



# Infrastructure Renewal Program Semi-Annual Update



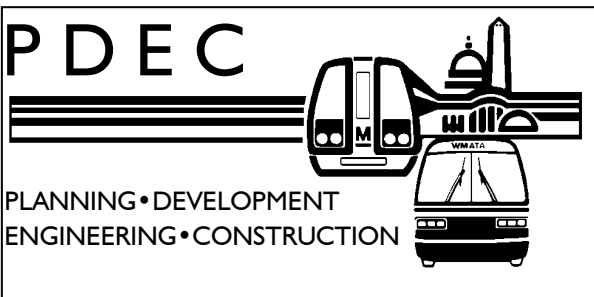
*Presented to the Board of Directors:*

Planning & Development Committee

*by*

**Planning, Development, Engineering &  
Construction**

March 2, 2006





# I. Purpose

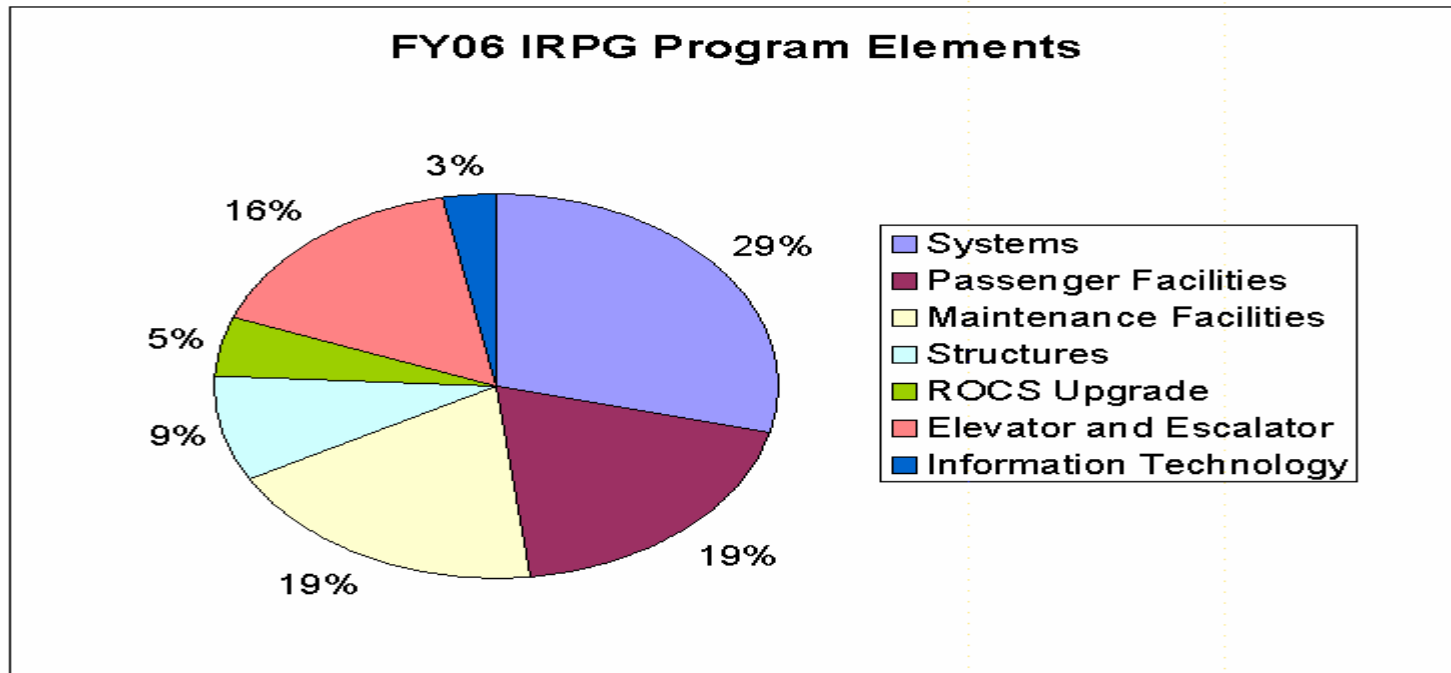
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- To provide the Planning and Development Committee with the Semi-Annual update on FY06 (July – December) Infrastructure Renewal Program (IRP) major accomplishments.



