3rd State of Good Repair Roundtable

Development of a System-Wide Asset Management Program

Southeastern Pennsylvania Transportation Authority

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The Southeastern Pennsylvania Transportation Authority (SEPTA)

- Sixth largest Public Transportation Agency in the Country.
- 1.1 million passenger trips per day.
- Modes Operated:
  - Heavy Rail
  - Commuter (Regional) Rail
  - Light Rail
  - Bus
  - Trackless Trolley
  - Paratransit
- Commuter (Regional Rail) trains also utilize infrastructure owned by Amtrak and CSX.

Infrastructure Origins

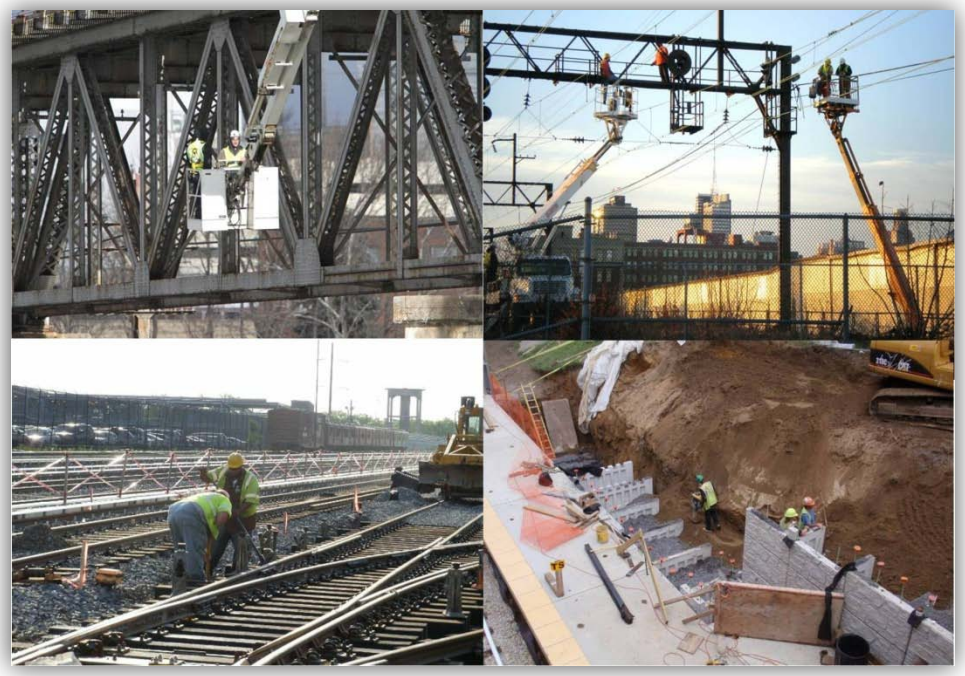
- Philadelphia Rapid Transit Company
- Philadelphia and West Chester Traction Company
- Philadelphia and Western Railroad
- Pennsylvania Railroad
- Reading Railroad
- Many facilities date back to the early 1900's.

Norristown Bridge 6.24 Built in 1882

Callowhill Bus Garage Built in 1913

Operating Territory Infrastructure (All Modes)

- 397.4 Total Miles of Main Line Track
- 30.8 Total Miles of Elevated Track
- 58.4 Total Miles of Underground/ Tunnel Track
- 90 Interlockings
- 182 Grade Crossings
- 77 Substations/Switching Stations
- 342 Stations and Bus Loops/Terminals
- 23 Vehicle Maintenance Shops



Vehicle Statistics

FLEET	QUANTITY	YEARS IN SERVICE
Bus	1408	Between 1 and 17 (Average = 7.6)
Trackless Trolley	32	4
Subway/Elevated: Broad Street Subway Market-Frankford Line	 125 220	 31 Years 13 Years
Trolley Lines Routes 10,11,13, 34, 36 Route 15 Routes 101/102	 112 18 29	 31 Years 6 Years* 31 Years
Norristown High Speed Line	26	17 Years
Regional Rail	375	1 Year (Silverliner V) To 48 Years (Silverliner II)

* = Rebuilt

Capital Investment Strategy

- Safety First
  - Rapid Modernization of Signal Systems Ongoing
  - No Long Term Speed Restrictions Due to Track Conditions
  - Market-Frankford Line Rebuilt End-to-End.
- Limited Debt
- "Fix-It-First" Before Expansion
- No "All or Nothing" Mentality for Stations.
- Maintain Strong In-House and Third Party Construction Programs including a Hybrid Approach that Utilizes Both.

