



Board Report

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**REVISED**  
**CONSTRUCTION COMMITTEE**  
**JUNE 16, 2022**

**SUBJECT: FY23 ANNUAL PROGRAM EVALUATION FOLLOW UP**

**ACTION: RECEIVE AND FILE**

**RECOMMENDATION**

RECEIVE AND FILE status report on the FY23 Annual Program Evaluation Follow-Up (Attachment A).

**SANDOVAL AMENDMENT:** Direct the CEO to develop an Early Intervention Project Team comprised of Metro’s finest and the best staff from planning, program management, operations, government relations, OMB, and vendor/contract management to design a list of a comprehensive checklist of criteria on successful project delivery addressing such as (1) funding strategy (either it is local or federal project), (2) project delivery method and why the project is being recommended for such delivery method for all Measure M Expenditure Plan Projects.

**DUPONT-WALKER AMENDMENT:**

1. As part of the next report on the cost management action plan, direct the CEO to include metrics to help evaluate the success and progress of cost control efforts; and
2. In the monthly Countywide Planning Major Project Status Report, direct the CEO to include a cost estimate range and design level for all projects.

**ISSUE**

On April 21, 2022, Staff presented the Annual Program Evaluation to the Construction Committee. In response, Director Dupont-Walker requested staff respond to the following:.

1. Establish specific measures to ensure project scope growth is being managed and controlled during all phases of project delivery, not just Program Management.
2. Develop a breakdown of specific third party and utility requirements that contribute the most to growing project costs and the steps being taken to amend or alter these requirements.
3. Detail the steps being taken to both evaluate and revise Metro Rail System Design Criteria to adequately balance system safety with project cost efficiency.

## **BACKGROUND**

Metro is delivering the largest transportation infrastructure program in the country. The Annual Program Evaluation (APE) initiative is a comprehensive evaluation of Metro's capital program, including Transit, Multimodal Highway, and Regional Rail projects. As part of the process, staff reviews and updates project costs and schedules to current conditions, challenges, and risks. In addition, APE serves as a project management tool bringing greater consistency, transparency, and discipline to better manage and deliver Board-approved projects. The APE is a dynamic tool, which is updated annually as projects move toward completion and any changes approved by the Board are incorporated.

In April 2022, the most recent annual APE update highlighted the role of construction market factors on the \$23.7 billion capital program. Specifically, market factors arising from the ongoing recovery from the COVID pandemic and Ukrainian conflict continue to escalate project related costs. Updated economic projections indicate that this will continue into FY23 and supply chain issues and labor impacts will continue to be potential cost and schedule drivers. In addition, with the significant number and size of Program Management projects and the accelerated implementation schedule for delivering Metro's capital program, Metro's capability and capacity to deliver multiple complex projects on-time and within budget creates unprecedented challenges to project delivery. Efforts to improve, innovate, and increase our capabilities to deliver projects were also presented. During the discussion, Director Dupont-Walker requested a report back reflecting a broader, agency-wide strategy to mitigate cost growth in the delivery of capital projects.

## **DISCUSSION**

The following departments contributed to the development of this report: Program Management, Planning and Development, Office of Management and Budget, Operations, and the Office of the CEO. This level of engagement lays the foundation for an ongoing collaborative and integrated approach to an effective cost containment strategy and aligns with the lifecycle of project development.

1. Establish specific measures to ensure project scope growth is being managed and controlled during all phases of project delivery, not just program management
  - Identify current best practices and new strategies to embed staff for planning, program management and operations in all stages of project delivery
  - Acknowledge that estimates of project schedule and cost become more accurate as project development advances. Report cost estimates in ranges, especially in early phases of project development when uncertainty is greatest
  - Extend project readiness review procedures across all lifecycle phases, including at various planning, engineering, and operational milestones
  - Assure configuration management process extends to cost and schedule variances from initial baseline plans

- Partner with jurisdictions and third parties to build consensus and buy-in on scope requirements, to freeze project designs earlier
- Conduct routine Board workshops to assure transparency and full understanding of scope alterations and cost implications
- Allocate staff and consultant resources to provide support

2. Third Party and Utility requirements that contribute the most to growing project costs and the steps being taken to amend or alter these requirements

*Third Party/Utilities Cost Drivers*

- Execution of agreements later in life cycle;
- Current agreements do not drive desired performance and accountability as follows:
  - Changing standards
  - Lack of adherence to timelines
  - Late design change requests; and
- Imposition of unexpected work hour restrictions by Third Parties.

