



Metro

Transit Asset Management Policy

(ETAM-1)

POLICY STATEMENT

Metro recognizes the need to make responsible decisions, to effectively manage risk through efficient expenditures of limited public funds to operate, maintain and renew assets to help ensure delivery of safe, reliable, and high quality transit services. This policy communicates the commitment to optimize the deployment of resources to maintain the system in continuing operations and during periods of expansion. Metro’s approach to asset management is to make the right amount of investment in the right assets at the right locations and time to keep the system in a State of Good Repair.

PURPOSE

This policy is intended to communicate to the Board of Directors, management, staff and external stakeholders principles Metro will follow in fostering a culture of continuous improvement in asset management planning and performance. This includes:

- Compliance with federal laws and regulations including the Final TAM Rule 49CFR, Parts 625 and 630;
- Establishing a clear priority to maintain the condition of existing assets in the context of a mandate to expand services;
- Identifying responsibilities;
- Define the basis for decision making regarding the application of limited financial resources; and
- Setting the approach for TAM actions relating to performance, conditions, backlog, and similar measures.

APPLICATION

This policy applies to all employees involved in activities that plan, design, procure and construct, operate, maintain, renew, replace, and dispose of physical assets. Metro will review and update the Asset Management Policy periodically as needed following its adoption. The authority to implement this Asset Management Policy is hereby delegated to the Accountable Executive, Chief Executive Risk, Safety and Asset Management (RSAM) Officer.

APPROVED: County Counsel or N/A



Department Head

ADOPTED: CEO

Effective Date: _____



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1.0 GENERAL

This policy applies to all modes of service operated by Metro and will be administered by the Enterprise Transit Asset Management Department (ETAM) in cooperation with other units as required (e.g., Operations, Construction, Planning, ITS, OMB, Procurement, and other offices). It is the responsibility of each Metro employee to support the specific activities addressed in this Policy which span nearly every organizational unit at Metro. Specific responsibilities by policy elements are identified across Metro organizational units.

2.0 PROCEDURES

Metro's transit asset management policies are structured around the FTA's following TAM business process areas:

Asset Management Vision and Direction: *Sets overall goal to maintain SGR, consider full lifecycle costs and defines what is SGR*

- Top down direction on expectations and commitment to asset management improvement
- Strategy for performance expectations
- Planning including roles, approach to implementation, resources and timelines

Lifecycle Management: *How are inventories, conditions, risks identified and considered*

- Asset Inventory: Quantities, costs, useful life, hierarchy, asset owners, data maintenance
- Condition and Performance Monitoring: Inspections, measurements
- Risks: identification and approaches to managing
- Decision making for asset renewal and replacements

Cross-Asset Planning and Management: *Linking needs, projects and funding to maintain acceptable backlog and SGR*

- Capital Planning and Programming: Identify needs and programming funding levels
- O&M Budgeting: Link to Budget Process, Estimate Resource Requirements
- Performance Modeling: Apply decision support tools to model performance based on asset inventory and condition/performance data



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Information Technology Systems: *Responsibilities for software tools and IT assets*

- EAM System
- Metro TAM Asset Inventory, Database: Funding plans, Performance Measurement, Target Setting, % SGR Backlog
- Transit Economic Requirement Model (TERM) : Estimate asset conditions based on funding level

Enablers: *Provision of training necessary to implement TAM business processes*

- Leadership and accountability: Training, leadership, accountability, project management
- Training: Staffing Levels, Skill Sets/Attract, Develop and Retain a Highly Trained TAM Workforce

Exhibit 1 summarizes the procedures that implement the Metro TAM Policy.



