



**METROPOLITAN  
TRANSPORTATION  
COMMISSION**

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## ***Memorandum***

TO: Partnership Technical Advisory Committee

DATE: March 19, 2007

FR: Glen Tepke

W. I.

RE: Regional Transit Capital Inventory Update

### **Background**

In order to improve MTC's ability to forecast transit capital rehabilitation and replacement project needs in the region, MTC staff has proposed the development of a Regional Transit Capital Inventory (RTCI). The objective for the RTCI is to collect data from the region's transit operators on their capital assets and the costs of rehabilitating and replacing those assets, which will provide consistent project information and be based on comparable definitions. The RTCI will also provide an automated and transparent data collection process to update data from the region's transit operators on a regular basis. Data will meet a regional standard to allow comparisons among operators and to ease aggregation into regional totals. A major portion of the RTCI project will involve working with operators to improve their data management systems and procedures so that each operator can readily provide data that meets the regional standard.

The project has been divided into three phases. The goals of Phase 1 are to assess the capital asset data maintained by the region's largest transit operators and to provide information on how the data is collected, stored and used by the operators. Based on this assessment, the selected consultant will recommend what data is needed for programming and planning purposes, and what steps are needed for each operator to provide data that meets the regional standard.

Phase 2 will focus on implementing the Phase 1 recommendations so each operator can provide data for the inventory, and Phase 3 will develop the RTCI database and an automated process for transmitting capital data from operators to the database. The need for a potential fourth phase – the development of a new model that will use the RTCI data to inform planning and programming – will be evaluated when the initial phases are nearer completion.

### **Current Status**

The Regional Transit Capital Inventory (RTCI) consultants submitted their interim report on January 16. The interim report provided an overall assessment of the suitability of the transit capital data and data management systems currently used by transit operators for development of the RTCI, and preliminary alternative approaches to developing the RTCI. The RTCI working group met on January 25 to review the report. Excerpts from the consultants' presentation regarding the interim report is attached. The full interim report is available from MTC staff for anyone who did not receive it.

The consultants submitted draft operator reports to each individual operator on February 25. The operator reports provide a more detailed assessment of each operator's asset data and data management systems. Comments on the draft operator reports should be provided directly to the consultants. The final operator reports were due on March 16.

Due to the wide variation in data and data sources among the operators that the consultants found in their initial assessment, we have pushed back the deadline for the draft final report to MTC and the RTCI working group (which was also due on 2/16) to allow more time to develop a workable data standard and work out the best approach to building the RTCI. We will schedule a meeting of the working group to review and comment on the draft final report after we receive it later this month.

Since questions about the consistency and comparability of data on rail and other fixed guideway assets were a major consideration in launching the RTCI project, MTC and consultant staff met with rail operators on February 13 and March 1 to work on asset definitions and data standards particular to rail assets. This work will feed into the consultant's recommendations in the draft final report.

### **Asset Classification**

Attached is a potential system for classifying transit assets that could be used to define the data that will go into the RTCI. This classification system was developed by the consultants for discussion purposes, and is not their final recommendation for the RTCI data standard. Each asset type is defined with increasing levels of detail as you move from left to right across the table. Below each asset category are colored bars indicating three alternative levels of detail that could be used in the RTCI. MTC staff is interested in any comments from the transit operators regarding whether the classification of assets into the various types, and the breakdown of each asset type into the different levels of detail, are appropriate.

Also attached is the consultants' initial assessment of which level of detail of asset data (as defined by the colored bars in the asset classification table) each transit operator could readily provide with their current data sources. The purpose of this assessment is to help us determine the optimum level of detail for RTCI data. MTC staff is interested in any comments transit operators have on the assessments. This feedback will help the consultants finalize their recommendations on the asset classification system and the level of detail that should be used in the RTCI.