*Third Party/Utilities Mitigation Measures*

- During project environmental clearance:
  - Engage third parties / utilities early and often
  - Finalize third party / utility agreements
  - Confirm applicable standards
  - Implement design freeze
  - Agree upon streamlined / expedited processes
  - Initiate subsurface exploration; and
- Beginning with project early works:
  - Expand subsurface exploration
  - Minimize changes relative to design freeze and enforce betterment policies
  - Adhere to agreed upon review and approval processes.

3. Metro Rail Design Criteria Plan for Cost Saving Measures

*Two Primary Mitigation Strategies*

1. Perform an internal assessment of opportunities to adjust requirements; and
2. Leverage alternative delivery contracts, specifically East San Fernando Valley, as an opportunity to further innovations that could result in cost reductions.

*Plan for Cost Saving Measures*

- Obtain input from the mega projects that are currently under construction as to which items related to Metro Rail Design Criteria for LRT and HRT may be a candidate for capital cost savings, including alternative technology;
- Secure funds and engage the services of an outside consultant to review and benchmark;
- Obtain the design criteria of three other transit rail peer agencies. Choose peer agencies that provide similar type of transit rail services as LA Metro;

- Identify items that will provide capital cost savings without compromising safety or adversely impact operations and maintenance or increase life cycle costs; and
- Coordinate with all the signatories to Metro Rail Design Criteria including Planning, Operations, Safety, and Quality and follow the Metro Systemwide Baseline Change Notice procedure to implement the identified changes.

The full Action Plan is outlined in Attachment A.

### **EQUITY PLATFORM**

There are no equity concerns anticipated as a result of this update.

### **IMPLEMENTATION OF STRATEGIC PLAN GOALS**

The recommendation supports Strategic Plan Goal #1 - Provide high-quality mobility options that enable people to spend less time traveling. This will be accomplished by planning and delivering multiple capital projects on time and on budget.

### **NEXT STEPS**

Metro staff's next steps are to report back to the Board in September with a more detailed plan for each of the three responses.

### **ATTACHMENTS**

Attachment A - Action Plan

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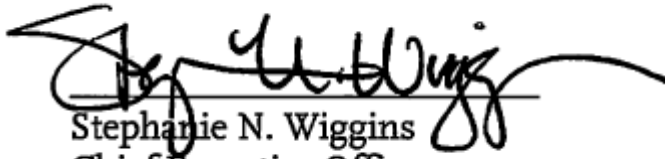
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Stephanie N. Wiggins  
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# Annual Program Evaluation Follow-Up

(Staff to report back in  
60 days with its first  
Action Plan)

1. *Establish specific measures to ensure project scope growth is being managed and controlled during all phases of project delivery, not just Program Management.*
2. *Develop a breakdown of specific third party and utility requirements that contribute the most to growing project costs and the steps being taken to amend or alter these requirements.*
3. *Detail the steps being taken to both evaluate and revise Metro Rail System Design Criteria to adequately balance system safety with project cost efficiency.*