# I I. Background

- The FY06 Facilities Portion of the Infrastructure Renewal Program provides funding to maintain facilities in a state of good repair.
- The FY06 projects with projected expenditures of \$180 million are:





# Infrastructure



# III. Infrastructure Accomplishments

- **Power Projects:**  
The AC Switchgear, transformers, uninterruptible power systems (UPS) and battery banks support the electrical systems in the passenger stations.
- **AC Switchgear**
  - Completed installation of AC switchgear at 22 out of 38 locations. Contract completion scheduled for December 2006.
- **UPS and Battery Replacement:**
  - Completed replacement of 1 UPS unit at Branch Avenue Station and 4 battery banks at Branch Avenue Station, Tenleytown, and Gallery Place. Completed 1 out of 22 UPS and 4 out of 16 Batteries.
  - Contract completion scheduled for April 2009.



DESCRIPTION	FY06 PROJECTION	FY06 MID YEAR
AC SWITCHGEAR	17 LOCATIONS	6 LOCATIONS
UPS & BATTERY	4 UPS AND 4 BATTERY	1 UPS AND 3 BATTERY

# III. 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 installation of 4 out of 56 MCC and Voltage Regulators at AVRFB08, AVRFB07, AVRFB06, and A14TB as of January 2006. Contract completion scheduled for December 2008.

DESCRIPTION	FY06 PROJECTION	FY06 MID YEAR
MCC/AVR	13 LOCATIONS	0 LOCATIONS



Motor Control Center prevents Damage to Motors due to Over/Under Voltage & Prevents Flooding/Poor Ventilation



Serves Ventilation Fans & Drainage Pumps



# III. Infrastructure Accomplishments

- **Power Projects:**
  - Traction Power Substations receive power from the utility companies; equipment within the substations convert the power to provide electrical energy to trains.
  - Completed procurement for TPSS Upgrade Program.
  - TPSS equipment contract for all major equipment awarded. Equipment delivered at Grosvenor, Twinbrook, and Farragut West as of January 2006.
  - TPSS facilities rehabilitation and installation contracts awarded. Installation started at Twinbrook and Grosvenor on January 2006.



DESCRIPTION	FY06 PROJECTION	FY06 MID YEAR
TPSS EQUIPMENT	24 LOCATIONS	0 LOCATION
TPSS INSTALL	5 LOCATIONS	0 LOCATION

# III. Infrastructure Accomplishments

- **Power Projects:**
- **DC Cable Procurement and Installation:**
  - Procured Metro Matters Upgrade Program in December 2005 for a total of 140,000LF of cable.
  - Phase II installation for Metro Matters Upgrade Program began in November 2005.
- **Replace Stingers at Metrorail shops:**
  - Completed installation of 22 out of 26 stinger systems. Contract completion scheduled for July 2006.
- **Heat Tape Procurement and Installation:**
  - Procured 188,000 LF of heat tape on Aerial Structure areas.
  - Contract completion scheduled for December 2007.



DESCRIPTION	FY06 PROJECTION	FY06 MID YEAR
DC CABLE PROCUREMENT	60,000LF	47,514LF
STINGER	17STINGER SYSTEMS	11 STINGER SYSTEMS
HEAT TAPE PROCUREMENT	60,000LF	92,000LF





# III. 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, speed and protection.

- **RTU Replacement:**

- Installed and cutover ten (10) RTU units at Silver Spring, Farragut North, Rhode Island Ave, Dupont Circle, McPherson Square, Judiciary Square, Rosslyn, Smithsonian, Fort Totten and Brentwood Yard. Contract Completed December 2005.

- **Ground Fault Detector Replacement:**

- Installed 171 ground fault detectors. Contract completed September 2005.



DESCRIPTION	FY06 PROJECTION	FY06 MID YEAR
RTU REPLACEMENT	6 UNITS	6 UNITS
GROUND FAULT DETECTOR REPLACEMENT	106 DETECTORS	106 DETECTORS

# III. Infrastructure Accomplishments

- **Automatic Train Control Projects:**
  - **ATP Track Circuits:**
    - Installed all 65 ATP Modules.
    - Contract completed January 2006.
  - **Mainline Switch Machine:**
    - Delivered 40 Switch Machines and began installation. 20 are under manufacture.
    - Contract completion scheduled for December 2007.
  - **Replace GL-1 Interlocking:**
    - Issued NTP to replace 6 GL1 type processors. In July 2005.
    - Alstom design is in progress and 30% completed.



