



# Washington Metropolitan Area Transit Authority

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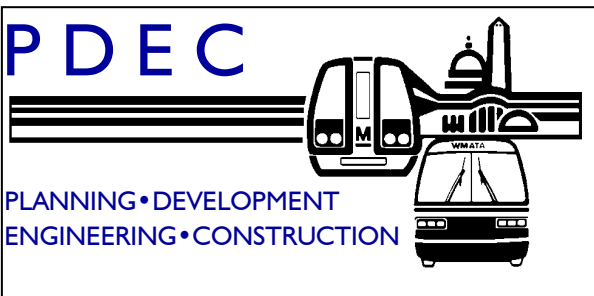
## ***Infrastructure Renewal Program Semi-Annual Update***



***Presented to the Board of Directors:***

**Planning & Development Committee**

July 7, 2005





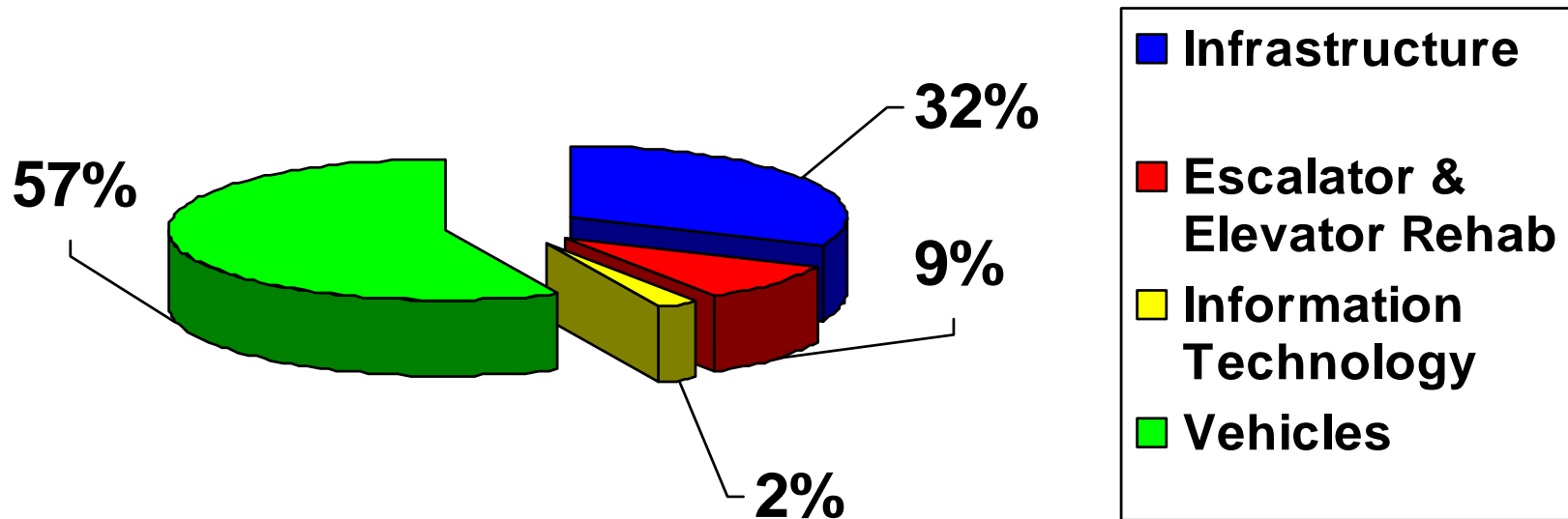
# I. Purpose

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- To provide the Planning and Development Committee an update on the FY05 Infrastructure Renewal Program (IRP) major accomplishments.

