

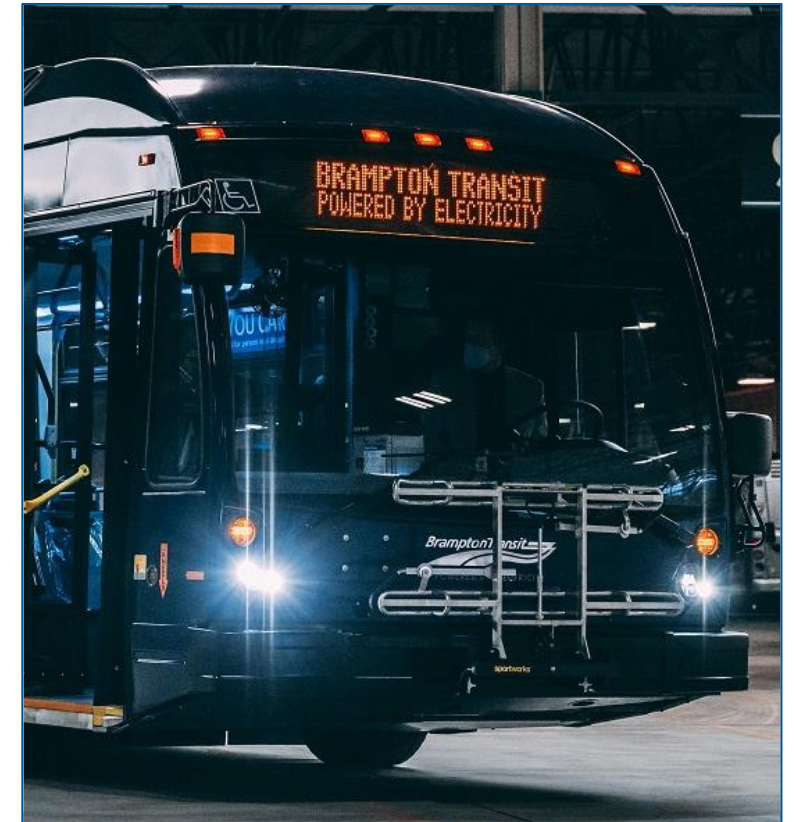


ZEB Strategic Plan

Zero Emissions Bus (ZEB) Committee

In early 2021, the OPTA Board recommended the establishment of a zero-emission bus (ZEB) Committee.

- **Mandate:** establish and maintain a forum for members to develop and share best practices, lessons learned, standards documentation, and key metrics to facilitate implementation of zero-emissions vehicle technology
- **Workstreams:**
 1. Operations
 2. Engineering
 3. Procurement & Vendor Management
 4. Advocacy & Communications





Workstream 1 – Operations

What we've accomplished

The Operations workstream has already seen movement on a number of key initiatives.

Through 2023, the workstream subcommittee has been advancing four key reports, relating to interoperability checklists, and guidelines for scheduling, opportunity chargers and change management.

On the reporting front, development of the OPTA ZEB Performance Dashboard continues with the help of CUTRIC.

On the safety front, in conjunction with Workstream 2, initial work has commenced with external help on reviewing ZEV safety and BEB fire safety.

For some of us, ZEBs have been on the road for a number of years now. Although we've learned valuable lessons from our deployments, there is more to learn and share with each other.

This workstream deals with both improving the operations and maintenance knowledge and practices for our ZEBs. It also aims to ensure we are sharing information with each other and those that are just beginning their journey.

With so many elements contained within the operations and maintenance of buses, there are three sub-workstreams to **Operations** as follows:

Planning, Scheduling & Operations

From a planning perspective, there are near-term questions to answer to make investment decisions. But there are also larger policy questions that we should be asking our partners, and solving together with them. From a scheduling and operations perspective, we will explore how to optimize our scheduling and recognize the organizational change implications of adopting ZEBs..

Safety, Training & Maintenance

Safety is paramount to all our organizations, so we will focus on deepening our understanding of safety risks from ZEBs. We will share leading practices for training all impacted staff and identify particular areas of focus. We will also develop a common understanding of preventative maintenance needs.

Performance & Monitoring

Together we are collecting significant data from our deployments, which is valuable to both us and our partners. By developing a common set of KPIs and performance definitions, and sharing reporting on them with each other, we can collectively improve our implementations.

Workstream 2 – Engineering

The technological shift that accompanies ZEBs is significant. From the buses, to the charging infrastructure, to new ways of managing electricity, understanding the and addressing the engineering implications is critical for success.

For those Transit Systems that have already begun their ZEB transition, there were a number of engineering questions raised and decisions made as a part of the planning for early implementation.

As those vehicles have been integrated into regular operation, technical issues have been addressed and lessons learned. Will we make the same decisions for our next order of buses or next installation of charging infrastructure, or will we do it differently?

For those of us moving to steady-state procurement of ZEBs, now is the time to share and integrate those lessons into the next phase of our implementation. Workstream 2's goal is to share and integrate all of the information we have collectively gathered to make better

decisions when it comes to specifying, delivering and maintaining ZEBs and their supporting infrastructure.

