



Reliability Analysis Update

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Transmission Expansion Advisory Committee

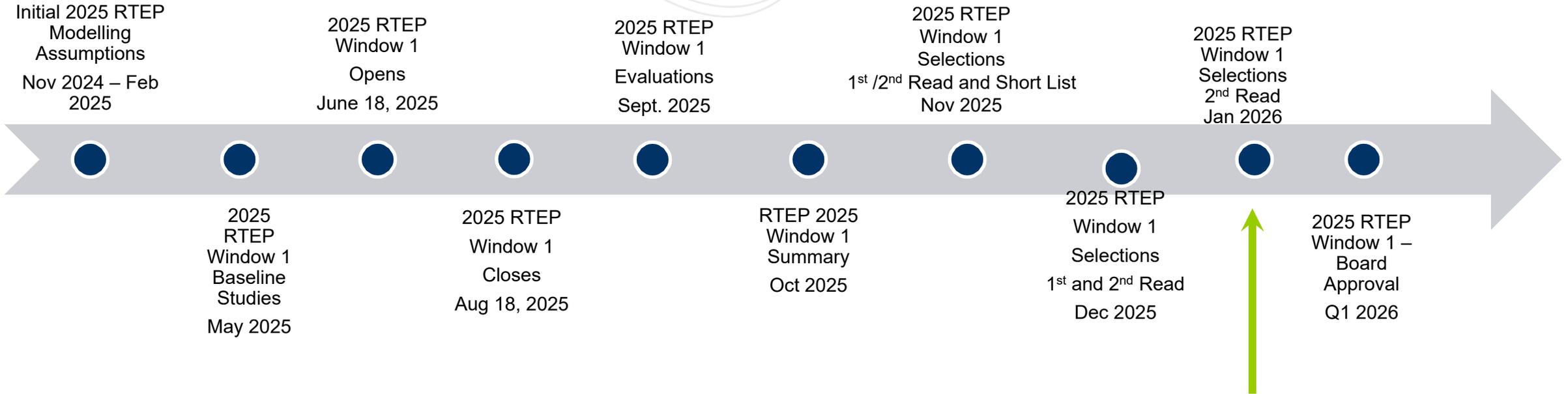
Jan. 6, 2026

- General Summary and Update - 2025 RTEP - Window 1
- Recommended Solutions (Second Reads) – 2025 Window 1 In-Zone Projects
- Recommended Solutions (Second Reads)– 2025 Window 1 Regional Clusters
- 2025 Window 1 Cost Summary
- Cancellations & Cost Updates
- 15 Year Analysis Results



2025 RTEP Window 1 – Schedule Update

2025 RTEP Window 1 – Timeline



Scenarios Studied, Problem Statement and High-Level Summary of Needs

- 5 Year (2030) Analysis

- Scenario 1 (2030 Base case): Existing generation, GIA/ISA generation, Suspended ISA generation, Fast Lane Queue, CVOW and Chesterfield plants
- Scenario 2: 2030 Base case + TC1 queue + (Remove) Q1 deactivations + (Remove) withdrawn queues + without NJ/DE OSW

- 7 Year (2032) Analysis

- Scenario 3 (2032 Base case): Existing generation, GIA/ISA generation, Suspended ISA generation, Fast Lane Queue, TC1 queue, TC2 queue (with RRI), 7500MW NJ OSW, (Remove) Q1 deactivations, (Remove) withdrawn queues
- Scenario 4: 2032 Base case + Removing NJ/DE OSW
- Scenario 5: 2032 Base case + Policy deactivations (may be combined with Scenario 6)
- Scenario 6: 2032 base case with Battery dispatched

(Informational Study)

- All previously planned backbone transmission enhancements continue to perform well up to and including 2030.
- The forecasted queued generation (up to Fast Lane + CVOW and Chesterfield) do not drive major regional transfer needs;
 - Generation developing in these areas efficiently serves the zonal load needs and offset regional imports
- MAAC/PPL which have relatively small amount of new generation added, will require additional transfer capability (enhance the import capability into MAAC/PPL).
 - The details on how the western generation may materialize will have minimal impact on this need given the level of generation forecasted in the west.
- The 2025 RTEP provides guidance to not only how the load reliability needs will be met, but also to where generation could materialize most efficiently

- All previously planned backbone transmission enhancements continue to perform well up to and including 2032.
- There could be need to reinforce the NW – AEP 765 kV transfer path
 - This need will depend on how generation in ComEd and NW PJM materializes.
- With the strong generation interconnection interest in Southern Dominion, and to enable this generation to serve load (mainly in Summer Months);
 - There will be a need to reinforce the Dominion 500kV backbone in Southern Dominion.
- The 2032 results affirm the need to enhance PPL/MAAC West-East transfer path.
- 2025 RTEP W1 will focus on addressing near term (5-year needs);
 - 2032 (longer-term) results will only be used to right-size needs already showing up in 2030.
 - Special cases may arise if longer term needs are confirmed and require long lead development.

As summarized in June and July TEAC Meetings

- No major regional transfer needs in the 2030 analysis. For 2032, several clusters showing EHV backbone overloads along the extremities of the upgraded bulk backbone transmission network that was reinforced as part of the PJM 2022 RTEP W3 and 2024 RTEP W1 competitive transmission windows.
- Needs:
 - MAAC 500 kV system:
 - In 2032, multiple 500 kV facilities are overloaded due to terminal equipment constraints. However, the violations can be mitigated without long lead-time solutions.
 - Due to NJ offshore wind, the Rock Springs–Bramah 500 kV line exceeds its conductor rating. Scenario 4 study results confirm that without NJ OSW, this line is not overloaded, therefore PJM is not currently seeking proposals for the violations on the line.
 - PPL Zone:
 - Several 230kV facilities overloaded in PPL zone in 2030, and these issues worsened in the 2032 analysis.
 - Additional overloads are identified in 2032 as the load continues to grow.
 - PJM expects that solutions proposed for the PPL area will address both the 2032 violations and account for potential future load growth (and resource mix evolution) in the region.
 - ATSI 138 & 115 kV (2030 RTEP) and 345 kV (2032) regional transfer overloads
 - PJM is seeking proposals to address these violations holistically and for the longer-term.



As summarized in June and July TEAC Meetings

- AEP Columbus area:
 - Two main 765 kV regional transfer lines supplying the western region. Under N-1-1 conditions and due to load increase, various contingency pairs cause wide-spread system voltage violations which are expected to worsen with forecasted load increase through 2032 and beyond.
 - All the related thermal and voltage issues in 2030 are posted and open to competition. Solutions need to consider the longer term needs to ensure efficient and cost-effective mitigation.
- Dominion / PJM South:
 - PJM will be addressing the 2032 needs to reinforce the southern 500 kV backbone. This 500kV corridor includes multiple North-South 500kV elements.
 - Violations associated with and/or impacted by CVOW (Coastal Virginia Offshore Wind) will be deferred until the network upgrades associated with the project are finalized.
 - 230kV Lines Chesterfield – Basin & Chesterfield – Hopewell will be addressed as part of the 2030 set of violations.



PJM appreciates all stakeholders' feedback

- PJM appreciates the efforts and diligence put forth by the 2025 RTEP Window 1 participants leading to such a high-quality portfolio of projects to support the 2025 Window 1 process.
- PJM received stakeholder feedback supporting the selection of a number of key regional enhancements including the Dominion HVDC link and the proposed 765kV lines through the MAAC and Western PJM regions.
- PJM Staff is also in discussion with and providing support to facilitate enhancement to proposed preliminary route selection of key proposals.
- A number of stakeholders requested that PJM defer selecting regional solutions in the south (primarily the proposed HVDC line in Dominion)
- PJM would like to thank all stakeholders for their constructive feedback. PJM will be proceeding with the needed bulk transmission enhancements while monitoring driving factors influencing the associated needs. PJM has also decided to defer decision on other upgrades for the time being (particularly those related to NJOSW). Bulk transmission enhancements need to be proactively and timely planned and constructed to ensure we maintain a reliable system.
- All stakeholder feedback received was taken into consideration and will be summarized in PJM's staff recommendation to PJM board.

