# PSEG 2020
# Submission of Supplemental Projects for Inclusion in the Local Plan

# PSE&G Transmission Zone M-3 Process
# Northern Burlington County Area

**Need Number:** PSEG-2020-0001

**Process Stage:** Submission of Supplemental Project for inclusion in the Local Plan 8/31/2020

**Previously Presented:**

- Need Meeting 4/14/2020
- Solutions Meeting 6/02/2020

**Supplemental Project Driver:**

- Customer Service

**Specific Assumption Reference:**

PSE&G 2019 Annual Assumptions

- Localized Load Growth & Contingency Overloads

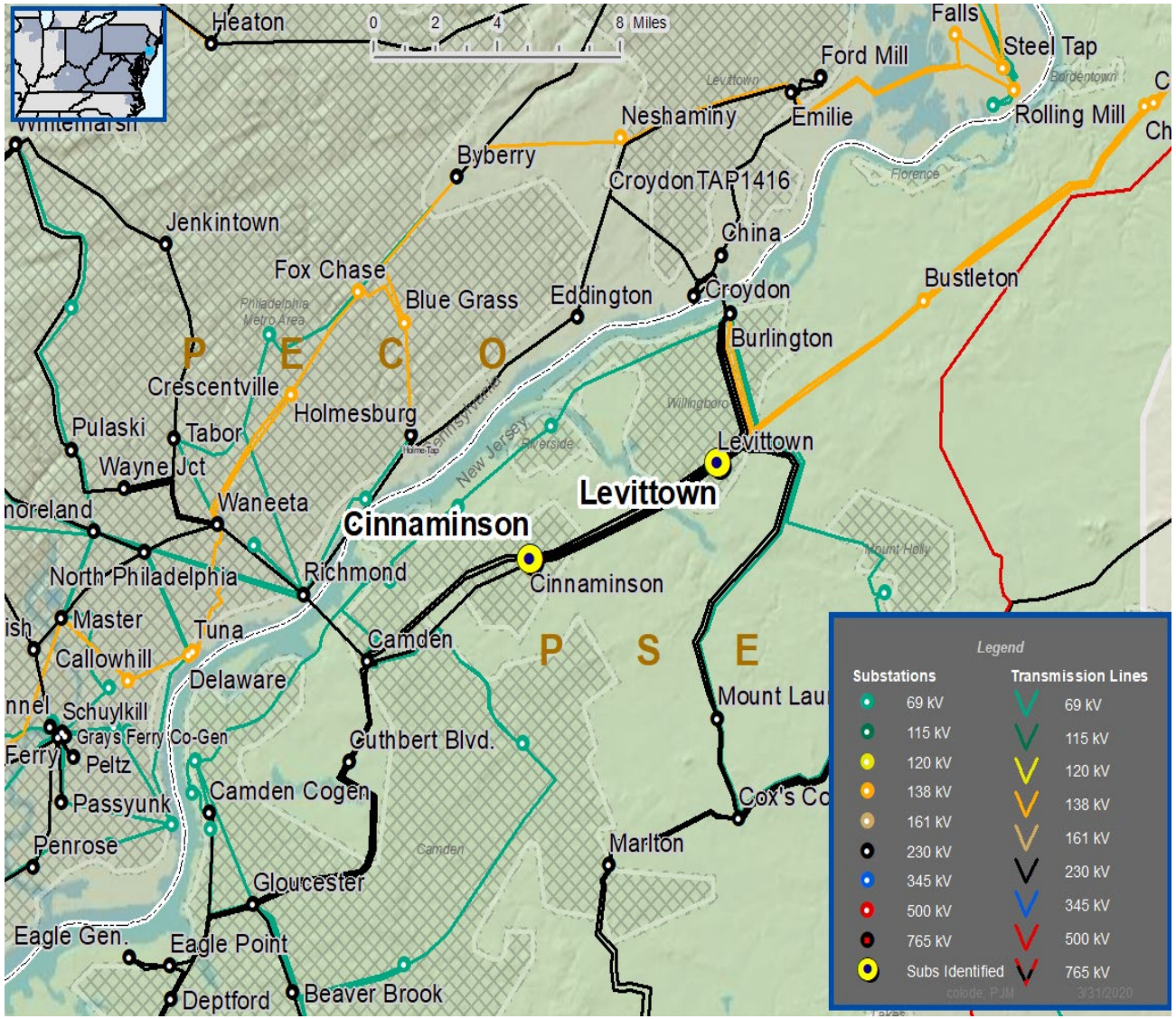
**Problem Statement:**

Cinnaminson and Levittown are stations in the Northern Camden/ Southern Burlington area respectively at capacity of 120 MVA each. The stations are currently at capacity.

- Cinnaminson serves roughly 20,500 customers with peak load of 121 MVA in 2019.

- Levittown serves roughly 34,000 customers with peak load of 126 MVA in 2019.

**Model:** 2019 Series 2024 Summer RTEP 50/50



# PSE&G Transmission Zone M-3 Process
# Northern Burlington County Area

**Need Number:** PSEG-2020-0001

**Process Stage:** Submission of Supplemental Project for inclusion in the Local Plan 8/31/2020

**Selected Solution:**

- New 230kV Station in Rancocas
  - Install a 230kV station on existing Right of Way with two (2) 230/13kV transformers.
  - Cut and loop the Camden-Burlington 230kV line in to the 230kV bus.
  - Transfer load from heavily loaded Cinnaminson and Levittown to the new station.

**Ancillary Benefits:**

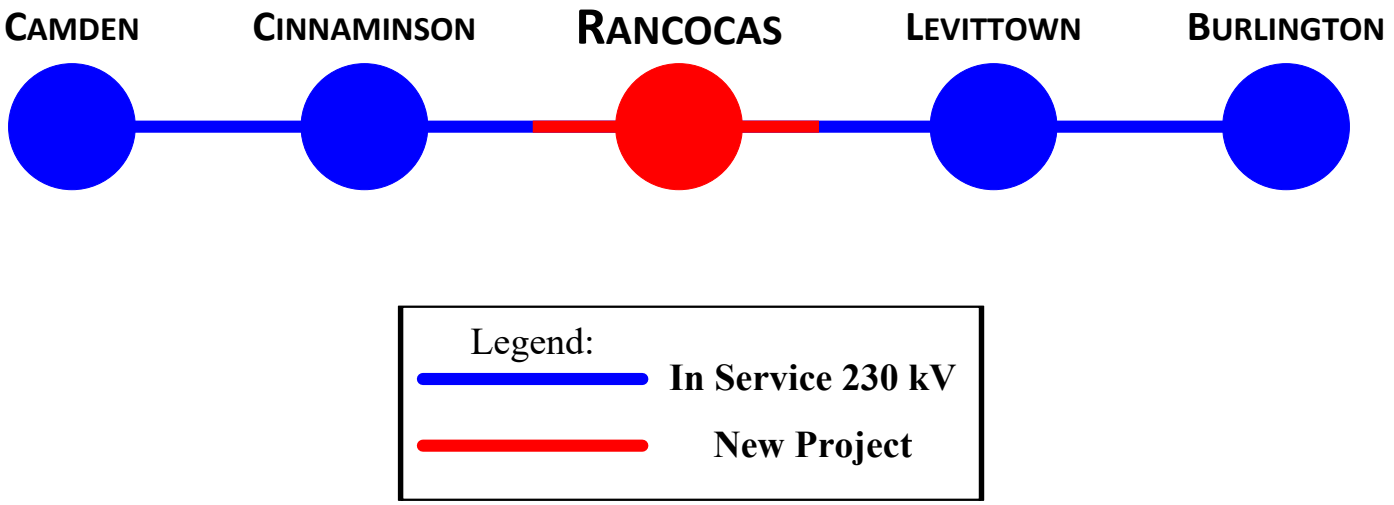
- Decreases the amount of exposure and increases the reliability of the 230kV circuit. Line exposure to a fault is halved by the cut and loop in to the new station.