## II. Background

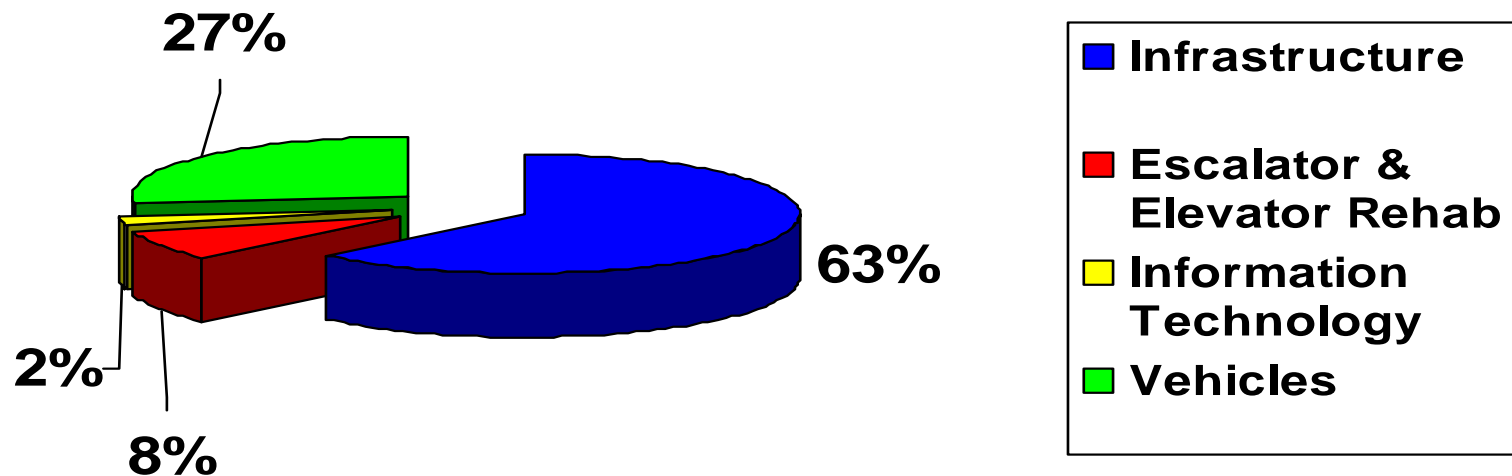
- The IRP Program from FY00 to FY05 was obligations budgeted for \$1.5B with financing.



- FY05 approved obligation budget for IRP was \$290.1M

## II. Background (cont'd)

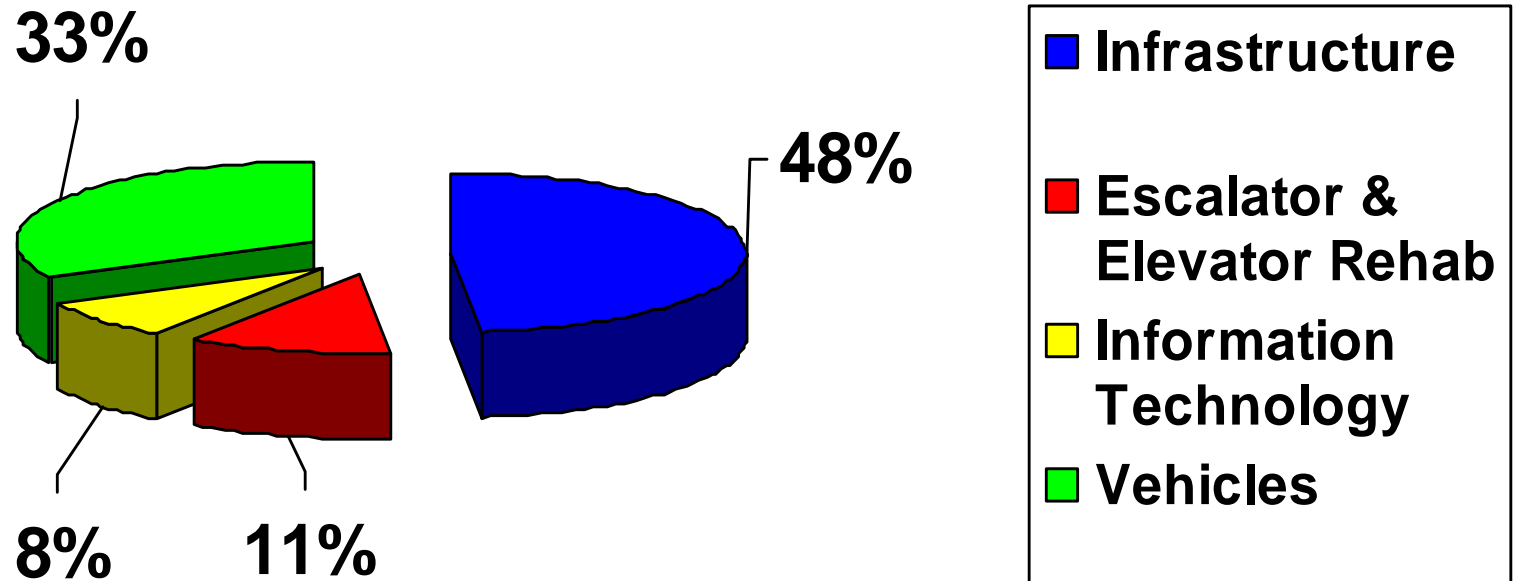
- Starting in FY06, Metro Matters Funding Agreement calls for the budgeting process to change to expenditure based – real time costs. The IRP Program from FY06 to FY11 is budgeted for \$1.9B