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Exhibit 1: TAM Policy Procedures

Procedure #	Procedure	Primary Responsibility	Coordination or Supporting Role
Asset Management Vision and Direction: Sets overall goal to maintain SGR and responsibility for TAM Planning			
1	Metro will operate, maintain, renew, and replace its assets to achieve and sustain a state of good repair that ensures a safe and reliable system that minimizes whole lifecycle costs and meets or exceeds the FTA's state of good repair and other regulatory requirements, as well as timely and accurate asset-related service information to deliver the Customer Experience our customers deserve.	OPS	ETAM, OPS, Planning, CONSTR, ITS, Procurement
2	Metro's Chief of Risk, Safety and Asset Management serves as the Accountable Executive responsible for developing the TAM Plan and carrying out transit asset management practices and control or direction over the human and capital resources needed to develop and maintain both the agency's public transportation agency safety plan and the agency's transit asset management plan.	ETAM	OPS, OMB, Planning
Strategic Approach: for considering full lifecycle costs and concurrence on targets			
3	Metro will consider the full cost (including O&M) to operate and maintain assets through their useful lives and then plan for meeting these costs prior to approving the acquisition or construction of a new asset. New Metro facilities should be planned within the overall business and service objectives of the agency. To ensure that the public gains the maximum utility from the new facility or capital asset, Metro shall identify the full cost of building and operating the facility throughout its useful life. Resources generated from its operation or other sources should be identified to meet these needs.	ETAM, OMB, OPS	Planning, CONSTR, Procurement



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Procedure #	Procedure	Primary Responsibility	Coordination or Supporting Role
4	The Stakeholder Advisory Group comprised of some members of the Senior Leadership Team will provide direction and strategies on approach for implementing the TAM Program.	ETAM	OPS, CONSTR, OMB, Planning
5	Performance/Condition Targets will be set with the concurrence of the Chiefs of Operations, RSAM, Planning and Finance for reporting to the FTA through the National Transit Database.	ETAM, OPS	OMB, Planning
6	Metro will apply a continuous improvement approach to the life cycle management of its physical assets, balancing cost, risk and performance to meet the needs and expectations of its customers.	ETAM, OPS	OPS, CONSTR, OMB, Planning
Planning Approach to Implementation: <i>Defining SGR</i>			
7	A capital asset is in a state of good repair if it meets the following objective standards: a) the capital asset is able to perform its designed function; b) the use of the asset in its current condition does not pose an identified unacceptable safety risk; and c) the life-cycle investment needs of the asset have been met or recovered, including all scheduled maintenance, rehabilitation, and replacements. An SGR asset is defined as one that is currently in use in operations and its rehabilitation or replacement needs shall be included in the asset inventory. An SGR capital project involves rehabilitating or replacing an existing asset. Excluded from this definition are capital projects for capacity enhancements or expansions to existing projects or new services.	OPS, ETAM	CONSTR, OMB, Planning



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Procedure #	Procedure	Primary Responsibility	Coordination or Supporting Role
Lifecycle Management - Inventory <i>Who develops and maintains inventories and ULBs</i>			
8	Metro will establish Technical Working Groups comprised of asset owners determined cooperatively with OPS, CONSTR, ETAM, Planning, ITS, Procurement.	ETAM, OPS, CONSTR	Planning, ITS
9	Useful Life Benchmarks (ULBs) shall be set by group consensus of the respective asset category members of the TAM Technical Working Groups (TWGs). Concurrence of COO required for major changes.	OPS, CONSTR	ETAM
10	Metro will assemble and maintain a current, accurate, comprehensive, and consistent asset inventory which will serve as the foundation for its asset management activities. The ETAM department shall provide oversight and maintenance of the overall asset inventory database. The TWG members of the respective asset categories will provide input on the asset data (unit costs, quantities, hierarchy, ULBs, in service dates, retirement dates, Conditions, Performance, Failures, Maintenance data, etc.) The asset database shall be the Official Metro record of its asset inventory shall be relied upon as the “single source of truth” regarding the Authority’s assets. The asset inventory will be applied to systematically measure conditions, recommend performance reinvestment needs, plan work, improve asset management practices, and develop capital SGR budgets and re-investment decisions.	ETAM	CONSTR, Planning, OPS