**Estimated Cost:** $39M

**Projected In-Service:** 05/2024

**Supplemental Project ID:** s2276

**Project Status:** Engineering and Planning



# PSE&G Transmission Zone M-3 Process
# Western Essex County Area

**Need Number:** PSEG-2020-0002

**Process Stage:** Submission of Supplemental Project for inclusion in the Local Plan 10/12/2020

**Previously Presented:**

- Need Meeting 7/07/2020
- Solutions Meeting 8/04/2020

**Supplemental Project Driver:**

- Customer Service

**Specific Assumption Reference:**

PSE&G 2019 Annual Assumptions

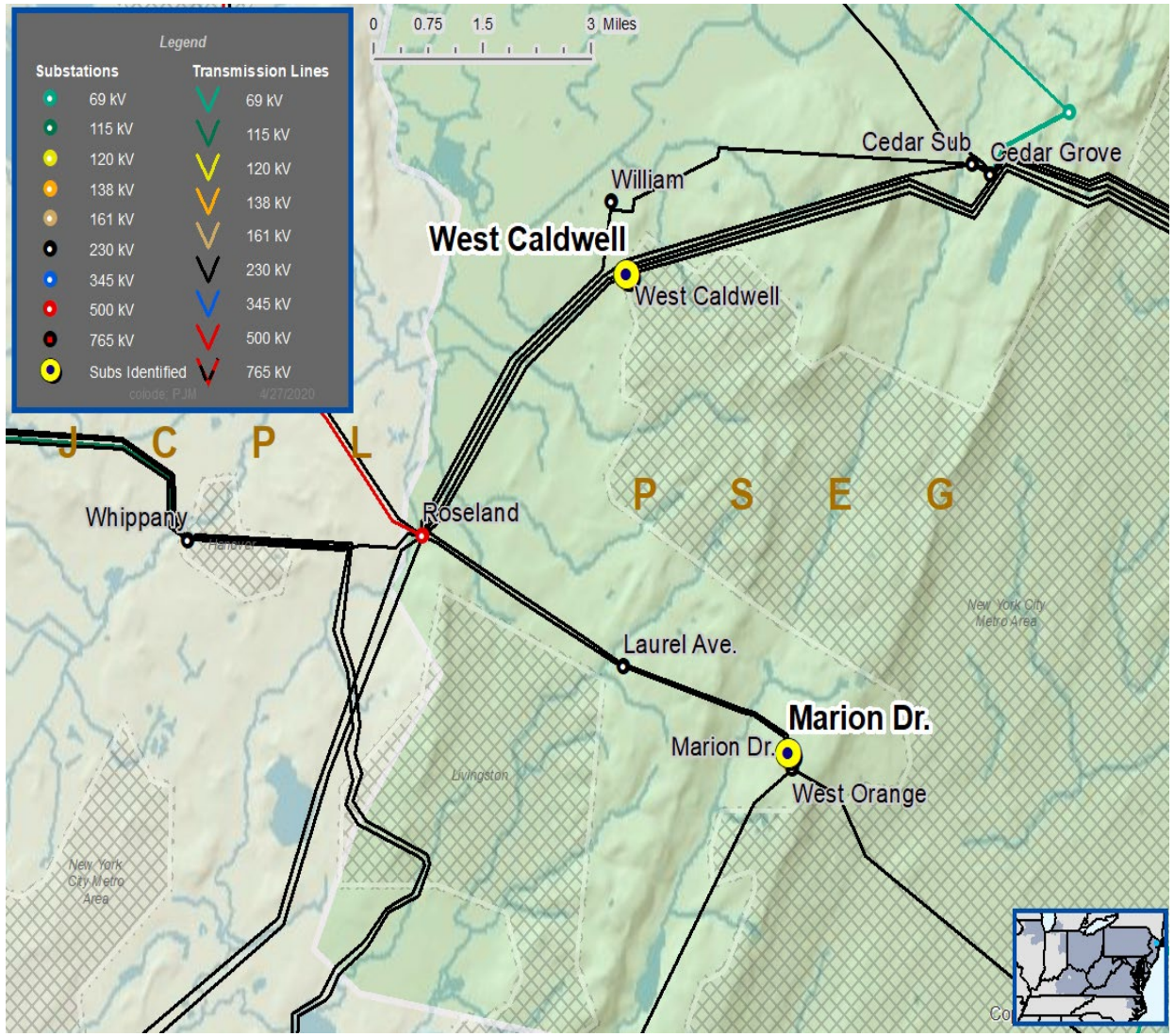
- Localized Load Growth & Contingency Overloads

**Problem Statement:**

West Caldwell is a station in the Western Essex County area at capacity of 120 MVA. Marion Drive is a station in the Western Essex County area at capacity of 60 MVA.

- Marion Drive serves roughly 18,200 customers with a peak load of 62 MVA in 2019.
- West Caldwell serves roughly 18,000 customers with a peak load of 131 MVA in 2019.

**Model:** 2019 Series 2024 Summer RTEP 50/50



# PSE&G Transmission Zone M-3 Process
# Western Essex County Area

**Need Number:** PSEG-2020-0002

**Process Stage:** Submission of Supplemental Project for inclusion in the Local Plan 10/12/2020

**Selected Solution:**

- New 230-13kV Station in Livingston
  - Install a 230 kV station with two (2) 230/13kV transformers.
  - Cut and loop the Roseland-Laurel Ave 230kV line into the 230kV bus.
  - Transfer load from heavily loaded Marion Drive and West Caldwell to the new station.
  - **Estimated Cost:** $29.8M