Metropolitan Transportation Commission

# Regional Transit Capital Inventory Project Interim Report Presentation



Booz | Allen | Hamilton

*in association with*

URS Corporation

January 25, 2007



Findings...Data Sources

## Summary of Existing Sources of Capital Asset Data

Source Type	Purpose	Frequency of Use by Regional Operators	Limitation of Source for Capital Asset Inventory
<b>Asset Inventory (i.e., Capital Planning Ready)</b>	Capital planning	None	<ul style="list-style-type: none"><li>- Few limitations / optimal data source for regional asset inventory development</li><li>- May not document rehabilitations</li></ul>
<b>Fixed Asset Database</b>	Financial accounting (not used for capital needs analysis)	High	<ul style="list-style-type: none"><li>- Insufficient detail</li><li>- Assets poorly categorized</li><li>- Rehabilitation records not linked to specific assets</li><li>- Includes assets not requiring replacement (e.g., land, studies)</li></ul>
<b>Grants Management Systems</b>	Management of capital grants (not used for capital needs analysis)	High	<ul style="list-style-type: none"><li>- Same limitations as fixed asset databases</li><li>- Does not record asset retirement</li><li>- Assets with widely differing life-cycle characteristics grouped together</li></ul>



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### Summary of Existing Sources of Capital Asset Data – cont'd

Source Type	Purpose	Frequency of Use	Limitation of Source for Capital Asset Inventory
<b>Maintenance Management Systems</b>	Asset repair and rehabilitation activities	Moderate (relatively few use a commercial product)	- Only document a fraction of asset holdings (e.g., just vehicles) - Many smaller operators using Excel spreadsheets - May not document asset date built or purchase cost
<b>Asset Condition Assessments</b>	Re-investment prioritization	Moderate	- Do not cover all asset types - Not linked to other data sources (e.g., fixed asset database) - No standardized condition rating criteria
<b>Fleet Rosters and Fleet Replacement Plans</b>	Fleet replacement needs analysis	High	- Only documents revenue vehicle fleet
<b>Special Division / Department Sources</b>	Document segment of agency asset holdings; support immediate needs of agency department or division staff	Moderate	- Do not cover all asset types - Not standardized documents - Rarely contain all data required for asset inventory development



### Developing a Regional Asset Inventory: Key Points of Interest

▶ **Capital Planning Asset Inventories:**

- Few operators currently possess a “true” asset inventory source that is operationally ready for use in capital planning
- As they exist today, does not represent a viable option for development of a regional asset inventory

▶ **All Operators Have Detailed Fixed Asset Databases:**

- Nearly all MTC operators have a fixed asset database system
- Represents the most comprehensive *single existing* source of asset inventory information available
- Provides some but not all of the data fields required for capital planning analysis
- Represents a viable but in many ways flawed source of regional capital asset inventory data (i.e., poor categorization, insufficient detail, insufficient condition information)



## Developing a Regional Asset Inventory: Key Points of Interest (cont'd)

▶ **There is a Wide Variety of "Partial" Data Sources:**

- Includes maintenance management systems, asset condition reports, fleet management plans and special department / division sources, etc.
- Can provide good capital asset data for specific segments of an operator's asset holdings (most notably revenue fleet vehicles but occasionally other asset types as well)
- Represent valuable, alternative sources of data that can be used to assist regional inventory development but lack sufficient coverage to fully construct a regional inventory

▶ **Some Sources Provide Additional Data on Life-Cycle Needs:**

- Some of the sources identified by staff interviews provide valuable information on asset life-cycle costs and the timing of rehabilitation and replacement activities.
- While not necessarily providing information on current asset holdings, these sources can be of significant interest to the analysis of future Bay Area transit re-investment needs
- Examples include the rehabilitation records from the maintenance management systems and useful life remaining assessments from the asset condition reports



