

Transit Asset Management System

Chicago Transit Authority (CTA)

July 2011

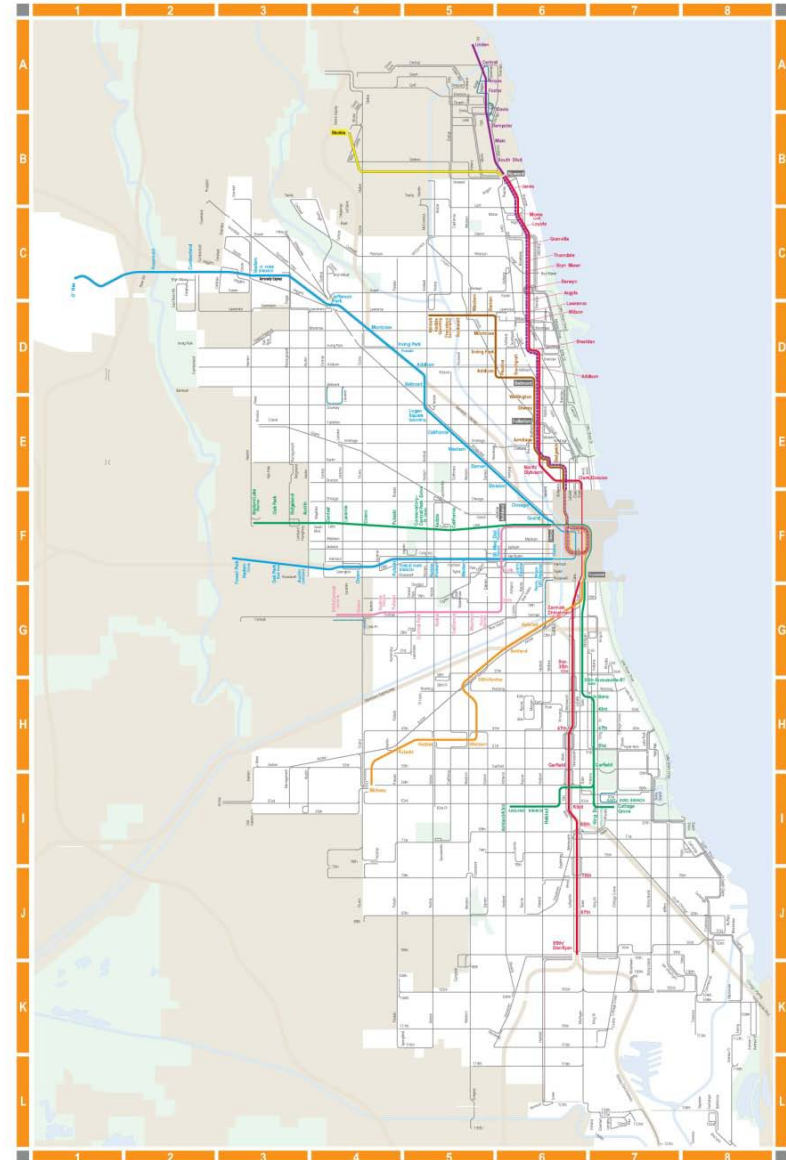


Overview

- History of Asset Management at Chicago Transit Authority
- Asset Management Challenges to Tackle
- Transit Asset Management System (Bus Facilities)
 - Current Approach
 - Four phases of work
 - Project Progress
 - Project Budget and Schedule
 - Implementation Plan
- Future Goals

History of TAM

- 1992 - Asset inventory and engineering condition assessment
- 2007 – Vehicle maintenance management system implemented
- 2008 - Facilities management system upgraded (ongoing for Power & Way)
- 2010 - Regional capital asset inventory
- 2011 - Regional capital decision tool
- 2011 - CTA Transit Asset Management System



1992 Engineering Condition Assessment

- CTA Consultant teams:
 - Inventory existing assets
 - Perform engineering condition rating (1-5 scale)
- Inputs for “20 Year Needs” and capital project list
 - \$6.8b unfunded capital need
 - \$800m annual need to stay in good repair, once attained
- Updates performed via desk audits (consultant staff)
 - Capital projects performed
 - Assets replaced in maintenance cycle
- Provided baseline data for RTA Capital Asset Condition Assessment
 - Condition rating data omitted

