Sub Regional RTEP Committee
Mid-Atlantic - PSEG
Solution Meeting

October 29, 2018

PSEG Transmission Zone

Need Number: PSEG-2018-0001

Need Presented: 9/21/2018

Meeting Date: 10/29/2018

Process Stage: Solution Meeting

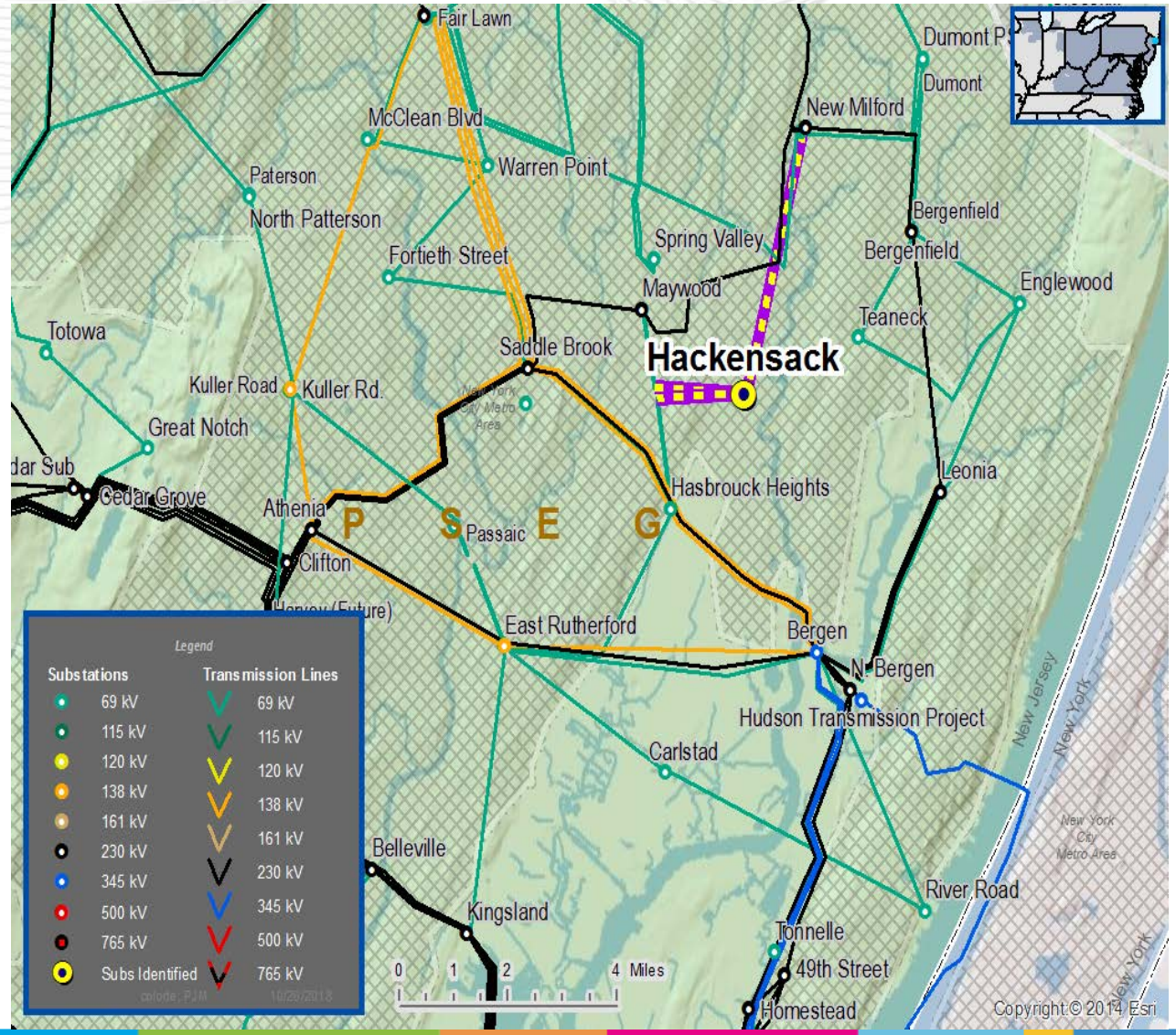
Supplemental Project Drivers: Equipment Material Condition, Performance and Risk

Problem Statement:

- Hackensack is supplied by 26kV circuits with increasing performance problems.
  - Over the past decade, the 26kV supply circuits have seen significant momentary and extended outages, with total duration of hundreds of hours.
- Station equipment at Hackensack has been in service for over 60 years. This equipment has been identified as being in poor condition and needs to be addressed.
  - Hackensack serves roughly 5,000 customers and 30 MVA of load

Specific Assumption References:

- August 2017 26kV to 69kV PSE&G Presentation
- PSE&G 2018 Annual Assumptions



PSEG Transmission Zone

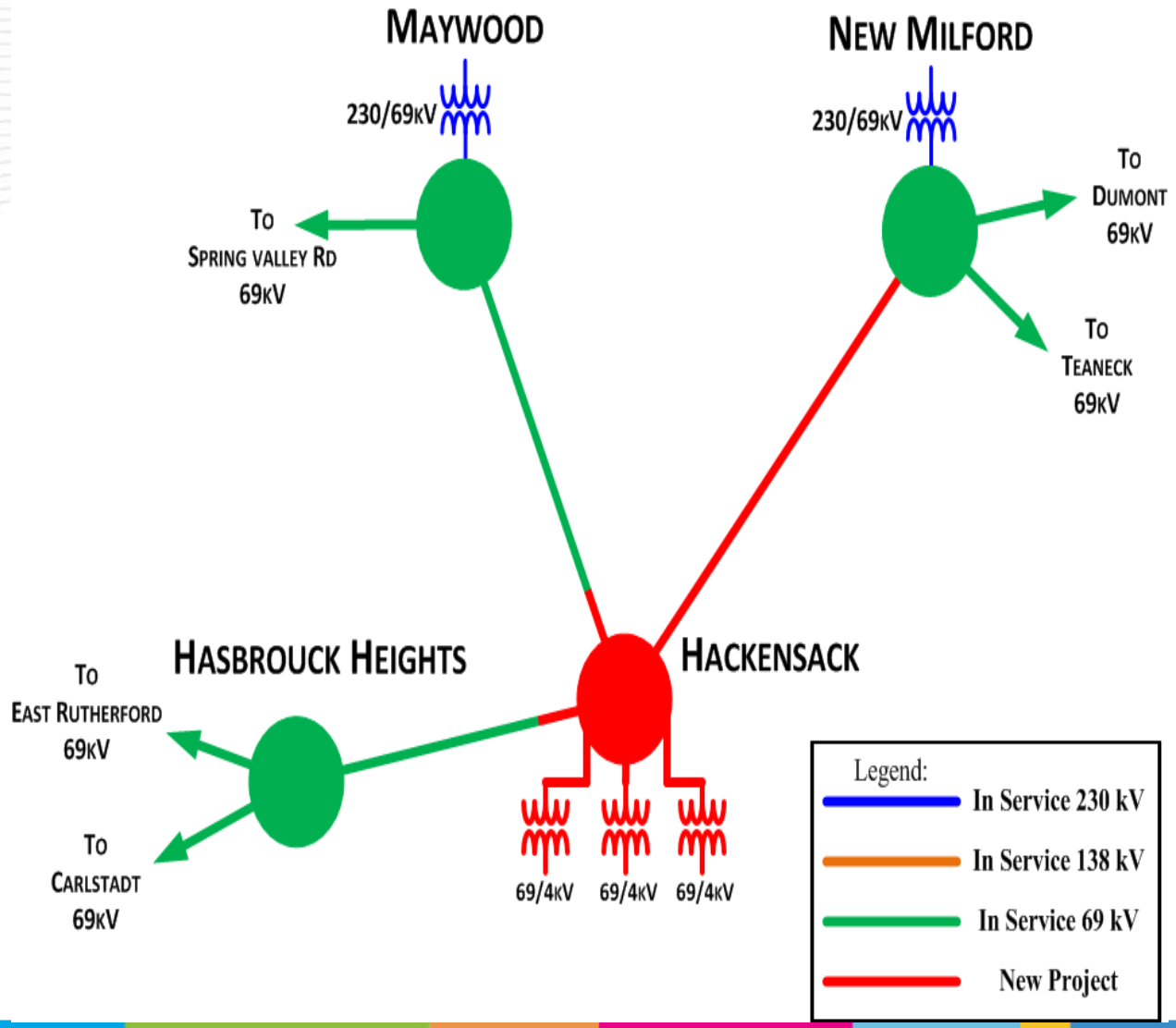
Need Number: PSEG-2018-0001

Proposed Solution:

