

**Washington Metropolitan Area Transit Authority
Board Action/Information Summary**

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TITLE

Federal Resiliency Grants Update

PRESENTATION SUMMARY

This presentation provides an overview of two Federal Transportation Administration (FTA) grants awarded to Metro on September 22, 2014. These grants will be used to implement multiple measures to harden the rail system and reduce the risk of damage from flooding during future natural disasters.

PURPOSE

To inform the Committee of Metro's use of federal funding to implement measures that protect the rail system and prepare for future disasters.

DESCRIPTION

Key Highlights:

- In September 2014, FTA awarded grants to fund three projects submitted by Metro, for a combined total of \$21 million, to be matched by \$7 million in local funding. The funding enables Metro to:
 - Harden vent shaft openings to prevent flooding at locations near Federal Triangle, Smithsonian and Archives stations;
 - Design and construct prevention measures to address flooding issues at 18 locations across the region;
 - Harden storm and sanitary sewer systems by placing backflow preventers in 133 strategic locations across the system.

Background and History:

In December 2013, FTA announced the availability of \$3 billion of federal grant aid to improve and strengthen resiliency of transit agencies affected by Hurricane Sandy. In response, WMATA submitted six applications for grant aid. The Board of Directors authorized submission of these grants applications on March 27, 2014.

The six projects included:

- Raise 10 shaft elevations to address regional flooding;
- Design and construct flood prevention measures;
- Research, design, construct and install backflow preventers at 58 pumping stations and 75 sewage ejectors;

- Develop a flood emergency response plan in response to regional flooding concerns;
- Develop a computer model of how the system would be impacted by major floods; and
- Improve and harden the Greenbelt yard flood wall to 500-year floodplain standards.

On September 22, 2014, the FTA announced that Metro would receive \$21 million for projects to strengthen the system and prevent water intrusion. The award is comprised of two separate grants, and provides funding for the first three projects listed above.

The first grant for \$13.5 million will fund the first two projects. The funding will allow Metro to harden vent shaft openings at a number of locations that serve the Federal Triangle, Smithsonian and Archives stations to address potential flooding issues and reflect changes to the flood plain maps. In addition, the funding from the first FTA grant will allow for design and construction of prevention measures to address flooding issues at 18 locations across the region. For example, at the Cleveland Park station, sandbags are often placed around vents near the station's east entrance to prevent water from coming in.

The second grant for \$7.5 million will fund the third project to harden the storm and sanitary sewer systems. In the event of major storm, rising waters can effectively reverse the flow direction. These drainage systems serve as inflow pipes when the drainage is reversed. Although the system has backflow preventers, the grant will allow WMATA to place backflow preventers in more strategic places at 133 sites throughout the rail system.

A timetable for construction will be determined once design work is completed. Much of the work will be conducted above ground or within the pumping stations themselves, so the upgrades are not expected to cause delays to service.

Discussion:

Staff continues to recognize the need to address the remaining projects.

The National Capital Region is vulnerable to flooding from hurricanes, rapid melting of regional snows, and intense local storms. In severe cases, resulting runoff can overwhelm the drainage system resulting in catastrophic damages. Major weather events affecting the region have increased 12 to 20 percent compared to the previous century, and projections indicate these trends will continue at increased frequency and intensity, both in terms of volume of water and intensity of winds.

To address the risks posed by future severe weather events, a Flood Emergency Response Plan is in development. This plan will provide a list of progressive measures to protect the system.

Regional organizations are preparing a model that will predict regional flooding under different scenarios. Metro has participated in regional efforts led by the National Capital

Planning Commission (NCPC) and others, and will continue to do so. This information will be incorporated into the Flood Emergency Response Plan, where appropriate.

Greenbelt Yard remains vulnerable to a 500 year flood event. In the event of an impending storm, railcars and other movable equipment would be relocated from the yard.

FUNDING IMPACT

Budgetary authority and local match funds will need to be identified. Staff is working on this and will return to the Board for review. Up to \$7 million in local funds will be required.

TIMELINE

Previous actions	<ul style="list-style-type: none">• March 27, 2014 -Board authorization to apply for FTA grants
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Federal Resiliency Grants Update

Safety and Security Committee

November 20, 2014



Background

December 2013:

Federal Transit Administration (FTA) announced \$3 billion available for resiliency projects



Real World Challenges

- Levees being overtopped



(2005 Hurricane Katrina)

- Flooded tunnels



(2012 Superstorm Sandy)

Flooding Scenarios in the National Capital Region

- Hurricane Flooding – Caused by severe precipitation combined with tides and concentrated runoff in the Anacostia and Potomac river basins (1942 flood)

Photos Courtesy of Naval Historical Center



Eastern end of Washington Navy Yard during the October 1942 flood



Washington Navy Yard during the October 1942 flood



Flooding Scenarios in the National Capital Region

- Rapid Melting of Snow
Causes the Potomac River to rise
- Intense Storm
Causes localized flooding due to rainfall and runoff



(1996 flooding)



(June 2006 storm)



Challenges We are Facing





Resiliency Grants Awarded to Metro

September 2014: \$21 million awarded

1st Award
\$13.5M



- 1** Raise 10 shaft elevations to address regional flooding
- 2** Design and construct flood prevention measures at 18 locations