Recommended Solutions (Second Reads) – 2025 Window 1 In-Zone Projects

Baseline Reliability Projects

DEOK Transmission Zone: Baseline Woodsdale 345 kV Reliability & Reconfigure

Process Stage: Recommended Solution

Criteria: Generator Deliverability

Assumption Reference: 2025 RTEP assumptions

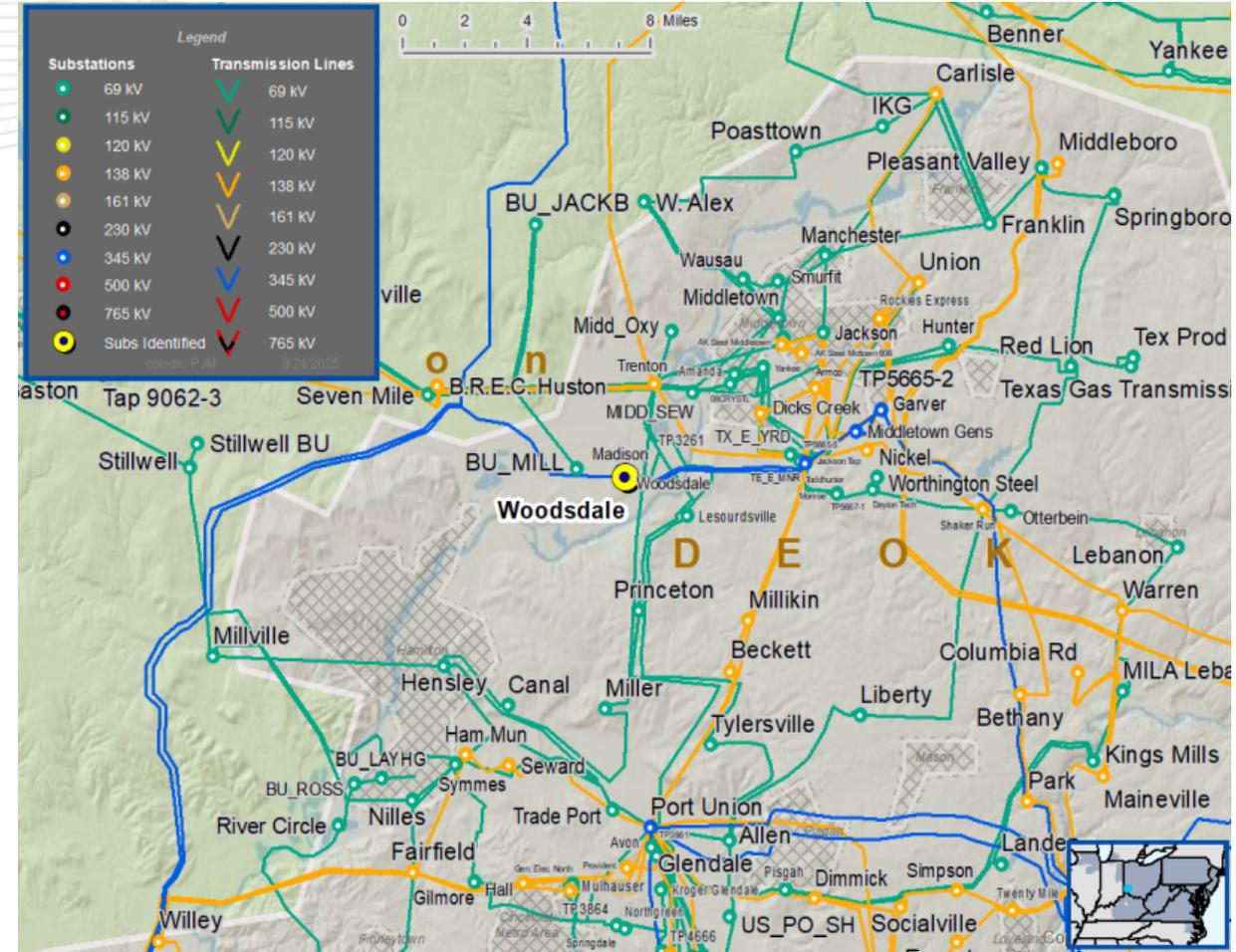
Model Used for Analysis: 2025 Series RTEP 2020 summer base case

Proposal Window Exclusion: Substation equipment

Problem Statement:

FG: 2025-W1-GD-S203, 2025-W1-GD-S204

In the 2020 RTEP summer case, the Woodsdale - Todhunter ckt 1 and Woodsdale - Todhunter ckt 2 345 kV lines are overloaded in the PJM Generation Deliverability Analysis for N-2 outage .



DEOK Transmission Zone: Baseline Woodsdale 345 kV Reliability & Reconfigure

Recommended Solution:

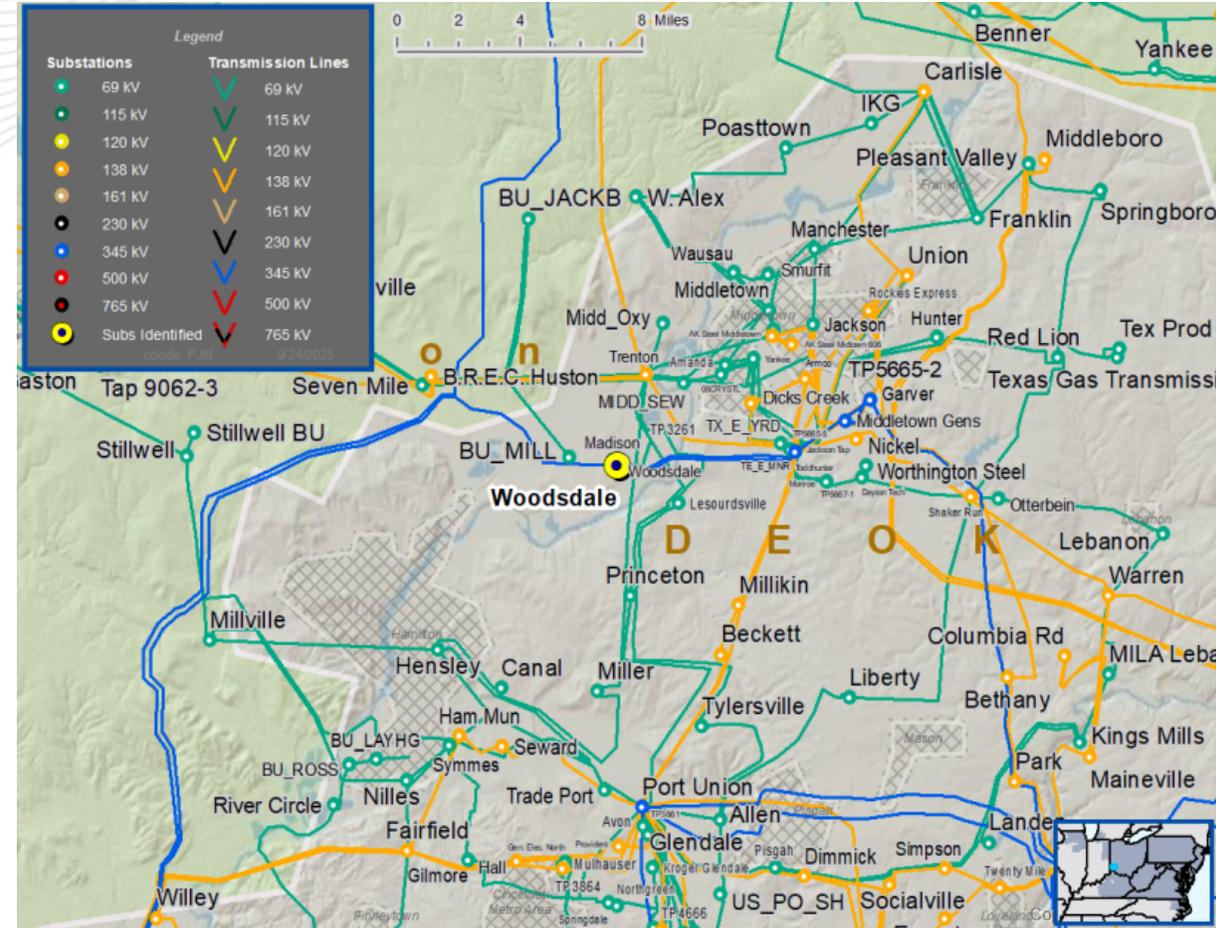
The 345 kV ring bus at Woodsdale Substation will be reconfigured into a 345 kV breaker-and-half yard to improve substation reliability. Additionally, all 2000A equipment at Woodsdale Substation will be upgraded to 3000A to increase substation capacity (b3940.1)

Currently two DEOK Supplemental Projects that are planned at Woodsdale Substation: s3447.1 & s3601.1. DEOK will convert all of s3447.1 & parts of s3601.1 to address these reliability violations.

Estimated Cost: \$36.818 M

Required In-Service Date: 6/1/2030

Projected In-Service Date: 11/16/2028



Process Stage: Recommended Solution

Criteria: N-1-1

Assumption Reference: 2025 RTEP assumptions

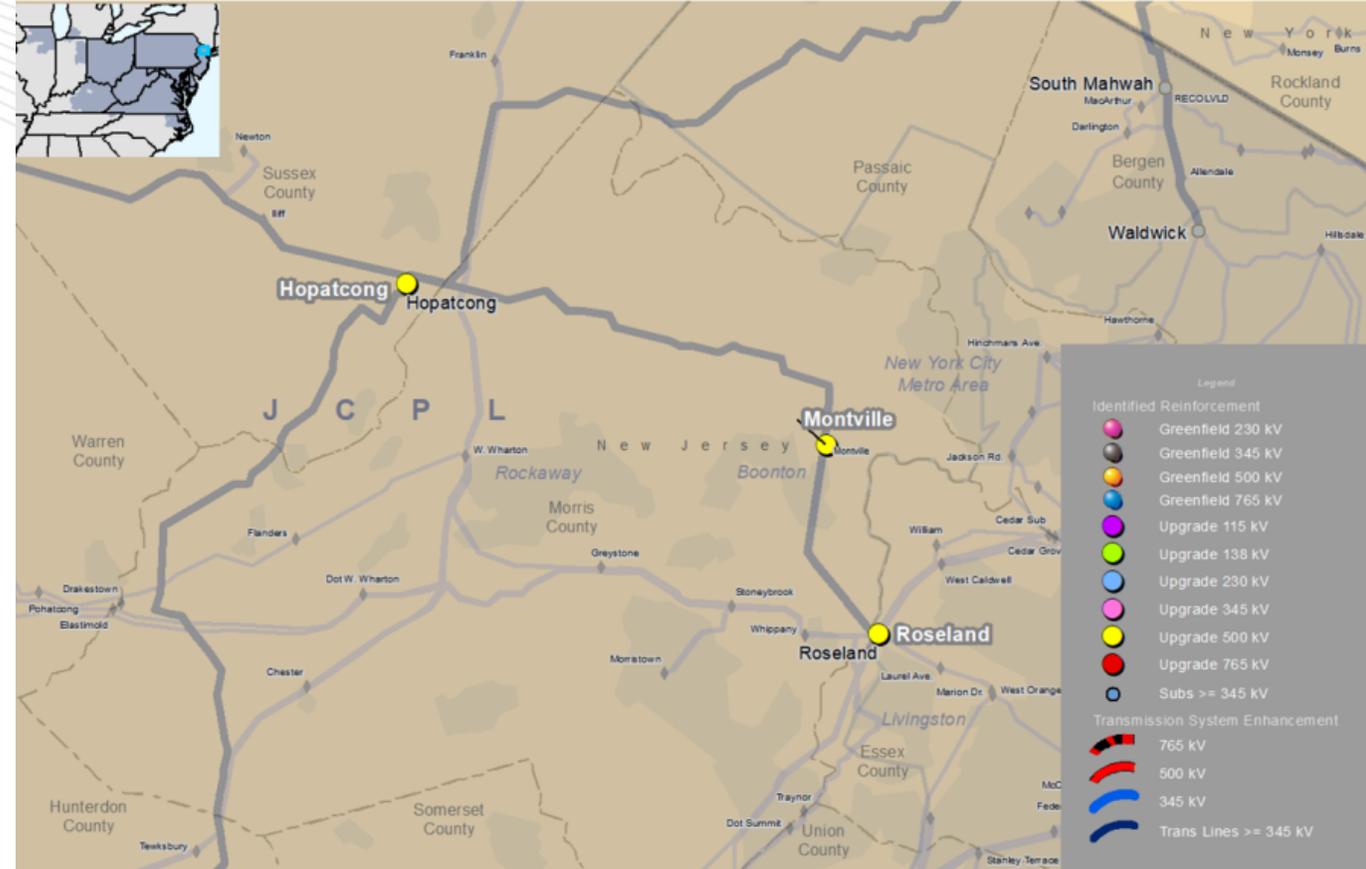
Model Used for Analysis: 2025 Series RTEP 2030 Summer