- Future semi-annual updates will be provided for the entire CIP program (IRP/SEP/SAP and Metro Matters) following the format of the Metro Matters Funding Agreement.

## II. Background (Cont'd)

- During FY05 actual IRP expenditures from FY05 and prior year obligations \$200M actual work was put into place. The following pages provide a brief update on these accomplishments.



# ***Vehicles***

# III. Vehicles

- Rehab Railcar 2000/3000 Series :  
Design and manufacture the mid-life rehabilitation of (76) 2000 Series and (288) 3000 Series Breda heavy rail rapid transit cars. Rehabilitation is being performed by ALSTOM.
  - 130 cars conditionally accepted; completion of rehab scheduled for June 2007.
  - Revenue mileage increased 50% on rebuilt 2000 Series cars compared to the previous 2000 Series cam motor design.
  - Cars available for daily service – 85% goal exceeded by rehab fleet for May 2005 with 88% average availability
  - Mean Distance Between Delays (MDBD) – Current status: on target and cautiously optimistic to meet 72,600 mi goal by December 2005.

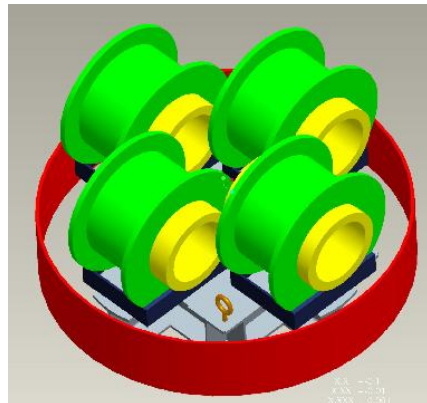


# III. Vehicles

- **AC Traction Motor Rewind**

Rewind 1,288 AC Traction Motors for the Rohr railcar fleet as replacements for burned out motors.

- FY05 deliveries total 275
- The manufacturer is providing a very high quality product
- Delivery schedule recovery being implemented through a 20% production capacity increase, from 25 per month to 30 per month
- Completion of motor rewind summer of 2007.





## III. Vehicles

- **Bus Procurement: Replacement Buses**  
250 CNG – compressed natural gas – low floor, heavy duty transit buses from Orion Bus Industries.
  - Pilot bus manufacture began October 2004
  - Pilot buses received January 28, 2005
  - Evaluation completed March 28, 2005
  - Bus production started with first delivery scheduled for August 2005; completion scheduled for March 2006.
- **Bus Fareboxes installed on the entire fleet August 2004.**



# ***Escalator & Elevator Rehab***



# IV. Elevator & Escalator Rehab

## Escalator Rehab Program

- The escalator component of the program includes:
  - Rehabilitate 70% or 413 escalators under the CIP through FY10
  - Replace poor performing/unique brands
  - Perform safety upgrades
  - Install canopies over exposed units
  - Install remote monitoring system
- In FY05 completed the rehabilitation of 32 of 170 Westinghouse Mod 100 escalators that were originally contracted out in 2000 with completion of all units by October 2005.
- Completed 8 additional Westinghouse Mod 250 units in FY05 that were added due to their deterioration and poor performance.
- Completed 160 of the 413 escalator rehabs to date with remaining escalators to be completed by end of FY10.



