



Metro

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

AUGUST 24, 2016

TO: BOARD OF DIRECTORS

THROUGH: PHILLIP A. WASHINGTON *PAW*
CHIEF EXECUTIVE OFFICER

FROM: GREGORY G. KILDARE *GK*
CHIEF RISK, SAFETY & ASSET MANAGEMENT OFFICER

**SUBJECT: FY 17 TRANSIT ASSET MANAGEMENT RAMP-UP ACTIVITIES-
FOR YOUR INFORMATION**

ISSUE

This Board Box outlines the resources necessary to continue to ramp-up the Enterprise Transit Asset Management (ETAM) department in FY 17 to effectively respond to its mission and to the reporting requirements included in the FTA's Transit Asset Management Regulations. As Metro continues work to expand the system it is also necessary to develop the business processes and information to effectively maintain it. Transit Asset Management (TAM) is a comprehensive and coordinated process to effectively manage the performance, risks and costs of renewing Metro's existing asset base used to provide transit services. The ETAM department was formally established in 2015 within Risk, Safety and Asset Management (RSAM) to develop and administer a Metro-wide integrated asset management program. The ETAM department developed Metro's first TAM plan in July 2015 and is responsible for its implementation.

The TAM Plan includes a list of 25 actions (Attachment A) for implementation that will provide Metro with improved capabilities to maintain a State of Good Repair (SGR) and provide the information to fully respond to FTA's requirements to report on asset inventories, conditions, performance and prioritization of SGR projects to renew existing assets.

DISCUSSION

The FTA issued its final TAM rule through the Federal Register on July 6, 2016 and will become effective October 1, 2016. The TAM rule mandates agency reporting on performance, prioritization of asset rehabilitation/replacement projects and compliance with the following requirements:

- An Inventory of the number and type of capital assets at a level of detail to identify a program of capital projects;
- Condition assessments sufficient to monitor, predict performance and describe changes in conditions of capital assets to show progress towards SGR targets using these performance measures:
 - Rolling Stock: % meeting or exceeding Useful Life Benchmark (ULB)
 - Equipment: % meeting or exceeding Useful Life Benchmark (ULB)
 - Guideway Infrastructure: % performance restrictions (slow zones)
 - Facilities: % with inspection ratings below 3.0 on Transit Economic Requirement Model scale;
- Analytical processes or decision-support tools to estimate capital investment needs and asset prioritization;
- Estimates of capital asset investment needs and project prioritization over time;
- TAM and SGR Policy;
- A strategy for implementation of the TAM Plan;
- Description of annual key TAM activities;
- Resource requirements to develop and implement the TAM plan;
- Outline of how the TAM plan and related business processes will be monitored, evaluated and updated to ensure continuous improvement of TAM practices.

Approved FY 17 Resources to Initiate Compliance with FTA TAM Regulations:

At this time, three (3) additional FTEs and \$1M in Non-labor budget for consulting contracts have been approved for the FY 17 budget period. The additional funding required to complete the contracts will be acquired in mid or out year budget processes. The additional resources will be used to manage consultant contracts to conduct condition assessment inspections of the following asset classes: rail vehicles, additional bridge and tunnel inspections, wayside systems for signals and traction power, fire/life safety systems and critical facilities assets. Upon completion of these contracts, the new staff will transition the developed processes and methods for inspection and findings to future assessments that will be done either with in-house staff or continuing professional services contracts pending availability of resources. Attachment B summarizes the additional ETAM department staffing, budget for initiating key near term actions in FY 17 and the Life of Project costs. Descriptions are shown below of the consultant tasks and associated additional staffing to initiate the ramp-up with outsourced condition assessments.

A. Descriptions of Professional Services Tasks

Assistance to perform initial condition assessments on seven asset categories is requested at a total Estimated Life of Project Cost of: \$4,500,000.

