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May 15, 2017

Ms. Brinda Westbrook-Sedgwick
Commission Secretary
Public Service Commission of the District of Columbia
1325 G Street N.W., Suite 800
Washington, DC 20005

Re: PEPACR-2017-1

Dear Ms. Westbrook-Sedgwick:

On April 3, 2017, Potomac Electric Power Company ("Pepco") filed the second part of its Annual Consolidated Report ("ACR"), including Attachments A through F. Attached to this letter are errata associated with Attachments A, D, and F of the aforementioned filing. The errata in Attachment A are shown in clean and red-line form such that the changes being made are transparent for the Commission and all interested persons. The changes being made to Attachment A are reflected in Attachment D. The other change being made is in Attachment F, and the single page affected is being provided in clean and red-line form.

Pepco has discussed the need for errata for these documents with the Office of the People's Counsel ("OPC") and Staff of the Commission. Given the delay in time between Pepco's April 3, 2017 ACR filing and this errata filing, Pepco would propose that OPC and any other interested persons have the full amount of time to respond to Pepco's ACR from the date of this errata filing.

Please let me know if you have any questions.

Sincerely,

Dennis P. Jamouneau

Enclosures

cc: All Parties of Record

Attachment A

Clean

Attachment A

Order No. 18148

Reliability Forecast for 2017

Table of Contents

Introduction

As directed by Order No. 18148 issued by the District of Columbia Public Service Commission ("Commission") in Formal Case No. 1119 on March 23, 2016,[1] Potomac Electric Power Company ("Pepco" or the "Company") submits its forecast of planned reliability work for the year 2017. The Company has planned this work to achieve the reliability performance levels required by Commitment 54 of Order No. 18148. Commitment 56 (d) of Order No. 18148 provides as follows:

> *No later than six (6) months after the close of the Merger, Pepco shall file with the Commission a report which includes a forecast of planned reliability-related work for that calendar year, including at a minimum the general project descriptions, locations, and associated reliability-related capital and O&M spending. The project description should denote the intended improvements to outage duration, frequency, or some other reliability metric. The filed forecast shall serve as a baseline comparison for the June 30, 2021 Company report on actual reliability-related expenditures, but shall not prompt Commission approval, denial, or other action in advance of the report. By April 1 of each subsequent calendar year through 2019, Pepco shall file the same information as part of its Annual Consolidated Report. Receipt of the forecast shall not constitute an endorsement by the Commission of the prudence of the expenditures.*

This report provides details on Pepco's 2017 planned projects for the following operations and maintenance ("O&M") and capital reliability categories:

1. Vegetation Management ("VM");
2. Scheduled and Preventive Maintenance;
3. Feeder and Substation Reliability Improvement;
4. Distribution Automation ("DA");
5. 4kV to 13kV Conversions;
6. Emergency Restoration; and
7. DC PLUG.

The projects within these categories are necessary to provide safe and reliable electric service to customers in the District of Columbia. As structured in the report, each category includes

[1] Order No. 18148, *In The Matter of the Joint Application of Exelon Corporation, Pepco Holdings, Inc., Potomac Electric Power Company, Exelon Energy Delivery Company, LLC and New Special Purpose Entity, LLC for Authorization and Approval of Proposed Merger Transaction*, Formal Case No. 1119, at P 1 (March 23, 2016) ("Merger Order"). The Commission subsequently issued Order No. 18160 (April 4, 2016) correcting certain errors in the Merger Order and in Attachment B to the Merger Order (the "Merger Commitments"). References herein to the Merger Order and the Merger Commitments are to Order No. 18148 and Attachment B to Order No. 18148, respectively, as corrected by Order No. 18160.

a description of the associated projects for 2017, the respective budget, and the location of the work to be done for planned activities. Identifying information for capital projects also includes the Work Breakdown Structure ("WBS") number, which is the number that the Company uses for organization and scheduling of proposed projects. Where applicable, the category's historical reliability performance is provided in addition to the reliability improvement metric used to track each category of projects. In addition, where applicable, the System Average Interruption Frequency Index ("SAIFI") and System Average Interruption Duration Index ("SAIDI") that the Company expects to achieve from the upcoming work has been included to reflect the overall modelled benefits expected to be realized.

The report includes the Company's overall expected reliability improvements for District of Columbia customers based on reliability improvements associated with vegetation management work, feeder improvement projects (*i.e.*, improvements done as part of the 2% Priority Performing Feeder Program and Comprehensive Feeder Program), Automatic Sectionalizing and Restoration ("ASR") schemes and automatic circuit reclosers ("ACRs"), in the aggregate.

Pepco District of Columbia Reliability Program

2017 Work Plan Summary

Organized by project category, the following table provides a general description, performance metric, and O&M and capital dollars planned for the year 2017. This table contains identifying information for each District of Columbia project organized by project category: (1) VM; (2) Scheduled and Preventive Maintenance; (3) Feeder and Substation Reliability Improvement; (4) DA; (5) 4kv to 13kV Conversions; (6) Emergency Restoration; (7) DC PLUG; and (8) Other Miscellaneous projects. The budget amounts set forth below are the current budget levels, all of which are within the annual capital and O&M reliability spending levels as set forth in Commitment 55 of Order No. 18148. The "Distribution Reliability net of DCPLUG Expenditures" budget set forth in Table 3 of Commitment 55 is reflected in the sum of the budgets for Feeder and Substation Reliability Improvement, DA, and 4kv to 13kV Conversions set forth below. In addition, the Scheduled and Preventative Maintenance category in the table below corresponds to the "Distribution System Planned Scheduled Maint DC and MD" budget set forth in Table 4 of Commitment 55.

Work Plan Summary

Project Name	Project Description	Performance Metric	2017 Budget $000s
Vegetation Management	Program to address vegetation, designed to maintain appropriate clearance on the system, remediate trouble spots (*e.g.*, Priority Feeders), and remove the vegetation hazards that have the greatest impact on system reliability.	Annual tree related SAIFI/SAIDI performance for all feeders.	$2,413
Scheduled and Preventative Maintenance	Program designed to maintain equipment in operable condition.	Inspections planned versus inspections completed and priority conditions identified addressed in a timely manner.	19,281
Total O&M Reliability Budget			$21,694
Feeder Reliability Improvement (including Priority Feeders, URD Cable Replacement and Other Feeder Reliability)	Program to address equipment, vegetation, weather, and animal-related interruptions which negatively impact reliability performance. These projects involve installing, removing, and replacing reclosers, switches, conductors, animal guards, lightning arresters and other equipment deemed necessary on the 2% Priority and Comprehensive Feeders (top SAIFI contributing, and high customer interruption feeders) to maintain safe operation and improve reliability. URD Cable replacement involves replacing or rejuvenating cable in order to minimize failures.	Annual cumulative SAIFI/SAIDI performance for the group of feeders included within the annual feeder improvement program. URD Cable Replacement performance is further measured by tracking the trend in URD cable failures. Equipment failure rates and equipment failure SAIDI/SAIFI.	$33,796
Substation Reliability Improvement	Program to proactively retire and replace aging or damaged substation equipment and support upgrades to improve substation reliability.	Operate substations within design loading criteria.	24,770
Distribution Automation	Program to address system reliability by deploying system automation technology. These projects involve installing advanced control systems across the distribution system in order to automatically identify and isolate faults in real time and restore service to customers in the unaffected parts of the system.	Performance metric tracks the number of installed devices relative to the planned number of devices scheduled to be installed. In addition an evaluation is performed that compares the number of customers interruptions per event compared to potential customer interruptions without automation device installed.	17,228
4kV to 13kV Conversions	This program involves upgrading aging 4kV feeders in order to reliably supply customers and support increased usage required by existing customers. Conversion projects improve reliability by replacing aging 4kV infrastructure. These projects are performed on feeders where the 4kV feeders are experiencing little or no growth however due to the operational condition of the equipment the feeders need to be converted to improved system performance and reliability.	Performance metric monitors the completion of conversion work by tracking the number of customers scheduled to be converted to 13 kV supply compared to actual number of customers converted.	19,880
Emergency Restoration	Blanket projects to restore electric plant damaged by storms, struck poles, dig-ins and miscellaneous component failures.	N/A	18,400
DC PLUG	Initiative for placing certain electric power lines and ancillary facilities underground	N/A	2,410
Other Miscellaneous	Projects including security, miscellaneous equipment replacement, accruals and salvage for scrap wire/cable.[2]	N/A	674
Total Pepco District of Columbia Distribution Capital Reliability Budget			$117,158
***Scheduled Maintenance includes total Pepco System (D.C. & Maryland)**			

[2] This is not a project category; these projects indirectly support reliability projects and are not discussed in the body of this report.

1. Vegetation Management

1.1. Vegetation Management Overview

Pepco's VM program consists of several components designed to manage vegetation that have the potential for the greatest impact on system reliability. Pepco's VM program in the District of Columbia includes a comprehensive inspection by an International Society of Arboriculture ("ISA") Certified Arborist to develop a work plan for each feeder on a two-year cycle in accordance with guidelines established in conjunction with the District of Columbia's Urban Forestry Administration ("UFA") and American National Standards Institute ("ANSI") standards, and ISA Best Management Practices ("BMPs"). The main objectives that the VM program attempts to balance are safety, reliability, regulatory compliance, environmental stewardship, and customer satisfaction. Pepco's VM program includes all activities from tree pruning through tree removal, as appropriate, to reduce vegetation caused outages. Pepco's scheduled VM work is conducted on a two-year cycle.

Pepco also performs VM work on feeders in conjunction with other planned reliability program work and feeder expansion projects in order to provide clearance to equipment being installed or upgraded. When capital work coincides with two-year cyclical pruning under the VM program, the routine VM work is performed in the areas of the feeder not already cleared during the capital-related work in order to complete VM work on the entire feeder. VM work performed in conjunction with capital work is performed under Pepco's capital budget associated with the installation of new distribution line equipment and is not included in O&M expenses. For 2017, Pepco has budgeted $2.413 million in O&M for VM work.

The following table provides the list of feeders for the Company's 2017 VM Work Plan, which was also filed February 15, 2017, under Formal Case No. 1087 and Docket PEPVMWPR.

Pepco District of Columbia 2017 Vegetation Management Plan

Feeder	Voltage Class	Description/Location
52	4kV	Palisades
56	4kV	Anacostia
57	4kV	Georgetown
58	4kV	Georgetown
60	4kV	Observatory Circle
63	4kV	Woodley
64	4kV	Kent/Spring Valley/Wesley Heights
65	4kV	Chevy Chase/Forest Hills/North Cleveland Park/Wakefield
66	4kV	Columbia Heights
75	4kV	American University
82	4kV	Chevy Chase/Forest Hills/North Cleveland Park/Wakefield
87	4kV	American University/Cleveland Park/Observatory Circle
96	4kV	Bolling Air Force Base
97	4kV	Deanwood/Fort Dupont Park
101	4kV	Cleveland Park/North Cleveland Park/Observatory Circle
102	4kV	North Cleveland Park/Wakefield
119	4kV	Congress Heights
120	4kV	Congress Heights
128	4kV	Chevy Chase
144	4kV	American University/Kent/Spring Valley
164	4kV	Congress Heights
165	4kV	Congress Heights
167	4kV	Deanwood/Fort Dupont Park
177	4kV	Anacostia
178	4kV	Congress Heights
181	4kV	Berkley/Kent/Palisades
183	4kV	Congress Heights
199	4kV	Observatory Circle
205	4kV	Deanwood
292	4kV	Fort Drive/Kent/Spring Valley
294	4kV	Congress Heights
309	4kV	Cleveland Park/North Cleveland Park
323	4kV	Congress Heights
324	4kV	Congress Heights

Feeder	Voltage Class	Description/Location
329	4kV	Congress Heights
333	4kV	Congress Heights
366	4kV	Deanwood/Marshal Heights
372	4kV	Deanwood/Marshal Heights
394	4kV	American University
467	4kV	Chevy Chase
14005	13kV	Fort Lincoln/Woodridge
14006	13kV	Brookland/Woodridge/Brookland
14007	13kV	Brookland/Michigan Park/Brookland
14008	13kV	Brentwood/Woodridge
14009	13kV	Brookland/Eckington
14014	13kV	Brookland/Woodridge
14015	13kV	Brookland/Michigan Park/Brookland/Riggs Park
14016	13kV	Brentwood/Fort Lincoln/National Arboretum/Woodridge
14017	13kV	Brookland
14019	13kV	Brentwood/Brookland/Eckington/Woodridge
14020	13kV	Brentwood/Brookland/Eckington/Woodridge/RLA NE/Woodridge
14021	13kV	Brentwood/Brookland/Eckington/National Arboretum/Woodridge
14023	13kV	Brentwood/Brookland/Eckington
14054	13kV	Columbia Heights
14055	13kV	Deanwood/Marshall Heights
14058	13kV	Deanwood/Marshall Heights/Lily Ponds
14093	13kV	Brentwood/Brookland/National Arboretum/Woodridge
14132	13kV	American University/Cleveland Park/Glover Archbold Parkway/Glover Park/Spring Valley/Wesley Heights
14133	13kV	Forst Hills/North Cleveland Park/Rock Creek Park 1
14134	13kV	Garfield/National Zoologic Park/North Cleveland Park
14135	13kV	Chevy Chase
14136	13kV	Cleveland Park/Glover Park/North Cleveland Park/Observatory Circle/
14139	13kV	Cleveland Park/North Cleveland Park
14140	13kV	Cleveland Park/North Cleveland Park
14145	13kV	Cleveland Park/North Cleveland Park
14146	13kV	Garfield/Massachusetts Avenue Heights/Observatory Circle/Rock Creek Park 1/ Woodley
14150	13kV	Cleveland Park
14159	13kV	Deanwood

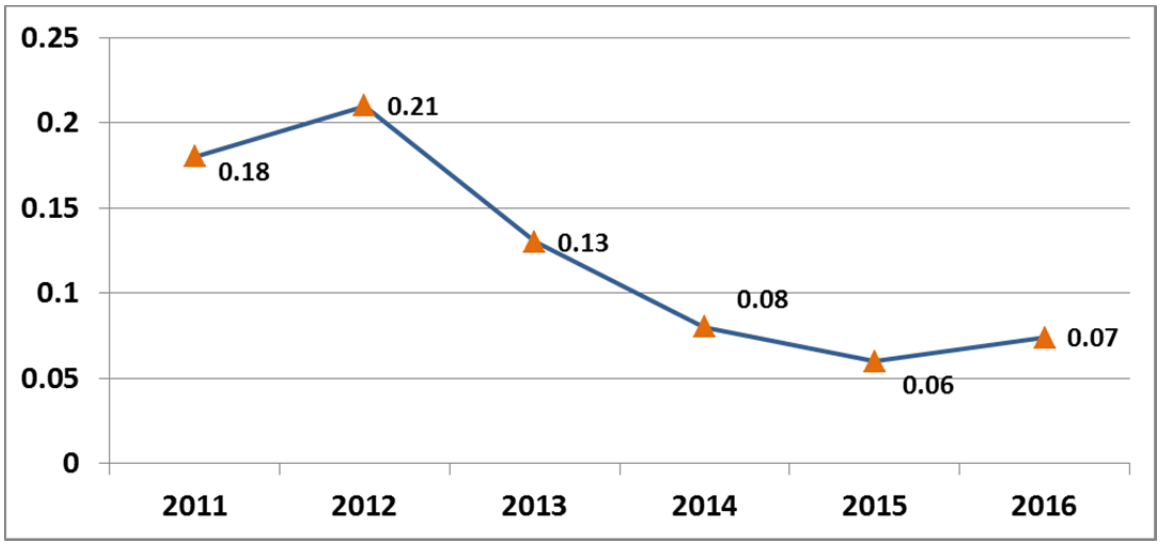
Feeder	Voltage Class	Description/Location
14200	13kV	Ledroit Park
14261	13kV	Hillcrest
14700	13kV	Anacostia/Barry Farms/Hillcrest/Randle Heights
14701	13kV	Anacostia/Barry Farms/Bolling Airforce Base/Congress Heights/St. Elizabeths Hospital
14702	13kV	Anacostia/Barry Farms/Hillcrest/Randle Heights
14703	13kV	Anacostia/Barry Farms/Hillcrest/Randle Heights
14707	13kV	Randle Heights
14709	13kV	Randle Heights
14713	13kV	DC Stadium/Old City 1/Trinidad
14716	13kV	Deanwood/For Dupont Park/Hillcrest
14717	13kV	DC Studium/Deanwood/Lily Ponds
14718	13kV	Anacostia/Randle Heights
14719	13kV	Randle Heights
14732	13kV	Columbia Heights/Mt Pleasant/National Zoological Park
14752	13kV	Congress Heights
14753	13kV	Congress Heights/DC Village
14755	13kV	Congress Heights
14756	13kV	Congress Heights
14758	13kV	Congress Heights/DC Village
14765	13kV	Berkely,/Palisades/Foxhall
14766	13kV	American University/Spring Valley
14767	13kV	Berkley/Fort Drive/Kent/Palisades/Wesley Heights
14768	13kV	Spring Valley
14806	13kV	Hillcrest/Lily Ponds
14808	13kV	Deanwood
14809	13kV	Deanwood/Marshall Heights
14811	13kV	Marshall Heights
14812	13kV	Fort Dupont Park
14813	13kV	Deanwood
15166	13kV	Randle Heights
15171	13kV	Congress Heights/Randle Heights
15175	13kV	Congress Heights
15198	13kV	Riggs Park

1.2. Intended Reliability Benefits for VM

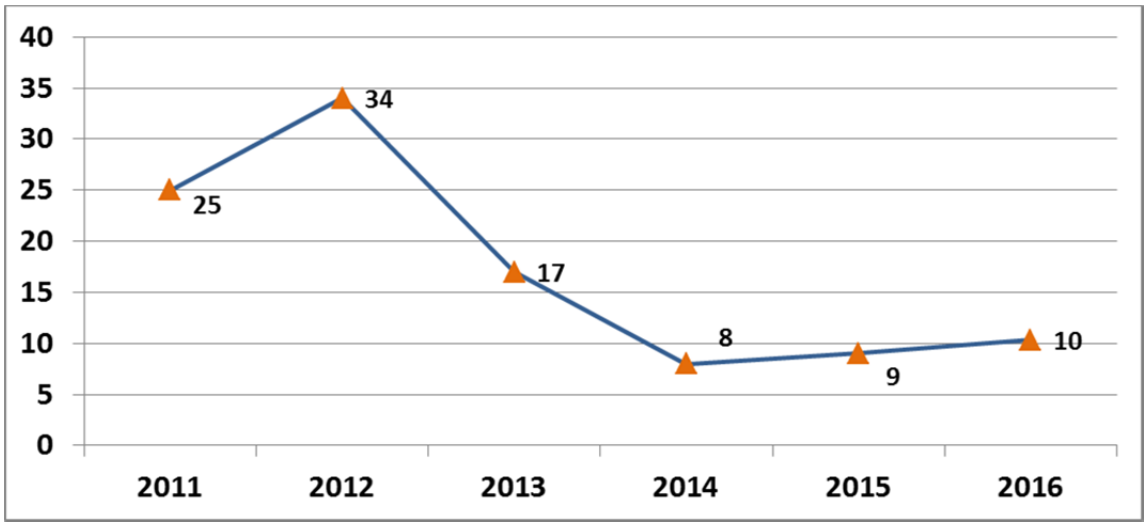
Pepco tracks the District of Columbia System Tree SAIFI and SAIDI to measure the effectiveness of VM. Tree SAIFI and SAIDI measures the level of vegetation-caused outages. The following figures present data showing the System Tree SAIFI and SAIDI (in minutes) for the Pepco District of Columbia service territory for 2012 to 2016, based on the Major Service Outage ("MSO") exclusion criteria. The forecast of VM work impact on reliability is included below in Section 8.

Historical Tree Related SAIFI in the District of Columbia,

Excluding Major Service Outages



Historical Tree Related SAIDI in the District of Columbia,
Excluding Major Service Outages



2. Scheduled and Preventive Maintenance

2.1. Scheduled and Preventive Maintenance Program Overview

The scheduled and preventive maintenance of substation and line equipment is intended to prevent equipment failures. For example, substation transformers, breakers, battery systems, protective relays, capacitor banks and switchgear undergo routine diagnostic testing and inspection to ensure this equipment remains in proper working condition and to identify equipment that has reached the end of its useful life. Failure of substation equipment could cause outages for multiple feeders and thousands of customers served by that substation.

The testing and inspection for substation transformers, breakers, capacitor banks and switchgear includes, but is not limited to: diagnostic testing, infrared scans, inspecting and/or cleaning transformer cooler equipment, assessing equipment condition and connections, checking for leaks, lubricating appropriate components, and performing operational or functional checks.

The maintenance program for substation equipment also includes periodic (*e.g.*, monthly or bi-monthly) inspection of other substation equipment and facilities. These inspections are focused on verifying the integrity of the substation facility and installed equipment, along with identifying incipient conditions that may require follow-up corrective maintenance.

There is also a preventive maintenance program for distribution line assets. Preventive maintenance of distribution line assets includes inspections which evaluate asset condition and verify that certain critical equipment (*e.g.*, reclosers) will operate as designed. It also includes, but is not limited to, inspection of overhead circuits, reclosers, capacitor banks, padmounted equipment and underground assets, such as manholes and network transformers. Similar to substation equipment, the objective is to ensure reliable service to customers.

2.1.1. Overhead Feeder Inspection Program

The Overhead Feeder Inspection Program in the District of Columbia will complete its current 2-year cycle in 2017. The table below shows the feeders to be inspected as part of the Overhead Feeder Inspection Program in 2017.

2017 Pepco District of Columbia Overhead Feeder Inspection Plan		
Feeder Number	**Neighborhood(s)**	**Substation**
14005	Fort Lincoln/Woodridge	12th Irving
14006	Brookland/Woodridge	12th Irving
14007	Brookland/Woodbridge/Michigan Park	12th Irving
14008	Brookland/Woodridge	12th Irving
14009	Brookland/Eckington	12th Irving
14014	Brookland/Woodridge	12th Irving
14015	Brookland/Riggs Park/Michigan Park	12th Irving
14016	Brentwood/Fort Lincoln/National	12th Irving

2017 Pepco District of Columbia Overhead Feeder Inspection Plan		
Feeder Number	**Neighborhood(s)**	**Substation**
	Arboretum/Woodridge	
14017	Brookland	12th Irving
14019	Eckington/Woodridge	12th Irving
14020	Brentwood/Brookland/Eckington/Woodridge	12th Irving
14021	Brentwood/Brookland/Eckington/National Arboretum/Woodridge	12th Irving
14023	Brentwood/Brookland/Eckington	12th Irving
14093	Brentwood/Brookland/National Arboretum/Woodridge	12th Irving
14200	Brookland/Ledroit Park	12th Irving
335	Congress Heights	23rd Street
365	Marshall Heights	53rd Street
367	Deanwood/Marshall Heights	53rd Street
368	Fort Dupont Park/Marshall Heights	53rd Street
369	Deanwood/Marshall Heights	53rd Street
383	Marshall Heights	53rd Street
385	Fort Dupont Park	53rd Street
386	Fort Dupont Park/Marshall Heights	53rd Street
387	Fort Dupont Park/Marshall Heights	53rd Street
388	Deanwood/Marshall Heights	53rd Street
15166	Randle Heights/St. Elizabeth's Hospital	Alabama Ave.
15170	Barry Farms/Hillcrest/Randle Heights	Alabama Ave.
15171	Congress Heights/Randle Heights	Alabama Ave.
15172	Barry Farms/Randle Heights/St. Elizabeth's Hospital	Alabama Ave.
15174	Randle Heights	Alabama Ave.
15175	St. Elizabeth's Hospital	Alabama Ave.
14700	Anacostia/Hillcrest/Randle Heights	Anacostia
14701	Anacostia/Barry Farms/Bolling Air Force Base/Congress Heights/ St. Elizabeth's Hospital	Anacostia
14702	Anacostia/Barry Farms/Hillcrest/Randle Heights	Anacostia
14703	Anacostia/Barry Farms	Anacostia
14709	Anacostia/Randle Heights	Anacostia
56	Anacostia/Barry Farms	Anacostia
96	Barry Farms/Bolling Air Force Base	Anacostia
126	Barry Farms/Congress Heights/St. Elizabeth's Hospital	Anacostia
177	Anacostia	Anacostia
364	Congress Heights/St. Elizabeth's Hospital	Anacostia
14055	Deanwood/Marshall Heights	Benning
14159	Deanwood	Benning
14713	DC Stadium/Old City 1	Benning
14716	Deanwood/Fort Dupont Park/Hillcrest	Benning
14717	DC Stadium/Deanwood/Lily Ponds	Benning
14806	Hillcrest/Lily Ponds	Benning
14813	Deanwood	Benning
15701	Brentwood/Old City 1/Trinidad	Benning
15702	Capitol Hill/National Arboretum/Old City 1/Trinidad	Benning
15705	DC Stadium/Deanwood/Lily Ponds	Benning
15706	Deanwood/Fort Dupont Park/Marshall Heights	Benning
15707	Deanwood	Benning
15709	Deanwood/Fort Dupont Park	Benning
15710	Fort Dupont Park/Lily Ponds	Benning
15755	Old City 1/RLA SW	Buzzard
15756	Old City 1/RLA SW	Buzzard
119	Congress Heights	Chesapeake

2017 Pepco District of Columbia Overhead Feeder Inspection Plan		
Feeder Number	**Neighborhood(s)**	**Substation**
120	Congress Heights	Chesapeake
164	Congress Heights	Chesapeake
165	Congress Heights	Chesapeake
183	Congress Heights	Chesapeake
323	Congress Heights	Chesapeake
324	Congress Heights	Chesapeake
329	Congress Heights	Chesapeake
333	Congress Heights	Chesapeake
178	Congress Heights	Congress Heights
294	Congress Heights	Congress Heights
332	St. Elizabeth's Hospital	Congress Heights
343	Congress Heights	Congress Heights
411	Congress Heights/Randle Heights	Congress Heights
480	Randle Heights	Congress Heights
97	Deanwood/Fort Dupont Park	Fort Chaplin
167	Deanwood/Fort Dupont Park	Fort Chaplin
205	Deanwood	Fort Chaplin
244	Hillcrest	Fort Davis
451	Fort Dupont Park	Fort Davis
327	Fort Dupont Park	Fort DuPont
328	Fort Dupont Park	Fort DuPont
381	Hillcrest/Fort Dupont Park	Fort DuPont
15001	Crestwood/Rock Creek Park 2	Fort Slocum
15006	16th Street Heights/Petworth	Fort Slocum
15007	Brightwood/Shepherd Park	Fort Slocum
15008	Brightwood/Shepherd Park t	Fort Slocum
15009	Brightwood/Chillum	Fort Slocum
15010	16th Street Heights/Brightwood/Rock Creek Park 2	Fort Slocum
15011	16th Street Heights/Brightwood/Rock Creek Park 2	Fort Slocum
15012	Chillum/Columbia Heights/Petworth	Fort Slocum
15013	Brookland/Chillum	Fort Slocum
15014	Brookland/Chillum/Riggs Park/Takoma	Fort Slocum
15015	16th Street Heights/Columbia Heights	Fort Slocum
15016	Brookland/Chillum/Riggs Park	Fort Slocum
15021	Brightwood/Chillum/Petworth/Shepherd Park	Fort Slocum
15197	16th Street Heights/Brightwood/Columbia Heights/Crestwood/Petworth/Rock Creek Park 2	Fort Slocum

2.1.2. Manhole Inspection Program

Pepco inspects over 60,000 manholes in the District of Columbia during each six-year cycle. The third cycle of the manhole inspection program, which began in the second quarter of 2013, is currently underway. In 2016, Pepco will be performing manhole inspections in Georgetown, the vicinity of H Street NE corridor and 14th St, NW corridor, southern 12th St, NW corridor, as well as the manholes associated with 2017 Priority Feeders.

2.1.3. Network Transformer Inspection Program

The majority of network transformers are typically inspected on a three-year cycle, which alternates between external inspections and internal inspections. The external inspections review transformers for overall appearance, oil levels, temperature, primary condition, secondary bushing and cable appearance, fuse appearance, breaker open or closed, purges the protector housing, checks the phasing cable, and assesses and records corrosion level and anodes. The internal inspections review a similar list of equipment, and in addition obtain an oil sample for dialectric breakdown, check interior housing and equipment, and inspect the protector mechanism.

2.1.4. Other Inspection Programs

Pepco performs numerous other inspection programs in the District of Columbia. The following table describes these other programs and their frequencies:

Equipment Class	General Description	General Inspection Cycle
Breaker	Both external and intrusive inspections of air, oil and vacuum breakers	6 to 8 year cycle
Cable	Inclusive of all cathodic protection test; oil consoles test, oil pressure readings, spotlight alarm testing of gas/oil filled feeders distribution; gas route testing; and cable electrical testing.	0.5 to 5 year cycle
Regulator	Overhead regulator inspection and repair program.	2 to 6 year cycle
Relay	Relay routine inspections	4 to 6 year cycle
Reliability	2% priority feeder program; Overhead Customer Voltage complaints testing; overhead load testing and thermovision.	1 year cycle
Substation	Oil sampling from transformer main tank, LTC and Oil circuit breakers; battery testing; station generation; fire pump inspections; cooler cleaning of transformers; and ground maintenance.	0.25 to 1 year cycle
Switch	OH Switch/Recloser PM from Inspections.	1 to 6 year cycle
Transformer	Transformers, LTC Routine & Testing (Intrusive); XFR Main Tank Inspection/Test; Underground Trans Insp (Subsurface); OH Transformer Insp and Nitrogen runs.	1 to 5 year cycle
URD Equipment	URD Padmounted Eq Insp and Pad/Subsurface Equipment Inspection	4 to 6 year cycle

2.2. Scheduled and Preventive Maintenance Reliability Benefits

The work conducted in Pepco's Scheduled and Preventive Maintenance Program leads to an avoidance of future outages. Failure to address this work will result in power quality issues or shorten equipment life, which ultimately may result in outages, reducing Pepco's overall service reliability and increasing the number of outages for our customers. Therefore, prevention of these outages through proper inspection and maintenance is critical to maintaining a reliable electric system. Since this program serves to prevent future outages from occurring, there are no reliability metrics that measure outage avoidance. Inspection programs performance is therefore measured by the number of inspections completed on schedule, and Priority Conditions identified and remediated in a timely manner. Pepco budgets Scheduled and Preventive Maintenance on a total system basis, which includes the Company's Maryland service territory. The total Pepco O&M budget for Scheduled and Preventive Maintenance for 2017 is approximately $19 million.

3. Feeder and Substation Reliability Improvement

3.1. Overview of Feeder Projects

There are three categories of projects captured under Feeder Reliability – Priority and Comprehensive Feeder Improvement, Underground Residential Cable ("URD") and Other Feeder Improvement. The projects within these three categories are described in more detail within this section.

3.2. Priority and Comprehensive Feeder Improvement

The Priority and Comprehensive Feeder Improvements are a reliability performance-based feeder group consisting of projects designed to address feeder reliability in response to historic performance in order to improve reliability. These projects are planned in nature and are primarily driven by the recent past performance of a feeder. The focus of these projects is to improve the performance of each feeder identified for corrective actions. The 2017 budget for these programs is reflected below.

WBS Element	Project Name	Project Description	2017 Budget $000s
Priority/Comprehensive Feeder Improvement			
UDLPRM4BF	PSC Priority Circuit Improvement: Benning[3]	Address least reliable 2% of feeders over the past year as required by the PSC.	$4,800
UDLPRM63D	Pepco DC: Comprehensive Feeder Reliability Improvements	Programmatic remediation of least reliable feeders not being addressed under the PSC Priority Circuit Improvement program.	2,313
Total Priority/Comprehensive Feeder Improvement Budget			**$7,113**

In the case of performance-based selection criteria, historic outage data are collected from the Outage Management System ("OMS") for analysis. These data are used to compute reliability indices such as SAIFI and SAIDI for the distribution system. The indices serve as an indicator of a system's overall performance over time and allow comparison of the relative impacts that feeder improvement projects have on overall system reliability indices. Those feeders displaying the historic performance that most affects the system reliability indices are selected for reliability

[3] Benning, when shown in a description for a WBS element, denotes the fact that the project is one located in the District of Columbia.

improvement projects.

3.2.1. Priority Feeder Program

Under present Commission regulations, Pepco is required to evaluation the 2% lowest performing feeders for remediation.[4] Pepco conducts annual system performance reviews of its 773 distribution feeders in the District of Columbia by first ranking these feeders from the most reliable to the least reliable using the System Performance Contribution ("SPC") method. The SPC value for each feeder is calculated by adding 75% of the SAIFI contribution to the system and 25% of the SAIDI contribution to the system.[5] Feeders whose SAIFI is less than 2.0, have experienced less than 10 interruptions over the past year, or where data anomalies are identified, are not included in the ranking. Pepco selects a total of 16 feeders, which accounts for approximately 2% of the Company's District of Columbia feeders, based on their SPC value across its service territory.

The 2017 Priority feeders are shown in the table below.

2017 2% Priority Feeders

Feeder	Location
14755	Bellevue
14758	Bellevue
14717	Deanwood, Burrville, and Mahaning Heights
14702	Woodland
14014	Brentwood, Langdon, and Brookland
15705	Eastland Gardens
15085	Congress Heights, Shipley Terrace, and Washington Highlands
14009	Capitol Hill, Lincoln Park

[4] See 15 DCMR *§§* 3603.1 -3603.6 (2012).

[5] SPC = 75% x (Feeder CI / System CI) + 25% x (Feeder CMI / System CMI),
Where:
Feeder CI = Customer Interruptions of the feeder
System CI = Customer Interruptions of the total system
Feeder CMI = Customer Minutes of Interruption of the feeder
System CMI = Customer Minutes of Interruption of the total system.
In addition, when selecting the annual priority feeders, the selections are made based on the combination of the following criteria:
(1) Feeders blended performance ranking by SPC values (i.e., individual feeder contribution to system SAIFI and SAIDI);
(2) Feeders that are not repeated from the year prior;
(3) Feeders with a minimum SAIFI value of 2.00; and
(4) Feeders experienced at least 10 outage occurrences in the evaluation period.

00228	Capitol Hill, Navy Yard, Barny Circle
15710	Carver Langston
15755	Navy Yard
14701	Barry Farm, Fort Stanton, and Anacostia
15013	Manor Park, Brighton Wood
14261	Woodland, Garfield Heights
14753	Barry Farm, Congress Heights
15014	Brightwood Park, Manor Park

Priority Feeder Reliability Remediation Strategy

While the remediation methods identified in the work plan for each priority feeder are determined based on the fault history on the feeder, Pepco has developed a list of feeder improvement approaches to guide the work plans and promote the implementation of fault mitigation strategies across its distribution network that have been found to improve a feeders performance during past reliability activities.

The remediation activities considered for overhead feeders are generally:

- Recloser installation;
- DA scheme installation;
- Fuse cutouts, fuse coordination;
- Lightning arrester installation;
- Animal guard installation;
- Vegetation management;
- Replace aging equipment (transformers, poles, wire, cables, etc.);
- Reconductoring; and
- Selective undergrounding.

