

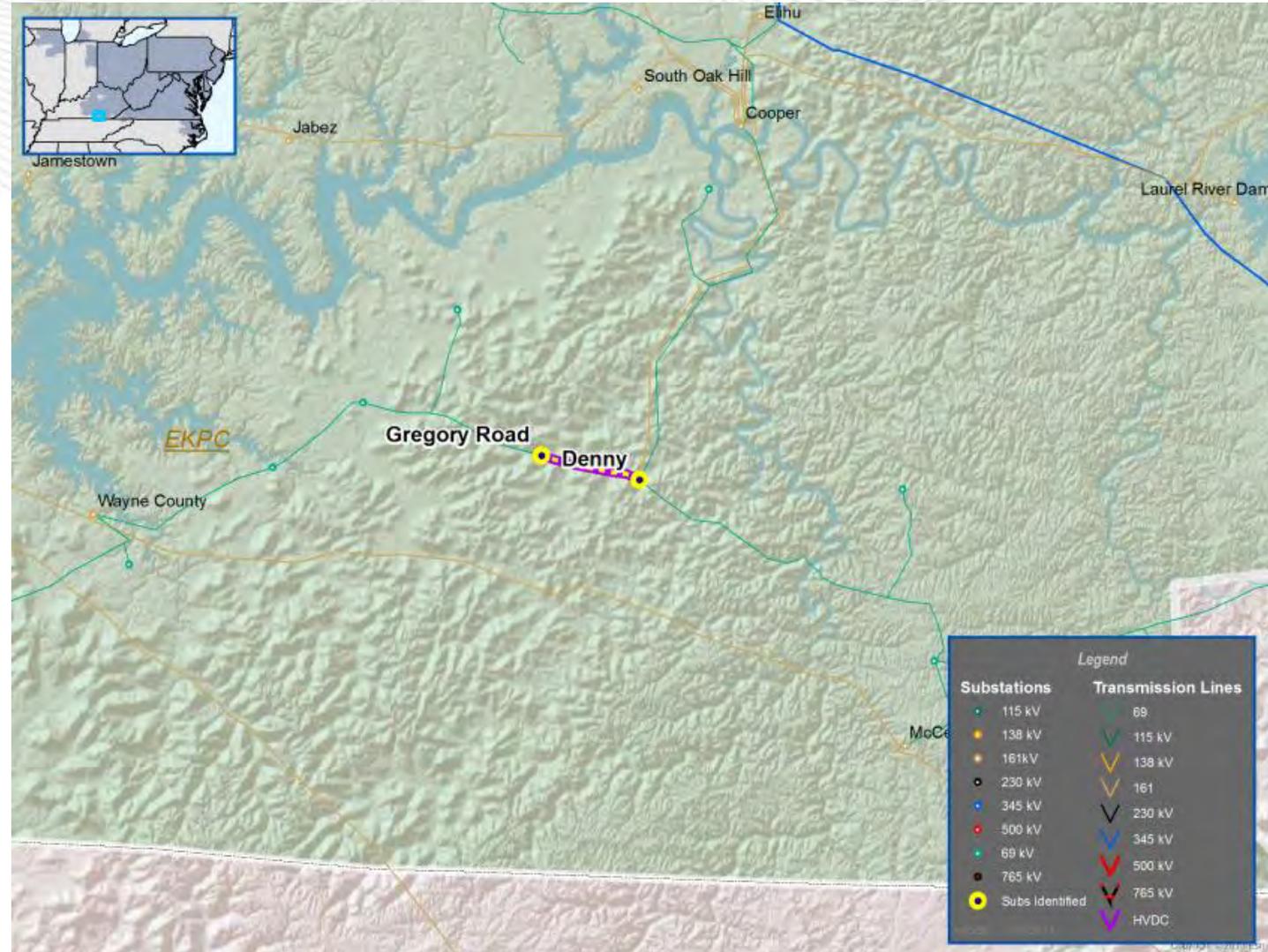


Reliability Analysis Update

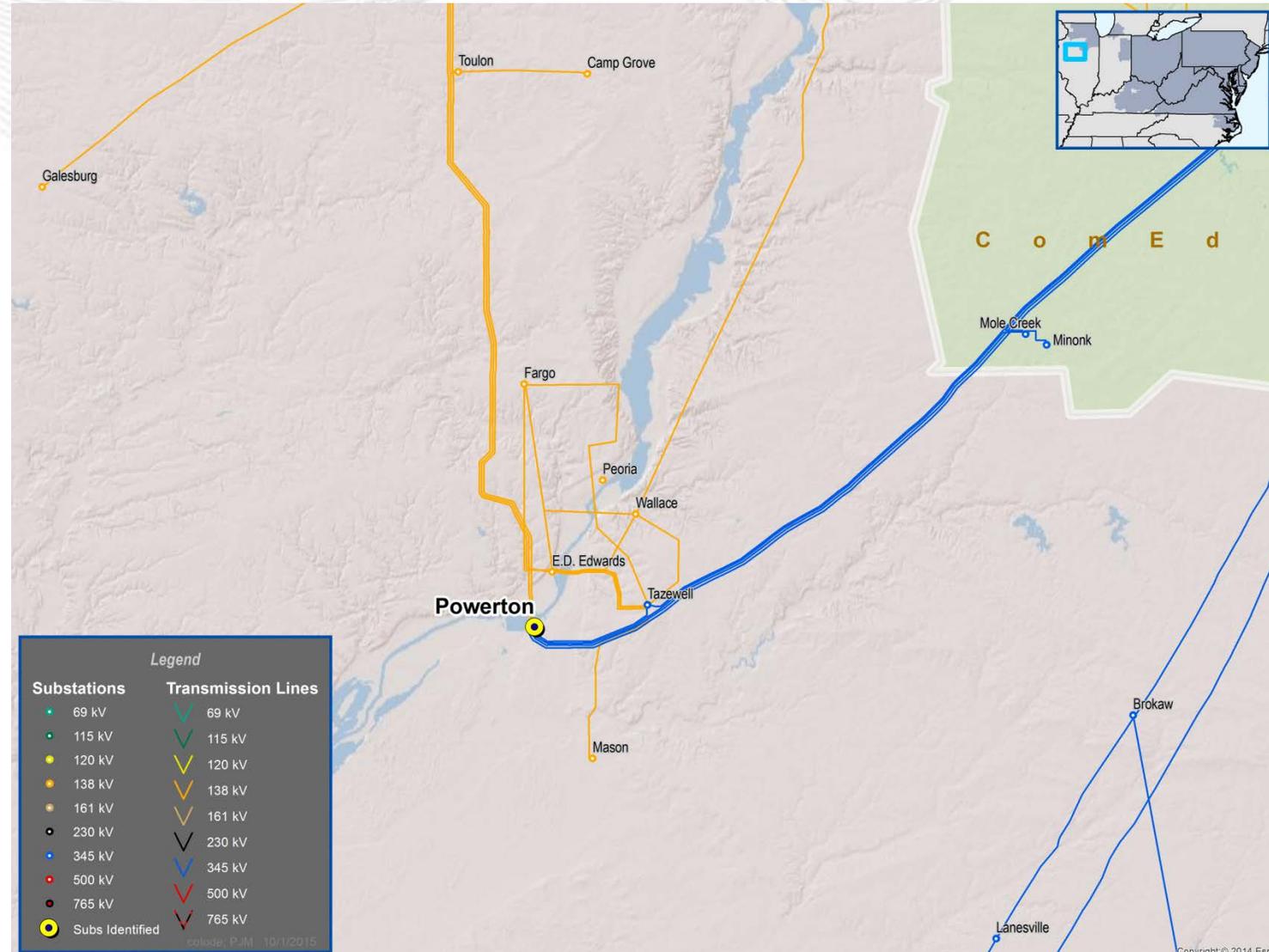
Transmission Expansion Advisory
Committee

February 11, 2016

- **EKPC Criteria Thermal Violation (FG # LT-EKPC1, LT-EKPC2)**
- Overload of the Denny-Gregory Road Jct. 69 kV line during an outage of the Wayne County 161/69 kV transformer with LGE/KU's Mill Creek Unit #4 off.
- **Alternatives considered:**
 - 201415_1-1A
- **Recommended Solution:**
 - Upgrade the Denny - Gregory Road Tap 69-kV line facility. (201415_1-1A) (B2730)
- **Estimated Project Cost:** \$ 0.72 M
- **Required IS Date:** 6/1/2020