DESCRIPTION	FY06 PROJECTION	FY06 MID YEAR
ATP TRACK CIRCUITS	106 ATP CIRCUITS	97 ATP CIRCUITS
MAINLINE SWITCH MACHINE	80 SWITCHS	40 SWITCHS
REPALCE GL-1 INTERLOCKING	30% DESIGN	100% DESIGN, 1 PROCESSOR

# III. 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**
  - Head-end-central monitoring system testing is completed for 76 stations.
  - Installed FIA system at 32 aboveground stations out of 36 stations.
  - Contract completion scheduled for June 2006.
- **Intercom System Replacement**
  - Completed installation of new Intercom System at 50 stations.
  - Contract completion scheduled for August 2006.

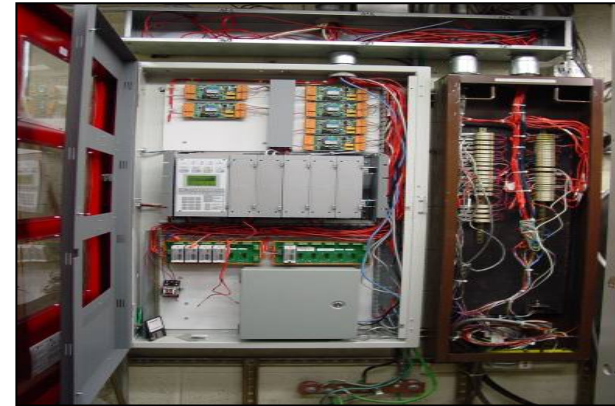


DESCRIPTION	FY06 PROJECTION	FY06 MID YEAR
FIRE INTRUSION ALARM (FIA) SYSTEM REPLACEMENT	24 ALARMS	12 ALARMS
INTERCOM SYSTEM REPLACEMENT	35 INTERCOMS	48 INTERCOMS

## III. Infrastructure Accomplishments

### Communications Projects

- **Comprehensive Radio System**
  - Bus remediation completed in December 2005 with the exception of disable buses.
  - Completed rail car mobile radio testing in December 2005.
  - Completed supplemental coverage testing.
  - Completed radio installation in all non-revenue and Plant vehicles. A total of 181 non-revenue and Plant vehicles were completed.
  - Work continues to improve the performance of the underground radio system that has not achieved necessary reception levels prohibiting deployment of the rail and MTPD radios.



# III. 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 one (1) station riser at Farragut West Station and 95 % of the C/J junction tunnel system with 2650 linear feet of pipe.
  - Contract Completion forecasted for February 2006.
- **Dry Standpipes Green Line:**
  - Completed 52% replacement in two (2) independent shafts of dry standpipe systems F route with 2787 linear feet of pipe.
  - Contract completion scheduled for March 2006.
- **Dry Standpipes Red Line:**
  - Complete the replacement of the wet system at White Flint Station. Contract was complete in November 2005.



DESCRIPTION	FY06 PROJECTION	FY06 MID YEAR
FIRELINE	23,176LF	9,827LF

## III. Infrastructure Accomplishments

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- **Mechanical Systems Projects:**
  - **Replace Wet Standpipe A Line:**
    - Completed wet standpipe system replacement at one location – Metro Center station. Contract was completed in December 2005.
  - **Replace Dry Standpipe Red Line:**
    - Completed VA-3 dry standpipe replacement.
    - Complete one leg of the FA-3 standpipe system.
  - **Replacement of Bethesda Bus Bay Sprinkler System:**
    - Completed 90% of the replacement of bus bay sprinkler system at Bethesda. Contract completion forecasted for February 2006.



# III. 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 two drainage pumping stations at Stadium Armory. Contract Completion scheduled for February 2007.
- **Rehabilitation Sewage Ejector Stations:**
  - Completed four (4) sewage ejector systems at Capital South, Potomac Avenue, Stadium Armory and Smithsonian. Contract completion scheduled for November 2007.



DESCRIPTION	FY06 PROJECTION	FY06 MID YEAR
DPS	6 STATIONS	2 STATIONS
SEWAGE EJETOR STATION	6 SYSTEMS	4 SYSTEMS

# III. 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.
- **Rehab of Station and Tunnel Chilled Water AHU:**
  - Completed replacement of 13 chilled water AHU units. Contract completion scheduled for August 2006.



DESCRIPTION	FY06 PROJECTION	FY06 MID YEAR
AHU	20	13





# III. 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 10 emergency egress hatches.
  - Contract was completed in October 2005.
- **Ventilation System for Substations:**
  - Completed 3 ventilation systems. Contract completion scheduled for October 2008.



