Sub Regional RTEP Committee
Mid-Atlantic

December 19, 2017

First Preliminary Review
Baseline Reliability and Supplemental Projects

The slide was previously presented at 8/31/2017 and is replaced by the slide on next page.

Load Deliverability DPL South (Summer):

Problem Statement:

- Low voltage violation at the Five Point 69 kV plus the Robinson and Rehoboth 138 kV stations during the Delmarva South LDA load deliverability analysis. (FG# LD-SVL1, LD-SVL,2 and LD-SVL3)

Potential Solution:

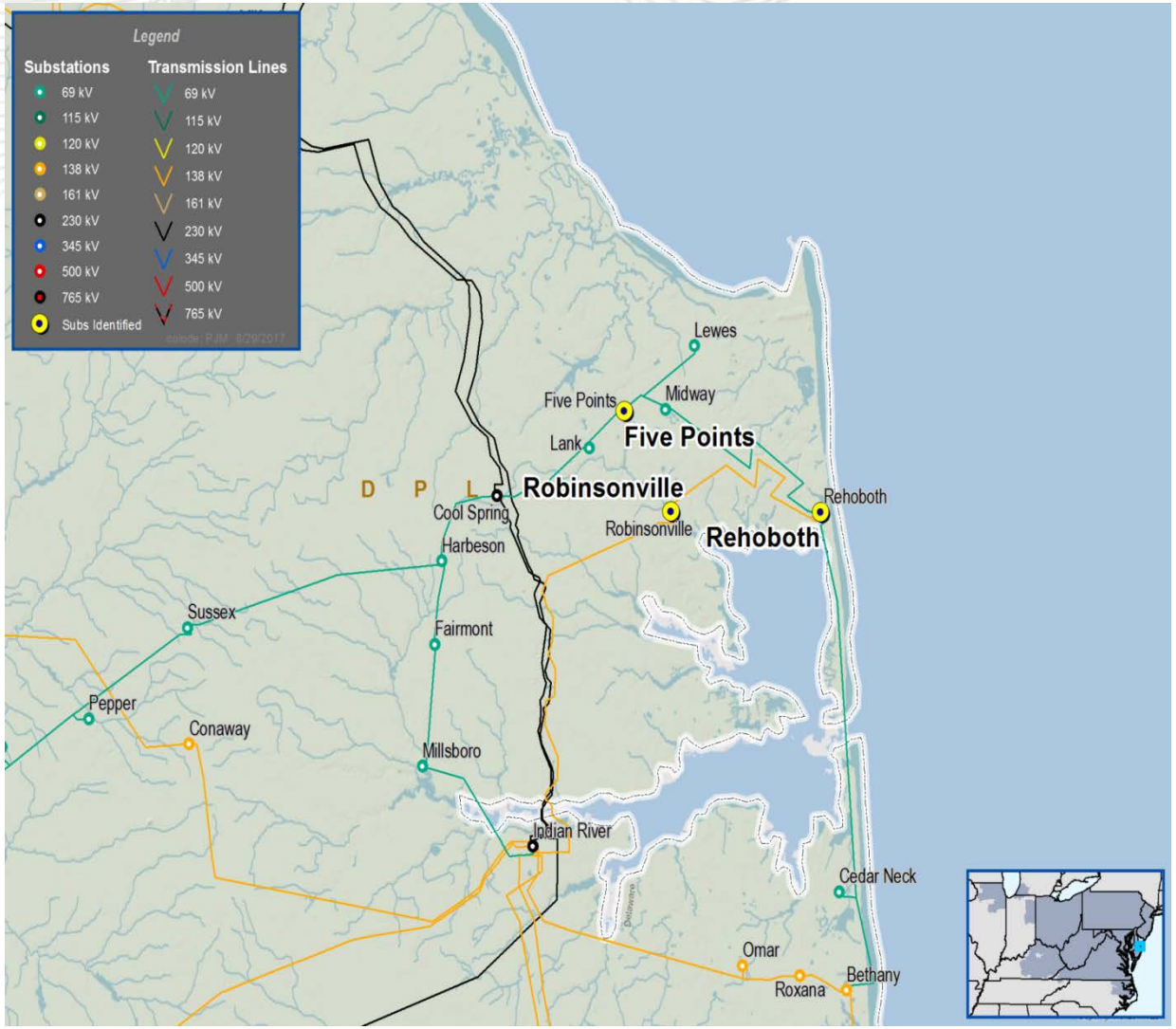
- Install additional 30 MVAR capacitor bank at DPL's Rehoboth 138 kV Substation.
  - The capacitor bank would be installed in two separate 15 MVAR stages allowing DPL operational flexibility. At this stage, there are ongoing discussions with Substation Engineering to assess the viability of this option from a constructability standpoint, and the estimate is being created accordingly. This solution will resolve all of the voltage issues identified above.