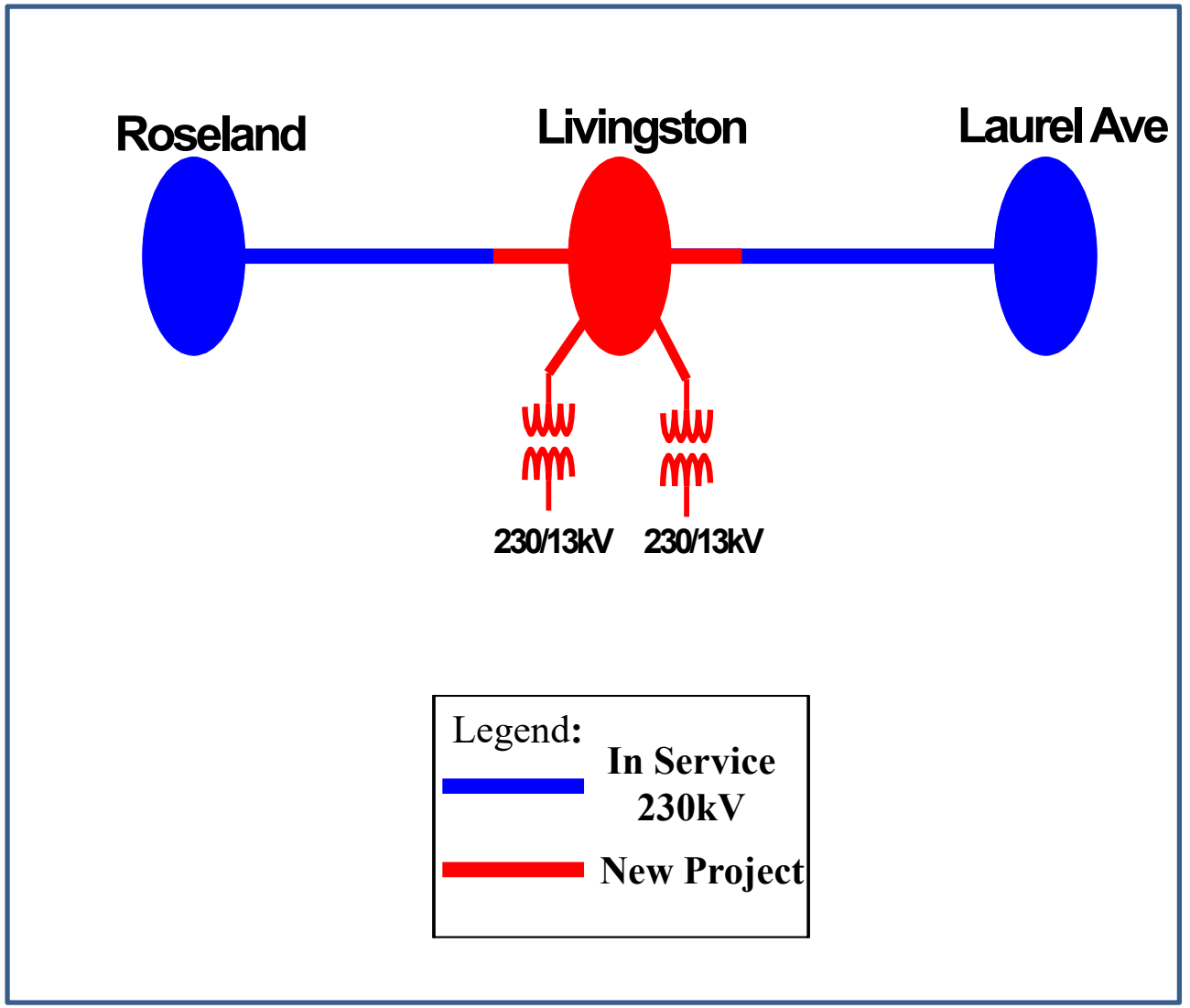
**Ancillary Benefits:**

  - Does not require an extension of the existing 230kV circuits due to close proximity to the 230kV Right of Way.
  - Decreases the amount of exposure and increases the reliability of the 230kV circuit.

**Projected In-Service:** 12/2024

**Supplemental Project ID:** s2316

**Project Status:** Engineering & Planning



# PSE&G Transmission Zone M-3 Process
# Southern Passaic County Area

**Need Number:** PSEG-2020-0003

**Process Stage:** Submission of Supplemental Project for inclusion in the Local Plan 10/12/2020

**Previously Presented:**

- Need Meeting 5/21/2020
- Solutions Meeting 8/13/2020

**Supplemental Project Driver:**

- Equipment Material Condition, Performance and Risk

**Specific Assumption Reference:**

PSE&G 2019 Annual Assumptions

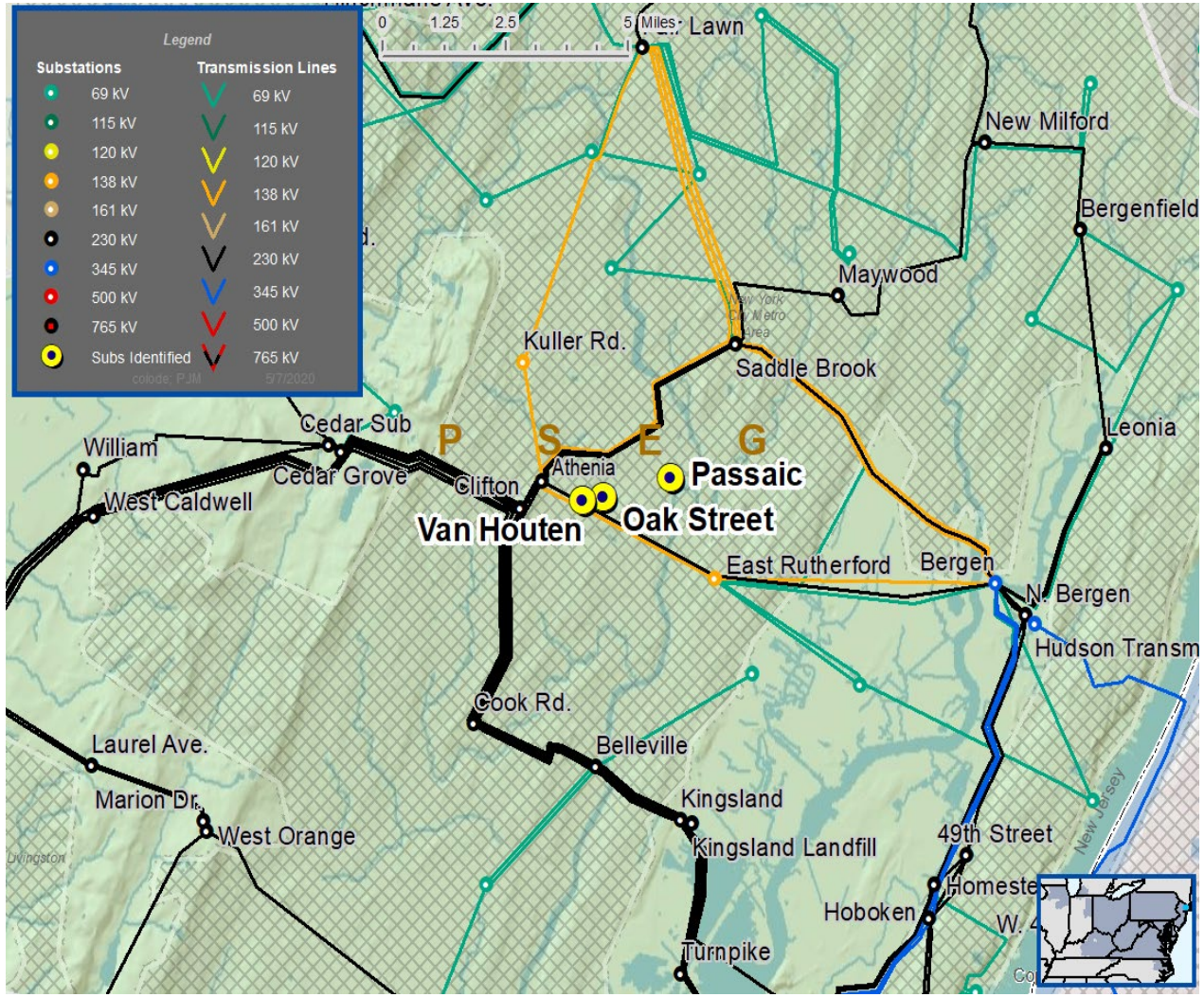
August 2017 26kV to 69kV PSE&G Presentation

