Reliability Analysis Update

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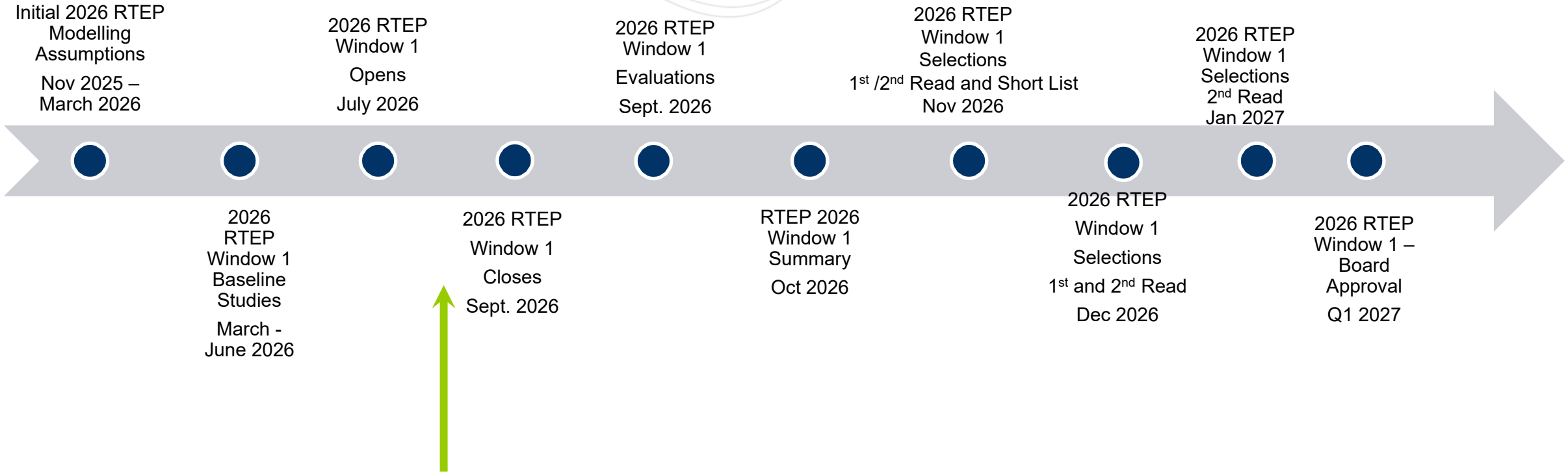
Transmission Expansion Advisory Committee
August 4, 2026

2026 RTEP Window 1 Update

2026 RTEP Window 1 – Timeline



2026 RTEP Window 1 Update

- Current schedule
  - 2026 RTEP proposal Window 1 opened on July 20th, 2026, and will close on September 21, 2026
  - Window 1 files updated on July 21st :
    - For the 2034 Light Load case, the Katydid Rd-Powerton-Dee Mac 345 kV line in ComEd was missing which has been corrected and flowgates updated accordingly
    - Update to the 2031 Summer and Winter Generation Deliverability Data sheet to correct data validation issues
- 60-day window
- Window summary and solutions to be brought forward to the TEAC starting in November 2026 through January 2027
- Board approvals in Quarter 1 of 2027

Problem Statement

PJM doesn't currently see major regional transfer issues in the 2031 analysis apart from ComEd. ComEd and its seams (with neighboring zones) show the need for upgrades in 5-year analysis that could benefit from right sizing using the 8-year model (using CapEx).

- ComEd
  - Load in the 2031 case has increased by approximately 4 GW, consistent with the 2026 Load Forecast, compared to the 2030 study year evaluated in the 2025 RTEP cycle.
  - System changes in the ComEd area (load increases, generation deactivations & generation profile changes) have resulted in numerous 345kV & 138kV overloaded facilities
  - The ComEd zone also fails in the load deliverability study to meet PJM Capacity Emergency Transfer Objective (CETO) which is a metric used by PJM to estimate the amount of power needed to be delivered into a specific PJM Zone or Region under specific stressed operating scenarios (usually Summer Peak).

Problem Statement

- Dominion / PJM South
  - In 2031, no major transmission needs were identified in the Dominion. However, there are several local needs that are scattered across the zone including the following violations ≥ 230kV:
    - In central Virginia, the Elmont 500/230kV transformer is overloaded in 2031 summer analysis. This facility has already been identified as part of an M-3 need and will be addressed through the corresponding M-3 project (DOM-2023-0023).
    - EOL criteria violations as part of its FERC Form 715 on 500kV Line #531 Suffolk – Surry & 500kV Line #578 Septa – Surry.
  - PJM did perform analysis on the 2031 RTEP cases including Dominion's HVDC link (b4053.3) awarded from 2025W1.
    - The project resolved all 230kV thermal overloads. Therefore, those flowgates will be excluded from competition (to avoid duplicating solutions).
    - Operational measures will be used to manage these anticipated issues until the HVDC link goes into service in 2032.

Problem Statement

- AEP
  - No major reliability violations were identified in the AEP zone. However, multiple 138 kV thermal overloads have been identified in the Columbus area around the Beatty substation and electrically adjacent facilities, with several branches exceeding conductor ratings, forming a geographically clustered set of violations that suggests competitive window consideration.
  - AEP also submitted violations as part of its FERC Form 715, including a few local clusters of geographically proximate overloads that further support competitive window consideration.
  - Additional 138 kV issues, including isolated line constraints and some AEP East area voltage and terminal equipment limitations, have been identified; however, these are excluded from competitive window. PJM does not anticipate regional solutions for the AEP zone.
- APS/ATSI/DLCO
  - ATSI submitted violations as part of its FERC Form 715, specifically for load loss greater than 300 MW at the North Star Seel 345 kV facility. Based on short-circuit analysis both with and without the Fulton-Melbourne and the Dowling-Melbourne 345 kV lines in service, the 138 kV system cannot provide sufficient power to support the arc furnaces at North Star Steel.
  - AMPT submitted N-1-1 violations as part of its FERC Form 715, notably on the East Fayette-Kexton 69 kV tie line, which could possibly impact the 345 kV transmission system so has been included for competition.

Problem Statement

- MAAC
  - There are no major reliability violations identified in the Mid-Atlantic region.
  - Power flow increased south-to-Northeast Mid-Atlantic along the PECO system – driven by load growth in PPL, PECO and PSEG zones resulting in overloads on the 230 kV facilities (Cooper-Peach Bottom-Nottingham 230 kV) within the PECO zone, as well as on one PECO/ACE tie facility (Mickleton-Delco Tap 230 kV).
  - The Cooper-Peach Bottom-Nottingham 230 kV also restricts the imports into the EMAAC LDA, resulting in failure to meet the CETL/CETO margin.
  - Multiple lines on the PECO/DPL (Edgemoor-Linwood 230 kV) tie and PECO transformer (Limerick) are overloaded; these facilities have already been identified as part of an M-3 need and will be addressed through the corresponding M-3 project
  - Multiple 138 kV facilities are overloaded in DPL zone for N-1-1 analysis and will be addressed accordingly.
  - In the Towanda area in northeast PENELEC near the NYISO border, multiple 115 kV and 230 kV facilities are overloaded in various analyses. These violations are affected by the interchange and flows into NY. These violations will be quarantined in the 2026 RTEP window and deferred to a separate process in consultation with NYISO.

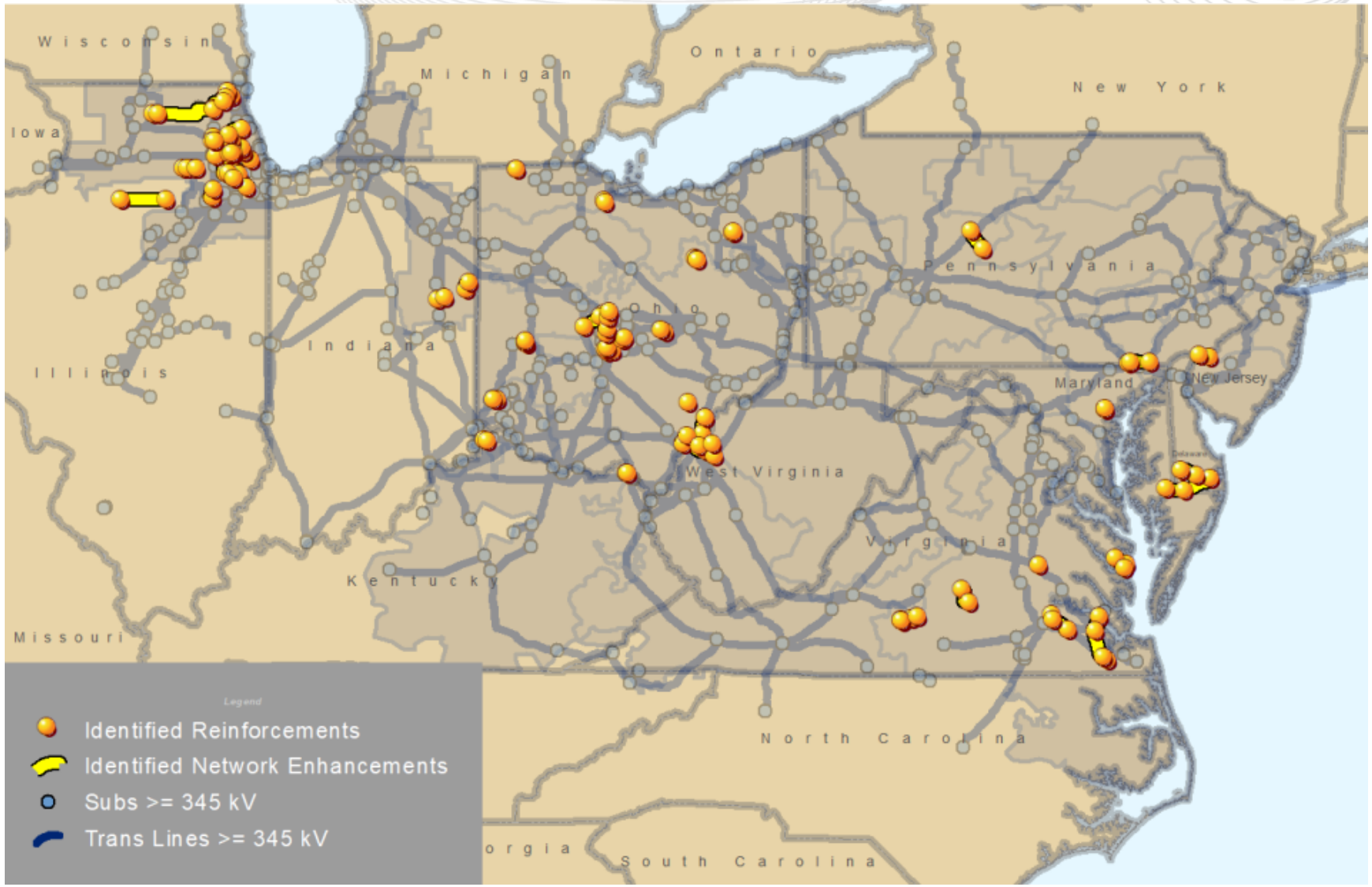
ComEd Load Forecast Update

- On July 30th 2026, PJM was informed by Exelon of an anticipated reduction in the ComEd load forecast resulting from the latest information about the firmness of commitments from customers..
- Based on current estimates, the ComEd load forecast is expected to decrease by approximately 1.3 GW in the 2031 planning year.
- Preliminary analysis indicates a 3.3 GW reduction in the ComEd load forecast for the 2034 planning year. However, other factors may also impact RTEP study assumptions and outcomes, including potential load growth from additional large-load projects under study and incremental generation deactivation requests within the ComEd zone, particularly in the 2034 planning year.
- PJM is currently working with Exelon to update the 2026 RTEP models to reflect the Load Forecast reductions for 2031 and 2034 and will post those updates, together with an updated Flowgate list and Problem Statement with the next 2 weeks.
  - PJM expects to remove the Right-Sizing planning objective in ComEd for 2034 part of the 2026 RTEP.
  - PJM will be extending the 2026 RTEP Window for two weeks following the release of the updated models which are expected to mainly impact the ComEd Zone and to some extent, neighboring zones.
- Given the potential implications for reliability analyses and the development of transmission solutions, PJM believes it is important to proactively inform stakeholders of these updates.
- As part of the 2027 RTEP, PJM will more holistically integrate the updates to the ComEd Load Forecast using the upcoming PJM 2027 Load Forecast. This along with the future RBP results and other policies will be used to develop a prudent Regional Transmission Expansion Plan for the area..