The remediation activities considered for underground feeders (URD as well as underground cables in manholes) are generally:

- Cable Injection;
- Cable Replacement;
- Cable Electrical testing;
- PILC replacement; and
- Thermal scanning of equipment.

The scope of work for these feeders is determined by the condition found on the feeder and work needed.

3.2.2. Comprehensive Feeder Program

The Comprehensive Feeder Program complements the 2% Priority Feeder Program. It is intended to identify the feeders that are not selected for the 2% Priority Feeder Program whose remediation will improve system reliability measures by addressing equipment, vegetation, weather, and animal caused interruptions. While this program is not specifically called for by a Commission order or regulation, the program is an essential means by which Pepco addresses feeders that have a high number of customer interruptions, or experience long outage durations in order to improve system reliability and provide additional measures in order to meet or exceed the SAIFI and SAIDI standards required by the merger commitment.

Feeder Selection Criteria

The Comprehensive Feeder group is not selected through the SPC or Composite Performance Index ("CPI") methods used to select the Commission-required 2% Priority Feeders. Instead, Pepco selects the group of feeders comprising this voluntary program based on several different factors to improve the customer experience and increase Pepco's system-wide reliability. High SAIFI feeders that did not make the 2% Priority Feeder list are analyzed first and remediated based on the types and frequency of outages. Other feeders, such as those with multiple device operations over the course of a rolling 12-month period and those with high Customers Experiencing Multiple Interruptions ("CEMI"), may also be remediated under the Comprehensive Feeder program. Other feeders are selected based on a combination of high SAIFI and high SAIDI. This program is able to capture many other feeders whose customers are experiencing higher number of interruptions or outages. The purpose of including these feeders on the Comprehensive Feeder list is to target specific trouble areas that may affect relatively small number of customers but cause high levels of customer outages both during storms as well as during non-storm conditions.

The Comprehensive Reliability Feeders are shown in the table below.

2017 Comprehensive Reliability Feeders

Feeder	Location
15762	Columbia Heights, Logan Circle
15709	Deanwood, Mahaning Heights, and Hillbrooke
15769	Columbia Heights, Logan Circle
00097	Penn Branch
00479	Penn Branch
15867	Forest Hills, McLean Garden
15173	Garfield Heights, Buena Vista, and Woodland
00117	Friendship Heights
00209	Lincoln Park
14136	Foxhall Village, Burleith - Hillandale
15009	Takoma, Manor Park, and Brightonwood Park
14767	McLean Gardens, Woodley Park
15801	Palisades
00063	Cleveland Park
00244	Anacostia, Penn Branch

Remediation Strategy

The selection of comprehensive feeders occurs after the Priority Feeders have been selected. At a high level, the remediation strategies for Priority Feeders and comprehensive feeders are the same. The scope of work for these feeders is similar to the improvement work performed under the Priority Feeder Program, but each feeder's precise scope of work is determined by the condition found on the feeder and work needed.

3.2.3. Most Susceptible Neighborhood Feeders

In Order No. 16623[6] the Commission directed Pepco to provide analysis regarding the neighborhoods in each ward which are most susceptible to outages as determined by outage data. In determining a definition of the term "neighborhood," as well as the capability of providing reliability measures at the neighborhood level, Pepco took the approach of determining the poorest performing feeder in each ward and identifying the neighborhood(s) served by that feeder. The feeder performance evaluation period is from October 1 to September 30 and is exclusive of major service outages. The feeders selected are then allocated to the Priority or Comprehensive Feeder programs, if they have not already been selected under those programs.

3.2.4. Intended Reliability Improvement for Feeder Reliability Projects

The following tables show the historical improvement for the 2013 – 2016 annual classes of feeders selected for the Feeder Improvement Plans that includes feeders selected for both the Priority and Comprehensive Reliability Feeder programs. The starting point for each class is the 12 months ending the December 31 prior to the commencement of their work.

Pepco District of Columbia Reliability Improvement Feeder SAIFI Performance (MSO)

	Beginning SAIFI	2016 SAIFI	% SAIFI Improvement
2012 Class Year 2% Priority and Comprehensive Feeders	3.18	2.39	-24.74%
2013 Class Year 2% Priority and Comprehensive Feeders	2.19	1.74	-20.50%
2014 Class Year 2% Priority and Comprehensive Feeders	2.11	1.95	-7.54%
2015 Class Year 2% Priority and Comprehensive Feeders	1.71	1.42	-16.97%
2016 Class Year 2% Priority and Comprehensive Feeders	2.84	0.77	-72.79%

Pepco District of Columbia Reliability Improvement Feeder SAIDI Performance in Minutes (MSO)

	Beginning SAIDI	2016 SAIDI	% SAIDI Improvement
2012 Class Year 2% Priority and Comprehensive Feeders	361.4	186.1	-48.51%
2013 Class Year 2% Priority and Comprehensive Feeders	323.1	235.5	-27.10%
2014 Class Year 2% Priority and Comprehensive Feeders	304.9	162.1	-46.83%
2015 Class Year 2% Priority and Comprehensive Feeders	184.8	123.5	-33.16%
2016 Class Year 2% Priority and Comprehensive Feeders	385.0	102.0	-73.51%

The measurement of benefits associated with the 2% Priority Feeder Program, and Comprehensive Feeder Program, can be determined by the performance of the feeders before and

[6] *In the Matter of the Commission's Fuel Adjustment Clause Audit and Review Program and In the Matter of the Investigation into Explosions Occurring in or Around the Underground Distribution Systems of the Potomac Electric Power Company*, Order No. 16623, Formal Case Nos. 766 and 991 at P 46 (November 30, 2011.)

after the improvement projects are carried out. As reflected in the tables above, the feeders that have been worked on as a part of the 2% Priority Feeder and Comprehensive Feeder Programs have demonstrated marked improvements in reliability as measured by the feeder-level SAIFI and SAIDI starting from the year the feeders were selected for reliability improvement. The forecast of Feeder Improvement work impact on reliability is included below in Section 8.

3.3. URD Cable Replacement

Pepco has a program to identify, analyze, and initiate corrective actions for the mitigation of URD cable failures as well as enhance the integrity of the URD system in terms of reliability, safety, and cost. This is performed through URD cable replacement.

Pepco monitors URD cable performance by tracking and recording the number of URD cable failures. URD cable replacement progress is measured by identifying the number of annual URD cable faults on a system wide basis.

Details on Pepco's current 2017 URD Cable Replacement projects and budget by WBS number are provided in the following table. The identification of cable faults is an ongoing process and specific work plans are developed throughout the year. Each feeder is evaluated to determine if it meets the criteria due to poor condition of the neutral or number of splices in the section of cable that will require replacement instead of curing. Since each feeder evaluation can result in different sections being replaced and other sections enhanced, detailed plans cannot be identified until actual field testing is performed on each section of cable.

WBS Element	Project Name	Project Description	2017 Budget $000s
Underground Residential Cable Replacement			
UDLPRM4BD	Benning:[7] Planned URD Cable Replacements	Blanket program that involves replacing or rejuvenating underground residential distribution (URD) cable in order to minimize URD failures.	$350
UDLPRM4BC	Benning: Replace Deteriorated URD Cable	Blanket project to replace damaged or failed URD cable.	121
Total Underground Residential Distribution Cable Replacement Budget			**$471**

[7] Benning, when shown in a description for a WBS element, denotes the fact that the project is one located in the District of Columbia.

Pepco 2017 Identified Feeders for URD Work

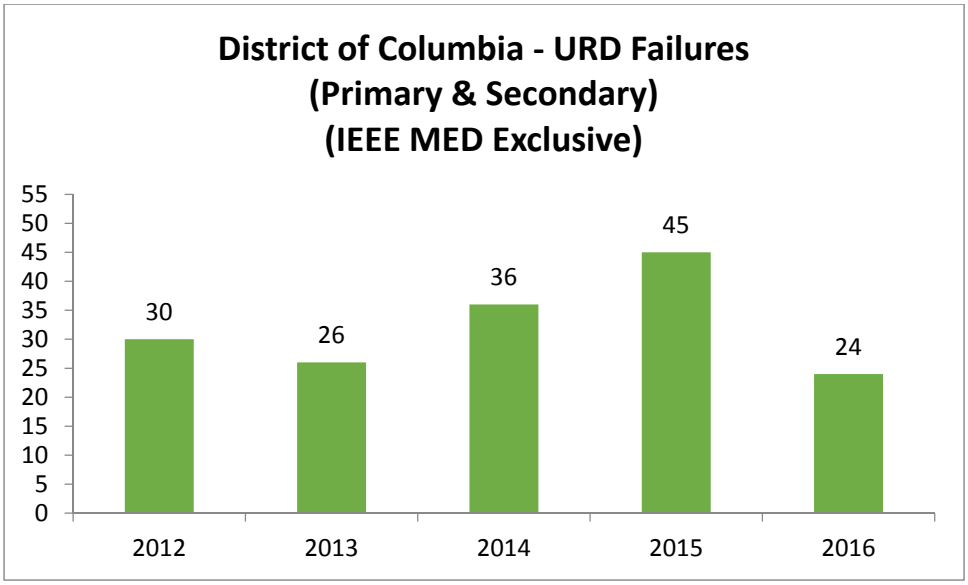
Location	FEEDER ID	Neighborhood
North East, Washington DC	14787	Brentwood/Capital Hill/Old City 1/Old City 2
North East, Washington DC	15013	Brookland/Chillum/
South East, Washington DC	15170	Barry Farms/Hillcrest/Randle Heights
North West, Washington DC	15943	Berkley/Burleith/Foxhall/Glover Park/Observatory Circle/Palisades.

3.3.1. Intended Reliability Improvement for URD Cable Replacement

The URD Cable Replacement Program complements work performed on overhead feeders through the Priority Feeder Program and Comprehensive Feeder Program and directs focus on URD subdivisions.

The program is focused on selected areas that have experienced cable failures, or where cable failures may be expected. The program is important to reduce the number of customers and neighborhoods experiencing multiple interruptions due to aging URD cable, which generally occur during high load periods. Combined with other reliability program efforts, these projects will contribute to overall system reliability improvement and increase customer satisfaction in those communities.

URD cable faults are a recurring factor in customer satisfaction with respect to reliability for the customers that are experiencing repeated outages due to failing cable, particularly due to “blue sky” failures. The following table reflects URD cable failures in the District of Columbia from 2012 to 2016.



URD Cable Replaced or Injected in the District of Columbia, 2011-2016

Year	Feet of URD Cable Replaced or Injected
2011	41,650
2012	225,418
2013	159,044
2014	22,487
2015	28,228
2016	131,449

3.4. Feeder Reliability Projects

Feeder Reliability projects include the following:

- Upgrades for Multi-Device Operations – replace or upgrade protective devices that have operated more than 3 times in the previous 12 months.
- Motor Operated Disconnect Switches (MODs) Replacement – replace older MOD switches with more advanced ACRs
- Customer Reliability Improvements – address work and corrective actions pertaining to individual customer reliability inquires
- Proactive Replacement Feeders – projects designed to maintain feeder reliability in response to concerns about the age and condition of an individual class of feeders.

These projects are part of the Company's obligation to maintain the distribution system to provide reliable service and not expose the customers to potential extended outages due to failure of aging and/or damaged equipment. The 2017 Work Plan for Feeder Reliability Improvement is provided in Attachment D.

2016 Feeder Reliability Improvement Plan

WBS Element	Project Name	Project Description	2017 Budget $000s
Feeder Reliability Improvement			
UDLPRM8BB	69kV Lines NRL Sub 168 to Blue Plains Sub 83	Extend two 69kV feeders from Blue Plains Substation 83 to NRL Substation 168 in order to serve as backup supply feeders to NRL Substation 168.	0
UDLPRM4BG	Benning Misc Dist Impvt: Mainline Heavy-Up	Installation of cable and wire on an as needed basis to address non-emergency deficiencies on wires, cables, and transformers.	0
UDLPRM4BA	Benning[8]: Misc Distribution Changes	Replacement of overhead (OH) and underground (UG) equipment as needed to address non-emergency deficiencies on equipment such as poles, wires, cable, fuse cutouts and boxes, transformers, etc.	592
UDLPRM4BO	Benning: Padmount Transformer Replacements	Replace padmount transformers associated with the Padmount Transformer Inspection program. Transformers are identified for replacement if they are found to be deteriorated or damaged as a result of age, external forces, leaking, etc.	101
UDLPRM4BQ	Benning: Upgrades for Multi Device Operations	Replace or upgrade protective devices that have operated more than 3 times in the previous 12 months.	532
UDLPRM4BM	Customer Reliability Impvts: Benning	Blanket to address work pertaining to individual customer reliability inquires.	2,450
UDLPRM5SD	DC: Repl Rubber/Lead Secondary Cables	Reactive replacement of damaged and / or failed underground (in duct) secondary cable and street light cable.	2,000

WBS Element	Project Name	Project Description	2017 Budget $000s
Feeder Reliability Improvement			
UDLPRM5ED	IR: 34 & 69kv Oil Filled Cable Replacements - DC	Replace 69 kV cables in DC identified after analyzing the current condition of Pepco's self-contained fluid filled (SCFF) underground transmission feeders.	0
UDLPRM5EV	IR: 34 & 69kv Oil Filled Cable Replacements - VA	Replace69kV cables supplying D.C. substations identified after analyzing the current condition of self-contained fluid filled (SCFF) underground transmission feeders.	0
UDLPRM5BP	MODs Replacement – Benning	Blanket to replace inoperative MOD switches with Automatic Circuit Recloser. Under this project, Automatic Circuit is installed and placed in service as automatic switch	50
UDLPRM4BN	Network Xfmr&Prot Repl Planned: Benni	Blanket used to replace network transformers and protectors on an as needed basis based on network transformer inspection.	10,084
UDLPRPLIC	PILC Replacement Planned	Blanket to replace approximately 4-5 miles per year of paper lead insulated cable with EPR.	2,319
UDLPRM41D	Placeholder - Future Pepco DC: OH Misc Planned Distribution Blanket	Placeholder - Future Pepco DC: OH Misc Planned Distribution Blanket	1
UDLPRM42D	Placeholder - Future Pepco DC: UG Misc Planned Distribution Blanket	This blanket is set up to complete non-reimbursable underground projects in DC. This is typical for DDOT projects which impact Pepco facilities.	0

WBS Element	Project Name	Project Description	2017 Budget $000s
Feeder Reliability Improvement			
UDLPRM4BE	Reject Pole Repl/Reinf : Benning	Covers the replacement or reinforcement of Pepco owned distribution utility poles in the District of Columbia based on inspection results.	700
UDLPRM5SG	Repl 69kV Slf-Containd UG Supl-Georgetown,"F" St, 22nd St Subs	Installation of four underground 69kV solid dielectric cables in two new 8-way conduit to resupply several downtown substations.	3,843
UDLPRM4VB	Repl Rubber/Lead Secondary Cables: Benning	Blanket program whose scope includes reactive replacement of damaged and/ or failed secondary Underground Residential Distribution (URD) cable.	40
UDLPRM4WA1	Van Ness Switchgear Replacement: Distribution Line	This project is for the distribution line work in support of the purchase and installation of replacement 13.8kV switchgear in DC substations.	750
UDLPRM4WA2	Pepco DC: Benning Sub Area Plan	Reconductor and redistribute load on Benning Substation overhead feeders to remediate circuit reliability. The project will include reclosers, ASR schemes, reconductoring, reconfiguring of circuits, new feeders, and optimizing all circuits out of Benning Substation.	1,750
UDLPRM4WJ	Pepco DC: Single Phase Reclosing Devices	Install single phase reclosing devices (TripSavers) on fused taps and other locations	1,000
Total Feeder Reliability Improvement Budget			**26,212**

3.4.1. Intended Reliability Improvement for Feeder Reliability Projects

The following table shows the SAIDI and SAIFI associated with equipment failures for all District of Columbia feeders and represents the annual contribution from equipment failures to total District of Columbia system reliability performance.

District of Columbia Equipment Failures 2012-2016 MSO Exclusive		
Year	**SAIFI**	**SAIDI (minutes)**
2012	0.391	55.4
2013	0.399	77.4
2014	0.311	49.8
2015	0.373	80.9
2016	0.358	72.71

3.5. Substation Reliability Projects Overview

This section of the report describes the capital reliability projects designed to support the safe and reliable operation of Pepco's substations in the District of Columbia. Substation reliability projects can be summarized as follows:

Proactive equipment replacements and spare purchases

Substation reliability equipment projects generally consist of planned projects to replace or purchase spare equipment for large, high-cost, long lead-time primary components within substations. Substation reliability is maintained by keeping both the primary and redundant assets in good working condition. Therefore, condition and criticality of assets predominantly drive substation reliability programs. Replacement of transformers, switchgear, battery charges and other substation equipment such as bushings and relays do not directly improve SAIDI and SAIFI system performance but do avoid equipment failures that would have a negative impact on system performance. Pepco's Equipment Condition Assessment ("ECA") process is the vehicle used to identify substation assets for reliability-driven replacement. The ECA process analyzes major equipment condition, makes major repair and replacement decisions utilizing various subject matter experts, and through consensus prioritizes candidates for replacement on a quarterly basis.

Substation Supporting Infrastructure Replacements

These projects include the planned replacement of the supporting infrastructure and monitoring equipment and upgrades to facilities in substations. These projects are annual in nature, and Pepco generally creates tentative plans under each project based on condition. System emergencies can alter the timing of these projects. Work performed within these projects is generally in response to failed or failing equipment that needs to be replaced to maintain the overall reliability of the substation and all feeders and customers served by that station.

Substation Retirements

These projects include the planned retirements of existing substations that are no longer needed

to serve load in the District of Columbia or are retired due to new substations coming online, and, for the projects associated with the retirement of generation at Benning, to ensure transmission and distribution reliability is maintained in the absence of generation. These substation retirement projects typically occur on an as-needed basis.

The 2017 Work Plan and budget for Substation Reliability Projects are provided in Attachment D.

2016 Substation Reliability Work Plan

WBS Element	Project Name	Project Description	2017 Budget $000s
UDSPRD8AD5	052 10th Street T4 Transformer Replace	Replace transformer - transformer is 40 years old and the Doble test indicates the insulation is degraded. Excessive gassing is also present in the LTC (sharp increase in Ethylene).	22
UDSPRD8KD	13.8kV Swgr Replacement - Pepco DC	Purchase and installation of replacement 13.8kV switchgear in DC substations. Existing deteriorated switchgear will be replaced based on priority list.	2,440
UDSPRD8JD	Animal Guards in Dist Subs: Pepco DC	Install animal guards on identified vulnerable insulators and equipment or install the new vanquish animal fencing around the substation to entirely keep animals out.	214
UDSPRD8ED	Batt & Chgr Replacement Distri. Subs. - DC	Existing batteries and chargers have been determined to be beyond their design life, or have been determined to be in failure mode due to testing and observation results.	351
UDSPRD8FD	Dist Sub Bushing Replacement: Pepco DC	Replace U-Type bushings that are susceptible to an industry known problem for failure.	110
UDSPRD8FV	Dist Sub Bushing Replacement: Pepco DC	Replace U-Type bushings that are susceptible to an industry known problem for failure at substations located in Virginia that supply District of Columbia.	72
UDSPRD8AD6	GE UR Relay Replacement	Replace failing GE UR relays across the Pepco distribution system.	1,500
UDSPLNW2	Harrison Sub: Construct New Sub	Rebuild the existing Harrison Substation 38 as equipment is in poor condition and non-standard.	11,029
UDLPLNW3	Harrison Sub: Extend New Dist Fdrs to 38	This is part of the Harrison Substation 38 rebuild project. Extend 17 -13.8kV underground feeder supplies from the Temp Substation located in the adjacent lot, and rearrange with each of the existing Harrison Substation 38 Distribution feeders.	1,000

WBS Element	Project Name	Project Description	2017 Budget $000s
UDSPRD8AD2	Harvard - New Sub - Distribution Upgrade to 230/13kV, 210 MVA	Build a new 230/13kV, 210 MVA class substation on existing Harvard Substation 13 site. All 13kV load would be temporarily transferred to a temporary substation consisting of mobile transformers and switchgear then cutover to the new Harvard Substation when complete.	1,060
UDSPRD8D2	Improve/Add Substation Enclosures	Blanket WBS to provide new, improve, or to restore substation enclosures. (i.e., transformer bays, fire walls, building restorations, etc.)	130
UDLPRM4S1	Pepco DC - Deteriorated Cap Bank Replacement	Covers the replacement of capacitor banks in the District of Columbia on an as needed basis based on field condition when assessing the bank for the installation of the replacement capacitor controller.	30
UDLPRM9PD	Pepco DC Distrib - Upgrade Pumping Plants	Conduct: 1) plant installation, 2) remote monitoring installation (PLC), and 3) HVAC installation at numerous pumping plants in DC.	50
UDSPRD8TD	Pepco DC: Roof Replacements	Replace and repair various substation roofs in order to avoid equipment and further structural damage.	122
UDSPRD8LD	Pepco DC: Substation Ventilation	Engineering, design, construction, and procurement of new HVAC systems for DC substations.	43
UDSPRD9D5	Pepco DC: Add Sub Condition Monitoring Points	Add condition monitoring points to equipment as it may become impaired throughout the year to enable proactive repair/replace decisions. These monitoring points can include transformer Dissolved Gas Analysis (DGA) monitors, bushing monitors, Load Tap Changer monitors and breaker or battery monitors.	111
UDSPRD8A1	Pepco-DC: 9th Street Sub 117-Switchgear Repl	Existing 6 bus sections of switchgear will be replaced with new double stacked metal-clad switchgear with new bus work, circuit breakers, and GE UR type smart relays for protection.	2,735

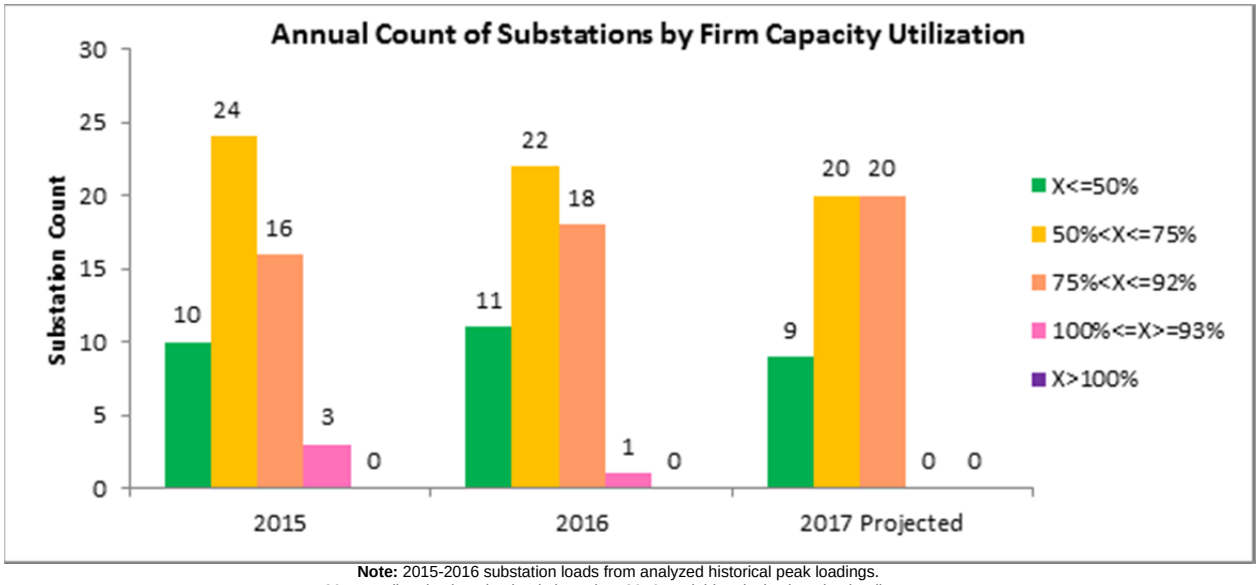
WBS Element	Project Name	Project Description	2017 Budget $000s
UDSPRD8UD	Repl Eng Generators Dist Sub: Pepco DC	Replace engine generators that are beyond their useful design life. Replacement includes engineering design, procurement of material and construction for installation.	99
UDSPRD9GD	Replace Deteriorated Dist Transformers DC	Engineer, procure and install replacement transformers at NJ Ave, and F St due to equipment deterioration.	1,950
UDSPRD8RD1	Retire Congress Height Sub. 64	Retire Congress Heights Substation 64 after Feeders 178 and 294 are converted to 13kV.	100
UDSPRD8Q1D	SPCC - Distribution Oil Brkr Replacements : Pepco DC	Replace 69kV Oil Circuit Breakers with SF6 Gas Circuit Breakers for Substation 133 and Substation 190 due to age and condition of equipment.	153
UDSPRD8AD14	Tenth Street (Sub 52) - Replace Transformer #3	Tenth Street (Sub 52) - Replace Transformer #3	1,050
UDSPRD8AD	Substation Improvements and Additions – DC	Blanket created to support various projects related to enhancing and replacing deteriorated /failed equipment, foundations, and structures related to maintaining the reliability of D.C. substations.	107
UDSPRD8AD8	Champlain - New 230/69/34kV Sub	Build New Champlain 69kV sub with 3-230/69kV, 225 MVA transformers, a 69kV GIS breaker and half bus, 4bays, 14 breakers, 4-69/34kV transformers, 4-34kV outgoing feeders to resupply "L" Street, and 4-69kV outgoing feeders to resupply "F" Street and Georgetown Subs.	292
Total Substation Reliability Budget			**24,770**

3.5.1. Substation Reliability Benefits

Generally, substation reliability projects are performed to avoid an outage and therefore cannot be translated directly into measurable or forecasted SAIDI or SAIFI benefits. Reliability work for new and upgraded substation equipment is critical to ensure the substations can meet load and continue to perform reliability. The presence of redundant systems within substations reduces or eliminates the direct threat to customer reliability from the loss of a single asset. However, equipment that is at risk of failing removes this redundancy since during routine equipment outages or failures the substation would be at an increased risk of large-scale customer outages if another failure was to occur. Given the high potential for customer impacts and the long replacement cycle of major substation assets, Pepco takes steps to replace these assets proactively based on condition assessment to address aging infrastructure and the desire to manage contingency risk and maintain system reliability.

Because substation equipment is replaced proactively and the reliability benefits of the outages avoided resulting from replacement is difficult to measure, Pepco measures the reliability benefits of substation work by substation firm capacity. Firm capacity is a design criterion that allows a substation to supply the full load of all the customers supplied from that station when one station transformer or supply line to that station is out of service. Thus, during normal conditions, a substation operated at a capacity above 100% does not necessarily represent a reliability threat but does indicate the need for analysis and planning to address the condition. Unlike other reliability measures, which are difficult to forecast with any precision due to the large number of variables (*e.g.*, weather, dig-ins, vehicle accidents, animal damage), it is more feasible to forecast substation capacity usage since the variables are relatively predictable (*e.g.*, substation capacity and load growth). Therefore the reliability of the substation must be maintained in order to maintain the ability to operate the substation up to the firm capacity of the station and to prevent the need to construct additional stations at a lower load growth rate than the design limit of the station. This could occur if the station equipment was not able to be operated to its full design rating due to failed components, reduced ratings or higher risk of failure from poor operating condition.

The following table provides a comparison of 2015 substation firm capacity usage to 2016 substation firm capacity usage and a forecast of 2017 for this measure.



Note: 2015-2016 substation loads from analyzed historical peak loadings.
2017 predicted substation loads based on 2016 peak historical substation loadings.

4. Distribution Automation

4.1. Overview of DA Projects

Pepco recognizes the benefits of deploying smart grid technology to improve infrastructure reliability, enhance customer experience, and provide enhanced operational flexibility and control over the grid. DA is one aspect of Pepco's larger smart grid implementation strategy. Pepco's DA approach is comprised of installing advanced control systems and devices across the distribution system to automatically identify and isolate faults in real time and restore service to customers. These systems and devices serve the following functions:

- Fault identification and isolation: DA can isolate faulted sections of the distribution infrastructure to minimize customer impact during outage events;
- Service restoration: DA can significantly reduce the duration of outages experienced by customers through automated isolation of faulted areas and restoration of customers unaffected by the fault;
- System/Data management: DA can provide accurate and real-time information regarding the overall integrity of the distribution system, which allows for targeted and timely deployment of system restoration measures; and
- Expanded control of field equipment outside of the substation and increased monitoring points spread across the entire distribution system. These control and monitoring points allow for real time operation of the system and increased awareness of loads and status of individual segments of the distribution grid.

Types of DA projects include:

1. ASR schemes;
2. Other Non-ASR switch additions (Switches and ACRs);
3. Other automation projects to add visibility and control (substations, capacitor banks, and automation equipment replacement);
4. Network transformer protector Remote Metering Systems ("RMS"); and
5. DA communication & control infrastructure build-out and integration.

A description of these categories and their intended reliability benefits are described in more detail later in this section.

A summary of Pepco's current 2017 DA projects and budget by WBS number are provided in Attachment D.

2017 DA Work Plan

WBS Element	Project Name	Project Description	2017 Budget ($000s)
UDSPRD8H	4kv Substation Automation	4kV Substation Automation (relays, comms, etc.) at 53rd Street Substation 48 and Chesapeake Street Substation 181	685
UDLPRDA1D	Distribution Automation - Pepco DC	Line improvements (switches, reclosers, Reconductoring, etc.) for new ASR schemes for feeders supplied by Van Ness, Takoma, and 12th St substations	9,648
UDSPRD8SD	Install Smart Relays & Replace RTU's –DC	Install / upgrade substation smart relays and upgrade RTUs	1,395
UDLPRM4DR	Network RMS - Pepco DC	Install transformer & protector monitoring and control devices for the RMS.	3,500
UDLPRM4DJ	Pepco DC- Add Recloser Sectionalization	Addition of new line reclosers to further segment feeders	2,000
Total Distribution Automation Budget			**17,228**

Pepco's current plan includes a goal of installing 25 total reclosers in the District of Columbia in 2016. Details on Pepco's DA work plan in the District of Columbia are provided in the following table.

4.2. Automatic Sectionalization and Restoration Schemes

ASR schemes improve system reliability by automatically isolating faults and restoring unaffected portions of feeders by using advanced sensors, controls, and communications systems. Sensors detect faults as they occur in the system. Control systems reconfigure the distribution system by operating switches and other isolation devices, such as automatic circuit reclosers to isolate the faulted sections. Loads served on unaffected sections are automatically switched over to neighboring feeders. ASR schemes resupply customers from alternate sources and shorten restoration times. An ASR scheme's "self-healing" design quickly identifies the faulted section, thereby reducing the time to dispatch restoration crews, and eliminating sustained outages for customers served from unfaulted portions of the feeder In 2015, the Company expanded ASR technology deployment to include three additional feeders out of Van Ness Substation, two feeders from Takoma Substation, and two additional feeders from 12th and Irving Substation. These seven feeders serve approximately 9,500 customers in the District of Columbia. One ASR feeder was activated in 2016. ASR functionality for the remaining six feeders was deferred to accommodate planned construction at the Van Ness and Harrison Substations, and is expected to be activated in the end of the second quarter of 2017. The Anacostia area ASR plan is being re-evaluated to account for possible impacts on the DC PLUG project. This ASR plan for the Anacostia area is expected to commence in 2018.[9]

4.2.1. Reliability Benefits of ASR Schemes

In 2016, ASR schemes within the District of Columbia have prevented a total of 3,185 customer interruptions (CI) and 1,637,147 customer minutes of interruptions (CMI) in total.

Since activation of the first ASR scheme in 2012, ASR schemes deployed in the District of Columbia have allowed for the avoidance of approximately 17,287 customer interruptions, and saved a combined total of approximately 4,228,751 minutes of service interruptions to customers cumulatively.

Benefits of the ASR schemes are based on calculations of outages avoided measured in terms of CI and CMI. For example, without an ASR scheme, customers upstream of a fault would experience an outage when the fault occurs. With an ASR scheme in place, these same upstream customers are automatically switched over to be fed from another source and do not experience

[9] Feeders associated with these ASR schemes serve the following District of Columbia neighborhoods: American University, Cleveland Park, Glover Archbold Parkway, Glover Park, Wesley Hills, Forest Hills, Massachusetts Avenue Heights, North Cleveland Park, Rock Creek Park 2, Woodley, American University, Chevy Chase, Chillum, Riggs Park, Takoma, Brightwood, Shepherd Park, Brookland, Woodridge, and Ledroit Park.

an outage when the fault occurs. Thus, for these customers, the benefit of an ASR scheme can be measured in terms of CI and CMI avoided.

4.3. Other Non-ASR switch additions (Switches and Automatic Circuit Reclosers (ACRs))

Non-ASR switch additions consist of projects that deploy remotely operated switches and stand-alone ACRs, which may be incorporated into future ASR schemes. ACRs and remotely operated switches on feeders allow for more capability to isolate the faulted portion of the feeder and return more customers to service sooner. ACRs activate to isolate downstream faults, which serves to limit the number customers affected during outage events. The remote control capability of these devices allows the System Operator to perform switching without the need to dispatch field crews, thus reducing customer outage time and related costs.

Currently, ACRs are deployed based on the feeder-level lockout histories and high SAIFI performance. The long-term goal for ACR deployments is to identify where the ACRs should be combined into an ASR scheme to realize the maximum reliability benefits. In order to perform this work, a feeder must have sufficient ties and sufficient ACRs to form an ASR Scheme. The installation of an ASR scheme and the installation of ACRs will help Pepco towards achieving its reliability improvements objectives.

4.3.1. Reliability Benefits of ACR

Benefits for ACRs can be calculated in a similar fashion as the ASR scheme activation benefits. A post- outage analysis is conducted to determine what the CI and CMI would have been had the ACR not activated (and thus the fault will have been cleared at the next up-stream reclosing device, either another recloser or a circuit breaker). Stand-alone ACRs (which are not part of ASR schemes) prevented a total of 16,059 CI and 2,560,934 CMI during 2015, and a total of 22,099 CI and 2,476,551 CMI as of December 31, 2016.

The 43 potential additional ACR deployment locations that have been identified for Pepco's District of Columbia feeders are provided in the following table.