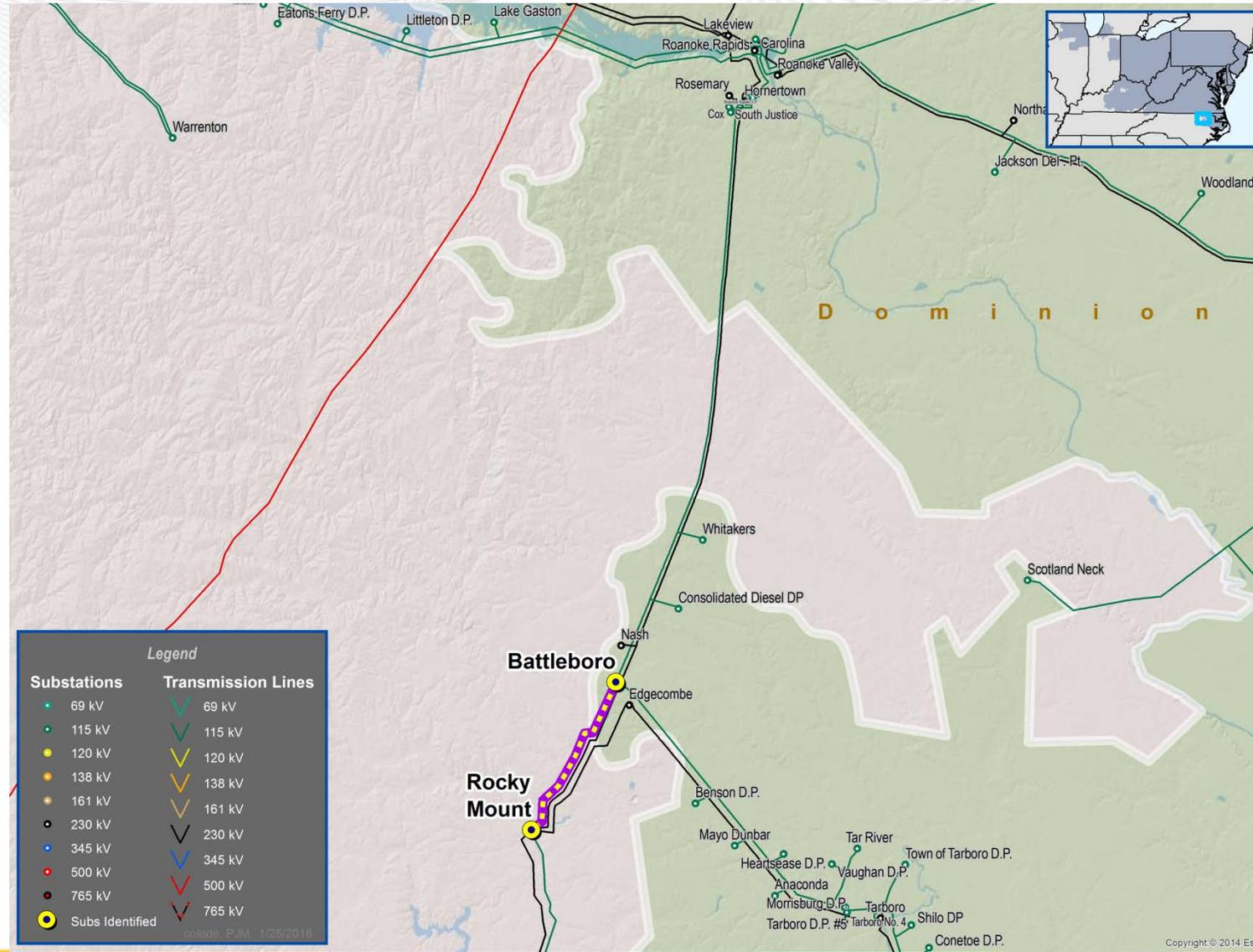


- **Scope Change – B2699**
- **Original Scope:**
- B2699.1: Replace 5 Powerton 345 kV CB's with 2 cycle IPO breakers, install one new 345 kV CB; swap line 0302 and line 0303 bus positions; reconfigure Powerton 345 kV bus as single ring configuration
- B2699.2: Remove SPS logic at Powerton that trips generators or sectionalizes bus under normal conditions; minimal SPS logic will remain
- **Additional Scope:**
- Add additional CB replacement of 345 kV BT3-4 and some relay revisions (B2699.3)
- **Reason for the additional scope:**
 - The original scope of b2699.1 and B2699.2 removes most of the SPS and specifies reinforcements to meet the special Powerton stability criteria. With removal of most of the SPS, ComEd would like to eliminate the use of the old criteria and bring the station up to current design standards. The additional scope (B2699.3) would eliminate the need to maintain this special, less conservative criteria, at Powerton station.
- **Estimated Project Cost: \$ 2 M**
- **Required IS Date: 6/1/2018**





Dominion Transmission Zone



Project Scope Change to Existing Project: B1794

Problem: N-1 Thermal Violation

- Overload of Rocky Mt - Battleboro 115kV for the loss of Battleboro – Carolina 115kV

Previous Scope:

- Build a new substation near Edgecombe NUG to be called Morning Star Substation with a 230-115kV Tx, 4-230kV breakers in a breaker and half scheme, 3-115kV breakers in a ring. Re-configure Lines 80, 229 and 2058 to terminate into Morning Star Substation.

Reason for Revision

- Original land acquisition was no longer available therefore, a new site was pursued just west of Edgecombe NUG near Hathaway Road (B1794)

New Scope:

- Build a new switching station west of Edgecombe NUG to be called Hathaway Switching Station (previously called Morning Star) with a 230-115kV Tx, 5-230kV breakers in a breaker and half scheme, 4-115kV breakers in a ring. Re-configure Battleboro – Benson 115kV, Nash – Hornertown 230kV, and Edgecombe Nug – Rocky Mt. 230V to terminate into Hathaway Substation (B1794)

Estimated Cost: \$19 M

Projected IS Date: 05/01/2017



Dominion Transmission Zone

Project Cost Change to Existing Project: B2186

Problem: N-1-1 Thermal Violation

- The loss of Carolina – Earleys 115 kV and the Earleys 230-115kV transformer overloads Boykins – Tunis 115kV

Project Scope:

- Install a 2nd 230-115kV transformer at Earleys connected to the existing 115kV and 230kV ring busses. Add a 115kV breaker and 230kV breaker to the ring busses. (B2186)