Workstream 2 also aims to package this technical information in a way that newer ZEB adoptees are in a position to be better equipped to address the technical challenges their implementations may pose. There is also a role to play in continuing to research emerging technical questions for transit systems, whether its about their current implementation or the next iteration of technology.

Lastly, its important to highlight the core focus on safety all of us have, which is why our Thermal Events Task Force and its focus on understanding BEB's safety implications, rests within Workstream 2.

What we've accomplished

The Engineering workstream has likewise seen movement on a number of key initiatives.

Through 2023, the workstream subcommittee has been advancing consultations in the areas of vehicles and infrastructure, working with Transit Systems to determine areas of priority.

On the safety front, in conjunction with Workstream 1, initial work has commenced with external help on reviewing ZEV safety and BEB fire safety.

The creation of the Thermal Events Management Task Force has also allowed start of planning for that important piece of research.

Workstream 3 – Procurement & Vendor Management

The shift to ZEBs has brought with it new vendors, different supply chains and the opportunity for a number of new business models and contracting strategies. Navigating this change requires a close and collaborative relationship with the market.

ZEB implementations thus far have taught us how important strong relationships with our vendor community are to a successful deployment.

Our deployments continue to be an opportunity for OEMs to see how their products are performing in real-world operations across Canada. This is particularly important when you consider Canada has some of the largest active ZEB deployments in North America.

One objective of Workstream 3 is to strengthen and expand that collaboration with the market, in order to collectively gather valuable insights and foster ongoing innovation in zero-emission bus technologies. Everyone's ultimate goal is the acceleration of adoption of sustainable solutions in public transportation across the country.

In most instances, these sustainable solutions bring with them new contracting models and commercial management considerations. The industry, whether it is commercial buses, paratransit buses (be they conversions or purpose-built) and non-revenue vehicles (NRVs), is grappling with changing business models, which each of us will need to deal with.

On this front, Workstream 3 aims to develop leading practices (and standardization where appropriate) for commercial management considerations across different fleet types, both for the vehicles themselves and their supporting infrastructure. Doing so will both optimize efforts within the vendor community and simplify the organization change for transit systems as procurements shift to sustainable choices.

What we've accomplished

Shared best practices for procurement requirements, including commercial terms, liquidated damages, procurement equity, and green procurement.

Collaborated on TTC joint procurement

Shared best practices on procurements for large and small buses from MX, CUTRIC, TransHelp, and others.

Hosted monthly market sounding sessions to inform transit agencies of current and emerging products and services

Conducted multiple surveys to confirm direction from both transit agencies and business members

Workstream 4 – Advocacy & Communications

The transition to zero emission vehicles is not just a procurement decision made by each transit systems, but both a transport and energy policy decision. As such, it requires the partnership of multiple levels of government to succeed.

Effective communications and advocacy are vital for our collective success in transitioning to zero-emission fleets. These efforts are critical not only for fostering public support but also for promoting the environmental benefits of such a shift. Moving toward zero-emission transit is a key component of reducing Canada's greenhouse gas emissions and improving air quality in our communities. By effectively communicating the positive environmental impact, transit systems can emphasize the role of public transit in reducing Canada's carbon footprint. Advocacy efforts can help secure funding and support from all levels of government to facilitate this transition.

Moreover, promoting a shift from personal vehicles to transit through zero-emission buses is an essential aspect of Canada's environmental strategy. Personal vehicles

are a major source of emissions, and transitioning to cleaner public transit options can significantly reduce individual and collective carbon footprints. Effective communication campaigns can highlight the convenience, affordability, and sustainability of transit systems, encouraging more Canadians to choose public transit over private cars. Advocacy efforts can also influence policy decisions, leading to investments in transit infrastructure and improved services, making it an attractive option for daily commuting.

By effectively conveying the environmental benefits and garnering support, transit agencies can contribute to Canada's sustainability goals while providing a greener and more efficient transportation option for Canadians.

What we've accomplished

The Intergovernmental Advocacy workstream has advanced a number of key initiatives in 2023, focusing on active engagement with business members in an effort to align common strategic goals and identify government relations bench strength within OPTA. These efforts have demonstrated a commitment to fostering collaboration between stakeholders through facilitated round table discussions, ensuring key interests are well represented in policy discussions and the direction this workstream intends to move forward.

Through these discussions, some common themes have emerged, including the development of a Centre of Excellence, and an emphasis on dialogue with CUTA and CUTRIC.