- Equipment Reliability and Condition Assessment
- Asset Risk Model

**Problem Statement:**

- Oak Street is supplied by two 26kV circuits with increasing performance problems. The station is configured with a normally open 26kV bus and normally open 4kV bus. The station is currently not designed for N-1.
    - Over the past decade, the 26kV supply circuits have seen 14 momentary and 10 extended outages, with total duration of 143 hours.
- Station equipment at Oak Street has been in service since 1961 and needs to be addressed.
- Oak Street serves roughly 7,843 customers and 16.8 MVA of load.

**Model:** 2019 Series 2024 Summer RTEP 50/50



# PSE&G Transmission Zone M-3 Process
# Southern Passaic County Area

**Need Number:** PSEG-2020-0003

**Process Stage:** Submission of Supplemental Project for inclusion in the Local Plan 10/12/2020

**Selected Solution:**

- New 69/13kV Station in Southern Passaic County Area
  - Purchase Property to accommodate new construction.
  - Install a 69kV station with two (2) 69/13kV transformers.
  - Construct a 69kV network in the Southern Passaic County Area.
  - Eliminate Oak Street Substation.
  - **Estimated Cost:** $75.6M

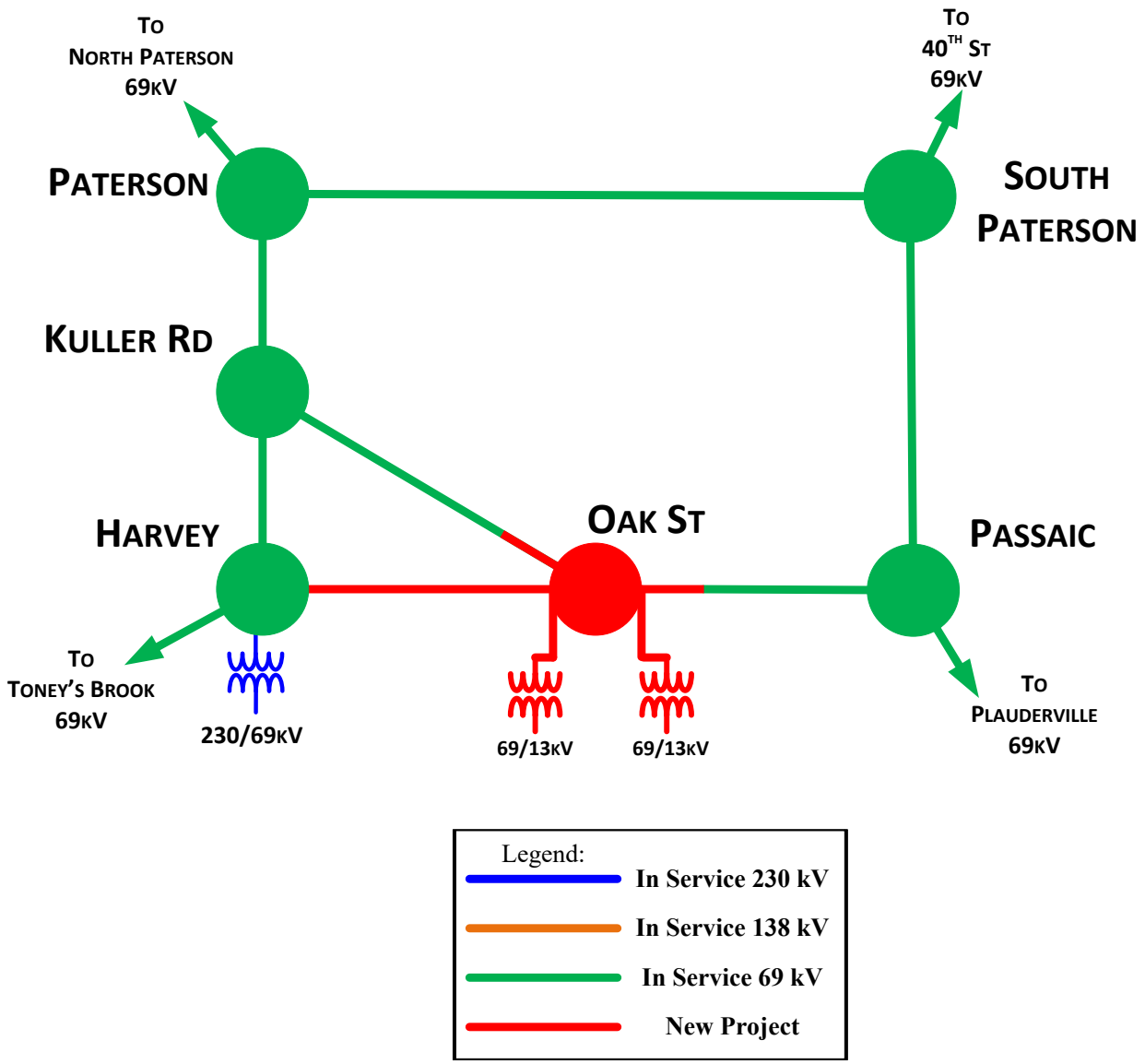
**Ancillary Benefits:**

- Provides capacity increase and 13kV self healing loops.
- Facilitates future asset condition based retirements.