- Hackensack Station Upgrade
  - Install a 69kV ring bus with three (3) 69/4kV transformers.
  - Construct a 69kV network between Hackensack, Hasbrouck Heights, Maywood, and New Milford.
    - Estimated Cost: $83M
    - Projected In-Service Date: 05/2023

TO Alternatives Considered:

- Alternative 1
  - Construct a 230/69kV station at Hackensack.
  - Install a 230kV ring bus with one (1) 230/69kV transformer.
  - Cut and loop C-2334 Saddle Brook-Bergen 230kV line in to the 230kV ring bus.
  - Install a 69kV ring bus with three (3) 69/4kV transformers.
  - Construct a 69kV network between Hackensack, Hasbrouck Heights, and Spring Valley.
    - Estimated Cost: $135M
- Alternative 2
  - Replace 26kV equipment at Hackensack in kind and rebuild 26kV supply.
  - This alternative is not feasible because it does not meet system planning needs.



PSEG Transmission Zone

Need Number: PSEG-2018-0002

Need Presented: 9/21/2018

Meeting Date: 10/29/2018

Process Stage: Solution Meeting

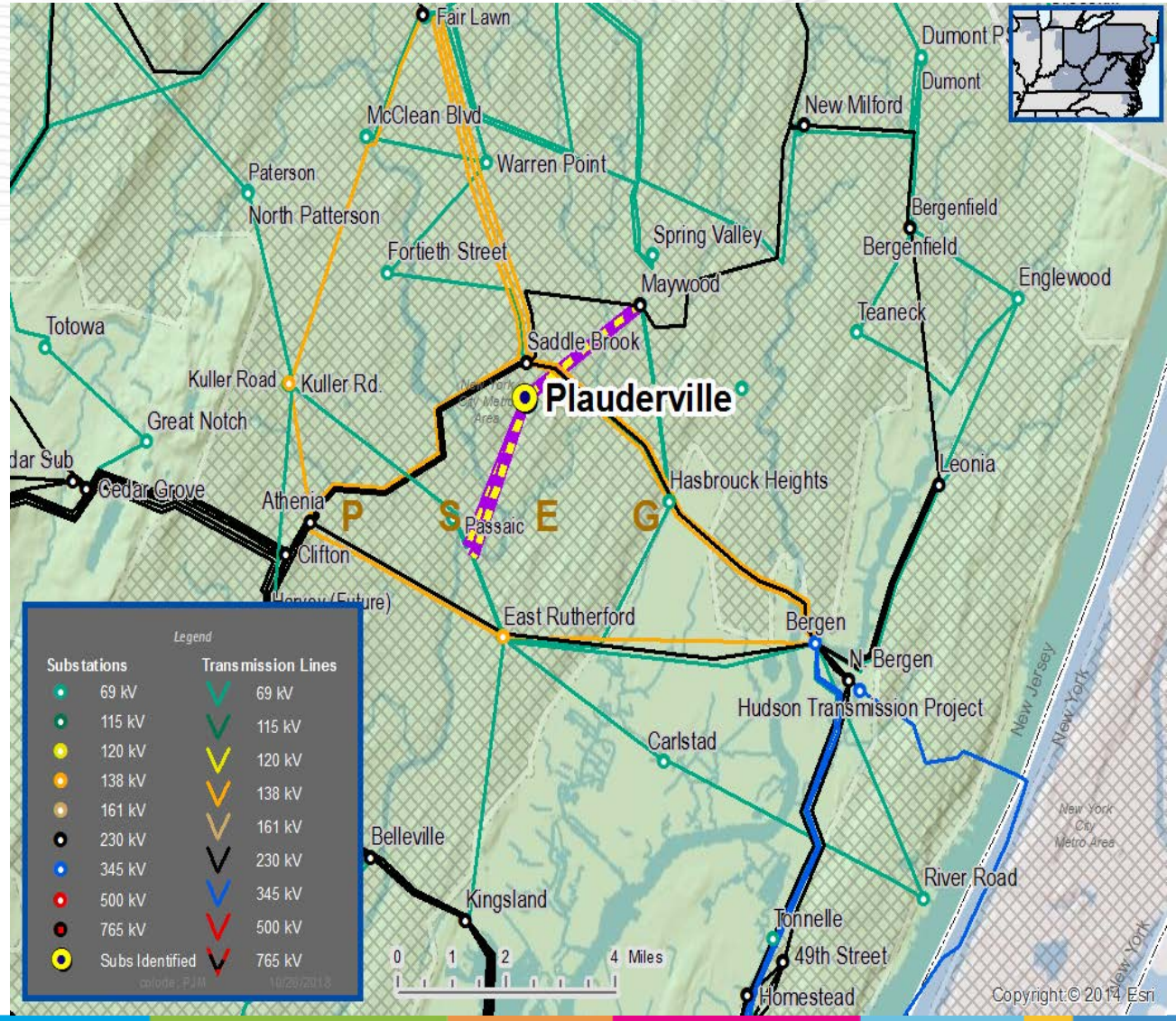
Supplemental Project Drivers: Equipment Material Condition, Performance and Risk; Customer Service