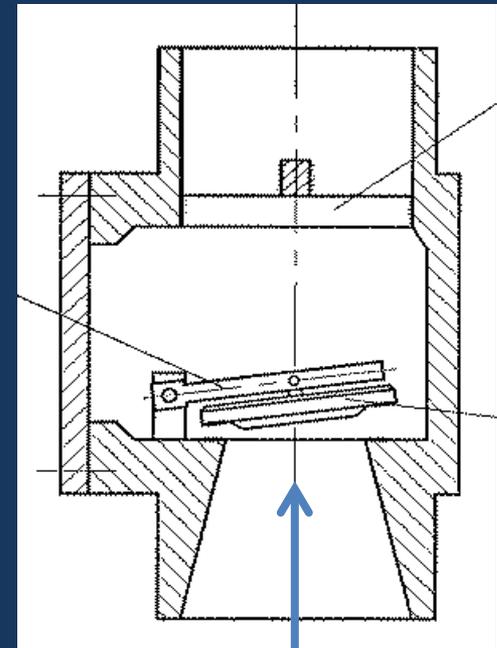
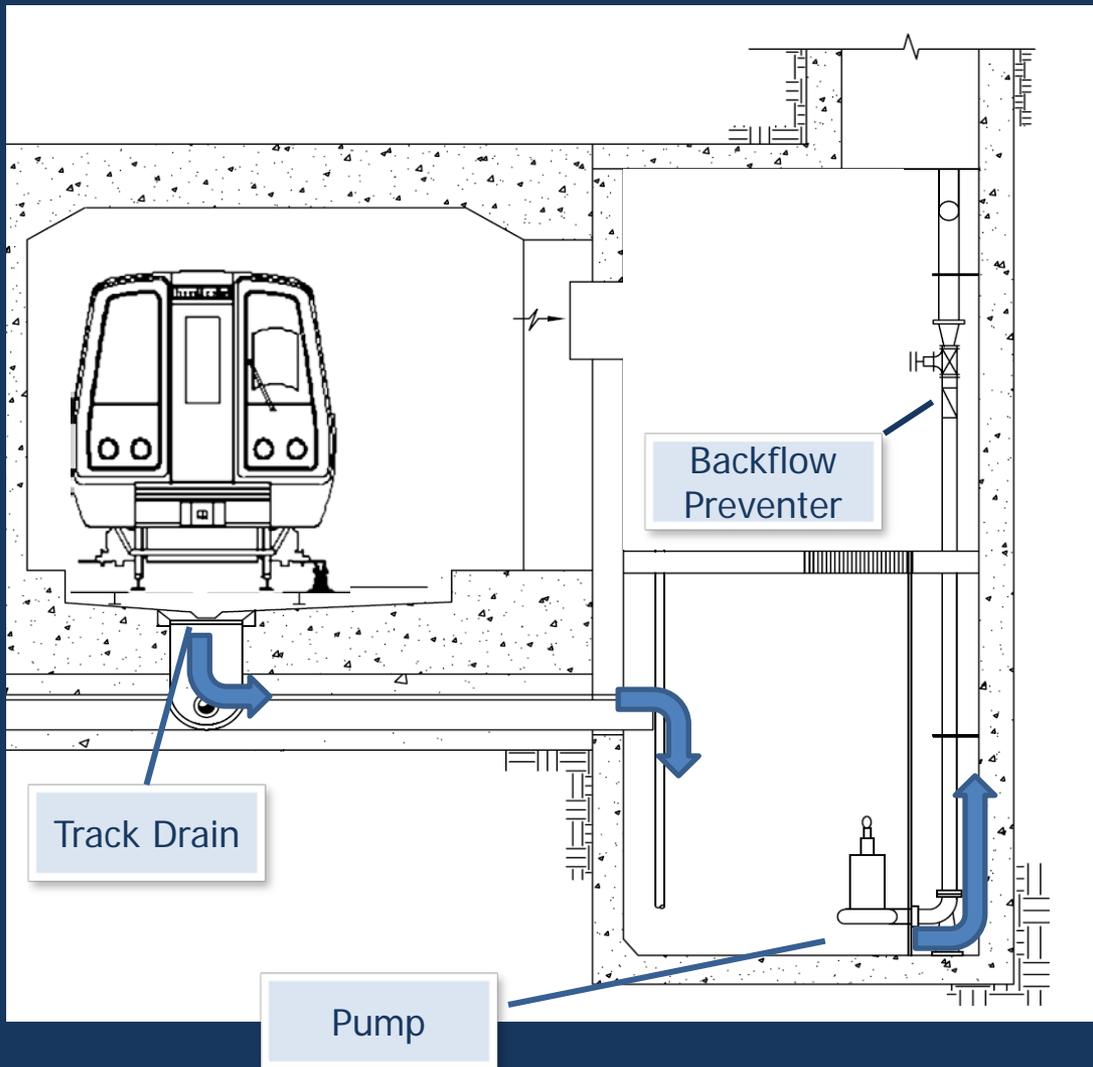
2nd Award
\$7.5M



- 3** Research, design, construct and install backflow preventers at 133 locations



Backflow Preventers



Direction of Flow