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Procedure #	Procedure	Primary Responsibility	Coordination or Supporting Role
11	Metro will establish Technical Working Groups to provide updates on asset inventories including costs, quantities, ULBs, conditions, lifecycle information on the following asset classes: Buses, Railcars, Power, Signals, Communications, Track, Structures, Non-Revenue Equipment, Facilities & Stations, and Information Technology. The composition of TWGs will be determined cooperatively with OPS, CONSTR, ETAM, Planning, ITS, Procurement ETAM will coordinate.	ETAM	OPS, CONSTR, OMB, Planning, ITS, Procurement
Lifecycle Management - Condition/Performance collection of conditions for reporting and decision making			
12	Metro will routinely monitor condition, performance, use, and cost at the appropriate level and against prescribed service levels and regulatory requirements as well as sufficient level of detail to apply advanced maintenance techniques such as Reliability Centered Maintenance, Condition Based Maintenance, Predictive Maintenance, Total Productive Maintenance etc. This will enable timely corrective action.	OPS, CONSTR	ETAM
13	Condition and performance assessments will be conducted periodically by Metro's ETAM department consistent with FTA reporting requirements and used for FTA compliance reporting, investment prioritization and planning level decisions. Information from other inspections/condition assessments routinely performed by operations maintenance or engineering departments may be integrated into the ETAM assessments.	ETAM, OPS	CONSTR
14	Metro will document root cause for asset failures and include accurate and timely updates into the Maintenance, Management, Material (M3) or replacement EAM system.	OPS	ETAM



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Procedure #	Procedure	Primary Responsibility	Coordination or Supporting Role
15	Assets will be made available and time allocated by responsible Metro managers for condition and performance assessments. Allocation priority will consider risk and criticality of assets with respect to the safety, reliability and criticality of assets in performing their function.	OPS, CONSTR	ETAM
Lifecycle Activities <i>Collecting risk information for decision making and for use in advanced maintenance techniques</i>			
16	Metro will develop and apply risk management processes to assist in making informed decisions on infrastructure priorities across a very complex and diverse portfolio of assets and to maximize the return on investments. Metro recognizes that operational risk (i.e., reliability) and safety risk (i.e., exposure to hazards) is driven by the condition of its physical assets and will consider risk (i.e., probability and consequences of failures) in prioritization and funding.	OPS, ETAM	OMB, Planning
17	Metro will apply advanced maintenance techniques such as Reliability Centered Maintenance (RCM), Predictive Maintenance, Condition Based Maintenance, Total Productive Maintenance, Lean Production, etc. where practical and cost effective in order to improve reliability, availability and to reduce life cycle costs.	OPS	ETAM
Lifecycle Decision Making <i>Adequately plan for rehabilitations/replacements including mid-life's</i>			
18	Mid-life rehabilitations and component overhaul campaigns shall be planned and funded to ensure the full useful life of the asset is reached and that the schedule is consistent with appropriate maintenance protocols (Original Equipment Manufacturer –OEM, or advanced maintenance technique schedules such as Reliability Centered Maintenance) The asset managers/owners - TWGs shall provide input on mid-life costs and schedules.	OPS, CONSTR	ETAM, OMB, ITS, Planning



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Procedure #	Procedure	Primary Responsibility	Coordination or Supporting Role
19	Metro will identify asset renewals and replacements needed over the appropriate horizon periods (annual, 4 year FTA TAM, 10 and 40 years) to ensure the maximum useful life of assets. This information will be the basis for capital improvement planning for existing asset categories and in determining the adequacy of funding levels to address SGR backlog and ongoing needs.	OPS, ETAM	OMB, Planning
Cross Asset Management - Capital Planning and Programming <i>Link needs to funding levels to projects</i>			
20	Project managers for new/rehabilitated projects including <u>major corridor projects</u> and other new expansion or enhancement projects shall provide asset inventory information including unit costs, quantities and lifecycle data and reported to ETAM for inclusion in the asset inventory database.	OPS, CONSTR, Planning	ETAM
21	Metro will sufficiently fund asset maintenance to protect Metro's investment in capital assets. Metro will allocate sufficient resources to preserve Metro' existing infrastructure to the best of its ability before allocating resources to other Capital Projects.	OPS, OMB, Planning	ETAM
22	The development of SGR Capital Projects through the annual budget process shall be linked to the asset inventory database and funding levels programmed in the LRTP based on the priorities, schedules, quantities, costs and condition information contained in the asset inventory database which establishes the official record of asset information for Metro.	OPS, OMB, ETAM	Planning, CONSTR, ITS