Stretching Capital Dollars

- Maintenance Programs that Prolong Useful Life
  - Fleet Management/Vehicle Overhaul Program
  - Escalator/Elevator Preventive Maintenance Routines
- Innovation
  - Reverse Engineering of Vehicle Components
  - Norristown Substation Overhaul Approach
- Improved Speed of Delivery of Capital Projects
  - Time is Money!
  - American Recovery and Reinvestment Act Projects
  - Cheltenham and Ogontz Loop and Parkside Loop Capital Projects

SEPTA's SOGR Public Outreach Program

It's a System in Need

Bringing SEPTA's Infrastructure into a State of Good Repair

SEPTA Report to the Federal Transit Administration, February 2011

The Southeastern Pennsylvania Transportation Authority (SEPTA) was originally founded by the Pennsylvania legislature in order to coordinate government subsidies to various public transportation providers in Philadelphia, Bucks, Montgomery, Delaware, and Chester Counties. Between 1964 and 1983, SEPTA assumed ownership and operation of various transportation companies, including the Philadelphia Transit Company (PTC), the Philadelphia and Western Railroad (the P&W or Red Arrow), and a commuter railroad system from Conrail that was originally constructed by the Pennsylvania and Reading Railroads. Today, SEPTA is the sixth largest public transportation operator in the county, and serves over 600,000 people per day. SEPTA is one of two transit operators in the country to operate five major modes of transportation: busses, light rail (trolleys), heavy rail (subway and elevated lines), commuter rail, and paratransit services.

Along with the transportation network, SEPTA inherited the enormous backlog of maintenance tasks that the previous transportation providers had deferred. SEPTA has spent many capital dollars bringing the infrastructure into a state of good repair. However, with the age of the system, there are still many basic infrastructure investments that must be made in order to maintain safe and reliable service.

Southeastern Pennsylvania Transportation Authority

Engineering, Maintenance, and Construction Division

SEPTA's State of Good Repair Backlog

The FTA estimated in 2010 that it would take $77.7 billion to bring the country's transit infrastructure to a state of good repair. SEPTA's portion of this total was estimated to be $4.2 billion in 2009.

SEPTA Railroad Assessment July 2011

	BRANCHES						TRUNK						BRANCHES				
Section of Railroad	Airport	Warminster	West Trenton	Media/ Elwyn	Lansdale	Doylestown	Glenside to Wayne Junction	Wayne Junction to North Portal	Center City Tunnel	South Portal to 30th St. Station	30th St. Station to Arsenal Interlocking	30th St. Station through "K" Interlocking	Cynwyd	Manayunk/ Norristown	Chestnut Hill East	Chestnut Hill West	Fox Chase
Number of Tracks	2	1	2	2	2	1	2	4	4	4	2	4	1	2	2	2	1
Signals RR = Reverse Running Capability ATC = Automatic Train Control	RR ATC	RR ATC	RR ATC	RR ATC	RR ATC	RR	RR ATC	RR ATC	RR ATC	RR ATC	RR ATC	RR ATC	RR*			ATC	RR ATC
Communications FO = Fiber Optic Based		FO	FO		FO	FO	FO	FO	FO	FO	FO	FO					FO
Catenary																	
Traction Power Distribution/Substations								FAIRMOUNT / WAYNE JUNCTION			ARSENAL / SUB 1A	ZOO / SUB 1A					
Signal Power (100 Hz) Distribution/Substations OLW = Open Line Wire		OLW	OLW	OLW		OLW							OLW	OLW		OLW	
Track T = Tie Concerns B = Ballast Concerns	T			B				T		T	T	T	T	T	T	T	T
Interlocking/Control Point Switches (SS) = Spring Switch								HUNT	BROAD	SCHUYLK LL	WALNUT AND ARSENAL	WEST	JEFF (SS)	KALB AND ELM		CHW	
R.O.W. Structures (Culverts, Bridges, Retaining Walls, Tunnels, Rock Cuts, etc.)				VIADUCTS						BRIDGES	MARKET ST TUNNEL					BRIDGE 0.35	
Catenary Structures																	
Average Score	2.4	2.2	2.3	1.3	2.7	2.0	2.7	2.4	2.4	2.0	1.7	1.9	1.9	1.3	1.8	1.4	2.3