Proposed Pepco District of Columbia ACR Deployments		
Feeder	**Substation**	**Neighborhood(s)**
14005	12th & Irving	Fort Lincoln/Woodridge
14006	12th & Irving	Brookland/Woodridge
14008	12th & Irving	Brentwood/Woodridge
14016	12th & Irving	Brentwood/Fort Lincoln/National Arboretum/Woodridge
14035	Suitland	Hillcrest
14132	Van Ness	American University/Cleveland

Proposed Pepco District of Columbia ACR Deployments		
Feeder	**Substation**	**Neighborhood(s)**
		Park/Glover Archbold Parkway/Glover Park
14145	Van Ness	Cleveland Park/North Cleveland Park
14146	Van Ness	Garfield/Massachusetts Avenue Heights/Observatory Circle/Rock Creek Park 1/Woodley
14701	Anacostia	Bolling Air Force Base/Congress Heights/St. Elizabeth's Hospital
14752	N.R.L.	Congress Heights
14755	N.R.L.	Congress Heights
14766	Little Falls	American University/Spring Valley
15006	Fort Slocum	16th Street Heights/Petworth
15010	Fort Slocum	16th Street Heights/Brightwood/Chillum
15011	Fort Slocum	16th Street Heights/Brightwood/Rock Creek Park 2
15012	Fort Slocum	Chillum/Columbia Heights/Petworth
15013	Fort Slocum	Brookland/Chillum
15015	Fort Slocum	16th Street Heights/Columbia Heights/Petworth
15085	St. Barnabas Road	Congress Heights/Randle Heights
15130	Walker Mill Road	Fort Dupont Park/Marshall Heights
15172	Alabama Avenue	Barry Farms/Randle Heights/St. Elizabeth's Hospital
15175	Alabama Avenue	Barry Farms/Congress Heights/Randle Heights/St. Elizabeth's Hospital
15198	Takoma	Riggs Park/Takoma
15944	Van Ness	American University/Chevy Chase
15945	Van Ness	American University/Chevy Chase
15947	Van Ness	American University/Chevy Chase
15950	Van Ness	Forest Hills/North Cleveland Park/Rock Creek Park 2

The forecast of ACR implementation's impact on reliability is included below in Section 8.

4.4. Other Substation Automation Projects (including substation automation and capacity automation)

Other substation automation projects include adding automation equipment (*e.g.*, remotely operated relays, monitors, and additional communications equipment) to provide Pepco system operators increased visibility into the Pepco distribution system.

Automation of 4kV substations has enabled the Pepco system operators to monitor and control the 4kV substations remotely, which avoids sending out crews to those substations to operate the breakers and relays. The ability to monitor loading of these substations may prevent overloading outages and truck rolls to perform switching operations and can potentially shorten outage restoration times and reduce costs. Those 4kV substations without SCADA controls are being upgraded to allow substation breakers and transformers to be monitored, and remotely controlled and operated. Work for 53rd Street Substation 48 is scheduled for completion in 2018.

Capacitor automation enables the Pepco distribution system to function more efficiently resulting in reduced line losses by allowing the system to be operated at a power factor closer to unity. In addition, the ability to coordinate capacitor bank operations will enable better reactive power control via Conservation Voltage Reduction ("CVR") and Variable Voltage Regulation ("VVR") events in the future. This may reduce the overall power needs from the transmission and distribution networks. In addition, increased control and management of distribution line equipment is needed to support growth in distributed energy resources. Voltage control is a key component for advanced grid operations and for future distribution management systems. Currently approximately 2,600 District of Columbia customers are served by Maryland substations implementing CVR, and Pepco plans to place approximately 9,500 more District of Columbia customers into the program. Additionally, as of December 2016, 30 capacitor bank controllers and radios are currently deployed in Pepco's District of Columbia territory (nine deployed in 2015 and twenty-one deployed in 2016). The 2017 target is to deploy 25 capacitor bank controllers and radios in Pepco's District of Columbia territory.

4.5. Network Transformer Protector Remote Metering Systems

RMS gives Pepco system operators and engineers more situational awareness by providing real-time load and environmental information, as well as transformer condition information and remote control capabilities. The real-time control and monitoring capabilities gained from Network RMS will allow System Operators to attend swiftly to emergencies when any transformer needs to be isolated from the network. The system will also provide operators real-time information on the status of a protector breaker (if open or closed); as well as the number of times and the frequency that protectors are operating, which can be useful in detecting reverse power flows. The analysis of trends in the underground network and can be useful in asset and

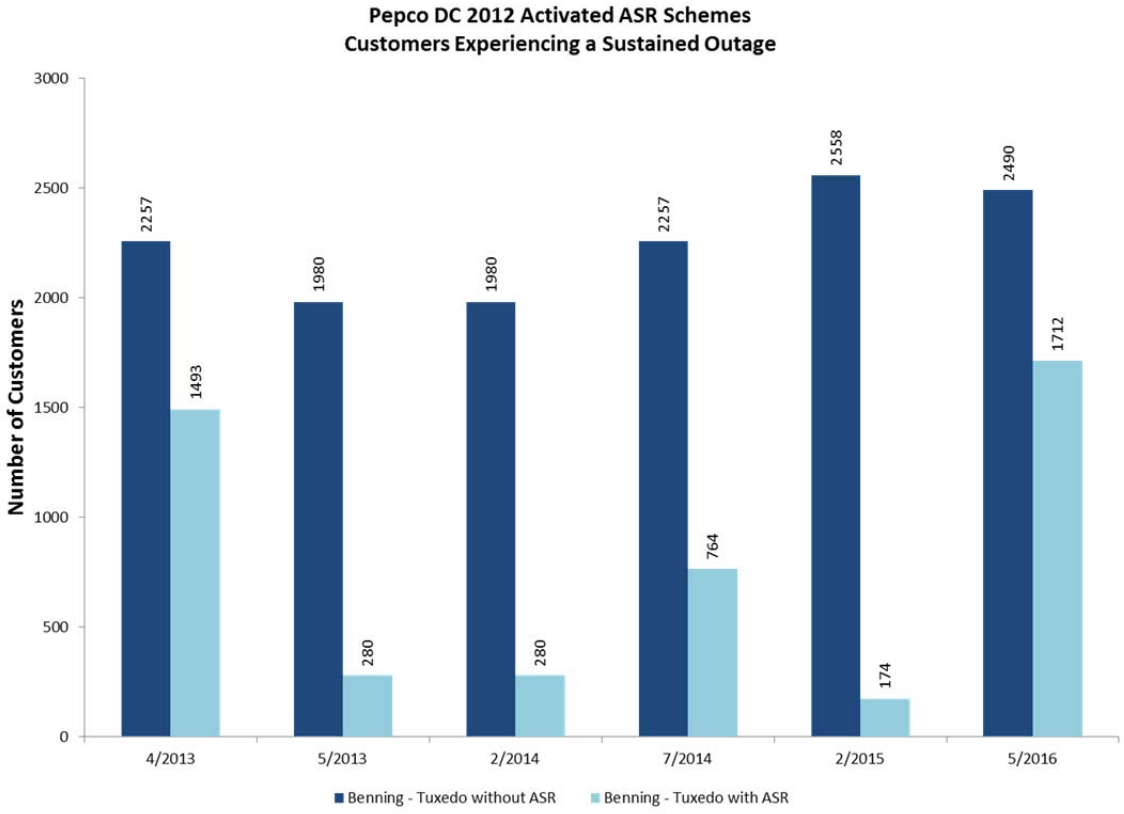
maintenance strategy and the detection of operating conditions that could lead to protector or transformer failure before a failure occurs.

From a maintenance perspective, RMS monitors provide up-to-date data on the operations as well as conditions (such as number of protector operations), which is used to determine when a particular monitored asset will need to be maintained. This performance-based asset maintenance strategy allows Pepco to perform maintenance activities on an as-needed basis and to detect operational issues with a network protector between planned inspection activities.

4.6. Intended Reliability Improvement for ASR Schemes

Benefits of the ASR schemes are based on calculations of outages avoided measured in terms of CI and CMI. For example, without an ASR scheme, customers upstream of a fault would experience an outage when the fault occurs. With an ASR scheme in place, these same upstream customers are automatically switched over to be fed from another source and do not experience an outage when the fault occurs. Thus, for these customers, the benefit of an ASR scheme can be measured in terms of CI and CMI avoided. The forecast of ASR implementation's impact on reliability is included below in Section 8.

Figure 1: District of Columbia 2012 Activated ASR Scheme – Customers Affected[10]



[10] Activations associated with Maryland feeders have been excluded from the Benning-Tuxedo data.

Figure 2: District of Columbia 2012 Activated ASR Scheme – Minutes of Interruptions

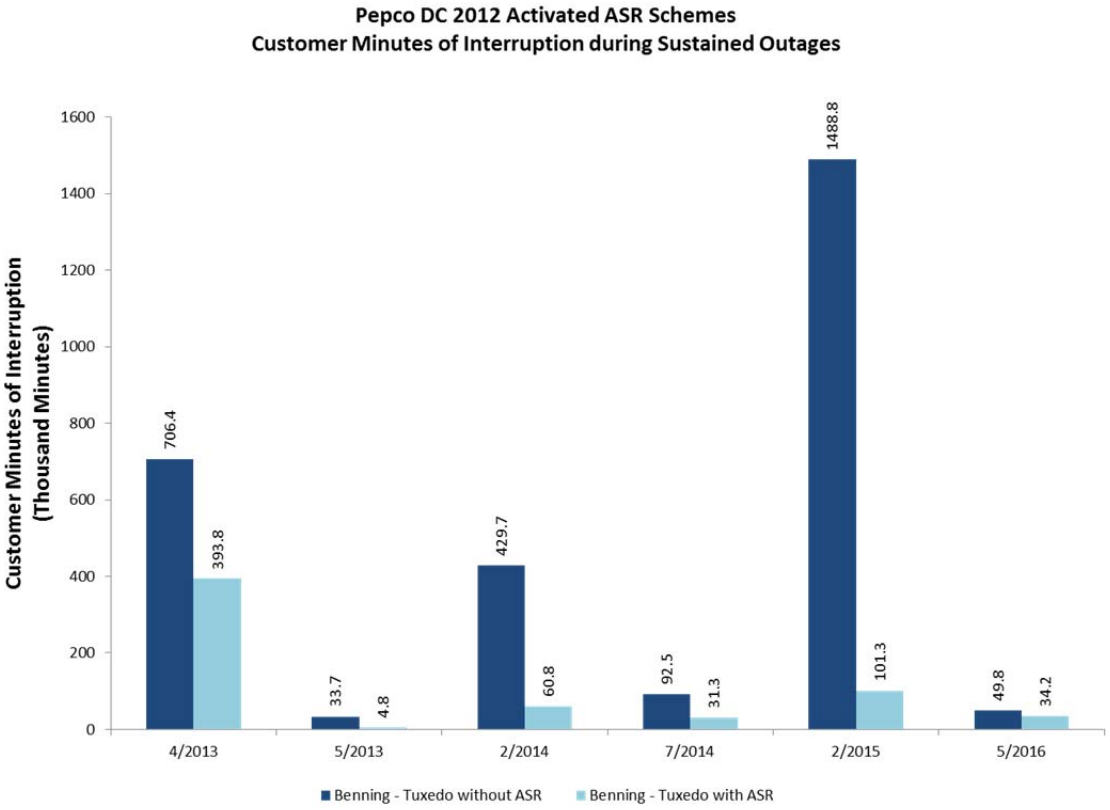


Figure 3: District of Columbia 2013 Activated ASR Scheme – Customers Affected

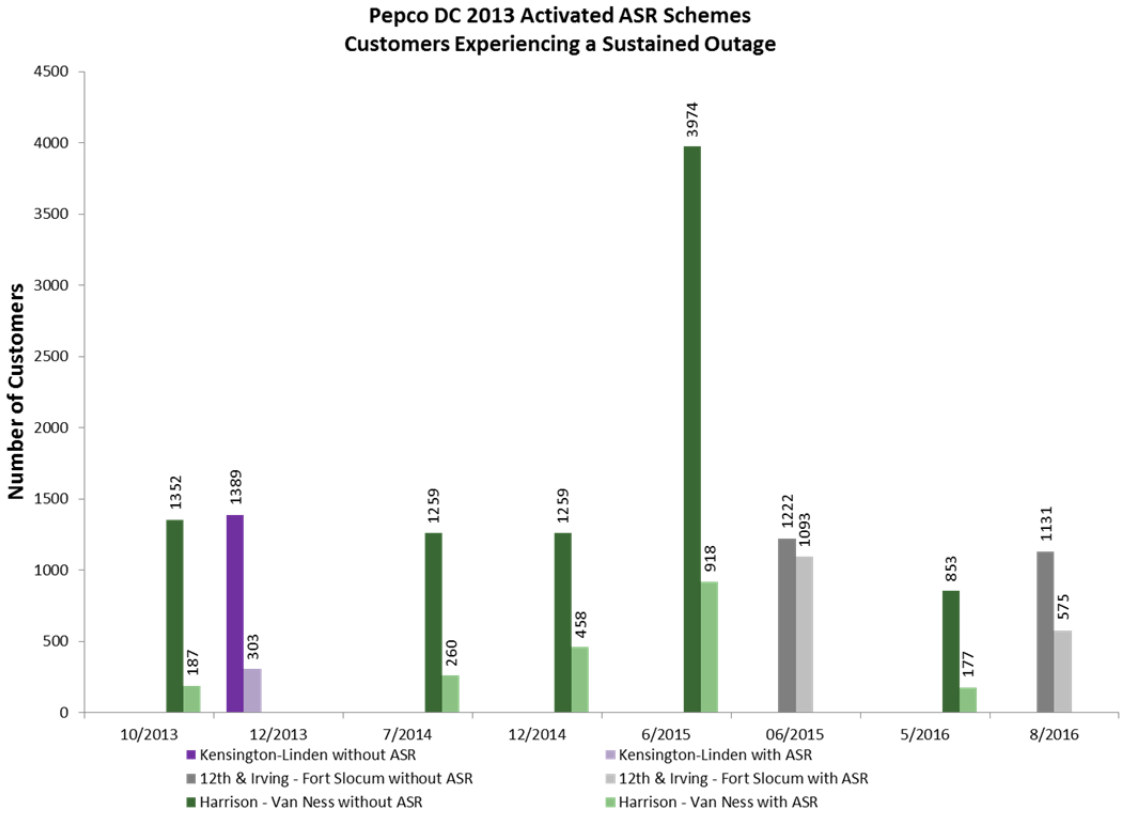
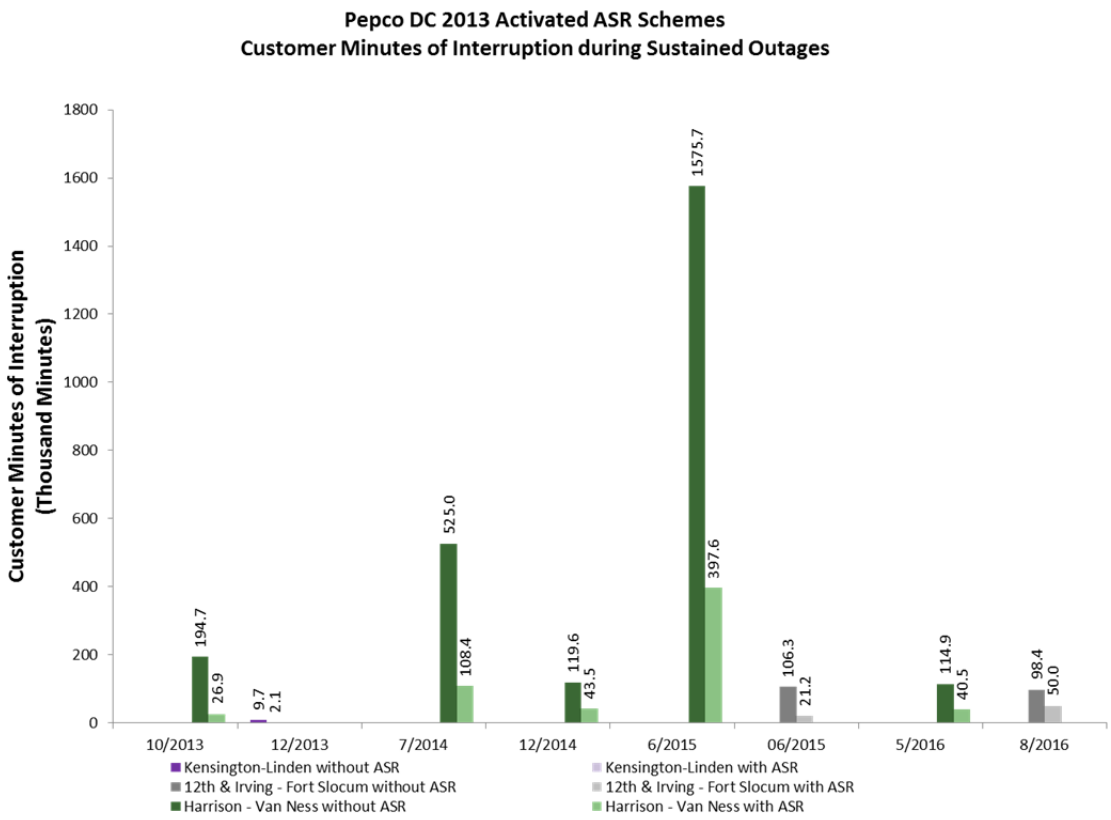


Figure 4: District of Columbia 2013 Activated ASR Scheme – Minutes of Interruption


Pepco DC 2013 Activated ASR Schemes
Customer Minutes of Interruption during Sustained Outages
Customer Minutes of Interruption (Thousand Minutes)
1800
1600
1400
1200
1000
800
600
400
200
0
194.7
26.9
9.7
2.1
525.0
108.4
119.6
43.5
1575.7
397.6
106.3
21.2
114.9
40.5
98.4
50.0
10/2013
12/2013
7/2014
12/2014
6/2015
06/2015
5/2016
8/2016
Kensington-Linden without ASR
Kensington-Linden with ASR
12th & Irving - Fort Slocum without ASR
12th & Irving - Fort Slocum with ASR
Harrison - Van Ness without ASR
Harrison - Van Ness with ASR

5. 4kV to 13kV Conversions

5.1. Overview of Projects

This section covers projects related to the conversion of parts of the distribution system in the District of Columbia from 4kV to 13kV and the maintenance of the remaining 4kV system. While the 4kV system has provided an effective and reliable supply to Pepco customers for many years, the 4kV system is an aging, lower-capacity distribution system supplying power to various neighborhoods in the District of Columbia. This system was once the main system of supply to distribution customers in and around the District of Columbia. However, beginning in the 1970s parts of this system were retired in surrounding Prince George's and Montgomery counties as these areas began growing and becoming more densely populated. Subsequently, beginning in the 1990s, Pepco began retiring portions of the 4kV system in the District of Columbia in areas where there was high growth, where the system was isolated with no backup and where it was determined to be economically beneficial in the longer-term to convert the 4kV to 13kV rather than maintain it by replacing aging infrastructure as it reached its useful end of life. Conversely, portions of the 4kV system, particularly in Northeast and Northwest of the District of Columbia, have maintained reliable operations and substation equipment has been updated and maintained in years past. It is Pepco's plan to maintain these portions of the 4kV distribution system into the future.

Generally, the overhead constructed 4kV system has the greatest potential for continued operation and by replacing substation transformers will continue to provide reliable service. The underground constructed system has little potential for upgrades to prolong the life of the cable system and requires complete replacement and conversion to 13kV operations. These projects are prioritized based on reaching full capacity of the equipment and therefore resulting in a future load project to increase the capacity of the area or based on operational performance the system must be replaced and converted to 13kV operation in order to maintain the reliability of the distribution system serving the customers. In all cases, routine replacement and upgrades are performed until the individual systems are replaced.

While it is Pepco's intention to continue to operate the portions of the 4kV system for as long as feasible given the condition of equipment, portions of the system require replacement in the short-term due to their age and condition. Moreover, portions of the system are sufficient for continued operations, but require incremental investments to improve reliability.

Information regarding the Company's 2017 Work Plan for reliability-driven 4kV conversion projects can be found in Attachment D.

2016 4kV Conversion Work Plan

WBS Element	Project Name	Project Description	2017 Budget $000s
UDSPRD8SD2	150 Twining City T3	Replace Twining City transformer 3 13kV to 4kV 5 MVA with 13kV to 4kV transformer. This transformer was placed in service in 1959 and has seen 56 years of continuous service. The last 3 oil samples have indicated high Relative Saturation (RS) levels.	838
UDLPRGST1	G STREET SUB 28 - CONVERT 4KV LOAD AND RETIRE - Line Work	Work to begin the first phase of the infrastructure upgrades to the existing 4kV system supplied from G St. Sub. 28 in parts of Capitol Hill, Barney's Circle and Navy Yard areas.	5
UDLPRM4WA	Congress Heights Sub. 64 - Convert all 4kV load from Feeder 00178 and 00294	Part of Pepco's long term plan to convert 4kv system to 13kV. This will allow for the retirement of the single supply/single transformer 4kV substation to improve reliability and operational flexibility.	1,500
UDLPRM8BI	Fort Carroll Sub. 130: Convert 4-13kV Conversion	Will facilitate the retirement of Fort Carroll Substation 130 which has deteriorating switch gear.	0
UDLPRM8BT	Georgetown : 4 to 13kv Conver Phs 3-8	Area 2B is the next location identified for conversion and encompasses between P and S St. east of Wisconsin Avenue, NW. 50,000 ft. conduit, 115,000 ft. cable, 8 3-way sws., 3 13/4kV step down trs., replace secondary where needed. Area 3B will begin at the end of 2013 and running into 2014, location is west of Wisconsin Ave and Reservoir St NW. It encompasses 25,000 ft. of conduit, 10,000 ft. of primary cable, 5-13kV step down transformers, and replace secondary as needed.	5,000

WBS Element	Project Name	Project Description	2017 Budget $000s
UDLPRM8BY	Harvard Sub - Convert 4-13 kV	Two 13kV Feeders extended from Florida Avenue Substation 10 in 2011 provide capacity for portion of the conversion and allow load to be transferred to Substation 10 from Substation 13. Existing 13kV Feeders from Substation 13 and new 13kV Feeders from Substation 25 is being used to convert the remaining 4kV load which started in 2014.	6,135
UDLPRM8BC	North Capitol Sub 4-13kV conversion	Initiate infrastructure upgrades to the existing 4kV system in the North Capitol Street., Kennedy Street, and New Hampshire Avenue, NW area. The proposed 4 to 13kV conversions will be accomplished by extending and/or rearranging existing or new overhead 13kV distribution feeders from Fort Slocum Substation 190.	2,401
UDSPRD8RM	Sub. 50 Marine D & R All 4kV Electrical	Project is to raze and demolish substation which is completely de-energized and no longer in service.	0
UDSPRD8AD3	Sub.048 53rd Street T4 Transformer Replacement (Voltage rating 13/4kV, Size:5MVA)	Replace the T4 transformer at 53rd street substation. Transformer is 45 years old and the 2014 Doble tests indicate insulation degradation, therefore, the transformer was identified on the ECA list. Transformer was identified on the ECA list due to high relative saturation (26%) inside the transformer.	0
UDLPRM8BU	Twelfth St Conversions	Convert majority of load to 13kV and install two new 13/4kV, 2000 MVA step-down transformers to supply the remaining 2.0 MVA of 4kV load on Feeders 230, 233, and 370.	4,000
Total Conversions Budget			**19,880**

5.2. Reliability Benefits of 4kV to 13kV Conversions

While the primary purpose of 4kV to 13kV Conversions is to maintain system capacity, replacement of aging, 4kV infrastructure with the new 13kV infrastructure results in improved

reliability. This improvement is difficult to quantify on an individual project basis, therefore the benefits of conversion projects are measured by the number of customers that are planned to be converted each year, and the overall reduction the frequency and duration of outages on 4kV feeders as the aging 4kV infrastructure is converted. There are presently 135 megawatts of 4 kV load on the Pepco system, mostly in the District of Columbia. Over the next ten years, approximately 45 megawatts (including growth) will be converted to 13 kV service. Allowing for load growth, approximately 100 megawatts is projected to remain on the 4 kV distribution system by

2025.

The following table tracks the class of District of Columbia 4kV feeder SAIFI and SAIDI (in minutes) from 2011 to 2016, MSO exclusive, independent of other District of Columbia feeders.

District of Columbia 4kv Feeder Reliability Performance 2011-2016 MSO Exclusive		
Year	**SAIFI**	**SAIDI (minutes)**
2011	1.00	139
2012	0.79	142
2013	0.68	110
2014	0.64	134
2015	0.54	104
2016	0.60	109

6. Emergency Restoration

6.1. Overview of Projects

Projects included in the Emergency Restoration category provide Pepco with the backup equipment and response services required to expeditiously respond to the existence of conditions in which customers are out of service or portions of the electric system are at an unusually high risk due to the distribution system being in a contingency configuration or when temporary repairs exist after a storm or similar event. Outages or risks that would be addressed by these projects may be caused by severe weather, external factors (such as vehicle accidents, dig-ins, or vandalism), or unexpected component failures. When outages occur as a result of these events, the larger grid's reliability is compromised, often requiring emergency replacement of portions of the electric infrastructure.

The 2017 budget for Emergency Restoration is based on historic expenditures and provided in Attachment D. Costs associated with Emergency Restoration are excluded from the Company's spending commitment for the merger, pursuant to Table 3 of Commitment 55.

2016 Emergency Restoration Work Plan

WBS Element	Project Name	Project Description	2017 Budget $000s
UDLPRM3B1	Benning:[11] Emergency Restoration - OH & UG	Blanket project for emergency replacement of distribution equipment damaged as a result of storms, accidents, wear and tear, falling trees/limbs, etc.	8,478
UDSPRD71D	Dist. Sub. Emergency Blanket DC	Blanket project to cover costs during emergencies involving failed substation equipment.	617
UDLPRM32D	Emergency Restoration Primary Cable in Duct: Pepco DC	Blanket project to address cable replacements on an as needed basis.	7,304
UDLPRM3K1	Emergency Restoration: Network Transfs & Protectors	Blanket project for emergency replacement of transformers and protectors.	2,000
Total Emergency Restoration Budget			**18,400**

6.2. Intended Reliability Improvement

Pepco's primary obligation is to serve Pepco customers, manage personnel and public safety, and minimize risk to the system. As a result, replacing failed or damaged equipment is considered the highest priority work, especially when the failure or damage results in customer outages and therefore there is no metric to track these projects. The cost of not performing this work would result in indefinitely extended outages or widespread damage to customer and Pepco equipment and potentially present a hazardous situation. The benefits of these projects include the reduced risk of extended outages as well as the ability to better forecast emergency response budgets. The need to quickly and safely restore power and minimize system risks themselves speak clearly to the necessity of these projects and the Company's obligation to provide a safe and reliable distribution system.

[11] Benning, when shown in a description for a WBS element, denotes the fact that the project is one located in the District of Columbia.

7. DC Power Line Underground Initiative

7.1.1. DC PLUG Overview

Pursuant to the Electric Company Infrastructure Improvement Financing Act of 2014, Pepco and the District of Columbia Department of Transportation (DDOT) submitted to the Commission in June 2014 their first Triennial Underground Infrastructure Improvement Projects Plan for placing certain electric power lines and ancillary facilities underground. The initiative to place these power lines is referred to as the DC PLUG initiative. In total, all or parts of 37 feeders will be placed underground in the first three years. The feeders that will be placed underground are located in Wards 3, 4, 5, 7, and 8. Pepco will place underground the mainline and primary lateral feeders and will leave the secondary lines or service lines overhead.

Pepco's portion of the DC PLUG initiative will be funded by an Underground Project Charge, a separate cost recovery mechanism from the other projects included in this Report. The Underground Project Charge is a non-bypassable surcharge collected by Pepco. A separate funding structure will recover the cost associated with the work to be performed by DDOT. DC PLUG funding is dedicated to the DC PLUG initiative work and has no impact on funds related to other Reliability programs.

While civil construction under the DC PLUG initiative was originally anticipated to begin in 2015, certain legal challenges have caused significant delays and further action is required by the District of Columbia Council to amend the authorizing legislation.

Costs associated with DC PLUG are excluded from the Company's capital reliability spending commitment for the merger, pursuant to Table 3 of Commitment 55.

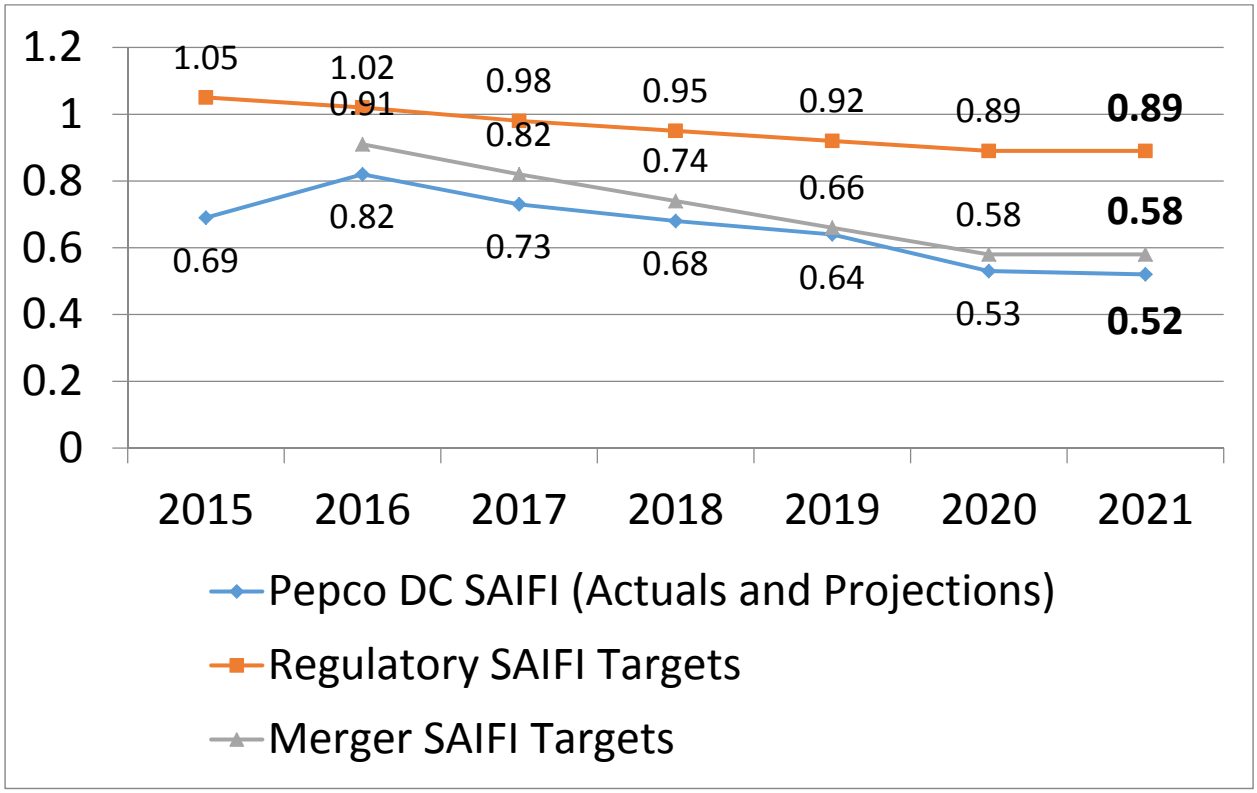
7.2. Intended Reliability Improvement

Due to ongoing legal challenges to DC PLUG, there are no performance metrics currently identified for this program.

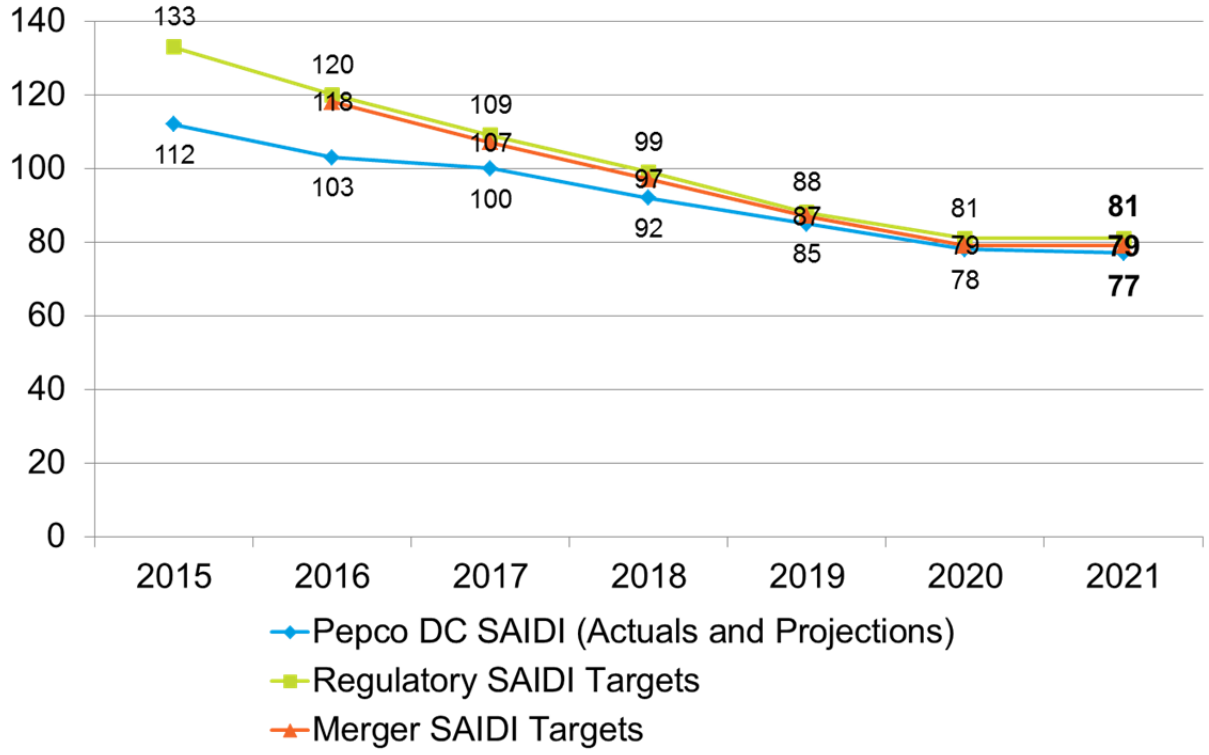
8. Projection of Intended Reliability Improvements

Pepco has employed a statistical modeling approach to project the expected reliability performance of the electric system based on the achievements gain for similar reliability enhancement projects performed during prior years. This method uses historical, observed improvements resulting from feeder improvement and distribution automation projects to project the impacts of planned work in these categories against the regulatory reliability targets as well as the PHI-Exelon Merger Commitments. The forecasted results are illustrated in the tables below, and reflect that the reliability improvement programs modeled over the next five years are generally on track to achieve both EQSS goals and Merger Commitments in 2020. Additional SAIDI (and SAIFI) process improvements may also be needed to assure achievement of the regulatory and Merger Commitment goals towards the end of the five-year period, which is typical when attempting to project out over a five year period for system performance. Pepco plans to re-evaluate the statistical modeling approach to project reliability benefits to ensure that the approach is aligned with Exelon polices to develop reliability projections and is fully committed to comply with its Merger Commitments.