**Projected In-Service:** 09/2024

**Supplemental Project ID:** s2317

**Project Status:** Engineering & Planning



# PSE&G Transmission Zone M-3 Process
# Eastern Essex County Area

**Need Number:** PSEG-2020-0004

**Process Stage:** Submission of Supplemental Project for inclusion in the Local Plan 10/12/2020

**Previously Presented:**

- Need Meeting 7/16/2020
- Solutions Meeting 8/13/2020

**Supplemental Project Driver:**

- Equipment Material Condition, Performance and Risk

**Specific Assumption Reference:**

PSE&G 2019 Annual Assumptions

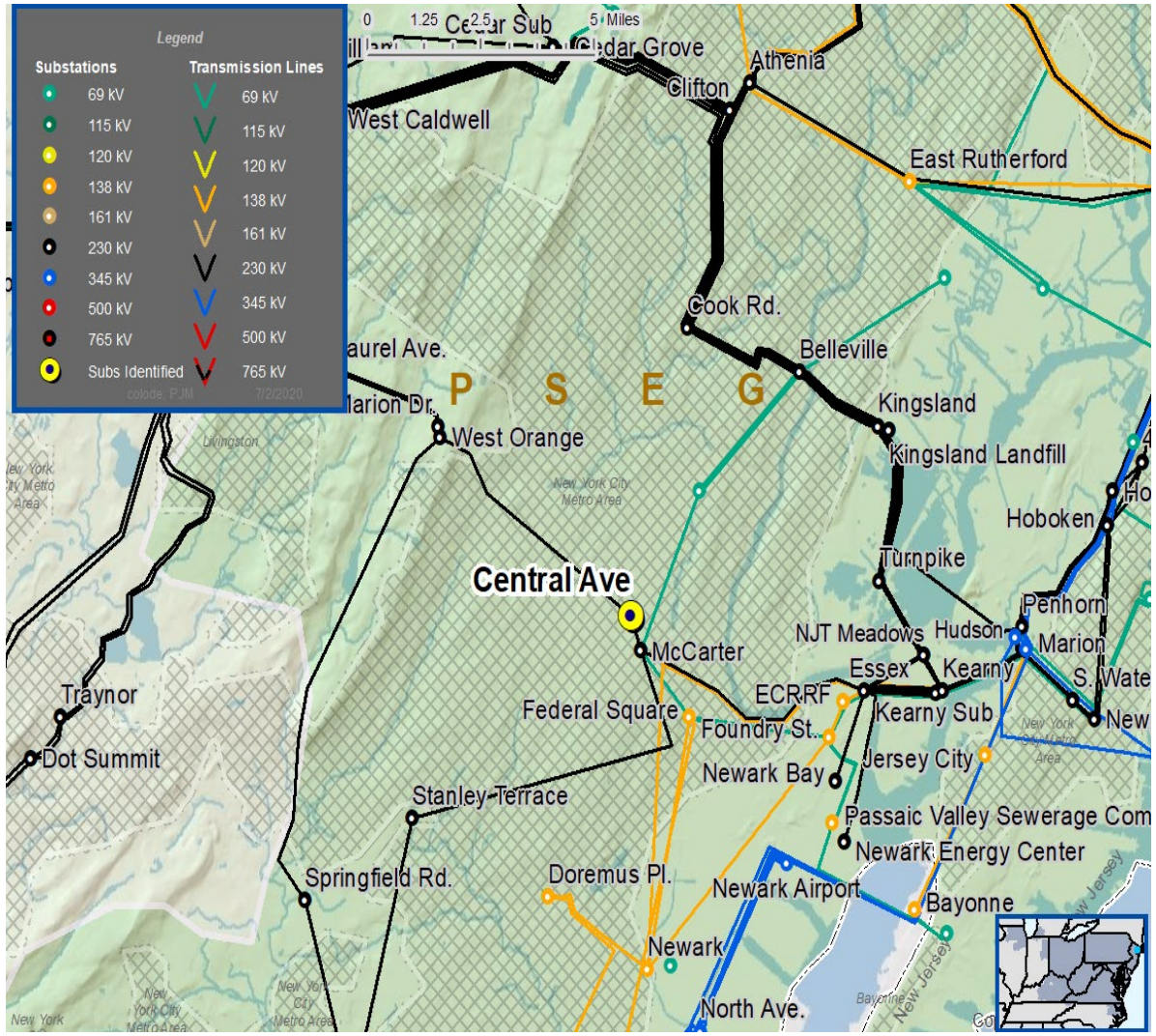
August 2017 26kV to 69kV PSE&G Presentation

- Equipment Reliability and Condition Assessment
- Asset Risk Model

**Problem Statement:**

- Station equipment at Central Avenue has been in service since 1926 and needs to be addressed. The station building is in poor condition.
- The 26kV breakers are original and failure of breakers to operate has resulted in 2 extended station shutdowns. Central Avenue protective relays do not have designated bus protection.
- Central Avenue serves roughly 18,300 customers and 24.7 MVA of load.