2026 RTEP Results - Overall

Subject to refinements

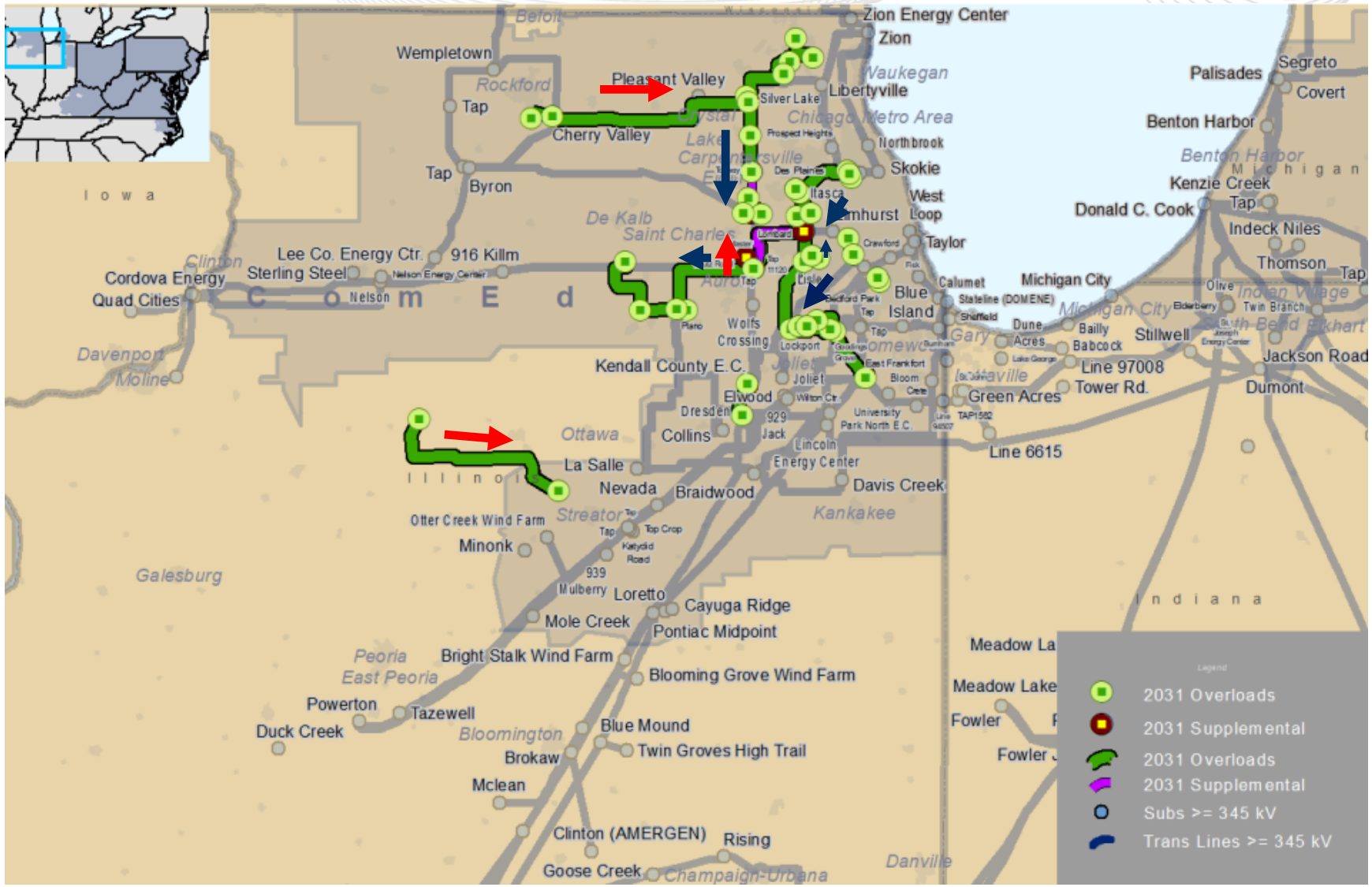
2031 PJM Footprint



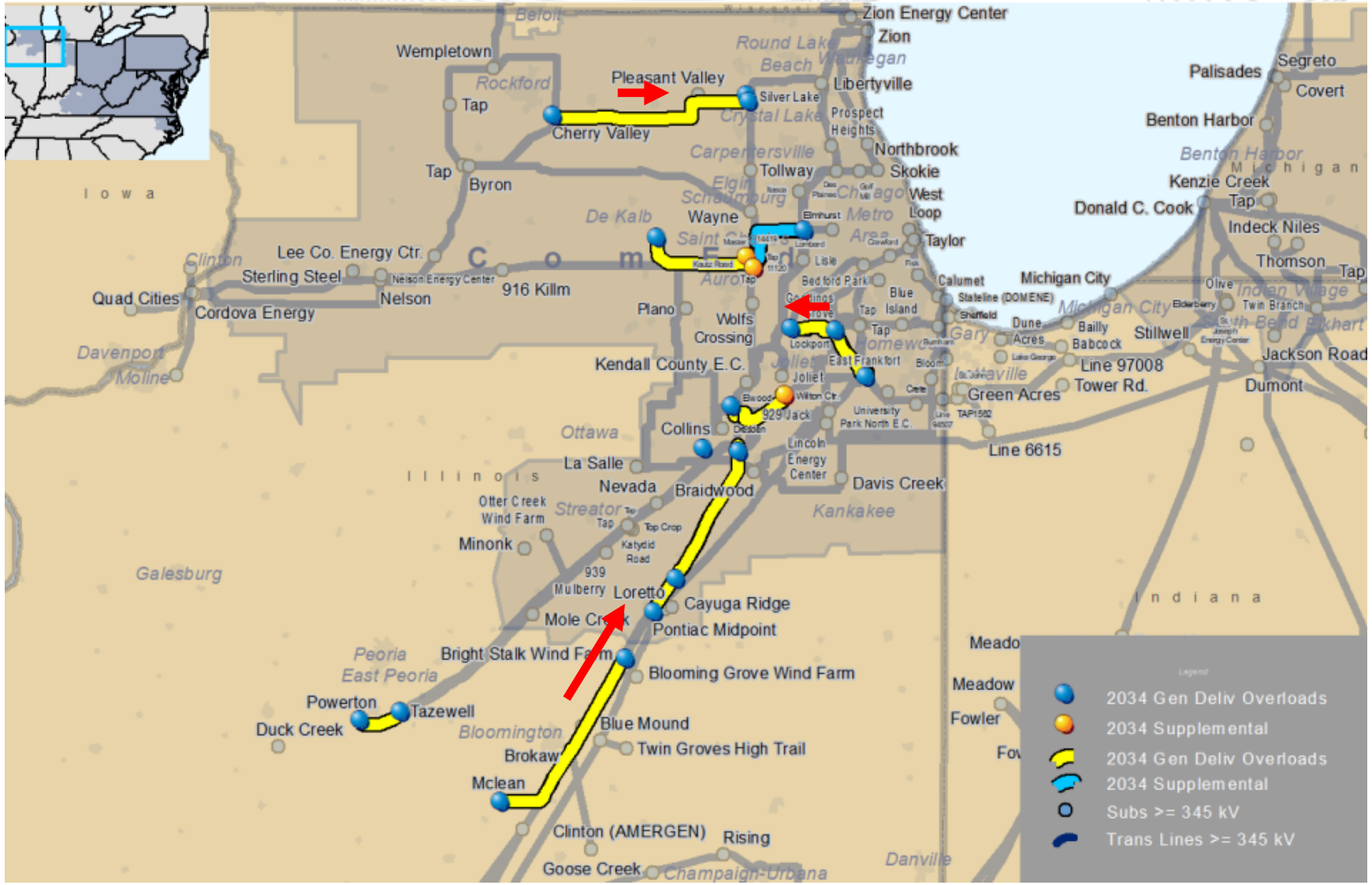
2026 RTEP Results – By Zone

Subject to refinements