Alternative Solution:

- Replace existing 30 MVAR capacitor bank at DPL's Rehoboth 138 kV Substation with a +50/-25 MVAR Static VAR Compensator (SVC).
  - At this stage, there are ongoing discussions with Substation Engineering to assess the viability of this option from a constructability standpoint, and the estimate is being created accordingly. This solution will resolve all of the voltage issues identified above

Required IS date: 6/1/2022

Project Status: Conceptual



DPL Transmission Zone
Baseline Reliability Project

DPL recently provided a new load profile in the Robinsonville area and PJM reevaluated the load deliverability analysis based on the modified load.

Load Deliverability DPL South (Summer):

Problem Statement:

- Low voltage violation at Lank 69 kV station during the Delmarva South LDA load deliverability analysis.

Potential Solution:

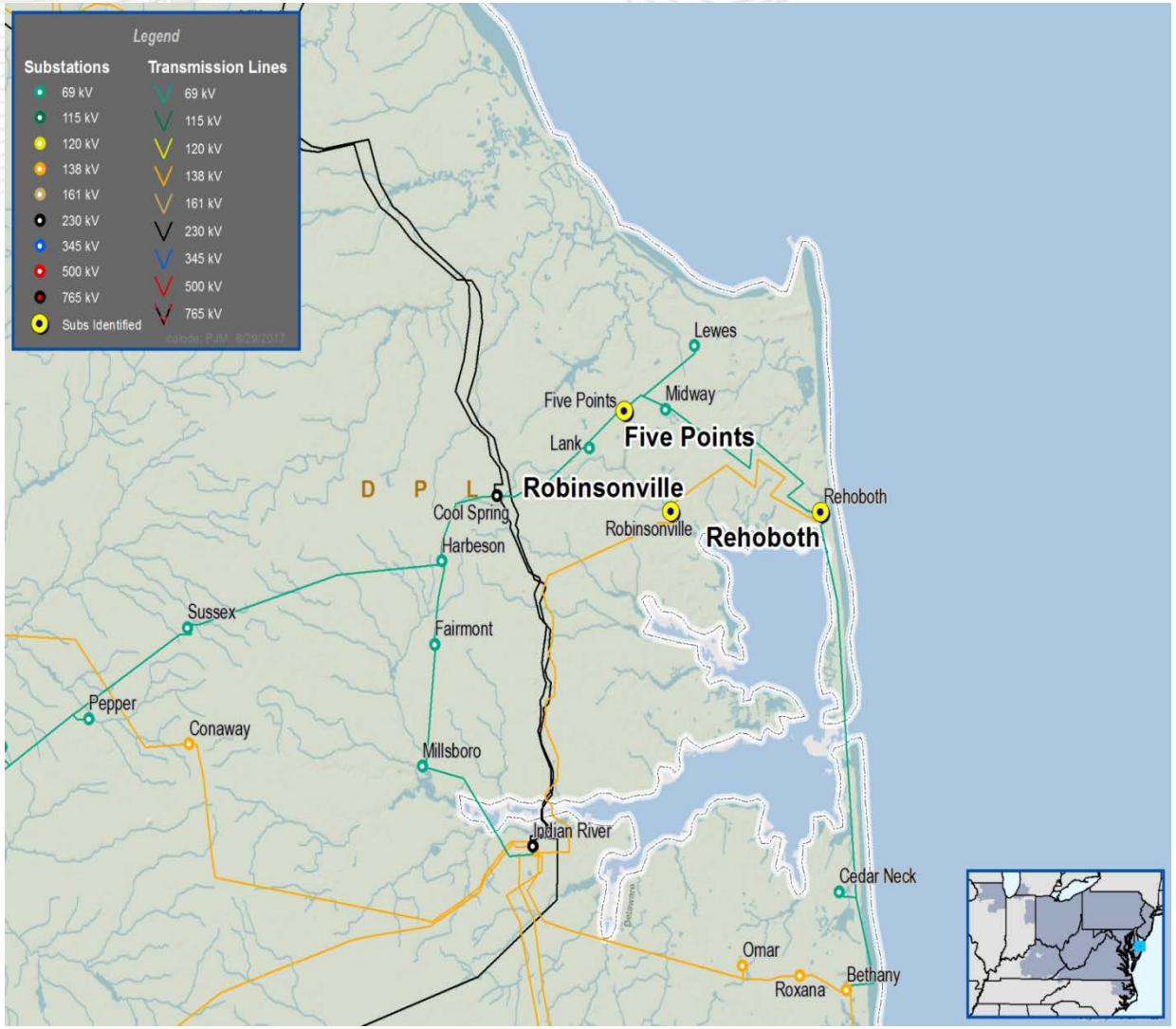
- Install a 30 MVAR capacitor bank at DPL's Cool Springs 69 kV Substation. The capacitor bank would be installed in two separate 15 MVAR stages allowing DPL operational flexibility. Estimated cost: $1.7 M

