The Electric Program is administered by the Electric division in the Utilities Department. The program is designed to achieve five primary strategic objectives:

1) Replace and or rehabilitate aging infrastructure;
2) Maintain or increase system reliability;
3) Ensure regulatory compliance;
4) Improve system efficiency; and
5) Address growth in the system

Each capital project is reviewed by staff to ensure it is both economically justifiable and consistent with the Utilities Strategic Plan. Projects are coordinated with Public Works to ensure that relocations and underground projects are accomplished together with transportation projects so community disruptions are minimized.

The City owns and maintains the electric distribution system within the City limits. The electrical system consists of 205 miles of primary lines; 15,150 electric meters, six electric substations, and 31 diesel generators that are used to reduce electric costs in the City. The annual peak electric load is 140 megawatts (MW).

THE FIVE-YEAR PLAN (FY 2017 – FY 2021)

The FY 2017 Adopted Five-Year Capital Improvement Program (CIP) includes $7,105,000 of Enterprise Funds (Electric Fund) and $4,900,000 in Bonds.

FY 2017 funding consists of a $965,000 Transfer from the Electric Fund and $1,000,000 in Bonds.

<table>
<thead>
<tr>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
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<td>$4,000</td>
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(Dollars in Thousands)

FY 2017 CAPITAL PROJECTS

Efforts to relocate overhead electric services to underground services will continue. In FY 2017, E-001 includes the undergrounding of services on Battle Street and Route 28/Nokesville Road. Services will also be relocated on Dean Drive from Foster Dr. to Wellington Rd. (E-019). Unrelated to transportation projects (E-033) services will be relocated on Landgreen Street from Weems Rd to Weir Pl.

While no additional funding is provided for in the CIP, work will continue on the Airport Substation Expansion project (E-021). The project is estimated to be completed in June 2017.

Underground Cable and Termination Replacement (E-030) was introduced into the CIP in 2010 in response to an above average number of failures on the 15KV main feeder circuits due to aged cable. FY 2017 calls for the replacement of cable along Confederate Trail.

New Generation Initiatives (E-031) has continued funding for planning purposes.

New Fiber Optic Loop/Ring (E-032) calls for the installation of new fiber optic cable to provide redundancy/looping. If FY2017, cable will replaced from VMEA to Quarry.

LED Streetlight Replacement (E-034) will begin in FY 2017 with the planning stages for upgrading all city streetlights to LED lights over the next seven years.

FY 2017 MAINTENANCE CAPITAL PROJECTS

Replace/Automate Pad Mount Fuse Cabinets in the only maintenance capital project for the program.

NEW PROJECTS

LED Street Light Replacement (E-034) is a new project for the FY 2017 CIP. It is planned to start in FY 2017.
## Program Highlights

The FY 2017 Adopted Five-Year CIP includes $12,005,000 for the Electric Program, which reflects an increase of $4,635,000 or 63%. Some of the increases in the program can be found in increased cost estimates for NVTA Place Overhead Lines Underground (E-001) and Liberia Avenue Widening (E-026); moving Grant Avenue (Prince William Street to Byrd Drive) (E-015) from future years; and a new project for LED Streetlight Replacement (E-034). Offsetting some of these increases was a decrease in the estimated cost of New Generation Initiatives.
## ELECTRIC CAPITAL PROJECT LISTING

($ in Thousands)

<table>
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<tr>
<th>Project Name</th>
<th>Prior Years</th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
<th>Future</th>
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<td>250</td>
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<td>1,555</td>
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<td>-</td>
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E-001  NVTA Place Overhead Lines Underground

Year Introduced: 1987
Change: Expanded Scope
Associated Proj: T063;T042;W042;T070
Program Area: Electric
Managing Dept: Utilities
Manager: D. Jones
Plan Conformance: Comprehensive Plan 7.6.3

Est. Start: 7/1/2013
Est. Complete: 6/30/2017

Description:
This project is for City overhead electric, telephone, fiber, and cable lines to be relocated underground based on Transportation improvement projects. This will improve reliability and aesthetics and lower maintenance costs. FY 2017 - Battle St from Quarry to Portner and Portner from Sudley to Longstreet FY 2017/2018 - Rt 28 / Nokesville Road Widening and West Street Streetscape (Norfolk Southern RR to Church St)

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<th>FY 2018</th>
<th>FY 2019</th>
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<td>100</td>
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<td>250</td>
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<td>2,323</td>
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<tr>
<td>Total Cost</td>
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<td>100</td>
<td>195</td>
<td>250</td>
<td>100</td>
<td>2,323</td>
</tr>
</tbody>
</table>