## IV. Elevator & Escalator Rehab

### Escalator Rehab Program

- Completed the design and initiated procurement efforts for the Mini-modernizations to 20 Montgomery Escalators to upgrade them to the latest codes and technology. This work is scheduled to be completed by the end of FY07.
- Completed the 100% design for replacing the 14 APV Bakers (6) and O&K's (8) that have proven to be problematic and unreliable; RFP is scheduled for a September 2005 advertisement with the completion of the work by the end of FY08.
- Completed Remote Monitoring capabilities on 315 escalators in the system. Completion of remaining scheduled for the end of FY06.





# IV. Elevator & Escalator Rehab

## Elevator Rehab Program

- The elevator component of the program includes:
  - Rehabilitate 45% or 95 units under the CIP through FY10
  - Upgrade any unit that is out of ADA compliance
  - Perform controller and modernization upgrades
  - Install remote monitoring system
- Completed rehabilitation of 9 elevators in FY05; total of 19 to date. Completion of 75 elevators currently contracted by end of FY08. Procurement for remaining elevators to be initiated in FY07.
- Completed Remote Monitoring capabilities on 70 elevators in the system. Completion of remaining scheduled for the end of FY06.



# ***Infrastructure***

# V. Infrastructure Accomplishments

## • Power Projects:

The AC Switchgear, transformers, Uninterruptible Power Systems (UPS) and battery banks support the electrical systems in the passenger stations.

- **Completed installation for AC switchgear at ten locations:**
  - Van Ness (2), Farragut North (2), Stadium Armory (2), Potomac (2), and Eastern Market (2). Contract completion scheduled for December 2006.
- **Installed two UPS units:**
  - U Street and Cleveland Park which completed the contract.
- **Installed two emergency generators:**
  - Grosvenor and Cheverly.
- **UPS and Battery Replacement:**
  - Completed design and awarded contract.
  - Delivery of (16) battery systems and 22 UPS units is expected early in FY06. Work to be completed by March 2009.



## V. Infrastructure Accomplishments

- **Power Projects:**

Replacement of Low voltage systems including: voltage regulators, motor control centers, cables, conduits, switches, boxes and lights.

- **Motor Control Center (MCC) and Voltage Regulator Replacement:**

- Completed design and awarded contract for 17 MCC and 39 voltage regulators located in fan shafts, drainage pumping stations, and chillers. Work to completed by December 2008.





# V. Infrastructure Accomplishments

- **Power Projects:**

- **DC Cable Procurement and Installation:**

- Delivered 110,000 feet of cable.
    - Installed approximately 70,000 feet at 12 locations. Remaining cable to be installed by August 2006.

- **Cathodic Protection System Repair:**

- Completed repair work for twenty-two (22) elevator units and twenty (20) piping systems.
    - Project was substantially completed

- **Replace Stingers at Metrorail shops:**

- Completed installation of 11 of 27 Stinger systems. Remaining Stingers to be installed by August 2006.

- **Heat Tape Procurement and Installation:**

- Delivered 40,000 feet of Heat Tape.
    - Installed 21,000 ft of heat tape on Aerial Structure areas. Remaining cable to be installed by December 2007.



# V. Infrastructure Accomplishments

- **Automatic Train Control Projects:**

The train control equipment is located in rooms along the wayside throughout the system. Critical equipment is used to control train movement.

- **RTU Replacement:**

- Manufactured and factory tested ten RTU units.
    - Dupont Circle, Rosslyn, Brentwood Yard, McPherson Square, Farragut North, and Judiciary Square and Silver Spring have been delivered and installed.
    - Brentwood, Rosslyn, and McPherson Square cutover have been completed. Contract to be completed by September 2005.

- **Ground Fault Detector Replacement:**

- Installation of ground fault detector has begun.
    - 103 detectors are installed in 44 Train Control Rooms. Work to be completed by September 2005.