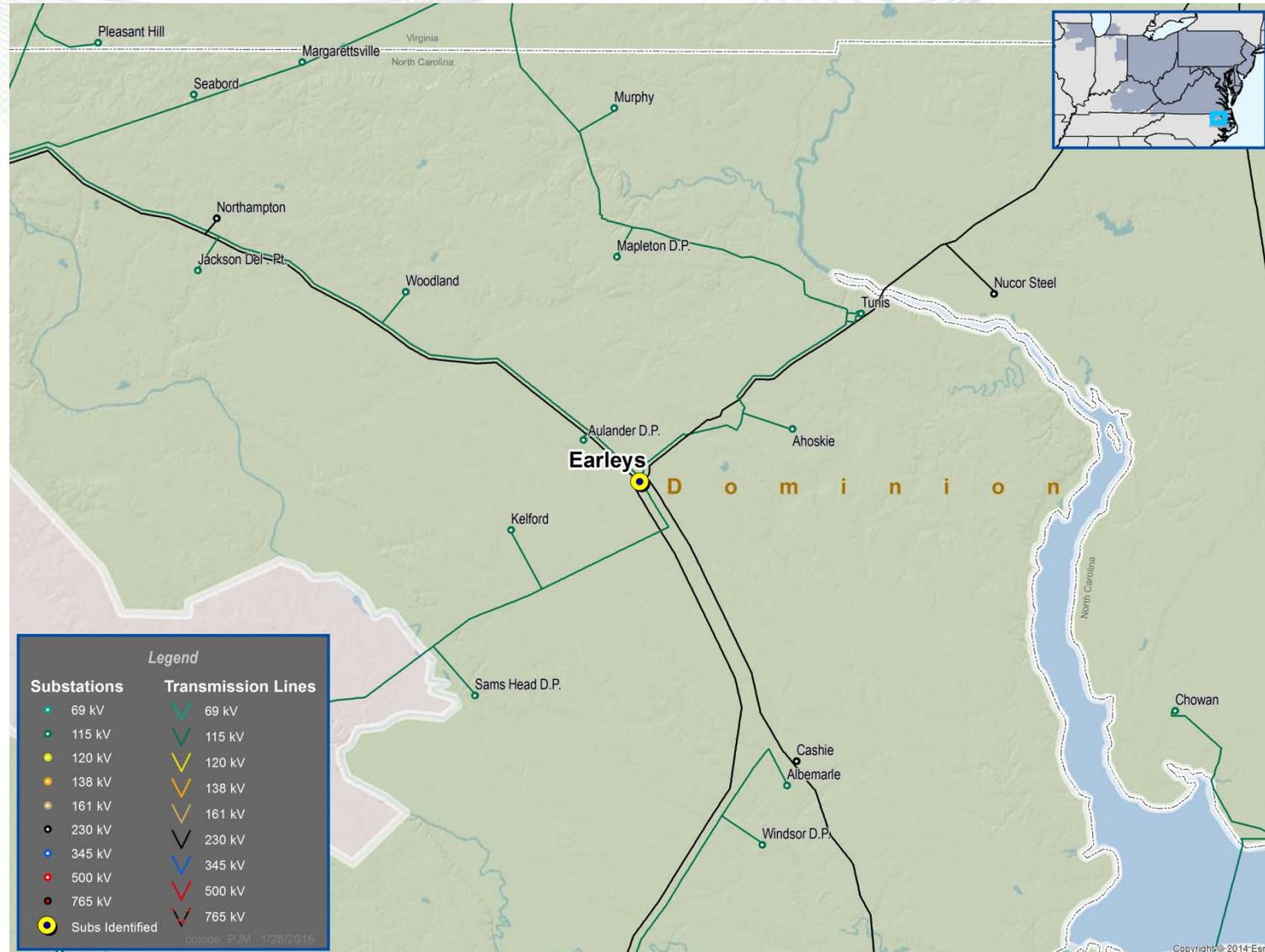
Reason for Cost Change:

- Cost changes reflect increase in construction costs due to equipment being relocated to allow for installation of the required 2nd transformer.

Original Estimated Cost: \$6.0 M

Revised Estimated Cost: \$ 11.5 M

Projected IS Date: 6/1/2017





2016 RTEP Assumptions (Continued from Dec and Jan TEAC)

- Queue projects with an FSA or ISA but are not included in 2021 RTEP case
 - Q65(Gen) North Anna Nuclear 1,594 MW
 - S57/S58 and U3-026 (MTX) Collins “Rock Island Clean Line” 3,500 MW
 - 3,500 MW total
 - 2,308 non-firm and 1,192 firm

- The 2021 generation machine list is posted with today's TEAC materials.