Vehicle Maintenance Management System

- Vehicle Fleet Maintenance Management Information System (MMIS) fully implemented by 2007
- Work order based approach
 - Labor, materials utilization and costing for all maintenance activities
 - Scheduling of preventive maintenance activities
 - Automated identification/analysis of vehicle/component failure trends
- MMIS process
 - Work orders created, stored and maintained in MMIS
 - Online processing of Work Orders
 - Annual updates based on user input
- Vehicle PM work well-defined
 - Regular maintenance cycles
 - Capital overhaul programs



Enterprise Asset Management System

- Facilities Maintenance replaced legacy work order management system in 2008 (Infor EAM)
 - Work order based approach
 - Preventive maintenance activities scheduled
 - CTA labor and vehicle usage tracked; vendor time and materials tracked
- EAM Process
 - Work orders created, stored and maintained; online Work Orders processing
 - Configuration changes done in-house or by consultants
- On-Going Rollout to Agency
 - Signal, Track, Structure and Power Maintenance implementation ongoing
 - Other areas: Safety, GPS Equipment, Revenue Technology



Asset Management Challenges

- Fragmented existing information
 - Legacy systems, excel spreadsheets
- Stale condition assessments
 - How to keep updated over time?
- Coordination with maintenance
 - Leverage field resources efficiently