DESCRIPTION	FY06 PROJECTION	FY06 MID YEAR
VENTILATION SYSTEM	7 VENTILATION SYSTEMS	3 VENTILATION SYTEM

## III. Infrastructure Accomplishments

- **Environmental Projects:**
  - **Four Mile Run Sumps**
    - Completed replacement of sump for two diesel tanks and one gas tank.
  - **Royal Street Inserts:**
    - Completed installation of storm water inserts for oil waste water separator.
  - **Alexandria Inserts:**
    - Completed installation of storm water inserts for oil separator.



# III. Infrastructure Accomplishments

- **Automatic Fare Collection (AFC)**

- **Bus Fare Collection System:**

- Installed and tested revised versions of software. Notified contractor that additional corrections are required.

- **Comprehensive Rail AFC:**

- Completed installation AFC Equipment at new mezzanine of King Street Station. Began steps to close-out contract.

- **Express Vendor Conversion:**

- Completed conversion of 43 vendors to Express Vendors in December 2005. Conversion of another 55 vendors is scheduled to be completed by March, 2006.



DESCRIPTION	FY06 PROJECTION	FY06 MID YEAR
BUS FARE COLLECTION SYSTEMS	2 SOFTWARE CONVERSIONS	2 SOFTWARE CONVERSIONS
COMPREHENSIVE RAIL AFC	11 VENDORS	11 VENDORS
EXPRESS VENDOR CONVERSION	98 VENDORS	43 VENDORS





# III. Infrastructure Accomplishments

- **Structural Projects:**

- **Anacostia Parking Garage Rehab:**
  - Completed four (4) zones of structural rehabilitation at Anacostia Parking Garage.
  - Contract completion anticipated July 2006.
- **Vienna Parking Garage Full Cycle Repair:**
  - Completed three (3) zones of structural rehab of Vienna Parking Garage.
  - Contract completion forecasted for June 2006.
- **Wheaton and Addison Road Parking garages:**
  - Contract awarded. Work to commence February 2006.
  - Contract Completion scheduled for September 2006.



DESCRIPTION	FY06 PROJECTION	FY06 MID YEAR
ANACOSTIA PARKING GARAGE REHABILITATION	7.5 PARKING ZONES	4 PARKING ZONES
VIENNA PARKING GARAGE FULL CYCLE REPAIR	6 PARKING ZONES	2 PARKING ZONES
WHEATON AND ADDISON ROAD PARKING GARAGES	5 PARKING ZONES	0 PARKING ZONES



# III. Infrastructure Accomplishments

- **Structural Projects:**

- **Rehab of Domes and Platform:**

- Work is in progress at two dome locations and one platform.
- Contract completion is scheduled for April 2006.

- **Aerial Painting of Four Bridges & Rehab of Steel Tunnel :**

- Completed paint of four bridge structures.
- Contract Completion scheduled for September 2006.



DESCRIPTION	FY06 PROJECTION	FY06 MID YEAR
REHABILITATION OF DOMES AND PLATFORMS	0.4 DOME, 1270 LF of CONCRETE	-
AERIAL PAINTING OF FOUR BRIDGES AND REHAB OF STEEL TUNNEL	4 BRIDGES 1.25 TUNNELS	4 BRIDGES 0.75 TUNNEL



## III. Infrastructure Accomplishments

- **Facilities Projects**
  - **ALEXANDRIA S&I Facility** -Completed installation of rebuilt Wheel Truing Machine in September 2005.





# III. Infrastructure Accomplishments

- **ROCS Upgrade Program**
  - **ROCS Upgrade Project –**
    - Upgrade software and replace hardware of the rail operations control system.
      - Completed requirement definition and prototype builds. Preparing for Factory Acceptance Testing.
  - **Rail Performance Monitoring System (RPM)**
    - Replace the Yard and Terminal tracking system.
      - Deployed Phase I – May 2005
        - » Yard and Terminal tracking and reporting
      - Phase II – April 2006
        - » RTU Monitoring and RECAP Reporting
      - Phase III – Dec. 2006
        - » Management Reporting on Rail Operation Data

DESCRIPTION	FY06 PROJECTION	FY06 MID YEAR
ROCS UPGRADE PROGRAM	REQUIREMENT TESTING, PROTOTYPE BUILDS, FACTORY ACCTEPTANCE TEST	REQUIREMENT TESTING, PROTOTYPE BUILDS
RAIL PERFORMANCE MONITORING SYSTEM (RPM)	PHASE II – RTU MONITORING, REPORTING AND DEPLOYMENT	SYSTEM INTEGRATION TESTING ONGOING