EM&C PLANT ASSESSMENT FOR THE REGIONAL RAILROAD

State-of-Good-Repair Condition/ no useful life concerns/ reliable system (3 pts)
Serviceable Condition/ midway to end of useful life/ some reliability issues (2 pts)
Useful-Life-Exceeded Condition/ useful life exceeded/ major reliability concerns (1 pt)

Assessment Date 07/11/11

RR* = Only Jeff to Cynwyd portion has reverse running capbility with signals.

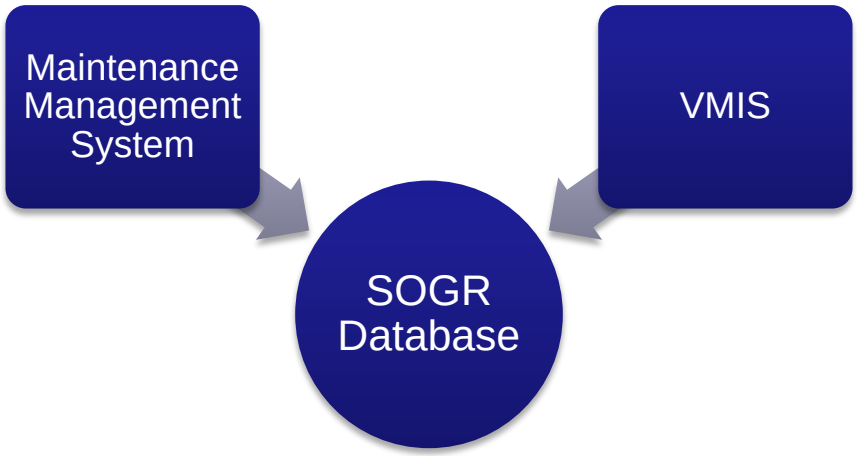
JDK, PE

Transit Asset Management Program Overview

- SEPTA has received an FTA Grant to create a Transit Asset Management Program.
- Three part strategy:
  - Investment Prioritization (Asset Listing, Useful Life, Ranking of Needs)
  - Vehicle Maintenance Information System Upgrade
  - Maintenance Management System Implementation (Enterprise).

SOGR Database: A Capital Planning Tool

- SEPTA's SOGR database is being developed by AECOM and will be modeled after the work performed at the MBTA with the goal of:
  - Establishing SOGR backlog.
  - Projecting future SOGR needs based on asset lifecycles.
  - Prioritizing capital expenditures with the intent of bringing all assets to a state of good repair.
- Will utilize data from upgraded vehicle and infrastructure databases but will not be integrated into those systems at this time.



Current Status: Asset Inventory Development

- Working with departments to develop a list of assets.
- Asset attributes:
  - Age
  - Remaining Useful life
  - Renewal activities
  - Cost of renewal activities
  - Cost of replacement
  - Cash flow/schedule
- Establishing granularity is key.
- Assets will be grouped together if they are
  - of a similar age and condition
  - likely to be replaced together as a part of a future capital project.

Targeting an inventory size of 4,000 to 5,000 assets systemwide.

Example of Granularity- Vehicles

Sample Asset Inventory from VMIS

Unit No	YR-Make-Model	License	VIN	In-Service	MIS
B2072	2003 CHAMPION DEFENDER27	MT40051	2UZAAZDD54CM74917	8-Mar-04	86
B2075	2003 CHAMPION DEFENDER27	MT40054	4UZAAZDD54CM74922	9-Mar-04	86
B2098	2007 CHAMPION DEFENDER27	MT39557	1GBE4V1987F425479	12-Sep-07	44
B2099	2007 CHAMPION DEFENDER27	MT39558	1GBE4V1987F425627	12-Sep-07	44
B4501	2000 ELDORADO TRANSMRKRE29	MT35282	1N9TBAC631C084098	13-Dec-00	125
B4502	2000 ELDORADO TRANSMRKRE29	MT34601	1N9TBAC611C084147	3-Jan-01	124
B4503	2000 ELDORADO TRANSMRKRE29	MT34605	1N9TBAC631C084148	12-Jan-01	124
B4504	2000 ELDORADO TRANSMRKRE29	MT34607	1N9TBAC651C084149	12-Jan-01	124
B4505	2000 ELDORADO TRANSMRKRE29	MT34610	1N9TBAC611C084150	12-Jan-01	124
B5208	1996 NABI 416.08	MT41943	1A9416086TA288486	18-Dec-96	172
B5215	1996 NABI 416.08	MT43037	1A9416083TA288493	17-Dec-96	172
B5229	1996 NABI 416.08	MT43358	1A941608XTA288507	3-Jan-97	172
B5232	1996 NABI 416.08	MT41629	1A941608XTA288510	8-Jan-97	172