Problem Statement:

- Plauderville is supplied by 26kV circuits with increasing performance problems.
  - Over the past decade, the 26kV supply circuits have seen significant momentary and extended outages, with total duration of hundreds of hours.
- Station equipment at Plauderville has been in service for over 60 years. This equipment has been identified as being in poor condition and needs to be addressed. The station has outdoor metal clad switchgear that has resulted in rust and leaks over time, which causes bus failures.
  - Plauderville serves roughly 3,000 customers and 15 MVA of load.
- Stations around Plauderville are at or near capacity. There is a need for additional capacity in the area.

Specific Assumption References:

- August 2017 26kV to 69kV PSE&G Presentation
- PSE&G 2018 Annual Assumptions



PSEG Transmission Zone

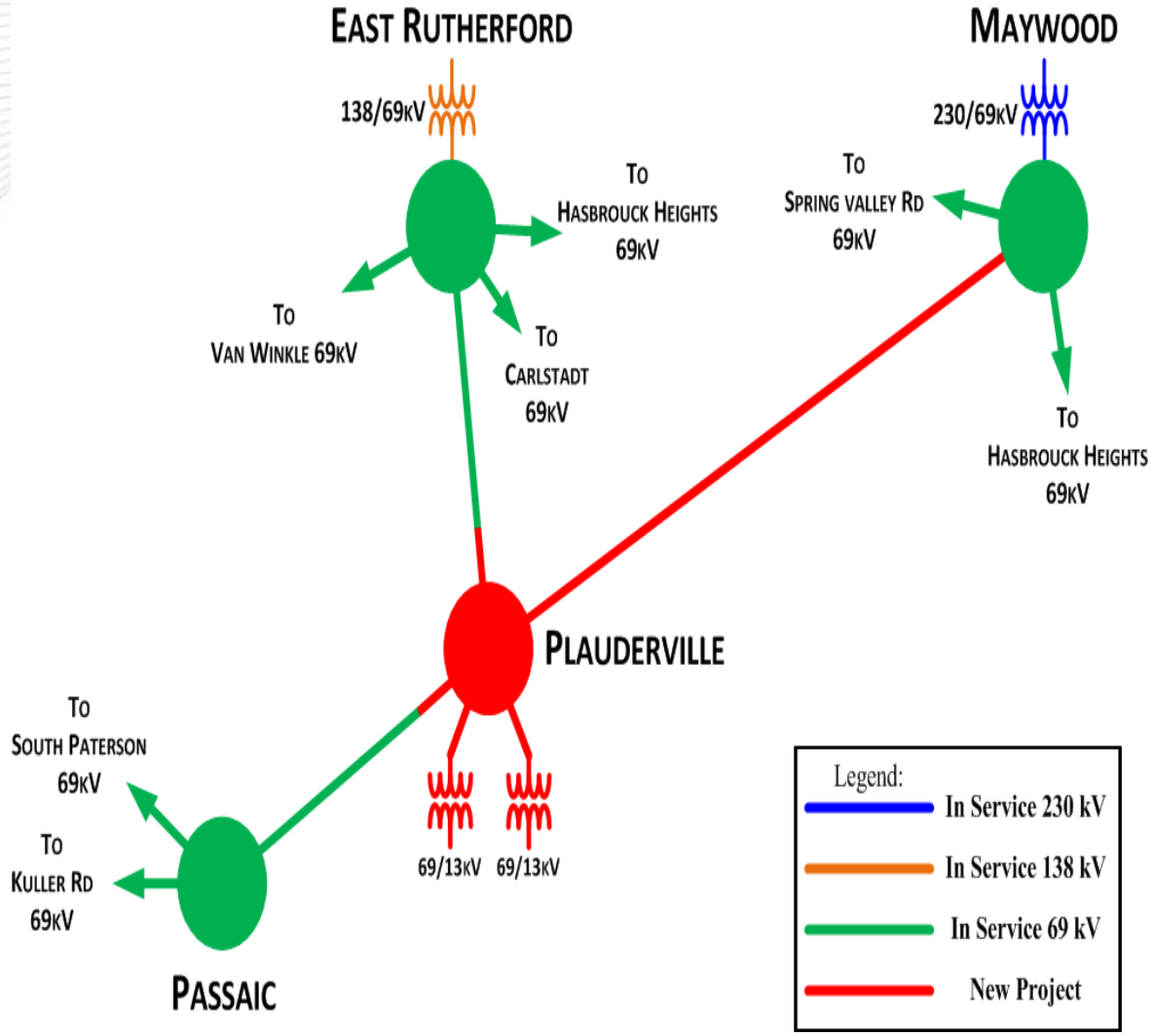
Need Number: PSEG-2018-0002

Proposed Solution:

- Plauderville Station Upgrade
  - Purchase nearby property to accommodate new construction.
  - Install a 69kV ring bus with two (2) 69/13kV transformers.
  - Construct a 69kV network between East Rutherford, Maywood, Passaic, and Plauderville.
    - Estimated Cost: $94M
    - Projected In-Service Date: 05/2023