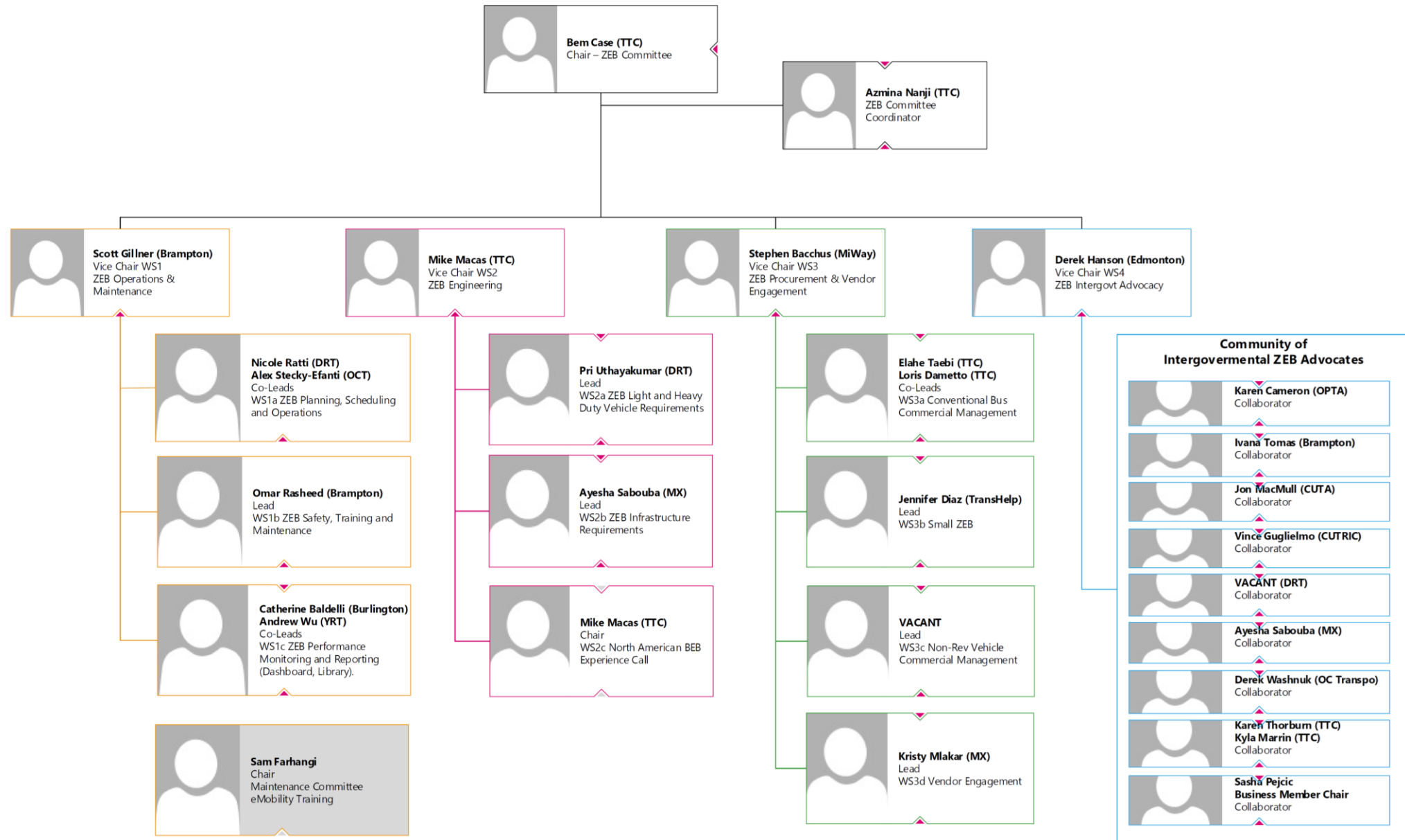
ZEB Committee Membership

Transit agency members from throughout Ontario, as well as:

- Alberta
- British Columbia
- Manitoba
- New Brunswick
- Nova Scotia
- Quebec



ZEB Committee Governance



ZEB Committee Resources

- Workstreams are advanced primarily by volunteers from transit agency members
- Business members are eager to contribute and are taking on an increasingly large role
- Requires an increasing demand on Association “staff” for project coordination, admin, and IT support
- Its evident that to truly support its goals, the ZEB Committee would be best served by having a national platform that is adequately resourced and funded

Issues:

Scope is resource limited.

Work is held by a lack of immediate funding for the dashboard and library.

What's Next: Identify Unconstrained Need

Mid-2023, the OPTA Board Executive requested the ZEB Committee **identify the unconstrained need** to enable the **transition to zero-emissions buses**.

The Chair facilitated **“Blue Sky” workshops** with Committee Vice-Chairs, OPTA’s CEO and business member representative, and CUTA staff.

KPMG assisted with framing and documenting the resulting Strategic Plan which organizes and prioritizes **needed actions, and identifies financial and human resourcing needs**.

The resulting scope would transition the **ZEB Committee** to a **National ZEB Centre of Excellence** needed to enable and accelerate progress toward achieving our transit agency, municipal, provincial, and federal goals to **achieve net-zero GHG emissions through fleet decarbonization**.