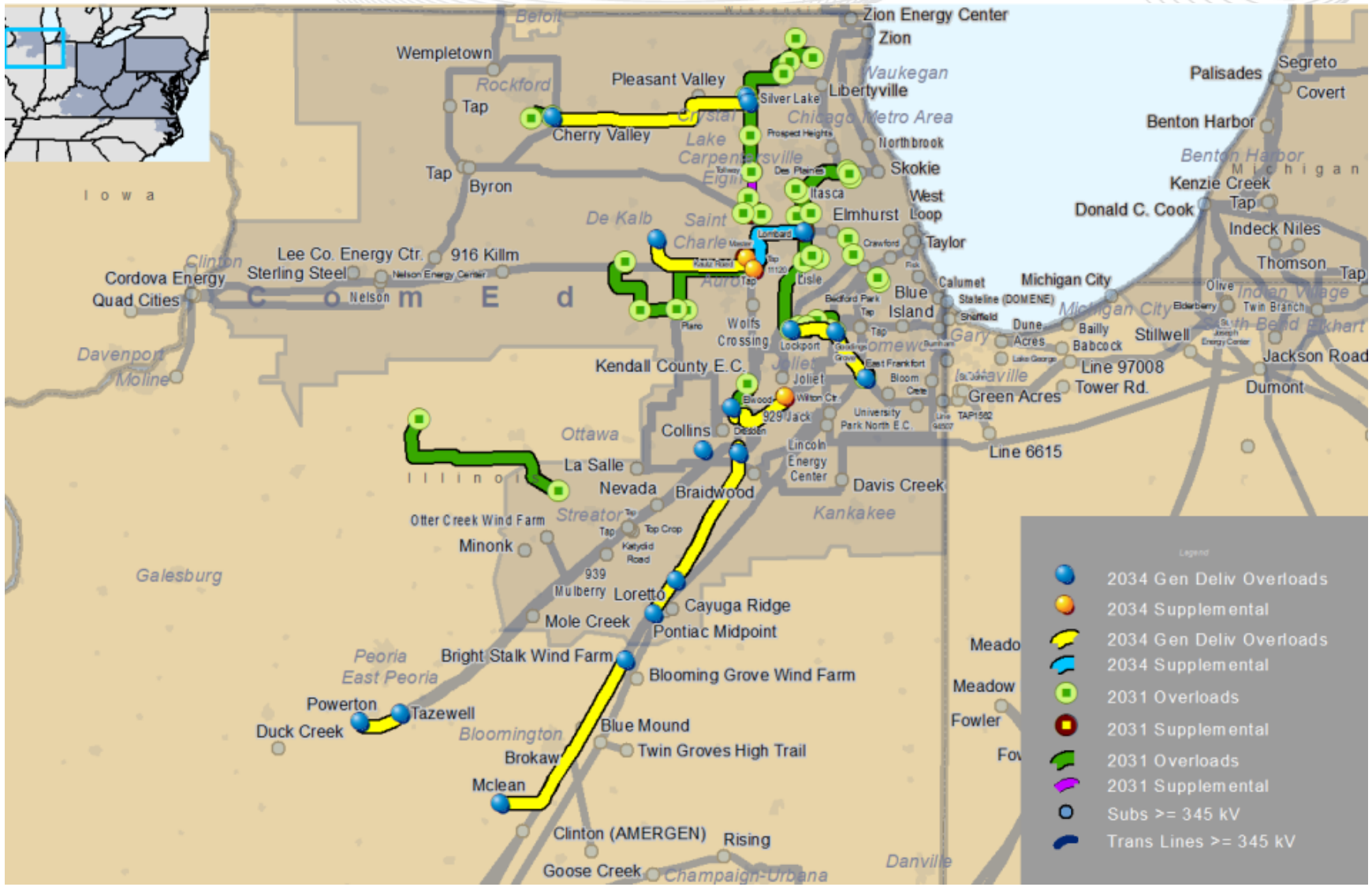
2031 ComEd Transmission Zone



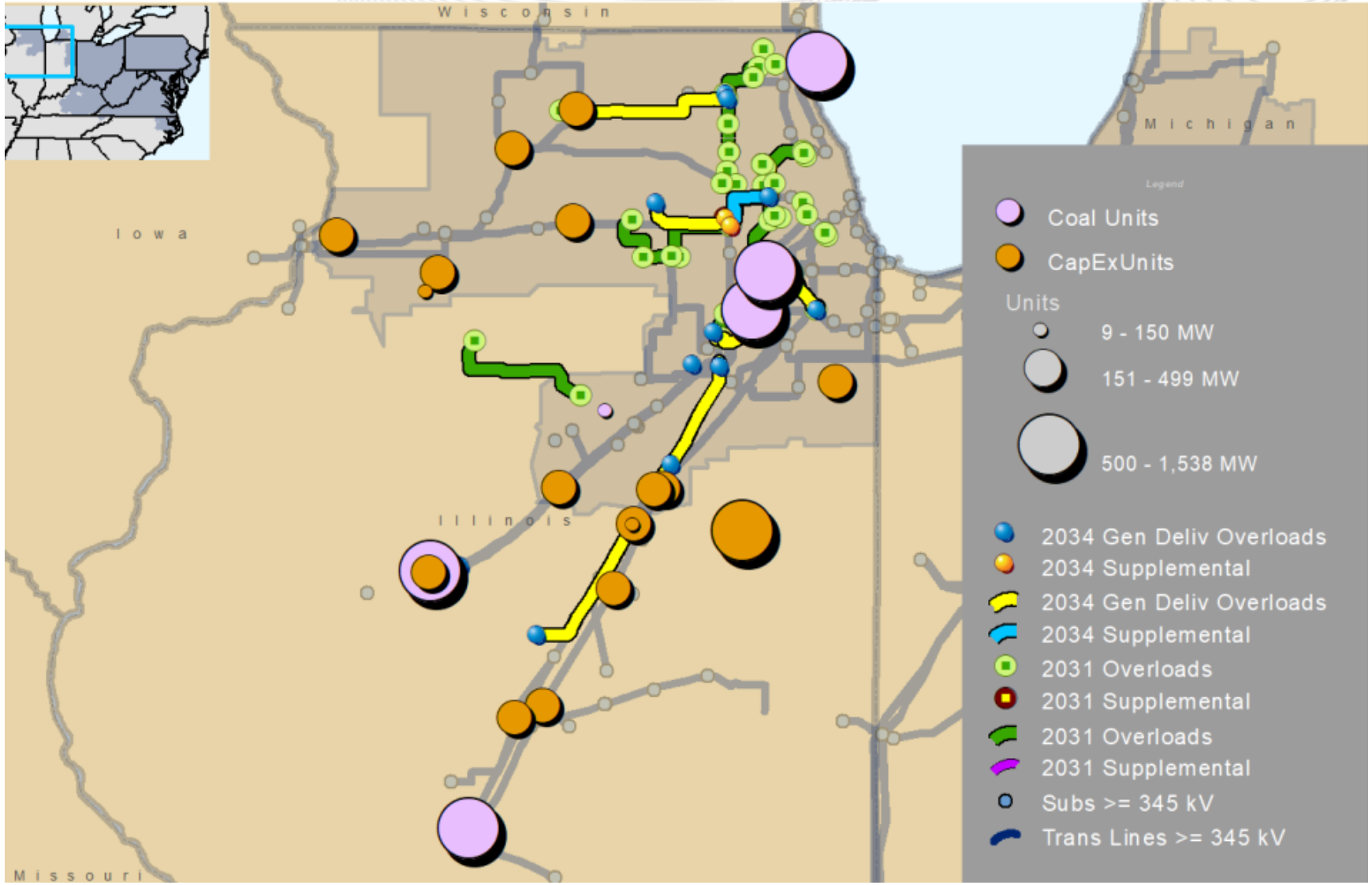
2034 ComEd Transmission Zone



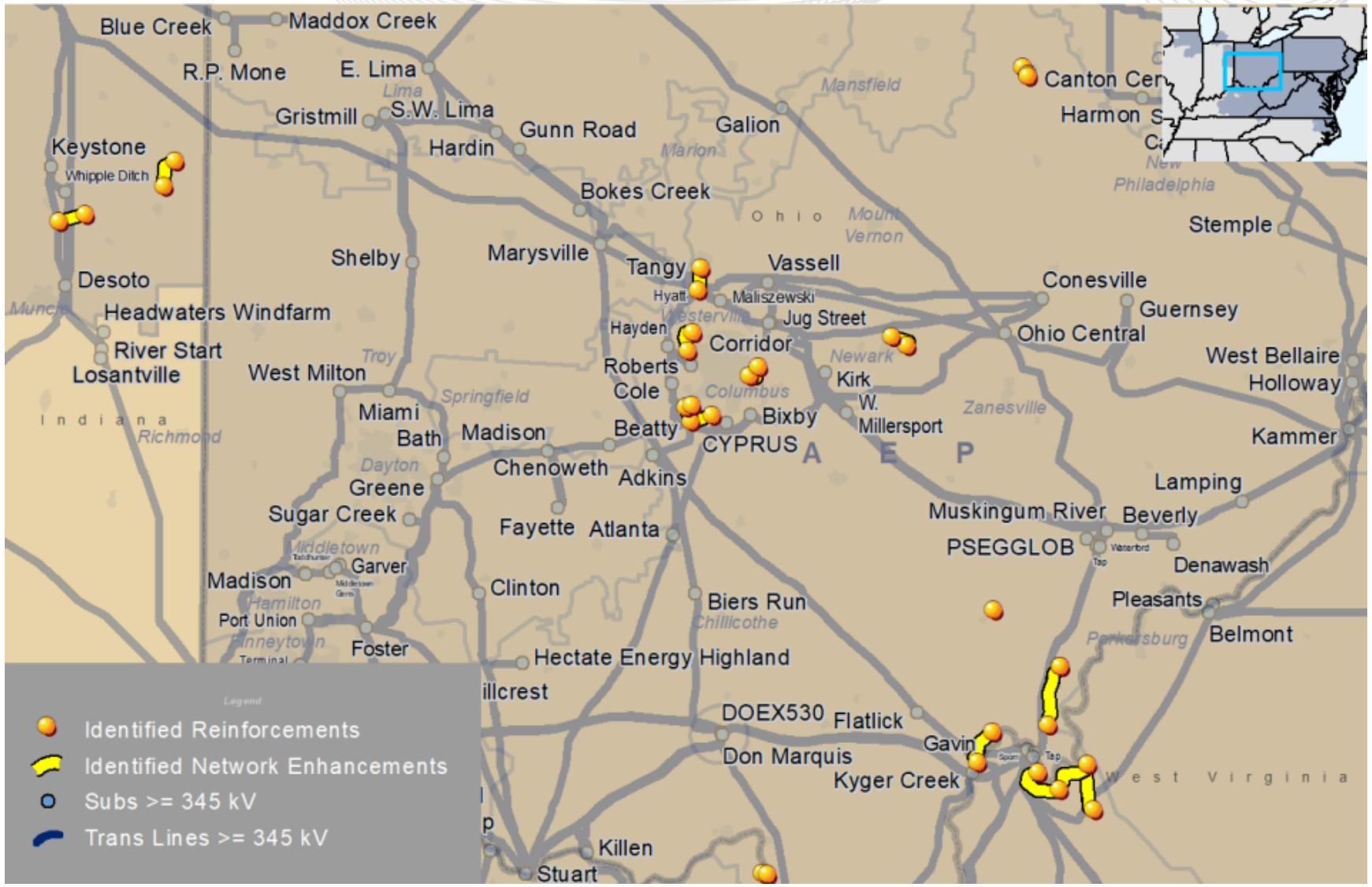
2031 & 2034 ComEd Transmission Zone (GD)