 - Inform capital decisions



CTA Bus Garages

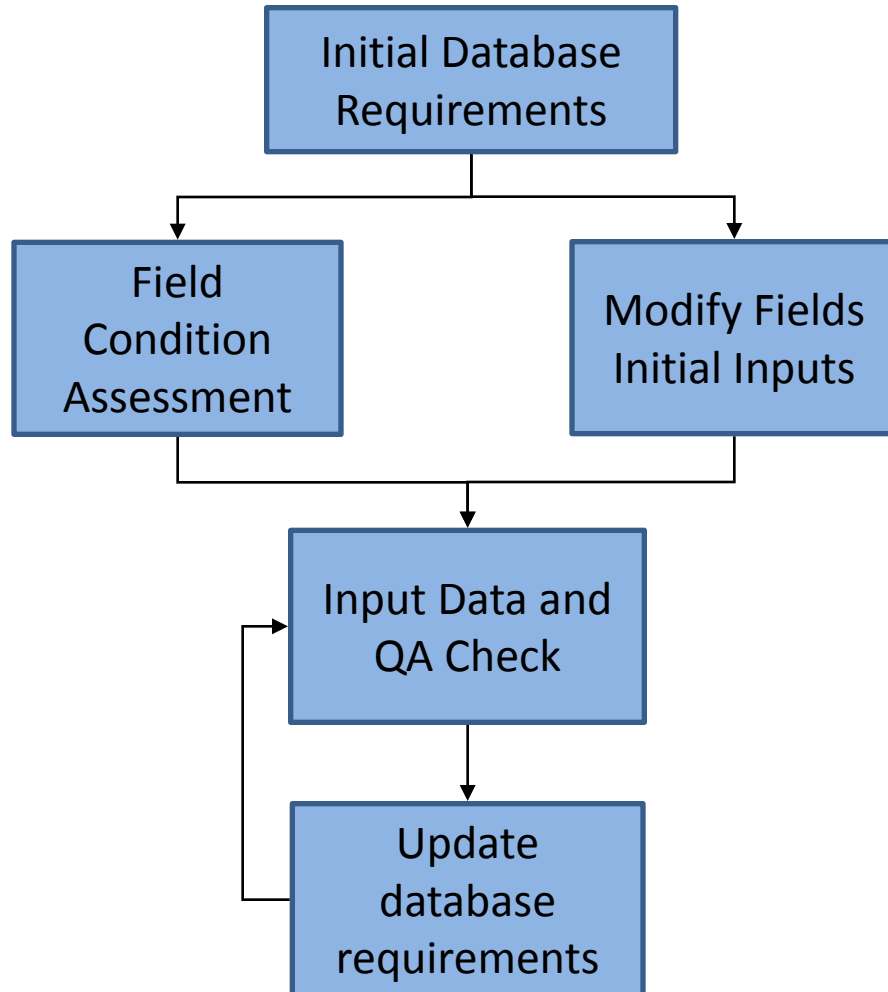
Identification		Condition													Standard Lifts		Condition													
Name	Address	Fueling System Condition	Underground Storage Tanks	Lube Oil/Fluid System	Engine Wash Equipment	Roof - Condition	Architectural	Transportation Office	Admin. Offices	Male Locker Room	Female Locker Room	Lunch Room	Battery Charging Room	Waste Water Systems	Quantity	Condition	Trash Collection	Bus Washer	Quantity - Portable Lifts	Condition - Portable Lifts	Fire Protection	Boiler	Air Curtain	Electrical	Outdoor Lighting	Indoor Lighting	HVAC	Aprons	Sewers	Parking Lots
Archer	2600 W. Pershing Rd	2	4	2	1	3	1	1	1	1	1	1	1	1	2	2	2	2	4	4	1	3	1	2	1	1	1	3	3	1
Forest Glen	5419 W. Armstrong Ave	1	4	2	2	3	1	1	1	1	1	1	3	3	12	2	1	1	1	4	1	2	4	1	1	2	1	2	1	2
Kedzie	358 S. Kedzie Ave	3	3	3	3	1	3	3	3	3	3	3	3	3	14	2	3	3	0	4	3	3	3	3	3	3	2	4	2	3
North Park	3112 W. Foster Ave	1	4	2	2	2	2	1	1	2	2	2	3	2	1	2	1	2	3	3	2	2	4	2	1	1	2	3	2	2
77th	210 W. 79th Street	1	2	2	1	1	1	2	2	2	1	2	2	1	17	2	1	1	3	2	1	2	4	2	2	1	2	1	1	1
103rd and Stony Island	10201 S. Stony Island Ave	2	4	3	1	3	2	3	3	3	3	3	3	2	14	2	3	2	2	2	3	1	2	3	3	2	3	3	3	3
Chicago and Pulaski	4301 W. Chicago Ave	2	4	3	1	2	4	3	3	3	3	3	3	1	12	3	4	2	2	3	3	4	3	3	3	2	4	2	3	3
74th and Wood	1715-1907 W. 74th Street	4	4	4	3	3	2	3	4	4	4	4	4	2	12	4	4	4	1	4	3	4	4	2	4	4	2	3	4	3