ZEB Centre of Excellence: Strategic Plan

- The Strategic Plan is intended to be a **succinct, outward-facing document**. It will include a short introduction, individual sections for each workstream, and an implementation summary.
- This document will support the ongoing discussions regarding the upload of the OPTA ZEB Committee to CUTA, giving visibility to the scale of the work we feel is necessary.
- Sitting below the Strategic Plan document will be more detailed plans for each workstream.
- The Strategic Plan will also include the tables that follow, giving some detail on each of the main actions within the plan.
- The cost key on the following slides is as follows:

\$ = <\$50k | \$\$=\$50k-150k | \$\$\$= \$150k-350k | \$\$\$\$ = >\$350k

DRAFT for discussion

Contents

- Introduction #
- Workstream #1 – Operations #
- Workstream #2 – Engineering #
- Workstream #3 – Procurement & Vendor Management #

Workstream 1 – Operations

For some of us, ZEBs have been on the road for a number of years now. Although we've learned valuable lessons from our deployments, there is more to learn and share with each other.

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Safety is paramount to all our organizations, so we will focus on deepening our understanding of safety risks from ZEBs. We will share leading practices for training all impacted staff and identify particular areas of focus. We will also develop a common understanding of preventative maintenance needs.

Performance & Monitoring

Together we are collecting significant data from our deployments, which is valuable to both us and our partners. By developing a common set of KPIs and performance definitions, and sharing reporting on them with each other, we can collectively improve our implementations.

Sourcing	Cost	Source
all Systems + 3 Parties (noted by WSC)	\$-\$	
all Systems + 2 Parties (noted by WSC)	\$-\$	
all Systems + 1 Party (noted by WSC)	\$	
all Systems + 0 Parties (noted by WSC)	\$	
all Systems + 3 Parties (noted by WSC)	\$	
all Systems + 2 Parties (noted by WSC)	\$	
all Systems + 1 Party (noted by WSC)	\$	
all Systems + 0 Parties (noted by WSC)	\$	

Planning, Scheduling & Op

Improve scheduling to optimize the advantages of and optimize the use of ZEBs.	Help ensure that ZEB considerations are seamlessly integrated into systems scheduling assumptions.	<ol style="list-style-type: none"> 1. Support the continuous improvement of scheduling practices to optimize ZEB use. <ul style="list-style-type: none"> i. Develop a guideline for schedulers, incorporating a scheduling impact assessment (e.g. building on the outcomes of the OPTA / CUTA / EqualCharge SPOT report) ii. Develop a roadmap for maturation from manual to automated integration of ZEB considerations into scheduling (ESB) to leverage efficiencies in subsystems 					Transit Systems + Association Admin + Industry Consultants \$-\$ \$\$\$
Improve integration of ZEBs into system bus operations.	Minimize the challenge of organizational change stemming from ZEBs for systems operations.	<ol style="list-style-type: none"> 1. Support transit systems through the organizational change management journey required of ZEB adoption. <ul style="list-style-type: none"> i. Develop a framework for change management that covers the entire lifecycle of implementation (e.g. trial, transition, and ongoing stakeholder management) <ul style="list-style-type: none"> 1. Managing risks transition (not transition) ii. E-aid vs. capitalizing costs ii. Develop and share regular case studies of change management topics iii. Develop an annual survey to help gauge organizational change management progress. 2. Develop a guidance Operations-based Approval Checklist (incorporating Interoperability Testing, Commissioning, Final Acceptance & Sign-off) 					Transit Systems + Association Admin Transit Systems + Association Admin Transit Systems + Association Admin \$ \$ \$