Pepco District of Columbia SAIFI 2015-2016 Actuals, 2017-2021 Forecast

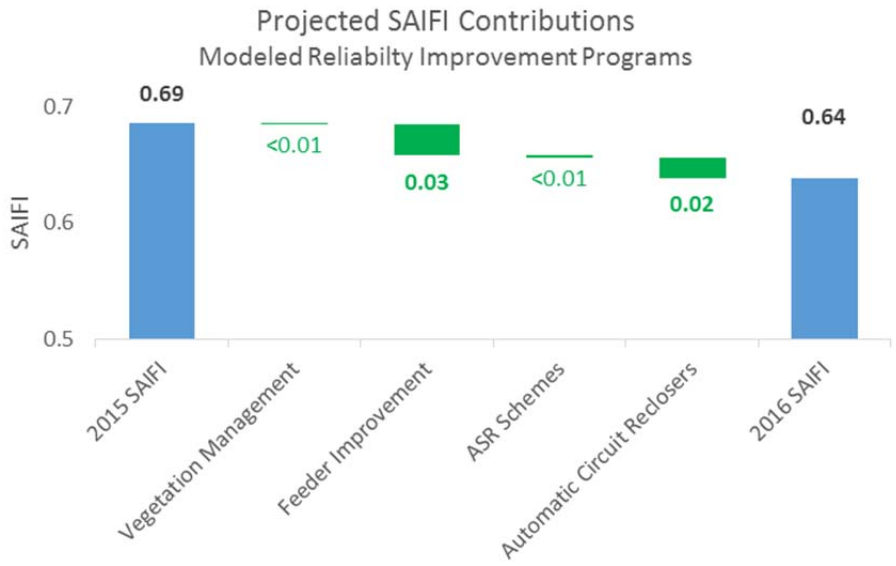


Pepco District of Columbia SAIDI 2015-2016 Actuals, 2017-2021 Forecast

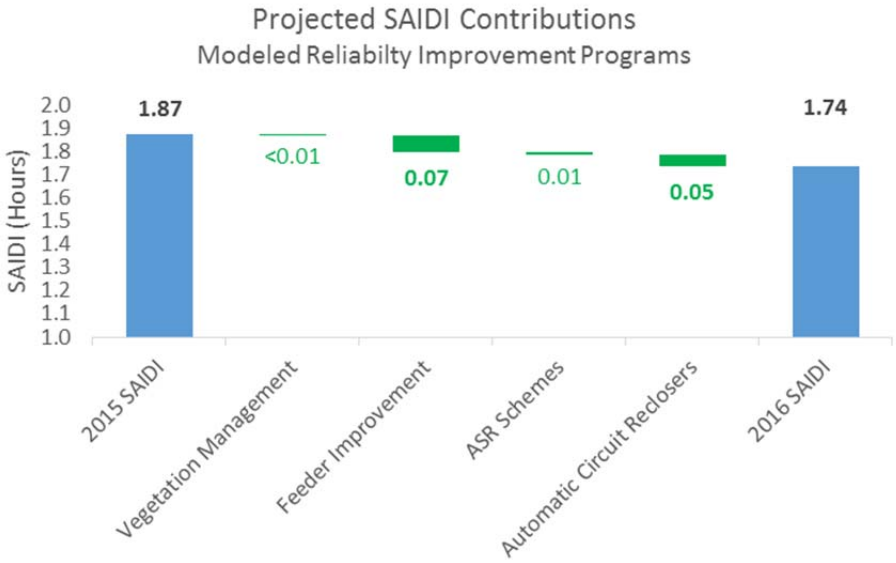


Pepco has continued to refine its methodology for measuring feeder reliability improvements to capture more reliability improvement project categories (such as ACRs, as well as a more comprehensive view of the improvements under the feeder reliability improvement programs), and has developed a method to estimate the SAIFI and SAIDI contributions of each of the reliability improvement programs modeled. See the following figures for the projected improvements to Pepco District of Columbia SAIFI and SAIDI associated with vegetation management work, feeder improvement projects (*i.e.*, improvements done as part of the 2% Priority Performing Feeder Program and Comprehensive Feeder Program), ASR schemes and automatic circuit reclosers scheduled for installation in 2016.

2015-2016 SAIFI Contributions from Modeled Reliability Improvement Initiatives



2015-2016 SAIDI Contributions (in hours) from Modeled Reliability Improvement Initiatives



The statistical approach to project future reliability metrics was not designed to be comprehensive in nature and does not model all feeder reliability initiatives underway. For example, the projects designed to replace aging infrastructure will provide reliability benefits but they are not modelled since the prediction of future failures cannot be based on past performance of the equipment such as cables and switchgear. This model is used to project future performance so that adjustments can be made in future

year reliability programs before required targets are missed. The model is not used to analyze actual reliability performance achieved or the actual performance of individual programs.

Redline

Attachment A

Order No. 18148

Reliability Forecast for 2017

Table of Contents

Introduction

As directed by Order No. 18148 issued by the District of Columbia Public Service Commission ("Commission") in Formal Case No. 1119 on March 23, 2016,[1] Potomac Electric Power Company ("Pepco" or the "Company") submits its forecast of planned reliability work for the year 2017. The Company has planned this work to achieve the reliability performance levels required by Commitment 54 of Order No. 18148. Commitment 56 (d) of Order No. 18148 provides as follows:

> *No later than six (6) months after the close of the Merger, Pepco shall file with the Commission a report which includes a forecast of planned reliability-related work for that calendar year, including at a minimum the general project descriptions, locations, and associated reliability-related capital and O&M spending. The project description should denote the intended improvements to outage duration, frequency, or some other reliability metric. The filed forecast shall serve as a baseline comparison for the June 30, 2021 Company report on actual reliability-related expenditures, but shall not prompt Commission approval, denial, or other action in advance of the report. By April 1 of each subsequent calendar year through 2019, Pepco shall file the same information as part of its Annual Consolidated Report. Receipt of the forecast shall not constitute an endorsement by the Commission of the prudence of the expenditures.*

This report provides details on Pepco's 2017 planned projects for the following operations and maintenance ("O&M") and capital reliability categories:

1. Vegetation Management ("VM");
2. Scheduled and Preventive Maintenance;
3. Feeder and Substation Reliability Improvement;
4. Distribution Automation ("DA");
5. 4kV to 13kV Conversions;
6. Emergency Restoration; and
7. DC PLUG.

The projects within these categories are necessary to provide safe and reliable electric service to customers in the District of Columbia. As structured in the report, each category includes

[1] Order No. 18148, *In The Matter of the Joint Application of Exelon Corporation, Pepco Holdings, Inc., Potomac Electric Power Company, Exelon Energy Delivery Company, LLC and New Special Purpose Entity, LLC for Authorization and Approval of Proposed Merger Transaction*, Formal Case No. 1119, at P 1 (March 23, 2016) ("Merger Order"). The Commission subsequently issued Order No. 18160 (April 4, 2016) correcting certain errors in the Merger Order and in Attachment B to the Merger Order (the "Merger Commitments"). References herein to the Merger Order and the Merger Commitments are to Order No. 18148 and Attachment B to Order No. 18148, respectively, as corrected by Order No. 18160.

a description of the associated projects for 2017, the respective budget, and the location of the work to be done for planned activities. Identifying information for capital projects also includes the Work Breakdown Structure ("WBS") number, which is the number that the Company uses for organization and scheduling of proposed projects. Where applicable, the category's historical reliability performance is provided in addition to the reliability improvement metric used to track each category of projects. In addition, where applicable, the System Average Interruption Frequency Index ("SAIFI") and System Average Interruption Duration Index ("SAIDI") that the Company expects to achieve from the upcoming work has been included to reflect the overall modelled benefits expected to be realized.

The report includes the Company's overall expected reliability improvements for District of Columbia customers based on reliability improvements associated with vegetation management work, feeder improvement projects (*i.e.*, improvements done as part of the 2% Priority Performing Feeder Program and Comprehensive Feeder Program), Automatic Sectionalizing and Restoration ("ASR") schemes and automatic circuit reclosers ("ACRs"), in the aggregate.

Pepco District of Columbia Reliability Program

2017 Work Plan Summary

Organized by project category, the following table provides a general description, performance metric, and O&M and capital dollars planned for the year 2017. This table contains identifying information for each District of Columbia project organized by project category: (1) VM; (2) Scheduled and Preventive Maintenance; (3) Feeder and Substation Reliability Improvement; (4) DA; (5) 4kv to 13kV Conversions; (6) Emergency Restoration; (7) DC PLUG; and (8) Other Miscellaneous projects. The budget amounts set forth below are the current budget levels, all of which are within the annual capital and O&M reliability spending levels as set forth in Commitment 55 of Order No. 18148. The "Distribution Reliability net of DCPLUG Expenditures" budget set forth in Table 3 of Commitment 55 is reflected in the sum of the budgets for Feeder and Substation Reliability Improvement, DA, and 4kv to 13kV Conversions set forth below. In addition, the Scheduled and Preventative Maintenance category in the table below corresponds to the "Distribution System Planned Scheduled Maint DC and MD" budget set forth in Table 4 of Commitment 55.

Work Plan Summary

Project Name	Project Description	Performance Metric	2017 Budget $000s
Vegetation Management	Program to address vegetation, designed to maintain appropriate clearance on the system, remediate trouble spots (*e.g.*, Priority Feeders), and remove the vegetation hazards that have the greatest impact on system reliability.	Annual tree related SAIFI/SAIDI performance for all feeders.	$2,413
Scheduled and Preventative Maintenance	Program designed to maintain equipment in operable condition.	Inspections planned versus inspections completed and priority conditions identified addressed in a timely manner.	19,281
Total O&M Reliability Budget			$21,694
Feeder Reliability Improvement (including Priority Feeders, URD Cable Replacement and Other Feeder Reliability)	Program to address equipment, vegetation, weather, and animal-related interruptions which negatively impact reliability performance. These projects involve installing, removing, and replacing reclosers, switches, conductors, animal guards, lightning arresters and other equipment deemed necessary on the 2% Priority and Comprehensive Feeders (top SAIFI contributing, and high customer interruption feeders) to maintain safe operation and improve reliability. URD Cable replacement involves replacing or rejuvenating cable in order to minimize failures.	Annual cumulative SAIFI/SAIDI performance for the group of feeders included within the annual feeder improvement program. URD Cable Replacement performance is further measured by tracking the trend in URD cable failures. Equipment failure rates and equipment failure SAIDI/SAIFI.	$33,79633,046
Substation Reliability Improvement	Program to proactively retire and replace aging or damaged substation equipment and support upgrades to improve substation reliability.	Operate substations within design loading criteria.	24,770 23,521
Distribution Automation	Program to address system reliability by deploying system automation technology. These projects involve installing advanced control systems across the distribution system in order to automatically identify and isolate faults in real time and restore service to customers in the unaffected parts of the system.	Performance metric tracks the number of installed devices relative to the planned number of devices scheduled to be installed. In addition an evaluation is performed that compares the number of customers interruptions per event compared to potential customer interruptions without automation device installed.	17,22816,580
4kV to 13kV Conversions	This program involves upgrading aging 4kV feeders in order to reliably supply customers and support increased usage required by existing customers. Conversion projects improve reliability by replacing aging 4kV infrastructure. These projects are performed on feeders where the 4kV feeders are experiencing little or no growth however due to the operational condition of the equipment the feeders need to be converted to improved system performance and reliability.	Performance metric monitors the completion of conversion work by tracking the number of customers scheduled to be converted to 13 kV supply compared to actual number of customers converted.	19,88075
Emergency Restoration	Blanket projects to restore electric plant damaged by storms, struck poles, dig-ins and miscellaneous component failures.	N/A	18,400
DC PLUG	Initiative for placing certain electric power lines and ancillary facilities underground	N/A	2,410
Other Miscellaneous	Projects including security, miscellaneous equipment replacement, accruals and salvage for scrap wire/cable.[2]	N/A	6743,328
Total Pepco District of Columbia Distribution Capital Reliability Budget			$114,422117,158
***Scheduled Maintenance includes total Pepco System (D.C. & Maryland)**			

[2] This is not a project category; these projects indirectly support reliability projects and are not discussed in the body of this report.

1. Vegetation Management

1.1. Vegetation Management Overview

Pepco's VM program consists of several components designed to manage vegetation that have the potential for the greatest impact on system reliability. Pepco's VM program in the District of Columbia includes a comprehensive inspection by an International Society of Arboriculture ("ISA") Certified Arborist to develop a work plan for each feeder on a two-year cycle in accordance with guidelines established in conjunction with the District of Columbia's Urban Forestry Administration ("UFA") and American National Standards Institute ("ANSI") standards, and ISA Best Management Practices ("BMPs"). The main objectives that the VM program attempts to balance are safety, reliability, regulatory compliance, environmental stewardship, and customer satisfaction. Pepco's VM program includes all activities from tree pruning through tree removal, as appropriate, to reduce vegetation caused outages. Pepco's scheduled VM work is conducted on a two-year cycle.

Pepco also performs VM work on feeders in conjunction with other planned reliability program work and feeder expansion projects in order to provide clearance to equipment being installed or upgraded. When capital work coincides with two-year cyclical pruning under the VM program, the routine VM work is performed in the areas of the feeder not already cleared during the capital-related work in order to complete VM work on the entire feeder. VM work performed in conjunction with capital work is performed under Pepco's capital budget associated with the installation of new distribution line equipment and is not included in O&M expenses. For 2017, Pepco has budgeted $2.413 million in O&M for VM work.

The following table provides the list of feeders for the Company's 2017 VM Work Plan, which was also filed February 15, 2017, under Formal Case No. 1087 and Docket PEPVMWPR.

Pepco District of Columbia 2017 Vegetation Management Plan

Feeder	Voltage Class	Description/Location
52	4kV	Palisades
56	4kV	Anacostia
57	4kV	Georgetown
58	4kV	Georgetown
60	4kV	Observatory Circle
63	4kV	Woodley
64	4kV	Kent/Spring Valley/Wesley Heights
65	4kV	Chevy Chase/Forest Hills/North Cleveland Park/Wakefield
66	4kV	Columbia Heights
75	4kV	American University
82	4kV	Chevy Chase/Forest Hills/North Cleveland Park/Wakefield
87	4kV	American University/Cleveland Park/Observatory Circle
96	4kV	Bolling Air Force Base
97	4kV	Deanwood/Fort Dupont Park
101	4kV	Cleveland Park/North Cleveland Park/Observatory Circle
102	4kV	North Cleveland Park/Wakefield
119	4kV	Congress Heights
120	4kV	Congress Heights
128	4kV	Chevy Chase
144	4kV	American University/Kent/Spring Valley
164	4kV	Congress Heights
165	4kV	Congress Heights
167	4kV	Deanwood/Fort Dupont Park
177	4kV	Anacostia
178	4kV	Congress Heights
181	4kV	Berkley/Kent/Palisades
183	4kV	Congress Heights
199	4kV	Observatory Circle
205	4kV	Deanwood
292	4kV	Fort Drive/Kent/Spring Valley
294	4kV	Congress Heights
309	4kV	Cleveland Park/North Cleveland Park
323	4kV	Congress Heights
324	4kV	Congress Heights

Feeder	Voltage Class	Description/Location
329	4kV	Congress Heights
333	4kV	Congress Heights
366	4kV	Deanwood/Marshal Heights
372	4kV	Deanwood/Marshal Heights
394	4kV	American University
467	4kV	Chevy Chase
14005	13kV	Fort Lincoln/Woodridge
14006	13kV	Brookland/Woodridge/Brookland
14007	13kV	Brookland/Michigan Park/Brookland
14008	13kV	Brentwood/Woodridge
14009	13kV	Brookland/Eckington
14014	13kV	Brookland/Woodridge
14015	13kV	Brookland/Michigan Park/Brookland/Riggs Park
14016	13kV	Brentwood/Fort Lincoln/National Arboretum/Woodridge
14017	13kV	Brookland
14019	13kV	Brentwood/Brookland/Eckington/Woodridge
14020	13kV	Brentwood/Brookland/Eckington/Woodridge/RLA NE/Woodridge
14021	13kV	Brentwood/Brookland/Eckington/National Arboretum/Woodridge
14023	13kV	Brentwood/Brookland/Eckington
14054	13kV	Columbia Heights
14055	13kV	Deanwood/Marshall Heights
14058	13kV	Deanwood/Marshall Heights/Lily Ponds
14093	13kV	Brentwood/Brookland/National Arboretum/Woodridge
14132	13kV	American University/Cleveland Park/Glover Archbold Parkway/Glover Park/Spring Valley/Wesley Heights
14133	13kV	Forst Hills/North Cleveland Park/Rock Creek Park 1
14134	13kV	Garfield/National Zoologic Park/North Cleveland Park
14135	13kV	Chevy Chase
14136	13kV	Cleveland Park/Glover Park/North Cleveland Park/Observatory Circle/
14139	13kV	Cleveland Park/North Cleveland Park
14140	13kV	Cleveland Park/North Cleveland Park
14145	13kV	Cleveland Park/North Cleveland Park
14146	13kV	Garfield/Massachusetts Avenue Heights/Observatory Circle/Rock Creek Park 1/ Woodley
14150	13kV	Cleveland Park
14159	13kV	Deanwood

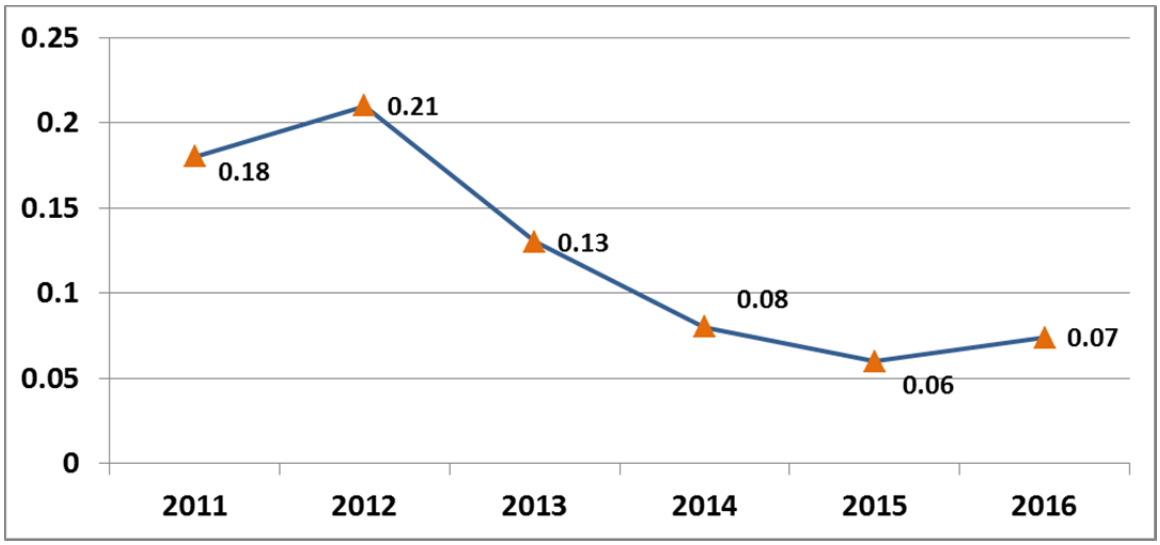
Feeder	Voltage Class	Description/Location
14200	13kV	Ledroit Park
14261	13kV	Hillcrest
14700	13kV	Anacostia/Barry Farms/Hillcrest/Randle Heights
14701	13kV	Anacostia/Barry Farms/Bolling Airforce Base/Congress Heights/St. Elizabeths Hospital
14702	13kV	Anacostia/Barry Farms/Hillcrest/Randle Heights
14703	13kV	Anacostia/Barry Farms/Hillcrest/Randle Heights
14707	13kV	Randle Heights
14709	13kV	Randle Heights
14713	13kV	DC Stadium/Old City 1/Trinidad
14716	13kV	Deanwood/For Dupont Park/Hillcrest
14717	13kV	DC Studium/Deanwood/Lily Ponds
14718	13kV	Anacostia/Randle Heights
14719	13kV	Randle Heights
14732	13kV	Columbia Heights/Mt Pleasant/National Zoological Park
14752	13kV	Congress Heights
14753	13kV	Congress Heights/DC Village
14755	13kV	Congress Heights
14756	13kV	Congress Heights
14758	13kV	Congress Heights/DC Village
14765	13kV	Berkely,/Palisades/Foxhall
14766	13kV	American University/Spring Valley
14767	13kV	Berkley/Fort Drive/Kent/Palisades/Wesley Heights
14768	13kV	Spring Valley
14806	13kV	Hillcrest/Lily Ponds
14808	13kV	Deanwood
14809	13kV	Deanwood/Marshall Heights
14811	13kV	Marshall Heights
14812	13kV	Fort Dupont Park
14813	13kV	Deanwood
15166	13kV	Randle Heights
15171	13kV	Congress Heights/Randle Heights
15175	13kV	Congress Heights
15198	13kV	Riggs Park

1.2. Intended Reliability Benefits for VM

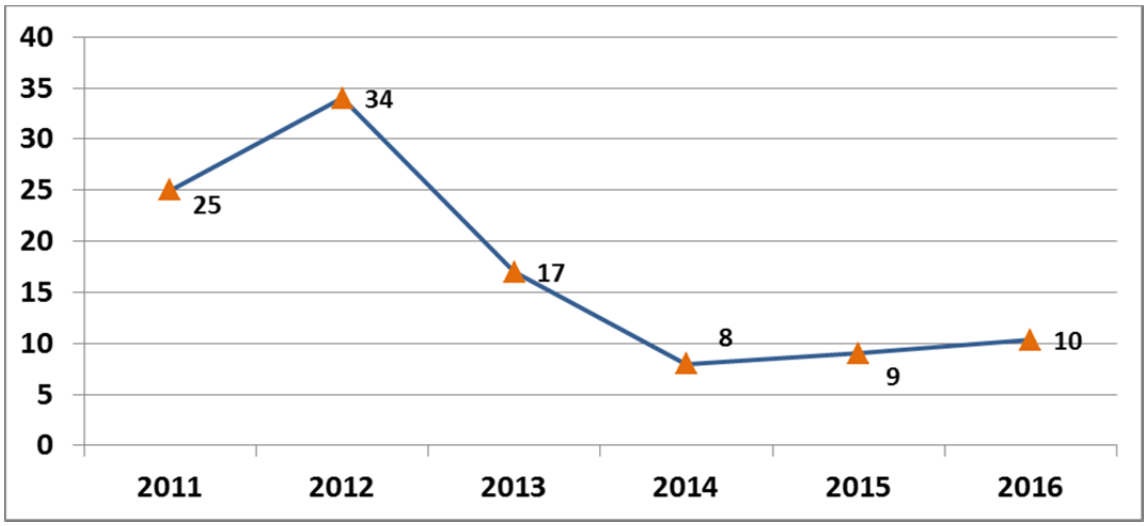
Pepco tracks the District of Columbia System Tree SAIFI and SAIDI to measure the effectiveness of VM. Tree SAIFI and SAIDI measures the level of vegetation-caused outages. The following figures present data showing the System Tree SAIFI and SAIDI (in minutes) for the Pepco District of Columbia service territory for 2012 to 2016, based on the Major Service Outage ("MSO") exclusion criteria. The forecast of VM work impact on reliability is included below in Section 8.

Historical Tree Related SAIFI in the District of Columbia,

Excluding Major Service Outages



Historical Tree Related SAIDI in the District of Columbia,
Excluding Major Service Outages



2. Scheduled and Preventive Maintenance

2.1. Scheduled and Preventive Maintenance Program Overview

The scheduled and preventive maintenance of substation and line equipment is intended to prevent equipment failures. For example, substation transformers, breakers, battery systems, protective relays, capacitor banks and switchgear undergo routine diagnostic testing and inspection to ensure this equipment remains in proper working condition and to identify equipment that has reached the end of its useful life. Failure of substation equipment could cause outages for multiple feeders and thousands of customers served by that substation.

The testing and inspection for substation transformers, breakers, capacitor banks and switchgear includes, but is not limited to: diagnostic testing, infrared scans, inspecting and/or cleaning transformer cooler equipment, assessing equipment condition and connections, checking for leaks, lubricating appropriate components, and performing operational or functional checks.

The maintenance program for substation equipment also includes periodic (*e.g.*, monthly or bi-monthly) inspection of other substation equipment and facilities. These inspections are focused on verifying the integrity of the substation facility and installed equipment, along with identifying incipient conditions that may require follow-up corrective maintenance.

There is also a preventive maintenance program for distribution line assets. Preventive maintenance of distribution line assets includes inspections which evaluate asset condition and verify that certain critical equipment (*e.g.*, reclosers) will operate as designed. It also includes, but is not limited to, inspection of overhead circuits, reclosers, capacitor banks, padmounted equipment and underground assets, such as manholes and network transformers. Similar to substation equipment, the objective is to ensure reliable service to customers.

2.1.1. Overhead Feeder Inspection Program

The Overhead Feeder Inspection Program in the District of Columbia will complete its current 2-year cycle in 2017. The table below shows the feeders to be inspected as part of the Overhead Feeder Inspection Program in 2017.

2017 Pepco District of Columbia Overhead Feeder Inspection Plan		
Feeder Number	**Neighborhood(s)**	**Substation**
14005	Fort Lincoln/Woodridge	12th Irving
14006	Brookland/Woodridge	12th Irving
14007	Brookland/Woodbridge/Michigan Park	12th Irving
14008	Brookland/Woodridge	12th Irving
14009	Brookland/Eckington	12th Irving
14014	Brookland/Woodridge	12th Irving
14015	Brookland/Riggs Park/Michigan Park	12th Irving
14016	Brentwood/Fort Lincoln/National	12th Irving

2017 Pepco District of Columbia Overhead Feeder Inspection Plan		
Feeder Number	**Neighborhood(s)**	**Substation**
	Arboretum/Woodridge	
14017	Brookland	12th Irving
14019	Eckington/Woodridge	12th Irving
14020	Brentwood/Brookland/Eckington/Woodridge	12th Irving
14021	Brentwood/Brookland/Eckington/National Arboretum/Woodridge	12th Irving
14023	Brentwood/Brookland/Eckington	12th Irving
14093	Brentwood/Brookland/National Arboretum/Woodridge	12th Irving
14200	Brookland/Ledroit Park	12th Irving
335	Congress Heights	23rd Street
365	Marshall Heights	53rd Street
367	Deanwood/Marshall Heights	53rd Street
368	Fort Dupont Park/Marshall Heights	53rd Street
369	Deanwood/Marshall Heights	53rd Street
383	Marshall Heights	53rd Street
385	Fort Dupont Park	53rd Street
386	Fort Dupont Park/Marshall Heights	53rd Street
387	Fort Dupont Park/Marshall Heights	53rd Street
388	Deanwood/Marshall Heights	53rd Street
15166	Randle Heights/St. Elizabeth's Hospital	Alabama Ave.
15170	Barry Farms/Hillcrest/Randle Heights	Alabama Ave.
15171	Congress Heights/Randle Heights	Alabama Ave.
15172	Barry Farms/Randle Heights/St. Elizabeth's Hospital	Alabama Ave.
15174	Randle Heights	Alabama Ave.
15175	St. Elizabeth's Hospital	Alabama Ave.
14700	Anacostia/Hillcrest/Randle Heights	Anacostia
14701	Anacostia/Barry Farms/Bolling Air Force Base/Congress Heights/ St. Elizabeth's Hospital	Anacostia
14702	Anacostia/Barry Farms/Hillcrest/Randle Heights	Anacostia
14703	Anacostia/Barry Farms	Anacostia
14709	Anacostia/Randle Heights	Anacostia
56	Anacostia/Barry Farms	Anacostia
96	Barry Farms/Bolling Air Force Base	Anacostia
126	Barry Farms/Congress Heights/St. Elizabeth's Hospital	Anacostia
177	Anacostia	Anacostia
364	Congress Heights/St. Elizabeth's Hospital	Anacostia
14055	Deanwood/Marshall Heights	Benning
14159	Deanwood	Benning
14713	DC Stadium/Old City 1	Benning
14716	Deanwood/Fort Dupont Park/Hillcrest	Benning
14717	DC Stadium/Deanwood/Lily Ponds	Benning
14806	Hillcrest/Lily Ponds	Benning
14813	Deanwood	Benning
15701	Brentwood/Old City 1/Trinidad	Benning
15702	Capitol Hill/National Arboretum/Old City 1/Trinidad	Benning
15705	DC Stadium/Deanwood/Lily Ponds	Benning
15706	Deanwood/Fort Dupont Park/Marshall Heights	Benning
15707	Deanwood	Benning
15709	Deanwood/Fort Dupont Park	Benning
15710	Fort Dupont Park/Lily Ponds	Benning
15755	Old City 1/RLA SW	Buzzard
15756	Old City 1/RLA SW	Buzzard
119	Congress Heights	Chesapeake

2017 Pepco District of Columbia Overhead Feeder Inspection Plan		
Feeder Number	**Neighborhood(s)**	**Substation**
120	Congress Heights	Chesapeake
164	Congress Heights	Chesapeake
165	Congress Heights	Chesapeake
183	Congress Heights	Chesapeake
323	Congress Heights	Chesapeake
324	Congress Heights	Chesapeake
329	Congress Heights	Chesapeake
333	Congress Heights	Chesapeake
178	Congress Heights	Congress Heights
294	Congress Heights	Congress Heights
332	St. Elizabeth's Hospital	Congress Heights
343	Congress Heights	Congress Heights
411	Congress Heights/Randle Heights	Congress Heights
480	Randle Heights	Congress Heights
97	Deanwood/Fort Dupont Park	Fort Chaplin
167	Deanwood/Fort Dupont Park	Fort Chaplin
205	Deanwood	Fort Chaplin
244	Hillcrest	Fort Davis
451	Fort Dupont Park	Fort Davis
327	Fort Dupont Park	Fort DuPont
328	Fort Dupont Park	Fort DuPont
381	Hillcrest/Fort Dupont Park	Fort DuPont
15001	Crestwood/Rock Creek Park 2	Fort Slocum
15006	16th Street Heights/Petworth	Fort Slocum
15007	Brightwood/Shepherd Park	Fort Slocum
15008	Brightwood/Shepherd Park t	Fort Slocum
15009	Brightwood/Chillum	Fort Slocum
15010	16th Street Heights/Brightwood/Rock Creek Park 2	Fort Slocum
15011	16th Street Heights/Brightwood/Rock Creek Park 2	Fort Slocum
15012	Chillum/Columbia Heights/Petworth	Fort Slocum
15013	Brookland/Chillum	Fort Slocum
15014	Brookland/Chillum/Riggs Park/Takoma	Fort Slocum
15015	16th Street Heights/Columbia Heights	Fort Slocum
15016	Brookland/Chillum/Riggs Park	Fort Slocum
15021	Brightwood/Chillum/Petworth/Shepherd Park	Fort Slocum
15197	16th Street Heights/Brightwood/Columbia Heights/Crestwood/Petworth/Rock Creek Park 2	Fort Slocum

2.1.2. Manhole Inspection Program

Pepco inspects over 60,000 manholes in the District of Columbia during each six-year cycle. The third cycle of the manhole inspection program, which began in the second quarter of 2013, is currently underway. In 2016, Pepco will be performing manhole inspections in Georgetown, the vicinity of H Street NE corridor and 14th St, NW corridor, southern 12th St, NW corridor, as well as the manholes associated with 2017 Priority Feeders.

2.1.3. Network Transformer Inspection Program

The majority of network transformers are typically inspected on a three-year cycle, which alternates between external inspections and internal inspections. The external inspections review transformers for overall appearance, oil levels, temperature, primary condition, secondary bushing and cable appearance, fuse appearance, breaker open or closed, purges the protector housing, checks the phasing cable, and assesses and records corrosion level and anodes. The internal inspections review a similar list of equipment, and in addition obtain an oil sample for dialectric breakdown, check interior housing and equipment, and inspect the protector mechanism.

2.1.4. Other Inspection Programs

Pepco performs numerous other inspection programs in the District of Columbia. The following table describes these other programs and their frequencies:

Equipment Class	General Description	General Inspection Cycle
Breaker	Both external and intrusive inspections of air, oil and vacuum breakers	6 to 8 year cycle
Cable	Inclusive of all cathodic protection test; oil consoles test, oil pressure readings, spotlight alarm testing of gas/oil filled feeders distribution; gas route testing; and cable electrical testing.	0.5 to 5 year cycle
Regulator	Overhead regulator inspection and repair program.	2 to 6 year cycle
Relay	Relay routine inspections	4 to 6 year cycle
Reliability	2% priority feeder program; Overhead Customer Voltage complaints testing; overhead load testing and thermovision.	1 year cycle
Substation	Oil sampling from transformer main tank, LTC and Oil circuit breakers; battery testing; station generation; fire pump inspections; cooler cleaning of transformers; and ground maintenance.	0.25 to 1 year cycle
Switch	OH Switch/Recloser PM from Inspections.	1 to 6 year cycle
Transformer	Transformers, LTC Routine & Testing (Intrusive); XFR Main Tank Inspection/Test; Underground Trans Insp (Subsurface); OH Transformer Insp and Nitrogen runs.	1 to 5 year cycle
URD Equipment	URD Padmounted Eq Insp and Pad/Subsurface Equipment Inspection	4 to 6 year cycle

2.2. Scheduled and Preventive Maintenance Reliability Benefits

The work conducted in Pepco's Scheduled and Preventive Maintenance Program leads to an avoidance of future outages. Failure to address this work will result in power quality issues or shorten equipment life, which ultimately may result in outages, reducing Pepco's overall service reliability and increasing the number of outages for our customers. Therefore, prevention of these outages through proper inspection and maintenance is critical to maintaining a reliable electric system. Since this program serves to prevent future outages from occurring, there are no reliability metrics that measure outage avoidance. Inspection programs performance is therefore measured by the number of inspections completed on schedule, and Priority Conditions identified and remediated in a timely manner. Pepco budgets Scheduled and Preventive Maintenance on a total system basis, which includes the Company's Maryland service territory. The total Pepco O&M budget for Scheduled and Preventive Maintenance for 2017 is approximately $19 million.

3. Feeder and Substation Reliability Improvement

3.1. Overview of Feeder Projects

There are three categories of projects captured under Feeder Reliability – Priority and Comprehensive Feeder Improvement, Underground Residential Cable ("URD") and Other Feeder Improvement. The projects within these three categories are described in more detail within this section.

3.2. Priority and Comprehensive Feeder Improvement

The Priority and Comprehensive Feeder Improvements are a reliability performance-based feeder group consisting of projects designed to address feeder reliability in response to historic performance in order to improve reliability. These projects are planned in nature and are primarily driven by the recent past performance of a feeder. The focus of these projects is to improve the performance of each feeder identified for corrective actions. The 2017 budget for these programs is reflected ~~in Attachment D~~below.

WBS Element	Project Name	Project Description	2017 Budget $000s
Priority/Comprehensive Feeder Improvement			
UDLPRM4BF	PSC Priority Circuit Improvement: Benning[3]	Address least reliable 2% of feeders over the past year as required by the PSC.	$4,800
UDLPRM63D	Pepco DC: Comprehensive Feeder Reliability Improvements	Programmatic remediation of least reliable feeders not being addressed under the PSC Priority Circuit Improvement program.	2,313
Total Priority/Comprehensive Feeder Improvement Budget			**$7,113**

In the case of performance-based selection criteria, historic outage data are collected from the Outage Management System ("OMS") for analysis. These data are used to compute reliability indices such as SAIFI and SAIDI for the distribution system. The indices serve as an indicator of a system's overall performance over time and allow comparison of the relative impacts that feeder improvement projects have on overall system reliability indices. Those feeders displaying the historic performance that most affects the system reliability indices are selected for reliability

[3] Benning, when shown in a description for a WBS element, denotes the fact that the project is one located in the District of Columbia.

improvement projects.