**Model:** 2019 Series 2024 Summer RTEP 50/50



# PSE&G Transmission Zone M-3 Process
# Eastern Essex County Area

**Need Number:** PSEG-2020-0004

**Process Stage:** Submission of Supplemental Project for inclusion in the Local Plan 10/12/2020

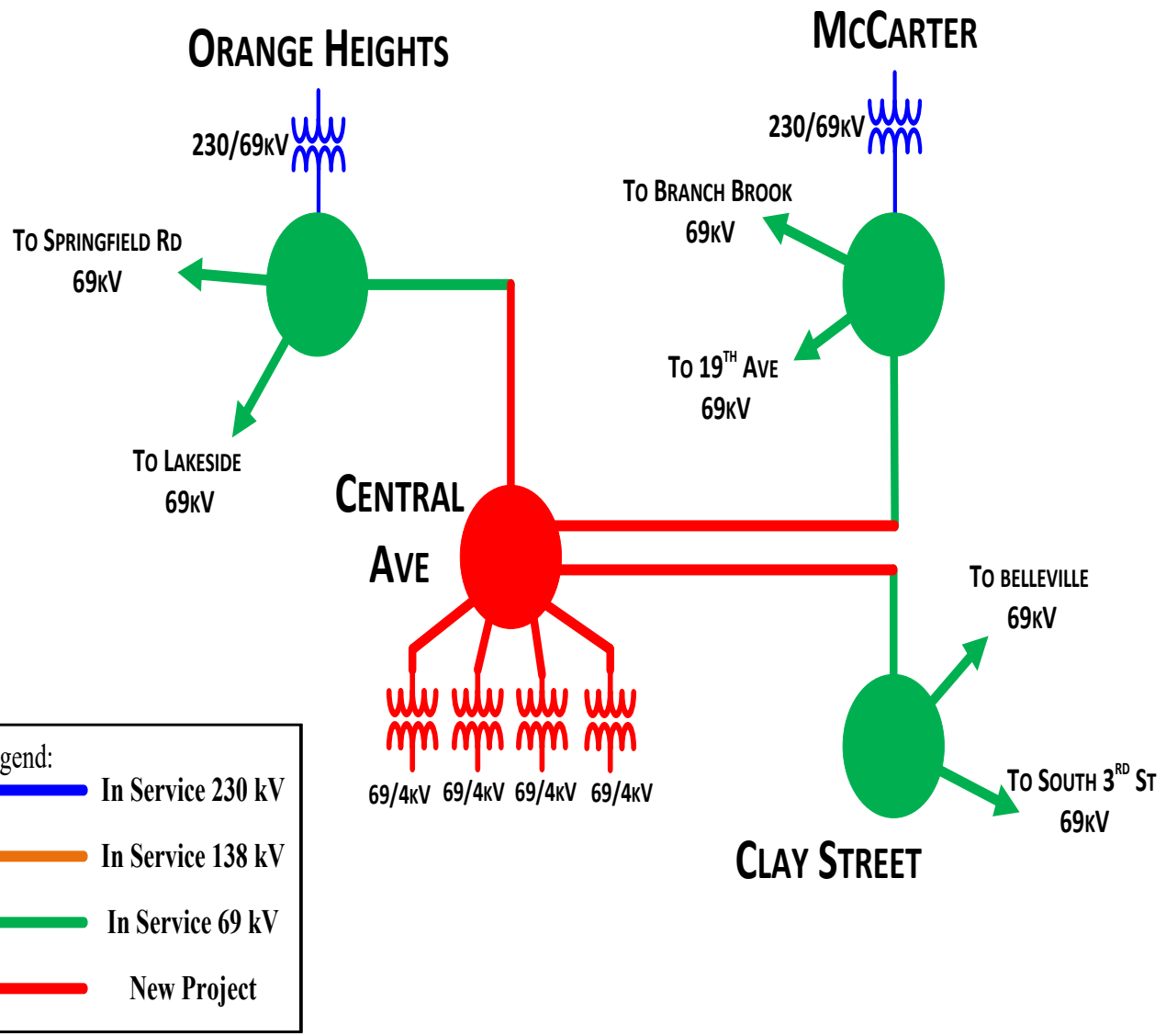
**Selected Solution:**

- New 69kV Station in Western Newark Area
  - Purchase Property to accommodate new construction.
  - Install a 69kV station with four (4) 69/4kV transformers.
  - Construct a 69kV network in Eastern Essex County Area via McCarter-Clay Street (overhead circuit).
  - Transfer Load and eliminate Central Avenue Substation.
  - **Estimated Cost:** $34.3M

**Projected In-Service:** 05/2024

**Supplemental Project ID:** s2318

**Project Status:** Engineering & Planning



# PSE&G Transmission Zone M-3 Process

**Need Number:** PSEG-2020-0005

**Process Stage:** Submission of Supplemental Project for inclusion in the Local Plan 10/29/2020

**Previously Presented:**

- Need Meeting 08/04/2020
- Solutions Meeting 09/01/2020

**Supplemental Project Driver:**

- Operational Flexibility and Efficiency

**Specific Assumption Reference:**

- Modernize legacy system to meet current standards
- Engineering directives & guidelines (both internal and external)
    - PJM Relay Subcommittee Directional Comparison Blocking (DCB) recommendations effective 4/17/2014
        - Recommendations recognize DCB is widely used and dependable line protection scheme, but when certain elements of DCB schemes fail to operate, they often trip more equipment than is necessary.
        - The tolerance for overtrips may be unacceptable when the stability of large generating units is adversely affected.
        - A protection scheme more secure than DCB is recommended in cases where additional analysis reveals stability concerns.

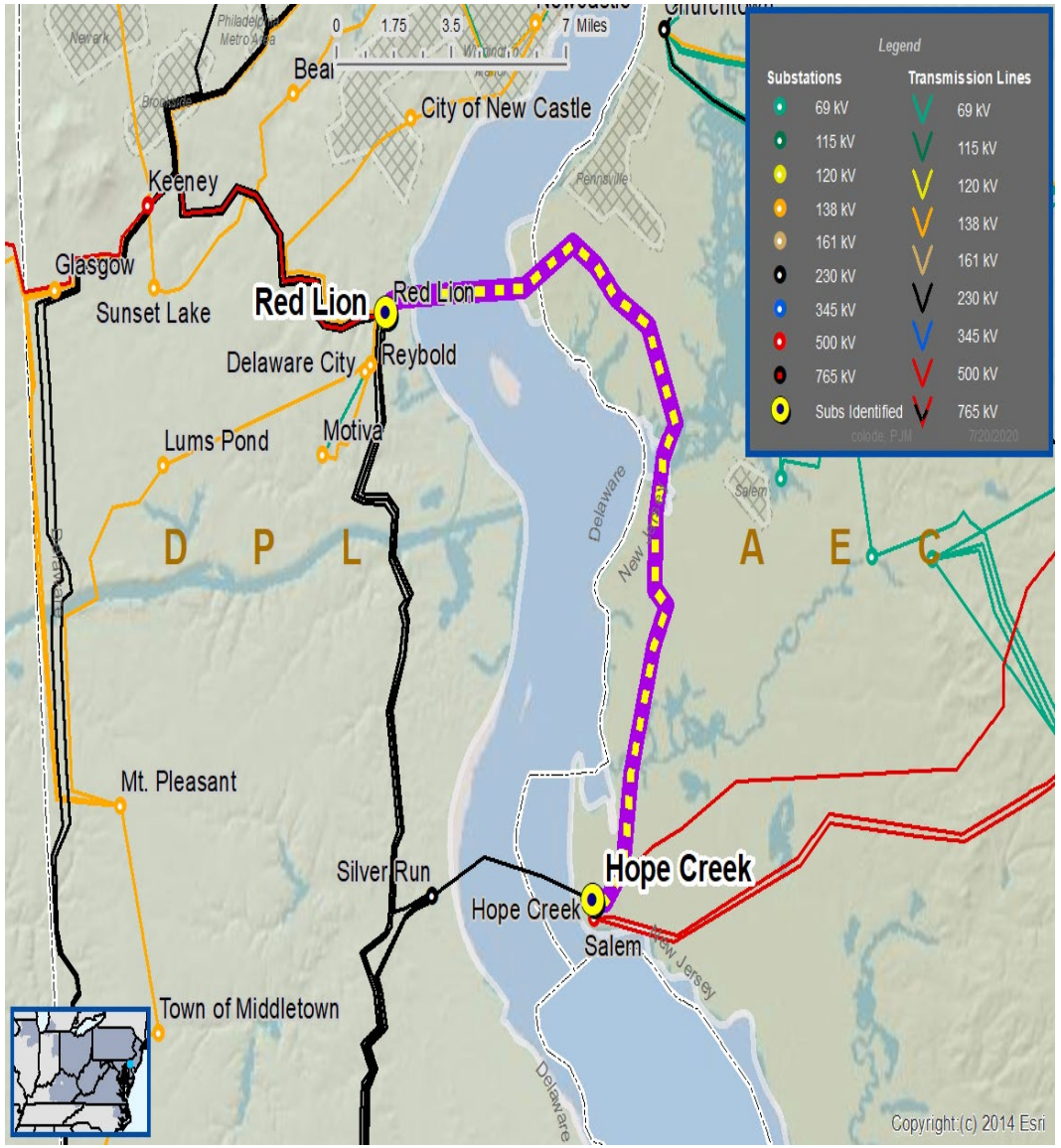
**Problem Statement:**

The 5015 line in southern New Jersey runs from Red Lion (DPL) to Hope Creek Nuclear Station (PSE&G) and has experienced 9 faults in the past 10 years due to avian activity and lightning strikes, with the two most recent faults occurring in April 2020. The line is currently protected using power line carrier relaying. Additional simulation testing has revealed a more secure and reliable method for fault detection and isolation is required to avoid potential overtrips.

Multiple towers on this line are only accessible by boat, so more accurate fault location methods are required.

- Faults on this line are very difficult to locate and detect.
- 5015 line is critical to the operation of Hope Creek and Salem Nuclear Power plants.