## Life Cycle Overview

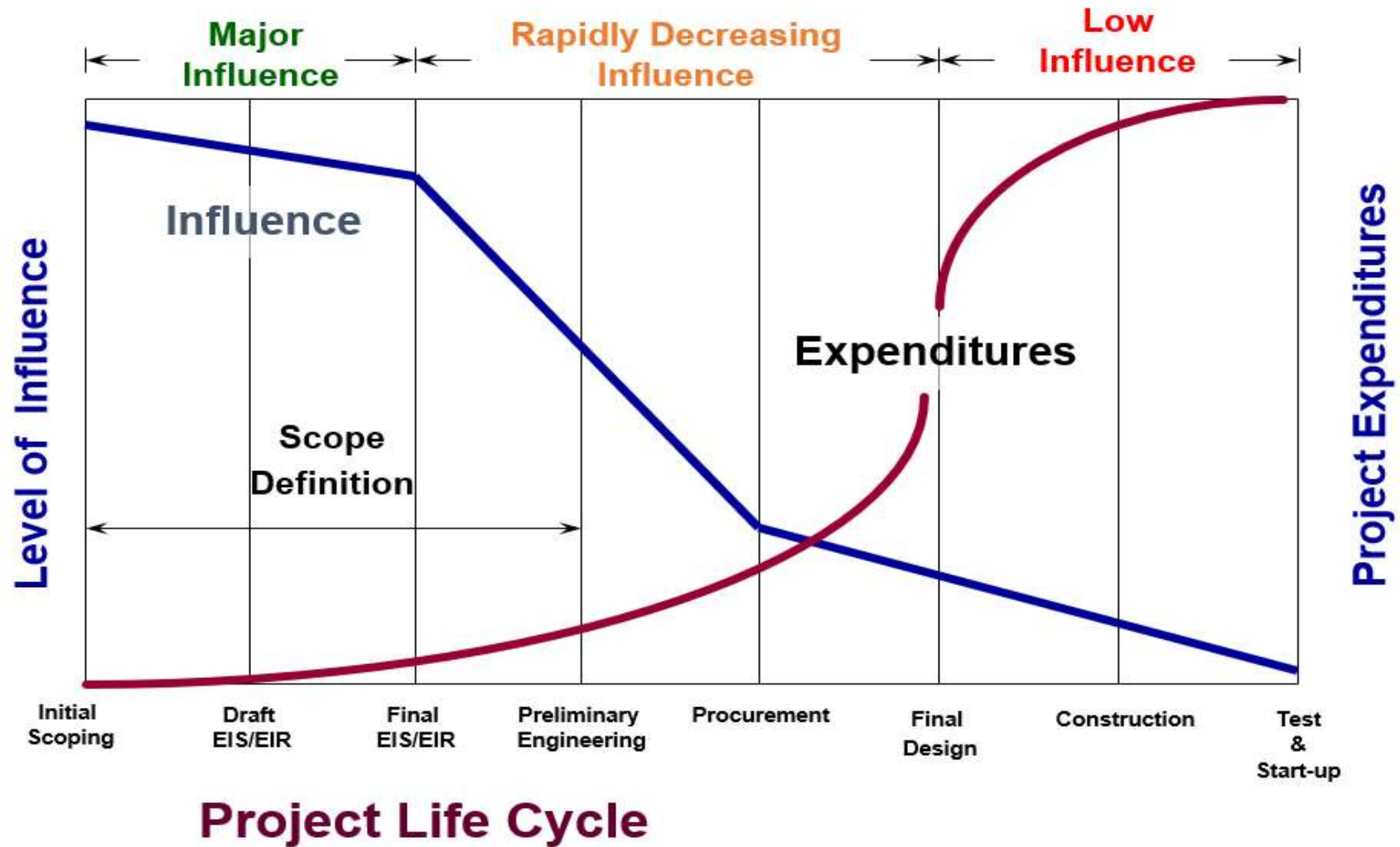
- Three key departments engaged with participation level changing by phase (i.e., Planning, Program Management, Operations)
- Department collaboration on scope, cost, schedule and risk is essential throughout the project life cycle
- Program-wide processes, procedures and project phase appropriate data informs stage gate decisions
- Approach entails commitment of Metro resources and knowledge
- Success also requires engagement from Metro Board and local stakeholders
- Pre-determined stage gates support reporting and cost and schedule mitigation efforts prior to next stage
- Decision-making at all stages of project development should consider full life cycle implications, with understanding that estimates (cost, schedule, etc.) become more accurate as design progresses
- Continuous configuration management over full project lifecycle improves consistency of reporting and decision making at key stages