TO Alternatives Considered:

- Alternative 1
  - Construct a 230/69kV Station at Plauderville.
  - Purchase property to accommodate new construction.
  - Install a 230kV ring bus with one (1) 230/69kV transformer.
  - Cut and loop G-2259 Saddle Brook-Maywood 230kV line in to the 230kV ring bus.
  - Install a 69kV ring bus with two (2) 69/13kV transformers.
  - Construct a 69kV network between East Rutherford, Passaic, and Plauderville.
    - Estimated Cost: $150M
- Alternative 2
  - Construct a new station in an alternate location to replace Plauderville.
  - Purchase property in an alternate location to accommodate new construction.
  - Install a 69kV ring bus with two (2) 69/13kV transformers.
  - Construct a 69kV network between East Rutherford, Hasbrouck Heights, Maywood, and the new station.
    - Estimated Cost: $134M
- Alternative 3
  - Replace 26kV equipment at Plauderville in kind and rebuild 26kV supply.
  - This alternative is not feasible because it does not meet system planning needs.



Sub Regional RTEP Committee
Mid-Atlantic - PSEG
Need Meeting

October 29, 2018

PSEG Transmission Zone

Need Number: PSEG-2018-0004

Meeting Date: 10/29/2018

Process Stage: Needs Meeting

Project Drivers:

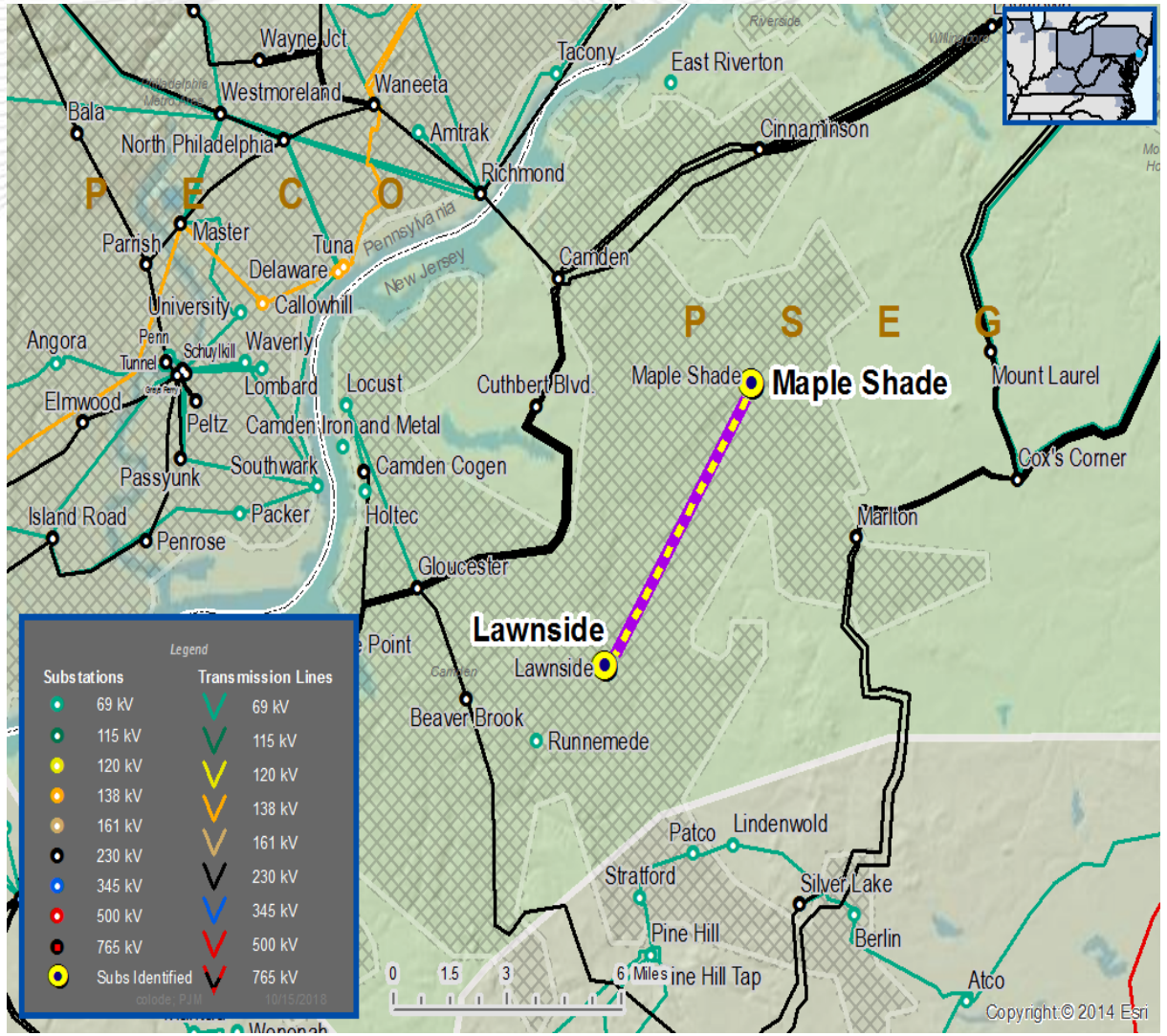
- Operational Flexibility and Efficiency
- Equipment Material Condition, Performance and Risk

Problem Statement:

- Lawnside is a straight bus fed by four 69kV lines that serves roughly 24,000 customers and 113 MVA of load.
- A stuck breaker condition on any of the 69kV bus section breakers causes the loss of three 69kV lines and two transformers, leaving the station with only a single 69kV supply. This results in an unacceptable voltage drop of roughly 7%.
- Poor circuit performance on the Lawnside-Maple Shade 69kV circuit.
- Over the past five years, the Lawnside-Maple Shade 69kV circuit has experienced 11 extended outages and 13 momentary outages, with total duration of over 113 hours.

Specific Assumption References:

- PSE&G 2018 Annual Assumptions



PSEG Transmission Zone

Need Number: PSEG-2018-0005

Meeting Date: 10/29/2018

Process Stage: Needs Meeting

Project Drivers:

Operational Flexibility and Efficiency

Equipment Material Condition, Performance and Risk

Problem Statement:

Poor station reliability at Mount Rose. Mount Rose serves roughly 11,000 customers and 60 MVA of load.