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Procedure #	Procedure	Primary Responsibility	Coordination or Supporting Role
23	A maximum acceptable level of backlog goal will be set by concurrence of the Chief Financial, Operating, Planning and Risk, Safety and Asset Management Officers. The acceptable level of backlog shall be such that assets are able to adequately perform their design function, the use of assets in current conditions do not pose and unidentified safety risk and the lifecycle investment needs of the assets have been met or recovered including all scheduled maintenance, rehabilitation and replacements.	OMB, Planning, RSAM, ETAM	ETAM
24	Metro will apply funding decision models to Metro's Asset Inventory either internal to the TAM Database or other software such as the FTA's TERM application to address prioritization of asset renewal and replacement needs within a budget constraint, estimate current and future SGR backlog, project future annual asset renewal and replacement needs, and project the impact on future asset condition of alternative funding scenarios and prioritization parameters, costs and backlog. The prioritization weighting factors (safety, reliability, condition, O&M costs) shall be set jointly with concurrence of the Chief Operation Officer, Chief Risk-Safety-Asset Management Officer, Chief Financial Officer.	OPS, ETAM,	ITS, OMB, Planning
Cross Asset Management - O&M Budgeting <i>sufficiently perform preventive maintenance to maintain SGR</i>			
25	Metro will identify and effectively perform all appropriate preventive maintenance in order to maximize the reliability of the transit system and minimize or eliminate corrective maintenance and to realize expected ULBs and asset SGR condition levels.	OPS	ITS, ETAM, OMB, Procurement



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Procedure #	Procedure	Primary Responsibility	Coordination or Supporting Role
26	Metro defines (per Capitalization Policy ACC-14) a capital project as facility or equipment purchases or construction which results in a capitalized asset costing more than \$5000 and having a useful (depreciable life) of five years or more. Also included are major maintenance projects of \$5,000 or more that have a useful life of at least five years.	OMB	ETAM
Cross Asset Management Performance Modeling <i>provide sufficient resources and access to the system for TAM</i>			
27	The correct balance must be struck between closing the system for work and keeping the service running. Metro recognizes that designing -in reliability upfront, ensuring seamless integration between old and new, is central to the transformation to becoming world class. As part of this, Metro assets need to remain available and perform well, even in the midst of project delivery.	OPS	ETAM, Planning, CONSTR, OMB
Information Technology Systems <i>include accurate inventories in EAM including ITS assets</i>			
28	The Metro ITS department will ensure that when new software for TAM is deployed such as the new EAM, it will contain a current copy of accurate and timely TAM inventory data so that an accurate up to date inventory is available upon initial deployment. The ITS department shall be responsible for updating ITS assets and providing the ITS asset inventory data to ETAM for updates to the asset inventory database including software, hardware, EAM system, mobile devices, etc.	ITS	ETAM



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Procedure #	Procedure	Primary Responsibility	Coordination or Supporting Role
Enablers - Leadership Accountability, Communication, Project Management <i>promote awareness of TAM and consider impacts of climate change on assets</i>			
29	Metro will consider the impacts from climate change on its asset renewal needs when updating asset inventories and developing SGR capital projects.	OPS, CONSTR, OMB	ETAM
30	Metro will promote awareness of TAM processes across all organizational levels.	ETAM	RSAM, OPS, CONSTR, ITS, Planning
Enablers – Staffing and Training <i>provide necessary work force and training for TAM business processes</i>			
31	Metro will ensure there are sufficient levels of work force capacity to deliver the TAM programs across the agency and that staff have the knowledge and skills necessary to carry out their asset management roles.	ETAM, OPS	ETAM