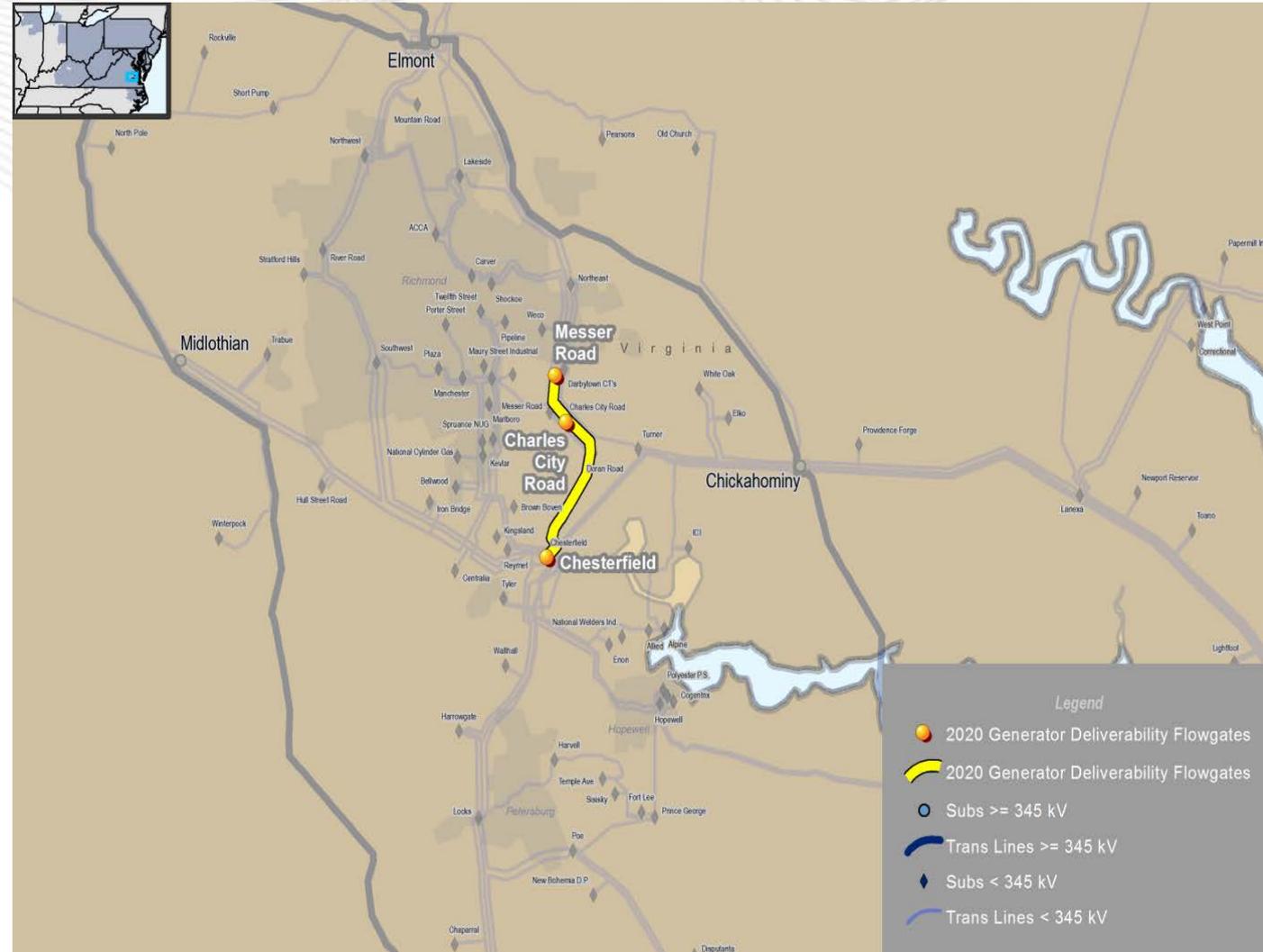


2016 RTEP Proposal Windows

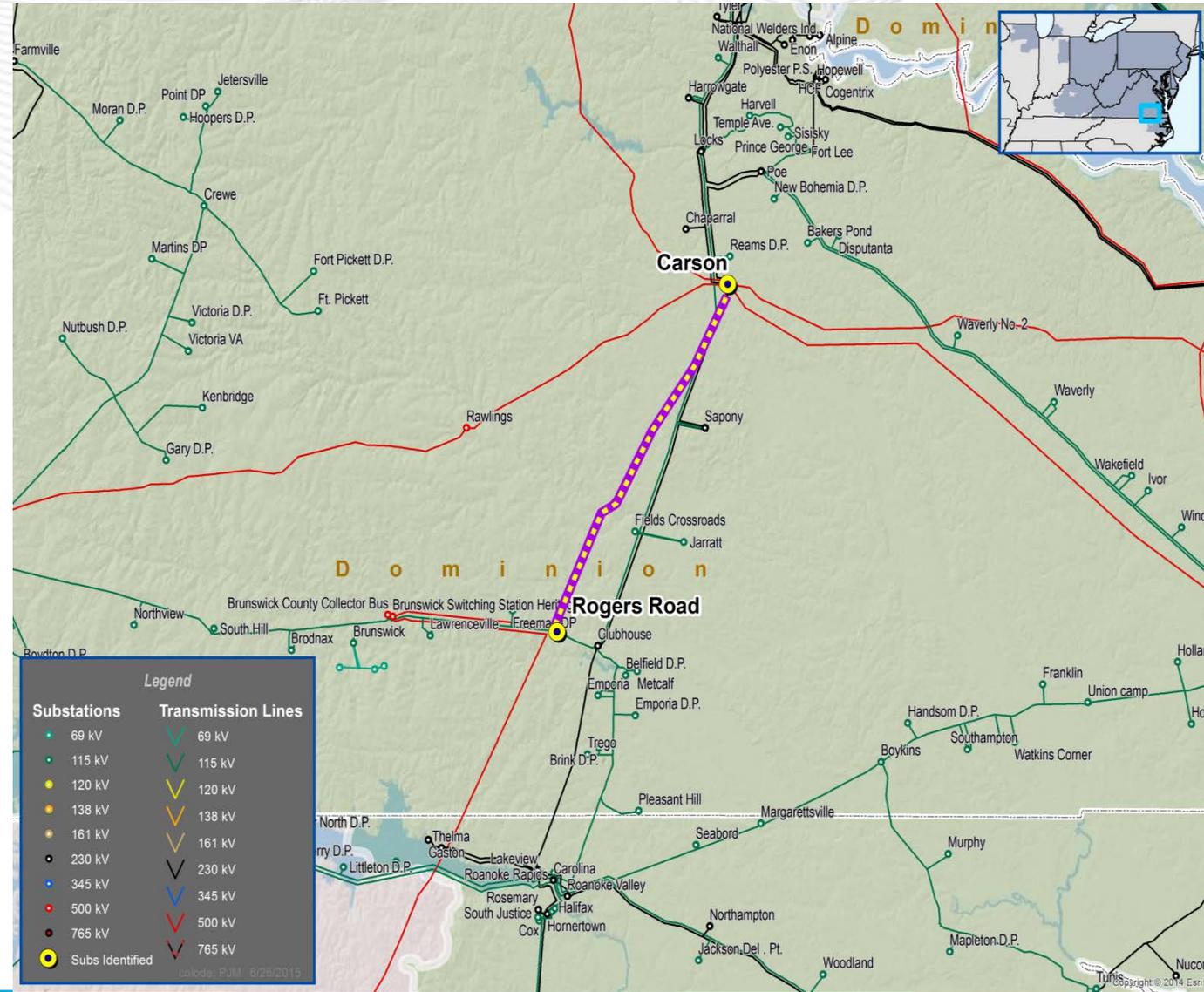
- **Scope**
 - Generator Deliverability and Common Mode Outage Violations
 - Preliminary version posted Friday, February 5, 2016
 - End of life facilities
- Anticipated 2016 RTEP Proposal Window #1 opening on the week of February 15th
- Anticipated Window Duration: 30 days
 - Proposal definitions, simulation data, and planning cost estimates due
- Detailed Proposal Cost Estimates
 - Additional 15 days to develop and provide detailed cost data