***1. Initial Assessment Inspections of Light & Heavy Rail Vehicle Fleets
Estimated Life of Project Cost: \$700,000***

This is to procure a consultant to perform condition assessments of Metro's Light Rail Fleets (P865, P2020, P2000, and P2550) and Heavy Rail Fleets (A650). The scope addresses inspection criteria/standards, developing methods for and assigning ratings,

interviews with staff, review of performance/failure data, sufficient number of physical inspections to sample fleet, reliability assessment of components and systems, especially safety related items, reporting on component and vehicle conditions by fleet including determination of State of Good Repair ratings consistent with FTA's Transportation Economic Reporting Method SGR Scale. The end products of this study (methods, standards and criteria) will be used to replicate future assessments on a continuous ongoing base by Metro staff. *Deliverables: Inspections, assessments, guidelines and standards, SGR ratings, report.*

2. Initial Assessment Inspections of Critical Facilities for Maintenance and Operations, Estimated Life of Project Cost: \$700,000

This consultant effort will provide the assessment methods and initial inspections for the facilities category of assets as defined by FTA's TAM rulemaking. The scope is to conduct condition inspections/assessments on critical elements and systems using defined measures including these facilities asset classes: Bus and Rail Maintenance, Systemwide Administration, Stations, Storage Yards and Parking Garage Facilities. Includes vertical transportation, but excludes rail communication, power systems inspections and bridge/tunnel inspections, which are covered under other assessments. The project includes: conducting inspections, assessments, facilitating capture of asset owner judgment on conditions, development of inspection guides and standards for replicating future inspections in-house. *Deliverables: Inspections, assessments, guidelines and standards, SGR ratings, report.*

**3. Bridges and Tunnels inspections on Rail Projects-Phase II
Estimated Life of Project Cost: \$600,000**

This is a continuation of the phase I Bridge/Tunnel Inspections from FY 15 and FY 16. Consultant assistance is needed to develop Bridge and Tunnel Condition Assessments Inspections and State of Good Repair condition ratings of critical Bridge and Tunnel Structures. The inspections will note visual physical conditions, assign ratings, find defects, recommend corrective repairs, verify damage due to earthquakes and other natural disasters and prepare written inspection reports. APTA recommends inspecting bridges every two years and tunnels every five years and the last inspections were done over 8 years ago. *Deliverables: Inspections, assessments, guidelines and standards, SGR ratings, report.*

**4. Initial Assessment Inspections of Critical Fire/Life Safety Elements
Estimated Life of Project Cost: \$500,000**

This professional services procurement is to hire a consultant to conduct condition inspections/assessments of the fire/life safety system including ventilation systems, fire suppression, and related systems, elements and infrastructure. The project includes: inspections, facilitating capture of asset owner judgment on conditions, development of inspection guides and standards for replicating future inspections in house. This is needed to respond to Los Angeles County fire life safety regulations and develop risk assessments for critical safety related assets. Procuring consultant assistance to perform this work is necessary as Metro does not have the capacity in its current work force with the required skill sets (large scale ventilation, communications systems) to

carry this work out on the large scale needed to survey all of the critical fire/life safety systems as Metro's current staffing levels are dedicated to current operations and expansion projects (Measure R, etc.). *Deliverables: Inspections, assessments, guidelines and standards, SGR ratings, report.*

5. Initial Assessment Inspections of Critical Wayside Control and Power Systems
Estimated Life of Project Cost: \$700,000

Consultant procurement to conduct condition inspections/assessments on critical wayside train control and power systems including: Signal Systems, Electrical Systems, IT Systems and Catenary. Includes but not limited to: Signals (Track Circuits, grade crossings, logical controllers, relays, power supplies, switch machines, data transmission units, substations, SCADA, revenue collection TVMs, Advanced Transit Management Systems (ATMS). Which includes conducting inspections, assessments, facilitating capture of asset owner judgment on conditions, development of inspection guides and standards and combine with Guideway Infrastructure assessments to develop performance measure and method for monitoring performance restrictions (slow zones, etc.). *Deliverables: Inspections, assessments, guidelines and standards, SGR ratings, report.*