3.0 DEFINITION OF TERMS

- **Accountable Executive** – A single person identified at a transit provider who has ultimate responsibility for the safety management system, TAM practices and policy, and control or direction over the human and capital resources needed to develop and maintain the safety and TAM plans.
- **Asset Hierarchy** – A structure for classifying physical assets. There are several levels of hierarchy applied by Metro and FTA to the asset inventory.
- **Asset Inventory** – A register of an agency’s assets and information about those assets. The inventory can be at multiple levels of granularity depending on purpose. The asset inventory supports capital programming.
- **Asset Management** - A systematic process of deploying, operating, maintaining, upgrading, and disposing of assets that supports an organization to achieve its overall objectives.
- **Capital Asset** – Includes physical assets for use in public transportation owned or leased by the transit provider. The Federal Transit Administration typically considers four main categories for capital assets: Equipment, Rolling Stock, Infrastructure and Facilities.
- **Capital Expenditure** – The expenses related to the construction, purchase, renewal, or replacement of physical assets valued at more than \$5000 (refer to policy ACC-14). Capital expenses generally refer to infrastructure activities with a cycle length more than 5 years; shorter cycle infrastructure activities (e.g., daily, weekly, monthly, quarterly, semi-annual, and annual inspections, preventive maintenance, and corrective maintenance are considered operating expenses.
- **Condition Assessment** – The process of inspecting the asset to collect data that is used to document and measure condition and performance. Condition can be estimated through modeling based on age, utilization, and prior maintenance practices.
- **Condition Ratings** – An evaluation of an asset’s fitness for use based largely on observation and partially through consideration of performance and prior maintenance practices. Rating levels established by the FTA to categorize the physical condition of assets are: 5 (excellent), 4 (good), 3 (adequate), 2 (fair), and 1 (worn).
- **Decision Support Tool** – An analytic process or repeatable methodology that quantifies the SGR backlog, identifies asset renewal and replacement needs, project the impact on future asset condition of alternative funding levels, and helps prioritize



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capital projects to maintain state of good repair (SGR) of assets based on available condition data and objective criteria. This includes the TAM database.

- Enterprise Asset Management (EAM) system, which supports maintenance work order management as well as other operating, maintenance, capital programming, and administrative functions. The current Metro EAM is the M3 system.
- Facilities – Facilities includes all assets related to maintenance and administrative facilities, as well as passenger stations and traction power substation enclosures.
- Federal Transportation Administration (FTA).
- Guideway – Includes track and associated structures, communications, signals, and power distribution and substations.
- International Organization for Standardization (ISO) 55000 – A set of standards for asset management developed by ISO and the Institute for Asset Management (IAM).
- Lifecycle Management Planning –enables agencies to make better investment decisions across the lifecycle using management processes and data specific to each asset as a basis for predicting remaining useful life (including age, condition, historic performance, and level of usage). Transit asset management involves processes for managing and maximizing the performance of an asset while minimizing its costs throughout the course of its lifecycle.
- Moving Ahead for Progress in the 21st Century Act (MAP-21) – A funding and authorization bill for federal surface transportation. Signed into law in July 2012, Section 20019 requires transit agencies to development of a Transit Asset Management Plan and to implement a Transit Asset Management System.
- National Transit Database (NTD); a data reporting system managed by the FTA to which all FTA grantees must report financial, operating, and asset data.
- Operating Expenses –The expenses associated with the operation of the transit agency.
- State of Good Repair (SGR) – A capital asset is in SGR if it meets the following objective standards:
 - The capital asset is able to perform its designed function
 - The use of the asset in its current condition does not pose an identified unacceptable safety risk
 - The life-cycle investment needs of the asset have been met or recovered, including all scheduled maintenance, rehabilitation, and replacements



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SGR projects may address obsolescence and changes in statute or regulation demanding asset replacement. An SGR project funds the rehabilitation or replacement of an existing asset currently in operation. This does not include capacity enhancements or betterments.