## V. Infrastructure Accomplishments

- **Automatic Train Control Projects:**
  - **Automatic Train Protection (ATP) Track Circuits:**
    - Installed 109 Impedance Bonds in the wayside.
    - Delivered 25 ATP modules for certification testing.
    - Installed 69 ATP modules.
    - Completion scheduled for August 2005.
  - **Mainline Switch Machine:**
    - Contract finalized for 82 Type M3 Switch Machine Material Procurement.
    - Delivered first 20 Switch Machines and began installation.
    - Completion scheduled for December 2007.





# V. Infrastructure Accomplishments

- **Communications Projects:**

Communications for the entire Authority encompasses all of the Rail, BUSV, and Operations radio systems, Authority telephone systems, closed circuit television systems, alarms and data transmission systems.

- **Fire and Intrusion Alarm (FIA) System Replacement**

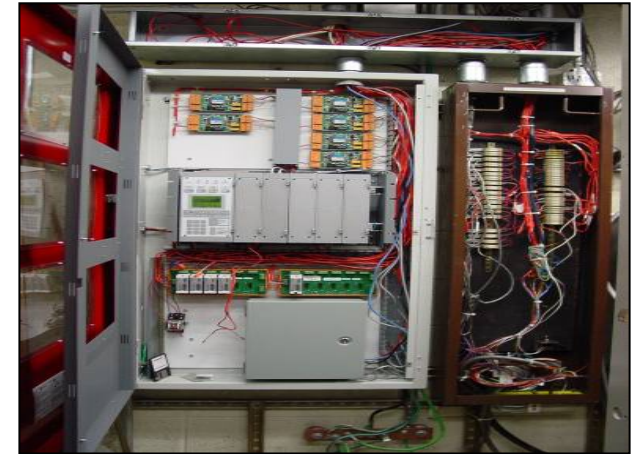
- Completed installation of FIA System at all underground stations.
      - Head-end-central monitoring system testing is complete for 28 stations.
    - Installed FIA system at 13 aboveground stations.
    - Completion scheduled for June 2006.

- **Intercom System Replacement**

- Completed installation of new Intercom System at 7 stations.
    - Contract completion scheduled for May 2006.

- **Comprehensive Radio System**

- Installed new radios and Automatic Vehicle Locator (AVL) in entire 1455 Bus fleet.
    - Completed area wide above ground antenna system; completing below ground antenna system.



## V. Infrastructure Accomplishments

- **Mechanical Systems Projects:**

Fire standpipe systems are used by the fire departments to provide water to the tunnel areas and at Metrorail stations to suppress fires.

- **Replace Dry Standpipe on Blue Line:**

- Completed replacement of seven station risers and a portion of the tunnel system with 1500 feet of pipe.
- Completion scheduled for November 2005.

- **Dry Standpipes Green Line:**

- Completed replacement six green line dry standpipe systems with 9,700 feet of pipe.
- Completion scheduled for January 2006.

- **Dry Standpipes Red Line:**

- Completed three dry standpipe systems on upper red line replacing 11,500 feet of pipe. Completion scheduled for November 2005.
- Completed replacement of the 800 feet of the wet system at White Flint Station.



## V. Infrastructure Accomplishments

- **Mechanical Systems Projects:**
  - **Replace Wet Standpipe Red Line:**
    - Completed wet system replacement at four stations, Cleveland Park, Van Ness, Bethesda and Medical Center comprised of 5,000 feet of piping. Contract completion scheduled for February 2006.
  - **Replacement of Bethesda Bus Bay Sprinkler System:**
    - Begin work on replacement of bus bay sprinkler system at Bethesda. Completion scheduled for December 2005.
  - **Fire Suppression System:**
    - Completed sprinkler system installation at Southern Avenue Annex bus garage.
  - **Rehab of Fire Deluge Valve Systems:**
    - Completed rehabilitation of the fire suppression deluge valve systems under entrance escalators at all twenty-one (21) stations in the entrance escalator wallways.