Proposal Window Exclusion: None

Problem Statement:

2025W1-N11-SVM206244, 2025W1-N11-SVD206244, 2025W1-N11-SVD206260, 2025W1-N11-SVD206264, FG-140-1/2/3

In the 2030 RTEP Summer case, under N-1-1 contingency condition, voltage collapse and load loss greater than 300 MW is observed at Montville and surrounding 34.5 kV system.





JCPL Transmission Zone: Baseline Montville 500/230 kV Substation

Proposed Solution (2025-W1-140):

JCPL Scope:

- At Montville Substation, install a 500 kV double-bus, double-breaker scheme. Install a 500/230 kV transformer. Install new breaker string in the 230 kV yard to create a breaker and a half layout. Re-terminate the 230-34.5 kV transformers. (b4032.1)
- Montville-Whippany 34.5 kV K115 Line: Replace the 2-pole wood structure #154 with a monopole and UG riser. Install approximately 200-ft of new UG conductor to be spliced with existing section of UG conductor into Montville Substation. (b4032.2)
- Montville-Whippany 34.5 kV O93 Line: Replace the 2-pole wood structure #154 with a monopole and UG riser. Install approximately 200-ft of new UG conductor to be spliced with existing section of UG conductor into Montville Substation. (b4032.3)

Proposed Solution (Cont'd):

PSEG Scope:

- Loop the adjacent PSEG Roseland - Hopatcong 500 kV line into the new 500 kV switchyard at JCPL Montville Substation. (b4032.4)
- Upgrade 500 kV terminals at Hopatcong and Roseland Substations. (b4032.5)
- Rework PSEG 230 kV lines into JCPL Montville Substation – Montville – Roseland 230 kV Line and Montville – Iliff 230 kV Line (b4032.6)

Estimated Cost: \$98.10 M

Alternatives: Previous project (b2003) to build a new 230 kV line from Whippany to Montville was cancelled due to routing and permitting issues.

Required In-Service Date: 6/1/2030

Projected In-Service Date: 11/1/2029

Process Stage: Recommended Solution

Criteria: Short Circuit

Assumption Reference: 2025 RTEP assumptions

Model Used for Analysis: 2025 Series RTEP 2030 Short Circuit base case + Preliminary preferred solution

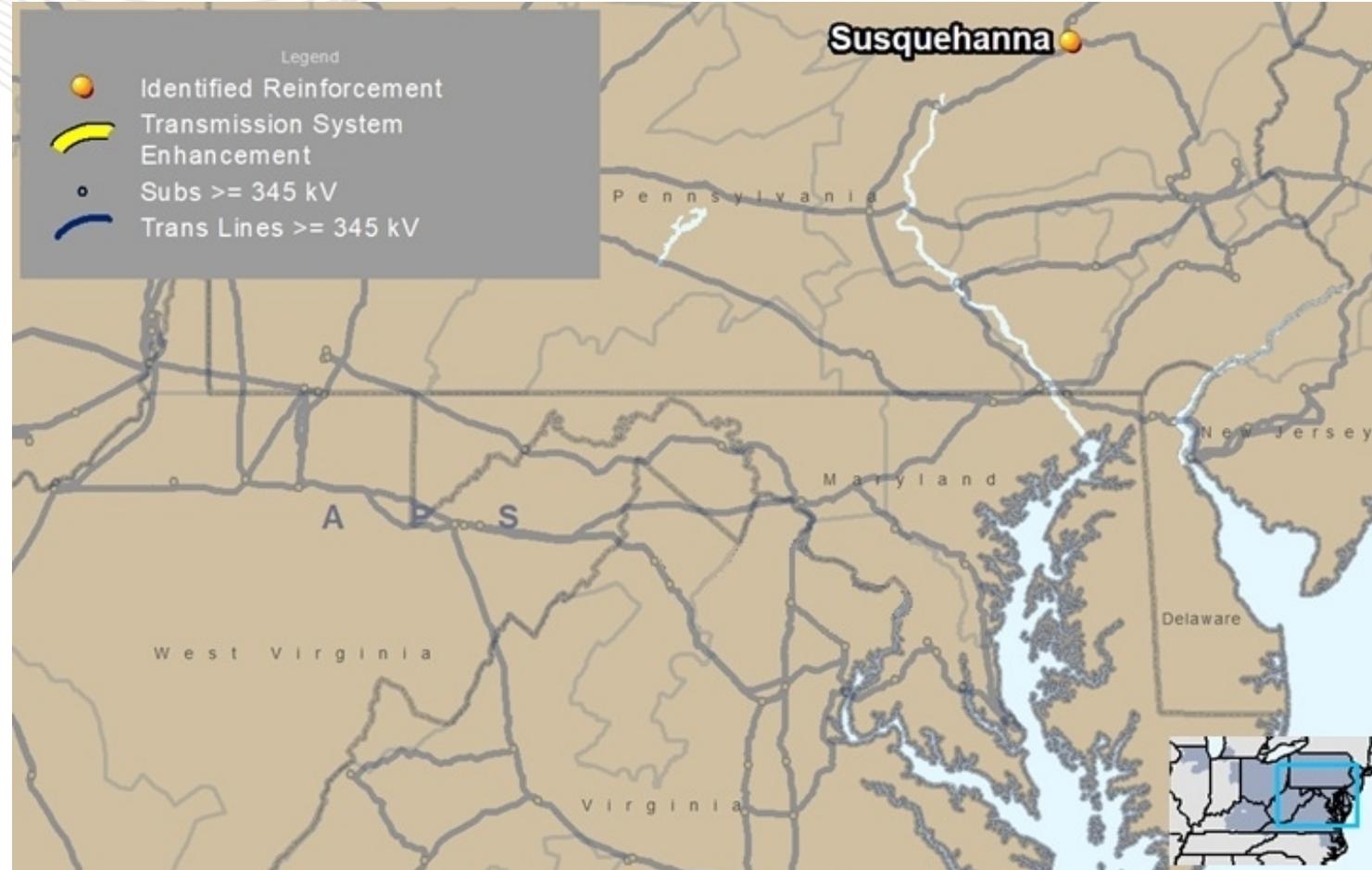
Proposal Window Exclusion: None

Problem Statement:

In the 2030 RTEP Short Circuit base case that includes the PPL cluster selected solution, 2025-W1-558 + Component from 2025-W1-853 (Kelayres 3rd 500/230 kV transformer), which was presented in 12/8/2025 TEAC, six 230KV breakers at Susquehanna were identified to be over duty.

Recommended Solution:

Replace the six 230KV breakers (2W T21, 4E PALO1, 5E MOUN, 2T T21 PALO, 4T GLBR PALO, CAP2) at Susquehanna with 63kA breakers. **(B4029.18)**



Existing Facility Rating:

Circuit Breaker	Interrupting Rating (KA)
Susquehanna 230KV breakers: 2W T21, 4E PALO1, 5E MOUN, 2T T21 PALO, 4T GLBR PALO, CAP2	50