## Option 1: Short-Term Solution

- ▶ Fixed asset databases appear to represent the best existing source to develop a regional transit asset inventory in the very near term:
  - Each of the MTC operators has some form of fixed asset database and these sources are comprehensive of all agency assets
  - Use of this source would provide comprehensive coverage of all Bay Area Assets
  - Fixed asset inventories also have many important limitations, the most significant of which are insufficient level of detail and poor categorization of assets
- ▶ This solution is cited as a "short-term" option given these issues (i.e., it is assumed MTC will desire a more effective long-term solution)
- ▶ In terms of providing the initial data, this option would require little input or assistance from the region's operators
- ▶ Primary challenge: sifting out the data that is not required, and ensuring that comparable assets are reported in a comparable manner at different operator



## Option 2: Medium Term Solution (“80/20” Rule)

- ▶ This rule-of-thumb suggests the option of collecting asset inventory data for that roughly twenty-percent of agency assets (by quantity, not by value) that account for the greatest share of each agency’s expected long-term investment needs. (“Twenty percent of the assets are responsible for 80% of costs”)
- ▶ Funding needs for this 20% of assets would then be identified using life-cycle cost models
- ▶ Remaining 80% would be estimated using simple rules-of-thumb (average annual capital expenditures on furniture, for example)
- ▶ Once the 20% of higher needs assets types were identified, each agency’s holdings for these assets could be identified using either their fixed asset database and/or the asset management system, asset condition report, fleet management plan or other specialized source



## Option 3: Long-Term Solution

- ▶ The optimal long-term solution may prove to be development of asset inventories from scratch
- ▶ Agency engineering and other staff responsible for verifying asset holdings for each agency’s fixed asset database could be tasked with primary collection of asset inventory information, here again using the “80/20” rule (i.e., collect data on the top 20% of assets in terms of expected reinvestment needs)
- ▶ The remaining 80% could be obtained either from the existing data sources (e.g., the fixed asset database) or estimated as described in option 2



#### Option 4: Phasing by Type of Operator or Asset

- ▶ Phase in asset inventory systems and requirements by either asset type or by type of operator
  - Vehicles account for the largest portion of replacement costs in the regional capital program, and data on vehicles is fairly well available
  - Vehicles could be phased in first, with facilities and infrastructure coming as later phases, under the assumption that the operating agencies may have to do more baseline evaluation and surveying in order to be able to report asset data at a comparable level for facilities and infrastructure.
  
- ▶ An alternate phasing method would be to do the opposite – since vehicle information is fairly well known, concentrate first on the areas where data is most sparse – i.e. the rail infrastructure systems
  - First bring all rail operators to a comparable level of asset knowledge for their track, signaling, power delivery and communications systems, then tackle facilities second, and vehicles third.
  - Concentrates on the programs where information has been most sparse in the region first, and where there have been the most questions of comparability



MTC DISCUSSION - WHAT IS THE APPROPRIATE LEVEL OF DETAIL FOR RTCI INVENTORY

GUIDEWAY	Quantity	Age	Grade	Surface	Alignment Type	Geologic	Location		
			At grade  Below  Above	Roadway Railway/Track	Exclusive Semi exclusive Mixed traffic Tunnel Cut and cover Retained cut Elevated structure Elevated fill	Hard Soils Soft Soils Tub	Milepost Marker		
Level of Detail 1									
Level of Detail 2									
Level of Detail 3									
RAILWAY/TRACK	Quantity	Age	Track Class	Track Type	Alignment Type	Location			
			Light Heavy Commuter	Ballast Embedded In Street Special	Yard Tangent Curve Station	Milepost Marker	Note: Track class based on maximum speed, weight and frequency of use, and related to FRA classes.		
Level of Detail 1									
Level of Detail 2									
Level of Detail 3									
ROADWAY	Quantity	Age	Pavement Class	Pavement Type	Alignment Type	Location			
			Local Arterial Highway	Concrete Asphalt	Yard Tangent Curve Station	Milepost Marker	Note: Pavement class based on maximum speed, weight and frequency of use, and related to CBRT classes.		
Level of Detail 1									
Level of Detail 2									
Level of Detail 3									
STATIONS	Quantity	Age	Size	Grade	Major Component	Minor Component	Platform	Material Types	Location
			Square Feet	At grade Below Above	Structure Roof Canopy Escalator/escalator Revenue/fare collection Access Facilities Auto Park Garage Auto Park Lot Auto Circ Bus Bike Ped	Equipment Public toilets Landscape Control rooms Mezzanine	Side Center	Concrete Brick Wood Asphalt	Milepost Marker
Level of Detail 1									
Level of Detail 2									
Level of Detail 3									
FACILITIES	Quantity	Age	Size	Type	Major Components	Equipment	Location		
			Square Feet	Maintenance Light Maint Activities Heavy Maint Activities Administrative	Roof Structure Parking/Circ/Access Service Line Fuel Clean Revenue	HVAC Tires Dynamometer Lifts	Milepost Marker		
Level of Detail 1									
Level of Detail 2									
Level of Detail 3									