Funding Sources: ($ in 1,000s)

| General Fund | - | - | - | - | - | - | - | - |
| Enterprise Funds | 668 | 10 | - | 100 | 195 | 250 | 100 | 1,323 |
| School Fund | - | - | - | - | - | - | - | - |
| Bonds | - | 1,000 | - | - | - | - | - | 1,000 |
| Other Government | - | - | - | - | - | - | - | - |
| State | - | - | - | - | - | - | - | - |
| Federal | - | - | - | - | - | - | - | - |
| Gas Taxes | - | - | - | - | - | - | - | - |
| Proffers | - | - | - | - | - | - | - | - |
| Stormwater Escrows | - | - | - | - | - | - | - | - |
| NVTA | - | - | - | - | - | - | - | - |
| Other | - | - | - | - | - | - | - | - |
| Total Funding | 668 | 1,010 | - | 100 | 195 | 250 | 100 | 2,323 |

Operating Impacts: ($ in 1,000s)

| Revenue Offset | - | - | - | - | - | - | - | - |
| Personnel | - | - | - | - | - | - | - | - |
| Facility (Costs) Savings | - | - | - | - | - | - | - | - |
| Program (Costs) Savings | - | - | - | - | - | - | - | - |
| Debt Service | - | - | (78) | (78) | (78) | (78) | (1,238) | (1,550) |
| Net Revenue | - | - | (78) | (78) | (78) | (78) | (1,238) | (1,550) |

- 114 -
E-014  Prince William Street (Grant Avenue to Wellington Road)

Year Introduced: 2003
Change: No change
Associated Proj: T019;S017;W063;D025
Program Area: Electric
Managing Dept: Utilities
Manager: D. Jones

Plan Conformance:
- Comprehensive Plan 7.6.3
- Comprehensive Plan 7.7
- Old Town Sector Plan

Description:
Underground OH Distribution facilities on Prince William Street from Wellington Road to Grant Avenue. Remove 21 spans of overhead 3-phase distribution and install 3,300' of 3-phase underground distribution. Install 32 aluminum street light poles.

PROJECT-TO-DATE
Account # CP3635
Budget: $ 1,021,000
Expend. / PO: $ 930,000
Balance: $ 91,000

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<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
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Funding Sources: ($ in 1,000s)
- General Fund
- Enterprise Funds 1,021
- School Fund
- Bonds
- Other Government
- State
- Federal
- Gas Taxes
- Proffers
- Stormwater Escrows
- NVTA
- Other
- Total Funding 1,021

Operating Impacts: ($ in 1,000s)
- Revenue Offset
- Personnel
- Facility (Costs) Savings
- Program (Costs) Savings
- Debt Service
- Net Revenue
Grant Avenue (Prince William Street to Byrd Drive)

Year Introduced: 2003
Change: Moved From Future
Associated Proj: T021; S018; W061
Program Area: Electric
Managing Dept: Utilities
Manager: D. Jones

Plan Conformance:
Comprehensive Plan 7.6.3
Comprehensive Plan 7.7
Old Town Sector Plan

Description:
Underground OH distribution facilities on Grant Avenue from Prince William Street to Byrd Drive. Remove 12 spans of OH 3-phase distribution and install 3,000' of 3-phase underground distribution. Install 10 aluminum street light poles. This will improve reliability and aesthetics and lower maintenance costs.

PROJECT-TO-DATE
Account # N/A
Budget: $ -
Expend. / PO: $ -
Balance: $ -

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<th>Cost Estimate: ($ in 1,000s)</th>
<th>Prior Years</th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
<th>Future</th>
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<th>Project</th>
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<tr>
<td>Construction</td>
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Funding Sources: ($ in 1,000s)

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Operating Impacts: ($ in 1,000s)

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E-019  Dean Drive Extended

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<td>D. Jones</td>
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Description:
Relocate up to six spans of overhead lines to underground to provide clearance for Dean Drive to be connected to Nokesville Road.

### PROJECT-TO-DATE

**Account #** CP3649

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### Funding Sources: ($ in 1,000s)

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### Operating Impacts: ($ in 1,000s)

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E-021  Airport Substation Expansion

Year Introduced: 2006
Change: No change
Associated Proj: N/A
Program Area: Electric
Managing Dept: Utilities
Manager: D. Jones
Plan Conformance: Comprehensive Plan 7.7

Description:
Upgrade 115KV to 230KV system and upgrade substation transfer. Reconfigure circuit 301 to split the overhead portion (Water Plant) from underground portion (Airport) & add 1+ distribution circuit(s) if justifiable. Substation expansion will provide adequate capacity for the electric system as yearly peak loading continues to increase and as commercial development of Route 28 corridor advances. Project was accelerated due to the new 230KV transmission line being planned by Dominion VA Power from Cannon Branch Substation to New Cloverhill Substation in PWC.