DRAFT for discussion

ZEB Centre of Excellence: Operations

Ramp up period

Work-stream	Strategic Objective	Goal / Outcomes	Priority Actions	2024	2025	2026	2027	2028	2029-2033	Resourcing	Cost	Source		
Safety	Collaborate to advance knowledge and understanding of ZEB safety	Ensure ZEBs pose no greater safety risk than today's bus fleets.	1. Develop work and safety standards for arc flash and high voltage work on EV electrical systems (e.g. lock out tag out [LOTO], standard operating procedures [SOPs])	█						Transit Systems + Third Parties (supported by WS2)	\$\$-\$			
			2. Develop a baseline Standard Operating Procedure (SOP) for safety implications of battery electric bus (BEB) thermal events (e.g. theory, risk, mitigations)	█							Transit Systems + Third Parties (co-led with WS2)	\$\$-\$		
			3. Develop a guideline on safety implications of electro-magnetic interference (EMI) to both the public and system staff (e.g. theory, risk, mitigations) – specific recommendations to mitigate risks, to be built into specs/contracts	█								Consultant (led by WS2)	\$\$	
Planning, Scheduling & Operations	Improve the planning of ZEB implementation by defining the pathways and proactively exploring the next challenge.	Have supports available for a variety of ZEB implementation pathways, allowing systems to choose a path rather than blaze one.	1. Examine priority implementation challenges to support immediate needs of systems.	█	█	█	█	█	█					
			i. Develop a guideline on Opportunity Charger planning considerations (e.g. cluster/optimization, optimal ratios and interoperability between LROC and LRID ZEBs, public access & site constraints)	█							Transit Systems + Association Admin. Consultants	\$\$		
			2. Support the advancement of emerging ZEB solutions	█	█	█	█	█	█	█				
			i. Develop a white paper on the opportunity of advancing the hydrogen supply chain in a) Alberta/Maritimes, followed by b) other provinces (e.g. pursue PESTEEL analysis)	█		█						Transit Systems + Consultants	\$\$	
			ii. Develop a white paper on the opportunity of Energy-as-a-Service (EaaS) as a solutions for ZEB implementations	█								Consultants	\$\$-\$	
	Improve scheduling to optimize the advantages of and optimize the use of ZEBs.	Help ensure that ZEB considerations are seamlessly integrated into system scheduling assumptions.	1. Support the continuous improvement of scheduling practices to optimize ZEB use.											
			i. Develop a guideline for schedulers, incorporating a scheduling impact assessment. (e.g. building on the outcomes of the OPTA / CUTA / EquiCharge SPOT report)	█							Transit Systems + Association Admin. + industry	\$\$-\$		
			ii. Develop a roadmap for maturation from manual to automated integration of ZEB considerations into scheduling. (EMS to leverage efficiencies in subsystems)	█								Consultants	\$\$	
	Improve integration of ZEBs into system bus operations.	Minimize the challenges of organizational change stemming from ZEBs for systems.	1. Support transit systems through the organizational change management journey required of ZEB adoption.	█	█	█	█	█	█	█				
			i. Develop a framework for change management that covers the entire lifecycle of implementation (e.g. trial, transition, and ongoing stakeholder management)		█							Consultants	\$\$\$	
			ii. Develop and share regular case studies of change management topics	█	█	█	█	█	█	█	█	Transit Systems + Association Admin.	\$	
iii. Develop an annual survey to help gauge organizational change management progress.			█	█	█	█	█	█	█	█	Transit Systems + Association Admin.	\$		
2. Develop a guidance Operations-based Approvals Checklist (incorporating Interoperability Testing, Commissioning, Final Acceptance & Sign-off)			█								Transit Systems + Association Admin.	\$		

ZEB Centre of Excellence: Operations

Ramp up period

Work-stream	Strategic Objective	Goal / Outcomes	Priority Actions	2024	2025	2026	2027	2028	2029-2033	Resourcing	Cost	Source	
Training & Maintenance	Improve ZEB training, both in content and reach.	Employees provided with high quality and relevant ZEB training in a timely manner and with the latest information on the equipment they use.	1. Develop function-specific guidelines for training, including core competencies and potential specializations.										
			i. Develop a guideline on BEBs for Operators							Transit Systems + OEMs	\$\$		
			ii. Develop a guideline on BEBs for Maintenance Staff								Transit Systems + OEMs	\$\$	
			2. Explore partnerships with educational institutions and certification providers to expand access to required training.							Transit Systems + Third Parties	\$		
	Advance our sophistication in the maintenance of ZEBs.	Transit Systems are making maintenance decisions that will optimize the ZEB technology and maximize its lifecycle.	3. Explore partnerships with unions to advance ZEB & BEB specific training and certifications.							Transit Systems + Unions	\$		
			1. Develop standardized preventative maintenance program elements for ZEBs.							OEMs / Consultants	\$\$		
			2. Develop standardized maintenance KPIs and comparative analysis framework for ZEBs.						Transit Systems + OEMs	\$			
			3. Work with appropriate authorities to develop high voltage system inspection requirements for commercial motor vehicles (i.e. as an update to NSC11B)						Third Parties / OEMs/ Consultants	\$\$			
Talent	Ensure we're staffed to support ZEBs.	Develop a strong, sustainable talent pipeline.	1. Explore partnerships with external groups to advance pipeline of skilled ZEB & BEB trained workforce.							Third Parties	\$		
Reporting	Improve our understanding of ZEB performance and standardize our data collection and reporting.	Harmonized reporting framework allows better comparison across the industry.	<p>1. Launch the OPTA ZEB Performance Dashboard</p>							Transit Systems + CUTRIC	\$\$		
	Have a common philosophy on data ownership and sharing.	Have a clear understanding on who owns what data resulting from ZEB implementations.	1. Develop a white paper on data strategy that tackles issues like data ownership (transit system, OEM, third party, etc.), primary use cases, data sharing, IP, etc.								Transit Systems + OEMs + Third Parties + Consultant support	\$\$	