**Model:** 2019 Series 2024 Summer RTEP 50/50



# PSE&G Transmission Zone M-3 Process

**Need Number:** PSEG-2020-0005

**Process Stage:** Submission of Supplemental Project for inclusion in the Local Plan 10/29/2020

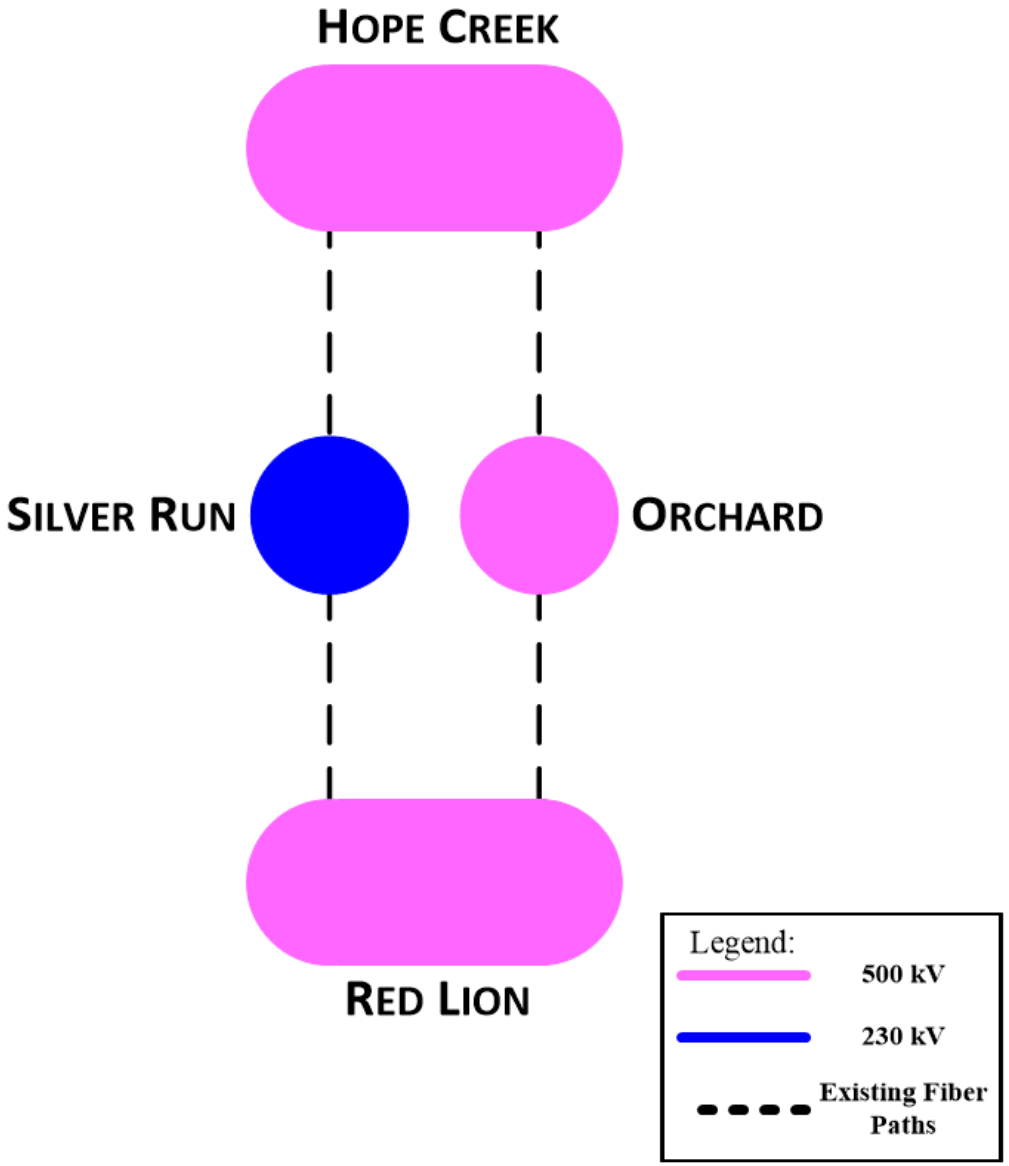
**Selected Solution:**

- Upgrade 5015 Relaying at Hope Creek and utilize existing fiber paths for primary and backup line protection.
  - For primary line protection, utilize the existing fiber paths from Hope Creek to Orchard via 5023 OPGW and from Orchard to Red Lion via the Delmarva SONET Fiber Network.
  - For backup line protection, utilize the existing fiber path constructed by the Artificial Island High Voltage Solution Project from Hope Creek to Silver Run to Red Lion. Silver Run has incorporated the necessary facilities as part of the Voltage Solution Project.
  - Modify the primary and upgrade the backup relay protection package at the Hope Creek 5015 line terminal.
  - Delmarva Power to modify relay protection at their facilities.
  - **Estimated Cost:** $1.2M