3.2.1. Priority Feeder Program

Under present Commission regulations, Pepco is required to evaluation the 2% lowest performing feeders for remediation.[4] Pepco conducts annual system performance reviews of its 773 distribution feeders in the District of Columbia by first ranking these feeders from the most reliable to the least reliable using the System Performance Contribution ("SPC") method. The SPC value for each feeder is calculated by adding 75% of the SAIFI contribution to the system and 25% of the SAIDI contribution to the system.[5] Feeders whose SAIFI is less than 2.0, have experienced less than 10 interruptions over the past year, or where data anomalies are identified, are not included in the ranking. Pepco selects a total of 16 feeders, which accounts for approximately 2% of the Company's District of Columbia feeders, based on their SPC value across its service territory.

The 2017 Priority feeders are shown in the table below.

2017 2% Priority Feeders

Feeder	Location
14755	Bellevue
14758	Bellevue
14717	Deanwood, Burrville, and Mahaning Heights
14702	Woodland
14014	Brentwood, Langdon, and Brookland
15705	Eastland Gardens
15085	Congress Heights, Shipley Terrace, and Washington Highlands
14009	Capitol Hill, Lincoln Park

[4] See 15 DCMR *§§* 3603.1 -3603.6 (2012).

[5] SPC = 75% x (Feeder CI / System CI) + 25% x (Feeder CMI / System CMI),
Where:
Feeder CI = Customer Interruptions of the feeder
System CI = Customer Interruptions of the total system
Feeder CMI = Customer Minutes of Interruption of the feeder
System CMI = Customer Minutes of Interruption of the total system.
In addition, when selecting the annual priority feeders, the selections are made based on the combination of the following criteria:
(1) Feeders blended performance ranking by SPC values (i.e., individual feeder contribution to system SAIFI and SAIDI);
(2) Feeders that are not repeated from the year prior;
(3) Feeders with a minimum SAIFI value of 2.00; and
(4) Feeders experienced at least 10 outage occurrences in the evaluation period.

00228	Capitol Hill, Navy Yard, Barny Circle
15710	Carver Langston
15755	Navy Yard
14701	Barry Farm, Fort Stanton, and Anacostia
15013	Manor Park, Brighton Wood
14261	Woodland, Garfield Heights
14753	Barry Farm, Congress Heights
15014	Brightwood Park, Manor Park

Priority Feeder Reliability Remediation Strategy

While the remediation methods identified in the work plan for each priority feeder are determined based on the fault history on the feeder, Pepco has developed a list of feeder improvement approaches to guide the work plans and promote the implementation of fault mitigation strategies across its distribution network that have been found to improve a feeders performance during past reliability activities.

The remediation activities considered for overhead feeders are generally:

- Recloser installation;
- DA scheme installation;
- Fuse cutouts, fuse coordination;
- Lightning arrester installation;
- Animal guard installation;
- Vegetation management;
- Replace aging equipment (transformers, poles, wire, cables, etc.);
- Reconductoring; and
- Selective undergrounding.

The remediation activities considered for underground feeders (URD as well as underground cables in manholes) are generally:

- Cable Injection;
- Cable Replacement;
- Cable Electrical testing;
- PILC replacement; and
- Thermal scanning of equipment.

The scope of work for these feeders is determined by the condition found on the feeder and work needed.

3.2.2. Comprehensive Feeder Program

The Comprehensive Feeder Program complements the 2% Priority Feeder Program. It is intended to identify the feeders that are not selected for the 2% Priority Feeder Program whose remediation will improve system reliability measures by addressing equipment, vegetation, weather, and animal caused interruptions. While this program is not specifically called for by a Commission order or regulation, the program is an essential means by which Pepco addresses feeders that have a high number of customer interruptions, or experience long outage durations in order to improve system reliability and provide additional measures in order to meet or exceed the SAIFI and SAIDI standards required by the merger commitment.

Feeder Selection Criteria

The Comprehensive Feeder group is not selected through the SPC or Composite Performance Index ("CPI") methods used to select the Commission-required 2% Priority Feeders. Instead, Pepco selects the group of feeders comprising this voluntary program based on several different factors to improve the customer experience and increase Pepco's system-wide reliability. High SAIFI feeders that did not make the 2% Priority Feeder list are analyzed first and remediated based on the types and frequency of outages. Other feeders, such as those with multiple device operations over the course of a rolling 12-month period and those with high Customers Experiencing Multiple Interruptions ("CEMI"), may also be remediated under the Comprehensive Feeder program. Other feeders are selected based on a combination of high SAIFI and high SAIDI. This program is able to capture many other feeders whose customers are experiencing higher number of interruptions or outages. The purpose of including these feeders on the Comprehensive Feeder list is to target specific trouble areas that may affect relatively small number of customers but cause high levels of customer outages both during storms as well as during non-storm conditions.

The Comprehensive Reliability Feeders are shown in the table below.

2017 Comprehensive Reliability Feeders

Feeder	Location
15762	Columbia Heights, Logan Circle
15709	Deanwood, Mahaning Heights, and Hillbrooke
15769	Columbia Heights, Logan Circle
00097	Penn Branch
00479	Penn Branch
15867	Forest Hills, McLean Garden
15173	Garfield Heights, Buena Vista, and Woodland
00117	Friendship Heights
00209	Lincoln Park
14136	Foxhall Village, Burleith - Hillandale
15009	Takoma, Manor Park, and Brightonwood Park
14767	McLean Gardens, Woodley Park
15801	Palisades
00063	Cleveland Park
00244	Anacostia, Penn Branch

Remediation Strategy

The selection of comprehensive feeders occurs after the Priority Feeders have been selected. At a high level, the remediation strategies for Priority Feeders and comprehensive feeders are the same. The scope of work for these feeders is similar to the improvement work performed under the Priority Feeder Program, but each feeder's precise scope of work is determined by the condition found on the feeder and work needed.

3.2.3. Most Susceptible Neighborhood Feeders

In Order No. 16623[6] the Commission directed Pepco to provide analysis regarding the neighborhoods in each ward which are most susceptible to outages as determined by outage data. In determining a definition of the term "neighborhood," as well as the capability of providing reliability measures at the neighborhood level, Pepco took the approach of determining the poorest performing feeder in each ward and identifying the neighborhood(s) served by that feeder. The feeder performance evaluation period is from October 1 to September 30 and is exclusive of major service outages. The feeders selected are then allocated to the Priority or Comprehensive Feeder programs, if they have not already been selected under those programs.

3.2.4. Intended Reliability Improvement for Feeder Reliability Projects

The following tables show the historical improvement for the 2013 – 2016 annual classes of feeders selected for the Feeder Improvement Plans that includes feeders selected for both the Priority and Comprehensive Reliability Feeder programs. The starting point for each class is the 12 months ending the December 31 prior to the commencement of their work.

Pepco District of Columbia Reliability Improvement Feeder SAIFI Performance (MSO)

	Beginning SAIFI	2016 SAIFI	% SAIFI Improvement
2012 Class Year 2% Priority and Comprehensive Feeders	3.18	2.39	-24.74%
2013 Class Year 2% Priority and Comprehensive Feeders	2.19	1.74	-20.50%
2014 Class Year 2% Priority and Comprehensive Feeders	2.11	1.95	-7.54%
2015 Class Year 2% Priority and Comprehensive Feeders	1.71	1.42	-16.97%
2016 Class Year 2% Priority and Comprehensive Feeders	2.84	0.77	-72.79%

Pepco District of Columbia Reliability Improvement Feeder SAIDI Performance in Minutes (MSO)

	Beginning SAIDI	2016 SAIDI	% SAIDI Improvement
2012 Class Year 2% Priority and Comprehensive Feeders	361.4	186.1	-48.51%
2013 Class Year 2% Priority and Comprehensive Feeders	323.1	235.5	-27.10%
2014 Class Year 2% Priority and Comprehensive Feeders	304.9	162.1	-46.83%
2015 Class Year 2% Priority and Comprehensive Feeders	184.8	123.5	-33.16%
2016 Class Year 2% Priority and Comprehensive Feeders	385.0	102.0	-73.51%

The measurement of benefits associated with the 2% Priority Feeder Program, and Comprehensive Feeder Program, can be determined by the performance of the feeders before and

[6] *In the Matter of the Commission's Fuel Adjustment Clause Audit and Review Program and In the Matter of the Investigation into Explosions Occurring in or Around the Underground Distribution Systems of the Potomac Electric Power Company*, Order No. 16623, Formal Case Nos. 766 and 991 at P 46 (November 30, 2011.)

after the improvement projects are carried out. As reflected in the tables above, the feeders that have been worked on as a part of the 2% Priority Feeder and Comprehensive Feeder Programs have demonstrated marked improvements in reliability as measured by the feeder-level SAIFI and SAIDI starting from the year the feeders were selected for reliability improvement. The forecast of Feeder Improvement work impact on reliability is included below in Section 8.

3.3. URD Cable Replacement

Pepco has a program to identify, analyze, and initiate corrective actions for the mitigation of URD cable failures as well as enhance the integrity of the URD system in terms of reliability, safety, and cost. This is performed through URD cable replacement.

Pepco monitors URD cable performance by tracking and recording the number of URD cable failures. URD cable replacement progress is measured by identifying the number of annual URD cable faults on a system wide basis.

Details on Pepco's current 2017 URD Cable Replacement projects and budget by WBS number are provided in ~~Attachment D~~the following table. The identification of cable faults is an ongoing process and specific work plans are developed throughout the year. Each feeder is evaluated to determine if it meets the criteria due to poor condition of the neutral or number of splices in the section of cable that will require replacement instead of curing. Since each feeder evaluation can result in different sections being replaced and other sections enhanced, detailed plans cannot be identified until actual field testing is performed on each section of cable.

WBS Element	Project Name	Project Description	2017 Budget $000s
Underground Residential Cable Replacement			
UDLPRM4BD	Benning:[7] Planned URD Cable Replacements	Blanket program that involves replacing or rejuvenating underground residential distribution (URD) cable in order to minimize URD failures.	$350
UDLPRM4BC	Benning: Replace Deteriorated URD Cable	Blanket project to replace damaged or failed URD cable.	121
Total Underground Residential Distribution Cable Replacement Budget			**$471**

[7] Benning, when shown in a description for a WBS element, denotes the fact that the project is one located in the District of Columbia.

Pepco 2017 Identified Feeders for URD Work

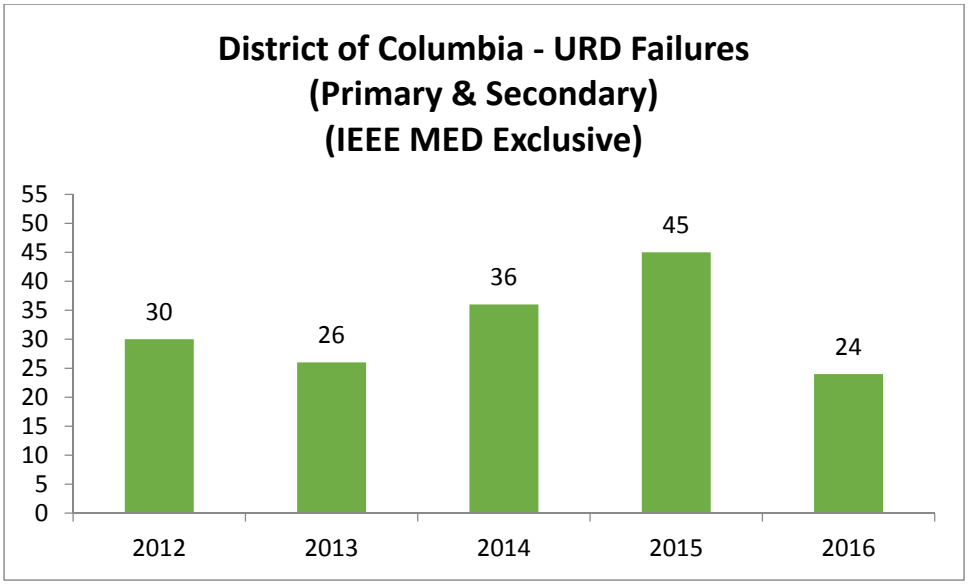
Location	FEEDER ID	Neighborhood
North East, Washington DC	14787	Brentwood/Capital Hill/Old City 1/Old City 2
North East, Washington DC	15013	Brookland/Chillum/
South East, Washington DC	15170	Barry Farms/Hillcrest/Randle Heights
North West, Washington DC	15943	Berkley/Burleith/Foxhall/Glover Park/Observatory Circle/Palisades.

3.3.1. Intended Reliability Improvement for URD Cable Replacement

The URD Cable Replacement Program complements work performed on overhead feeders through the Priority Feeder Program and Comprehensive Feeder Program and directs focus on URD subdivisions.

The program is focused on selected areas that have experienced cable failures, or where cable failures may be expected. The program is important to reduce the number of customers and neighborhoods experiencing multiple interruptions due to aging URD cable, which generally occur during high load periods. Combined with other reliability program efforts, these projects will contribute to overall system reliability improvement and increase customer satisfaction in those communities.

URD cable faults are a recurring factor in customer satisfaction with respect to reliability for the customers that are experiencing repeated outages due to failing cable, particularly due to “blue sky” failures. The following table reflects URD cable failures in the District of Columbia from 2012 to 2016.



URD Cable Replaced or Injected in the District of Columbia, 2011-2016

Year	Feet of URD Cable Replaced or Injected
2011	41,650
2012	225,418
2013	159,044
2014	22,487
2015	28,228
2016	131,449

3.4. Feeder Reliability Projects

Feeder Reliability projects include the following:

- Upgrades for Multi-Device Operations – replace or upgrade protective devices that have operated more than 3 times in the previous 12 months.
- Motor Operated Disconnect Switches (MODs) Replacement – replace older MOD switches with more advanced ACRs
- Customer Reliability Improvements – address work and corrective actions pertaining to individual customer reliability inquires
- Proactive Replacement Feeders – projects designed to maintain feeder reliability in response to concerns about the age and condition of an individual class of feeders.

These projects are part of the Company's obligation to maintain the distribution system to provide reliable service and not expose the customers to potential extended outages due to failure of aging and/or damaged equipment. The 2017 Work Plan for Feeder Reliability Improvement is provided in Attachment D.

2016 Feeder Reliability Improvement Plan

WBS Element	Project Name	Project Description	2017 Budget $000s
Feeder Reliability Improvement			
UDLPRM8BB	69kV Lines NRL Sub 168 to Blue Plains Sub 83	Extend two 69kV feeders from Blue Plains Substation 83 to NRL Substation 168 in order to serve as backup supply feeders to NRL Substation 168.	~~592~~0
UDLPRM4BG	Benning[8] Misc Dist Impvt: Mainline Heavy-Up	Installation of cable and wire on an as needed basis to address non-emergency deficiencies on wires, cables, and transformers.	0
UDLPRM4BA	Benning[9]: Misc Distribution Changes	Replacement of overhead (OH) and underground (UG) equipment as needed to address non-emergency deficiencies on equipment such as poles, wires, cable, fuse cutouts and boxes, transformers, etc.	~~2,450~~592
UDLPRM4BO	Benning: Padmount Transformer Replacements	Replace padmount transformers associated with the Padmount Transformer Inspection program. Transformers are identified for replacement if they are found to be deteriorated or damaged as a result of age, external forces, leaking, etc.	101
UDLPRM4BQ	Benning: Upgrades for Multi Device Operations	Replace or upgrade protective devices that have operated more than 3 times in the previous 12 months.	532
UDLPRM4BM	Customer Reliability Impvts: Benning	Blanket to address work pertaining to individual customer reliability inquires.	2,450~~000~~
UDLPRM5SD	DC: Repl Rubber/Lead Secondary Cables	Reactive replacement of damaged and / or failed underground (in duct) secondary cable and street light cable.	~~0~~2,000

[8] Benning, when shown in a description for a WBS element, denotes the fact that the project is one located in the District of Columbia.

WBS Element	Project Name	Project Description	2017 Budget $000s
Feeder Reliability Improvement			
UDLPRM5ED	IR: 34 & 69kv Oil Filled Cable Replacements - DC	Replace 69 kV cables in DC identified after analyzing the current condition of Pepco's self-contained fluid filled (SCFF) underground transmission feeders.	0
UDLPRM5EV	IR: 34 & 69kv Oil Filled Cable Replacements - VA	Replace69kV cables supplying D.C. substations identified after analyzing the current condition of self-contained fluid filled (SCFF) underground transmission feeders.	0
UDLPRM5BP	MODs Replacement – Benning	Blanket to replace inoperative MOD switches with Automatic Circuit Recloser. Under this project, Automatic Circuit is installed and placed in service as automatic switch	50
UDLPRM4BN	Network Xfmr&Prot Repl Planned: Benni	Blanket used to replace network transformers and protectors on an as needed basis based on network transformer inspection.	10,084
UDLPRPLIC	PILC Replacement Planned	Blanket to replace approximately 4-5 miles per year of paper lead insulated cable with EPR.	2,319
UDLPRM41D	Placeholder - Future Pepco DC: OH Misc Planned Distribution Blanket	Placeholder - Future Pepco DC: OH Misc Planned Distribution Blanket	1~~,000~~
UDLPRM42D	Placeholder - Future Pepco DC: UG Misc Planned Distribution Blanket	This blanket is set up to complete non-reimbursable underground projects in DC. This is typical for DDOT projects which impact Pepco facilities.	0

WBS Element	Project Name	Project Description	2017 Budget $000s
Feeder Reliability Improvement			
UDLPRM4BE	Reject Pole Repl/Reinf : Benning	Covers the replacement or reinforcement of Pepco owned distribution utility poles in the District of Columbia based on inspection results.	700
UDLPRM5SG	Repl 69kV Slf-Containd UG Supl-Georgetown,"F" St, 22nd St Subs	Installation of four underground 69kV solid dielectric cables in two new 8-way conduit to resupply several downtown substations.	3,843
UDLPRM4VB	Repl Rubber/Lead Secondary Cables: Benning	Blanket program whose scope includes reactive replacement of damaged and/ or failed secondary Underground Residential Distribution (URD) cable.	40
UDLPRM4WA1	Van Ness Switchgear Replacement: Distribution Line	This project is for the distribution line work in support of the purchase and installation of replacement 13.8kV switchgear in DC substations.	750
UDLPRM4WA2	Pepco DC: Benning Sub Area Plan	Reconductor and redistribute load on Benning Substation overhead feeders to remediate circuit reliability. The project will include reclosers, ASR schemes, reconductoring, reconfiguring of circuits, new feeders, and optimizing all circuits out of Benning Substation.	1,750
UDLPRM4WJ	Pepco DC: Single Phase Reclosing Devices	Install single phase reclosing devices (TripSavers) on fused taps and other locations	1,000
Total Feeder Reliability Improvement Budget			**26,212**

3.4.1. Intended Reliability Improvement for Feeder Reliability Projects

The following table shows the SAIDI and SAIFI associated with equipment failures for all District of Columbia feeders and represents the annual contribution from equipment failures to total District of Columbia system reliability performance.

District of Columbia Equipment Failures 2012-2016 MSO Exclusive		
Year	**SAIFI**	**SAIDI (minutes)**
2012	0.391	55.4
2013	0.399	77.4
2014	0.311	49.8
2015	0.373	80.9
2016	0.358	72.71

3.5. Substation Reliability Projects Overview

This section of the report describes the capital reliability projects designed to support the safe and reliable operation of Pepco's substations in the District of Columbia. Substation reliability projects can be summarized as follows:

Proactive equipment replacements and spare purchases

Substation reliability equipment projects generally consist of planned projects to replace or purchase spare equipment for large, high-cost, long lead-time primary components within substations. Substation reliability is maintained by keeping both the primary and redundant assets in good working condition. Therefore, condition and criticality of assets predominantly drive substation reliability programs. Replacement of transformers, switchgear, battery charges and other substation equipment such as bushings and relays do not directly improve SAIDI and SAIFI system performance but do avoid equipment failures that would have a negative impact on system performance. Pepco's Equipment Condition Assessment ("ECA") process is the vehicle used to identify substation assets for reliability-driven replacement. The ECA process analyzes major equipment condition, makes major repair and replacement decisions utilizing various subject matter experts, and through consensus prioritizes candidates for replacement on a quarterly basis.

Substation Supporting Infrastructure Replacements

These projects include the planned replacement of the supporting infrastructure and monitoring equipment and upgrades to facilities in substations. These projects are annual in nature, and Pepco generally creates tentative plans under each project based on condition. System emergencies can alter the timing of these projects. Work performed within these projects is generally in response to failed or failing equipment that needs to be replaced to maintain the overall reliability of the substation and all feeders and customers served by that station.

Substation Retirements

These projects include the planned retirements of existing substations that are no longer needed

to serve load in the District of Columbia or are retired due to new substations coming online, and, for the projects associated with the retirement of generation at Benning, to ensure transmission and distribution reliability is maintained in the absence of generation. These substation retirement projects typically occur on an as-needed basis.

The 2017 Work Plan and budget for Substation Reliability Projects are provided in Attachment D.

2016 Substation Reliability Work Plan

WBS Element	Project Name	Project Description	2017 Budget $000s
UDSPRD8AD5	052 10th Street T4 Transformer Replace	Replace transformer - transformer is 40 years old and the Doble test indicates the insulation is degraded. Excessive gassing is also present in the LTC (sharp increase in Ethylene).	223
UDSPRD8KD	13.8kV Swgr Replacement - Pepco DC	Purchase and installation of replacement 13.8kV switchgear in DC substations. Existing deteriorated switchgear will be replaced based on priority list.	2,440
UDSPRD8JD	Animal Guards in Dist Subs: Pepco DC	Install animal guards on identified vulnerable insulators and equipment or install the new vanquish animal fencing around the substation to entirely keep animals out.	214
UDSPRD8ED	Batt & Chgr Replacement Distri. Subs. - DC	Existing batteries and chargers have been determined to be beyond their design life, or have been determined to be in failure mode due to testing and observation results.	351
UDSPRD8FD	Dist Sub Bushing Replacement: Pepco DC	Replace U-Type bushings that are susceptible to an industry known problem for failure.	110
UDSPRD8FV	Dist Sub Bushing Replacement: Pepco DC	Replace U-Type bushings that are susceptible to an industry known problem for failure at substations located in Virginia that supply District of Columbia.	72
UDSPRD8AD6	GE UR Relay Replacement	Replace failing GE UR relays across the Pepco distribution system.	1,500
UDSPLNW2	Harrison Sub: Construct New Sub	Rebuild the existing Harrison Substation 38 as equipment is in poor condition and non-standard.	11,029
UDLPLNW3	Harrison Sub: Extend New Dist Fdrs to 38	This is part of the Harrison Substation 38 rebuild project. Extend 17 -13.8kV underground feeder supplies from the Temp Substation located in the adjacent lot, and rearrange with each of the existing Harrison Substation 38 Distribution feeders.	1,000

WBS Element	Project Name	Project Description	2017 Budget $000s
UDSPRD8AD2	Harvard - New Sub - Distribution Upgrade to 230/13kV, 210 MVA	Build a new 230/13kV, 210 MVA class substation on existing Harvard Substation 13 site. All 13kV load would be temporarily transferred to a temporary substation consisting of mobile transformers and switchgear then cutover to the new Harvard Substation when complete.	~~1,513~~~~151~~1,060
UDSPRD8D2	Improve/Add Substation Enclosures	Blanket WBS to provide new, improve, or to restore substation enclosures. (i.e., transformer bays, fire walls, building restorations, etc.)	130
UDLPRM4S1	Pepco DC - Deteriorated Cap Bank Replacement	Covers the replacement of capacitor banks in the District of Columbia on an as needed basis based on field condition when assessing the bank for the installation of the replacement capacitor controller.	30
UDLPRM9PD	Pepco DC Distrib - Upgrade Pumping Plants	Conduct: 1) plant installation, 2) remote monitoring installation (PLC), and 3) HVAC installation at numerous pumping plants in DC.	50
UDSPRD8TD	Pepco DC: Roof Replacements	Replace and repair various substation roofs in order to avoid equipment and further structural damage.	122
UDSPRD8LD	Pepco DC: Substation Ventilation	Engineering, design, construction, and procurement of new HVAC systems for DC substations.	43~~1~~
UDSPRD9D5	Pepco DC: Add Sub Condition Monitoring Points	Add condition monitoring points to equipment as it may become impaired throughout the year to enable proactive repair/replace decisions. These monitoring points can include transformer Dissolved Gas Analysis (DGA) monitors, bushing monitors, Load Tap Changer monitors and breaker or battery monitors.	111
UDSPRD8A1	Pepco-DC: 9th Street Sub 117-Switchgear Repl	Existing 6 bus sections of switchgear will be replaced with new double stacked metal-clad switchgear with new bus work, circuit breakers, and GE UR type smart relays for protection.	2,735

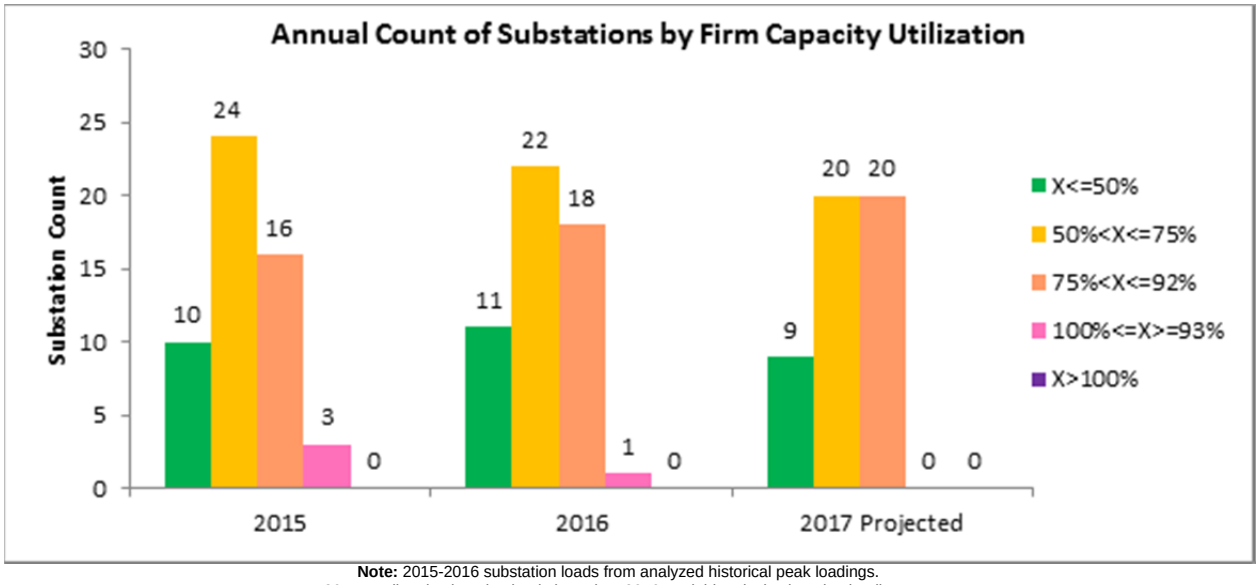
WBS Element	Project Name	Project Description	2017 Budget $000s
UDSPRD8UD	Repl Eng Generators Dist Sub: Pepco DC	Replace engine generators that are beyond their useful design life. Replacement includes engineering design, procurement of material and construction for installation.	99
UDSPRD9GD	Replace Deteriorated Dist Transformers DC	Engineer, procure and install replacement transformers at NJ Ave, and F St due to equipment deterioration.	1,950
UDSPRD8RD1	Retire Congress Height Sub. 64	Retire Congress Heights Substation 64 after Feeders 178 and 294 are converted to 13kV.	100
UDSPRD8Q1D	SPCC - Distribution Oil Brkr Replacements : Pepco DC	Replace 69kV Oil Circuit Breakers with SF6 Gas Circuit Breakers for Substation 133 and Substation 190 due to age and condition of equipment.	153
UDSPRD8AD14	Tenth Street (Sub 52) - Replace Transformer #3	Tenth Street (Sub 52) - Replace Transformer #3	1,050
UDSPRD8AD	Substation Improvements and Additions – DC	Blanket created to support various projects related to enhancing and replacing deteriorated /failed equipment, foundations, and structures related to maintaining the reliability of D.C. substations.	107
UDSPRD8AD8	Champlain - New 230/69/34kV Sub	Build New Champlain 69kV sub with 3-230/69kV, 225 MVA transformers, a 69kV GIS breaker and half bus, 4bays, 14 breakers, 4-69/34kV transformers, 4-34kV outgoing feeders to resupply "L" Street, and 4-69kV outgoing feeders to resupply "F" Street and Georgetown Subs.	292
Total Substation Reliability Budget			~~23,521~~24,770

3.5.1. Substation Reliability Benefits

Generally, substation reliability projects are performed to avoid an outage and therefore cannot be translated directly into measurable or forecasted SAIDI or SAIFI benefits. Reliability work for new and upgraded substation equipment is critical to ensure the substations can meet load and continue to perform reliability. The presence of redundant systems within substations reduces or eliminates the direct threat to customer reliability from the loss of a single asset. However, equipment that is at risk of failing removes this redundancy since during routine equipment outages or failures the substation would be at an increased risk of large-scale customer outages if another failure was to occur. Given the high potential for customer impacts and the long replacement cycle of major substation assets, Pepco takes steps to replace these assets proactively based on condition assessment to address aging infrastructure and the desire to manage contingency risk and maintain system reliability.

Because substation equipment is replaced proactively and the reliability benefits of the outages avoided resulting from replacement is difficult to measure, Pepco measures the reliability benefits of substation work by substation firm capacity. Firm capacity is a design criterion that allows a substation to supply the full load of all the customers supplied from that station when one station transformer or supply line to that station is out of service. Thus, during normal conditions, a substation operated at a capacity above 100% does not necessarily represent a reliability threat but does indicate the need for analysis and planning to address the condition. Unlike other reliability measures, which are difficult to forecast with any precision due to the large number of variables (*e.g.*, weather, dig-ins, vehicle accidents, animal damage), it is more feasible to forecast substation capacity usage since the variables are relatively predictable (*e.g.*, substation capacity and load growth). Therefore the reliability of the substation must be maintained in order to maintain the ability to operate the substation up to the firm capacity of the station and to prevent the need to construct additional stations at a lower load growth rate than the design limit of the station. This could occur if the station equipment was not able to be operated to its full design rating due to failed components, reduced ratings or higher risk of failure from poor operating condition.

The following table provides a comparison of 2015 substation firm capacity usage to 2016 substation firm capacity usage and a forecast of 2017 for this measure.



Note: 2015-2016 substation loads from analyzed historical peak loadings.
2017 predicted substation loads based on 2016 peak historical substation loadings.

4. Distribution Automation

4.1. Overview of DA Projects

Pepco recognizes the benefits of deploying smart grid technology to improve infrastructure reliability, enhance customer experience, and provide enhanced operational flexibility and control over the grid. DA is one aspect of Pepco's larger smart grid implementation strategy. Pepco's DA approach is comprised of installing advanced control systems and devices across the distribution system to automatically identify and isolate faults in real time and restore service to customers. These systems and devices serve the following functions:

- Fault identification and isolation: DA can isolate faulted sections of the distribution infrastructure to minimize customer impact during outage events;
- Service restoration: DA can significantly reduce the duration of outages experienced by customers through automated isolation of faulted areas and restoration of customers unaffected by the fault;
- System/Data management: DA can provide accurate and real-time information regarding the overall integrity of the distribution system, which allows for targeted and timely deployment of system restoration measures; and
- Expanded control of field equipment outside of the substation and increased monitoring points spread across the entire distribution system. These control and monitoring points allow for real time operation of the system and increased awareness of loads and status of individual segments of the distribution grid.

Types of DA projects include:

1. ASR schemes;
2. Other Non-ASR switch additions (Switches and ACRs);
3. Other automation projects to add visibility and control (substations, capacitor banks, and automation equipment replacement);
4. Network transformer protector Remote Metering Systems ("RMS"); and
5. DA communication & control infrastructure build-out and integration.

A description of these categories and their intended reliability benefits are described in more detail later in this section.

A summary of Pepco's current 2017 DA projects and budget by WBS number are provided in Attachment D.

2017 DA Work Plan

WBS Element	Project Name	Project Description	2017 Budget ($000s)
UDSPRD8H	4kv Substation Automation	4kV Substation Automation (relays, comms, etc.) at 53rd Street Substation 48 and Chesapeake Street Substation 181	6,855
UDLPRDA1D	Distribution Automation - Pepco DC	Line improvements (switches, reclosers, Reconductoring, etc.) for new ASR schemes for feeders supplied by Van Ness, Takoma, and 12th St substations	9,64811,000
UDSPRD8SD	Install Smart Relays & Replace RTU's –DC	Install / upgrade substation smart relays and upgrade RTUs	1,395
UDLPRM4DR	Network RMS - Pepco DC	Install transformer & protector monitoring and control devices for the RMS.	3,500
UDLPRM4DJ	Pepco DC- Add Recloser Sectionalization	Addition of new line reclosers to further segment feeders	2,000
Total Distribution Automation Budget			**16,58017,228**

Pepco's current plan includes a goal of installing 25 total reclosers in the District of Columbia in 2016. Details on Pepco's DA work plan in the District of Columbia are provided in the following table.

4.2. Automatic Sectionalization and Restoration Schemes

ASR schemes improve system reliability by automatically isolating faults and restoring unaffected portions of feeders by using advanced sensors, controls, and communications systems. Sensors detect faults as they occur in the system. Control systems reconfigure the distribution system by operating switches and other isolation devices, such as automatic circuit reclosers to isolate the faulted sections. Loads served on unaffected sections are automatically switched over to neighboring feeders. ASR schemes resupply customers from alternate sources and shorten restoration times. An ASR scheme's "self-healing" design quickly identifies the faulted section, thereby reducing the time to dispatch restoration crews, and eliminating sustained outages for customers served from unfaulted portions of the feeder In 2015, the Company expanded ASR technology deployment to include three additional feeders out of Van Ness Substation, two feeders from Takoma Substation, and two additional feeders from 12th and Irving Substation. These seven feeders serve approximately 9,500 customers in the District of Columbia. One ASR feeder was activated in 2016. ASR functionality for the remaining six feeders was deferred to accommodate planned construction at the Van Ness and Harrison Substations, and is expected to be activated in the end of the second quarter of 2017. The Anacostia area ASR plan is being re-evaluated to account for possible impacts on the DC PLUG project. This ASR plan for the Anacostia area is expected to commence in 2018.[10]

4.2.1. Reliability Benefits of ASR Schemes

In 2016, ASR schemes within the District of Columbia have prevented a total of 3,185 customer interruptions (CI) and 1,637,147 customer minutes of interruptions (CMI) in total.