# V. Infrastructure Accomplishments

- **Mechanical Systems Projects:**

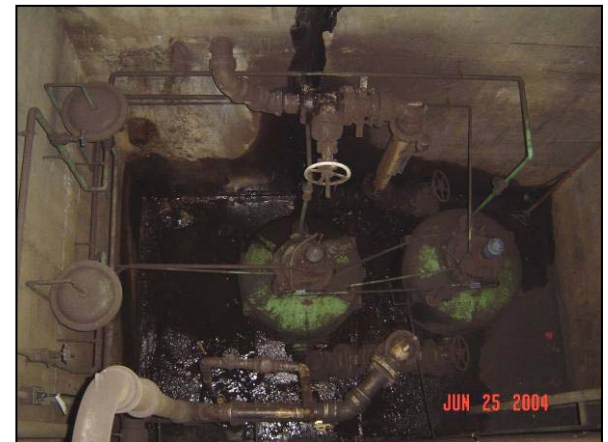
Drainage Pumping stations prevent flooding in underground stations. Sewage ejectors provide means to remove waste from the stations.

- **Drainage Pumping Station Replacement:**

- Completed four drainage pumping stations at Stadium Armory and Dupont Circle. Contract completion scheduled for February 2007.

- **Rehabilitation Sewage Ejector Stations:**

- Completed five sewage ejector systems at Metro Center, L'Enfant Plaza, Eastern Market, Gallery Place and Brookland CUA. Contract completion scheduled for November 2007.





# V. Infrastructure Accomplishments

- **Mechanical Systems Projects:**

Chiller systems provide station cooling during the spring and summer months. Presentation to the Committee on design criteria will be provided later this year.

- **Multi-Year Replacement Cooling Towers:**

- Completed replacement of last cooling tower at Bethesda.

- **Rehabilitation of Station and Tunnel Chilled Water Air Handling Unit (AHU):**

- Completed replacement of thirteen chilled water AHU units at Cleveland Park, Van-Ness UDC, Tenleytown, and Friendship Heights.
    - Completion of work scheduled for December 2006.

- **Overhaul of chillers at five locations:**

- Mt. Vernon Square, Farragut West, Navy Yard, Forest Glenn, and Wheaton.
    - Completion of work scheduled for April 2006.





# V. Infrastructure Accomplishments

- Mechanical Systems Projects:
  - Station and Tunnel Ventilation systems provide emergency egress and control of air pressure by moving trains.
  - **Emergency Hatch Replacement Systems:**
    - Completed 17 emergency egress hatches. Completion of remaining 10 scheduled for October 2005.
  - **Rehab of Station and Tunnel Ventilation:**
    - Completed rehabilitating ventilation systems on seven fan/vent shafts.
  - **Ventilation System for Substations:**
    - Completed 12 ventilation systems at Gallery Place, Metro Center, and Union Station. Remaining stations to be completed by November 2006.



# V. Infrastructure Accomplishments

## Environmental Projects:

### – Suction Line Replacement and Underground Storage Tanks (UST)

#### ▪ Conversion at Northern Bus Garage:

- Completed conversion of the former gas line system to store and dispense automotive transmission fluid.

#### ▪ Conversion of UST at Bladensburg Bus Division:

- Completed converting one 10,000 gallon heating oil and two 25,000 gallon tanks.

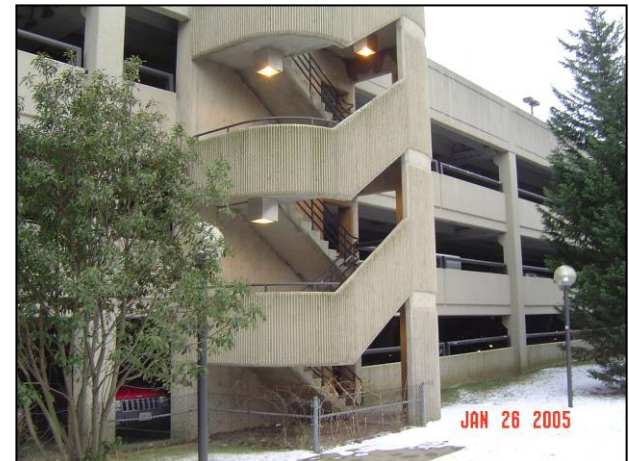
### – Replace Manhole and Sumps at Montgomery Bus Division:

- Replaced sump risers, lids, gravel base on six UST systems at Montgomery Bus Division.
- Removed and replaced existing manholes at Montgomery Bus Division and Olive Street.