6. Functional Obsolescence Review of the BOC/ROC
Estimated Life of Project Cost: \$600,000

A consultant that is already looking at the near term impacts of Metro's growing system will be tasked via modification to look at the Agency's Bus and Rail Operations Control (BOC/ROC) needs until the year 2070. This will include all Measure M expansion projects in addition to the Measure R projects. As well as the potential for including the facility within the ESOC campus located at 410 Center St. in Los Angeles. *Deliverables: Report.*

7. Enterprise Transit Asset Management Software
Estimated Life of Project Cost: \$700,000

Metro has reached the limit of its existing Excel based asset inventory database and needs a more sophisticated software application to manipulate and analyze the growing amount of data related to major assets and individual components. Currently, system component lifecycles and ages, to estimate each asset's condition, must be input manually and ad hoc. Further, all asset condition reporting and prioritization of State of Good Repair rehabilitation/replacement projects based on obsolescence continues to be done heuristically. With asset condition reporting requirements now in place by the FTA, Metro needs to migrate towards a near real time, continuous assessment of major asset condition statuses. Only Enterprise Transit Asset Management database software has that capability, which will ultimately be able to be linked to the replacement Enterprise Asset Management (EAM) system of Metro's maintenance and material management (M3) program. *Deliverables: Software Installation.*

B. Additional Staffing Descriptions

The following additional positions are necessary to manage consultant contracts, coordinate the findings with other TAM actions such as prioritizing capital asset renewal projects, updating and implementing the data collection and reporting process in the asset inventory, and transitioning future condition assessments to be done in-house or with future consulting assistance. The FY 17 ETAM organization chart with the additional staffing is shown in Attachment C.

TAM Project Manager #1: Manages professional service consultant contracts for condition/performance assessments of rail vehicles and critical wayside train control and traction power systems assets. Responsibilities include managing and implementing development of inspection criteria, physical inspections, predictive maintenance, standards and methods for assigning SGR condition ratings, reliability and obsolescence assessments, identification of risks and lessons learned to link prioritized asset replacement needs from planning to budgeting processes, and supports transitioning of results of consultant efforts to operations for on-going, in-house condition assessments and reporting to FTA.

TAM Project Manager #2: Manages professional service consultant contracts for condition/performance assessments for operations facilities critical assets (stations, maintenance facilities, divisions, administration), Bridge and Tunnel, Vertical Transportation and Fire/life Safety Inspections. Responsibilities include managing the development of inspection criteria and standards, methods for assigning SGR condition ratings, reliability and obsolescence assessments, identification of risks and lessons learned to link prioritized asset replacement needs from planning to budgeting processes, and supports transitioning of results of consultant efforts to operations for on-going in-house condition assessments and reporting to FTA.

Principal Transportation Planner: Reports to Sr. Manager, Transportation Planning and supports condition assessment contracts, the DEO, and the Supervising Engineer in charge of the migration of the asset inventory database spreadsheet to a true relational SQL database and in implementing all action plans in Metro's 2015 Transit Asset Management Plan. The Principal Transportation Planner will coordinate with various asset stakeholders, departments and external agencies including the FTA and SCAG in addition to assisting with managing consultant contracts and performance reporting to FTA. Other duties include working with the asset inventory database developing analysis to model needs due to future transit projects (Measure R, etc.), updates to the TAM plan as a result of FTAs final rulemaking, supports workforce capacity analysis, implementation of SGR training (condition, performance, and asset inventory reporting).

C. Current Condition Assessments Progress

1. Phase I Bridge and Tunnel Inspections:

A professional services contract is currently underway for the Phase I Inspection of Structures. Visual condition inspections of bridges, tunnels, subway stations, aerial structures and stations for the Red/Purple, Blue, Green and Gold lines is complete

with reports still forthcoming. Data collection to date has not resulted in identification of imminent impacts to safety. Initial areas found with deteriorated conditions include water intrusion due to seepage in tunnels, evidence of rusting conduits, corroded electrical boxes, structural reinforcement and pipes, minor cracking and spalling.

