

Asset Management System Implementation & Integration



July 17, 2012

About the LIRR

- Chartered April 24, 1834
- Agency of the Metropolitan Transportation Authority (MTA)
- Commuter Railroad Serving Nassau and Suffolk Counties (Long Island) and Queens, Brooklyn and Manhattan (New York City)
- 11 Branches
- 3 Western Terminals –
 - Penn Station (Manhattan)
 - Atlantic Terminal (Brooklyn)
 - Hunterspoint Av (Queens)
- Jamaica Station - LIRR's hub, served by 10 Branches





Metropolitan Transportation Authority

MTA Long Island Rail Road

Key

- Full Time rail station
- Accessible station
- Part Time rail station
- Major Transit Hub

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4th

FEDERAL TRANSIT ADMINISTRATION

State of Good Repair Roundtable

July 16-18, 2012 ■ Philadelphia, PA



U.S. Department of Transportation
Federal Transit Administration

About the LIRR

FLEET

1,006 Electric MU Cars
134 Bi-Level Coaches (Diesel-hauled)
23 Diesel Locomotives
22 Dual Mode Locomotives

INFRASTRUCTURE

Over 661 miles of track
124 Passenger Stations
294 Grade Crossings
750 Overgrade/Undergrade Bridges
29 Viaducts



73 Interlockings
328 miles of 3rd Rail
108 Substations

Asset Management – Drivers

- Since 1982, the MTA agencies have had a series of 5 Year Capital Programs, totaling \$75 billion in capital investments (1982-2009)
- Capital Planning Process
 - Asset Inventory
 - Twenty Year Needs Assessment
 - Development of 5 Year Capital Program
- Recent Financial Challenges – Re-examine future assumptions of both funding and project scoping

Transformative Projects

- In past LIRR Capital Programs, much of the investments were large scale:
 - Large Scale Fleet Replacement
 - Construction of High Level Platforms at all Diesel Stations
 - Major Investment in Jamaica Station and Atlantic Terminal



Jamaica Station – Before

Station built 1913



Jamaica Station – After

Station Renovation 2002 - 2005



Atlantic Terminal – Before

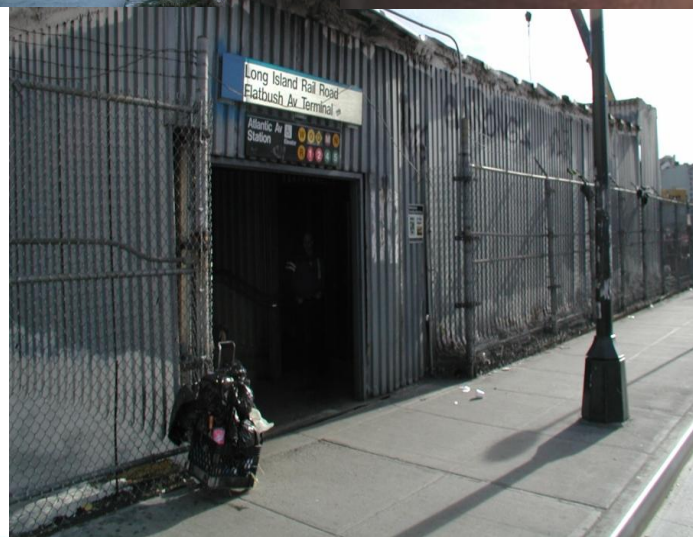
Station building built 1907 & Demolished 1988



Station Building - 1986



Platform - 2001



Atlantic Terminal – After

Station Renovation 2004 - 2010



Increased Focus on Lifecycle Costs

Moving forward, the LIRR's focus will be more on minimizing lifecycle costs of assets:

- Examination of Inspection and Maintenance Practices
- Identify Candidates for Component Replacement, focusing on Signals and Substations
- Assess & Prioritize Assets in a more detailed way (i.e. risk, criticality and interdependency)
- Recognition of our unmet data needs, particularly in regards to Maintenance / Repair Costs / Decision Support

Enterprise Asset Management (EAM)