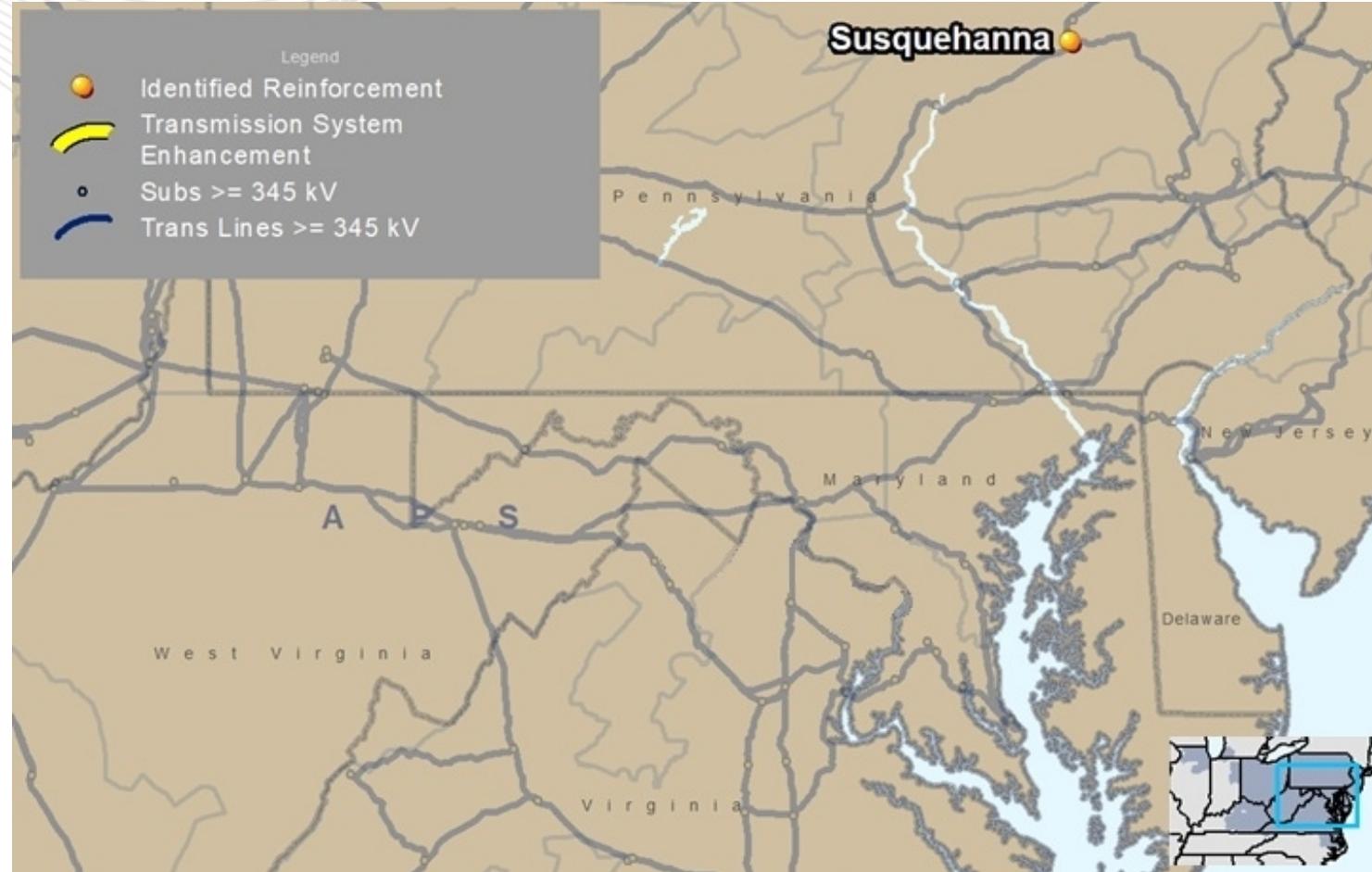
Preliminary Facility Rating:

Circuit Breaker	Interrupting Rating (KA)
Susquehanna 230KV breakers: 2W T21, 4E PALO1, 5E MOUN, 2T T21 PALO, 4T GLBR PALO, CAP2	63

Estimated Cost: \$4.5 M

Required IS Date: 6/1/2030

Projected IS Date: 6/1/2030



Recommended Solutions (Second Reads) – 2025 Window 1 Regional Clusters

Baseline Reliability Projects

MAAC Cluster

Regional Transfers – Recommended Solutions (Second Reads)

Baseline Reliability Projects

Process Stage: Recommended Solution

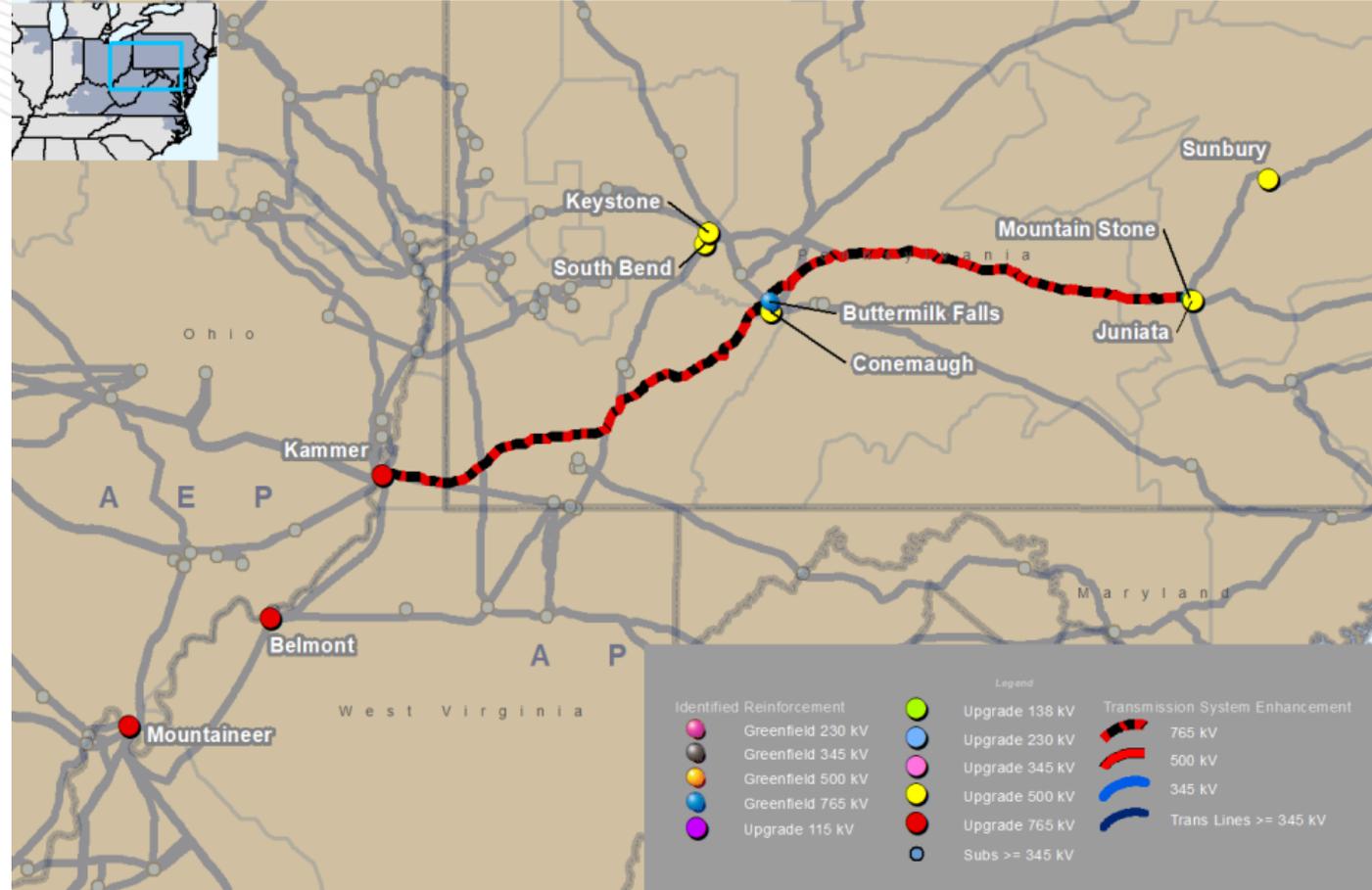
Criteria: Baseline Load Growth Deliverability & Reliability

Assumption Reference: 2025 RTEP Assumption

Model Used for Analysis: 2025 Series RTEP 2032 base cases

Proposal ID: 2025-W1-237

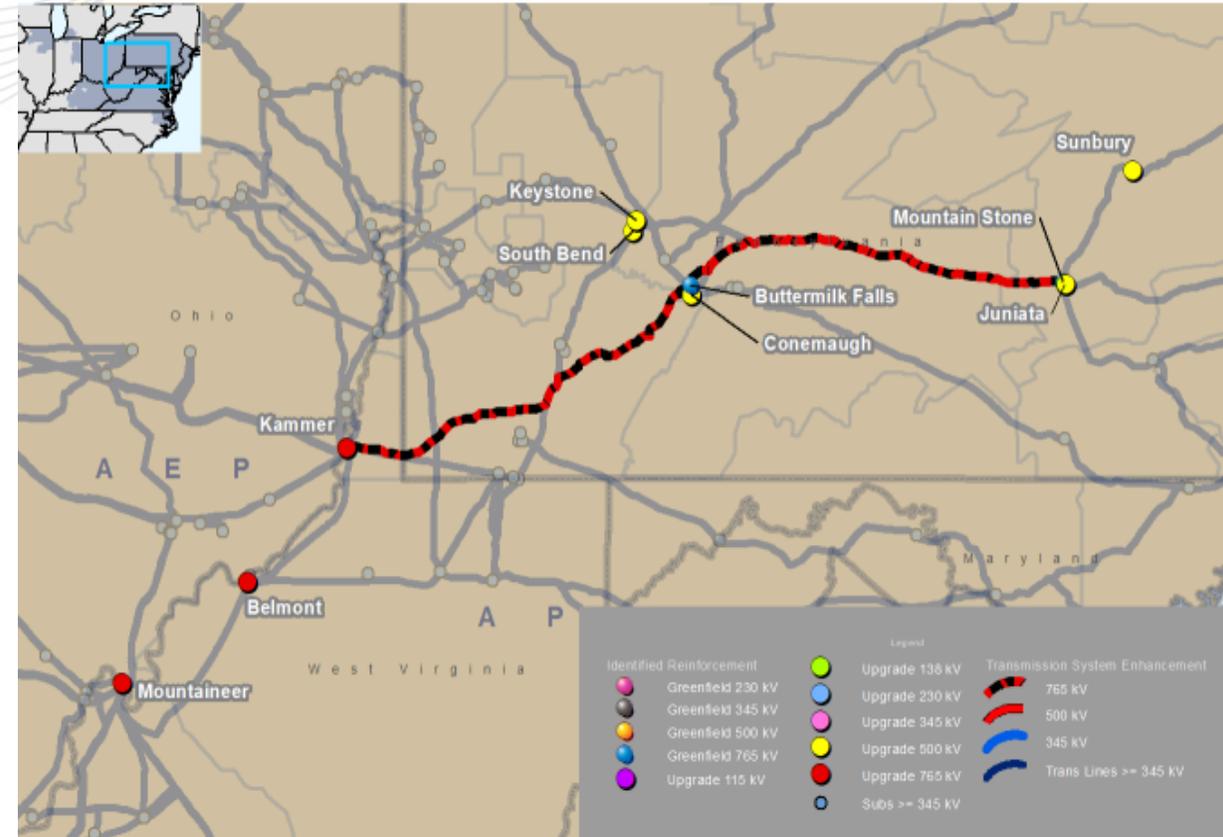
Problem Statement: In the 2032 RTEP analysis, multiple 500 kV transmission lines sourcing the Mid-Atlantic region are overloaded, and voltage collapse is observed for several regional facilities.