ZEB Centre of Excellence: Operations

Work-stream	Strategic Objective	Goal / Outcomes	Priority Actions	2024	2025	2026	2027	2028	2029-2033	Resourcing	Funding		
											Cost	Source	
WS2A – Technical Guidelines, & Supporting Operations and Safety	Identify key technical considerations and requirements	Informing a well-defined set of technical specifications and standards that will guide the procurement of ZEB's.	1. Develop a technical specification document and establishing ZEB performance standards.	▶									
			i. Undertake HV battery testing to ensure safety, performance, and durability of the batteries used in ZEBs, while also confirming alignment with expected criteria (e.g. energy storage)		■						Consultants	\$\$\$	
			ii. Collaborate closely with HV battery manufacturers to promote transparency and gain a deeper understanding of overall battery design (e.g., to better understand Quality Assurance and Quality Control.	■							OEMs	\$	
	To provide necessary assistance, guidance, and resources to ensure successful implementation and smooth operation.	Facilitate the widespread adoption of sustainable and environmentally friendly buses.	1. Develop standardized commissioning and interoperability templates while ensuring flexibility and adaptability										
			i. Conduct a needs assessment to identify components and systems involved in the ZEB infrastructure that require commissioning.	■							Transit agencies + OEMs	\$\$	
			ii. Engage SMEs to create standardized templates for commissioning each component and system. Ensure templates are adaptable to diverse bus models and charging setups while maintaining consistency.		■						Transit agencies + OEMs + Consultants	\$\$\$	
	To effectively adopt and enforce safety protocols.	Ensuring the highest safety standards are met throughout the entire ZEB fleet operations, maintenance, and charging processes.	1. Conduct HV related safety tasks										
			i. Conduct thorough arc flash testing to identify hazards linked to high-voltage (HV) systems in ZEBs and devise mitigation strategies including PPE, safety barriers, and system optimization for reduced arc flash risks.		■						Transit agencies + Third Parties (supporting WS1)	\$\$	
			ii. Establish and enforce comprehensive lock-out-tag-out (LOTO) procedures for HV systems during maintenance, repair, and servicing, while providing detailed training.		■								
			2. Utilize the thermal task force to perform thorough risk assessments to identify thermal hazards in ZEB battery systems, and create detailed mitigation plans outlining actions (e.g., active cooling systems, thermal barriers, and proper ventilation.)			■						Transit agencies + Third Parties (co-led with WS1)	\$\$\$\$
3. Conduct Electromagnetic Compatibility (EMC) testing on ZEB systems to identify potential electromagnetic interference (EMI) sources and vulnerabilities.					■						Transit agencies + Third Parties	\$\$\$\$	

ZEB Centre of Excellence: Engineering

Work-stream	Strategic Objective	Goal / Outcomes	Priority Actions	2024	2025	2026	2027	2028	2029-2033	Resourcing	Funding		
											Cost	Source	
Energy Management System, & Supporting Planning	Developing charging standards	Timely introduction of national charging guidelines.	1. Partnering with CSA to develop charging guidelines	█						OEMs	\$\$		
	Optimize energy usage and reduce costs.	Enhance the overall efficiency and sustainability of charging operations	1. Optimize costs through energy usage analysis and smart charging										
			i. Develop white paper, analyzing historical energy usage patterns to pinpoint peak demand periods and consumption trends.	█							Transit agencies	\$	
			ii. Advance the integration of smart metering and energy monitoring systems for real-time consumption tracking, enabling informed decisions.	█	█						Transit agencies + Consultants	\$\$\$	
			2. Develop guidance documents on implementing peak shaving strategies that includes smart charging algorithms and energy storage integration.	█	█						Association Admin + Third parties	\$\$	
	Optimize the charger locations and clusters.	Encourage seamless transition to ZEB's by ensuring ease of access to charging infrastructure.	3. Leverage lessons learned from existing transit system agreements (e.g. PowerON/Bluewave) to develop guidance documents on considerations for alternative delivery models for charging infrastructure and management, including items such as business requirements.	█									
			1. Develop guidance documentation on charger location/cluster optimization, considering various factors such as usage patterns, transit routes, and charging demands.	█							Transit agencies + OEMs + Consultants	\$\$	
		2. Develop guidance documentation on best practices for own properties, site constraint considerations.	█							Transit agencies + OEMs + Consultants	\$\$		
Technical Working Group	Establish a robust collaborative technical working group framework.	Enhance Collaborative Knowledge Sharing and Problem Resolution for (ZEB) Technology through a working group that facilitates the exchange of technical insights, problem-solving strategies, and best practices among ZEB stakeholders	1. Provide OPTA/CUTA ZEB members access to logs documenting problem discussion thus, encouraging transparency and knowledge sharing, enabling members to learn from others' experiences and collaboratively find solution	█	█	█	█	█	█	Association Admin	\$		