## ITEM 1

*Establish specific measures to ensure project scope growth is being managed and controlled during all phases of project delivery, not just Program Management*



# Opportunity to Influence Project Cost Outcomes



# Capital Project Lifecycle – Typical Stage Gate Review Process \*

Countywide Planning and Development

Program Management

Operations

INITIATE	PRELIMINARY ENGINEERING & ENVIRONMENTAL APPROVAL		EARLY WORKS	PROCUREMENT	DESIGN & BUILD	OPERATE
STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	STAGE 6	STAGE 7
Project Initiation	Identify Preferred Alternative & Begin Preliminary Design	Environmental Clearance, Prepare for Construction	Early Works and Right-of-Way Acquisition	Procurement for Construction	Final Design, Construction, Testing and Commissioning	Operations & Project Closeout
Define initial scope, cost and schedule	15% Preliminary Engineering	Final (EIR/EIS)	Right-of-Way Acquisition	Request for Qualifications/Proposals	Contractor completes final design	Transfer completed project from contractor to Agency
Initial scope evaluated in programmatic environmental impact statement	Draft Environmental Impact Report (EIR/EIS)	Record of Decision - Environmental Clearance	Third party agreements - railroads, local jurisdictions, utilities	Select contractor/award contract	Construction initiated	Operate and maintain in-service asset
Service planning	Evaluate Range of Alternatives	Up to 30% Preliminary Engineering	Environmental permits - federal agencies	Issue Notice to Proceed	Change order management	Detailed project documentation complete
Risk Assessment	Model operational scenarios	<b>Risk Assessment</b>	<b>Risk Assessment</b>	Finalize right-of-way, third party agreements, permits, and environmental mitigation	<b>Risk Assessment</b>	
Scope, cost, schedule	Identify Preferred Alternative	Develop Procurement/Delivery Plan	<b>Scope, cost, schedule</b>	<b>Risk Assessment</b>	Construction completed	
	<b>Risk Assessment</b>	Right of Way Mapping		<b>Scope, cost, schedule</b>	Project tested and commissioned	
	<b>Scope, cost, schedule</b>	Identify Utility Relocations			Substantial completion milestone	
		<b>Scope, cost, schedule</b>			Ready for track & systems	
					<b>Scope, cost, schedule</b>	

\*Process shown correlates to a design-build project delivery model. Recommendations that follow would also apply to other delivery methods.



## High Level Recommendations (Life Cycle Approach)

*Establish specific measures to ensure project scope growth is being managed and controlled during all phases of project delivery, not just program management.*

- Identify current best practices and new strategies to embed staff for planning, program management and operations in all stages of project delivery
- Acknowledge that estimates of project schedule and cost become more accurate as project development advances. Report cost estimates in ranges, especially in early phases of project development when uncertainty is greatest
- Extend project readiness review procedures across all lifecycle phases, including at various planning, engineering, and operational milestones
- Assure configuration management process extends to cost and schedule variances from initial baseline plans
- Partner with jurisdictions and third parties to build consensus and buy-in on scope requirements, to freeze project designs earlier
- Conduct routine board workshops to assure transparency and full understanding of scope alterations and cost implications
- Allocate staff and consultant resources to provide support

## ITEM 2-A

*Develop a breakdown of specific third party and utility requirements that contribute the most to growing project costs and the steps being taken to amend or alter these requirements → **Third Party and Utilities***



# Introduction and Background

Average Cost of Utilities:  
10% of the LOP



Cost of Third Party Work:  
Between 7-12% of the LOP  
(depending on project type)

Cost Drivers for Utilities and Third Parties include:

- Need authority for self-permitting
- Need Master Cooperative Agreement (MCA) that drives accountability
- Need approved standards prior to bid issuance
- Enforce betterment policies
- Resource challenges and minimal work hours