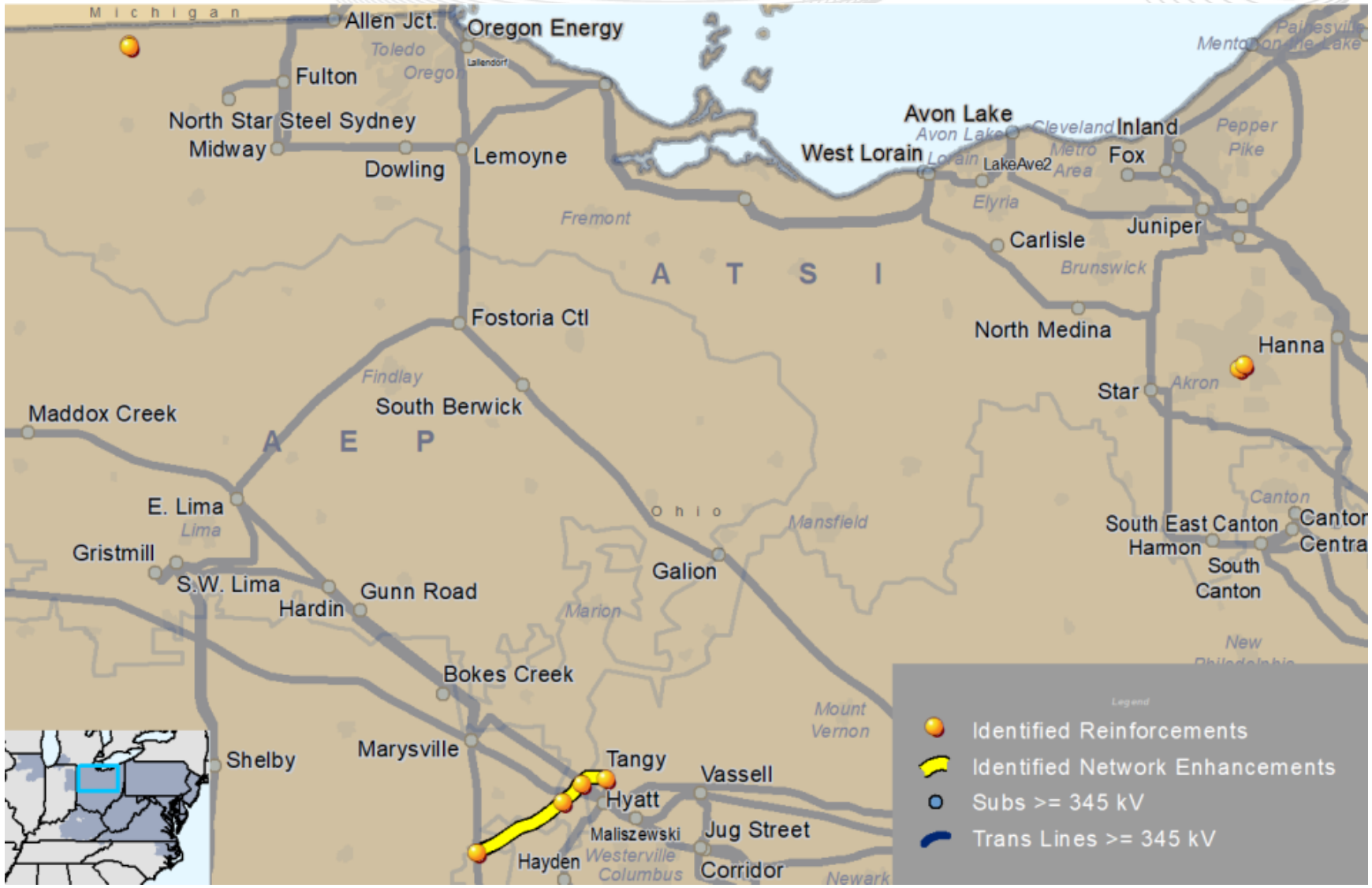
2034 ComEd Coal Units and CapEx Units



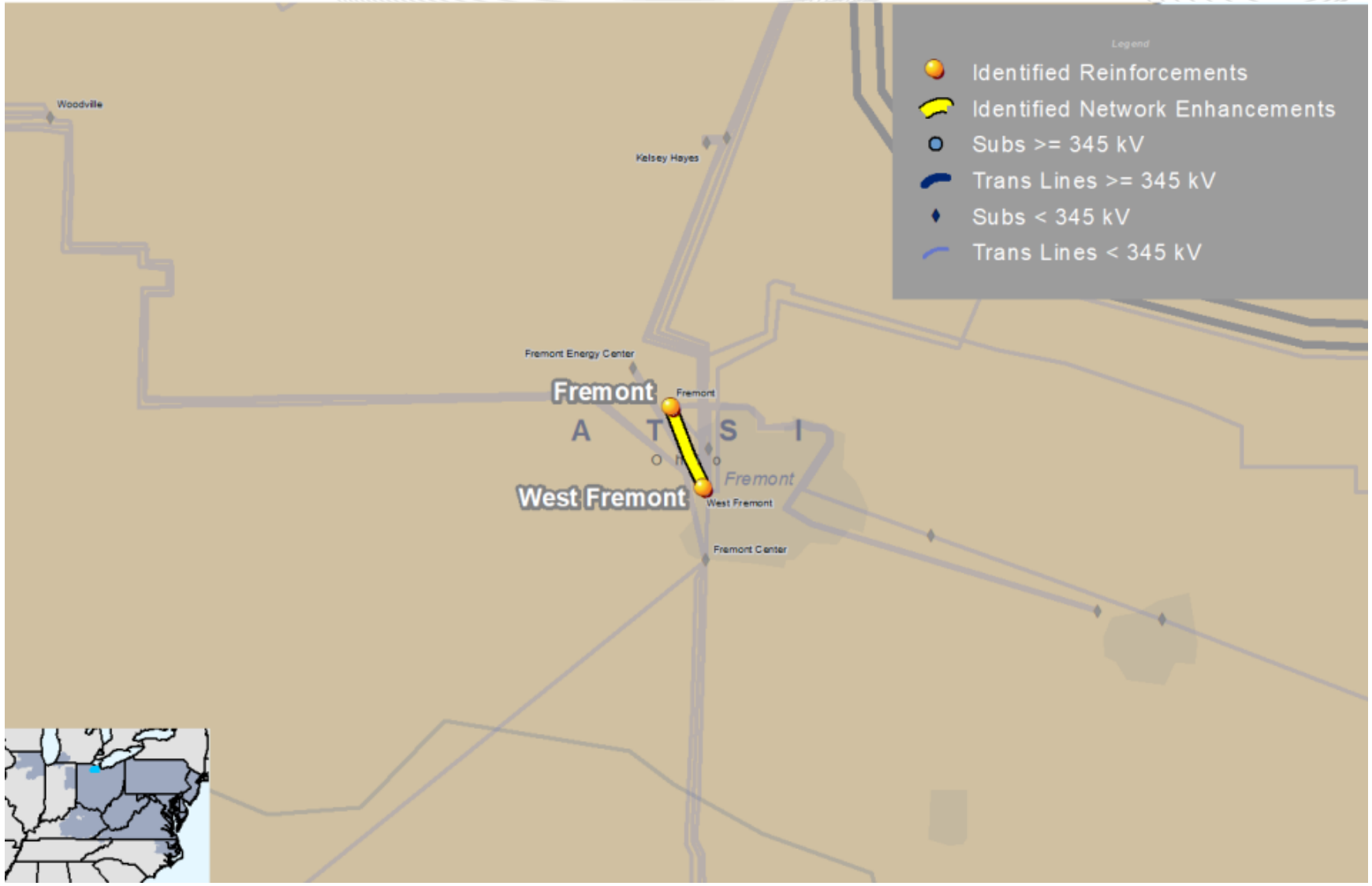
2031 AEP Transmission Zone



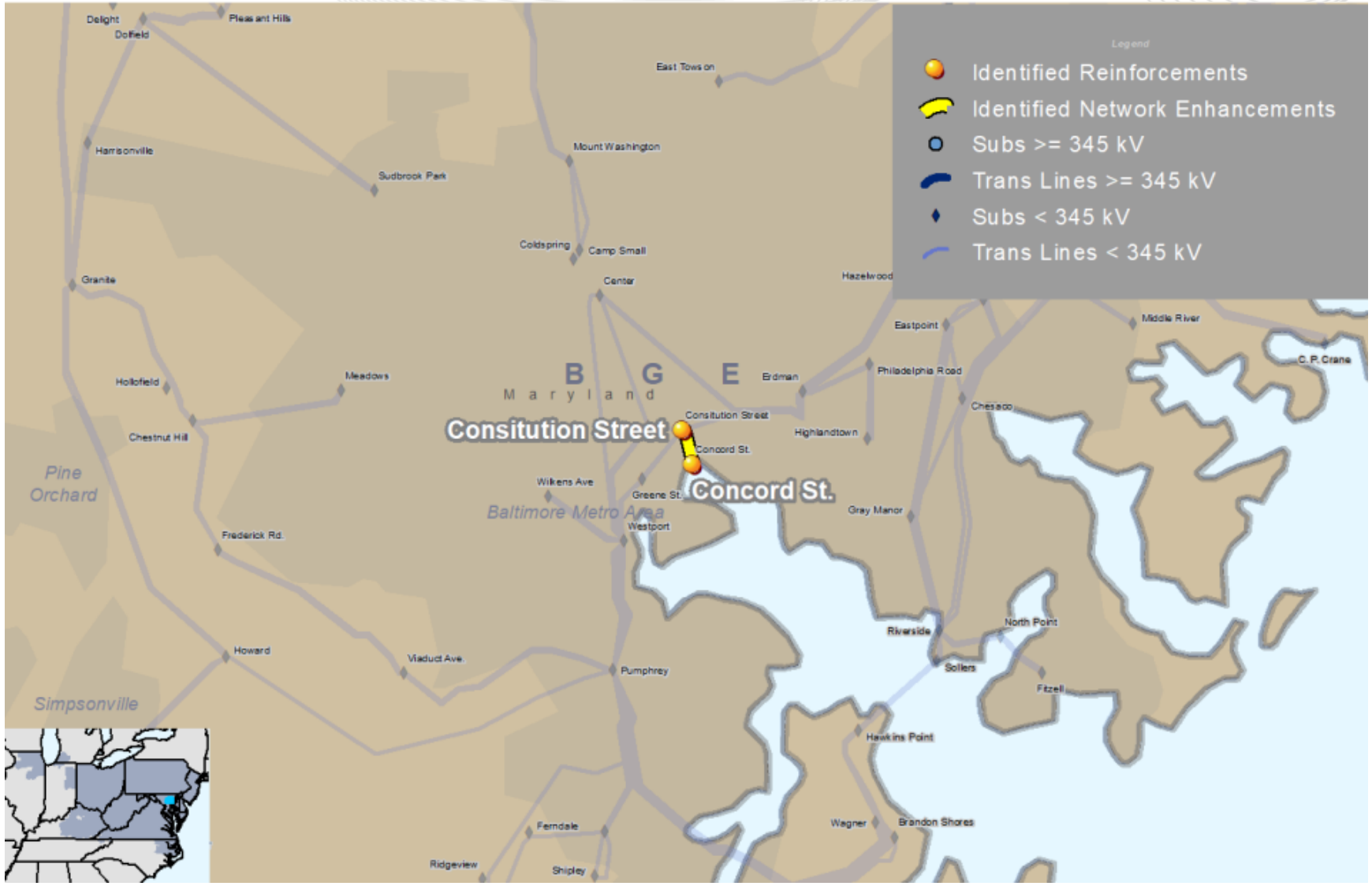
2031 ATSI Transmission Zone



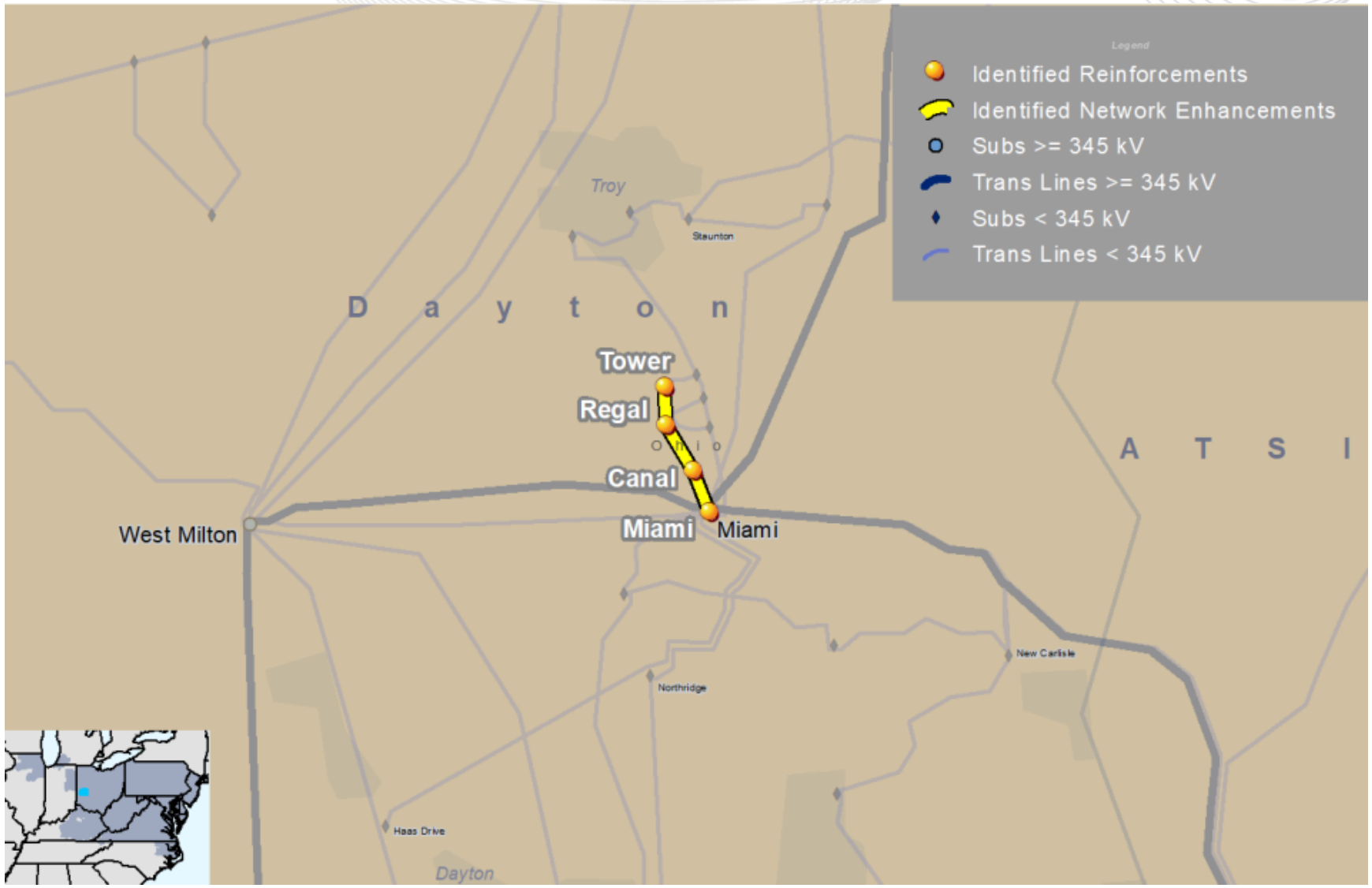
2031 ATSI/AEP Transmission Zone



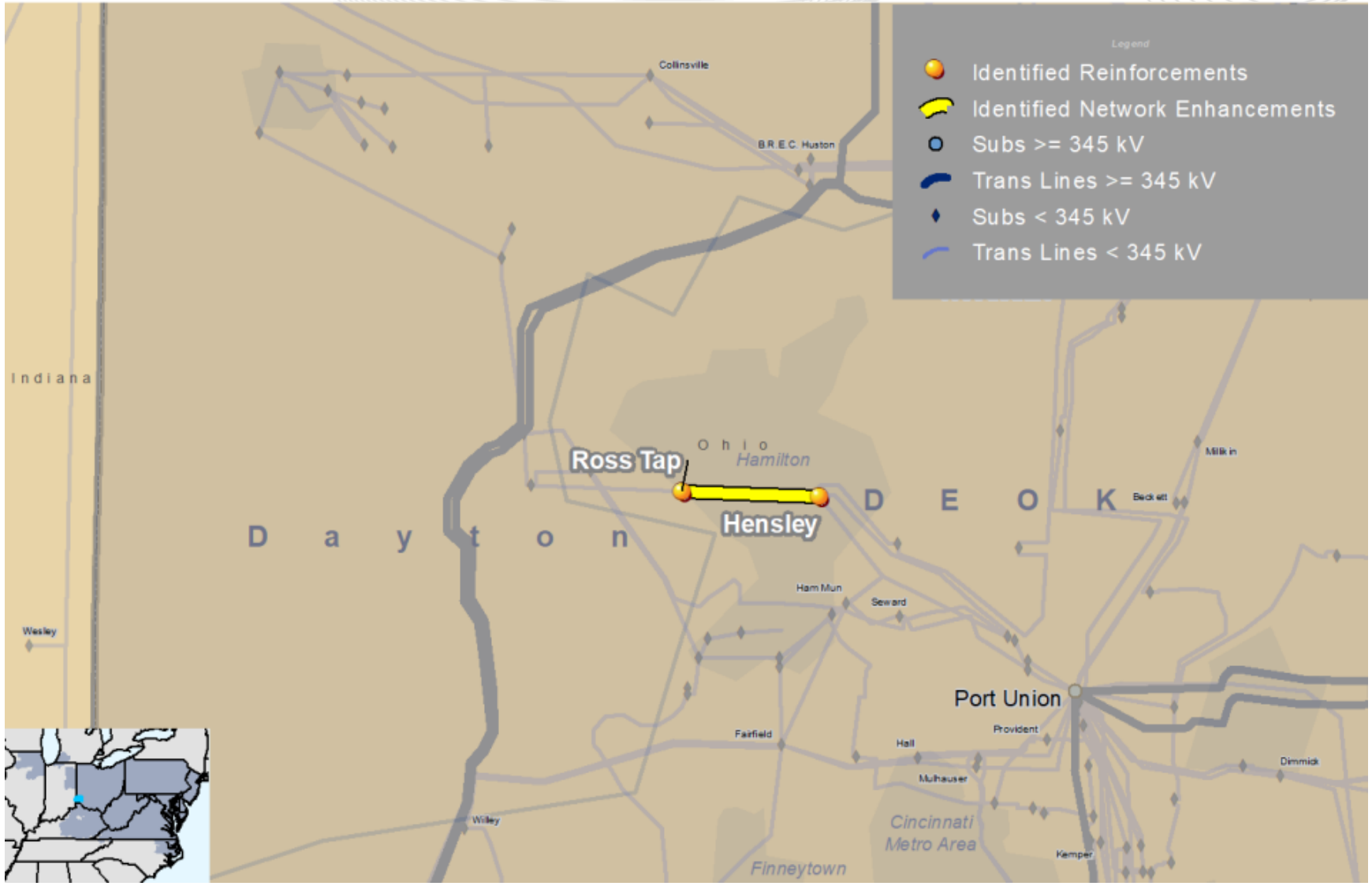
2031 BGE Transmission Zone



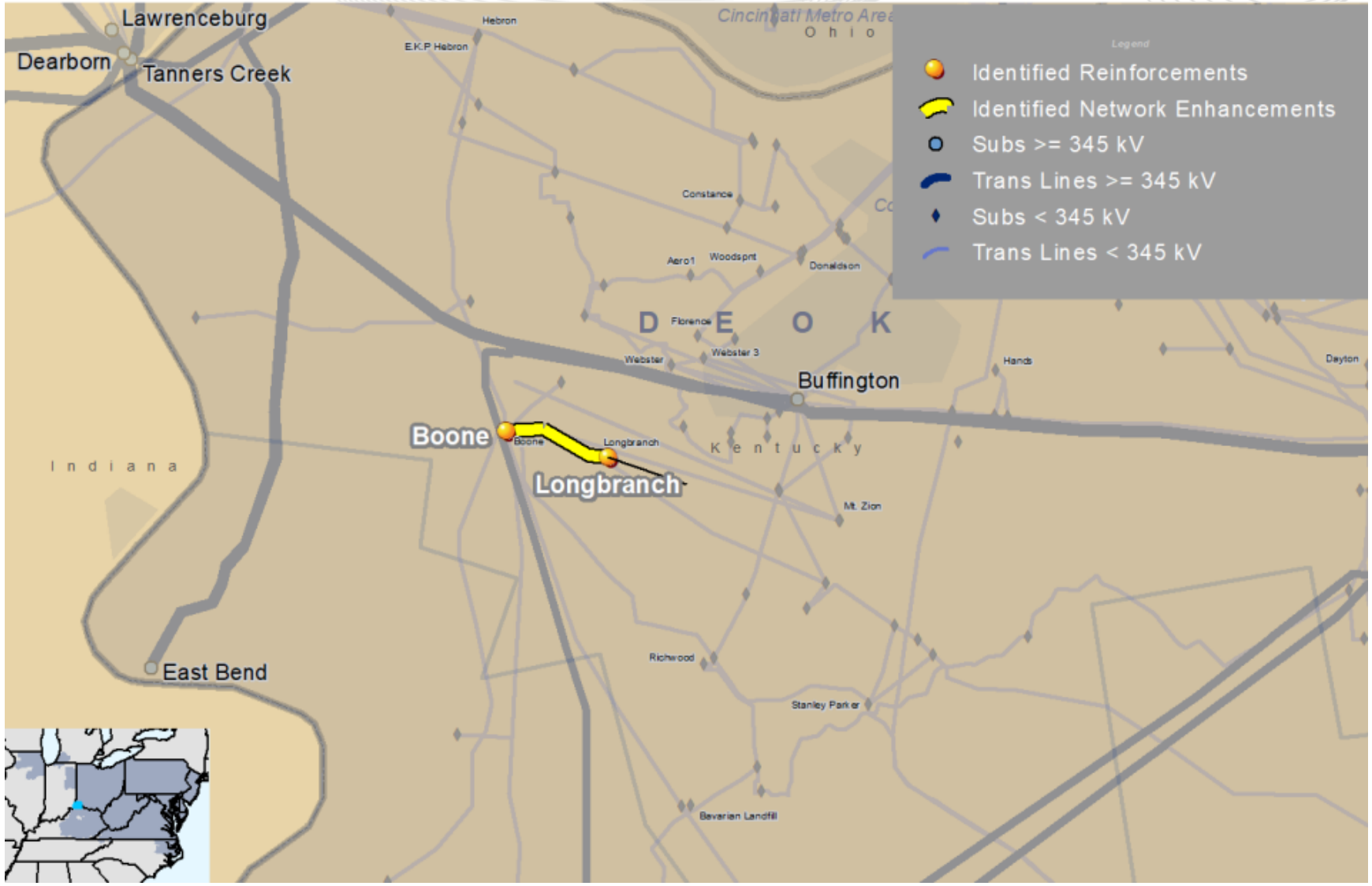
2031 Dayton Transmission Zone



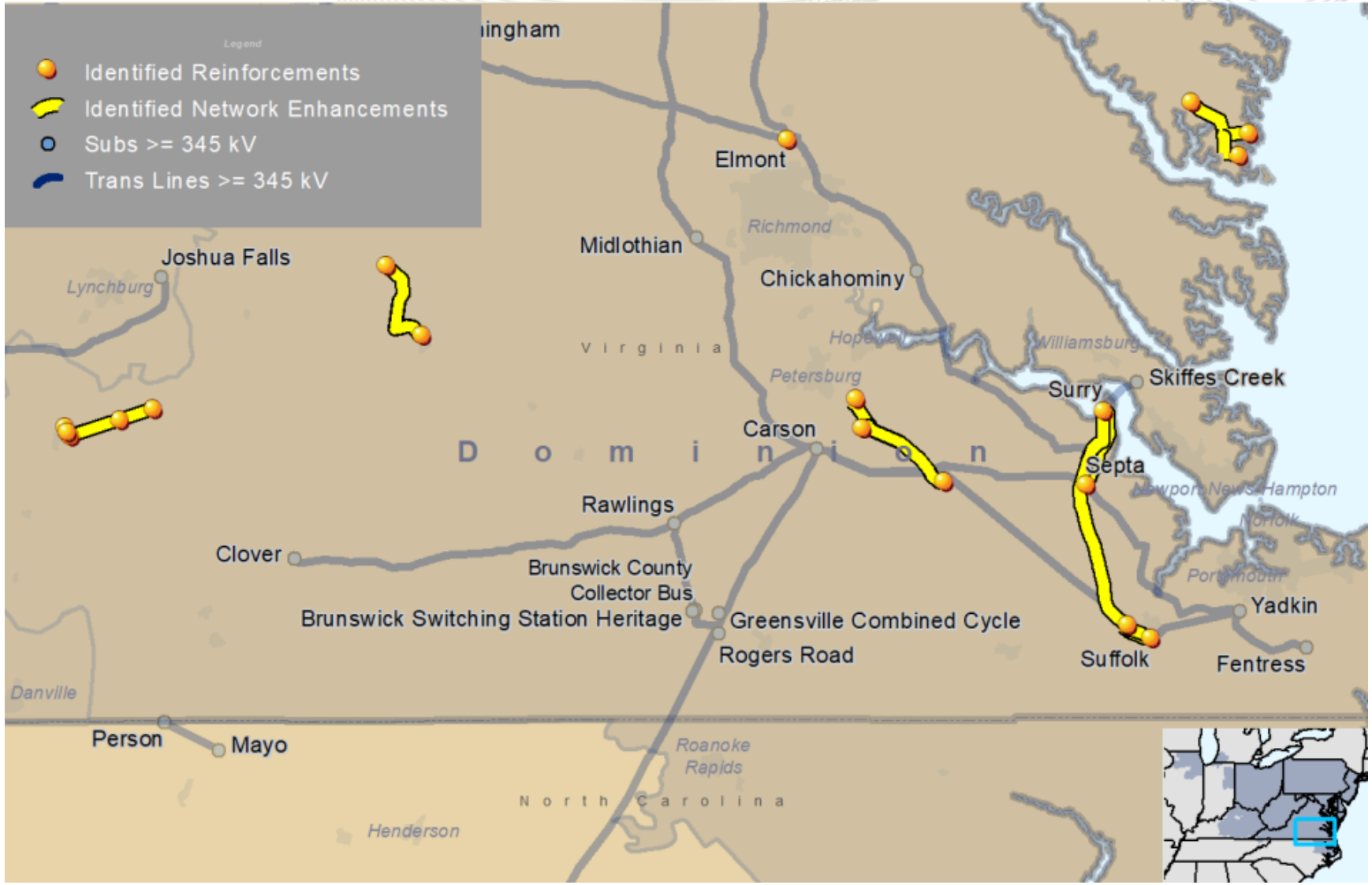
2031 DEOK Transmission Zone



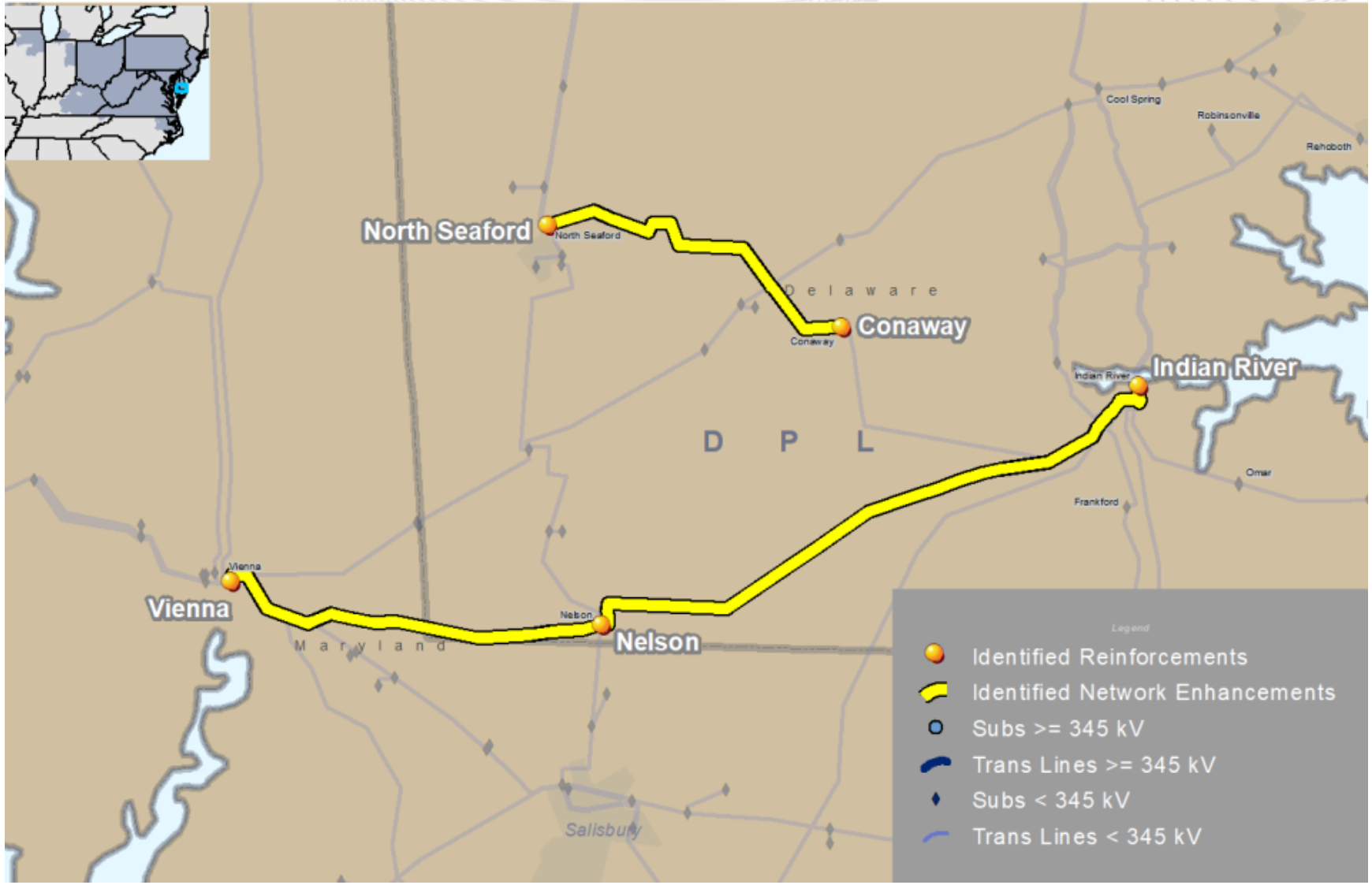
2031 DEOK/EKPC Transmission Zone



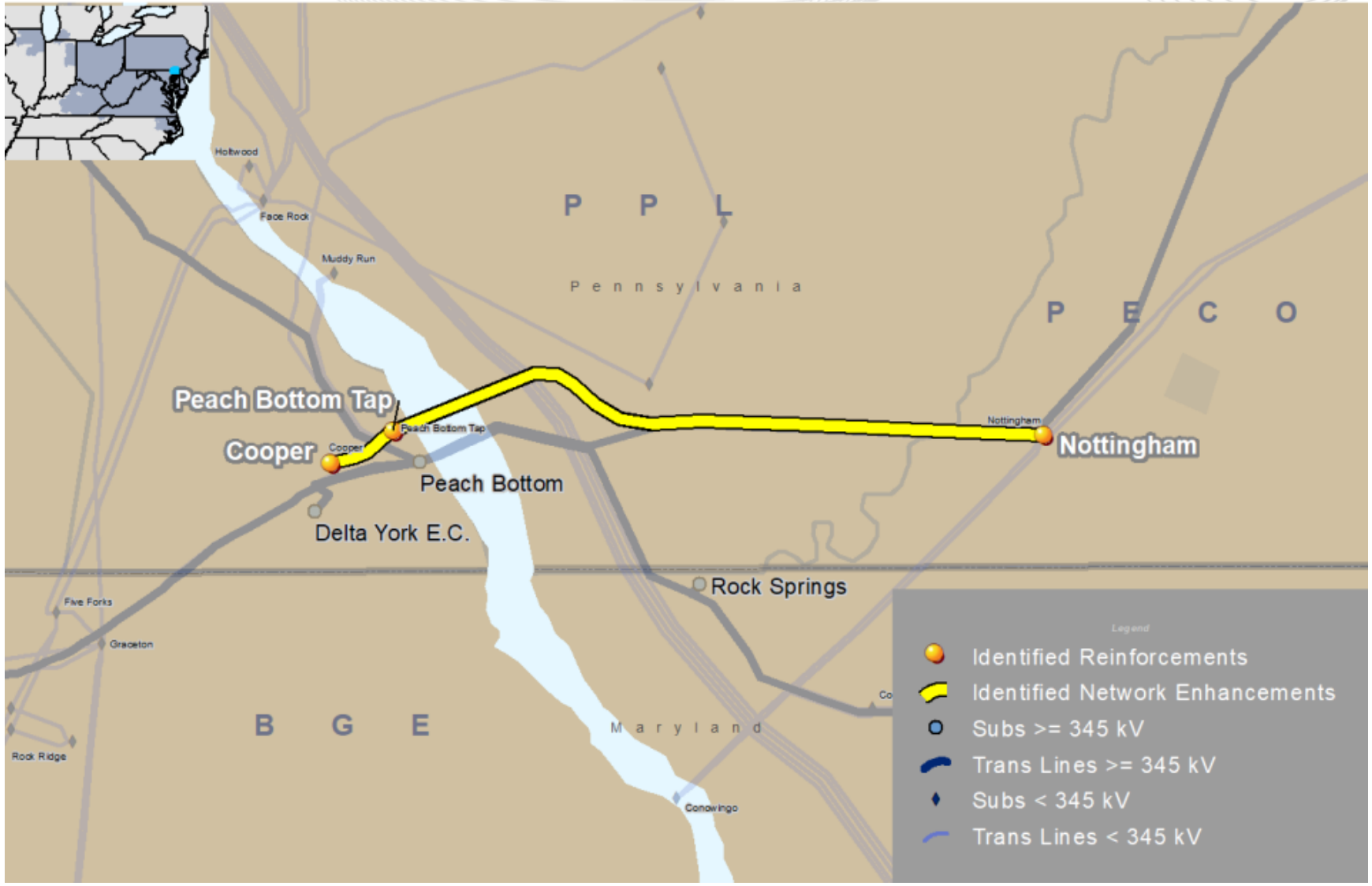
2031 Dominion Transmission Zone



2031 DPL Transmission Zones

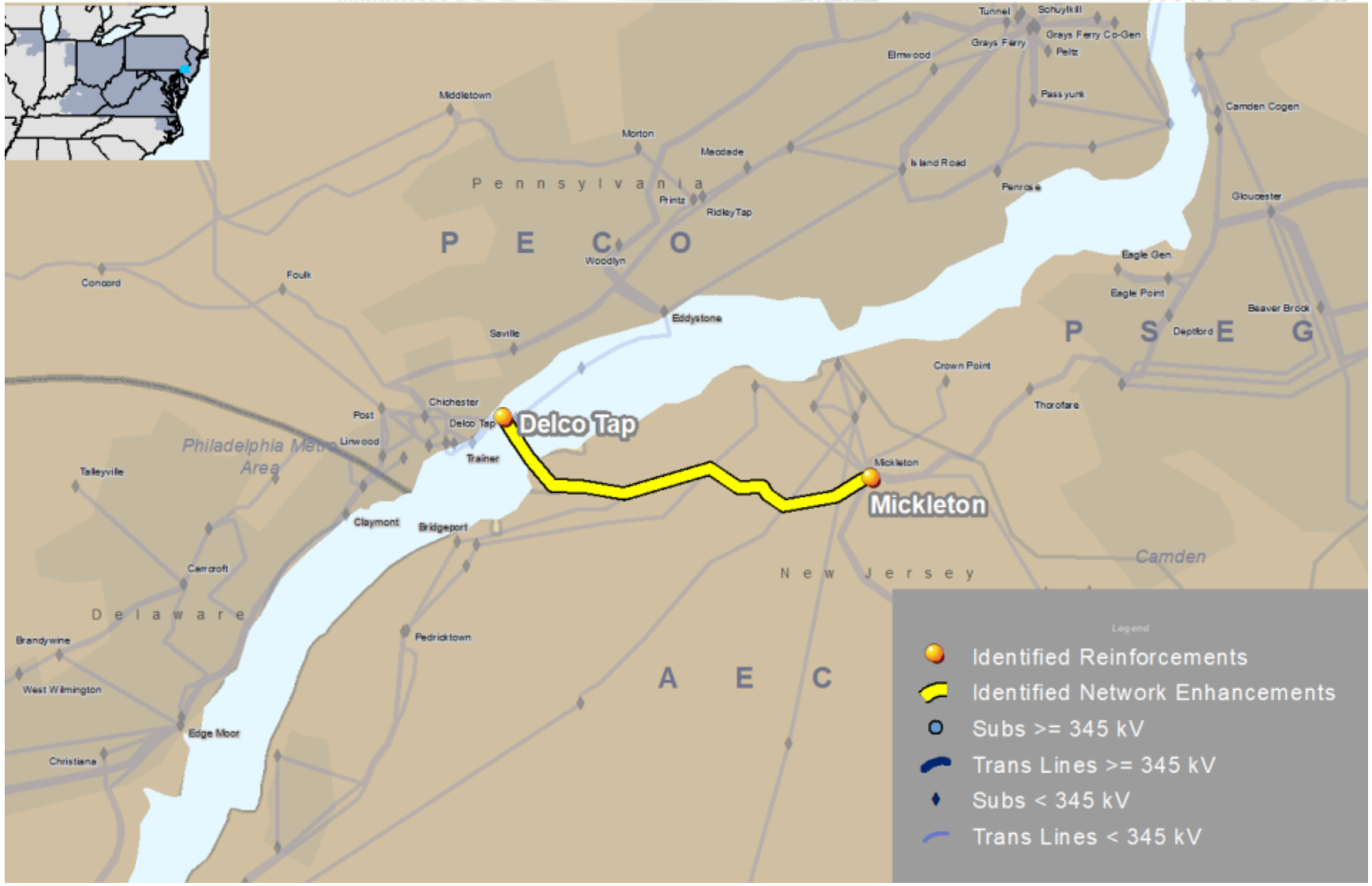


2031 PECO Transmission Zone



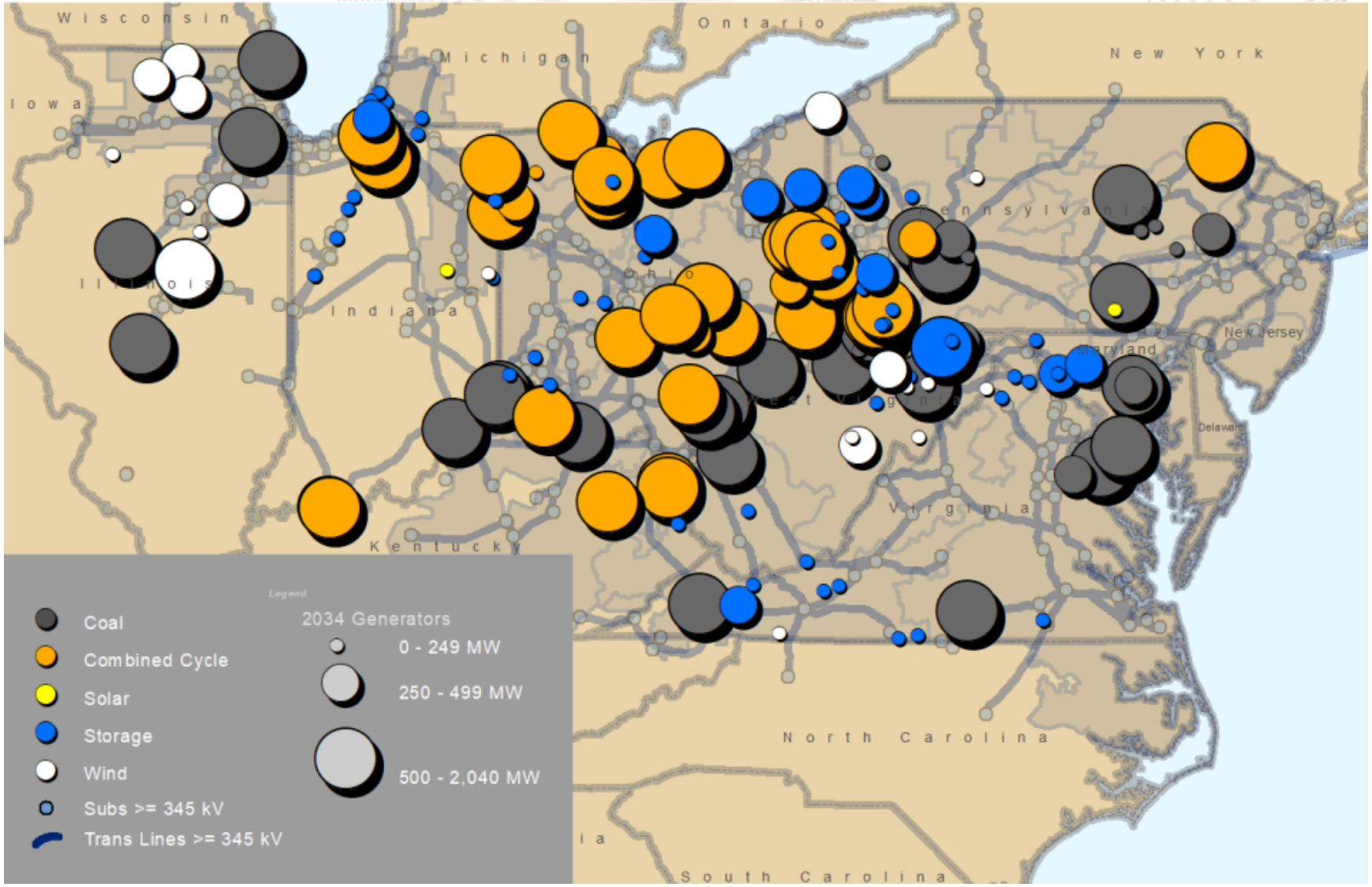
2031 PENELEC Transmission Zone

2031 PECO/AEC Transmission Zones



2034 CapEx Units

2034 CapEx Units + Existing Coal Units

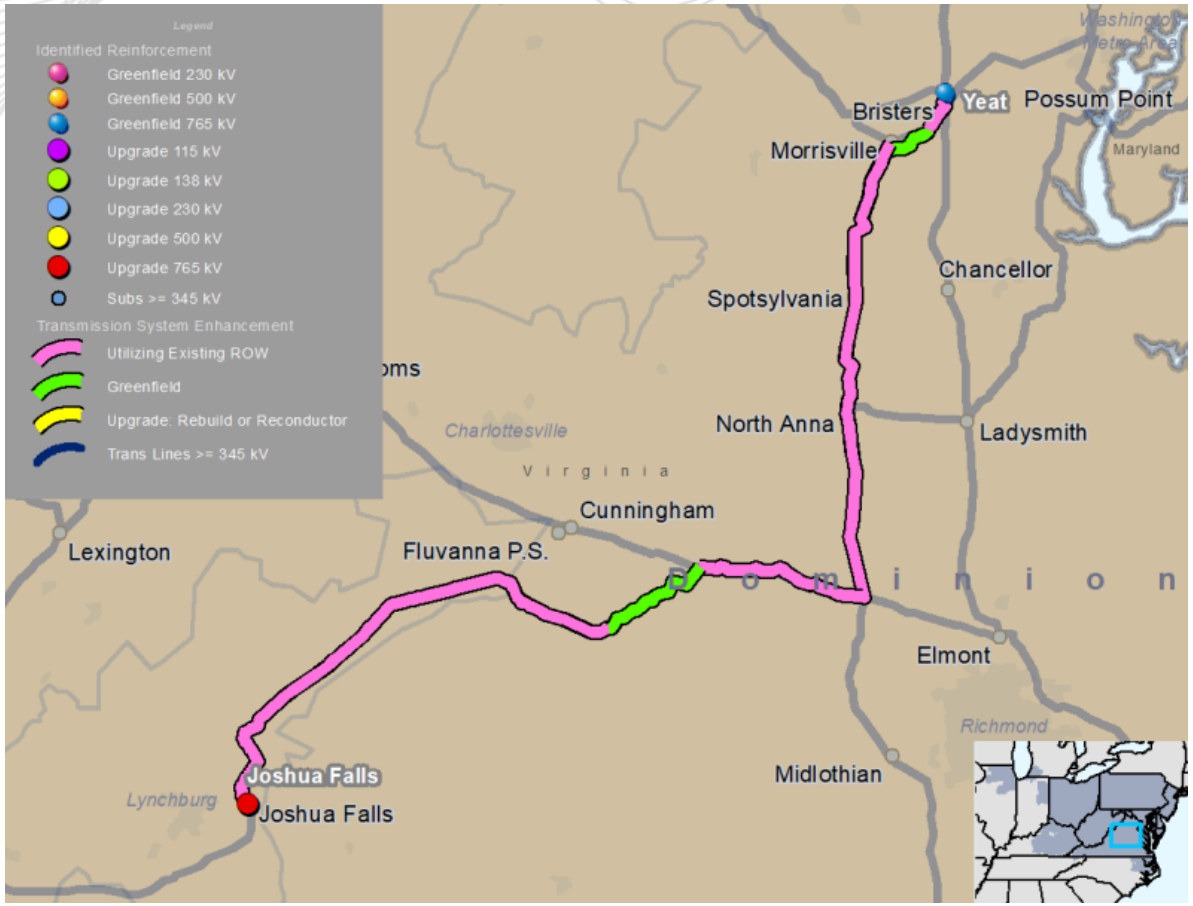


Scope / Cost Changes

2024W1 – Regional Cluster
Recommended Solution: 2024-W1-820

Recommended Solution: 2024-W1-820 **(Revised)**

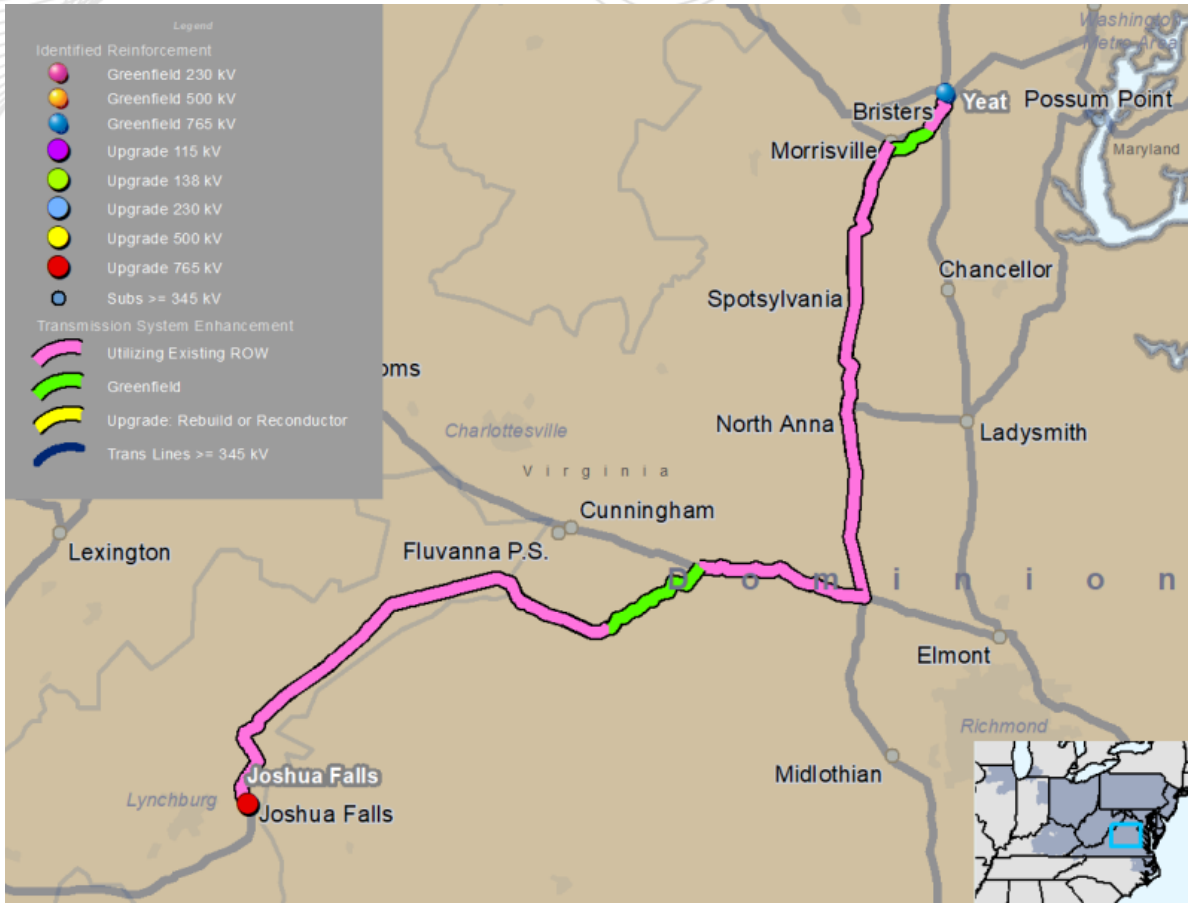
- Build a new 156-mile 765kV line from the relocated Joshua Falls substation – Yeat. (Roughly 69.3 miles in AEP section). **Estimated Cost: $341.17M (b4000.355)**
- Build a new 156-mile 765kV line from the relocated Joshua Falls substation – Yeat. (Roughly 86.7 miles in Dominion section). **Estimated Cost: $426.83M (b4000.356)**