MTC DISCUSSION - WHAT IS THE APPROPRIATE LEVEL OF DETAIL FOR RTCI INVENTORY

SYSTEMS	Quantity	Age	Type	Component	Element	Location	
			Train control	Fixed/wayside Moving block Communications based Centralized control Gates/crossing protection	Conduit Cable Relay rooms	Milepost Marker	
			Bus control	Traffic signals Gates/crossing protection Centralized control			
			Traction power	Power supply Substations Breaker houses Power distribution Catenary Third rail	Conduit Cable		
			Communications	Voice-radio Data	Radio Phones Base station Public announcement		
			ITS	GPS AVL CAD APC			
			Fare collection	Stations Vehicles Central revenue counting	TVM/add fare Turnstiles Fareboxes Translink		
			Utilities	Lighting Pump stations Ventilation			
Level of Detail 1							
Level of Detail 2							
Level of Detail 3							
VEHICLES	Quantity	Age	Revenue	Mode	Size	Propulsion Type	Passenger Capacity
			Revenue	Bus - Static Bus - Artic Light Rail - Static Light Rail - Artic Heavy Rail Com Rail - Single Level Com Rail - Bi Level Com Rail - Power Car Com Rail - Multiple Unit Locomotive Paratransit Van Car Trolley Bus Cable Car	1 - 10 10 - 20 20 - 30 30 - 40 40 - 60 60 - 80 80 +	Electric - Catenary Electric- Third Rail Diesel Gasoline CNG LP	1 - 5 5 - 12 12 - 20 20 - 30 30 - 40 40 - 50 50 - 100 100 - +
			Non Revenue	Auto Truck Special Vehicle			
Level of Detail 1							
Level of Detail 2							
Level of Detail 3							

	Estimated Ability to Immediately Populate Inventory for All Asset Types		
	Level of Detail 1	Level of Detail 2	Level of Detail 3
<b>Tier 1 Operators</b>			
ACE	Yes	Yes, but not for Track	For vehicles and stations
AC Transit	Yes	Yes	For some assets
BART	Yes	Yes	For most assets
Caltrain	Yes	Yes	For most assets
CCCTA	Yes	Yes	No
Tri Delta Transit	Yes	Yes	No
GGBHTD	Yes	Yes	No
LAVTA	Yes	Yes	No
Muni	Yes	For some assets	No
Samtrans	Yes	Yes	For some assets
Vallejo Transit	Yes	Yes	No
VTA	Yes	Yes	For most assets
West CAT	Yes	Yes	No
<b>Tier 2 Operators</b>			
Alameda-Oakland Ferry	Yes	For vehicles but not facilities	No
Benicia Transit	Yes	For vehicles but not facilities	No
Fairfield-Suisun Transit	Yes	For vehicles but not facilities	No
Napa Valley Transit	Yes	For vehicles but not facilities	No
Santa Rosa City Bus	Yes	For vehicles but not facilities	No
Sonoma County Transit	Yes	For vehicles but not facilities	No
Union City Transit	Yes	For vehicles but not facilities	No
Vacaville City Coach	Yes	For vehicles but not facilities	No