- Reliability Test Criteria
 - 2020 Generator Deliverability
 - 2020 Common Mode Outage test procedure

- **Generation Deliverability and Common Mode Outage (FG# 60, 61, 62, 66, 68, 70, 71, 72, 76, 78, 248, 249)**
- The Chesterfield – Messer Road – Charles City Road 230kV circuit is overloaded for several contingencies



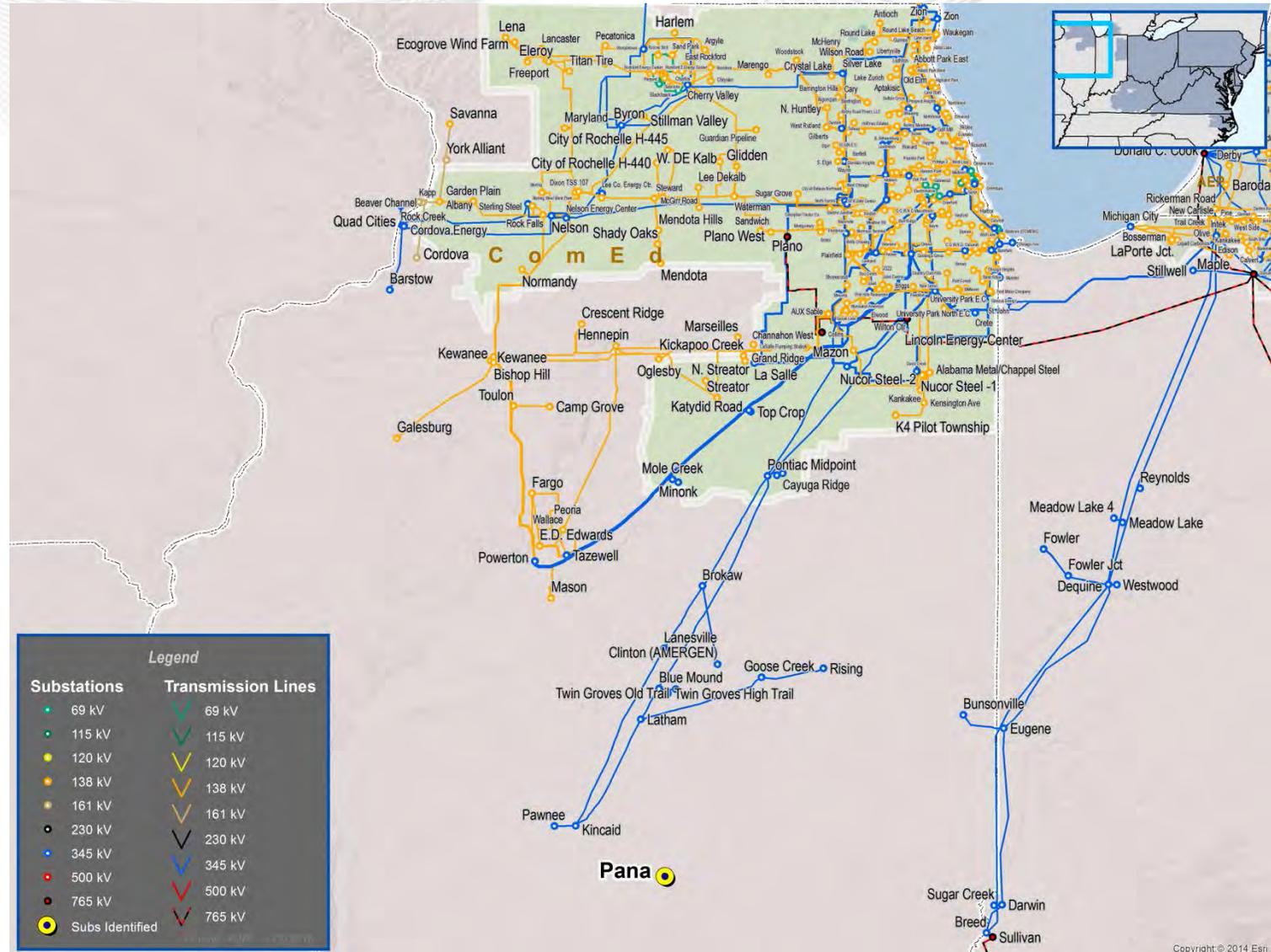
- **Generation Deliverability and Common Mode Outage (FG# 102)**
- The Carson – Rogers Rd 500 kV circuit is overloaded for single contingency loss of the Carson – Rawlings 500 kV circuit.