Alternative Solution:

- Install an additional 30 MVAR capacitor bank at DPL's Rehoboth 69 kV Substation. The capacitor bank would be installed in two separate 15 MVAR stages allowing DPL operational flexibility. This solution would resolve all of the voltage issues identified above, but due to lack of space in the Rehoboth Substation and surrounding areas, there are major constructability concerns.

Required IS date: 6/1/2022

Project Status: Conceptual



PSE&G Transmission Zone: Supplemental Project
Harvey Switching Station

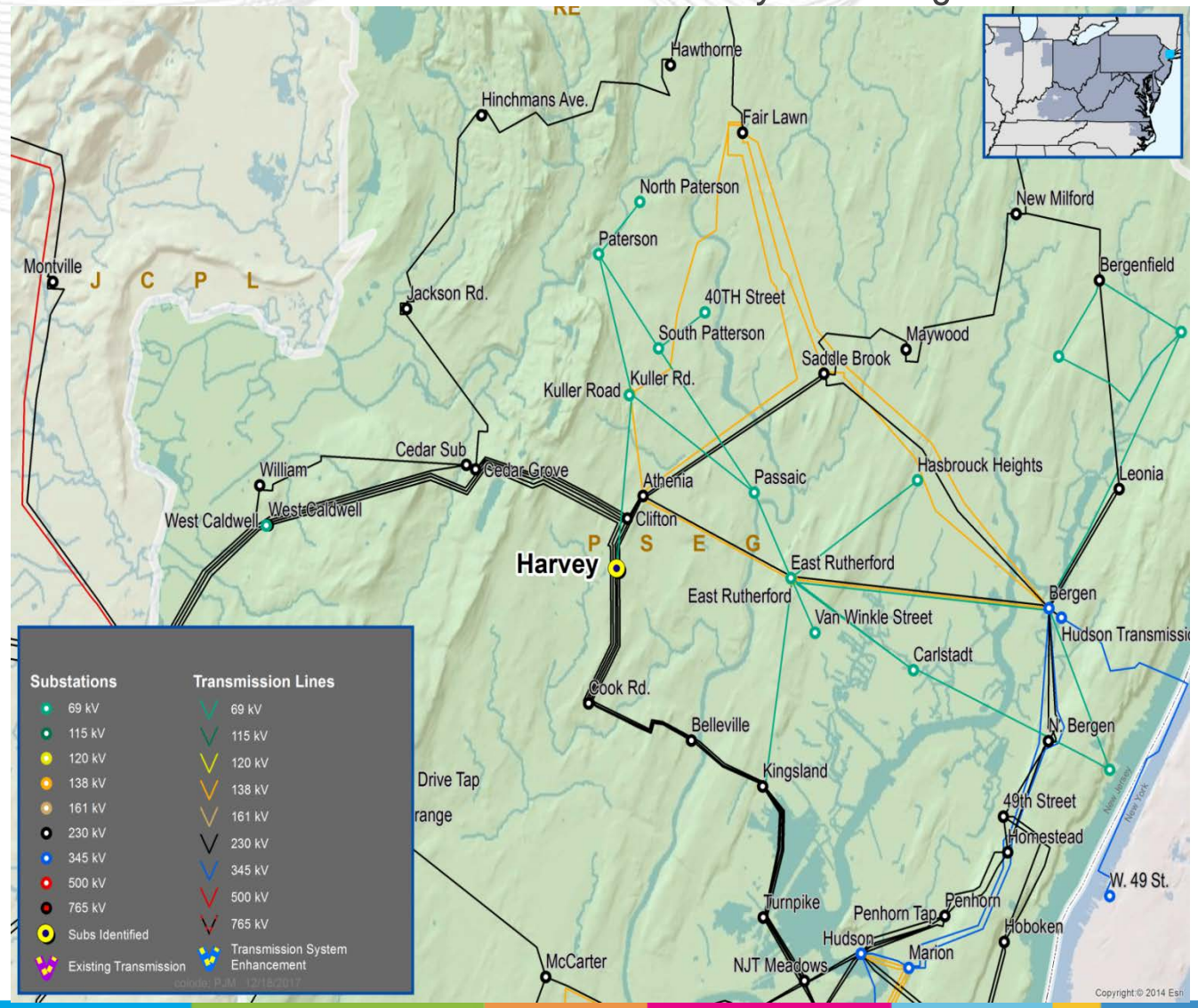
Problem Statement:

Equipment Material Condition, Performance and Risk: As discussed during the 8/31/2017 SRRTEP Mid Atlantic meeting, there are several 26kV and 13kV substations in the Clifton area with equipment in poor condition. The majority of equipment at Allwood, Nutley, and Van Houten Substations is over 60 years of age and must be addressed.

Alternatives:

1. Construct a new 230/69kV station in the Clifton area on the existing ROW and a new 69/13kV station within the existing ROW.
   - Construct a new 230/69kV station in the Clifton area to provide a third source to Kuller Road. Install 230kV ring bus with two (2) 230/69kV transformer and 69kV ring bus at Harvey Switching Station.
   - Loop in overhead 230kV line to Harvey Switching Station.
   - Install two (2) 69/13kV transformers fed from 69kV ring bus.
   - Provides a source for a third supply to Kuller Rd
   - Estimated Project Cost: $195 M
2. Construct a new 230/13kV station in the Clifton area and a new 230/69kV station at a new site
   - Purchase property and construct a new 230/69kV station to provide a third source to
   - Kuller Road and outlets for Allwood, Nutley, and Van Houten.
   - Install 230kV ring bus with one (1) 230/69kV transformer and 69kV ring bus at a new site.
   - Construct 230kV ring bus on the existing ROW to avoid derating the line and extend
   - 230kV circuit using XLPE cable to Harvey Switching Station.
   - Install two (2) 230/13kV transformers fed from 230kV ring bus.
   - Provides a source for a third supply to Kuller Rd
   - Estimated Project Cost: $379M
3. Rebuild Allwood, Nutley, and Van Houten as 69/4kV stations and connect to East Rutherford 69kV and Belleville 69kV Switching Stations.
   - Purchase additional property to accommodate new construction at all three locations.
   - Install 69kV ring bus and three (3) 69/4kV transformers at each location.
   - Construct a 69kV network between Allwood, Nutley, Van Houten, Belleville, Branch Brook,
   - East Rutherford, and Kuller Road.
   - Estimated Project Cost: $244M
4. Do Nothing Alternative – there is a reliability risk created by not acting to address.