- Build a new 765/500/230kV substation called Yeat. Install (2) 765/500 kV transformers. Cut in 500kV line Bristers – Ox and 500kV line Meadowbrook – Vint Hill into Yeat. **Estimated Cost: $197.1M (b4000.357)**
- At Yeat substation, install (1) 500/230kV transformer. Cut in 230kV line Vint Hill – Elk Run into Yeat substation. **Estimated Cost: $45.6M (b4000.358)**
- ~~Add (2) 765kV breakers at Joshua Falls substation. Substation expansion is required to add the additional breakers. Estimated Cost: $99.19M (b4000.359)~~
- Relocate the Joshua Falls 765 kV substation. Install (5) 765 kV breakers and relocate Joshua Falls 765/138 kV transformer to the new site. Terminate the 765 kV Cloverdale line and the 765 kV Yeat line into the relocated station. Build 138 kV line to reconnect the existing Joshua Falls 138 kV yard to the relocated station. **Estimated Cost: $225.5M (b4000.359)**
- **Primary Drivers for Change:**
  - To add the (2) 765 kV breakers at Joshua Falls, significant grading is required to expand the existing Joshua Falls site. This work includes extensive movement and imports of fill, even after making concessions to slope away from the site aggressively to limit the amount of fill required. Also, because of the magnitude of movement a temporary retaining wall would be required just to complete construction. If this project were to be completed as proposed, there would be no opportunity to expand Joshua Falls substation further.