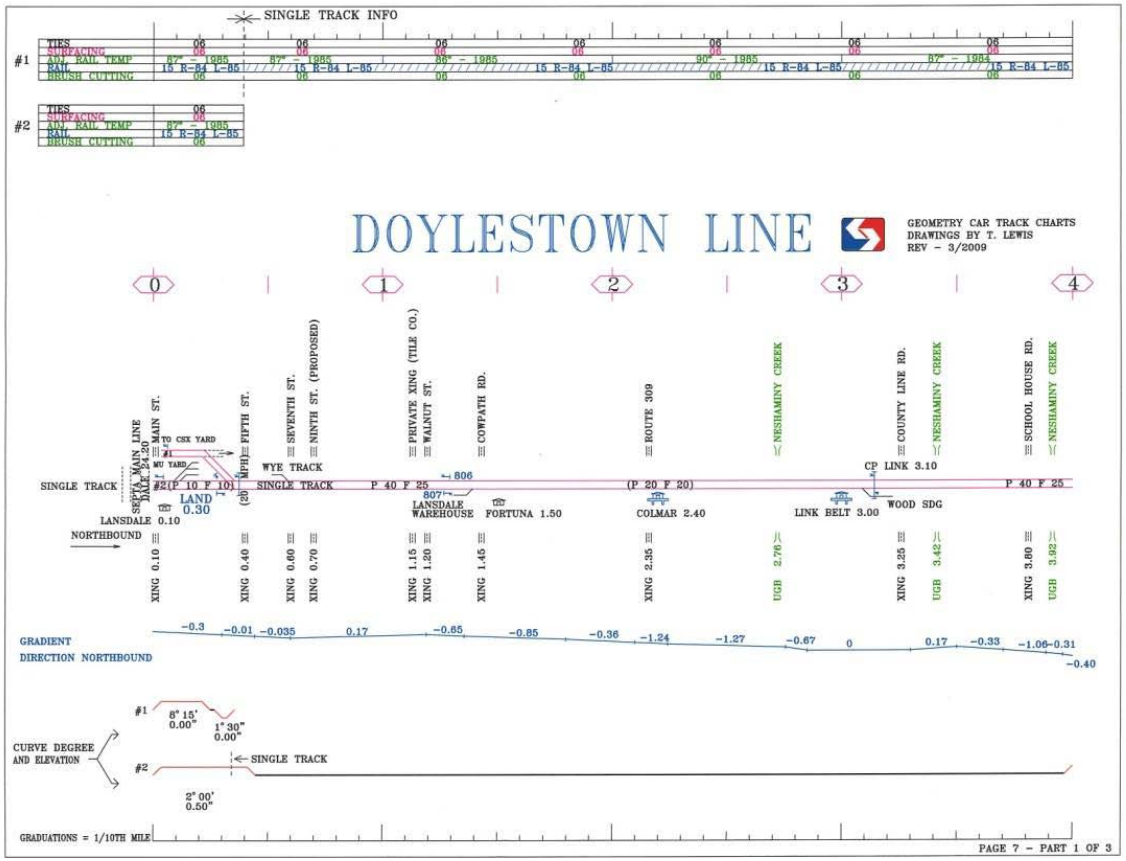
1400 buses in VMIS will be consolidated into 15 “assets” in the SOGR database.

Sample Fleet Inventory in SOGR Database

Asset ID	Asset Category	Year-Make-Model	Qty.	Service Date	Useful Life	Mid Life Overhaul Due
101	Bus	2003 Champion	12	6/26/05	12 years	2011
102	Bus	2000 El Durado	46	12/13/00	12 years	2006
103	Bus	1996 NABI	142	12/18/96	12 years	2002

Projected Inventory

- Recent infrastructure renewals have been comprehensive; therefore, making it easier to consolidate large stretches of linear right-of-way assets into fewer items in the SOGR database.