- Implement an EAM program to achieve systematic, optimal and sustainable asset management at the lowest lifecycle cost:
 - Deliver necessary outputs to the asset managers and decision-makers
 - Deliver outputs valued by customers, funders and other key stakeholders
- EAM Benefits:
 - Understand Risks associated with Capital Assets & how these Risks change over time
 - Corporate impact / consequences of increasing or decreasing capital investment levels of a particular asset
 - Provide asset data and information to decision makers on multiple levels that facilitates knowledge-based decisions
 - Consistent asset management framework company-wide

Path Towards EAM

- **Rolling Stock**

- Rolling Stock Maintenance – Replaced legacy software system with Maximo
- Fixed locations – Hillside, West Side Yard, Morris Park / Richmond Hill
- Major Fleet Replacement Effort
- Implementation of Reliability Centered Maintenance (RCM) Program
 - Need for Data
- Three Types of Rolling Stock:
 - M-3 Electric Multiple Units (1984 – 1986)
 - M-7 Electric Multiple Units (2002 – 2007)
 - Diesel / Dual Mode Locomotives & Bi-Level Coaches (1998 - 1999)

Planning EAM

Business Process Analysis

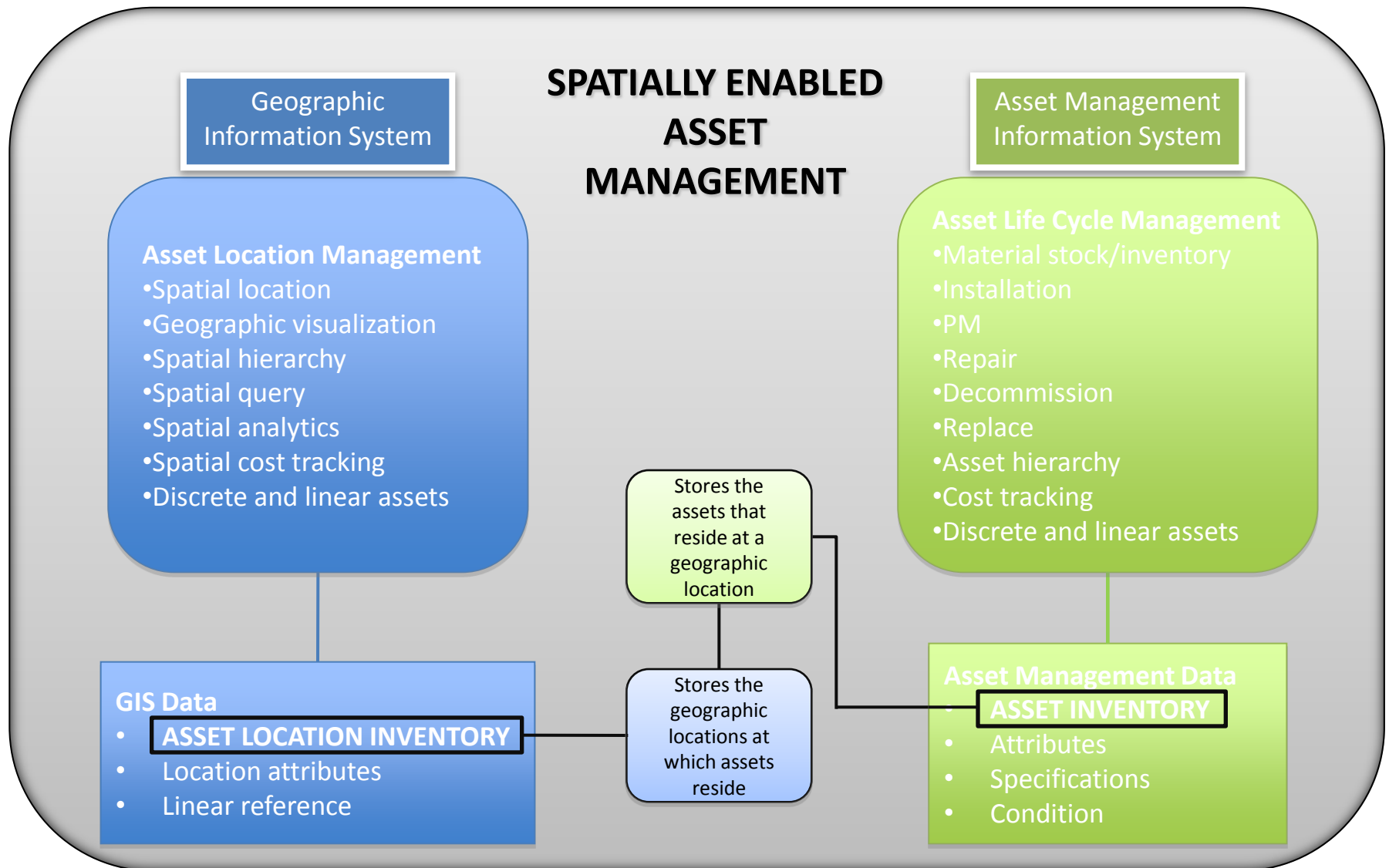
- Understand how assets are managed today
 - Identify Current Inspection / Regulatory Requirements
- Compare to industry best practices (PAS55)
 - Determine EAM maturity level
- Examine:
 - LIRR's business needs and data required for informed decision making
 - What level of detail and frequency of inspection is appropriate
 - Changes / modifications to inspection process
 - Risk and criticality of assets
 - Policies / Resources needed to implement changes
 - Support and training requirements for business process change and technology implementation