Process Stage: Recommended Solution

Proposed Solution: 2025-W1-237

Baseline ID	Component description
b4036.1	Upgrade remote end terminals at Keystone 500kV (South Bend to Keystone)
b4036.2	Upgrade remote end terminals at South Bend 500kV (Keystone to South Bend)
b4036.3	Upgrade the terminal equipment of Keystone 500 kV line to match the line conductor rating.
b4036.4	Upgrade the terminal equipment of Juniata 500 kV line to match the line conductor rating.
b4036.5	Upgrade the terminal equipment of Mountaineer 765kV (Mountaineer - Belmont)
b4036.6	Upgrade the terminal equipment of Belmont 765kV (Mountaineer - Belmont)
b4036.7	Kammer Substation work for new Kammer - Buttermilk Falls 765kV line termination
b4036.8	Construct a new single circuit 765kV transmission line between Kammer and proposed Buttermilk Falls substations. (AEP Zone)
b4036.9	Construct a new single circuit 765kV transmission line between Kammer and proposed Buttermilk Falls substations. (APS Zone)
b4036.10	Construct a new single circuit 765kV transmission line between Kammer and proposed Buttermilk Falls substations. (PENELEC Zone)
b4036.11	Construct a new single circuit 765kV transmission line between proposed Buttermilk Falls and proposed Mountain Stone substations. (PENELEC Zone)
b4036.12	Construct a new single circuit 765kV transmission line between proposed Buttermilk Falls and proposed Mountain Stone substations. (PPL Zone)



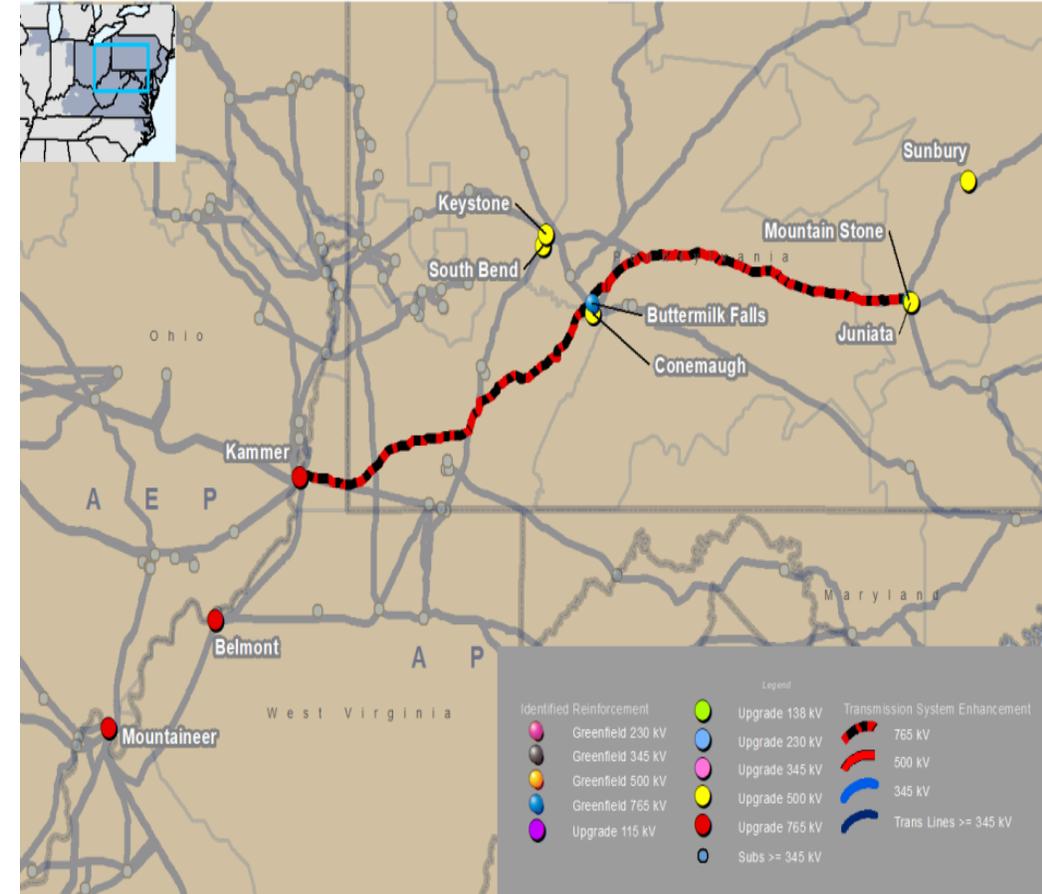
Process Stage: Recommended Solution

Baseline ID	Component description
b4036.13	765/500 kV Substation work at new Mountain Stone
b4036.14	765/500 kV Substation work at new Buttermilk Station
b4036.15	Install two new 500 kV CB at North and South bus to terminate the 765-500 kV transformers leads Upgrade protection settings at Juniata (PPL Work)
b4036.16	Install two new 500 kV CB at North and South bus to terminate the 765-500 kV transformers leads Upgrade protection settings at Juniata (NextEra Work)
b4036.17	Install two new 500 kV circuit breakers with 63 kA, 5,000 Amps rating in transformer T24 and T25 bay. Both transformers will be in double bus double breaker position after adding these two new breakers. (Sunbry)
b4036.18	Construct two new single circuit 500kV t-lines between proposed Mountain Stone substation and Juniata substation.
b4036.19	Replace nine 500 kV circuit breakers with new breakers at Penelec's Conemaugh 500 kV sub with new breakers than can provide 63 kA fault duty and 5,000 Amps rating
b4036.20	Keystone - Buttermilk 500kV Termination work at Buttermilk Station
b4036.21	Keystone remote work on the Keystone - Buttermilk 500kV Line
b4036.22	Conemaugh - Buttermilk 500kV Termination work at Buttermilk Station
b4036.23	Conemaugh remote work on the Conemaugh - Buttermilk 500kV Line

Estimated Total Cost: \$1791.81M

Projected ISD: 6/1/2032

Note: PPL is working on the additional scope required to terminate the 500 kV lines from the newly NextEra proposed Mountain Stone 500 kV station. This additional scope will result in added cost