Next Steps in the SOGR Process

- AECOM will develop the financial modelling portion of the database.
- Given capital constraints, develop capital plans.
- Projects to be prioritized based on
  - Age (Remaining useful life)
  - Ridership impact
  - Cost effectiveness ($Cost/Ridership)
- Projects deferred year will have a higher priority in following years until SOGR is achieved for those assets.
- Future development: The ability to indicate which projects have safety and regulatory impacts.

Vehicle Maintenance Information System (VMIS)

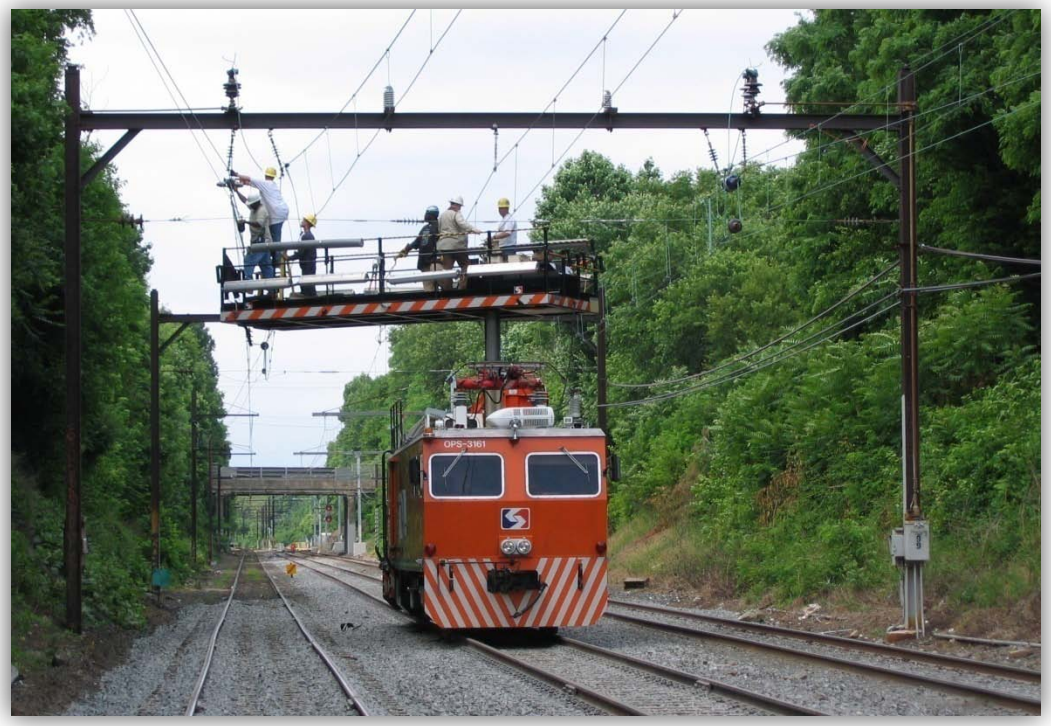
- Current fleet management system: Asset Works M4.
  - Maintenance information
  - Consumables
- Current fuel pump system functionally obsolete.
  - Requires manual data input from operators.
- Delay in data uploads.
- Paratransit vehicles are not included in the system.
- Working with Asset Works to purchase and deploy new hardware and software.

VMIS System Upgrade

- New hardware on vehicles will record all odometer, vehicle, and operator information to the database at fueling station or yard.
- New island control units will track all fluid consumables.
- Information to be transmitted to an upgraded database with web access.
- Maintenance information will continue to be input by employees.

Maintenance Management System (EAMS)

- No integrated system for tracking asset conditions, inspections, and maintenance records.
- Data exists in “information silos” in each department.
- Working with Universal Business Solutions (UBS) to develop functional requirements and recommendations for the new software package.