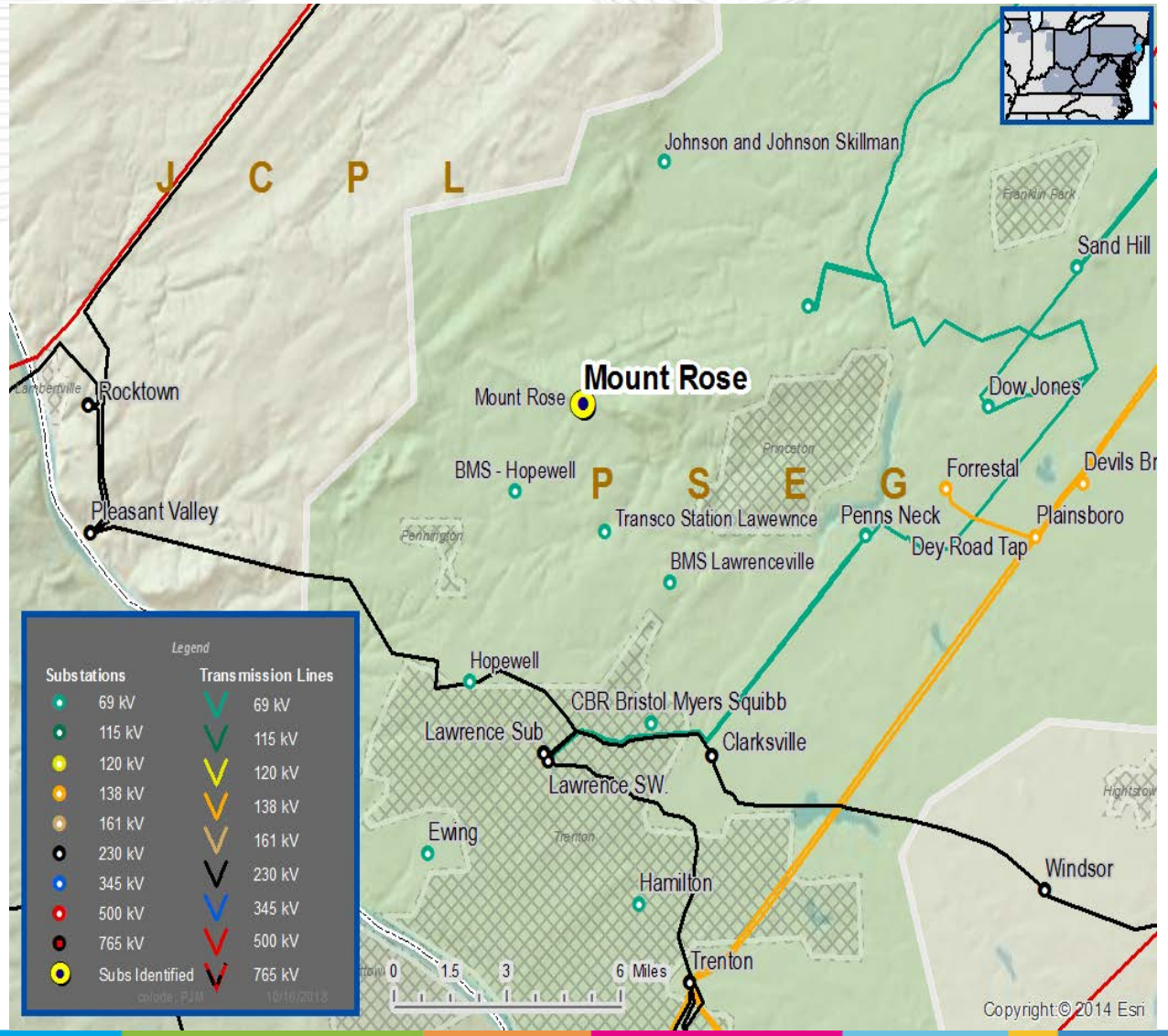
- Mount Rose experienced station shutdowns due to loss of all 69kV supply in 2016 and 2018.
- Over the past decade, the three 69kV supply circuits at Mount Rose have experienced 21 extended outages and 9 momentary outages, with total duration of over 207 hours.

Mount Rose is a straight bus fed by three 69kV lines. There are several contingencies that would result in unacceptable voltage drops:

- An N-1-1 condition on 69kV supplies in the network leaves Mount Rose and several customer substations in the area with only long distance, daisy-chained paths to 230kV sources. The voltage drops by roughly 7%.
- A stuck breaker condition on the capacitor bank breaker causes the loss of two 69kV lines and the capacitor bank, leaving the station with only a single 69kV supply. The voltage drops by roughly 6%.
- A stuck breaker condition on the bus section breaker results in the loss of the entire station.

Specific Assumption References:

[PSE&G 2018 Annual Assumptions]



Revision History

10/16/2018 – V1 – Original version posted to pjm.com

10/16/2018 – V2 – Changed the 'Process stage' from Need to Solution for the projects at solution review

10/24/2018 – V3 – Revised slides to reflect change of meeting from 10/26/2018 to 10/29/2018

10/26/2018 – V4 – Updated diagram for Slide # 2, 3, 4 and 5. Removed slides # 6 and 7