# Third party and Utilities – Cost Drivers and Mitigation Measures

Third Party/Utilities Cost Drivers	Third Party/Utilities Mitigation Measures
<ul style="list-style-type: none"><li>• Execution of agreements later in life cycle</li><li>• Current agreements do not drive desired performance and accountability as follows:<ul style="list-style-type: none"><li>• Changing standards</li><li>• Lack of adherence to timelines</li><li>• Late design change requests</li></ul></li><li>• Imposition of unexpected work hour restrictions by third parties</li></ul>	<ul style="list-style-type: none"><li>• During project environmental clearance<ul style="list-style-type: none"><li>• Engage third parties / utilities early and often</li><li>• Finalize third party / utility agreements</li><li>• Confirm applicable standards</li><li>• Implement design freeze</li><li>• Agree upon streamlined / expedited processes</li><li>• Initiate subsurface exploration</li></ul></li><li>• Beginning with project early works<ul style="list-style-type: none"><li>• Expand subsurface exploration</li><li>• Minimize changes relative to design freeze and enforce betterment policies</li><li>• Adhere to agreed upon review and approval processes</li></ul></li></ul>

## ITEM 2-B

*Identify largest construction cost drivers that contribute the most to increased project costs and the steps being taken to mitigate → **Differing Site Conditions – Geotechnical and Environmental***



# Environmental and Geotechnical Cost Drivers - Introduction and Background

Cost of Environmental and Geotechnical Work:

Approximately 10 - 13% of the LOP

(inclusive of permitting, construction compliance, and differing site condition changes and claims)

- Differing Site Conditions (DSC) are the primary cost driver for construction contract changes.
- Geotechnical investigations occur during Environmental Planning and Preliminary Engineering project phases with some detailed geotechnical investigations deferred to the Final Design and Construction Phase.
- Environmental issues are well known to impact construction costs, and to be relatively unanticipated. In some cases, this is due to California's position on the leading edge of rapidly evolving environmental regulations. In other cases, the impacts are due to a lack of awareness (on the part of planners, designers, and contractors) of the degree to which environmental compliance and mitigation requirements can extend beyond the specific issues encountered, and their cascading effects on cost and schedule.





# Environmental/Geotechnical Cost Drivers and Mitigation Measures

Environmental/Geotechnical – Cost Drivers	Environmental/Geotechnical – Mitigation Measures
<ul style="list-style-type: none"><li>• Unforeseen/undefined below ground conditions</li><li>• Unknown underground obstructions including abandoned oil wells along with buried structures for piles, building foundations, utilities, concrete drainage structures</li><li>• Environmental conditions such as hazardous/contaminated materials, and presence of cultural or paleontological resources</li><li>• Waste and wastewater management</li><li>• Subsurface conditions and their flow for groundwater and gases</li><li>• Demolition and abatement of structures</li><li>• Schedule impacts from regulatory agency involvement</li></ul>	<ul style="list-style-type: none"><li>• Perform initial environmental and geotechnical investigations for all projects and property acquisitions (Stage 2 Preliminary Engineering)</li><li>• Expand investigations during early works stage (Early Works - Stage 4)</li><li>• Perform additional investigation, early remediation, mitigation, and abatement activities ahead of construction where feasible (Early Works - Stage 4)</li><li>• Early engagement with various oversight agencies to secure necessary permits and agreements (Early Works - Stage 4)</li><li>• Provide detailed guidance to Contractors and assist with logistical efficiency with respect to environmental and geotechnical concerns (Design &amp; Build - Stage 5)</li></ul>

## ITEM 3

*Detail the steps being taken to both evaluate and revise Metro Rail System Design Criteria to adequately balance system safety with project cost efficiency.*



# Metro Rail Design Criteria - Introduction, History, Content

- Developed over the past 20+ years for design of light and heavy rail facilities
- All major Metro departments including, Safety and Risk Assessment, Quality, Planning, Operations and Engineering are signatory to content and requirements of MRDC
- All changes must be approved by the signatory departments before using these requirements
- Mainly uses/references the various requirements of national design codes for each discipline where available and applicable
- Aims to satisfy the pertaining national state and local mandates while using industry best practices to suit Metro's specific requirements. Not meeting these mandates would translate into a major liability for Metro.
- There are only handful of requirements that exceed code mandates to meet Metro's specific requirements
- MRDC prescribes the minimum requirements for the design of transit rail facilities that will provide for optimum life cycle costs
- Requirements are updated on a regular basis based on an internal identified need or code mandate
- Valid deviations to the MRDC requirements are entertained and approved on a project basis and agreed and signed off by all the signatory departments