Since activation of the first ASR scheme in 2012, ASR schemes deployed in the District of Columbia have allowed for the avoidance of approximately 17,287 customer interruptions, and saved a combined total of approximately 4,228,751 minutes of service interruptions to customers cumulatively.

Benefits of the ASR schemes are based on calculations of outages avoided measured in terms of CI and CMI. For example, without an ASR scheme, customers upstream of a fault would experience an outage when the fault occurs. With an ASR scheme in place, these same upstream customers are automatically switched over to be fed from another source and do not experience

[10] Feeders associated with these ASR schemes serve the following District of Columbia neighborhoods: American University, Cleveland Park, Glover Archbold Parkway, Glover Park, Wesley Hills, Forest Hills, Massachusetts Avenue Heights, North Cleveland Park, Rock Creek Park 2, Woodley, American University, Chevy Chase, Chillum, Riggs Park, Takoma, Brightwood, Shepherd Park, Brookland, Woodridge, and Ledroit Park.

an outage when the fault occurs. Thus, for these customers, the benefit of an ASR scheme can be measured in terms of CI and CMI avoided.

4.3. Other Non-ASR switch additions (Switches and Automatic Circuit Reclosers (ACRs))

Non-ASR switch additions consist of projects that deploy remotely operated switches and stand-alone ACRs, which may be incorporated into future ASR schemes. ACRs and remotely operated switches on feeders allow for more capability to isolate the faulted portion of the feeder and return more customers to service sooner. ACRs activate to isolate downstream faults, which serves to limit the number customers affected during outage events. The remote control capability of these devices allows the System Operator to perform switching without the need to dispatch field crews, thus reducing customer outage time and related costs.

Currently, ACRs are deployed based on the feeder-level lockout histories and high SAIFI performance. The long-term goal for ACR deployments is to identify where the ACRs should be combined into an ASR scheme to realize the maximum reliability benefits. In order to perform this work, a feeder must have sufficient ties and sufficient ACRs to form an ASR Scheme. The installation of an ASR scheme and the installation of ACRs will help Pepco towards achieving its reliability improvements objectives.

4.3.1. Reliability Benefits of ACR

Benefits for ACRs can be calculated in a similar fashion as the ASR scheme activation benefits. A post- outage analysis is conducted to determine what the CI and CMI would have been had the ACR not activated (and thus the fault will have been cleared at the next up-stream reclosing device, either another recloser or a circuit breaker). Stand-alone ACRs (which are not part of ASR schemes) prevented a total of 16,059 CI and 2,560,934 CMI during 2015, and a total of 22,099 CI and 2,476,551 CMI as of December 31, 2016.

The 43 potential additional ACR deployment locations that have been identified for Pepco's District of Columbia feeders are provided in the following table.

Proposed Pepco District of Columbia ACR Deployments		
Feeder	**Substation**	**Neighborhood(s)**
14005	12th & Irving	Fort Lincoln/Woodridge
14006	12th & Irving	Brookland/Woodridge
14008	12th & Irving	Brentwood/Woodridge
14016	12th & Irving	Brentwood/Fort Lincoln/National Arboretum/Woodridge
14035	Suitland	Hillcrest
14132	Van Ness	American University/Cleveland

Proposed Pepco District of Columbia ACR Deployments		
Feeder	**Substation**	**Neighborhood(s)**
		Park/Glover Archbold Parkway/Glover Park
14145	Van Ness	Cleveland Park/North Cleveland Park
14146	Van Ness	Garfield/Massachusetts Avenue Heights/Observatory Circle/Rock Creek Park 1/Woodley
14701	Anacostia	Bolling Air Force Base/Congress Heights/St. Elizabeth's Hospital
14752	N.R.L.	Congress Heights
14755	N.R.L.	Congress Heights
14766	Little Falls	American University/Spring Valley
15006	Fort Slocum	16th Street Heights/Petworth
15010	Fort Slocum	16th Street Heights/Brightwood/Chillum
15011	Fort Slocum	16th Street Heights/Brightwood/Rock Creek Park 2
15012	Fort Slocum	Chillum/Columbia Heights/Petworth
15013	Fort Slocum	Brookland/Chillum
15015	Fort Slocum	16th Street Heights/Columbia Heights/Petworth
15085	St. Barnabas Road	Congress Heights/Randle Heights
15130	Walker Mill Road	Fort Dupont Park/Marshall Heights
15172	Alabama Avenue	Barry Farms/Randle Heights/St. Elizabeth's Hospital
15175	Alabama Avenue	Barry Farms/Congress Heights/Randle Heights/St. Elizabeth's Hospital
15198	Takoma	Riggs Park/Takoma
15944	Van Ness	American University/Chevy Chase
15945	Van Ness	American University/Chevy Chase
15947	Van Ness	American University/Chevy Chase
15950	Van Ness	Forest Hills/North Cleveland Park/Rock Creek Park 2

The forecast of ACR implementation's impact on reliability is included below in Section 8.

4.4. Other Substation Automation Projects (including substation automation and capacity automation)

Other substation automation projects include adding automation equipment (*e.g.*, remotely operated relays, monitors, and additional communications equipment) to provide Pepco system operators increased visibility into the Pepco distribution system.

Automation of 4kV substations has enabled the Pepco system operators to monitor and control the 4kV substations remotely, which avoids sending out crews to those substations to operate the breakers and relays. The ability to monitor loading of these substations may prevent overloading outages and truck rolls to perform switching operations and can potentially shorten outage restoration times and reduce costs. Those 4kV substations without SCADA controls are being upgraded to allow substation breakers and transformers to be monitored, and remotely controlled and operated. Work for 53rd Street Substation 48 is scheduled for completion in 2018.

Capacitor automation enables the Pepco distribution system to function more efficiently resulting in reduced line losses by allowing the system to be operated at a power factor closer to unity. In addition, the ability to coordinate capacitor bank operations will enable better reactive power control via Conservation Voltage Reduction ("CVR") and Variable Voltage Regulation ("VVR") events in the future. This may reduce the overall power needs from the transmission and distribution networks. In addition, increased control and management of distribution line equipment is needed to support growth in distributed energy resources. Voltage control is a key component for advanced grid operations and for future distribution management systems. Currently approximately 2,600 District of Columbia customers are served by Maryland substations implementing CVR, and Pepco plans to place approximately 9,500 more District of Columbia customers into the program. Additionally, as of December 2016, 30 capacitor bank controllers and radios are currently deployed in Pepco's District of Columbia territory (nine deployed in 2015 and twenty-one deployed in 2016). The 2017 target is to deploy 25 capacitor bank controllers and radios in Pepco's District of Columbia territory.

4.5. Network Transformer Protector Remote Metering Systems

RMS gives Pepco system operators and engineers more situational awareness by providing real-time load and environmental information, as well as transformer condition information and remote control capabilities. The real-time control and monitoring capabilities gained from Network RMS will allow System Operators to attend swiftly to emergencies when any transformer needs to be isolated from the network. The system will also provide operators real-time information on the status of a protector breaker (if open or closed); as well as the number of times and the frequency that protectors are operating, which can be useful in detecting reverse power flows. The analysis of trends in the underground network and can be useful in asset and

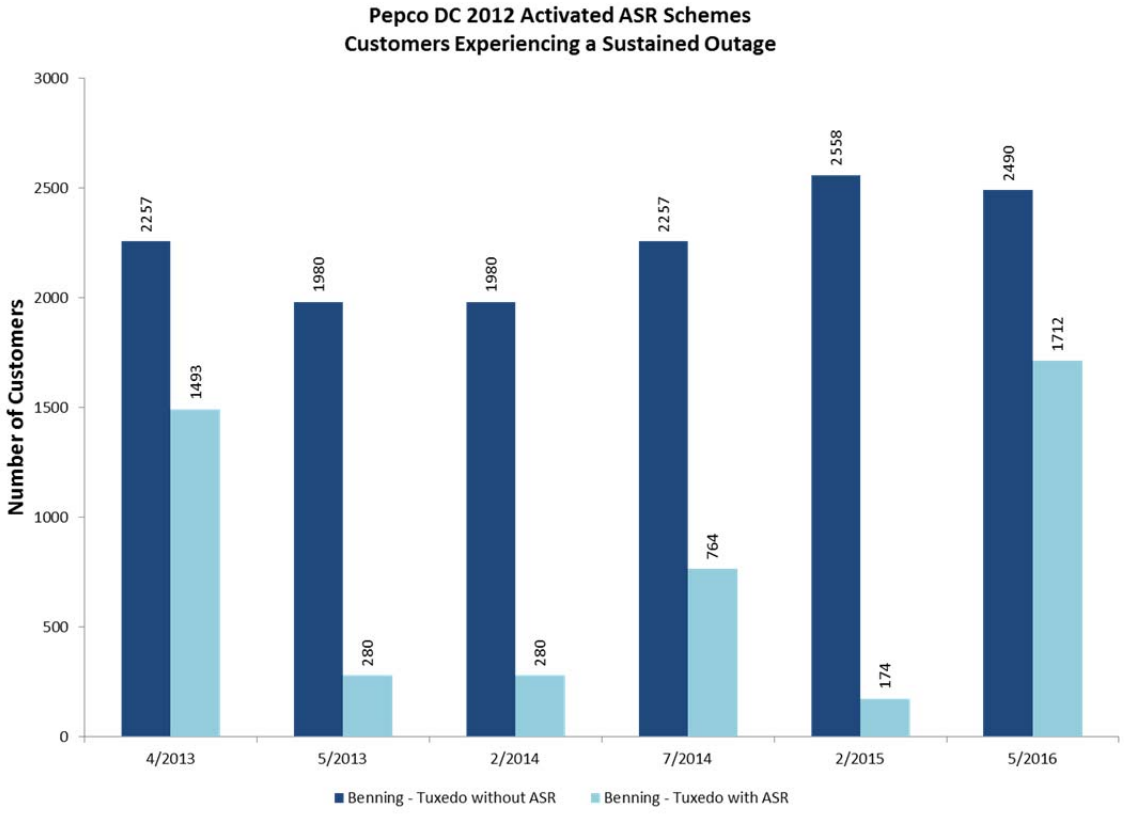
maintenance strategy and the detection of operating conditions that could lead to protector or transformer failure before a failure occurs.

From a maintenance perspective, RMS monitors provide up-to-date data on the operations as well as conditions (such as number of protector operations), which is used to determine when a particular monitored asset will need to be maintained. This performance-based asset maintenance strategy allows Pepco to perform maintenance activities on an as-needed basis and to detect operational issues with a network protector between planned inspection activities.

4.6. Intended Reliability Improvement for ASR Schemes

Benefits of the ASR schemes are based on calculations of outages avoided measured in terms of CI and CMI. For example, without an ASR scheme, customers upstream of a fault would experience an outage when the fault occurs. With an ASR scheme in place, these same upstream customers are automatically switched over to be fed from another source and do not experience an outage when the fault occurs. Thus, for these customers, the benefit of an ASR scheme can be measured in terms of CI and CMI avoided. The forecast of ASR implementation's impact on reliability is included below in Section 8.

Figure 1: District of Columbia 2012 Activated ASR Scheme – Customers Affected[11]



[11] Activations associated with Maryland feeders have been excluded from the Benning-Tuxedo data.

Figure 2: District of Columbia 2012 Activated ASR Scheme – Minutes of Interruptions

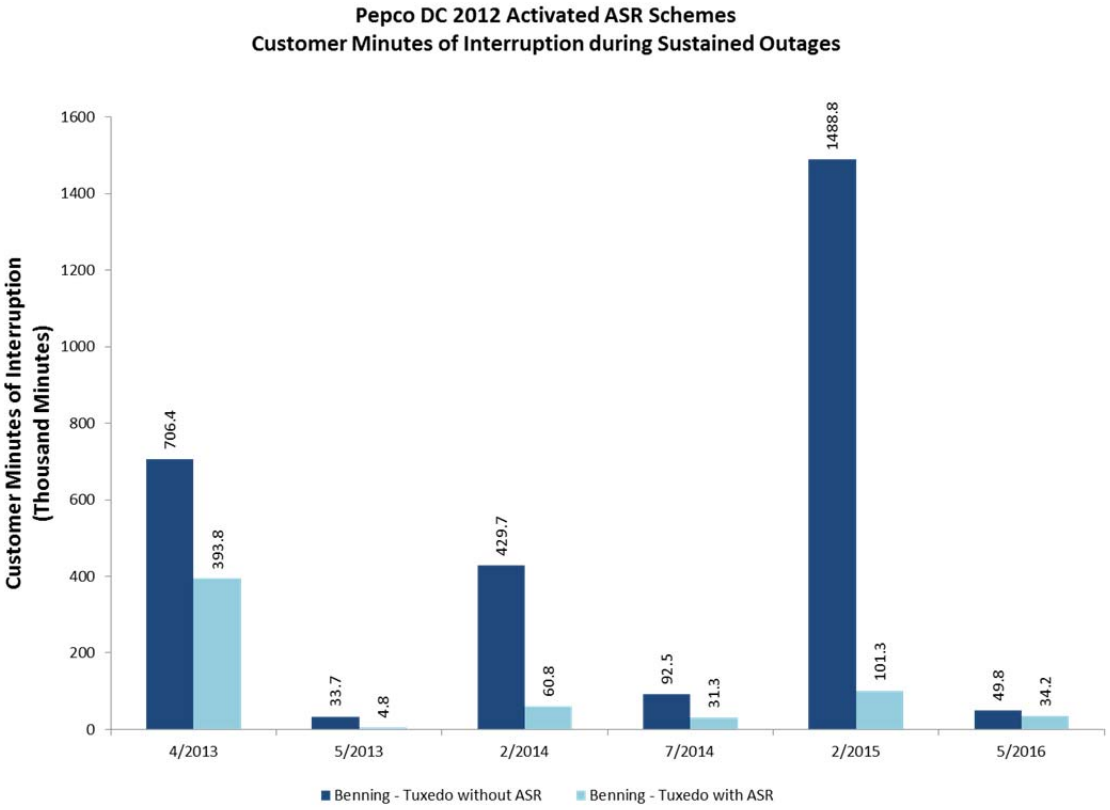


Figure 3: District of Columbia 2013 Activated ASR Scheme – Customers Affected

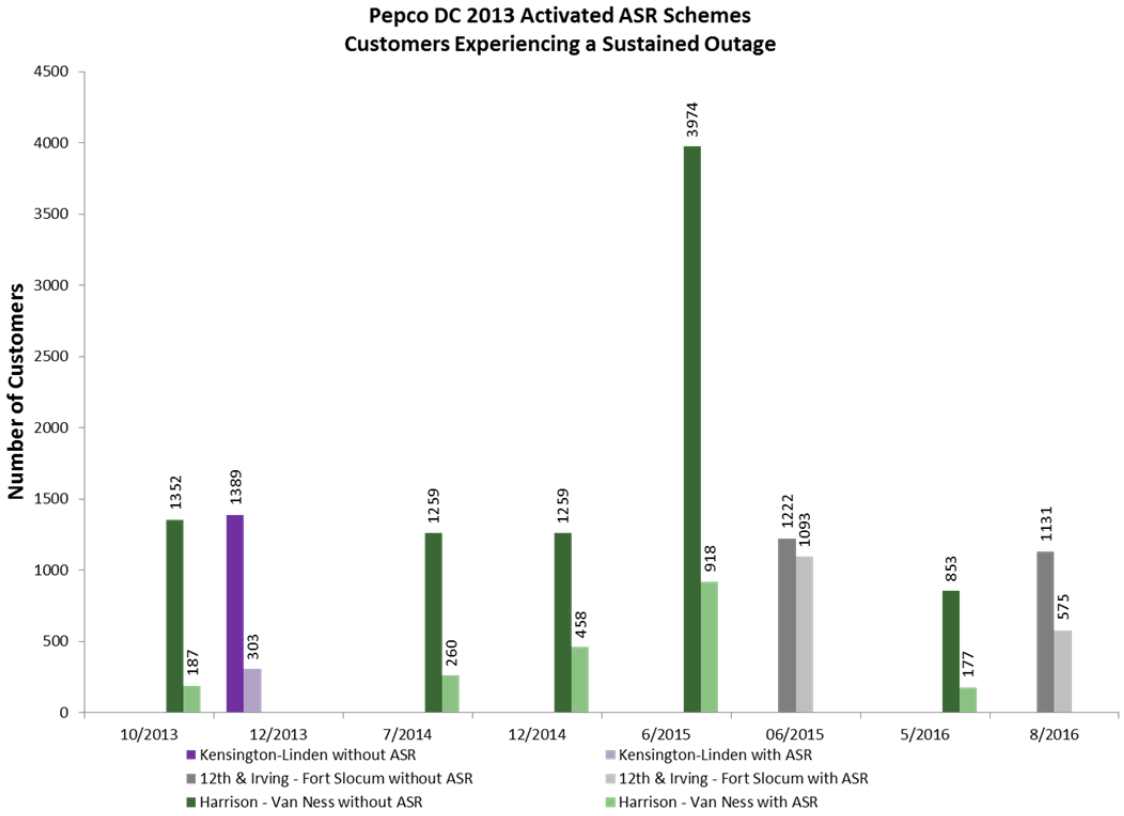
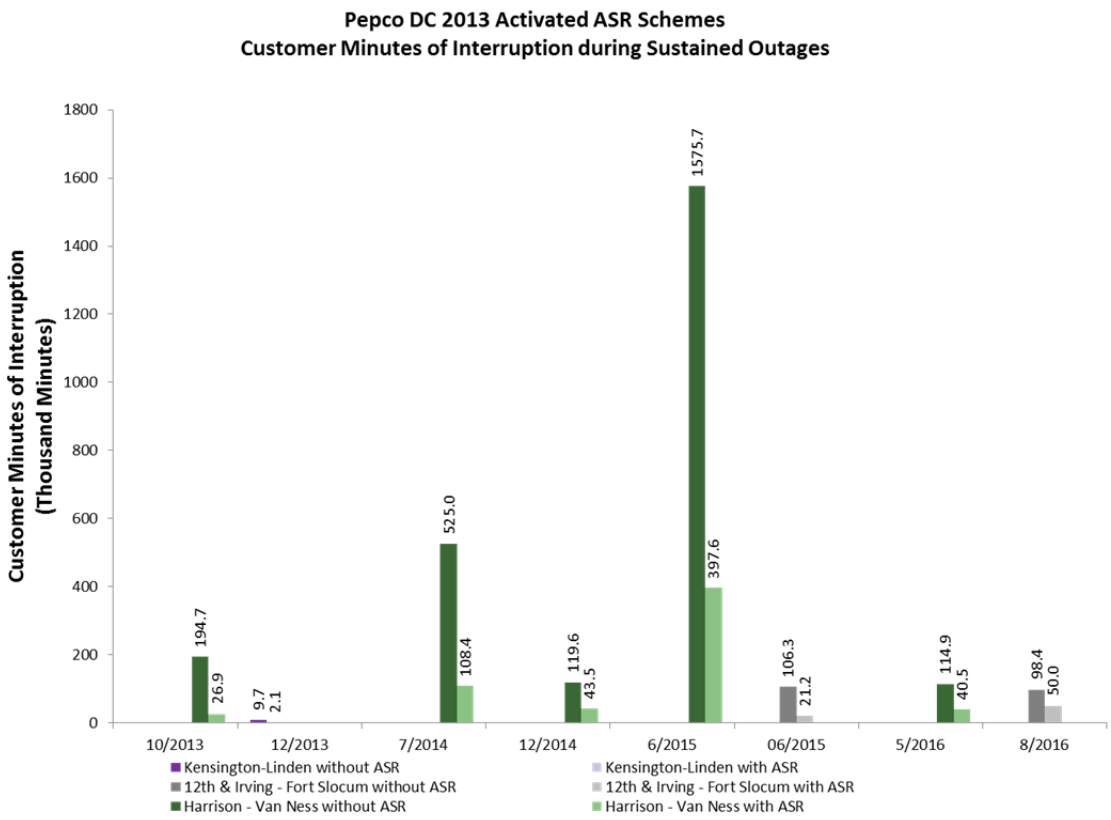


Figure 4: District of Columbia 2013 Activated ASR Scheme – Minutes of Interruption


Pepco DC 2013 Activated ASR Schemes
Customer Minutes of Interruption during Sustained Outages
Customer Minutes of Interruption (Thousand Minutes)
1800
1600
1400
1200
1000
800
600
400
200
0
194.7
26.9
9.7
2.1
525.0
108.4
119.6
43.5
1575.7
397.6
106.3
21.2
114.9
40.5
98.4
50.0
10/2013
12/2013
7/2014
12/2014
6/2015
06/2015
5/2016
8/2016
Kensington-Linden without ASR
Kensington-Linden with ASR
12th & Irving - Fort Slocum without ASR
12th & Irving - Fort Slocum with ASR
Harrison - Van Ness without ASR
Harrison - Van Ness with ASR

5. 4kV to 13kV Conversions

5.1. Overview of Projects

This section covers projects related to the conversion of parts of the distribution system in the District of Columbia from 4kV to 13kV and the maintenance of the remaining 4kV system. While the 4kV system has provided an effective and reliable supply to Pepco customers for many years, the 4kV system is an aging, lower-capacity distribution system supplying power to various neighborhoods in the District of Columbia. This system was once the main system of supply to distribution customers in and around the District of Columbia. However, beginning in the 1970s parts of this system were retired in surrounding Prince George's and Montgomery counties as these areas began growing and becoming more densely populated. Subsequently, beginning in the 1990s, Pepco began retiring portions of the 4kV system in the District of Columbia in areas where there was high growth, where the system was isolated with no backup and where it was determined to be economically beneficial in the longer-term to convert the 4kV to 13kV rather than maintain it by replacing aging infrastructure as it reached its useful end of life. Conversely, portions of the 4kV system, particularly in Northeast and Northwest of the District of Columbia, have maintained reliable operations and substation equipment has been updated and maintained in years past. It is Pepco's plan to maintain these portions of the 4kV distribution system into the future.

Generally, the overhead constructed 4kV system has the greatest potential for continued operation and by replacing substation transformers will continue to provide reliable service. The underground constructed system has little potential for upgrades to prolong the life of the cable system and requires complete replacement and conversion to 13kV operations. These projects are prioritized based on reaching full capacity of the equipment and therefore resulting in a future load project to increase the capacity of the area or based on operational performance the system must be replaced and converted to 13kV operation in order to maintain the reliability of the distribution system serving the customers. In all cases, routine replacement and upgrades are performed until the individual systems are replaced.

While it is Pepco's intention to continue to operate the portions of the 4kV system for as long as feasible given the condition of equipment, portions of the system require replacement in the short-term due to their age and condition. Moreover, portions of the system are sufficient for continued operations, but require incremental investments to improve reliability.

Information regarding the Company's 2017 Work Plan for reliability-driven 4kV conversion projects can be found in Attachment D.

2016 4kV Conversion Work Plan

WBS Element	Project Name	Project Description	~~2016~~ 2017 Budget $000s
UDSPRD8SD2	150 Twining City T3	Replace Twining City transformer 3 13kV to 4kV 5 MVA with 13kV to 4kV transformer. This transformer was placed in service in 1959 and has seen 56 years of continuous service. The last 3 oil samples have indicated high Relative Saturation (RS) levels.	838
UDLPRGST1	G STREET SUB 28 - CONVERT 4KV LOAD AND RETIRE - Line Work	Work to begin the first phase of the infrastructure upgrades to the existing 4kV system supplied from G St. Sub. 28 in parts of Capitol Hill, Barney's Circle and Navy Yard areas.	5
UDLPRM4WA	Congress Heights Sub. 64 - Convert all 4kV load from Feeder 00178 and 00294	Part of Pepco's long term plan to convert 4kv system to 13kV. This will allow for the retirement of the single supply/single transformer 4kV substation to improve reliability and operational flexibility.	1,500
UDLPRM8BI	Fort Carroll Sub. 130: Convert 4-13kV Conversion	Will facilitate the retirement of Fort Carroll Substation 130 which has deteriorating switch gear.	0
UDLPRM8BT	Georgetown : 4 to 13kv Conver Phs 3-8	Area 2B is the next location identified for conversion and encompasses between P and S St. east of Wisconsin Avenue, NW. 50,000 ft. conduit, 115,000 ft. cable, 8 3-way sws., 3 13/4kV step down trs., replace secondary where needed. Area 3B will begin at the end of 2013 and running into 2014, location is west of Wisconsin Ave and Reservoir St NW. It encompasses 25,000 ft. of conduit, 10,000 ft. of primary cable, 5-13kV step down transformers, and replace secondary as needed.	5,000

WBS Element	Project Name	Project Description	~~2016~~ 2017 Budget $000s
UDLPRM8BY	Harvard Sub - Convert 4-13 kV	Two 13kV Feeders extended from Florida Avenue Substation 10 in 2011 provide capacity for portion of the conversion and allow load to be transferred to Substation 10 from Substation 13. Existing 13kV Feeders from Substation 13 and new 13kV Feeders from Substation 25 is being used to convert the remaining 4kV load which started in 2014.	6,135
UDLPRM8BC	North Capitol Sub 4-13kV conversion	Initiate infrastructure upgrades to the existing 4kV system in the North Capitol Street., Kennedy Street, and New Hampshire Avenue, NW area. The proposed 4 to 13kV conversions will be accomplished by extending and/or rearranging existing or new overhead 13kV distribution feeders from Fort Slocum Substation 190.	2,401
UDSPRD8RM	Sub. 50 Marine D & R All 4kV Electrical	Project is to raze and demolish substation which is completely de-energized and no longer in service.	0
UDSPRD8AD3	Sub.048 53rd Street T4 Transformer Replacement (Voltage rating 13/4kV, Size:5MVA)	Replace the T4 transformer at 53rd street substation. Transformer is 45 years old and the 2014 Doble tests indicate insulation degradation, therefore, the transformer was identified on the ECA list. Transformer was identified on the ECA list due to high relative saturation (26%) inside the transformer.	0
UDLPRM8BU	Twelfth St Conversions	Convert majority of load to 13kV and install two new 13/4kV, 2000 MVA step-down transformers to supply the remaining 2.0 MVA of 4kV load on Feeders 230, 233, and 370.	4,000
Total Conversions Budget			**19,880~~75~~**

5.2. Reliability Benefits of 4kV to 13kV Conversions

While the primary purpose of 4kV to 13kV Conversions is to maintain system capacity, replacement of aging, 4kV infrastructure with the new 13kV infrastructure results in improved

reliability. This improvement is difficult to quantify on an individual project basis, therefore the benefits of conversion projects are measured by the number of customers that are planned to be converted each year, and the overall reduction the frequency and duration of outages on 4kV feeders as the aging 4kV infrastructure is converted. There are presently 135 megawatts of 4 kV load on the Pepco system, mostly in the District of Columbia. Over the next ten years, approximately 45 megawatts (including growth) will be converted to 13 kV service. Allowing for load growth, approximately 100 megawatts is projected to remain on the 4 kV distribution system by

2025.

The following table tracks the class of District of Columbia 4kV feeder SAIFI and SAIDI (in minutes) from 2011 to 2016, MSO exclusive, independent of other District of Columbia feeders.

District of Columbia 4kv Feeder Reliability Performance 2011-2016 MSO Exclusive		
Year	**SAIFI**	**SAIDI (minutes)**
2011	1.00	139
2012	0.79	142
2013	0.68	110
2014	0.64	134
2015	0.54	104
2016	0.60	109

6. Emergency Restoration

6.1. Overview of Projects

Projects included in the Emergency Restoration category provide Pepco with the backup equipment and response services required to expeditiously respond to the existence of conditions in which customers are out of service or portions of the electric system are at an unusually high risk due to the distribution system being in a contingency configuration or when temporary repairs exist after a storm or similar event. Outages or risks that would be addressed by these projects may be caused by severe weather, external factors (such as vehicle accidents, dig-ins, or vandalism), or unexpected component failures. When outages occur as a result of these events, the larger grid's reliability is compromised, often requiring emergency replacement of portions of the electric infrastructure.

The 2017 budget for Emergency Restoration is based on historic expenditures and provided in Attachment D. Costs associated with Emergency Restoration are excluded from the Company's spending commitment for the merger, pursuant to Table 3 of Commitment 55.

2016 Emergency Restoration Work Plan

WBS Element	Project Name	Project Description	2017~~6~~ Budget $000s
UDLPRM3B1	Benning:[12] Emergency Restoration - OH & UG	Blanket project for emergency replacement of distribution equipment damaged as a result of storms, accidents, wear and tear, falling trees/limbs, etc.	8,478
UDSPRD71D	Dist. Sub. Emergency Blanket DC	Blanket project to cover costs during emergencies involving failed substation equipment.	617
UDLPRM32D	Emergency Restoration Primary Cable in Duct: Pepco DC	Blanket project to address cable replacements on an as needed basis.	7,304
UDLPRM3K1	Emergency Restoration: Network Transfs & Protectors	Blanket project for emergency replacement of transformers and protectors.	2,000
Total Emergency Restoration Budget			**18,400**

6.2. Intended Reliability Improvement

Pepco's primary obligation is to serve Pepco customers, manage personnel and public safety, and minimize risk to the system. As a result, replacing failed or damaged equipment is considered the highest priority work, especially when the failure or damage results in customer outages and therefore there is no metric to track these projects. The cost of not performing this work would result in indefinitely extended outages or widespread damage to customer and Pepco equipment and potentially present a hazardous situation. The benefits of these projects include the reduced risk of extended outages as well as the ability to better forecast emergency response budgets. The need to quickly and safely restore power and minimize system risks themselves speak clearly to the necessity of these projects and the Company's obligation to provide a safe and reliable distribution system.

[12] Benning, when shown in a description for a WBS element, denotes the fact that the project is one located in the District of Columbia.

7. DC Power Line Underground Initiative

7.1.1. DC PLUG Overview

Pursuant to the Electric Company Infrastructure Improvement Financing Act of 2014, Pepco and the District of Columbia Department of Transportation (DDOT) submitted to the Commission in June 2014 their first Triennial Underground Infrastructure Improvement Projects Plan for placing certain electric power lines and ancillary facilities underground. The initiative to place these power lines is referred to as the DC PLUG initiative. In total, all or parts of 37 feeders will be placed underground in the first three years. The feeders that will be placed underground are located in Wards 3, 4, 5, 7, and 8. Pepco will place underground the mainline and primary lateral feeders and will leave the secondary lines or service lines overhead.

Pepco's portion of the DC PLUG initiative will be funded by an Underground Project Charge, a separate cost recovery mechanism from the other projects included in this Report. The Underground Project Charge is a non-bypassable surcharge collected by Pepco. A separate funding structure will recover the cost associated with the work to be performed by DDOT. DC PLUG funding is dedicated to the DC PLUG initiative work and has no impact on funds related to other Reliability programs.

While civil construction under the DC PLUG initiative was originally anticipated to begin in 2015, certain legal challenges have caused significant delays and further action is required by the District of Columbia Council to amend the authorizing legislation.

Costs associated with DC PLUG are excluded from the Company's capital reliability spending commitment for the merger, pursuant to Table 3 of Commitment 55.

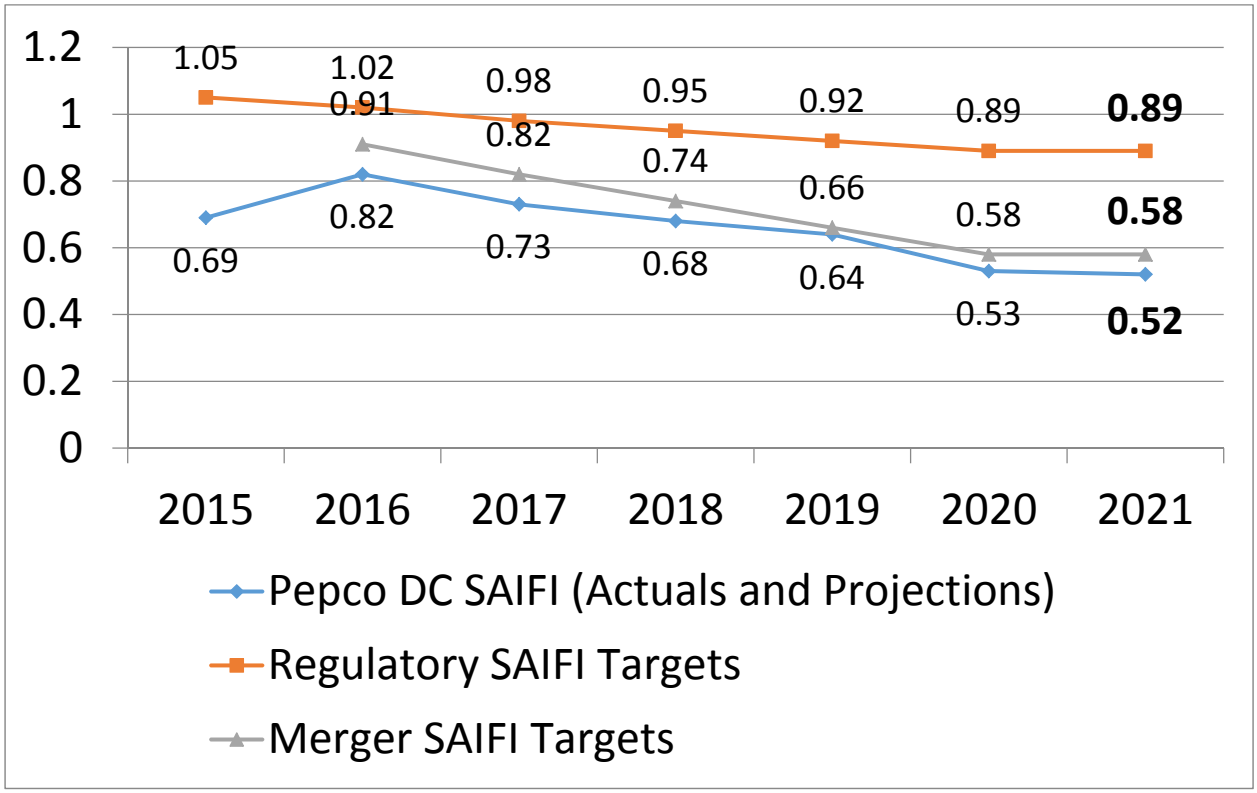
7.2. Intended Reliability Improvement

Due to ongoing legal challenges to DC PLUG, there are no performance metrics currently identified for this program.