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# *Escalator & Elevator Rehab*





## III. Infrastructure Accomplishments

### Escalator Rehabilitation Program



- Since the inception of the escalator rehabilitation program we have:
  - Completed 181 of 400 escalators scheduled for CIP Rehabilitation by FY 2010
  - Contracted out another 38 units for rehabilitation by Spring of 2007
  - Initiated contract actions for 34 more units with awards scheduled by year end
  - By the end of 2006, over 60% of the 400 scheduled will be completed or awarded
- These numbers include the following milestones:
  - Completion of all 170 of the original station entrance escalators
  - Completion of the additional 8 units added due to their deterioration and poor performance
  - Completion of 3 of the 41 additional units recently awarded with 7 rehabilitations in process



## III. Infrastructure Accomplishments

### Escalator Rehabilitation Program



Pending awards for this program are:

- The Mini-Modernization of 20 more Escalators to upgrade them to the latest codes and technology is in the procurement stage. This work is scheduled to be awarded by the end of FY06 with completion of the work by December 2008.
- The Final design for the replacement of 14 escalators that have proven to be problematic and unreliable is due by the end of this March. RFP's will follow in July with award by January 2007. The contract duration is expected to be 40 months.
- Design services have been initiated for the rehabilitation of approximately 200 interior/platform units.



# III. Infrastructure Accomplishments

## Elevator Rehabilitation Program



- Since the inception of the elevator rehabilitation program we have:
  - Rehabilitated 30 elevators of 95 units scheduled for completion through FY 2010
  - Contracted out another 45 units with completion scheduled for Spring of 2008
  - Almost 80% of the 95 units are completed or contracted out for rehabilitation
- Design and procurement for the next phase of elevators will be initiated in FY07.



## III. Infrastructure Accomplishments

### Elevator / Escalator Remote Monitoring Program



- The remote monitoring program provides real time data for more automated tracking of immediate vertical transportation availability and enhances response time for equipment shutdown.
- The data received will be used for predictive maintenance procedures and schedules, improved equipment failure analysis and more reliable and comprehensive repairs.
- Remote Monitoring capabilities has been completed on 145 of 238 elevators in the system. All are scheduled for completion by the end of FY06.
- In addition, completed Remote Monitoring capabilities on 489 escalators in the system with completion of all 588 scheduled for the end of FY06.





# Information Technology



## III. Infrastructure Accomplishments

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- **Information Technology Infrastructure Upgrades**
  - **Replacement of Obsolete Equipment**
    - Replaced over 200 obsolete PCs and laptops
    - Replaced two network switches
  - **Server Consolidation**
    - 48 Netware servers consolidated to 23
    - 24 post offices consolidated to 4
    - Can survive a 50% loss of servers at a single site
  - **Spam Filtering**
    - Implementation of a new e-mail spam filtering system February 12



## III. Infrastructure Accomplishments

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### ITRP

- **Business Systems Replacement**
  - **Bus and Rail Scheduling System**
    - **Bus (100%)**
      - Trapeze scheduling and dispatch software running at 10 divisions.
    - **Rail (60%)**
      - All rail divisions will be running Trapeze by the end of June 2006.
    - **Accounting, Budget, Capital Plus Procurement System (90%)**
      - Installed General Ledger, Billing, Budgeting, Cash Management, Procurement, Capital Projects and Customer Relationship Management (CRM).



## III. Infrastructure Accomplishments

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- **Business Systems Replacement**
  - **Human Resources/Payroll (75%)**
    - **Base HR, benefits, and payroll installed**
    - **E-recruit scheduled for Spring 2006**
  - **Maintenance & Material Management System (60%)**
    - **Maximo software systems testing is complete**
    - **Installation began February 2006 – Landover Bus Division, Maintenance Planning, ELES & SAMS operational. Complete phased installation May 2006**
    - **For ELES, automatic monitoring system (SCADA) interfaces with Maximo to automatically generate work order when a problem is detected**
    - **Maximo also feeds intranet/internet site giving real-time information on elevator/escalator availability**





## **III. Infrastructure Accomplishments**

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- **Business Systems Replacement**
  - **ITRP scheduled for completion July 2006**
  - **Efforts underway to develop 5-year plan to further enhance business systems (ITRP II)**
  - **ITSV transformation underway, including peer review by District of Columbia, Fairfax, and Montgomery County**