Transit Asset Management Solution

- CTA received \$5.4 million grant
 - 2010 FTA Bus State of Good Repair Program
- Focus on Bus & Bus Facility Assets:
 - Goal is to expand to rail infrastructure assets upon completion
- Four phases of work envisioned:
 - A. Incorporate assets into existing database (Infor EAM)
 - B. Engineering condition assessment to re-baseline information
 - C. Reporting and modeling
 1. Ad Hoc reporting drawing from multiple sources
 2. Incorporation with modeling tool(s)
 - D. Develop plan to maintain asset information over time

Phase A: Incorporate Assets into EAM System



- Initial information from existing EAM asset data and 1992 Inventory
- Validate database structure
- Add Required Fields: age, quantity, location, cost
- Create placeholder fields for condition data
- Add data from condition assessment
- Condition Assessments may create new requirements for database

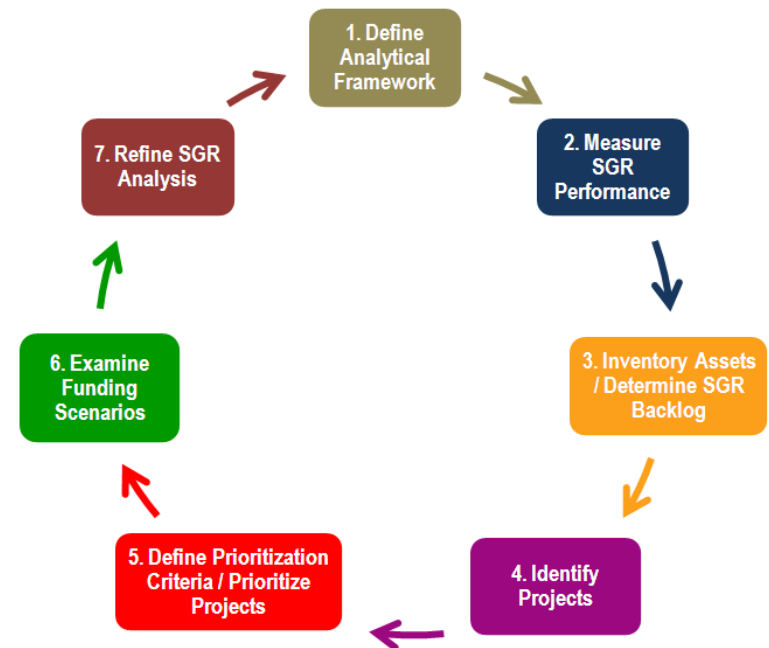
Phase B: Engineering Condition Assessment

- Multi-disciplinary teams of engineers survey: 6 garages, 1 maintenance campus and up to 140 turnarounds
- Produce condition ratings to be incorporated in EAM system
- Engineers also develop:
 - Recommendations on future data collection: methods and timeframe
 - Work processes to be incorporated into preventive maintenance SOPs
 - Checklists to guide PM and identify elements to trigger future reviews
- Develop cost estimate data to be incorporated into database



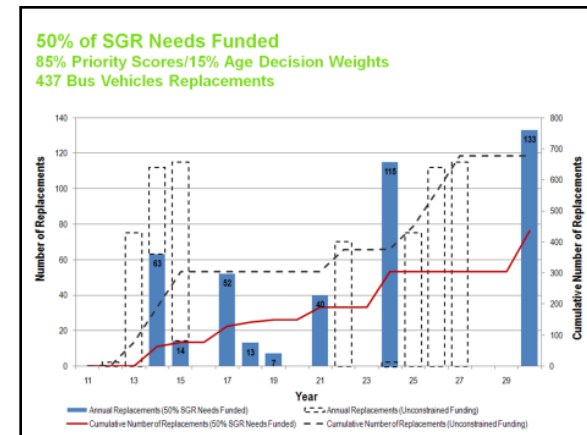
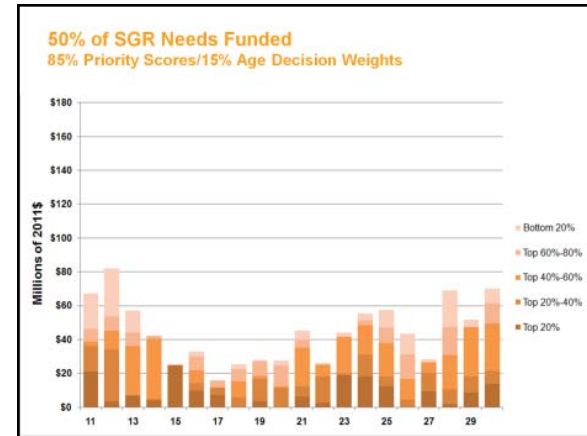
Phase C: Develop Reporting & Modeling Tools

- Develop ad hoc reporting for CTA use in policy/planning
 - Initial phase for immediate functionality
 - Incorporate vehicle and facilities information
- Model Development
 - Coordinate with regional project: provide better inputs
 - Consider development of “higher resolution” modeling tool



Phase C: Develop Reporting & Modeling Tools

- Modeling Approach
 - Assign end-of-life assets to projects
 - Rank projects based on criteria: age, actual condition, safety and reliability impact
 - Limit by funding available
 - Maintain alignment with regional project; leverage that effort
- Identify opportunities for new information sources:
 - Work order data, cost to maintain assets, impact on operations



Phase D: Develop Plan to Maintain Data

- Incorporate recommendations of multidisciplinary engineering teams:
 - Where possible leverage maintenance efforts
 - Incorporate checklists and SOPs in facilities maintenance plan
 - Adopt recommendations for frequency of inspections
 - Identify “triggers” for additional engineering review
- Establish data owners to manage subsections of data
 - Engineering owners responsible for updating based on capital investment
 - Maintenance updates based on repair/replace work orders
 - Visibility into system allows discrepancies to be reconciled
- Longer Term: Develop methods to automate updates of assets associated with capital project completion