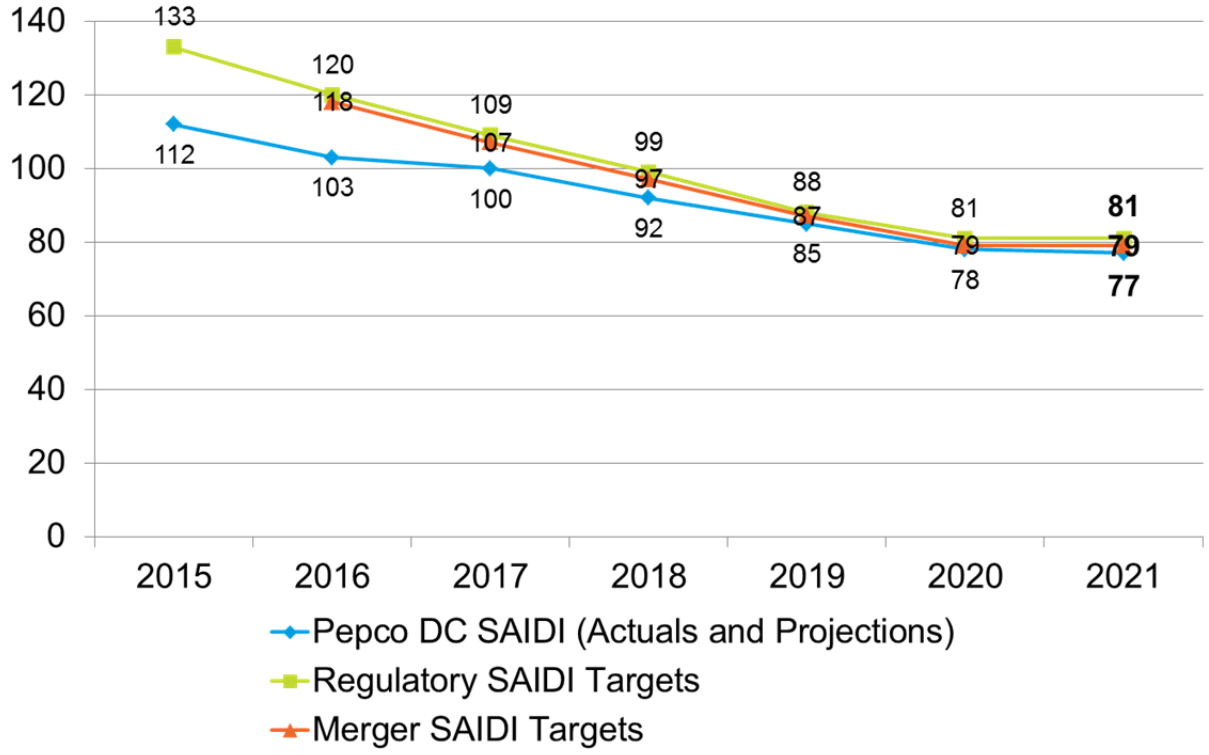
8. Projection of Intended Reliability Improvements

Pepco has employed a statistical modeling approach to project the expected reliability performance of the electric system based on the achievements gain for similar reliability enhancement projects performed during prior years. This method uses historical, observed improvements resulting from feeder improvement and distribution automation projects to project the impacts of planned work in these categories against the regulatory reliability targets as well as the PHI-Exelon Merger Commitments. The forecasted results are illustrated in the tables below, and reflect that the reliability improvement programs modeled over the next five years are generally on track to achieve both EQSS goals and Merger Commitments in 2020. Additional SAIDI (and SAIFI) process improvements may also be needed to assure achievement of the regulatory and Merger Commitment goals towards the end of the five-year period, which is typical when attempting to project out over a five year period for system performance. Pepco plans to re-evaluate the statistical modeling approach to project reliability benefits to ensure that the approach is aligned with Exelon polices to develop reliability projections and is fully committed to comply with its Merger Commitments.

Pepco District of Columbia SAIFI 2015-2016 Actuals, 2017-2021 Forecast

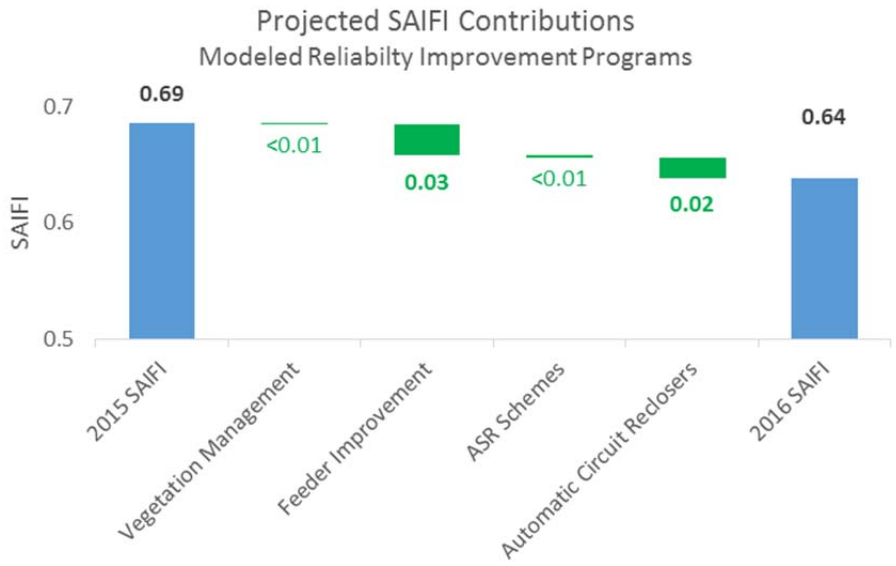


Pepco District of Columbia SAIDI 2015-2016 Actuals, 2017-2021 Forecast

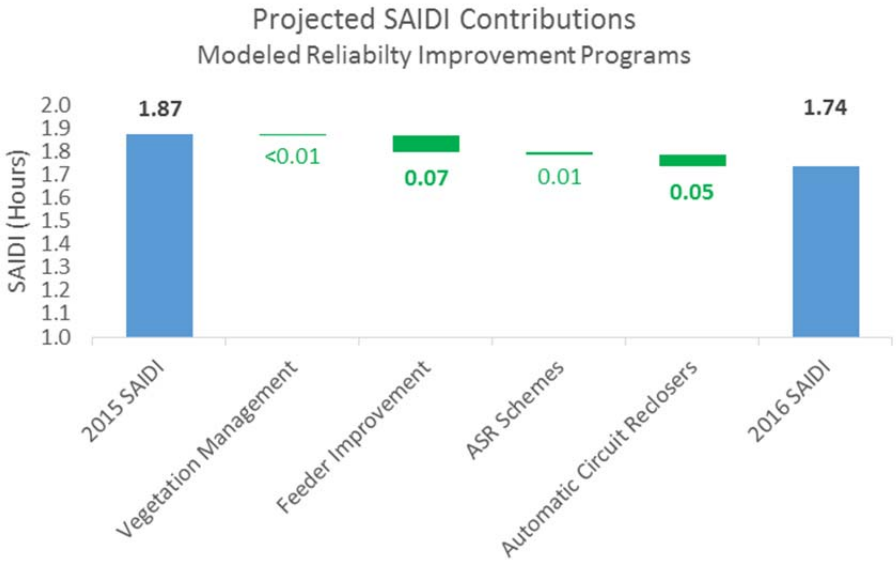


Pepco has continued to refine its methodology for measuring feeder reliability improvements to capture more reliability improvement project categories (such as ACRs, as well as a more comprehensive view of the improvements under the feeder reliability improvement programs), and has developed a method to estimate the SAIFI and SAIDI contributions of each of the reliability improvement programs modeled. See the following figures for the projected improvements to Pepco District of Columbia SAIFI and SAIDI associated with vegetation management work, feeder improvement projects (*i.e.*, improvements done as part of the 2% Priority Performing Feeder Program and Comprehensive Feeder Program), ASR schemes and automatic circuit reclosers scheduled for installation in 2016.

2015-2016 SAIFI Contributions from Modeled Reliability Improvement Initiatives



2015-2016 SAIDI Contributions (in hours) from Modeled Reliability Improvement Initiatives



The statistical approach to project future reliability metrics was not designed to be comprehensive in nature and does not model all feeder reliability initiatives underway. For example, the projects designed to replace aging infrastructure will provide reliability benefits but they are not modelled since the prediction of future failures cannot be based on past performance of the equipment such as cables and switchgear. This model is used to project future performance so that adjustments can be made in future

year reliability programs before required targets are missed. The model is not used to analyze actual reliability performance achieved or the actual performance of individual programs.

Attachment D

Work Plan Summary

Project Name	Project Description	Performance Metric	Miles/Feeders
Vegetation Management	Program to address vegetation, designed to maintain appropriate clearance on the system, remediate trouble spots (e.g., Priority Feeders), and remove the vegetation hazards that have the greatest impact on system reliability.	Annual tree related SAIFI/SAIDI performance for all feeders.	Number of miles pruned
Feeder Improvement	Program to address equipment, vegetation, weather, and animal-related interruptions which negatively impact reliability performance. These projects involve installing, removing, and replacing reclosers, switches, conductors, animal guards, lightning arresters and other equipment deemed necessary on the worst performing, top SAIFI contributing, and high customer interruption feeders to maintain safe operation and improve reliability.	Annual cumulative SAIFI/SAIDI performance for all feeders included within the feeder improvement as well as feeders where DA has been installed and feeders are undergrounded.	Number of feeders impacted
URD Cable Replacement and Enhancement	Program to address reliability of the underground residential infrastructure. These projects involve replacing or rejuvenating underground residential distribution (URD) cable in order to minimize URD failures.	Annual number of underground (URD) cable failures.	Number of miles replaced/ injected
Distribution Automation	Program to address system reliability by deploying technology. These projects involve installing advanced control systems across the distribution system in order to automatically identify and isolate faults in real time and restore service to customers in the unaffected parts of the system.	Annual cumulative SAIFI/SAIDI performance for all feeders included within the feeder improvement as well as feeders where DA has been installed and feeders are undergrounded.	Number of ASR schemes
Conversions	Program to address increasing load demands to maintain reliability and to ensure that future demands can be met under adverse conditions. These projects involve adding or upgrading feeders in order to reliably supply new customers and support increased usage required by existing customers.	Operate substations within design loading criteria.	N/A
Load Growth			

Work Breakdown Structure - 2017 Projects										
Initiative	**WBS Element**	**WBS Element Description**	**WBS Detailed Description**	**2014 Budget**	**2014 Actuals**	**2015 Budget**	**2015 Actuals**	**2016 Budget**	**2016 Actuals**	**2017 Budget**
Vegetation Management	N/A	N/A	N/A	$2,113,300	$2,164,335	$2,324,572	$2,238,654	$2,335,008	$2,269,634	$2,412,774
Feeder Improvement	UDLPRM4BF	PSC Priority Ckt Improvement: Benning	Install, remove, replace reclosers, switches, poles, wires, animal guards, lightning arresters and other equipment deemed necessary on the PSC mandated 2% Priority Feeders in the District, to maintain safe operation and improve reliability.	$16,003,043	$9,912,324	$14,462,995	$10,494,333	$14,009,093	$11,373,620	$4,800,000
	UDLPRM63D	Pepco DC: Feeder Reliability Improvements	Design and construct reliability improvements to additional feeders based on reliability performance. These feeders are in addition to the Priority Feeders. Install, remove, replace reclosers, switches, poles, wires, animal guards, lightning arresters and other equipment deemed necessary to improve performance.	$22,003,011	$11,744,607	$9,958,055	$3,252,478	$8,000,000	$5,157,483	$2,312,955
URD Cable Replacement and Enhancement	UDLPRM4BC	Benning: Replace Deteriorated URD Cable (UDLPRM4BC)	Reactive replacement of damaged and/ or failed URD cable	$120,964	$0	$117,808	$0	$120,909	$0	$120,658
	UDLPRM4BD	Benning: Planned URD Cable Replacements	Planned URD cable replacement or curing in DC. Planned program to reduce cable failures in URD cable and to prevent future failures from occurring.	$350,239	$1,139,768	$291,079	$804,999	$350,238	$283,009	$350,238
Other Feeder Reliability Projects	UDLPRM4BA	Benning: Misc Distribution Changes	Replace OH & UG equipment as needed based on equipment conditions.	$420,745	$905,018	$411,909	$366,899	$561,283	$491,182	$591,655
	UDLPRM4BG	Misc Dist Impvt - Mainline Heavy-Up: Benning	Increase capacity of underground secondary cables and overhead secondary wires to improve system reliability based on customer reliability inquiries.	$170,067	$55,761	$152,094	$112,433	$30,000	$25,137	$0
	UDLPRM4BM	Customer reliability improvements	Install/replace tree wire, #4 copper wire, damaged poles, fuses and transformers.	$2,026,544	$2,796,515	$2,313,932	$2,493,618	$2,390,362	$803,677	$2,449,943
	UDLPRM4BO	Benning: Padmount Transformer Replacements	Replacement of padmount transformers that are associated with URD cable replacement projects in DC.	$200,516	$82,299	$223,461	$83,792	$100,558	$4,815	$100,651

Work Breakdown Structure - 2017 Projects										
Initiative	**WBS Element**	**WBS Element Description**	**WBS Detailed Description**	**2014 Budget**	**2014 Actuals**	**2015 Budget**	**2015 Actuals**	**2016 Budget**	**2016 Actuals**	**2017 Budget**
	UDLPRM4BQ	Benning: Upgrades for Multi Device Operations	Replace equipment on a multiple device operation basis identified through OMS outage report.	$500,386	$0	$549,973	$21,697	$281,026	$48,832	$532,183
Other Feeder Reliability Projects	UDLPRM5SD	Emergency restoration secondary cable in duct	Install/replace mainline secondary cable, mainline single phase cable, secondary neutral cable, non-lead secondary cable and three phase mainline cable.	$2,600,963	$2,434,963	$2,431,615	$5,271,025	$2,000,833	$2,380,597	$2,000,343
	UDLPRM8BB	Blue Plains 69kV Feed NRL - Station C	Extend two 69 kV feeders from Blue Plains Sub. 83 to NRL Sub. 168 in order to serve as backup supply feeders to NRL Sub. 168.	$7,232,547	$2,450,321	$0	$1,238,486	$600,000	$682,270	$0
	UDLPRM5ED	34 & 69kV Oil Filled Cable Replmnts - DC	Failed sub transmission cable blanket - replace cable that fails while in service	$3,095,778	$737,323	$4,086,659	$2,918,107	$1,303,065	$1,617,240	$0
	UDLPRM5EV	IR: 34 & 69kv Oil Filled Cable Replacements - VA	An indepth cable study was performed in 2013 analyzing the current condition of our high pressure pipe type (HPPT) underground transmission feeders and our self-contained fluid filled (SCFF) underground transmission feeders. As a result of the cable study findings, a priority list of cable replacements reccommended a significant number of 69 kV SCFF feeders should be replaced, reconductored, or retired over the next five years.	$0	$6,464	$1,195,960	$95,350	$623,198	$899,161	$0
	UDLPRM5BP	MODs Replacement - Benning	Replace inoperative Motor Operated Disconnect switches.	$150,235	$100,627	$446,632	$341,970	$450,092	$63,893	$50,042
	UDLPRM4BN	Planned network transformer and protector replacements	Network transformer and protector replacement resulting from inspection indicating deterioration towards failure in DC and MD.	$10,159,894	$10,886,605	$10,226,294	$12,180,416	$10,174,076	$12,892,836	$10,084,234
	UDLPRPLIC	PILC REPLACEMENT PLANNED (UDLPRPLIC)	Replace approximately 4-5 miles per year of paper lead insulated cable with EPR. Replacement targets determined by PILC replacement strategy. Detailed scopes for planned improvements will be developed and subsequent scope descriptions added to program description.	$0	$131,047	$2,292,295	$2,565,760	$2,256,304	$844,856	$2,319,119
	UDLPRM41D	Placeholder - Future Pepco DC: OH Misc Planned Distribution Blanket (UDLPRM41D)	This is a blanket project to cover any miscellanous overhead distribution projects that may arise	$0	$0	$0	$0	$1,002	$0	$1,000

Work Breakdown Structure - 2017 Projects

Initiative	WBS Element	WBS Element Description	WBS Detailed Description	2014 Budget	2014 Actuals	2015 Budget	2015 Actuals	2016 Budget	2016 Actuals	2017 Budget
	UDLPRM42D	Placeholder - Future Pepco DC: UG Misc Planned Distribution Blanket (UDLPRM42D)	Pepco DC: UG Misc Planned Distribution Blanket	$0	$43,403	$598,003	$0	$250,000	$0	$0
Other Feeder Reliability Projects	UDLPRM4BE	Reject Pole Replace : Benning	Replace/reinforce wood poles that have not passed periodic inspection.	$646,881	$336,503	$622,059	$758,302	$682,306	-$172,771	$699,761
	UDLPRM5SG	Repl 69kV Slf-Containd UG Supl-Georgetwn,"F" St, 22nd St Subs	The 69 kV loop project will connect Takoma to Georgetown via 22nd Street Sub and F Street Sub. There will be four 69 kV solid dielectric feeders connecting Takoma Sub to 22nd Street Sub. Three of these solid dielectric feeders will continue on to F Street sub and terminate at Georgetown substation. One of the feeders will leave 22nd Street sub and travel directly to Georgetown substation. The last phase of the project will include a reconductoring of 3 exisiting pipe type feeders from Takoma to Champlain. These feeder will be tapped into before they enter Champlain and will travel to L Street substation.	$0	$233,659	$0	$106,590	$30,000	$45,209	$3,843,370
	UDLPRM4VB	Repl Rubber/Lead Secondary Cables: Benning	Replace lead secondary cable on an as needed basis	$123,265	$0	$117,808	$0	$120,909	$3,796	$40,146
	UDLPOEMGD	Pep-DC Damage Equipment Replacements	Blanket project to capture any unrecoverable equipment and asset replacement caused by others such as theft and accidents.	$0	$0	$0	$0	$0	$1,138,170	$300,000
	UDLPRM4WA1	Van Ness Switchgear Replacement: Distribution Line	This project is for the distribution line work in support of the purchase and installation of replacement 13.8kV switchgear in DC substations.	$0	$0	$0	$0	$0	$0	$750,000
	UDLPRM4WA2	PEPCO DC: Benning Sub Area Plan	Reconductor and redistribute load on Benning Substation overhead feeders. The project will include reclosers, ASR schemes, reconductoring, reconfiguring of circuits, new feeders, and optimizing all circuits out of Benning Substation.	$0	$0	$0	$0	$0	$0	$1,750,000
	UDLPRM4WJ	PEPCO DC: Single Phase Reclosing Devices	Install single phase reclosing devices (TripSavers) on fused taps and other locations.	$0	$0	$0	$0	$0	$0	$1,000,000
Distribution	UDSPRD8H	4kV Substation Automation	Purchase and install transformer secondary, feeder and DRTU smart relays at identified 4kV substations to improve reliability and level of monitoring and control at 4kV stations.	$829,000	$518,612	$702,982	$1,493,215	$669,007	$333,440	$685,475
	UDLPRDA1D	Distribution Automation - Pepco DC	Design & install automated switches and automatic circuit reclosers on various feeders per System Planning recommendations under Distribution Automation (DA) Program.	$701,815	$0	$569,071	$471,850	$300,000	$278,670	$9,647,791

Work Breakdown Structure - 2017 Projects

Initiative	WBS Element	WBS Element Description	WBS Detailed Description	2014 Budget	2014 Actuals	2015 Budget	2015 Actuals	2016 Budget	2016 Actuals	2017 Budget
Distribution Automation	UDSPRD8SD	Install Smart Relays and Replace RTU's - DC	To design and construct Digital Remote Terminal Unit (DRTU) in Substations for DA and non DA Applications.	$1,000,000	$846,729	$1,174,845	$1,083,806	$900,000	$1,023,055	$1,394,913
	UDLPRM4DR	Network RMS - Pepco DC (UDLPRM4DR)	Install Remote Monitoring System equipment for network trasformers and protectors	$0	$0	$0	$9,517,466	$3,250,000	$6,012,633	$3,500,000
Distribution Automation	UDLPRM4DJ	Pepco DC- Add Recloser Sectionalization	Install reclosers to mitigate impact of down-stream outages and reduce customer impact during sustained feeder outages.	$750,030	$0	$706,586	$235,705	$750,032	$1,164,589	$2,000,000
	UDSPRD8VD	NERC Physical Security Pepco	Substations included in the ASR schemes are connected through a secure communication infrastructure. In line with industry best practice, the Company is installing additional security equipment.	$119,693	$119,537	$110,682	$43,796	$120,686	$72,637	$121,185
	UOIPRASRD	Pepco DC: Install ASR Computer	Install Automatic Sectionalizing and Restoration (ASR) computer and complete point to point testing with field devices.	$500,000	$0	$294,349	$0	$200,000	$0	$150,000
	UORPOBR1D	DC Comm Work - Collector to Data Network	Design and construct radio mesh communications network (repeaters, master radios & access points) for Distribution Automation (DA) schemes in DC.	$500,000	$270,763	$287,823	$173,183	$149,999	$540,467	$113,806
	UORPODA1D	DC Comm Work: Install Radios in Line Eq	Complete engineering and installation of Distribution Automation (DA) field device controls, radios and antennas.	$710,445	$414,836	$511,374	$275,900	$199,998	$194,806	$200,000
	UORPORBSB	Base Stations for Communications Infrastructure - Benning	Design and construct base station equipment to transport Distribution Automation (DA) traffic over private, licensed wireless infrastructure to the Power Delivery Data Network (PDDN).	$137,660	$302,189	$117,053	$1,101,166	$150,000	-$140,082	$102,034
	UORPORCPD	Install Cap Controlls - DC	The purpose of this projects is to install controller and remote radios for line capacitors in Pepco DC.	$500,000	$11,643	$956,942	$192,725	$1,010,934	$268,969	$250,000
	UORPOR34D	Install Fault Detection System (FDS) in DC	Install smart fault indicators with telecommunications to aid in the location of faults on the distributiion circuits.	$125,182	$0	$133,161	$0	$126,823	$0	$0
	UORPORNPD	Network Remote Monitoring System Installation	Design and install communication devices for the Network Remote Monitoring System.	$5,250,364	$2,090,268	$5,397,656	-$3,525,719	$0	-$1,500,392	$650,294
	UORPORSSB	Benning: Sub Subscriber - BBW	Design and construct subscriber (remote) radio units colocated at access points and master radios to transport Advanced Metering Infrastructure (AMI) and Distribution Automation (DA) traffic over private, licensed wireless infrastructure to the Power Delivery Data Network (PDDN).	$144,006	-$32,651	$0	$77,559	$0	-$287,551	$0
	UDSPRD8SD2	Congress Heights Sub. 64 - Convert all 4kV load from Feeder 00178 and 00294	Replace Twining City T3 13kV to 4kV 5 MVA with 13kV to 4kV transformer.	$0	$0	$0	$2,530	$1,000,001	$517,196	$838,406

Work Breakdown Structure - 2017 Projects										
Initiative	**WBS Element**	**WBS Element Description**	**WBS Detailed Description**	**2014 Budget**	**2014 Actuals**	**2015 Budget**	**2015 Actuals**	**2016 Budget**	**2016 Actuals**	**2017 Budget**
Reliability Conversions	UDLPRGST1	G STREET SUB 28 - CONVERT 4KV LOAD AND RETIRE - Line Work	Work to begin the first phase of the infrastructure upgrades to the existing 4kV system supplied from G St. Sub. 28 in parts of Capitol Hill, Barney's Circle and Navy Yard areas.	$0	$0	$0	$0	$0	$685,731	$5,000
	UDLPRM4WA	Congress Heights Substation 64 - Convert all 4kV load from Feeder 00178 and 00294	Part of Pepco's long term plan to convert 4kv system to 13kV. This will allow for the retirement of the single supply/single transformer 4kV substation to improve reliability and operational flexibility	$0	$0	$0	$0	$100,000	$4,772	$1,500,000
Reliability Conversions	UDLPRM8BI	Fort Carroll Sub. 130: Convert 4-13kV Conversion (UDLPRM8BI)	Converting approximately 26,000 circuit feet of overhead; Fort Carroll Sub. 130 approximately 20,000 feet, Congress Heights Sub. 64 approximately 6,000 feet.	$3,000,000	$664,206	$2,264,493	$2,792,446	$149,998	$20,054	$0
	UDLPRM8BT	Convert 4-13 kV-Georgetown	This is the continuation of Project M34 for the Georgetown infrastructure projects and will convert the remaining 4kV load supplied from this substation. The project will identify all required underground system modifications necessary to maintain and improve distribution facilities by converting to 13kV. Area 2B is the next location identified for conversion and encompasses between P and S Sts. east of Wisconsin Avenue, NW. 50,000 ft conduit, 115,000 ft cable, 8 3-way switches, 3 13/4 kV step-down transformers, replace secondary where needed.	$4,804,472	$7,009,228	$5,461,506	$1,553,185	$3,714,990	$2,271,394	$5,000,001
	UDLPRM8BY	Convert 4-13 kV-Harvard	This project is being recommended to continue infrastructure upgrades to the existing 4kV system in the Upper Shaw and Harvard/Columbia Heights areas. Two 13kV Feeders extended from Florida Avenue Sub. 10 in 2011 provide capacity for portion of the conversion and allow load to be transferred to Sub. 10 from Sub. 13. Existing 13kV Feeders from Sub. 13 and new 13kV Feeders from Sub. 25 will be used to convert the remaining 4kV load starting in 2014. Total amount to be converted is approximately 60,200 feet. Customers supplied from the Harvard 4 kV substation experienced a total of 2,831,000 customer minutes of interruption in 2010.	$7,426,308	$3,120,044	$6,157,051	$5,254,572	$5,476,789	$6,712,936	$6,135,373
	UDLPRM8BC	North Capital Sub 40: Convert 4 to 13kV	This project is being recommended to initiate infrastructure upgrades to the existing 4kV system in the North Capitol Street, Kennedy Street, and New Hampshire Avenue, NW area. The proposed 4 to 13 kV conversions will be accomplished by extending and/or rearranging existing or new 13 kV distribution feeders from Fort Slocum Sub. 190 beginning in 2014. The total amount to be converted is approximately 50,600 feet.	$2,400,732	$1,851,637	$1,106,935	$1,294,283	$1,117,308	$1,439,370	$2,400,752
	UDSPRD8RM	Sub. 50 Marine D & R All 4kV Electrical	Project is to raze and demolish substation which is completely de-energized and no longer in service.	$0	$33,274	$83,601	$112,375	$17,401	$1,576	$0

Work Breakdown Structure - 2017 Projects

Initiative	WBS Element	WBS Element Description	WBS Detailed Description	2014 Budget	2014 Actuals	2015 Budget	2015 Actuals	2016 Budget	2016 Actuals	2017 Budget
	UDSPRD8AD3	Sub.048 53rd Street T4 Transformer Replacement (Voltage rating 13/4kV, Size:5MVA)	Replace the T4 transformer at 53rd street sub	$0	$0	$0	$157,226	$1,000,001	$978,848	$0
	UDLPRM8BU	Convert 4-13 kV-12th St.	The 12th Street Sub. 126 contains oil circuit breakers that will be removed based on review of condition and reliability. Both the 13 kV/4 kV transformers are identified as suspect and in need of eventual replacement. These oil circuit breakers are no longer manufactured and the manufacturer no longer provides spare parts. The existing conduit and cables are very old and upgrades of this system are being proposed to eliminate potential reliability concerns proactively.	$4,781,265	$5,592,139	$4,967,804	$4,428,860	$5,044,310	$3,764,043	$4,000,000
Substation Reliability	UDSPRD8AD5	10th Street T4 Transformer Replacement	Replace the T4 Transformer at sub 052 10th Street	$0	$0	$394,829	$0	$3,160,000	$1,906,220	$22,300
	UDSPRD8KD	13kV Swgr Impvts and Additions: Pepco DC	This project is for the purchase and installation of replacement 13.8kV switchgear in DC substations. Existing deteriorated switchgear will be replaced based on priority list determined through 2011-2012 Kinectrics study. Proposed plan is to replace all bus sections at one substation per year over next 5 years.	$5,898,944	$172,353	$3,297,771	$2,928,338	$4,498,999	$3,195,150	$2,439,879
	UDSPRD8JD	Animal Guards in Dist Subs: Pepco DC	As a result of documented animal related outage within substations in Pepco in DC, this project will either install animal guards on identified vulnerable insulators and equipment or install the new vanquish animal fencing around the substation to entirely keep animals out. Size and cost are key factors when determining if a fence will be used. Two substations in scope for 2013 are Benning and Van Ness based on the history of animal outages at these two substations.	$151,640	$271,706	$216,831	$155,794	$212,978	$25,624	$214,672
	UDSPRD8ED*	Battery & Charger Dist Subs: Pep DC	The existing batteries and chargers have been determined to be beyond their design life, or have been determined to be in failure mode due to testing and observation results. Battery systems across the Pepco system will be tested and visually inspected for condition and replaced accordingly to ensure reliable DC power systems in all Pepco stations. Chargers will be replaced as well as internal caps that have degraded over time.	$123,851	$391,771	$505,376	$450,995	$267,232	$263,841	$351,302
	UDSPRD8FD*	Dist Sub Bushing Repl: Pepco DC	Replace remaining U-Type bushings that are susceptible to an industry known problem for equipment failure. Test values of individual bushings will indicate the need for replacement. Bushings are tested at increased frequencies when power factors degrade and until these identified bushings can be replaced.	$136,191	$136,927	$149,594	-$2,784	$145,627	$522,187	$110,221
	UDSPRD8FV*	Dist Sub Bushing Replacement: Pepco DC	The purpose of this projects is Replace U-Type bushings that are susceptible to an industry known problem for equipment failure. Test values of individualbushings will indicate the need for replacement. Bushings of this type will be tested across PEPCo's system.	$63,955	$0	$67,921	$0	$72,629	$0	$72,469

Work Breakdown Structure - 2017 Projects

Initiative	WBS Element	WBS Element Description	WBS Detailed Description	2014 Budget	2014 Actuals	2015 Budget	2015 Actuals	2016 Budget	2016 Actuals	2017 Budget
	UDSPRD8AD6	GE UR Relay Replacement - DC	The scope of this project is the replacement of failing GE UR relays across the Pepco distribution system. This will also include the installation of new Ethernet switches and RTU upgrades at some substations. This work will be completed at a large number of substations/feeder terminals across the system.	$0	$0	$0	$0	$300,001	$397,366	$1,500,000
	UDSPLNW2	Harrison Sub: Construct New Sub	Rebuild the existing Harrison Substation 38 as equipment is in poor condition and non-standard.	$0	$0	$0	$0	$0	$10,534,900	$11,029,282
	UDSPRD8AD2	Harvard - New Sub - Rebuild to 230/13kV, 210 MVA	Build a new 230/13kV, 210 MVA class substation on existing Harvard Sub. 13 site. All 13 kV load would be temporarily transferred to a temporary substation consisting of mobile transformers and switchgear then cutover to the new Harvard sub when complete. Substation to consist of 6 bus sections, 48 feeder positions, 6 bus cap postions, 4 230/13kV 56 MVA transformer bays. Initial build will install three 230/13 kV transformers, four 230 kV supplies and four 9.0 MVar bus capacitor banks.	$0	$0	$0	$543,862	$599,999	$618,990	$1,060,389
Substation Reliability	UDSPRD8AD8	Champlain - New 230/69/34kV Sub	Build New Champlain 69kV sub with 3-230/69kV, 225 MVA transformers, a 69kV GIS breaker and half bus, 4bays, 14 breakers, 4-69/34kV transformers, 4-34kV outgoing feeders to resupply "L" Street, and 4-69kV outgoing feeders to resupply "F" Street and Georgetown Subs.	$0	$0	$0	$0	$0	$0	$291,820
	UDSPRD8D2	Pepco DC: Improve/Add Sub Enclosures	Address areas where transformer fire walls and ventilation systems need repair to protect the equipment.	$101,463	$31,714	$168,642	$38,067	$103,927	$732,684	$130,000
	UDSPRD8RC	Kennilworth Sub: Retire Sub	This project is for the demolition of Kenilworth Sub. Environmental assessments and permits are required.	$0	$12,383	$265,666	$6,403	$150,001	$1,670	$0
	UDLPRM4S1	Pepco DC - Deteriorated Cap Bank Replacement	Replace Capacitor banks as needed based on field condition assessment through various programs	$0	$0	$0	$0	$50,001	$0	$30,000
	UDLPRM9PD	Pepco DC: Upgrade Pumping Plants	Replace obsolete pumping plants. Vendors supply, remove and dispose of old plant then install new plants and then bring new plant on line and provide training for PEPCO personnel.	$50,000	$325,033	$270,707	$68,745	$1,000,001	$873,639	$50,000
	UDSPRD8TD	Pepco DC: Roof Replacements	To replace and repair various substation roofs in order to avoid equipment and further structural damage. Multiple points of failure have been identified in the form of severe leaks which are no longer economically feasible to repair.	$126,085	$139,557	$172,644	$123,874	$121,338	$10,453	$121,518

Work Breakdown Structure - 2017 Projects										
Initiative	**WBS Element**	**WBS Element Description**	**WBS Detailed Description**	**2014 Budget**	**2014 Actuals**	**2015 Budget**	**2015 Actuals**	**2016 Budget**	**2016 Actuals**	**2017 Budget**
	UDSPRD8LD	Pepco DC: Substation Ventilation	To be defined when warm weather in the late spring to early summer 2013 begins.	$42,054	-$14,091	$41,217	$0	$41,988	$0	$43,055
	UDSPRD9D5	Pepco DC Add Sub Cond Monitoring Points	This project allows us to add condition monitoring points to equipment as it may become impaired throughout the year. These monitoring points enable for proactive repair/replace decisions to be made. These monitoring points can include transformer DGA monitors, bushing monitors, Load Tap Changer monitors and even breaker or battery monitors. If no condition based needs arise funds may be utilized to add monitoring devices to new equipment.	$108,120	$0	$103,691	$0	$109,503	$0	$110,559
	UDSPRD8A1	Retire Congress Height Sub. 64	This project is for the purchase and installation of replacement 13.8kV switchgear in 9th Street Sub 117. Existing deteriorated switchgear will be replaced based on priority list determine through 2013 revised Kinectrics study. Proposed plan is to replace all bus sections.	$0	$0	$0	$0	$150,000	$79,572	$2,735,121
Substation Reliability	UDSPRD8UD*	Repl Eng Generators Dist Sub: Pepco DC	Replace engine generators that are beyond their useful design life.	$307,097	$457,677	$81,669	$11,103	$99,104	$18,668	$98,791
	UDSPRD9GD*	Pepco DC Xfrmr Repl - Aging Infrastuct	Condition and age related replacement of Transformers T2 at L Street Sub. 21 and T4 at New Jersey Sub. 161.	$5,351,119	$5,238,305	$5,671,529	$3,108,830	$1,597,001	$3,192,306	$1,950,000
	UDSPRD8RD1	Retire Congress Height Sub. 64	Retire Congress Heights Sub. 64 after Feeders 178 and 294 are converted to 13kV construction.	$0	$0	$0	$0	$5,000	$0	$100,000
	UDSPRD8Q1D	SPCC - Distribution Oil Brkr Replacements : Pepco DC	Replacement of 69kV Oil Circuit Breakers with GCBs for the following substations: 1) Ft Slocum - Replaced Five(5) 69kV OCBs 2) 12th & Irving - Replaced Five(5) 69kV OCBs	$0	$0	$1,933,120	$1,506,052	$671,358	$766,427	$153,387
	UDSPRD8AD14	Tenth Street (Sub 52) - Replace Transformer #3	Tenth Street (Sub 52) - Replace Transformer #3	$0	$0	$0	$0	$0	$0	$1,050,000
	UDSPRD8AD	Planned Dist Sub Impvt: Pepco DC	Foundation and building repairs required at Sub 190 Fort Slocum, presumably from earthquake damage in 2011.	$72,852	$6,941	$131,627	$564,851	$73,614	$257,490	$107,364