Project Status: Conceptual



Second Review and Recommendations
Baseline Reliability and Supplemental Projects

PSE&G Transmission Zone: Baseline Reliability
Kuller Road Substation

Previously Presented: 10/31/2017

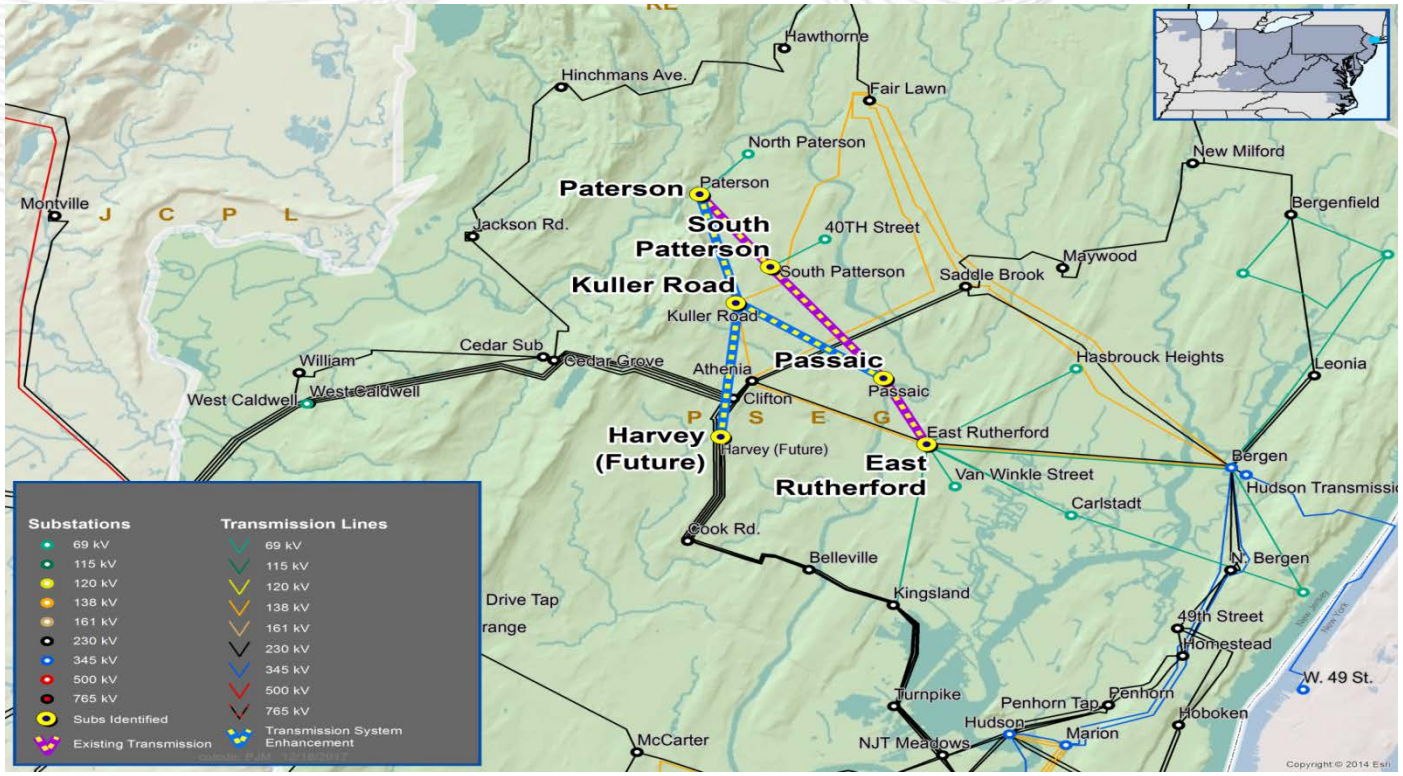
Problem Statement:

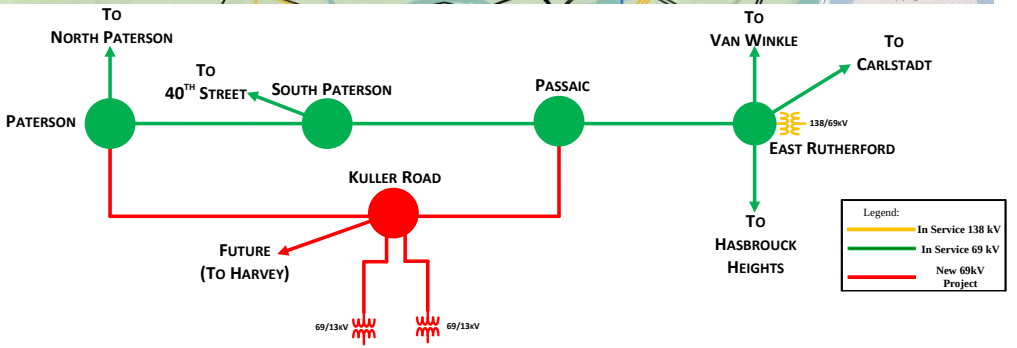
- PSE&G FERC Form 715: Kuller Road Substation is supplied by two underground 138kV lines. Kuller Road supplies more than 18,000 customers with load in excess of 60 MVA. An N-1-1 event would result in a complete loss of electric supply to the station for more than 24 hrs, a violation of PSE&G acceptable load drop levels and durations.

Recommended Solution:

- Convert Kuller Road to a 69/13kV station. (B2983)
  - Install 69kV ring bus and two (2) 69/13kV transformers at Kuller Road.
  - Construct a 69kV network between Kuller Road, Passaic, Paterson, and Harvey (new Clifton area switching station).

Estimated Project Cost: $98.25 M
Required IS Date: 6/1/2018
Expected IS Date: 6/30/2021
Project Status: Engineering





Previously Presented: 10/31/2017

Problem Statement:

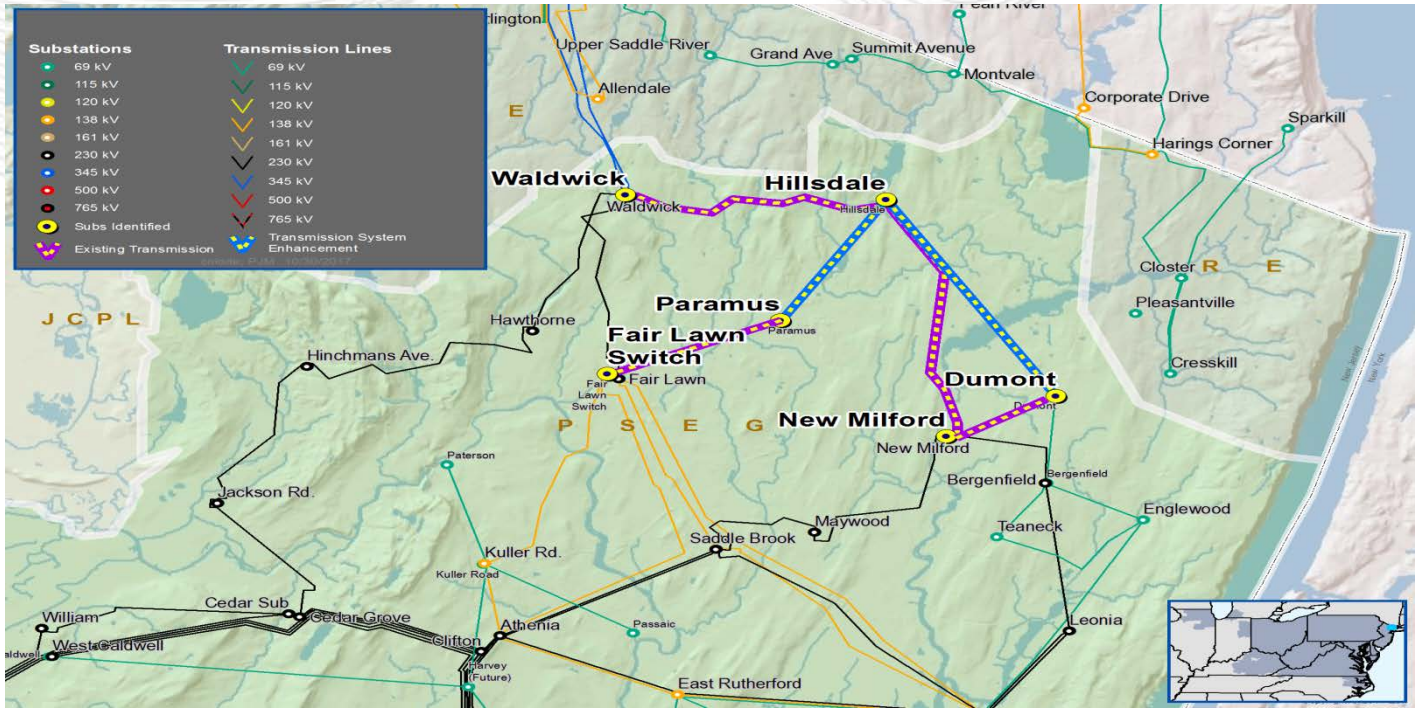
- PSE&G FERC Form 715: Hillsdale Substation is supplied by two underground 230kV lines. Hillsdale supplies more than 17,000 customers with load in excess of 80 MVA. An N-1-1 event would result in a complete loss of electric supply to the station for more than 24 hrs, a violation of PSE&G acceptable load drop levels and durations.