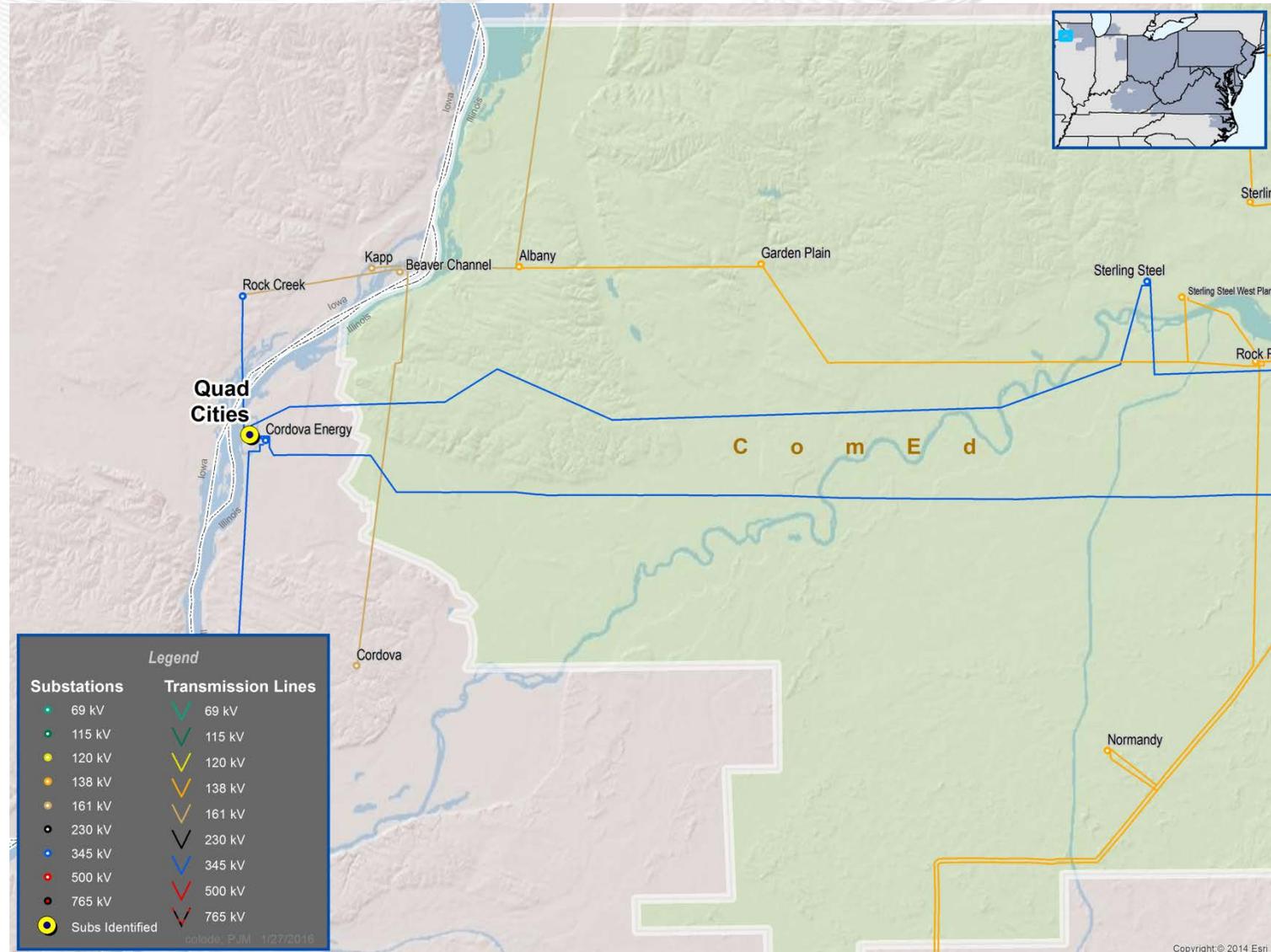


Supplemental Projects

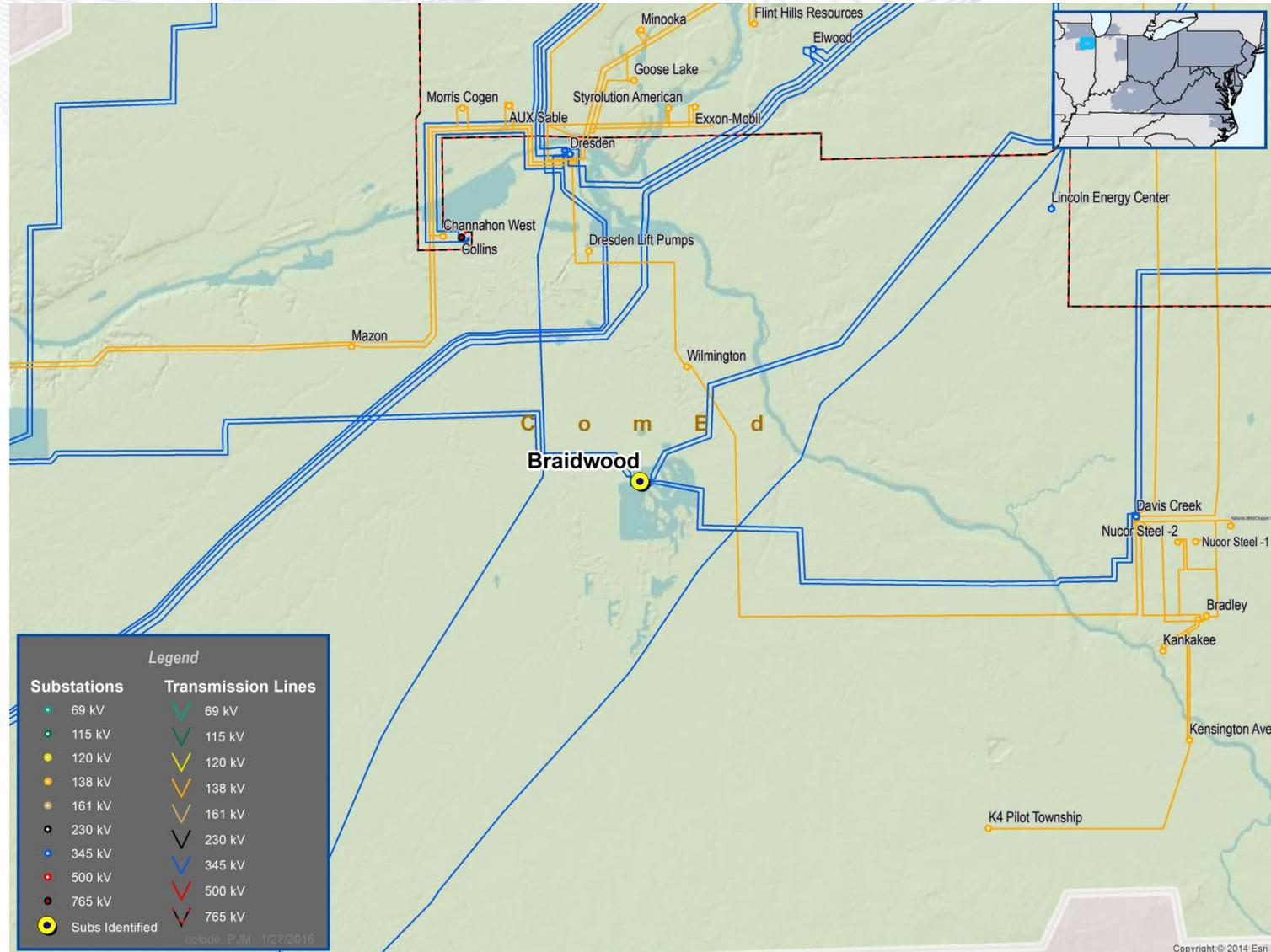
- **Supplemental Project**
- Coordinate with the a planned MISO MVP project by installing a new Pana substation on 345 kV line 2105. (S1109)
- MISO MVP
- Estimated Project Cost: \$0M
- Projected IS Date: 6/1/2017



- **Supplemental Project**
- Quad Cities replace 345 kV circuit breaker BT 3-4. (S1111)
- Material condition: This circuit breaker is 30 years old and requires special maintenance.
- Estimated Project Cost: \$2.3M
- Projected IS Date: 6/1/2017



- **Supplemental Project**
- Braidwood replace 345 kV circuit breaker BT 9-10. (S1112)
- Material condition: This circuit breaker is 38 years old and the overhaul cost exceeds replacement cost.
- Estimated Project Cost: \$2.5M
- Projected IS Date: 6/1/2017





RTEP Next Steps

- Administer the 2016 RTEP Window #1
- Exercise and benchmark the draft 2021 Summer RTEP base case
- Continue to populate Model on Demand

Questions?

Email: RTEP@pjm.com

- Revision History
 - Original version posted to PJM.com – 2/9/2016