Project Budget

- Total Project Budget = \$5.4 million
 - Developed for grant based on man-hours calculation
- Current Working Budget Breakdown
 - Phase A: EAM System Development \$500,000
 - Phase B: Condition Assessment \$3,800,000
 - Phase C: Model/Reports Development \$800,000
 - Phase D: Documentation/Process \$300,000
- Budget to be solidified in work plan

Progress to Date

- Sept 2010 - Re-bid Program Management contract
 - Included scope for transit asset management work
- April 2011 - New PM contract in place
 - Joint venture AECOM and Kenny Construction + sub-consultants
- July 2011 - Interviewed project manager candidates
 - One primary full-time PM
 - Part-time support for software portion
 - Subject matter expert to provide additional support

Implementation Plan

- Overall 24 months from grant award (May 2011)
- August 2011 - Begin project implementation
 - Work plan to create project road-map in 8 weeks
- October 2011 - Begin condition assessments of facilities
 - Will overlap with database development
- August 2012 - Updated asset information in database
 - Includes new condition ratings
- May 2013 - Project complete
 - Ad hoc reports built earlier than modeling tool
 - Documentation for SOPs part of Phase B effort
- Will review additional opportunities to overlap activities

Project Schedule

	Schedule by Month																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Phase A: EAM Development																								
Contract for Services																								
Map and Modify Database																								
Migrate Data																								
Document and Train																								
Phase B: Condition Assessment																								
Contract for Services																								
Bus Garage Data																								
Field Assessment by Garage																								
Document Garage Assets																								
Migrate Condition Data																								
Bus Turnaround Data																								
Field Assess. by Turnaround																								
Documentation																								
Migrate Condition Data																								
Phase C: Modeling/Reporting Tool																								
Contract for Services																								
Develop Cost Data																								
Develop Reports & Model																								
Train and Support																								
Phase D: Transition/Support and Training																								
Document Recommendations on Asset Data																								
Train and Support																								

Future Goals

1. Incorporate Rail Infrastructure Assets in EAM System
2. Develop better information on “costs to maintain” to assist with project selection
 - Link EAM system with Oracle to track materials purchases
 - Will support cost/benefit analysis
3. Better tracking and managing of warranty information
4. Develop methods to automate asset update when capital project completed
 - Possible interface between asset management system and web-based project management system

Thank You

APPENDIX

Scope Section (PM LIQ)

Asset Management Plan Development

The PM shall assist the CTA in integrating existing capital asset information into the CTA's Enterprise Asset Management (EAM) system so that it can be used to inform the Construction Plan and Strategic Plan. The PM shall also coordinate and manage the development of assessment protocol for existing CTA assets.

Existing Asset Tables

CTA capital asset information is currently maintained in a series of spreadsheets. The PM will be responsible for maintaining the current versions of CTA infrastructure asset data, based on information provided by CTA Infrastructure.

Asset Information Migration

CTA currently uses its Enterprise Asset Management (EAM) system to manage its maintenance defect data and work orders. This system has proved extremely valuable to CTA in terms of visibility into maintenance activities and prioritization of workload. The particular tool that CTA has selected for this maintenance function has sufficient functionality to also incorporate information that would be useful in capital asset management and capital planning.

The PM will assist the CTA in developing a strategy to migrate the data from spreadsheets into the CTA's EAM system, incorporating additional pieces of information and new data fields as required. As directed by the CTA, the PM will assist directly with the data migration effort.
Asset Assessment Protocol

The PM shall assist the CTA to develop a strategy for updating capital asset condition information, for use in the CTA's CP and SP. To the extent possible, this strategy should limit cost by leveraging existing maintenance information where possible and recommending engineering assessments where necessary.

As directed by the CTA, the PM should also collect assessment data and audit a limited number of assessments for accuracy and consistency.

Data Collection Schedule

The PM shall assist the CTA to prepare, maintain, and execute a schedule to complete the collection of existing conditions data for infrastructure assets. The schedule shall be revised and updated, as directed by the CTA.