Process Stage: Recommended Solution

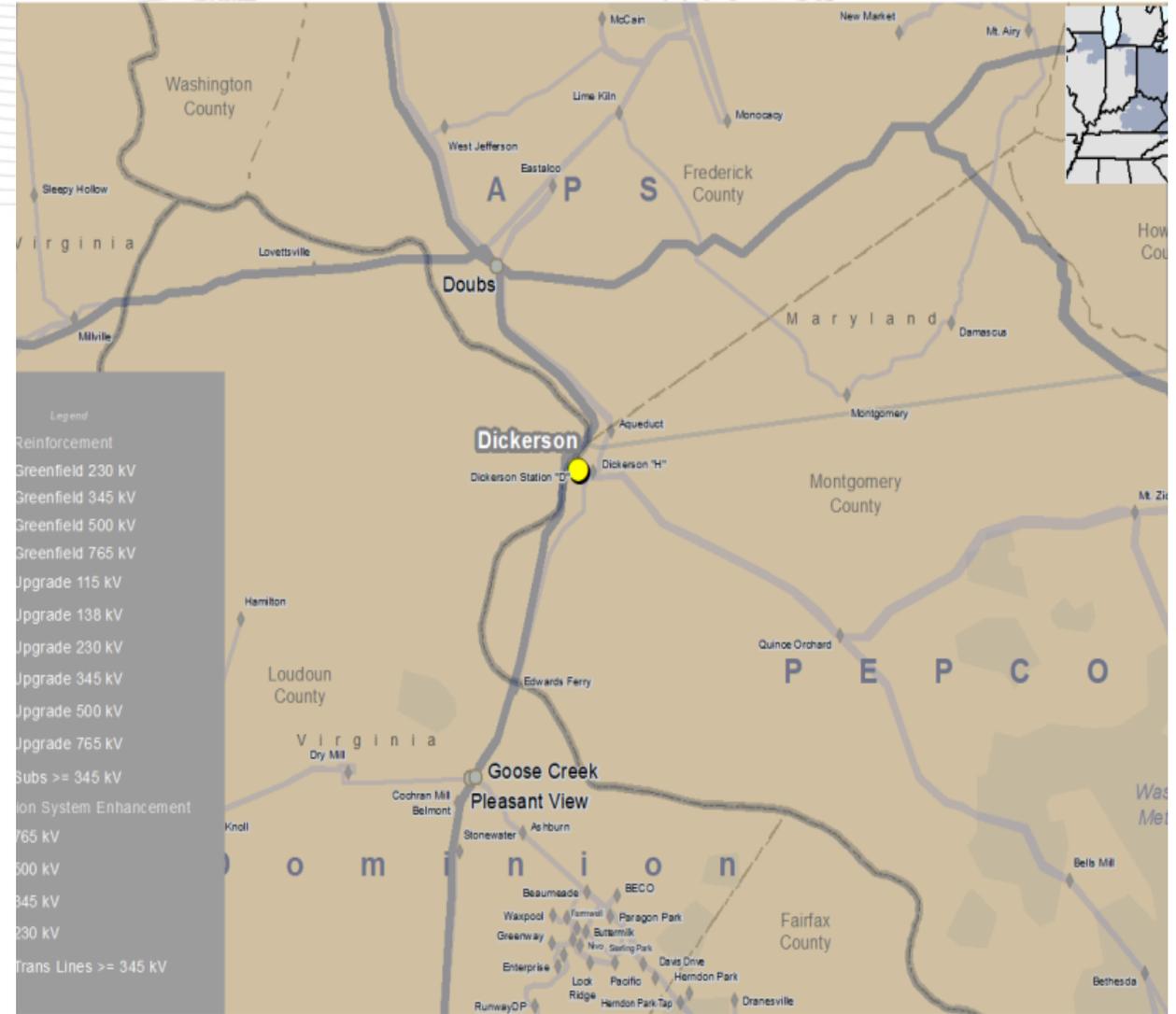
Proposal ID: 2025-W1-919

Proposed Solution (2025-W1-919):

Baseline ID	Component description
b4052.1	New 500 kV substation (Dickerson) by cutting into the Aspen - Rocky Point 500 kV line
b4052.2	Install 2-500/230 kV transformers connecting a new 500 kV Dickerson Station and Dickeson "H" 230 kV station including 230 kV substation work
b4052.3	Rocky Point -Dickerson (new 500 kV) termination work at Dickerson 500 kV
b4052.4	Aspen -Dickerson (new 500 kV) termination work at Dickerson 500 kV
b4052.5	Rocky Point 500 kV remote work for Dickerson (new 500 kV) - Rocky Point line
b4052.6	Aspen 500 kV remote work for Dickerson (new 500 kV) - Aspen line
b4052.7	Install 3.2% 230 kV series Reactor at Dickerson "H" terminal side of the Edwards Ferry - Dickerson Circuit
b4052.8	Relocate Dickerson "D"- Quince Orchard 23035 to terminate at Dickerson "H" at Dickerson #2 Tie Location
b4052.9	Replace 2- Breakers, 1- Bushing CT, 1- Stranded Bus Conductor, 4- Disconnect Switches at Brighton 500 kV Substation
b4052.10	Replace 1- Stranded Bus Conductor, 3- Thermal Relay, 2- Disconnect Switches at Quince Orchard 230 KV Substation
b4052.11	Replace Bells Mill T3 XF with new PEPCO standard 260 MVA 230/138 kV Transformer

Estimated Total Cost: \$282.16 M

Projected ISD: 6/1/2032





Southern Cluster

Regional Transfers – Recommended Solutions (Second Reads)

Process Stage: Recommended Solution

Criteria: Generator Deliverability

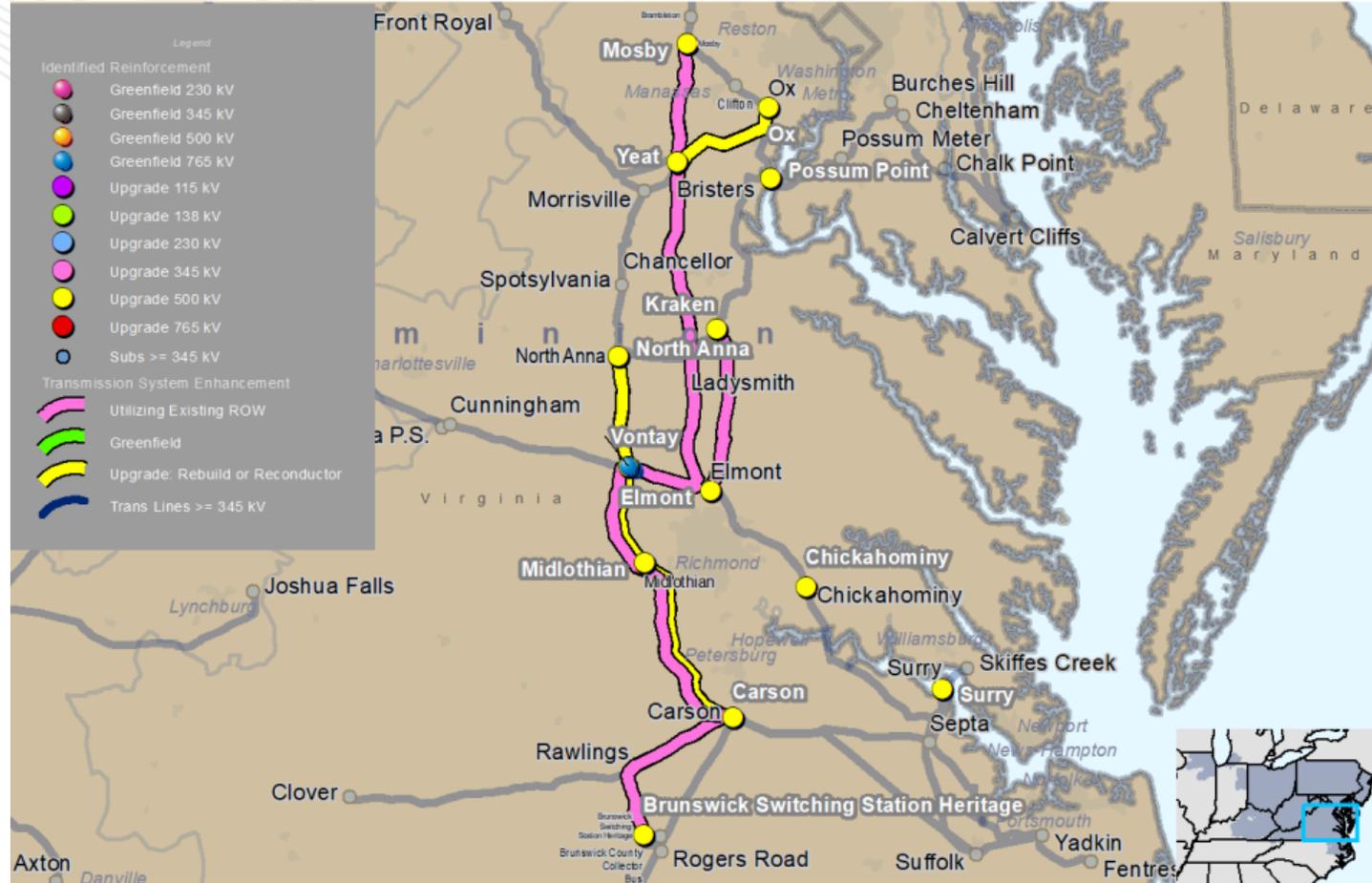
Assumption Reference: 2025 RTEP assumptions

Model Used for Analysis: 2025 Series RTEP 2032 summer, winter, & light load base cases

Proposal Window Exclusion: None

Problem Statement:

In the 2032 RTEP summer, winter and light load base cases, various Dominion 500kV transmission lines are overloaded under single and common mode contingencies.





Dominion Transmission Zone: Baseline Regional Solution: 2025-W1-275 Portfolio Components

Proposal ID #	Project Title	Cost (\$M)
2025-W1-9	Line 576 Partial Rebuild - Vontay to Midlothian	\$104.86
2025-W1-117	Line 539 Rebuild - Yeat to Ox	\$125.25
2025-W1-126	Line 567 Terminal Upgrade Chickahominy & Surry	\$2.49
2025-W1-238	Line 563 Rebuild - Carson to Midlothian	\$237.06
2025-W1-243	Carson Substation Equipment Upgrade	\$12.44
2025-W1-247	New 765/500kV Switching Station - Vontay	\$248.69
2025-W1-253	Line 5008 Cut-in into Mosby Substation	\$16.25
2025-W1-306	New 500kV Line - Elmont to Kraken	\$162.50
2025-W1-339	Line 576 Partial Rebuild - North Anna to Vontay	\$104.86
2025-W1-815	New HVDC Transmission Link from Heritage to Mosby	\$3790.85
2025-W1-916	Line 560 Rebuild - Possum Point to Burches Hill	\$14.21
N/A	Scope Change: Yeat - Vint Hill Uprate	\$0
N/A	Breaker Upgrades	\$13.0
		\$4832.45

Recommended Solution (2025-W1-9):

- Rebuild 500 kV line 576 from Vontay Substation to Midlothian Substation. The existing structures shall be replaced within the existing ROW in-line using primarily 500/230kV 5-2KT tangent lattice towers, 500/230 kV 5-2 MA running angle lattice towers, and 500/230 kV 3-pole dead-end structures. The line will be rebuilt with 3-phase 3-1351 ACSS/TW/HS285 conductor and two (2) DNO-10100 OPGW wire. **\$102.7M (b4053.26)**
- Upgrade/install 6000A equipment at substation to support the new conductor termination. **\$2.158M (b4053.27)**

Existing Facility Rating:

#	Branch	SN/SE/SLDWN/WE/WLD (MVA)
1	500kV Line Vontay– Midlothian	3396/3425/3939/3983/4018/4759

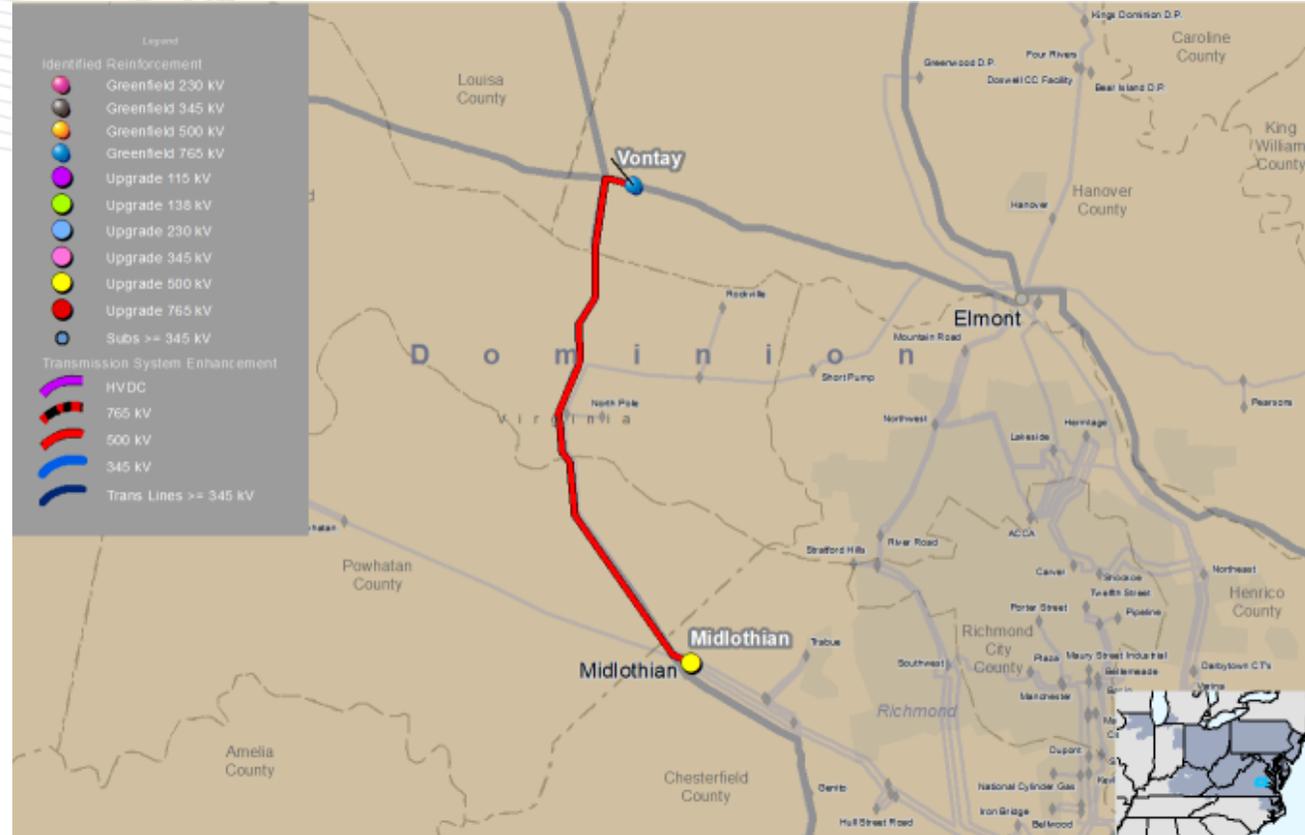
Preliminary Facility Rating:

#	Branch	SN/SE/SLDWN/WE/WLD (MVA)
1	500kV Line Vontay– Midlothian	5109/5268/6057/5691/5867/6748

Total Estimated Cost: \$104.86M

Required In-Service Date: 6/1/2032

Projected In-Service Date: 6/1/2032



Recommended Solution (2025-W1-117):

- Rebuild existing 500kV Line 539 on double circuit structures with the option of adding a 230 kV line at a later time. Rebuild approximately 20 miles of transmission line from the existing structure, outside of Yeat Substation, to the Ox substation to current 500 kV / 230 kV double circuit standards. The conductor and shield wire to be used will be triple bundled 1351.5 ACSS/TW/HS285 145°C MOT and dual 619 DNO-10100 OPGW respectively. **\$122.664M (b4053.23)**
- Upgrade equipment at Ox substation to support the new conductor rating. **\$2.253M (b4053.24)**
- Upgrade equipment at Yeat substation to support the new conductor rating. **\$0.334M (b4053.25)**

Existing Facility Rating:

#	Branch	SN/SE/SLDWN/WE/WLD (MVA)
1	500kV Line Yeat – Ox	3396/3425/3939/3983/4018/4759

Preliminary Facility Rating:

#	Branch	SN/SE/SLDWN/WE/WLD (MVA)
1	500kV Line Yeat – Ox	5109/5268/6057/5691/5867/6748

Total Estimated Cost: \$125.25M

Required In-Service Date: 6/1/2032

Projected In-Service Date: 6/1/2032





Dominion Transmission Zone: Baseline 2025-W1-126: Line 567 Chickahominy to Surry Uprate

Recommended Solution (2025-W1-126):

- Uprate Line 567 associated terminal equipment at Chickahominy to 5000A standards. **\$0.029M (b4053.21)**
- Uprate Line 567 associated terminal equipment at Surry to 5000A standards. **\$2.462M (b4053.22)**

Existing Facility Rating:

#	Branch	SN/SE/SLDWN/WE/WLD (MVA)
1	500kV Line Chickahominy – Surry	2538/2598/2931/2987/3013/3523

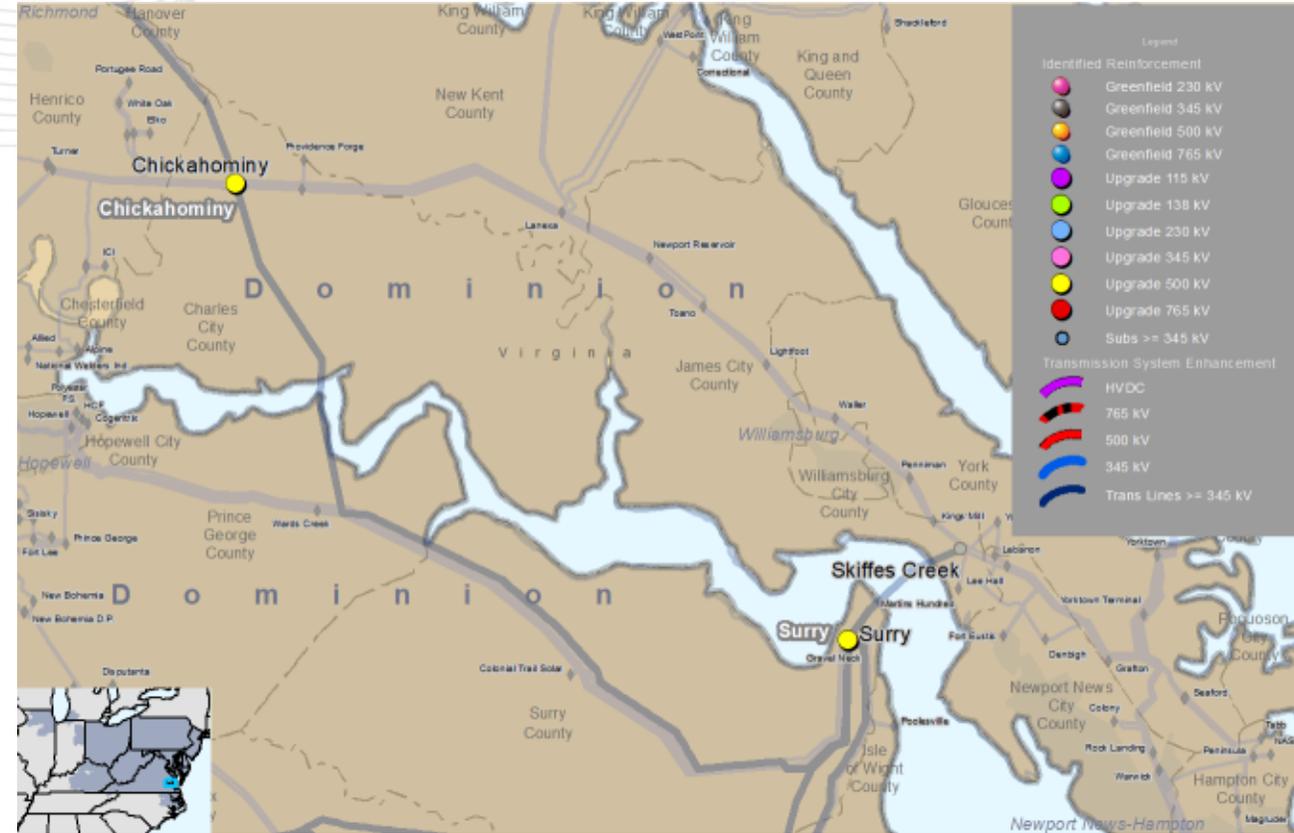
Preliminary Facility Rating:

#	Branch	SN/SE/SLDWN/WE/WLD (MVA)
1	500kV Line Chickahominy – Surry	3322/3425/3939/4191/4376/5032

Total Estimated Cost: \$2.49M

Required In-Service Date: 6/1/2032

Projected In-Service Date: 6/1/2032



Recommended Solution (2025-W1-238):

- This project serves to wreck and rebuild 500kV line 563 from Carson substation to Midlothian substation in Chesterfield and Dinwiddie County, VA. The existing line consists mainly of 500 kV SC Steel Suspension Towers built in 1981. The proposed structures to be installed are mainly 500/230kV Double Circuit V-String Suspension Towers. The 230kV circuit position will be vacant at the completion of this project but serves to accommodate a future 230kV line. **\$228.478M (b4053.18)**
- Uprate terminal equipment at Carson to 5000 A. **\$6.152M (b4053.19)**
- Uprate terminal equipment at Midlothian to 5000 A. **\$2.429M (b4053.20)**