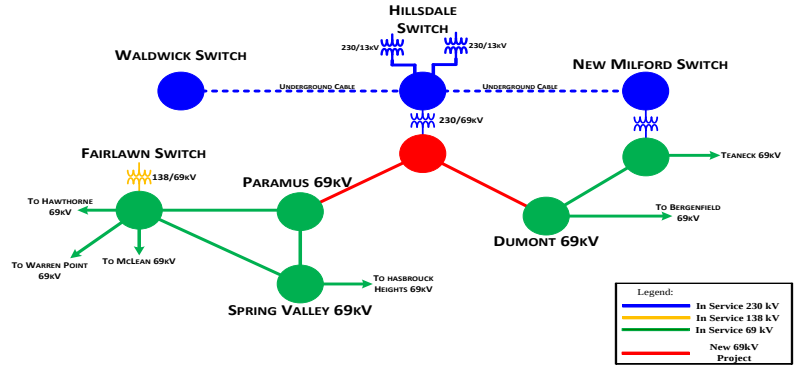
Recommended Solution:

- Construct a 230/69kV station at Hillsdale Substation and tie to Paramus and Dumont at 69kV. B2982)
  - Install a 69kV ring bus and one (1) 230/69kV transformer at Hillsdale.
  - Construct a 69kV network between Paramus, Dumont, and Hillsdale Substation using existing 69kV circuits

Estimated Project Cost: $115M

Required IS Date: 6/1/2018
Expected IS Date: 6/30/2021
Project Status: Engineering





PSE&G Transmission Zone: Supplemental Project
North Bridge St and Mountain 69 kV stations