Bringing It Together

Building Upon Recent Experiences

- Lessons Learned
 - Already implemented new RCM program for Fleet, done in conjunction with large-scale fleet replacement
- GIS
 - Recent substantial investments in Corporate GIS
 - Training / Maintenance of GIS network
 - Active Users throughout Engineering, System Safety, etc.
- Recognized Unaddressed Data Needs
 - Make informed investment decisions / prioritization
 - Coordinate / refine data that was being collected / maintained by various departments / divisions with goal of migrating to corporate resource

EAM and Geospatial Technology



Map Interface - Bridge Flags

Find: Select Action

List Asset Sub Structures Meters Specifications PMS History Flag Report Load Ratings Work Need **Map**

You can create, modify, and delete features on the non-versioned map, and link Maximo records with geographic information system records. [More information](#)

Asset: Feature Class: Attachments

Status:

Map

The map displays the LIRR route with various bridge locations marked. Key locations include New Rochelle, Pelham, Oyster Bay, Huntington, Smithtown, Islip, Babylon, and Long Beach. The map interface includes a toolbar with navigation and editing tools, and a status bar showing the selected asset and feature class.

Infrastructure - Where to Start?

- **Line Structures (Bridges, Viaducts, Tunnels & Culverts)**
 - Set Inspection / Reporting Requirements
 - Biggest Rehabilitation Backlog
 - Majority of Bridge Projects are not full Replacements
 - Need for Data
 - Structures Department Strong Supporter of EAM
 - Deterioration / Hidden Problems / Bridge Strikes
 - Impact on Service
 - Concentrated in high traffic areas
 - Age of Bridges
 - Capital & Operating Funded Work
 - Geographic Nature / Involves other Assets (Signal, Power, Comm., etc.)



Strategy Planning

- **Power Substations**

- Total of 108 Substations / Breaker Houses
- Six date from 1945 - 1948
- 57 Substations were built between 1970 and 1972
 - Electrification to Huntington
 - Power Demands of M-1 Fleet
- Operational Challenges
- Property Challenges
- Balance resource availability with Operational Demands, while factoring in Risk
- Critical nature of Queens substations
- East Side Access Service Requirements



Requirements for Success

- Corporate Buy-in / Long-term commitments at all Levels
- Dedicated resources and support at the department level and the capital level
- Clearly defined EAM framework including policy, strategy, initiatives, and measurable goals
- Clearly defined roles, responsibilities, and processes that focus on achieving corporate goals
- EAM Working Groups – project level support and coordination
- EAM Executive Committee – EAM monitoring and issue resolution