- SGR Backlog – Deferred investment in asset rehabilitation, replacement, and annual capital maintenance.
- Short Range Transportation Plan (SRTP).
- Short Range Financial Forecast (SRFF).
- Transit Asset Management (TAM) – A strategic and systematic process through which an organization procures, operates, maintains, rehabilitates, and replaces transit assets over their lifecycle to manage their performance, risks, and costs to provide safe, cost-effective, reliable service to current and future customers.
- TAM Plan. A plan developed by an agency that includes, at a minimum, discussion of current transit capital asset inventories and condition assessments, decision support, project investment prioritization, and State of Good Repair condition/performance.

4.0 RESPONSIBILITIES

Responsibilities are identified in the right two columns in Exhibit 1.

5.0 FLOWCHART

Exhibit 2 summarizes the application of the TAM Database in decision making regarding the identification of projects and the prioritization of these projects in the Metro annual budget, the 10-year capital plan, and the long range transportation plan financial plan. The process involves the following steps (the step numbers are referenced in Exhibit 2):

- 1) Asset data from M3 and other asset data sources spreadsheets is provided by the Technical Working Group Members who are the asset owners.
- 2) This data is the source of the asset inventory in the TAM Database, which is maintained by ETAM and which generates a projection of replacement needs by year which can be aggregated at various levels (assets, subclasses, major categories) and can be group types of assets by location and year due show as conceptual projects for consideration by the asset owners for purposes of developing capital projects.