# V. Infrastructure Accomplishments

- **Structural Projects:**
  - **Anacostia Parking Garage Rehab:**
    - Completed 9 out of 19 zones of structural rehabilitation at Anacostia Parking Garage. Completion of remaining scheduled for June 2006.
  - **Vienna Parking Garage Full Cycle Repair:**
    - Completed 1 out of 10 zones of structural rehab of Vienna Parking Garage. Completion of remaining scheduled for June 2006.
  - **Wheaton and Addison Road Parking garages:**
    - Design complete and procurement is in process. Work scheduled to commence September 2005.
  - **Rehab of Domes and Platform:**
    - Work started to rehab fifteen station platforms and five station domes. Completion scheduled for April 2008.
  - **Aerial Painting on Red, Yellow, Green, and Orange Lines:**
    - Work started to rehab steel tunnel liners between L'Enfant and Waterfront stations and four bridge structures. Completion of work scheduled for September 2006.





## V. Infrastructure Accomplishments

- **Structural Projects:**

- **Four Mile Run Compressed Natural Gas (CNG) Facility:**

- Completed construction of CNG Fueling Facility at Four Mile Run Bus Garage. Final Testing and commissioning will be done in August 2005 upon completion of gas pipeline by Washington Gas

- **Rehab of Parking Lots:**

- Started work at three locations, Benning Road, Minnesota Avenue, and Cheverly to rehabilitate kiss and ride lots, concrete curbs, and sidewalk. Completion scheduled for December 2005.
    - Completed two entrance gates at Dupont Circle and Bethesda Stations.

- **Replace Ceiling Above Friendship Heights Bus Loop:**

- Award contract to replace ceiling at the Friendship Heights Station Bus Loop. Completion scheduled for August 2005.



## V. Infrastructure Accomplishments

- **Facilities Projects**

- Completed waterproofing at Northern Bus Garage.
- Completed Four Mile Run concrete pavement repair.
- Completed engine oil dispensing system upgrade at Bladensburg.
- **HVAC Installation at Royal Street Bus Garage:**
  - Completed conduit, wiring and installed 2 heat pumps. Contract completion scheduled for September 2005.
- **Bus Facility Exhaust Extraction System:**
  - Completed five bus garages, Northern, Arlington, Bladensburg, Royal Street, and Four Mile Run. Work us underway at Landover and Montgomery bus garage. Completion of remaining work scheduled for August 2005.



## V. Infrastructure Accomplishments

- **Facilities Projects**

- **Shady Grove S&I Facility -**  
Completed installation of new  
Wheel Truing Machine.
- Contract completion scheduled  
for October 2007.



# ***Information Technology***

## VI. Information Technology

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**Information Technology Program consists of three major parts:**

- Rail Operations Computer System (ROCS) Upgrade
  - Rail Performance Monitoring system
  - ROCS system replacement
- Information Technology Infrastructure Upgrades
- Information Technology Renewal Program (ITRP) - Business Systems Replacement
  - Bus and Rail Scheduling and Dispatch system
  - Accounting, Budgeting, Capital plus Procurement system
  - Human Resources and Payroll system
  - Maintenance & Material Management system



## VI. Information Technology

### Rail Operations Computer System (ROCS) Upgrade

- Rail Performance Monitoring System
  - Completed Yard rail car management including terminal management
  - Capability includes operational data warehouse and on-demand reporting
- ROCS system replacement
  - Completed requirements definition, business process reengineering, and first system build.
  - Factory test to be completed in January 2006 with implementation to be completed by Fall 2006.



# VI. Information Technology

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## Information Technology Infrastructure Upgrades

- **Deployed Phase I of IT Disaster Recovery:**
  - Completed IT Communications Infrastructure at Carmen Turner Training Facility (CTF).
  - Relocated ITRP backup servers to CTF.
- **Replacement of Obsolete Equipment:**
  - Replaced over 300 obsolete PCs and laptops.
  - Replaced IBM Mainframe with z890
  - Replaced 20 servers.
  - Replaced 16 Network Printers.
  - Replacement of 18 Routers.
- **Communications Equipment:**
  - Installed 3 Cisco Switches at new stations.