  - Moving off site is a comparable cost, but has more space to allow a more traditional 765 kV station configuration and flexibility for future growth. Property under consideration does not need fill to be imported or exported.



2024W1 – Regional Cluster Recommended Solution: 2024-W1-820

Recommended Solution: 2024-W1-820 **(Revised)**

- **Additional Options Considered:**
  - AEP explored three options to complete the required work for Joshua Falls:
    - Remain on the existing site and expand the station as originally proposed. To accomplish this, a very large quantity of imported fill is required. The outage sequence to expand on site would be complicated and would take the transformer out of service multiple times. The newly constructed site would still need to be relocated in the future to accommodate ongoing development opportunities. Not relocating now also inhibits other state approved development work at the site. Future expansion of the site at the present location would be extremely difficult and expensive; the configuration cannot be expanded beyond a ring bus without additional fill and extensive site work. Any additional expansion would also require line exits to the north that would need cross the James River. Total estimated cost to expand on site (does not include future relocation costs for the site): $216.6M
    - A hybrid approach, constructing a new ring bus to accommodate the line to Yeat at a new station location but leaving the existing 765 kV yard at Joshua Falls in place. This options leaves the 765/138 kV transformer at Joshua Falls Station in place but will require relocation later, including building the new 138 kV line back to the 138 kV yard, resulting in additional outages and increased costs; costs for the 138 kV line will go up if not executed at the same time due to additional mobilization efforts and material/labor cost increases. Relocating the transformer later is a significant outage risk. Replacement of the Joshua Falls transformers would still need to be completed as proposed under s1668 at the existing site and will then be relocated at additional cost at a future date. The 765 kV line extension to reconnect the transformer to the new yard crosses a quarry which has future plans to mine the area the 765 kV line is running through. The lack of relocation of the 765 kV yard inhibits the site development work that is already approved by the State of Virginia for future development. Total estimated cost for a hybrid approach, including the future relocation efforts: $243.9M
    - The revised recommended solution as described on the previous slide is to entirely relocate the 765 kV yard, including the 765/138 kV transformers, to a new site and build a 138 kV line back to the remaining 138 kV yard at the existing site. Construction is largely in the