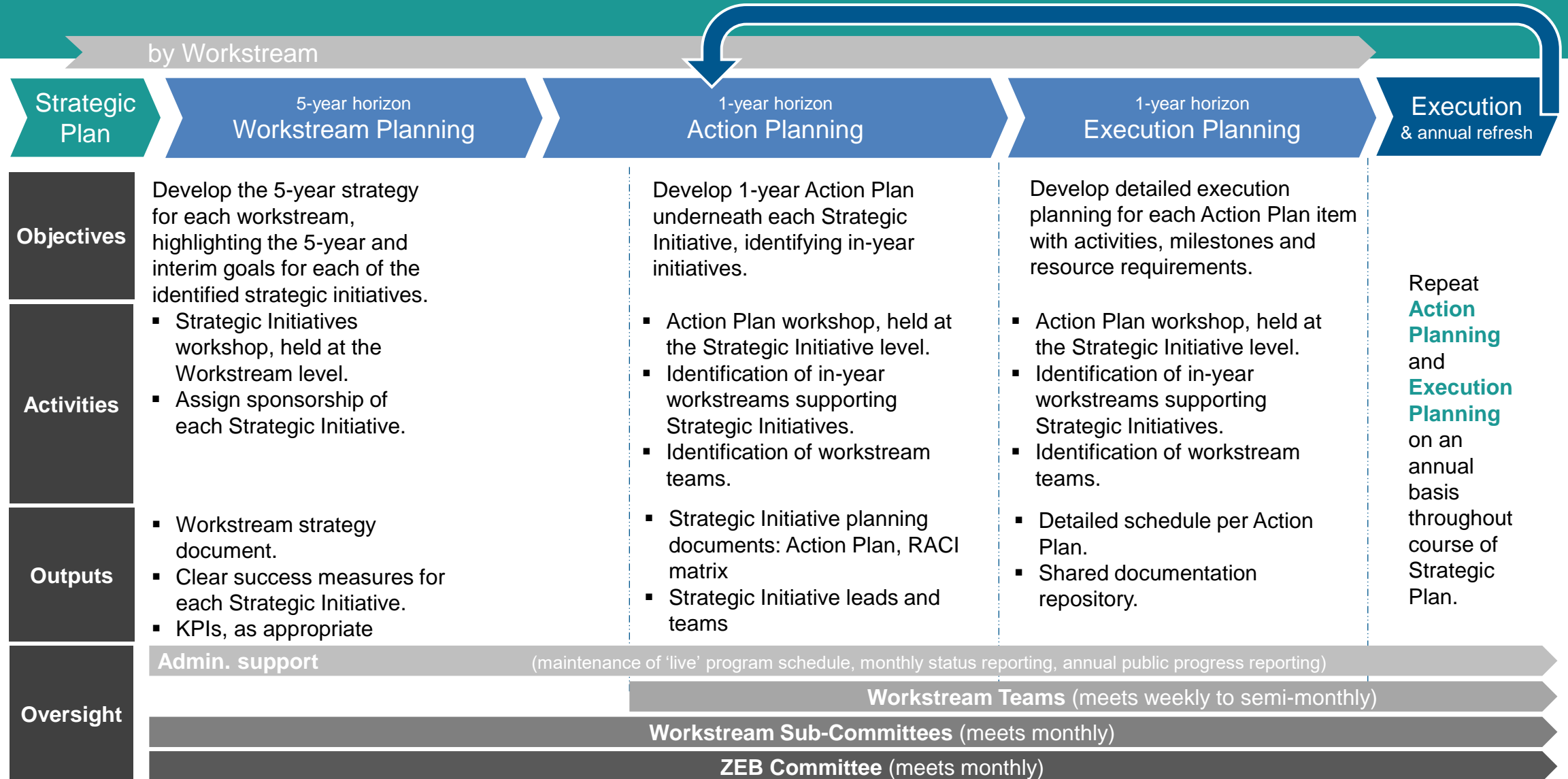
ZEB Centre of Excellence: Engineering

Work-stream	Strategic Objective	Goal / Outcomes	Priority Actions	2024	2025	2026	2027	2028	2029-2033	Resourcing	Funding			
											Cost	Source		
WS3A – Vendor Engagement	Enhance collaboration between Transit Systems and the Vendor Community	To gather valuable insights, identify potential partnerships, and foster innovation in zero-emission bus technologies, ultimately accelerating the adoption of sustainable solutions in public transportation.	1. Develop a platform for vendors to present their company, showcase their capabilities through presentations, and enhance their visibility and recognition within the ZEB Space.	■							Association Admin			
			i. Secure Webinar Presentations / Open Houses on a regular cadence and confirm participation with Vendor Community		▶							Association Admin	\$	
			2. Provide OPTA/CUTA members with vendor-supplied data and information pertaining to zero-emission vehicle implementation.		▶									
			i. Implement an annual updated survey mechanism that effectively differentiates between transit agency feedback and insights from the vendor community, ensuring comprehensive and accurate feedback.	■								Association Admin + Consultants	\$\$\$	
			ii. Present the market sounding report which presents an opportunity for OEM and existing transit agencies to explore findings and potential collaborations.									Association Admin	\$	
S3B/C/D – Commercial Management	Developing comprehensive and efficient commercial management plans that promote industry collaboration, technological advancements, and financial viability.	To accelerate the adoption of sustainable, zero-emission commercial buses, paratransit EV's and non-revenue vehicles in the public transportation sector.	1. Finalize the commercial bus management plan	■										
			i. Deliver a guidance document on commercial management considerations that includes leading practices on the following topics: unified bus specifications, dealing with OEMs to address contract concerns, and general conditions (including warranty terms, liquidated damages, performance targets, latent defects, escalation clauses, and adoption agreements).	■	▶							Association admin + consultants + OEMs.	\$\$	
			ii. Develop and continuously update a data warehouse that includes the following information: recent contract awards, pricing directory with standardized pricing based on specs, forecast procurements/pipeline, etc.	■	▶							Association admin + consultants + OEMs.	\$\$	
			2. Finalize the EV paratransit commercial management plan		■									
			i. Develop jurisdictional scan and market-sounding white paper to understand the current state and planned evolution of the sector.			■						Association admin + consultants + OEMs.	\$\$\$	
			ii. Deliver a guidance document on commercial management considerations, covering same topics as the commercial bus management plan.									Association admin	\$	
			iii. Incorporate EV paratransit data into the vehicle procurements data warehouse.									Association admin	\$	
			3. Finalize the non-revenue vehicle commercial management plan	■										
			i. Deliver a white paper / feasibility study on the timeline and considerations for implementation of lower-emissions and zero-emissions non-revenue vehicles.			■						Association admin + consultants	\$\$	
ii. Develop a forum that allows the sharing of information on the latest zero-emissions options for non-revenue vehicles, with an emphasis on specialized equipment.									Association admin	\$				