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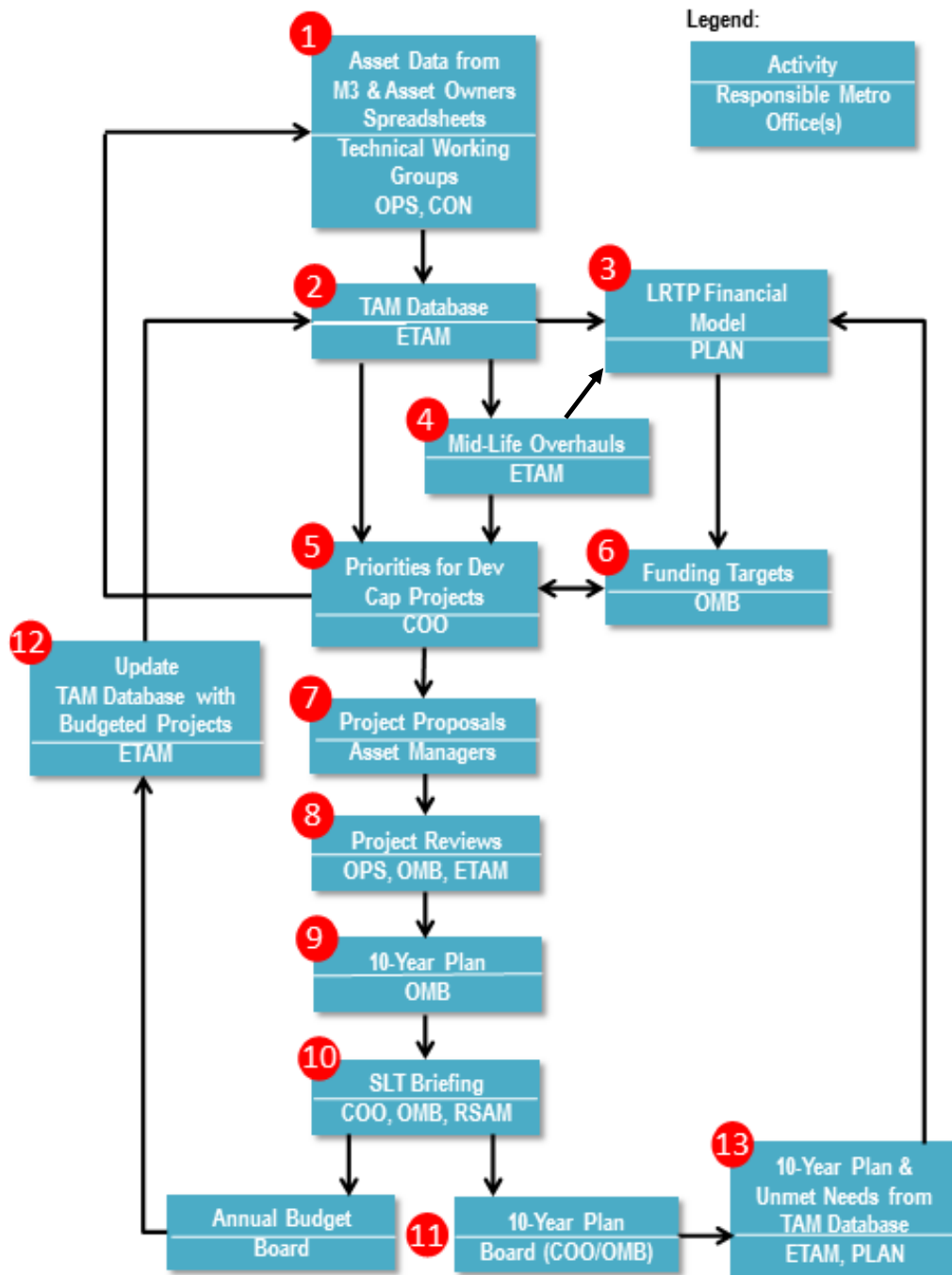
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- 3) The need from the projected annual cash flow for asset rehabilitation and replacement needs from the TAM database are input into the LRTP financial model to program funding for Capital SGR needs.
- 4) ETAM supplements this with an off-line projection of mid-life and component overhaul needs for Rolling Stock assets requiring such investment. Currently this is addressed separate from the TAM Database, but work is underway to incorporate overhaul needs into a SQL version of the TAM Database. The off line projection of midlife and component overhaul needs are provided along with the TAM database needs into the LRTP financial model.
- 5) The Chief Operating Officer (COO) sets general priorities to give direction to asset owners to develop capital projects such as priorities from the Board, Regulations (i.e. CARB for electric buses), considerations for scheduling due to service impacts, etc.
- 6) The OMB targets for Operations Capital Projects are set with the COO and are informed by funding levels programmed for SGR needs in the long range transportation plan (LRTP) financial model maintained by the Planning Department (PLAN).
- 7) Asset Owners develop proposed projects for the Capital Budget process based on the COO priorities and informed by the asset replacement needs indicated by the TAM Database.
- 8) The projects recommended for approval by OMB with input from OPS and ETAM are included in the 10-Year Budget Plan.
- 9) The Senior Leadership Team (SLT) is briefed on the capital program by the COO and OMB, Chief Risk/Safety and Asset Management (RSAM).
- 10) The outcome of the SLT briefing identifies projects to be included in the annual budget and 10-Year Budget, which is approved by the Metro Board.
- 11) The Board approves the annual budget and the 10 Year Plan (of which the first year is the annual budget).
- 12) ETAM updates the TAM Database based on the projects included in the annual budget.
- 13) The projects in the 10-year plan and unburdened needs identified in the TAM Database are updated inputs to the Long Range Transportation Plan (LRTP) financial model. The application of the financial model supports the determination of the allocation of overall Metro revenue to be allocated to SGR investment.



Exhibit 2: Application of TAM Database in Decision Making





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6.0 REFERENCES

- BS ISO 55000:2014, Asset management — Overview, principles and terminology, International Standards Organization, 2014
- BS ISO 55001:2014, Asset management — Management systems — Requirements, International Standards Organization, 2014
- BS ISO 55002:2014, Asset management — Management systems — Guidelines for the application of ISO 55001, International Standards Organization, 2014
- Asset Management — An Anatomy, Version 3, December 2015, The Institute of Asset Management
- International Infrastructure Management Manual 2015 Edition, NAMS, Inc., 2015
- AASHTO Transportation Asset Management Guide — A Focus on Implementation, American Association of State Highway and Transportation Officials, 2011
- Asset Management Guide: Focusing on the Management of Our Transit Investment, Federal Transit Administration, FTA Report No. 0027, October 2012

7.0 ATTACHMENTS

Not Applicable

8.0 PROCEDURE HISTORY

Not Applicable