**Projected In-Service:** 3/2021

**Supplemental Project ID:** s2355.1

**Project Status:** Engineering & Planning



# PSE&G Transmission Zone M-3 Process
# Northern Camden County Area

**Need Number:** PSEG-2020-0007

**Process Stage:** Submission of Supplemental Project for inclusion in the Local Plan 11/30/2020

**Previously Presented**:

- Need Meeting 09/01/2020
- Solution Meeting 10/06/2020

**Supplemental Project Driver:**

- Customer Service

**Specific Assumption Reference:**

PSE&G 2019 Annual Assumptions

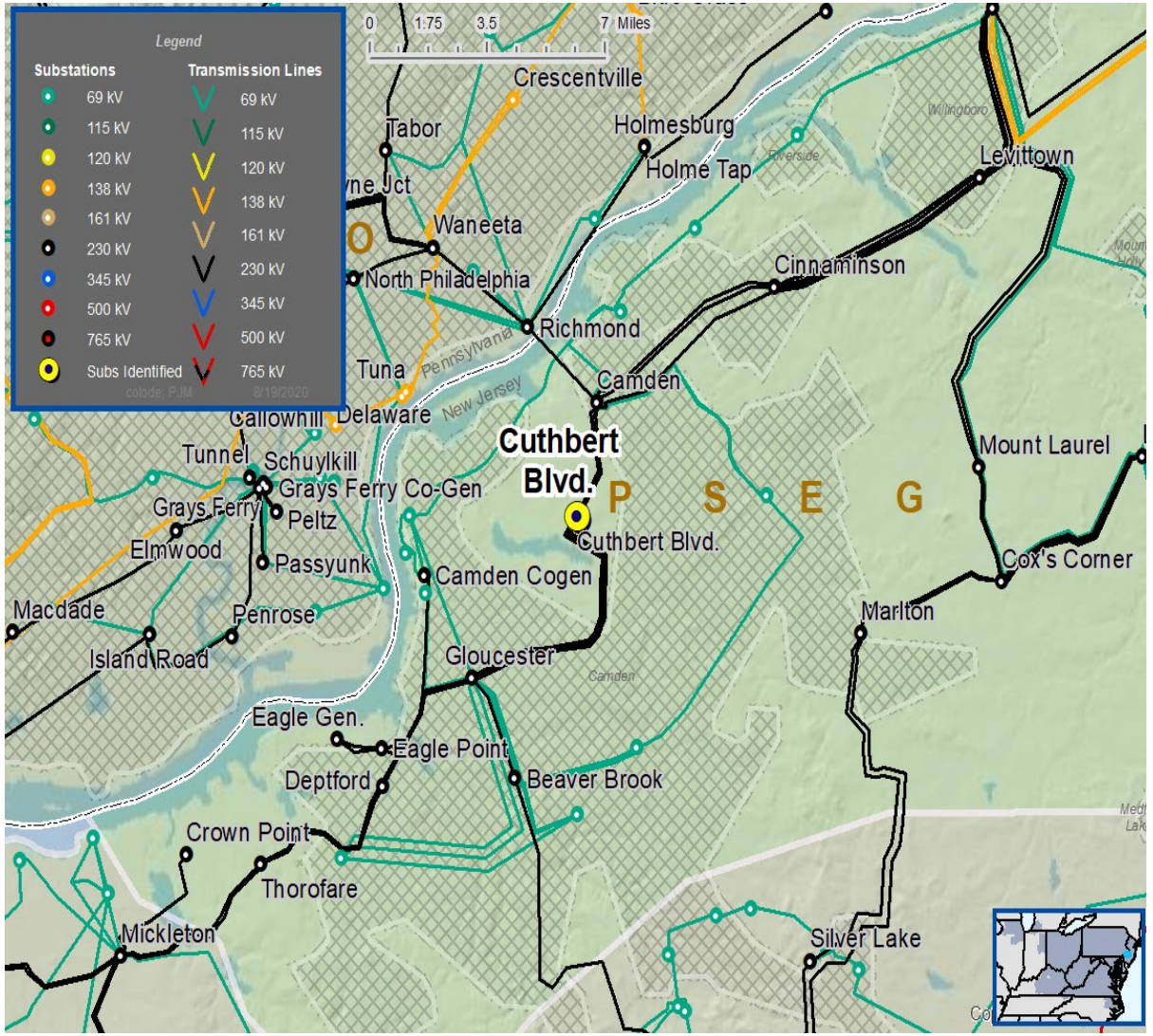
- Localized Load Growth & Contingency Overloads

**Problem Statement:**

Cuthbert Blvd is a station in the Northern Camden area at capacity of 120MVA.

- Cuthbert Blvd serves roughly 33,000 customers with a peak load of 143MVA in 2019.

**Model:** 2020 Series 2025 Summer RTEP 50/50



# PSE&G Transmission Zone M-3 Process
# Northern Camden County Area

**Need Number:** PSEG-2020-0007

**Process Stage:** Submission of Supplemental Project for inclusion in the Local Plan 11/30/2020

**Selected Solution:**

- New 230-13kV Station along the existing ROW in Pennsauken
  - Install a 230kV station with two (2) 230/13kV transformers.
  - Cut and loop the Camden-Cinnaminson 230kV line into the 230kV bus.
  - Transfer load from heavily loaded Cuthbert Blvd to the new station.

**Ancillary Benefits:**

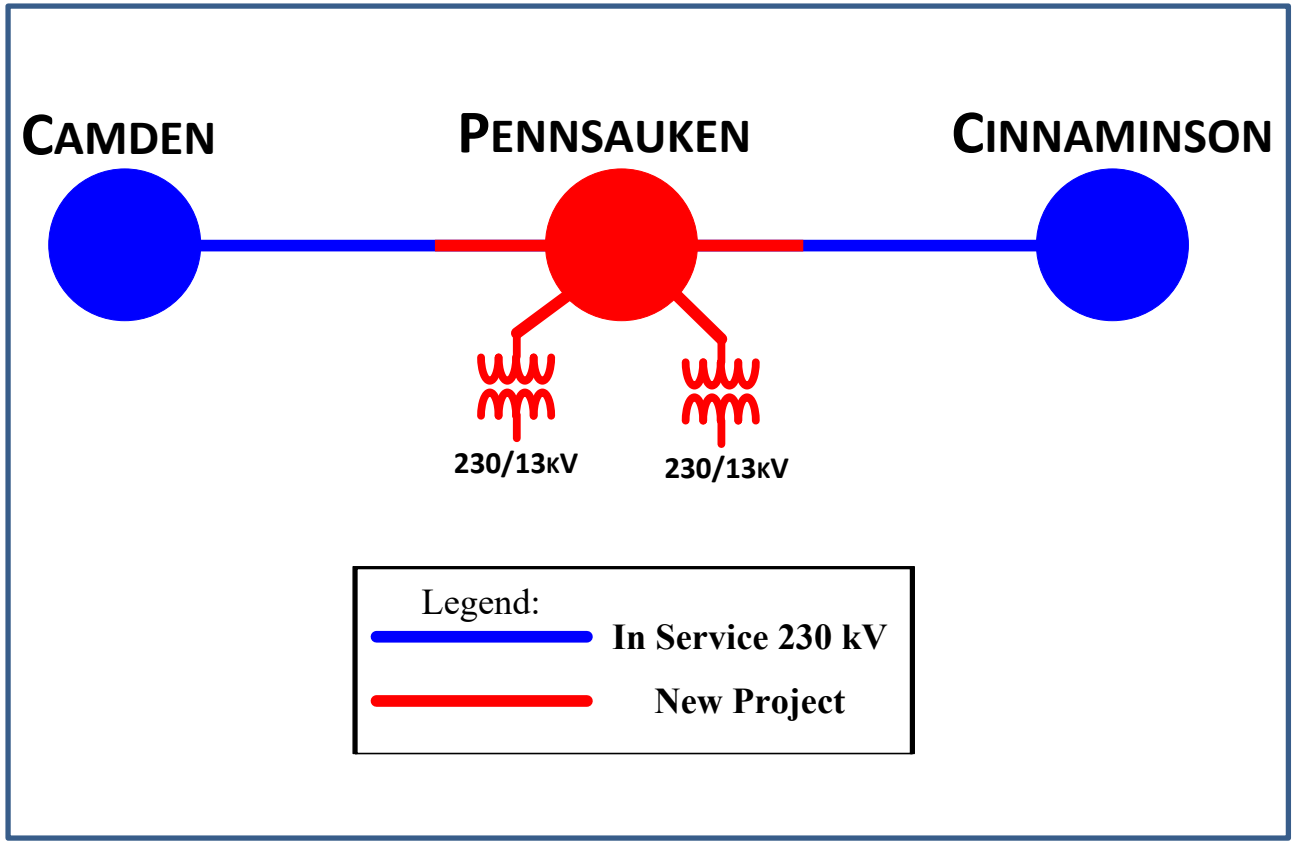
- Does not require any additional construction of new transmission circuits due to close proximity to the 230kV Right of Way.
- Decreases the amount of exposure and increases the reliability of the 230kV circuit.

**Estimated Cost:** $48.6M

**Projected In-Service**: 05/2024

**Supplemental Project ID:** s2385

**Project Status:** Engineering and Planning



# Revision History

8/31/2020 – V1 – Local Plan for s2276 posted to pjm.com

10/12/2020 – V2 – Added Local Plan for s2316, s2317 and s2318

10/29/2020 – V3 – Added local plan for s2355.1

11/30/2020 – V4 – Added local plan for s2385