2. Light and Heavy Rail Vehicle Condition Assessments:

Procurement, using the planning bench, awarded the contract on May 20, 2016. The anticipated period of performance is six months.

3. Traction Power Electrification Cable Inspections:

The FTA issued Safety Advisory 16-2 on May 16, 2016 and is requiring operators of contact rail (third rail) fixed guideway systems to report within 90 days on third rail power electrification systems including any smoke/fire events and hazards or issues concerning the contact rail system. Metro will be providing this information within the deadline.

4. California Public Utilities Commission Tunnel Ventilation System Assessment Status:

The FTA issued Safety Advisory 15-1 on June 17, 2015, requiring audit of ventilation systems. Metro staff initiated a program in conjunction with the CA Public Utilities Commission, and the CPUC's final report dated August 28, 2015 with findings being addressed and corrected within 20 days of the testing.

D. Current ETAM Department Activities

The ETAM department currently includes eight positions. Although the actions in the TAM Plan are new activities not currently being performed or managed at Metro, the ETAM department is currently performing initial TAM planning activities funded within the existing RSAM cost center budget that provides the preliminary work and support for implementation of the action plans. Currently ETAM and RSAM staff are continuing to perform the following functions and activities:

- Developing and implementing Metro's TAM Plan and associated 25 action plans in conformance with FTA regulations;
- Conducting condition assessments of rail communications systems;
- Updating the asset inventory database;
- Developing TAM requirements for a new EAM system;
- Prioritizing assets for replacement;
- Developing TAM performance measure reporting and targets;
- Developing input on SGR needs for Short and Long Range Plan updates;
- Coordinating the TAM Technical and Stakeholder Advisory Groups;
- Providing SGR data in support of grant applications for FTA's SGR Program and other federal requirements.

NEXT STEPS

The FY 17 ETAM ramp-up provides initial resources to start development of the predictive condition and performance data to respond to the FTA TAM regulations. Recruitment will commence for the three additional FTEs acquired in FY17 and procurement will start for four new professional services contracts to conduct condition assessments on critical operating facilities, phase II bridge and tunnel inspections, fire/life safety systems and wayside systems. In-house staff will continue to work on rail communications condition assessments, coordinating with internal asset stakeholders for updating the TAM plan to comply with FTA's final rule, updating SGR needs into the long range planning process, and transferring the asset inventory to formal EAM database software.

In FY 18 and beyond, the ETAM department will address implementation of the full range of action plans in Attachment A. Development of a mature Metro TAM organization includes capabilities for advanced techniques such as predictive and reliability centered maintenance, understanding of full lifecycle costs and evaluation of alternative technical concepts for reinvestment decision making. Building these capabilities will require a commitment to additional resources to transition the condition/performance assessment process in-house to provide for more responsive cost-effective decision-making, continuous monitoring and analysis and will be subject to the availability of future additional resources.