Cost Estimate: ($ in 1,000s)

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<th>Prior Years</th>
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Funding Sources: ($ in 1,000s)

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Operating Impacts: ($ in 1,000s)

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PROJECT-TO-DATE

Account # CP3640
Budget: $ 5,600,000
Expend. / PO: $ 2,730,354
Balance: $ 2,869,646

Est. Start: 7/1/2005
Est. Complete: 6/30/2017
E-026 Liberia Avenue Widening

Year Introduced: 2008
Change: Increased Estimate
Associated Proj: T046; W048
Program Area: Electric
Managing Dept: Utilities
Manager: D. Jones

Plan Conformance:
Comprehensive Plan 7.6.3
Comprehensive Plan 7.7

Est. Start: 7/1/2018
Est. Complete: 6/30/2022

Description:
Relocate existing underground electric lines and move existing overhead lines to underground to allow widening of Liberia Avenue from four lanes to six lanes.

PROJECT-TO-DATE

Account # N/A
Budget: $ -
Expend. / PO: $ -
Balance: $ -

Cost Estimate: ($ in 1,000s)
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Funding Sources: ($ in 1,000s)

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Operating Impacts: ($ in 1,000s)

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- 119 -
**Advanced Meter Infrastructure (AMI)**

**Year Introduced:** 2009  
**Change:** No change  
**Associated Proj:** W-044  
**Program Area:** Electric  
**Managing Dept:** Utilities  
**Manager:** D. Jones

**Plan Conformance:**  
Comprehensive Plan 7.7  
Comprehensive Plan 8.3

**Est. Start:** 9/1/2014  
**Est. Complete:** 9/1/2016

**Description:**
Provide a fixed network 2-way communications system to implement full AMI supporting Demand Response, Remote Disconnect/Reconnect, Outage Notification & Management, Tampering, etc. This will reduce expenses and improve meter reading accuracy and reliability. Customers will be able to monitor their usage via web portal access.

### PROJECT-TO-DATE

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### Funding Sources: ($ in 1,000s)

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| Enterprise Funds | 6,020 | - | - | - | - | - | 6,020 |
| School Fund | - | - | - | - | - | - | - |
| Bonds | - | - | - | - | - | - | - |
| Other Government | - | - | - | - | - | - | - |
| State | - | - | - | - | - | - | - |
| Federal | - | - | - | - | - | - | - |
| Gas Taxes | - | - | - | - | - | - | - |
| Proffers | - | - | - | - | - | - | - |
| Stormwater Escrows | - | - | - | - | - | - | - |
| NVTA | - | - | - | - | - | - | - |
| Other | - | - | - | - | - | - | - |
| Total Funding | 6,020 | - | - | - | - | - | 6,020 |

### Operating Impacts: ($ in 1,000s)

| Revenue Offset | - | - | - | - | - | - | - |
| Personnel | - | - | - | - | - | - | - |
| Facility (Costs) Savings | - | - | - | - | - | - | - |
| Program (Costs) Savings | - | - | - | - | - | - | - |
| Debt Service | - | - | - | - | - | - | - |
| Net Revenue | - | - | - | - | - | - | - |

- 120 -
E-030  Underground Cable and Termination Replacement

Year Introduced:  2010
Change:  No change
Associated Proj:  N/A
Program Area:  Electric
Managing Dept:  Utilities
Manager:  D. Jones
Plan Conformance:  Comprehensive Plan 7.7

Est. Start:  7/1/2010
Est. Complete:  6/30/2022

Description:
The utility has experienced an above average number of failures on the 15KV main feeder circuits because cable has been in use long past its expected service life. This is a formal program for replacing cables and terminations based on test results, age, and the number of faults experienced.

FY 2017 - Confederate Trail
FY 2018 - Rolling Road
FY 2019 - Liberia Avenue
FY 2020-2021 - Georgetown Tie Point

Cost Estimate:  ($ in 1,000s)

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Funding Sources:  ($ in 1,000s)

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Operating Impacts: ($ in 1,000s)

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E-031  New Generation Initiatives

Year Introduced: 2011
Change: Decreased Estimate
Associated Proj: N/A
Program Area: Electric
Managing Dept: Utilities
Manager: D. Jones

Plan Conformance:
Comprehensive Plan 7.7
Comprehensive Plan 8.3

Est. Start: 7/1/2010
Est. Complete: 6/30/2022

Description:
Phase II - Engineering study and site evaluation of generator options for Church Street Generation Site.
Phase III - A cost-benefit analysis will be conducted before any replacement/construction activity. Current emission standards and anticipated legislation will require cleaner initiatives and reductions in emissions.