## VI. Information Technology

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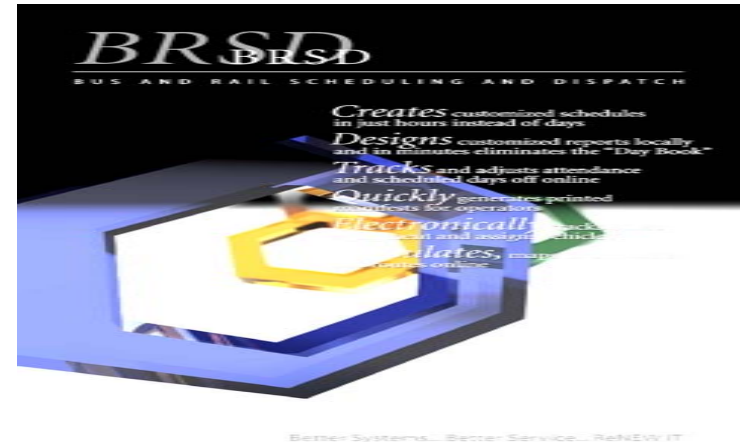
### Business Systems Replacement

- The ITRP was established by the Board in 2001
- Almost 100 systems/subsystems are being replaced by ITRP. There are 17 full-time staff with over 300 Subject Matter Experts working on the project every day.
- GSA/FEDSIM was used to award systems integration contract
  - FEDSIM relationship ended in June 2005
  - WMATA has assumed direct contract management through a sole source contract to FEDSIM systems integrator.

## VI. Information Technology

### Business Systems Replacement

- **Bus and Rail Scheduling System**
  - **Bus (90%)**
    - Trapeze scheduling and dispatch software running at 4 divisions.
    - Remaining six bus divisions will be running in August 2005.
  - **Rail (40%)**
    - All rail divisions will be running Trapeze by the end of December 2005 to complete this system.

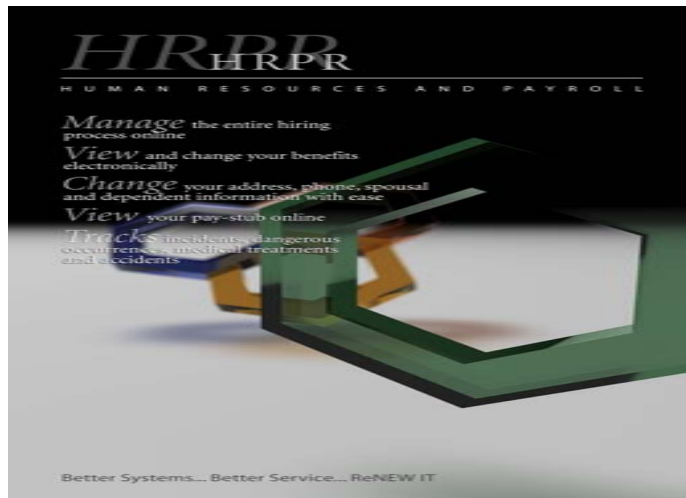


- **Accounting, Budget, Capital Plus Procurement System (75%)**
  - Installed General Ledger, Billing and Budgeting
  - Roll out of Cash Management and Procurement (non-capital) – July 2005, with Capital Projects and Procurement (Capital) in September 2005 to complete this system

## VI. Information Technology

### Business Systems Replacement

- **Maintenance & Material Management System (60%)**
  - Maximo software systems testing is complete
  - Final system design will be completed in November 2005 with inventory installation to begin in December 2005 and implementation complete by April 2006.



- **Human Resources and Payroll (80%)**
  - PeopleSoft Financial Software
  - New Payroll System will go live in August 2005
  - Approximately 7000 hourly payroll checks and 3000 salary payroll checks will be issued
    - By October 2005, recruitment and hiring as well as e-Manager Desktop will go live to complete this system.