clear with a single 3 week cut-over outage needed to complete energization, which avoids repeated, lengthier outages. Clears the existing site for other state approved development work to begin as soon as possible. Transformer units are already available to make this transition without a lengthy transformer outage. Completing all the relocation in a single project is the most cost efficient and avoids future relocation and rework. This site accommodates breaker and half layout and can be expanded in the future; the existing site is limited to a ring bus with no potential for future expansion. Total relocation estimated cost: $225.5M



2024W1 – Regional Cluster
Recommended Solution: 2024-W1-820

Existing Facility Rating:

#	Branch	SN/SE/WN/WE (MVA)
1	765kV Line Joshua Falls - Yeat	NA

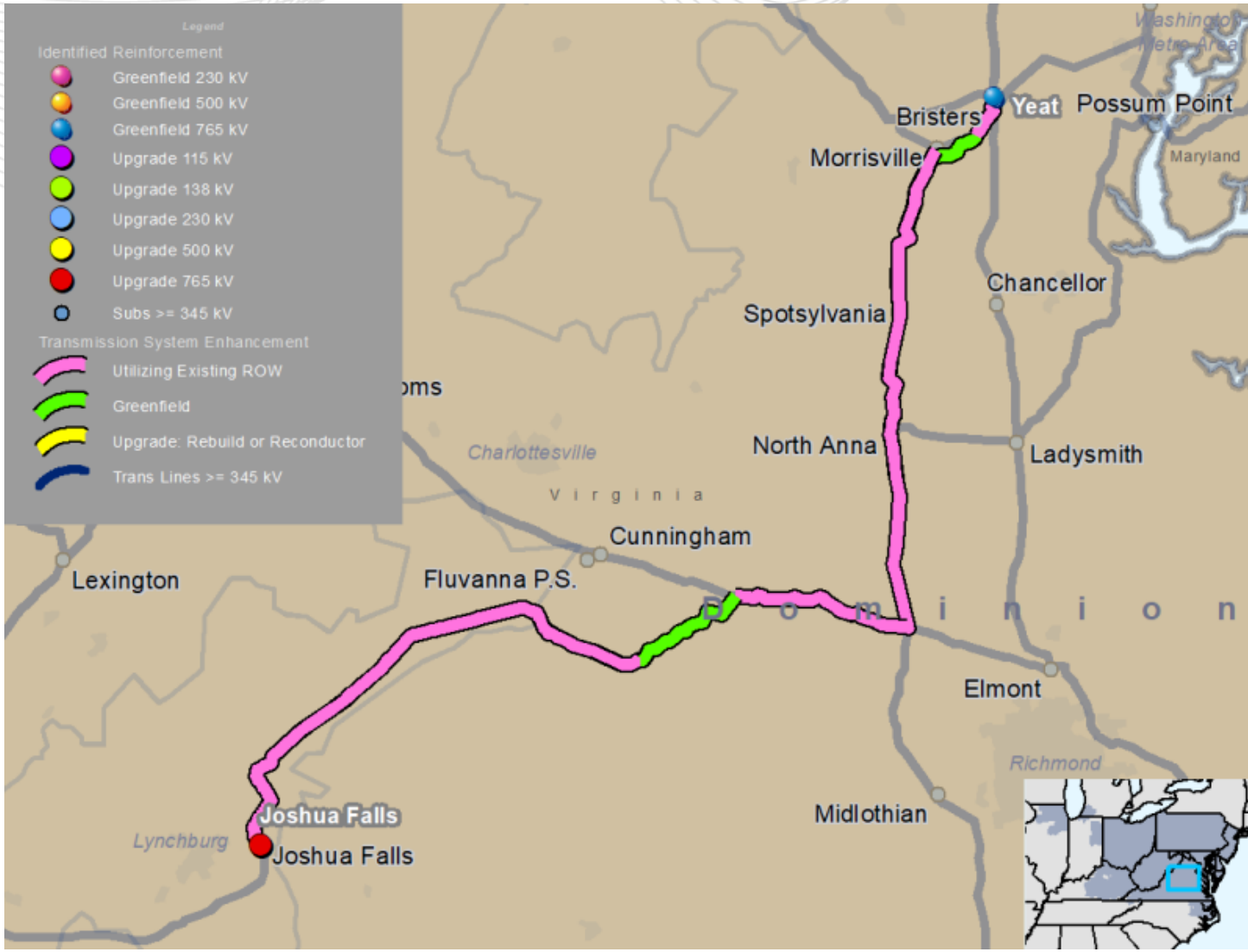
Preliminary Facility Rating:

#	Branch	SN/SE/WN/WE (MVA)
1	765kV Line Joshua Falls - Yeat	5523/5523/6845/6845

Estimated Cost: ~~$1,055.3 M~~ ~~$1,109.89M~~ $1,236.20 M

Required IS Date: 6/1/2029

Projected IS Date: 6/1/2029



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Reliability Analysis Update

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Revision History

Version No.	Date	Description
1	7/30/2026	• Initial slides posted
2	7/31/2026	• Added ComEd Load Forecast update on slide 9 and added scope change section with slides 31-34.

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