Work Breakdown Structure - 2017 Projects										
Initiative	**WBS Element**	**WBS Element Description**	**WBS Detailed Description**	**2014 Budget**	**2014 Actuals**	**2015 Budget**	**2015 Actuals**	**2016 Budget**	**2016 Actuals**	**2017 Budget**
Emergency Restoration	UDLPRM3B1	Benning: Emergency Restoration - OH & UG	Blanket project for emergency replacement of distribution equipment damaged as a result of storms, accidents, wear and tear, falling trees/limbs, etc	$4,478,499	$10,135,891	$4,386,936	$7,156,555	$8,228,329	$7,410,776	$8,478,390
	UDSPRD71D	Dist. Sub. Emergency Blanket DC	Blanket project to cover costs during emergencies involving failed substation equipment.	$600,000	$313,409	$684,233	$461,462	$613,540	$586,998	$617,187

Work Breakdown Structure - 2017 Projects										
Initiative	**WBS Element**	**WBS Element Description**	**WBS Detailed Description**	**2014 Budget**	**2014 Actuals**	**2015 Budget**	**2015 Actuals**	**2016 Budget**	**2016 Actuals**	**2017 Budget**
Emergency Restoration	UDLPRM32D	Emergency Restoration Primary Cable in Duct: Pepco DC	Blanket project to address cable replacements on an as needed basis.	$7,623,773	$6,605,541	$7,756,454	$6,672,175	$9,169,722	$12,872,054	$7,304,353
	UDLPRM3K1	Emergency Restoration: Network Transfs & Protectors	Blanket project for emergency replacement of transformers and protectors.	$2,000,425	$1,105,930	$2,137,044	$3,062,005	$4,000,306	$6,207,484	$2,000,400
Load Growth	UDLPLLF1	Little Falls Sub. 77 - Extend New Dist. Feeder (UDLPLLF1)	The purpose of this project is to extend one outgoing 13.8kV Distribution feeder from Little Falls Sub. 77 along Loughboro Rd., north on Dalecarlia Pkwy, south on Rockwood Pkwy until Tilden St., and north on Tilden St. until Fordham Rd. underground a total distance of about 0.9 miles. Then, extend overhead from Fordham Rd & Tilden St. north on Fordham Rd. a total distance of approximately 0.1 mile. This feeder will be used to relieve Little Falls Sub. 77 Feeder 14766. Model with Term for new Little Falls Sub. 77 feeder project.	$2,106,836	$0	$0	$0	$254,999	$0	$270,000
	UDLPLM7W	Dist Feeder Load Relief - DC	Placeholder for miscellaneous line work.	$8,616,017	$3,836,506	$4,445,657	$4,190,143	$4,827,574	$1,146,867	$727,478
	UDLPLNE5	Sub. 52 to Sub. 212 Network Cutover	Extend a new (2nd) six feeder LVAC group from Northeast Sub. 212 west along Harry Thomas Way and Q St, south along North Capitol St and west along N St to 6th St using approximately 7000' of new conduit and 42000' of new cable to transfer all load from the Sub. 52 North LVAC Group.	$6,937,906	$0	$4,931,953	$2,141,698	$3,468,952	$9,749,951	$500,000
	UDLPLNW1	Harrison: Convert 3-4kv Fdrs & Reconf Fdrs	This project is being recommended to convert and/or transfer the 4kV load supplied from Harrison Sub. 38 to initiate the retirement of Harrison Sub. 38. Three 4kV Feeders (310, 416, and a portion of 414) will be converted to a new 13kV Feeder (15944) from Van Ness Sub. 129. Extend one outgoing 13.8kV Distribution Feeder (15944) from Van Ness Sub. 129 along Van Ness Street, NW, north on 39th Street, NW, west on Albemarle Street, NW to 40th Street, NW, north on 40th Street, NW to Brandywine Street west on Brandywine Street and north on Wisconsin Avenue to the vicinity of Ellicott Street, NW to make a tie connection with Harrison Sub. 38 Distribution Feeder 15930. The remainder of Feeder 414 will be transferred to Nebraska Sub. 92 – 4kV Feeder 117. The remaining 3 feeders supplied from Harrison Sub. 38 (65, 308, & 413) will be resupplied from Oliver Street Sub. 146.	$5,233,789	$6,584,281	$0	$829,840	$0	-$64,458	$0
	UDLPLNW3	New NW Sub: Extend New Dist Fdrs to 38 (UDLPLNW3)	The purpose of this project isto extend 17 -13.8kV underground feeder supplies a total distance of 1/4 mile, and rearrange with each of the existing Harrison Sub. 38 Distribution feeders. Build 4 -8W duct banks from new Northwest Sub. a total distance of approximately 1/4 mile. Model with new Northwest 138/13kV Sub. Model with UDSPLNW2, UTLPLNW1, UDSPLNW3 AND UDLPLNW1.	$673,975	$460,803	$3,254,809	$2,142,458	$3,020,953	$2,483,847	$1,000,000

Work Breakdown Structure - 2017 Projects										
Initiative	**WBS Element**	**WBS Element Description**	**WBS Detailed Description**	**2014 Budget**	**2014 Actuals**	**2015 Budget**	**2015 Actuals**	**2016 Budget**	**2016 Actuals**	**2017 Budget**
Load Growth	UDLPLWF1	SE:Sub136: Extend 7 Fdrs to Retire Anacostia	This project will require the extension of two overhead distribution feeders from Alabama Ave. Sub. 136, which along with existing feeders will be used to transfer all distribution load from Anacostia Sub. 8. Three new 13 kV feeders are to be extended to transfer the supplies of Twining City Sub. 50 from Sub. 8 to Sub. 136. Two new spot network feeders would be extended to transfer the spot network load from Sub. 8 to Sub. 136. The three feeders and the two spot network would be extended underground in new 8-way conduit from Sub. 136 to Sub. 8 to cut over the five Anacostia feeders, a distance of approximately 9500 feet.	$16,000	$4,495	$5,010,836	$814,820	$3,915,001	$4,176,778	$0
	UDLPLWF3	SE: Anacostia Sub : Convert 4 to 13kv & Retire Sub	The proposed 4 to 13kV conversions will be accomplished by extending and/or rearranging existing or new 13kV distribution feeders from Alabama Avenue Sub. 136 and converting all feeders from Anacostia Sub. 8 4kV along with portions of feeders from Congress Heights Sub. 64, Fort Carroll Sub. 130 and Twining city Sub. 150. This will require converting approximately 141,900 circuit feet of overhead. Anacostia Sub. 8 18,900 feet, Congress Heights Sub. 64 18,300 feet, Fort Carroll Sub. 130 60,200 feet, and Twining City Sub. 150 44,500 feet of overhead circuit. Conversion of 4 kV load out of Anacostia substation will allow the retirement of the station, which other wise would have to be rebuilt.	$16,632	$34,188	$0	-$12,417	$0	$17,827	$0
	UDLPLWF4	SE: Waterfront Sub: Construct New LVAC Groups (UDLPLWF4)	The purpose of this projects is to extend 6 -13kV underground feeder group from the new Waterfront Sub. 223 to cutover Buzzard Pt. Sta. B - East LVAC group. Build approximately 0.4 miles of a new 8 way conduit bank and install approximately 2.4 miles of 600 MCM 3/c cable. Model with UDSPLWF1 138/13kV Waterfront Sub. 223 and UTLPLWF1 Waterfront Sub. 223 -new 138kV supply feeders.	$5,353	$0	$5,529,428	$261,742	$6,167,908	$3,597,948	$1,500,762
	UDLPLWF5	Southwest Sub 18: Rearrange Central LVAC to South LVAC	SW Sub. 18 Central LVAC group will be extended from D St., SW along 6th St., to C St., SW to transfer 5.0 MVA of summer 2017 load from SW Central to SW South LVAC group. This will require approximately 3500 feet of 8way conduit bank and 21000 feet of new 500 3/c cable.	$0	$0	$1,685	$0	$0	$0	$1,673
	UDLPLIST2	Sub 197 Central to Sub 197 North LVAC Cutover	Extend the I St Sub. 197 North LVAC Group south along 19th St St from I St to G St using approximately 1000' of new conduit and 6000' of new cable to transfer load from the Sub. 161 Central Group.	$0	$0	$1,506,822	$0	$609,000	$806,127	$1,506,822
	UDLPLM7W10	Install Tie Switch Between 4kV Feeders 144 and 308	Extend and/or rearrange 4kV Feeder 144 (Westmoreland Sub. 93 & Palisades Sub. 145) and 4kV Feeder 308 (Westmoreland Sub. 93 & Oliver Street Sub. 146) to install one (1) Normally Open tie-switch between Feeders 144 and 308 on Brandywine Street east of 49th Street, NW.	$0	$0	$8,899	$0	$0	-$251	$0
	UDLPLM7W4	O St. Sub. 2 Feeder 14367 heavy-up	Heavy-up O Street Sub. 2 South LVAC Network Group Feeder 14367 from MH# 790389-349295 to MH# 790388-353765 from #2 3/C P.L. to 4/0 3/C P.L., requiring approximately 432' of cable.	$0	$706	$294,336	$374,521	$0	$38,359	$0
	UDSPLM7W	Dist Fdr Load Relief: DC Sub Work	Benning Sub. 7: Extend 2 new Dist. Feeders by 2014 Alabama Ave. Sub. 136: Extend 5 new Dist. Feeders by 2014 Champlain Sub. 25: Extend 2 new Dist. Feeder by 2015 Alabama Ave. Sub. 136: Extend Fdrs. 15173, 15175, 15176, & 15177 by 2015 New Northwest Sub.: Extend 5 new Dist. Feeder by 2015 Ft. Slocum Sub. 190: Extend one new Dist. Feeder by 2016.	$200,000	$561,297	$299,950	$0	$0	$975,944	$182,158
	UDSPLMV2	New Mt Vernon Sq Sub: Purchase Land (UDSPLMV2)	The purpose of this project is to Buy land for New Mt. Vernon Square 138/13.8 kV Substation. Model with UDSPLMV1, UTLPLMV1, UDSPLMV3 AND UDLPLMV1.	$30,517,504	$58,638	$17,618,566	$16,193,600	$300,000	$18,207	$0

Work Breakdown Structure - 2017 Projects										
Initiative	**WBS Element**	**WBS Element Description**	**WBS Detailed Description**	**2014 Budget**	**2014 Actuals**	**2015 Budget**	**2015 Actuals**	**2016 Budget**	**2016 Actuals**	**2017 Budget**
Load Growth	UDSPRD8AD4	Sub 161 New Jersey Ave: Repl Cap Bank 1-1 & 5-1	Replace the 1-1 and 5-1 cap bank at New Jersey Avenue Sub	$0	$0	$0	$30,230	$900,001	$1,694,547	$0
	UDSPRD8RO	Trinidad Sub 106 - Retire	This project is for the demolition of Trinidad sub 106. Environmental asessments and permits are also required	$0	$22,383	$83,601	$16,298	$17,963	$1,559	$0
	UDSPLNE2	Northeast Sub : Add 4th Transformer	Install 4th 69/13.8 kV Transformer at Northeast Sub 212. Install one 9 MVAR cap bank on the 13.8 kV bus. Terminal costs at Benning Sta A for 69 kV supply to fourth transformer.	$2,608,460	$1,302,169	$971,581	$1,336,657	$0	$2,516	$0
	UDSPLNE4	Benning 69kv Sub: Term for 4th NE Fdr (UDSPLNE4)	The purpose of this project is ND21 - Benning 69kV Sub Terminal for 4th NE Feeder Install 69kV terminal at Benning to extend 69kV feeder to 4th 69/13.8 kV Transformer at Northeast Sub 212. Model UDSPLNE2, UDLPLNE2, and UDLPLNE5.	$416,615	$34,477	$334,333	$371,191	$0	$2,596	$0
	UDSPLNW2	New NW Sub: Construct New Sub	Start of engineering for a new substation named Northwest Substation. This station is neededto replace the existing Harrison Substation due to the condition of the existing switchgear and transformers. In addition this new station will support the continued growth in the upper nothwest portion of the District of Columbia. This work will establish a new 138/13.8 kV substation. Extend seventeen (17) feeders from Northwest Sub. 228, and tie them to the existing feeders coming from Harrison Sub. 38.	$9,763,691	$2,439,540	$13,215,151	$6,322,676	$9,069,778	$10,534,900	$11,029,282
	UDSPLWF1	SE: Waterfront: Establish New Substation	Start of engineering for a new substation in the Buzzard Point area of the system. Substation needs to supply increased capacity to the southwest portion of the city and support current and increased load growth in that area.	$836,377	$1,479,988	$9,270,819	$12,732,821	$21,292,212	$23,208,716	$17,575,191

Feeder Improvement - 2017 Projects

Program to address reliability performance of the 2% Worst Performing Feeders and Comprehensive Feeders. These projects involve detailed field inspections and installing, removing, and replacing reclosers, switches, conductors, animal guards, lightning arresters and other equipment deemed necessary in order to maintain safe operation and improve reliability.

Location	FEEDER ID	WBS	Location-Description	Jurisdiction	Estimated Completion
Bellevue	14755	UDLPRM4BF	Vicinity of Danbury St., South Capitol St., and Mississippi Ave. between Martin Luther King, Jr. Ave., and 6th St., S.E.	District of Columbia	3rd Quarter 2017
Bellevue	14758	UDLPRM4BF	Vicinity of Livingston Rd. from Chesapeake Street to South Capitol Street and Galveston Street from South Capitol Street to Martin Luther King, Jr. Ave., S.W.	District of Columbia	3rd Quarter 2017
Deanwood, Burrville, and Mahaning Heights	14717	UDLPRM4BF	Vicinity of Kenilworth Terrace at Hayes and Jay Sts., N.E.	District of Columbia	3rd Quarter 2017
Woodland	14702	UDLPRM4BF	Vicinity of Fairlawn Ave., from Talbert St. to N St., 18th St. from Fairlawn Ave. to Good Hope Rd. and Naylor Rd. from Minnesota Ave. to Alabama Ave., S.E.	District of Columbia	3rd Quarter 2017
Brentwood, Langdon, and Brookland	14014	UDLPRM4BF	Vicinity of Rhode Island Avenue from 14th St. to Eastern Ave., N.E. Also, on Queens Chapel Rd. from Bladensburg Rd. to Evarts St., N.E. Also, on Eastern Ave. from Varnum St. to Rhode Island Ave., N.E.	District of Columbia	3rd Quarter 2017
Eastland Gardens	15705	UDLPRM4BF	Vicinity of 46th St. at Sheriff Rd. and Kenilworth Ave. between 42nd St. and Eastern Ave., N.E.	District of Columbia	3rd Quarter 2017
Congress Heights, Shipley Terrace, and Washington Highlands	15085	UDLPRM4BF	General vicinity of Owens Rd. from Wheeler Rd. to Southern Ave. (MD), and Southern Ave. from Owens Rd. to Wheeler Rd., Wheeler Rd. to Valley Ave., S.E. (DC).	District of Columbia	3rd Quarter 2017

Feeder Improvement - 2017 Projects

Program to address reliability performance of the 2% Worst Performing Feeders and Comprehensive Feeders. These projects involve detailed field inspections and installing, removing, and replacing reclosers, switches, conductors, animal guards, lightning arresters and other equipment deemed necessary in order to maintain safe operation and improve reliability.

	Location	FEEDER ID	WBS	Location-Description	Jurisdiction	Estimated Completion
District of Columbia 2% Priority Feeders	Capitol Hill, Lincoln Park	14009	UDLPRM4BF	Vicinity of Franklin St. between 2nd and 10th Sts., N.E.	District of Columbia	3rd Quarter 2017
	Capitol Hill, Navy Yard, Barny Circle	00228	UDLPRM4BF	Area bounded by 11th St. and O St. and G Sts., S.E. Also M St. S.E. from 14th St. east to the Anacostia Marina.	District of Columbia	3rd Quarter 2017
	Carver Langston	15710	UDLPRM4BF	Vicinity of Benning RD NE and Kenilworth Ave NE. Vicinity of Blaine ST NE heading East from Minnesota Ave NE and ending North on 42nd ST NE.	District of Columbia	3rd Quarter 2017
	Navy Yard	15755	UDLPRM4BF	Vicinity of South Capitol Street between Eye Street and V Street, S. E. and S. W.	District of Columbia	3rd Quarter 2017
	Barry Farm, Fort Stanton, and Anacostia	14701	UDLPRM4BF	Area bounded by Pomeroy Rd. and Bowen Pl. and by Sheridan Rd. and Howard Rd., S.E. and vicinity.	District of Columbia	3rd Quarter 2017
	Manor Park, Brighton Wood	15013	UDLPRM4BF	Vicinities of N. Capitol St. at Blair Rd.N.E & N.W. and the vicinities of Ft. Totten Rd. Blair Rd. Taylor St. and Harwood Rd., N.E.	District of Columbia	3rd Quarter 2017
	Woodland, Garfield Heights	14261	UDLPRM4BF	Vicinity of Gainesville Rd., Alabama Ave., S.E. & 30th St.	District of Columbia	3rd Quarter 2017

Feeder Improvement - 2017 Projects

Program to address reliability performance of the 2% Worst Performing Feeders and Comprehensive Feeders. These projects involve detailed field inspections and installing, removing, and replacing reclosers, switches, conductors, animal guards, lightning arresters and other equipment deemed necessary in order to maintain safe operation and improve reliability.

	Location	FEEDER ID	WBS	Location-Description	Jurisdiction	Estimated Completion
	Barry Farm, Congress Heights	14753	UDLPRM4BF	Vicinity of Martin Luther King, Jr. Ave. South of Chesapeake St. to D.C. Village.	District of Columbia	3rd Quarter 2017
	Brightwood Park, Manor Park	15014	UDLPRM4BF	Vicinity of Blair Rd. at Sligo Mill Rd. and Riggs Rd. between Oglethorpe St. and Kennedy St., N.W.	District of Columbia	3rd Quarter 2017
	Columbia Heights, Logan Circle	15762	UDLPRM63D	Vicinity of Florida Avenue, 14th St, Newton St., and 19th St.	District of Columbia	4th Quarter 2017
	Deanwood, Mahaning Heights, and Hillbrooke	15709	UDLPRM63D	Vicinity of Eads St., between Anacostia Av. and 36th St., Benning Rd. between 36th St. and Minnesota Av., Minnesota Av. between Benning Rd. and Ames St., Blain St. between Minnesota Av., and Benning Rd., also 35th St., Ames St., and 37th Street, N.E.	District of Columbia	4th Quarter 2017
	Columbia Heights, Logan Circle	15769	UDLPRM63D	Vicinity of 13th St, Florida Avenue, Barry Pl, Georgia Ave, Bryant St, N.W.	District of Columbia	4th Quarter 2017
	Penn Branch	00097	UDLPRM63D	Vicinity of Ridge Road between Texas Avenue and Anacostia Road, S.E. Minnesota Avenue between Ames Sreet and Gault Place, N.E. and 44th Street Between Grant Street and Benning Road, N.E.	District of Columbia	4th Quarter 2017
	Penn Branch	00479	UDLPRM63D	Vicinity of Minnesota Ave. between 19th St. and Lyndale Pl., SE.	District of Columbia	4th Quarter 2017

Feeder Improvement - 2017 Projects

Program to address reliability performance of the 2% Worst Performing Feeders and Comprehensive Feeders. These projects involve detailed field inspections and installing, removing, and replacing reclosers, switches, conductors, animal guards, lightning arresters and other equipment deemed necessary in order to maintain safe operation and improve reliability.

	Location	FEEDER ID	WBS	Location-Description	Jurisdiction	Estimated Completion
District of Columbia Comprehensive Feeders	Forest Hills, McLean Garden	15867	UDLPRM63D	Vicinity of VanNess St. between International Dr. and Conn. Ave. Upton Street at Conn. Ave. Macomb St. between Conn. Ave. and 34th St. and Porter St. between Quebec St. and Williamsburg Lane, N.W.	District of Columbia	4th Quarter 2017
	Garfield Heights, Buena Vista, and Woodland	15173	UDLPRM63D	Vicinity of Mississippi Ave, Southern Ave, Hartford St, Irving St, 24th St, Alabama Ave, Ainger Pl, Gainsville St, Morris Road, and Ernie St.	District of Columbia	4th Quarter 2017
	Friendship Heights	00117	UDLPRM63D	Area bounded by Connecticut Ave. and Broad Branch Rd., and by Fessenden St. and Military Rd., N.W. and vicinity.	District of Columbia	4th Quarter 2017
	Lincoln Park	00209	UDLPRM63D	Vicinity of Pennsylvania Ave. from 8th St. and 12th St., S.E.	District of Columbia	4th Quarter 2017
	Foxhall Village, Burleith - Hillandale	14136	UDLPRM63D	Van Ness St. between Wisconsin Ave. and Connecticut Ave., N.W., and on Connecticut Ave. between Albermarle St. and Porter St., N.W. Also, on Wisconsin Ave. from Van Ness St. to Reservoir Rd., N.W., and on Reservoir Rd. between Wisconsin Ave. and Foxhall	District of Columbia	4th Quarter 2017
	Takoma, Manor Park, and Brightonwood Park	15009	UDLPRM63D	Vicinity of Blair Rd. between Oglethorpe St. and Whittier St. Rittenhouse St. between Blair Rd. and 9th St. and Whittier St. between 3rd St. and Piney Branch Rd. N.W.	District of Columbia	4th Quarter 2017
	McLean Gardens, Woodley Park	14767	UDLPRM63D	Vicinities of MacArthur Blvd. from Macomb St. to 49th St., W St. from 49th St. to Foxhall Rd. and Foxhall Rd. from W St. to Canal Rd.	District of Columbia	4th Quarter 2017

Feeder Improvement - 2017 Projects

Program to address reliability performance of the 2% Worst Performing Feeders and Comprehensive Feeders. These projects involve detailed field inspections and installing, removing, and replacing reclosers, switches, conductors, animal guards, lightning arresters and other equipment deemed necessary in order to maintain safe operation and improve reliability.

	Location	FEEDER ID	WBS	Location-Description	Jurisdiction	Estimated Completion
	Palisades	15801	UDLPRM63D	Vicinity of MacArthur Blvd., Sherrier Place, Canal Rd. and Reservoir Rd., N.W.	District of Columbia	4th Quarter 2017
	Cleveland Park	00063	UDLPRM63D	Vicinity of 34th St. between Macomb St. and Mass. Ave. and Wisconsin Ave. at Woodley Rd. and Cleveland Park, N.W.	District of Columbia	4th Quarter 2017
	Anacostia, Penn Branch	00244	UDLPRM63D	Carpenter St. from 38th St. to Pennsylvania Ave., S.E. and vicinity.	District of Columbia	4th Quarter 2017

Underground Residential Cable Replacement and Enhancement - 2017 Projects

Program to address reliability of the underground residential infrastructure. These projects involve replacing or rejuvenating underground residential distribution (URD) cable in order to minimize URD failures.

Location	FEEDER ID	WBS Element	Location-Subdivision	Jurisdiction	Estimated Completion
North East, Washington DC	14787	UDLPRM4BD	Urban URD	District of Columbia	2nd Quarter 2017
North East, Washington DC	15013	UDLPRM4BD	Taylor St.	District of Columbia	2nd Quarter 2017
South East, Washington DC	15170	UDLPRM4BD	Stanton Ter.	District of Columbia	2nd Quarter 2017
North West, Washington DC	15943	UDLPRM4BD	Reservoir Rd.	District of Columbia	3rd Quarter 2017

Load Growth - 2017 Projects

Program to address increasing load demands to maintain reliability and to ensure that future demands can be met under adverse conditions. These projects involve adding or upgrading feeders in order to reliably supply new customers and support increased usage required by existing customers.

Location	FEEDER ID	WBS Element	Location-Subdivision	Jurisdiction	Estimated Completion
Benning Sub. 7	14151 14711	UDLPLBN1	1. Extend and/or rearrange Benning Sub. 7 – 13kV Feeders 14151, 14712, 15703, and 15704 to accomplishing the following: a.) Re-establish Feeder 14151 as an active feeder by converting it from a 3-wire LVAC Network Feeder to a 4-wire Distribution Fdr. b.) Transfer approximately 2.9 MVA summer 2013 load from Feeder 14712 to Feeder 14151. c.) Transfer approximately 1.5 MVA summer 2013 load from Feeder 15703 to Feeder 14151. 3. Extend and/or rearrange Benning Sub. 7 – 13kV Feeders 14713, 14711, and 15704 to accomplish the following: a.) Re-establish Feeder 14711 as an active feeder by converting it from a 3-wire LVAC Network Feeder to a 4-wire Distribution Fdr. b.) Transfer approximately 3.7 MVA summer 2013 load from Feeder 14713 to Feeder 14711.	District of Columbia	2nd Quarter 2017
10th Street Sub. 52	TBD	UDLPLFL3	Extend and/or rearrange the Florida Ave. Sub. 10 South LVAC group and the Tenth St. Sub. 52 North LVAC group, thereby transferring approximately 15.0 MVA Summer 2016 load from Florida Avenue Sub. 10 South LVAC Network, South of N Street on 7th Street to Tenth Street Sub. 52 North LVAC Network, with the following individual feeder transfers: (Preliminary work)	District of Columbia	2nd Quarter 2017

Load Growth - 2017 Projects

Program to address increasing load demands to maintain reliability and to ensure that future demands can be met under adverse conditions. These projects involve adding or upgrading feeders in order to reliably supply new customers and support increased usage required by existing customers.

Location	FEEDER ID	WBS Element	Location-Subdivision	Jurisdiction	Estimated Completion
Northeast Sub. 212	15475 15476 15477 15478 15479 15480	UDLPLNE5	Extend a new West LVAC Network Group from Northeast Sub. 212 Extend Feeders 15475, 15476, 15477, 15478, 15479, and 15480. Conduit Phase 1 Extend a new LVAC Network Group from Northeast Sub. 212. Conduit Phase 2 Extend a new LVAC Network Group from Northeast Sub. 212. Conduit Phase 3 Extend a new West LVAC Network Group from Northeast Sub. 212. Cable work from the Substation to N St and 6th St NW	District of Columbia	1st Quarter 2017
			Convert all load (approximately 0.5 MVA and 0.4MVA summer 2015 load) from Feeder 56 to Feeders 15177 and 15173, respectively.		
			Convert all load (approximately 0.2 MVA summer 2015 load) from Feeder 96 to Feeder to 15177		
			Convert all load (approximately 0.5 MVA summer 2015 load) from Feeder 177 to Feeder 15177.		

Load Growth - 2017 Projects

Program to address increasing load demands to maintain reliability and to ensure that future demands can be met under adverse conditions. These projects involve adding or upgrading feeders in order to reliably supply new customers and support increased usage required by existing customers.

Location	FEEDER ID	WBS Element	Location-Subdivision	Jurisdiction	Estimated Completion
Anacostia Sub. 8	15056 15177 15173	UDLPLWF3	Convert all load (approximately 0.3 MVA summer 2015 load) from Feeder 499 to Feeder 15177.	District of Columbia	4th Quarter 2017
			Retire Anacostia Sub. 8 after Feeders 56, 96, and 177 are converted to 13kV construction.		
			Install one normally open tie-switch between Twining City Sub. 150 – 4kV Feeders 499 and 348 at the intersection of Good Hope Rd and 14th Street SE at pole #804376-170280.		
			2. Extend and/or rearrange the I St. Sub. 197 North LVAC group and Central LVAC group to transfer approximately 10.8 MVA summer 2017 load from the I St. Sub. 297 Central LVAC group to the North LVAC group. Conduit from getaway man-hole front of substation to next block existing empty manhole - Phase 1		

Load Growth - 2017 Projects

Program to address increasing load demands to maintain reliability and to ensure that future demands can be met under adverse conditions. These projects involve adding or upgrading feeders in order to reliably supply new customers and support increased usage required by existing customers.

Location	FEEDER ID	WBS Element	Location-Subdivision	Jurisdiction	Estimated Completion
I Street Sub. 197	TBD	UDLPLIST2	2. Extend and/or rearrange the I St. Sub. 197 North LVAC group and Central LVAC group to transfer approximately 10.8 MVA summer 2017 load from the I St. Sub. 297 Central LVAC group to the North LVAC group. Approximately 530' conduit extending feeders across Penn Ave to continue cutover extension and accomodate branches to 2 spot-networks - Phase 2	District of Columbia	4th Quarter 2017
			2. Extend and/or rearrange the I St. Sub. 197 North LVAC group and Central LVAC group to transfer approximately 10.8 MVA summer 2017 load from the I St. Sub. 297 Central LVAC group to the North LVAC group. Approximately 530' conduit extending feeders across Penn Ave to continue cutover extension and accomodate branches to 2 spot-networks - Phase 2		
			2. Extend and/or rearrange the I St. Sub. 197 North LVAC group and Central LVAC group to transfer approximately 10.8 MVA summer 2017 load from the I St. Sub. 297 Central LVAC group to the North LVAC group. Approximately 530' conduit extending feeders across Penn Ave to continue cutover extension and accomodate branches to 2 spot-networks - Cutover Preparation - Scrap 2 Primary Cables H to G St and 22 St NW to free duct space.		

Load Growth - 2017 Projects

Program to address increasing load demands to maintain reliability and to ensure that future demands can be met under adverse conditions. These projects involve adding or upgrading feeders in order to reliably supply new customers and support increased usage required by existing customers.

Location	FEEDER ID	WBS Element	Location-Subdivision	Jurisdiction	Estimated Completion
			2. Extend and/or rearrange the I St. Sub. 197 North LVAC group and Central LVAC group to transfer approximately 10.8 MVA summer 2017 load from the I St. Sub. 297 Central LVAC group to the North LVAC group. Conduit extending North LVAC group feeders across Penn Ave to tie-in points on 22nd & H to continue cutover extension - Phase 3		
Van Ness Sub. 129	15946 15945 14766	UDLPLLF1	10. Extend one new outgoing 13.8 kV distrubiton feeder (Feeder 15946) from Van Ness Sub. 129 Bus #2, Cubicle #11A and rearrange with Van Ness Sub. 129 distribuiton Feeder 15945 and Litlle Falls Sub. 77 distribuiton Feeder 14766 in order to accomplish the following transfers: a) Transfer approximately 1.0 MVA of summer 2017 13 kV load from Van Ness Sub. 129 Distribution Feeder 15945 to new Van Ness Sub. 129 Distribution Feeder 15946. b) Transfer approximately 2.0 MVA of summer 2017 13 kV load from Little Falls Sub. 77 Distribution Feeder 14766 to new Van Ness Sub. 129 Distribution Feeder 15946. SUMMER READINESS - 2017	District of Columbia	2nd Quarter 2017
Waterfront Sub. 223	SEE DESCRIPTION FOR FDR#s	UDLPLWF4	9. Transfer the entire Buzzard Point Sta. B East LVAC Network Group (Feeders 14407, 14408, 14409, 14410, 14411 & 14412), approximately 40.6 MVA load to Waterfront Sub. 223 new East Network Group Feeders 16320, 16321, 16322, 16323, 16324 & 16325, respectively. Sta. B East Network Group feeders are available adjacent to the future Waterfront Sub. 223 in the vicinity of Q Street and First Street Southwest. 10. Transfer the entire Buzzard Point Sta .B Southeast LVAC Network Group (Feeders 14119, 14120, 15596,	District of Columbia	2nd Quarter 2017

Load Growth - 2017 Projects

Program to address increasing load demands to maintain reliability and to ensure that future demands can be met under adverse conditions. These projects involve adding or upgrading feeders in order to reliably supply new customers and support increased usage required by existing customers.

Location	FEEDER ID	WBS Element	Location-Subdivision	Jurisdiction	Estimated Completion
			15597, 15598 & 15599), approximately 41.0 MVA load to New Waterfront Substation 223 Southeast LVAC Network Group Feeders 16326, 16327, 16328, 16329, 16330 & 16331, respectively. Sta. B Southeast Network Group feeders are available two blocks east from the future Waterfront Sub. 223 in the vicinity of Q Street and South Capitol Street Southeast.		

PEPCO DC- Distribution Automation - 2017 Pojects						
Project	WBS Element	Feeders	Location	District	Estimated Completion	Comments
DA/ASR for selected feeders, including related substation, line device, telecom and programming work.	UDLPRDA1D UOIPRASRD UORPOBR1D UORPODA1D	14132 15867 15945 15200 14006 14200	Takoma 12th & Irving Van Ness	District of Columbia	2nd-3rd Quarter 2017	Total of 6 feeder out of 3 different substations have been identified for ASR implementation.
Install Automatic Circuit Recloser Sectionailization, including line devices and related telecom work.	UORPORBTB UDLPRM4DJ	Various	Plan is to install up to 25 total reclosers located in the District of Columbia	District of Columbia	4th Quarter 2017	all 25 Locations have identified and currently in design and in construction
Install RMS for network transformers, including monitoring equipment and related telecom work.	UDLPRM4DR UORPORNPD	Various	Sub 7 Benning Sub 212 North East Network Sub 161 South Sub 25 Champlain Buzzard Point West, PV Monitoring Sub 52 West Network Sub 52 South Network	District of Columbia	2nd Quarter 2017 - 2nd Quarter 2018	Total of 6 Networks and 1 Photovoltaic Location.
Capacitor Control Project,	UORPORCPD	Various	Pepco is installting 2-way communicating controllers on approximately 25 capacitors on 13kV feeders across DC	District of Columbia	4th Quarter 2017	2017 capacitor selection is in progress.
Install Telecom Infrastructure to facilitate use of company owned BBW radio frequencies.	UORPORBSB		Various	District of Columbia	4th Quarter 2017	This includes radio towers and associated base stations.

Attachment F

Clean

Pepco Transmission and Distribution Incident Rate, Including Edison Electric Institute (EEI) 2016 Rankings

Year	Incident Rate	EEI Quartile Ranking
2012	1.89	Third Quartile
2013	1.79	Third Quartile
2014	1.52	Third Quartile
2015	1.68	Fourth Quartile
2016	2.16	TBD[2]

[2] EEI safety rankings are not yet available for 2016 data.

Redline

Pepco Transmission and Distribution Incident Rate, Including Edison Electric Institute (EEI) 2016 Rankings

Year	Incident Rate	EEI Quartile Ranking
2012	1.89	Third Quartile
2013	1.79	Third Quartile
2014	1.52	~~Second~~ Third Quartile
2015	1.68	~~Third~~ Fourth Quartile
2016	2.16	TBD[2]

[2] EEI safety rankings are not yet available for 2016 data.

Certificate of Service

I hereby certify that a copy of Potomac Electric Power Company's Errata to the 2017 Annual Consolidated Report's Attachments A, D and F and will be served by electronic mail, hand delivery, or first class mail, postage prepaid on all parties in Docket PEPACR2017-01 on this May 15, 2017.

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