# Metro Rail Design Criteria –Mitigation Strategies

## Two Primary Mitigation Strategies

- Perform an internal assessment of opportunities to adjust requirements
- Leverage alternative delivery contracts, specifically East San Fernando Valley, as an opportunity to further innovations that could result in cost reductions
- Overarching Assessment Assumptions:
  - 1.Revisions to MRDC would not compromise safety or adversely impact operations and maintenance or negatively impact customer experience.
  - 2.Fire Life Safety Design Criteria will be included in this review



## Metro Rail Design Criteria - Plan for Cost Saving Measures

- Obtain input from the mega projects that are currently under construction as to which items related to Metro Rail Design Criteria for LRT and HRT may be a candidate for capital cost savings
- Secure funds and Engage the services of an outside consultant to review and benchmark
- Form a multidisciplinary team consisting of internal Metro Staff and outside consultant discipline experts
- Obtain the design criteria of three other transit rail peer agencies. Choose peer agencies that provide similar type of transit rail services as LA Metro
- Identify items that will provide capital cost savings without compromising safety or adversely impact operations and maintenance or increase life cycle costs.
- Coordinate with all the signatories to Metro Rail Design Criteria including Planning, Operations, Safety, and Quality and follow the Metro Systemwide Baseline Change Notice procedure to implement the identified changes



## **Metro Design Criteria – Using Alternative Project Delivery/Progressive Design Build to Analyze Cost**

- Progressive Design Build (PDB) is a qualifications-based project delivery system that transparently builds up the project scope and cost with our selected contractor in a transparent, collaborative, and risk-informed manner
- During the cost build up process of a PDB project, the owner is afforded visibility and influence into all project costs, and is in position to analyze all project requirements in relation to tradeoffs between initial capital expenditures vs. lifecycle operational costs
- The East San Fernando Valley (ESFV) Light Rail Transit (LRT) project is Metro's first PDB contract for the Measure M rail expansion program and will give Metro true visibility into the relative cost of MRDC requirements. This process allows staff and the contractor team to analyze direct capital expenditure against the operational lifecycle cost, and will give us additional data in regard to the relative cost of the MRDC requirements, as described in the next slide
- This cost data can be used to further inform the MRDC studies described in the prior slide
- Metro's approach to PDB and transparent cost negotiation is generally consistent with other transit agencies engaged in alternative project delivery, such as DART, SANDAG, and VTA, as examples.



# Metro Design Criteria – ESFV PDB Contract

## SCOPE

The initial PDB Phase I scope for ESFV will contractually require an initial costing and open-books review of project estimates by the private sector contractor as follows:

1. Pricing the project as drawn in the contract documents and fully compliant with the MRDC; and
2. Bringing innovative ideas and technology solutions that result in cost and schedule reduction strategies that may include deviations from the MRDC

These tasks will be instrumental in our evaluation of MRDC cost vs. lifecycle operational cost, as we will know the relative up front and long term costs of price reduction ideas derived from deviations to the MRDC.



# Conclusion and Next Steps

**Initial Action Plan identified steps to help control project costs for the following:**

1. Alleviate project scope growth
2. Minimize third-party and utility related cost increases
3. Reduce contract changed conditions for ground conditions and soils
4. Revise Metro Rail System Design Criteria

## **Short Term**

- Continue alternative delivery roll-out including mitigation measures
- Deploy focused process area tiger teams
- Update processes / procedures / associated contract documents
- Assess staff and consultant resources required
- Report back to board within 90 days with detailed mitigation plan

## **Long Term**

- Continue to monitor scope control opportunities
- Continue to increase focus on program and project cost/schedule risk