

## **Early Intervention Team – Initial Project Phase Assessment Exercise:**

### **Planning Phase Assessment:**

*Phase purpose: Identify and evaluate project alternatives and environmentally clear a preferred alternative that provides high quality mobility options for diverse communities.*

<b><i>Identified Cost Drivers</i></b>	<b><i>Identified Mitigation Opportunities<sup>(1)</sup></i></b>
Limited design development and operations team involvement during period of initial scope development.	Implement methodology to conduct stage gate lifecycle project review process to review scope, cost, schedule, and risk. Evaluate cost estimates in ranges to reflect uncertainty in early design and planning phases.
Potential integration of additional community requests, as well as external stakeholder mandates.	Establish a clear project definition (purpose, scope, and goals) to reduce the possibility of subsequently added scope, time, and cost after the selection of Locally Preferred Alternative (LPA).
Third party requirements and payment for expedited review and permitting services to maintain focus on project schedule needs.	Reach agreement with key third parties reflecting scope freeze of critical project components at the end of environmental phase.
Future requirements for construction mitigations and systems planning needs.	Leveraging monthly coordination meetings, identify project constructability needs and conduct assessment of projects' connectivity to systems.

*1 – Identified mitigation opportunities shown may apply to more than one cost driver.*

**Engineering Phase Assessment:**

*Phase purpose: Design the project to provide for the intended scope of work including safety, operational, and maintenance requirements. The contractor uses the design documents as a basis for the project's subsequent construction, testing, and commissioning.*

<b><i>Identified Cost Drivers</i></b>	<b><i>Identified Mitigation Opportunities <sup>(1)</sup></i></b>
Continued project scope growth.	Continue implementation of stage gate lifecycle project review process to review and control scope, cost, schedule, and risk. Involve all Metro departments in developing the project scope during planning and avoid oversimplifying the scope to match the budget.
Third party and utilities requirements, processes and design criteria that differ from those of Metro or are imposed on Metro after completion of planning phase.	Identify items that require permits from third parties. Advance the project in line with the scope freeze of critical project components agreed upon at the end of environmental phase. Enforce policies related to when and how stakeholders can request project enhancements (i.e., betterments), including a process to evaluate and identify related cost, schedule, and third party funding needs.
Discovery of previously unforeseen and/or undefined site conditions.	Provide sufficient soils and geotechnical investigations that align with the project needs to reduce the subsequent risks associated with differing site conditions.
Consideration of FLS requirements, particularly for underground systems.	Evaluate technical solutions to address FLS requirements cost-effectively, leveraging expertise from multiple departments and agencies.
Construction planning with limited contractor involvement.	Advancement of alternative project delivery models, when appropriate, to enhance opportunities to leverage a partnership approach leading into the construction phase of project delivery.

*1 – Identified mitigation opportunities shown may apply to more than one cost driver.*

**Construction Phase Assessment:**

*Phase purpose: Deliver capital projects safely on-time, on-budget while effectively addressing both internal and external stakeholder needs.*

<b>Identified Cost Drivers</b>	<b>Identified Mitigation Opportunities <sup>(1)</sup></b>
Ensure project scope is managed and controlled to reduce costly contractor claims and project changes.	Continue implementation of stage gate lifecycle project review process to review scope, cost, schedule, and risk. Leverage advanced technology, such as Building Information Modelling (BIM), during design and construction for improved design efficiency and scope monitoring.
Mega project construction contracts have significant longevity ranging up to ten years. Escalating market conditions have further increased contractor risk, leading to increasingly strained contractor relationships.	Ensure Metro-seasoned key staff who can bring lessons learned from recent projects are embedded into upcoming project teams. For agreed upon changes, ensure change processes are done timely.
Execution of third party/utility agreements later in life cycle and agreements that do not drive desired performance and accountability, resulting in some changing standards, lack of adherence to timelines, late design change requests and imposition of unexpected work hour restrictions by third parties.	Engage third parties/utilities early to finalize agreements, confirm standards, agree upon streamlined processes, and implement design freeze for significant scope components.
Discovery of previously unforeseen and/or undefined site conditions.	Assist with logistical efficiency with respect to environmental and geotechnical issues that arise. For agreed upon changes, ensure change processes are done timely.
Schedule delays and contractor claims resulting in additional project soft costs and professional service cost increases.	Ensure Metro-seasoned key staff who can bring lessons learned from recent projects are embedded into upcoming project teams.  Advancement of alternative project delivery models, when appropriate, to enhance partnership approach and reduce potential impacts of strained relationships.

*1 – Identified mitigation opportunities shown may apply to more than one cost driver.*

**Operations Phase (Testing, Commissioning & Operations) Assessment:**

*Phase purpose: Identify and evaluate project alternatives and environmentally clear a preferred alternative that provides high quality mobility options for diverse communities.*

<b><i>Identified Cost Drivers</i></b>	<b><i>Identified Mitigation Opportunities <sup>(2)</sup></i></b>
Cost impact for scope necessary for system operations or system implementation needs increase significantly when identified later in the project lifecycle.	Ensure operations team involvement within all phases of the stage gate lifecycle project review process to review scope, cost, schedule, and risk.  Identify and provide sufficient and as needed resources, via internal staff and bench contractors, to support operations and maintenance review during earlier project phases. This includes, but is not limited to, review of value engineering proposals, bus bridge planning, and subsequent needs related to system expansion.  Ensure project scope components which are critical to future operations and maintenance costs are embedded in the design and closely monitored in earlier stages of project development.
Additional and unplanned Bus Bridges requested on projects during implementation phase.	
Late engagement of operations expertise, resulting in Value Engineering reversals/corrections to avoid future impacts on maintenance and system operations.	
Unanticipated requirements for partial demolition and reconstruction of existing systems or facilities, which are required to accommodate system expansion.	

*2 – Identified mitigation opportunities shown apply to all cost drivers listed.*