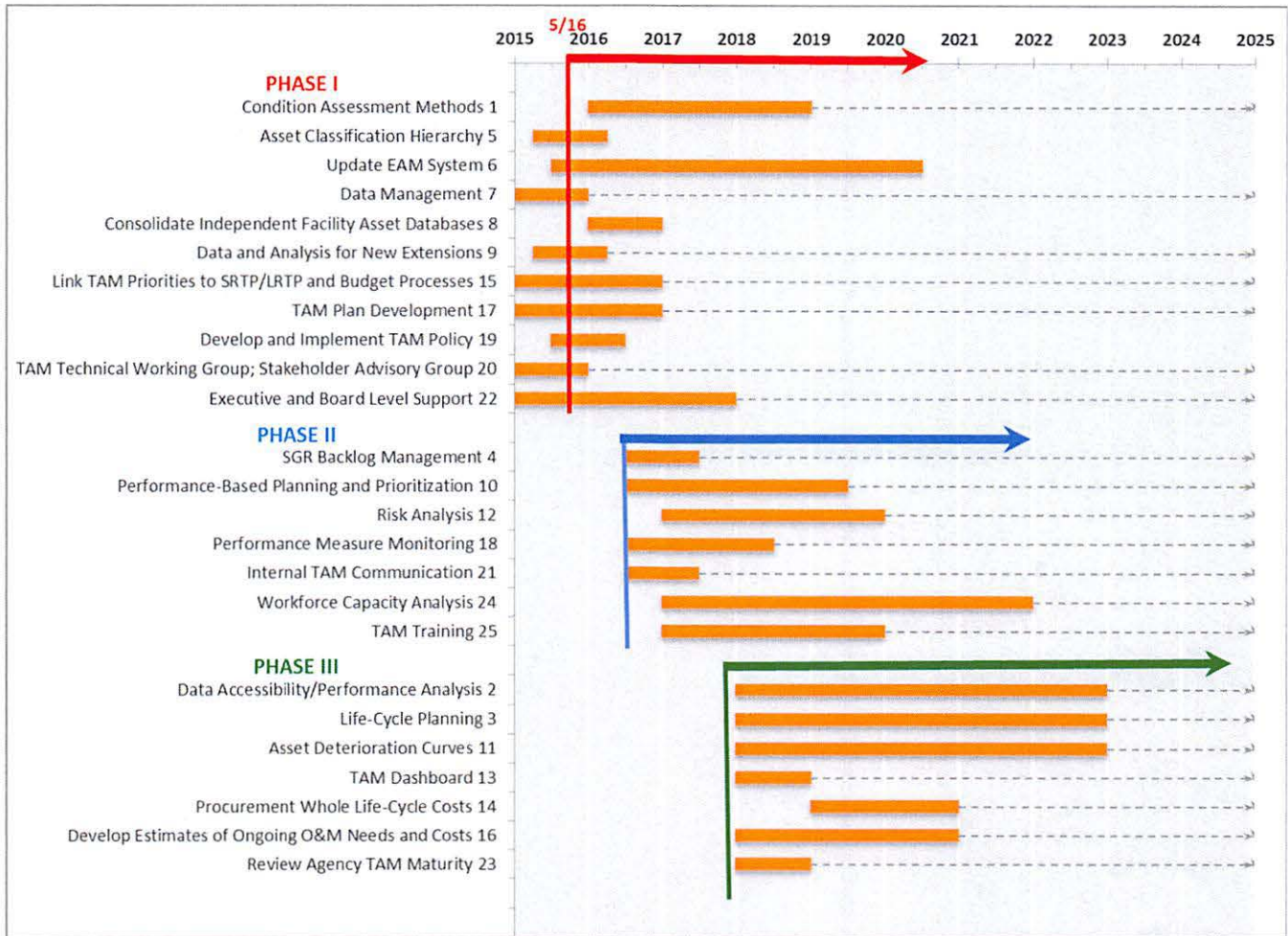
ATTACHMENTS

Attachment A - 2015 TAM Plan Phased Implementation of Action Plans

Attachment B - Professional Services and Staffing Requirements

Attachment C – FY-16 ETAM Organization and FY-17 ETAM Organization

2015 TAM Plan Phased Implementation of Action Plans*



* Not ranked within phases, dependent on availability of resources

ATTACHMENT B

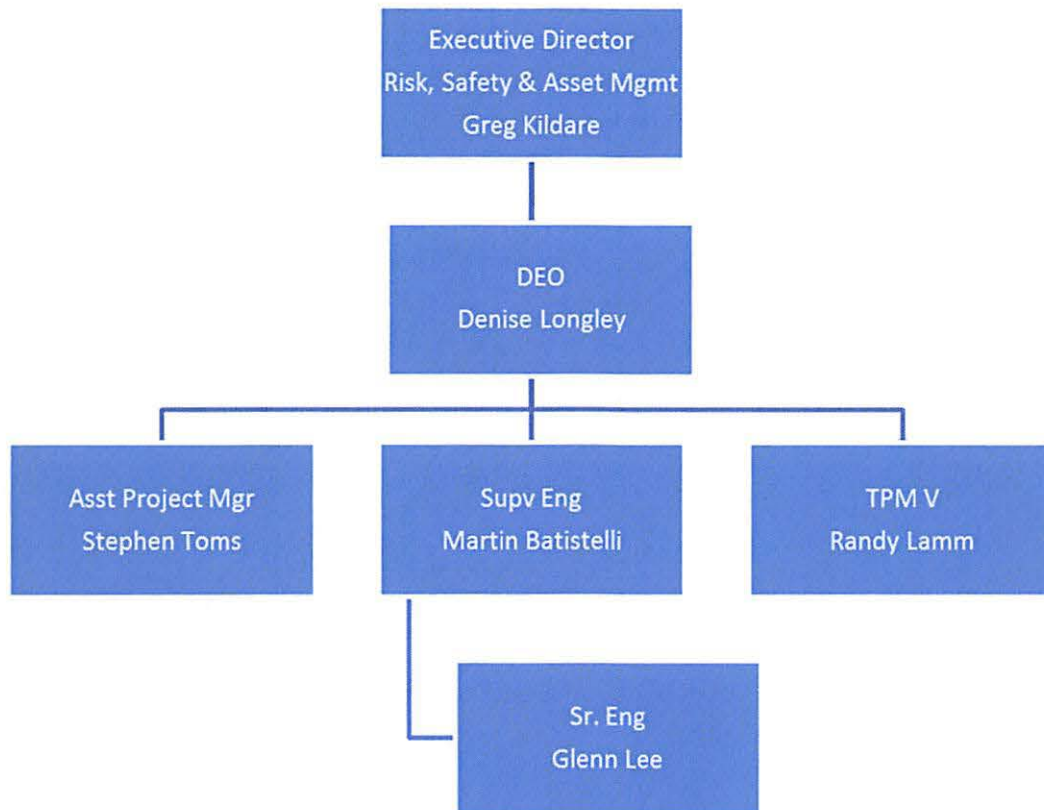
Professional Services and Staffing Requirements

Condition Assessments	Approximate Start	Approximate Duration	Included in FY 17 Budget (000s)	Professional Services Life Of Project Cost (000s)
Light and Heavy Rail Vehicles	7/1/16	9 Months	\$400	\$700
Facilities Inspections	1/1/17	12 Months	\$200	\$700
Bridge/Tunnel Inspections Phase II	2/1/17	9 Months	\$100	\$600
Fire/Life Safety systems and elements	3/1/17	9 Months	\$200	\$500
Wayside Systems	5/1/17	12 Months	\$100	\$700
Total			\$1,000	\$3,200
Other Non-Consultant Tasks				
Rail Communications Condition Assessments	7/1/16	9 Months on-going		N/A
Provide Executive/Stakeholder Support on TAM issues	7/1/16	12 Months on-going		N/A
Develop TAM Performance Targets for FTA	9/1/16	3 Months on-going		N/A
Linking Asset Priorities between LRTP/Budget	9/1/16	6 Months on-going		N/A
Develop estimates of SGR needs for future extensions	10/1/16	8 Months on-going		N/A

FY-17 Additional Staffing Requirements – 3 FTEs

Position/Responsibilities	Tasks
Project Manager #1	Manages Consultant Condition Assessment/Inspections of: Rail Vehicles and Wayside Systems
Project Manager #2	Manages Consultant Condition Assessment/Inspections of: Bridge/Tunnel, Facilities and Fire Life Safety Systems
Principal Transportation Planner	Provides support on all action plans (AP's) including: Rail Vehicle Inspections, Facilities Inspections, SGR estimates of new extensions, Asset Inventory Analysis, Linking between LRTP/Budget Process, Lifecycle Planning, FTA TAM performance Targets, Executive/Stakeholder Support

FY-16 Enterprise Transit Asset Management Organization



FY-17 Enterprise Transit Asset Management Organization