Previously Presented: 10/31/2017

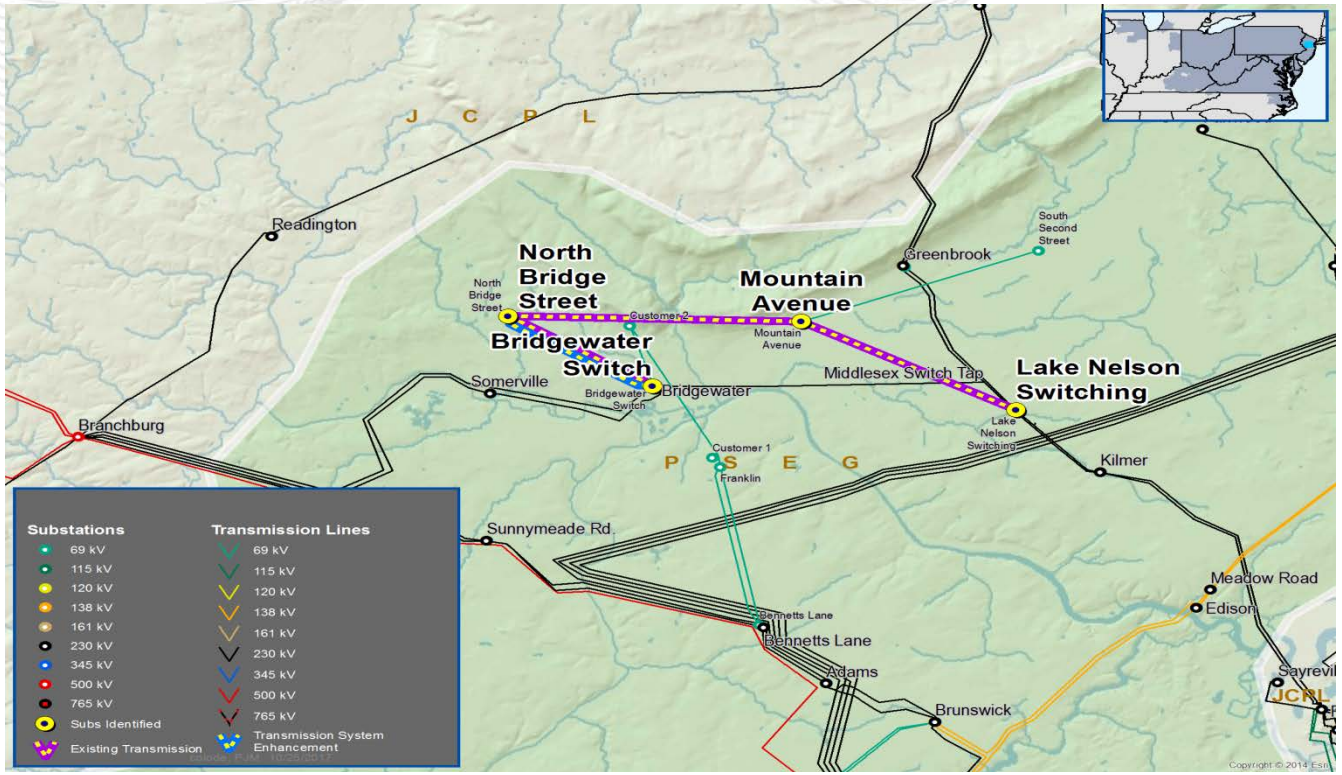
Problem Statement:

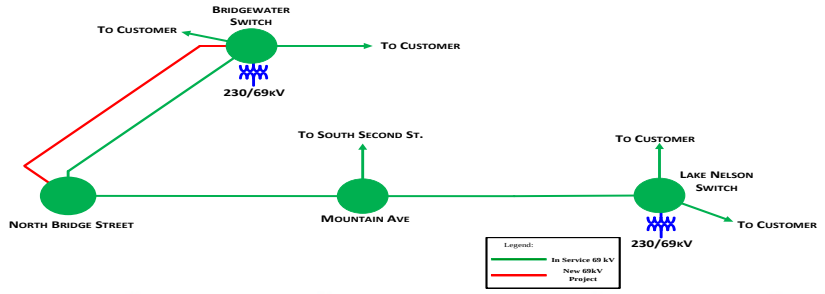
- During an N-1-1 contingency event, the voltage at North Bridge St 69kV and Mountain Ave 69kV drops to below 0.95 p.u. The loss of the Bridgewater - North Bridge Street 69kV line and the Lake Nelson - Mountain Ave 69kV line would leave North Bridge Street and Mountain Ave fed from a single 69kV line. North Bridge Street serves around 2000 customers and over 40 MVA of load, while Mountain Ave also serves around 2000 customers and over 20 MVA of load.

Selected Solution:

- Construct a new 69kV line from Bridgewater to North Bridge Street. (S1459)
  - Rebuild North Bridge Street 69kV bus as a GIS ring bus.
  - Install new 69kV overhead line from Bridgewater to North Bridge Street using existing line position at Bridgewater.

Estimated Project Cost: $60 M
Expected IS Date: 10/31/2021
Project Status: Engineering





Next Steps

Mid Atlantic	Start	End
1/26/2018	8:30	12:30
3/23/2018	8:30	12:30
5/25/2018	8:30	12:30
7/20/2018	8:30	12:30
9/21/2018	8:30	12:30
11/28/2018	8:30	12:30

Questions?

or

RTEP@pjm.com

Revision History

12/13/2017– V1 – Original version posted to PJM.com

12/18/2017– V2 – Slide # 5 – minor correction to alternative 1 and replaced the map

- Slide # 7 – changed map

12/18/2017– V3 – Slide # 5 – minor correction to alternative 1

- Removed Slide # 10 and 11