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<th>FY 2018</th>
<th>FY 2019</th>
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Funding Sources: ($ in 1,000s)

- General Fund
- Enterprise Funds
  - 700
  - 150
  - 300
  - 300
  - 300
  - 300
  - 2,050
- School Fund
- Bonds
- Other Government
- State
- Federal
- Gas Taxes
- Proffers
- Stormwater Escrows
- NVTA
- Other
- Total Funding
  - 700
  - 150
  - 300
  - 300
  - 300
  - 300
  - 2,050

Operating Impacts: ($ in 1,000s)

- Revenue Offset
- Personnel
- Facility (Costs) Savings
- Program (Costs) Savings
- Debt Service
- Net Revenue

- 122 -
E-032  New Fiber Optic Loop/Ring

Year Introduced: 2015
Change: No change
Associated Proj: N/A
Program Area: Electric
Managing Dept: Utilities
Manager: D. Jones
Plan Conformance: Comprehensive Plan 7.7
Est. Start: 7/1/2016
Est. Complete: 6/20/2021

Description:
Identify needs of self-healing rings/loops using fiber optic paths for priority services. Install new fiber optic cabling to provide priority services the necessary redundancy loops/rings. This will improve reliability of critical infrastructure networks and public safety services. FY 2017 - VMEA to Quarry (28,000' for $160,000); FY 2019 - Point of Woods to VMEA (20,000' for $115,000); FY 2019 - Ball Field to Micron (1,200' for $5,000); FY 2019 - Prince William to Buckner (12,100' for $75,000)

PROJECT-TO-DATE
Account # CP3694
Budget: $ -
Expend. / PO: $ -
Balance: $ -

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Funding Sources: ($ in 1,000s)

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Operating Impacts: ($ in 1,000s)

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- 123 -
**E-033 Place Overhead Lines Underground (Non-Transportation)**

- **Year Introduced:** 2016  
- **Change:** No change  
- **Associated Proj:** N/A  
- **Program Area:** Electric  
- **Managing Dept:** Utilities  
- **Manager:** D. Jones  
- **Plan Conformance:** Comprehensive Plan 7.6.3

---

### Description:

Place overhead electric, telephone, cable, and fiber lines underground, improving reliability and aesthetics and lowering maintenance costs.  
FY 2017 - Landgreen St from Weems to Weir  
FY 2018 - Landgreen St from Liberia to Weems  
FY 2019 and FY 2020 - Foster Dr from Technology to Dean  
FY 2021 - Sudley Rd from Stonewall to Diggles

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### Prior Years

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E-034  LED Streetlight Replacement

Year Introduced: 2017
Change: New Project
Associated Proj: N/A
Program Area: Electric
Managing Dept: Utilities
Manager: D. Jones
Plan Conformance: Comprehensive Plan 8.3

Description:
Upgrade all Manassas City streetlights to LED over seven years. First year is planning, design and specifications of fixtures to include public input and investigation of other local municipalities that have changed to LED.

Plan Conformance:
Total Project

Cost Estimate: ($ in 1,000s)

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Funding Sources: ($ in 1,000s)

- General Fund
- Enterprise Funds
- School Fund
- Bonds
- Other Government
- State
- Federal
- Gas Taxes
- Proffers
- Stormwater Escrows
- NVTA
- Other

Total Funding

Operating Impacts: ($ in 1,000s)

- Revenue Offset
- Personnel
- Facility (Costs) Savings
- Program (Costs) Savings
- Debt Service
- Net Revenue

Est. Start: 7/1/2016
Est. Complete: 6/30/2024
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<td>E-013</td>
<td>Dumfries Rd Northbound 3rd Lane (Wellington to Hastings) Underground OH distribution facilities on Dumfries Road from Hastings Drive to Orchard Lane. Remove 18 spans of 3-phase overhead distribution and install 1,900' of underground 3-phase distribution. Install 28 aluminum street lights.</td>
<td>$400</td>
<td>Electric Fund</td>
</tr>
</tbody>
</table>
The City identifies Capital Projects as projects with a cost greater than $100,000 and a useful life of 10+ years. The City recognizes that there are additional projects/needs that are capital in nature but do not meet the requirement set forth for a capital project. These additional projects/needs are considered Maintenance Capital Projects, a list of which is provided below for the Electric Program.

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Prior Years</th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
<th>Future</th>
<th>Total Project</th>
<th>5-Year CIP</th>
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<tbody>
<tr>
<td>Replace/Automate Pad</td>
<td>263</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>593</td>
<td>275</td>
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<tr>
<td>Total Cost</td>
<td>263</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>593</td>
<td>275</td>
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### Funding Sources

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<tr>
<th>Funding Source</th>
<th>Prior Years</th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
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<th>FY 2021</th>
<th>Future</th>
<th>Total Project</th>
<th>5-Year CIP</th>
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<td><strong>Total Funding</strong></td>
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<td><strong>55</strong></td>
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