Transit taken steps to address risks for electrification capital projects since our capital delivery audit report in 2023 and bus electrification report in 2020?

Methodology

To assess Metro Transit’s plans for completing its transition to battery-electric buses, we considered King County Code sections 18.22.010, 28.94.080, and 28.94.085, as well as federal and industry guidance on transitioning bus fleets to battery-electric buses. We also interviewed subject matter experts at the National Renewable Energy Laboratory (NREL) and attended trainings by the US Federal Transit Administration to better understand recommended practices. We reviewed Metro Transit’s zero emission

work planning documents, risk register, communication documents, and agency strategic plans. We also interviewed department leadership and subject matter experts across the department, including within the Zero Emission team, procurement, government relations, safety and security, maintenance, and capital. We observed a zero-emission capital project site as well as active operations at South Annex Base. We also gathered information about other jurisdictions' goals and plans for zero-emission bus fleet transitions. Lastly, we reviewed the County's Emergency Support Function annexes and interviewed Metro Transit and Office of Emergency Management staff. We then assessed Metro Transit's efforts with the criteria from King County Code and recommended practices and identified opportunities for improvement in planning and communication toward reaching the County's zero emission goal.

To better understand planning for supply chain, market, and technology risks that might affect Metro Transit's ability to transition its fleet, we considered risks identified in our 2020 electrification report as well as risks identified by Metro Transit and federal and industry organizations. We also reviewed consultant reports on capital project risks and plans, particularly for planning capital work, working with stakeholders, resiliency planning, and delivery method selection. We interviewed staff across the department about steps to mitigate those risks and identified opportunities to ensure current efforts are completed to mitigate risks related to alternative delivery methods, safety, procurement, and government relations.

To report on the timeline and delivery status of electrification capital projects and the extent to which Metro Transit has taken steps to address risks for electrification capital projects, we interviewed staff within the Capital Division and utilized the division's project data and documentation stored in Microsoft BI and SharePoint to gather information about project schedules, costs, and risks. We also reviewed documentation of the division's Get Things Built framework updates on alternative minimum milestones and lessons learned repository. We interviewed staff further about division practices to use and maintain these tools. We assessed this material against four of the recommendations made in the 2023 capital delivery audit and provided a follow-up status update as part of this audit report.



Appendix 5: List of Recommendations

Recommendation 1

Metro Transit should work with the King County Council to clarify and document both its reporting requirements in King County Code 28.94.085.B and ongoing communication steps to meet King County Council needs for information on the zero emissions goal.

Recommendation 2

Metro Transit should document how it plans to clarify and fulfill its emergency responsibilities as it transitions to a zero-emission fleet and incorporate emergency contingency strategies into capital project planning as needed.

Recommendation 3

Metro Transit should develop, document, and implement a strategy to maximize the benefits of using collaborative delivery methods, which could include pursuing the Washington State Project Review Committee certification for collaborative delivery methods.

Recommendation 4

To continue its work to ensure better collaboration between the Finance and Business Operations Division and the Capital Division, Metro Transit should develop, document, and implement a structure for working with Procurement and Payables to ensure timely planning for procurement needs over the course of its zero emissions transition.

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Advancing Performance & Accountability

KYMBER WALTMUNSON, KING COUNTY AUDITOR

MISSION Promote improved performance, accountability, and transparency in King County government through objective and independent audits and studies.

VALUES INDEPENDENCE • CREDIBILITY • IMPACT

The King County Auditor’s Office is committed to equity, social justice, and ensuring that King County is an accountable, inclusive, and anti-racist government. While planning our work, we develop research questions that aim to improve the efficiency and effectiveness of King County government and to identify and help dismantle systemic racism. In analysis we strive to ensure that communities referenced are seen, not erased. We promote aligning King County data collection, storage, and categorization with just practices. We endeavor to use terms that are respectful, representative, and people- and community-centered, recognizing that inclusive language continues to evolve. For more information, see the King County [Equity and Social Justice Strategic Plan](#), King County’s [statement on racial justice](#), and the King County [Auditor’s Office Strategic Plan](#).

ABOUT US The King County Auditor’s Office was created by charter in 1969 as an independent agency within the legislative branch of county government. The office conducts oversight of county government through independent audits, capital projects oversight, and other studies. The results of this work are presented to the Metropolitan King County Council and are communicated to the King County Executive and the public. The King County Auditor’s Office performs its work in accordance with Government Auditing Standards.



This audit conforms to Generally Accepted Auditing Standards for independence, objectivity, and quality.