ZEB Centre of Excellence: Advocacy and Comms

Work-stream	Strategic Objective	Goal / Outcomes	Priority Actions	2024	2025	2026	2027	2028	2029-2033	Resourcing	Funding		
											Cost	Source	
Advocacy & Communications	Facilitate and strengthen intergovernmental relationships and policy engagement	Drive policy change and secure grant funding for ZEB.	1. Develop and execute strategy to engage in both advocacy for funding and proactive education regarding currently available funding opportunities.	█	█	█	█	█	█	Association Admin + Third Parties	\$		
			i. Create standardized templates for grant applications.				█			Association Admin + Consultants	\$\$		
			2. Provide focused education on carbon credit strategies, specifically the choice between selling and retaining credits, while enhancing competencies to capitalize on carbon credit opportunities.	█									
			i. Conduct a needs assessment to evaluate the current knowledge and awareness level of stakeholders regarding carbon credit strategies and their implications.		█					Association Admin + Transit Systems	\$\$		
			ii. Collaborate with industry experts, economists, and environmental specialists to provide insights and practical strategies for capitalizing on carbon credits, published on a regular cadence			█				Association Admin + Transit Systems + Third Parties	\$\$		
			3. Engage in advocacy efforts to promote interim measures towards achieving the ideal carbon intensity for hydrogen, facilitating pilot initiatives to drive innovation as we progress towards the ultimate goal.			█				Association Admin + Transit Systems + Third Parties	\$		
			i. Develop a white paper focused on removing obstacles related to "green" hydrogen production, thereby paving the way for innovative solutions.			█				Consultants	\$\$		
			4. Drive conversations on the impact of BEB ZEBs on the electricity load on the grid and regulatory and rate issues.	█						Association Admin + Transit Systems	\$		
			i. Develop a white paper focused on the national electricity impact of the electrification of transit fleets, quantifying the impact on generating capacity.			█				Consultants	\$\$		
	5. Help drive conversations on the implementation of carbon accounting within municipalities and Transit Systems with the goal of alignment and sharing of leading practices.	█						Association Admin + Transit Systems	\$				
	Enhance industry awareness and knowledge sharing through strategic communication	Foster a well-informed and collaborative ecosystem.	1. Develop and distribute a newsletter to share industry updates and committee activities, addressing the lack of awareness and education about opportunities and advancements in the transit/transport transition sector.	█						Association Admin + Transit agencies + OEM	\$\$\$		
			2. Assess the current communication strategy of CUTRIC and consider engaging a PR firm to improve and amplify public-facing communication efforts, especially concerning funding programs.	█	█					Association Admin + Consultants	\$\$\$		
	Enhancing clarity and accountability in procurement processes and performance.	Establish a streamlined and transparent procurement framework.	1. Implement joint procurements for enhanced clarity and accountability	█									
			i. Identify procurement needs and opportunities for collaboration across member organizations.							Association Admin	\$\$		
			ii. Identify suitable procurement categories for joint efforts, focusing on areas that will							Association Admin	\$\$		

ZEB Centre of Excellence: Detailed Planning



ZEB Centre of Excellence: Preliminary Budget

- This Strategic Plan has an order of magnitude cost totaling about \$10M
 - Operations cost: \$3M
 - Engineering costs: \$3.5M
 - Procurement & Vendor Management costs are about \$1.5M
 - Advocacy & Communications costs are about \$2M

Discussion Points:
*Resourcing and
funding this work*

ZEB Centre of Excellence: Resources

Role/Skill	Load FTE	Priority
Director	1	1
Admin	1/2	1
IT Support	1/2	1
Engineer	1	2
Funding coordinator	1/2	2
IGR and Comms	1	3
Advisor/coordinator	1/2	3
Procurement	1/2	4

Discussion Points:
*Resourcing and
funding this work*

Next Steps

1. Research?
2. Standards?
3. Governance?
4. Funding?
5. Collaborations?