Using Enterprise GIS To Support Transit Operations

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Using Enterprise GIS To Support Transit Operations

• The Importance of Location Information in Transit Operations
• Using GIS Data and Location Referencing Framework to Support Transit Operations
• Use Cases of GIS Support for Transit Operations in WMATA
The Importance of Location Information in Transit Operations

• Operation Control
  – Real time operation status
    • Train/bus locations
    • Incident locations
    • Outage Status
  – Emergency Responses

• Transit Planning and Scheduling
  – Rail Scheduling
  – Bus Route Planning

• Asset Maintenance and Resource Allocation
  – Asset Repair Dispatch and Resource Allocation
  – Asset Maintenance Process
    • Survey Monument Record Maintenance

• Customer Services and Support
  – Station Asset Outage Report
  – Customer Service Department
Using GIS Data and Location Referencing Framework to Support Transit Operations

• Operation Control
  – Using Location Referencing Framework to Integrate with Operation Control Data Feed
    • Train locations: using linear referencing system to visualize automatic train control data
    • Bus locations: using Coordinate based location referencing system to display on-board AVL data
    • Incident locations:
      – Linear incidents: using linear referencing system to dynamically locate linear incidents
      – Asset based incidents: using feature based location referencing system to link incidents with GIS features
      – Address referencing incidents: geocoding addresses to locate address based incidents
      – Highway referencing incidents: using highway feature feature based location referencing system
    • Asset Outage Status:
      – Linear referencing outage: linear referencing system
      – Asset based outage: feature based location referencing system
  – Dynamic Map to display Operation Control Data
    • Real time train locations: refresh every 20 seconds
    • Real time bus locations: refresh every 30 seconds
    • Real time outage locations: refresh every 2 minutes
Using GIS Data and Location Referencing Framework to Support Transit Operations

• Transit Planning and Scheduling
  – Transit network creation
    • GIS track network creation
    • Schematic track network creation
    • One-to-one correspondence between GIS track network and Schematic track network
  – Integration with Rail Scheduling software (HASTUS)
    • Import schematic network for HASTUS
    • Export network based scheduling information from HUSTAS
      – Blocks, Trips, Times points with GIS identifier
  – Bus route maintenance
    • Bus route maintenance at service change
    • Maintain bus route-bus stop relationship and sequence
    • Import bus schedule information
• Customer Services and Support
  – WMATA Public Facing Web Site
    • Provide bus stop accessibility information for the public through www.wmata.com
  – Station Manager Kiosk
    • Provide Station Manager Repair List to show current station asset outage status (work order and repair status)
  – Customer Service Department
    • Provide map and functions for various customer support scenarios
      – Incident impact zone
      – Bus location history tracing
Use Case of GIS Support for Transit Operations in WMATA

- Get Data
- Update Train
- Analyze Train Location Data
- Update Tbl_Train
- WinService Processing
- Oracle DB
- ArcGIS Server SOE Service
- Geocode Trains’ Locations
- Update Train Layer
- MetroView Display
- MetroView Website

Process to geo-reference ATC train control data to display real time train location on map.
Real time train/bus locations
Use Cases of GIS Support for Transit Operations in WMATA

Bus Location History Tracing
Use Cases of GIS Support for Transit Operations in WMATA

Asset Maintenance Resource Allocation Support
Examples of GIS Support for Transit Operations

Survey Monument Maintenance Tool
Use Cases of GIS Support for Transit Operations in WMATA

Rail Scheduling Support
Use Cases of GIS Support for Transit Operations in WMATA - Demo

Demo - Station Manager Repair List