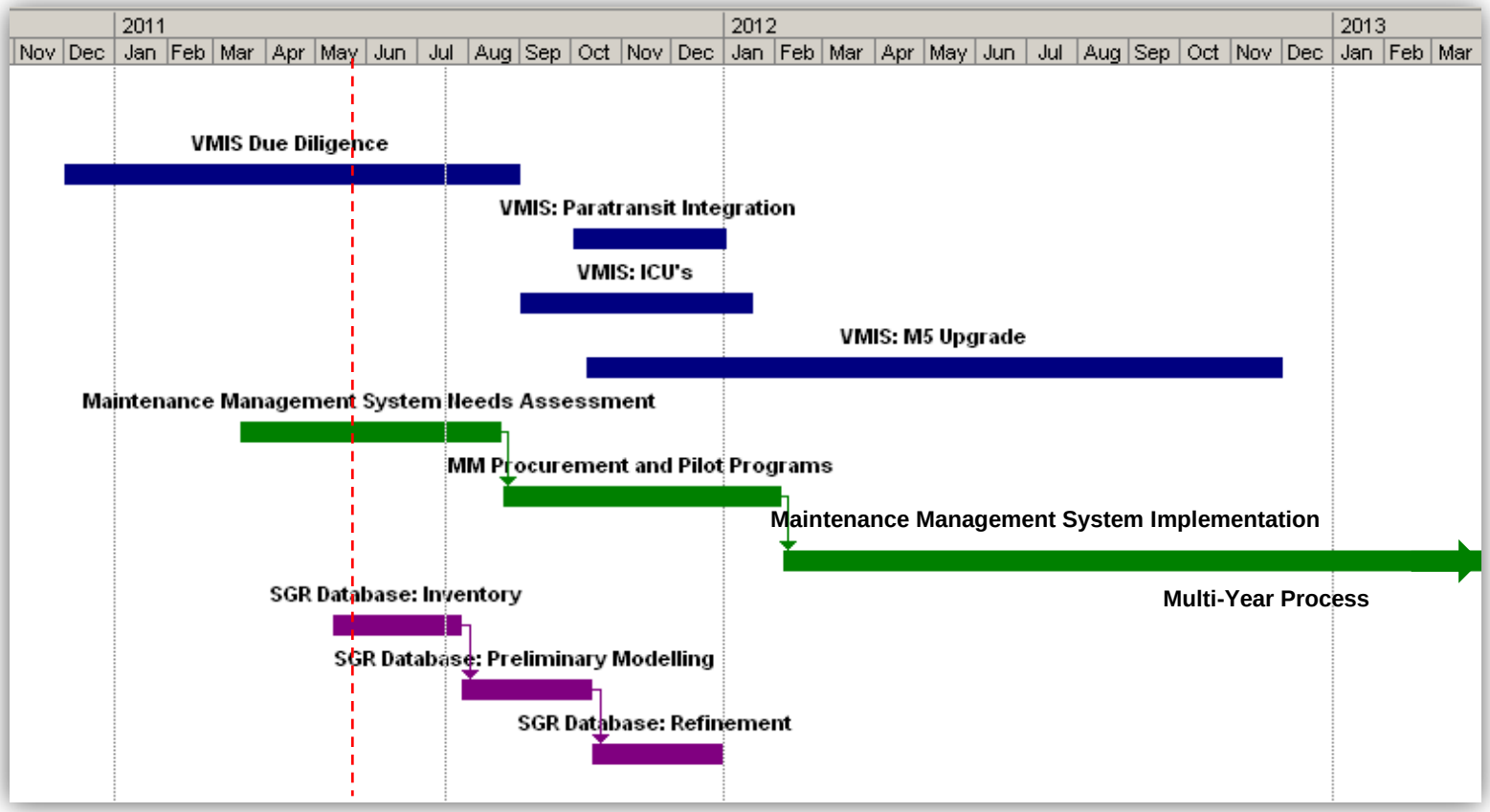
Maintenance Management System Features

- Comprehensive database of assets maintained by the EM&C Division.
- Inspection and preventive maintenance schedules, asset history.
- Generation of work orders based on asset conditions or scheduled tasks
- Data from work tasks can be input by inspectors or managers
- Real-time updates of the database via web access

Maintenance Management System Development

- UBS developed functional requirements based on
  - Input of Chief Engineering Officers
  - Input of Maintainers and Crew Chiefs
  - Review of maintenance and inspection logs, reports, and forms
  - Interviews with Peer Agencies

Overall Project Schedule



In Conclusion…

SEPTA is looking forward to presenting another progress update at next year's roundtable…

How about in Philadelphia?