Existing Facility Rating:

#	Branch	SN/SE/SLDWN/WE/WLD (MVA)
1	500kV Line Carson – Midlothian	3425/3425/3939/3983/4018/5030

Preliminary Facility Rating:

#	Branch	SN/SE/SLDWN/WE/WLD (MVA)
1	500kV Line Carson – Midlothian	4357/4357/5011/5155/5155/5928

Total Estimated Cost: \$237.06M

Required In-Service Date: 6/1/2032

Projected In-Service Date: 6/1/2032

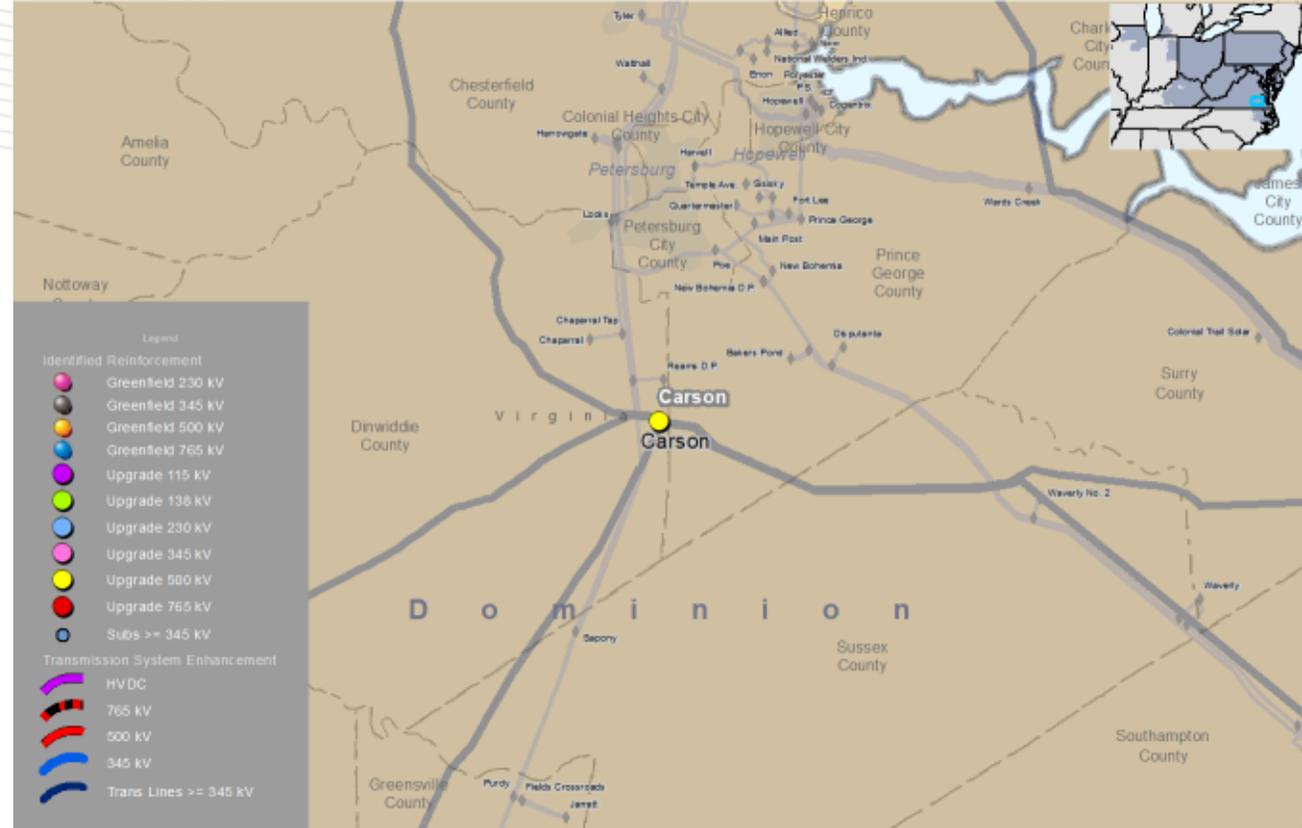


Dominion Transmission Zone: Baseline

2025-W1-243: Carson Substation 500kV Upgrades

Recommended Solution (2025-W1-243):

- Replace the following 500kV substation equipment at Carson with 5000A equipment (Alternative 1): **\$12.439M (b4053.17)**
- Breakers: 51172, 58572, 58572-2 (W72)
- Switches and disconnects: 56274, 56275, 56278, 56378, 54474, 54475, 54478, 51178, 51175, 51174, 58574-1, 58575, 58578, 58570, 58574-2 (W74)
- Leads: if they are less than 4000A



Total Estimated Cost: \$12.44M

Required In-Service Date: 6/1/2032

Projected In-Service Date: 6/1/2032

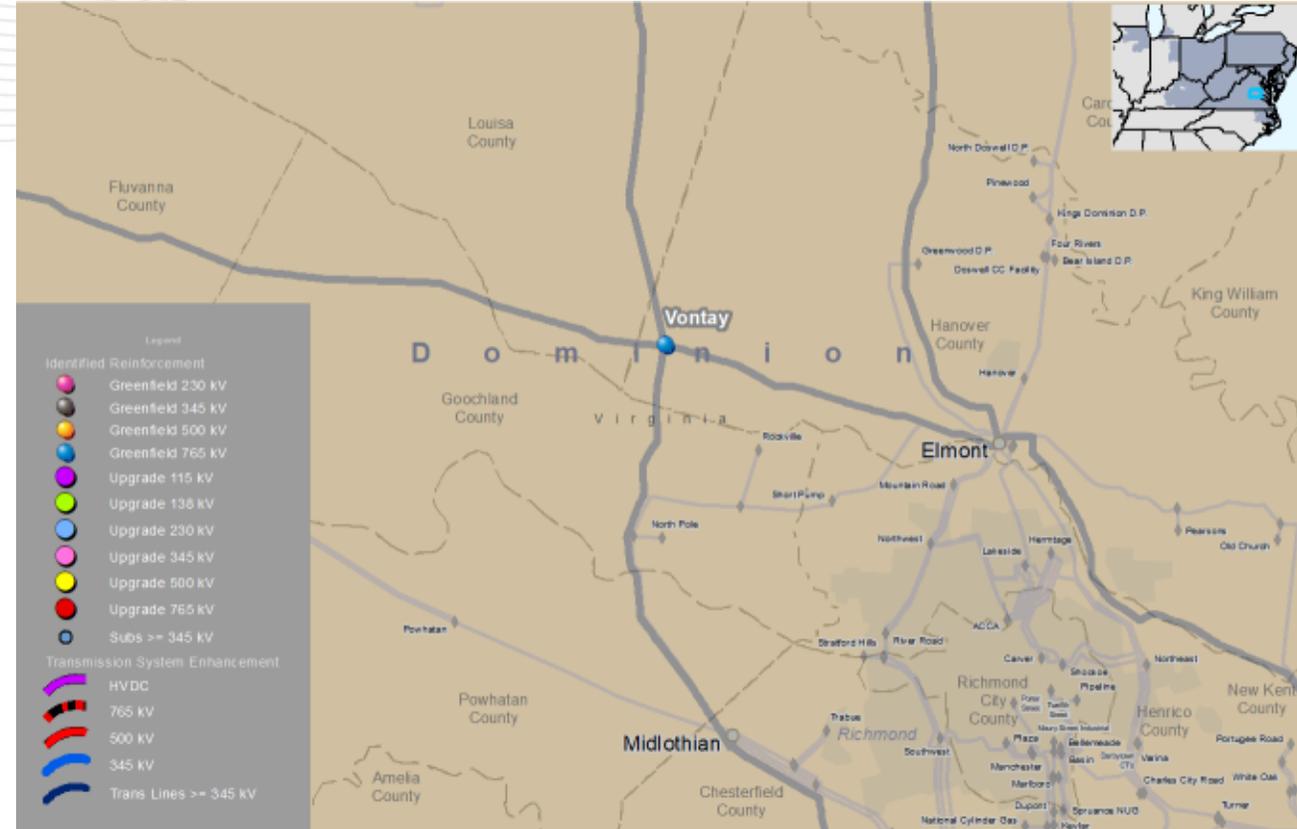
Recommended Solution (2025-W1-247):

- Construct a new 765/500kV Vontay switching station at the crossing of Line #553 (Cunningham – Elmont 500kV line) and the Joshua Falls – Yeat 765kV line. Install one (1) 765/500kV transformer, with provisions for a future second transformer. Utilize a double bus double breaker configuration for both the 765kV and 500kV sides of the station. **\$217.759 (b4053.13)**
- Loop 500 kV Line #553 into the new Vontay substation, which will result in two (2) 500 kV lines: Cunningham – Vontay and Vontay – Elmont. **\$6.686M (b4053.14)**
- Replace CBs (54265 and 553T564) and all associated equipment to Line #553 including Switches and CT with 5000A equipment at Cunningham substation. **\$9.2M (b4053.28)**
- Loop 500 kV Line #576 into the new Vontay substation, which will result in two (2) 500 kV lines: from North Anna – Vontay and Vontay – Midlothian **\$6.686M (b4053.15)**
- Loop 765kV Joshua Falls – Yeat into the new Vontay substation, which will result in two (2) 765 kV lines: from Joshua Falls to Vontay and from Vontay to Yeat **\$8.358M (b4053.16)**

Total Estimated Cost: \$248.69M

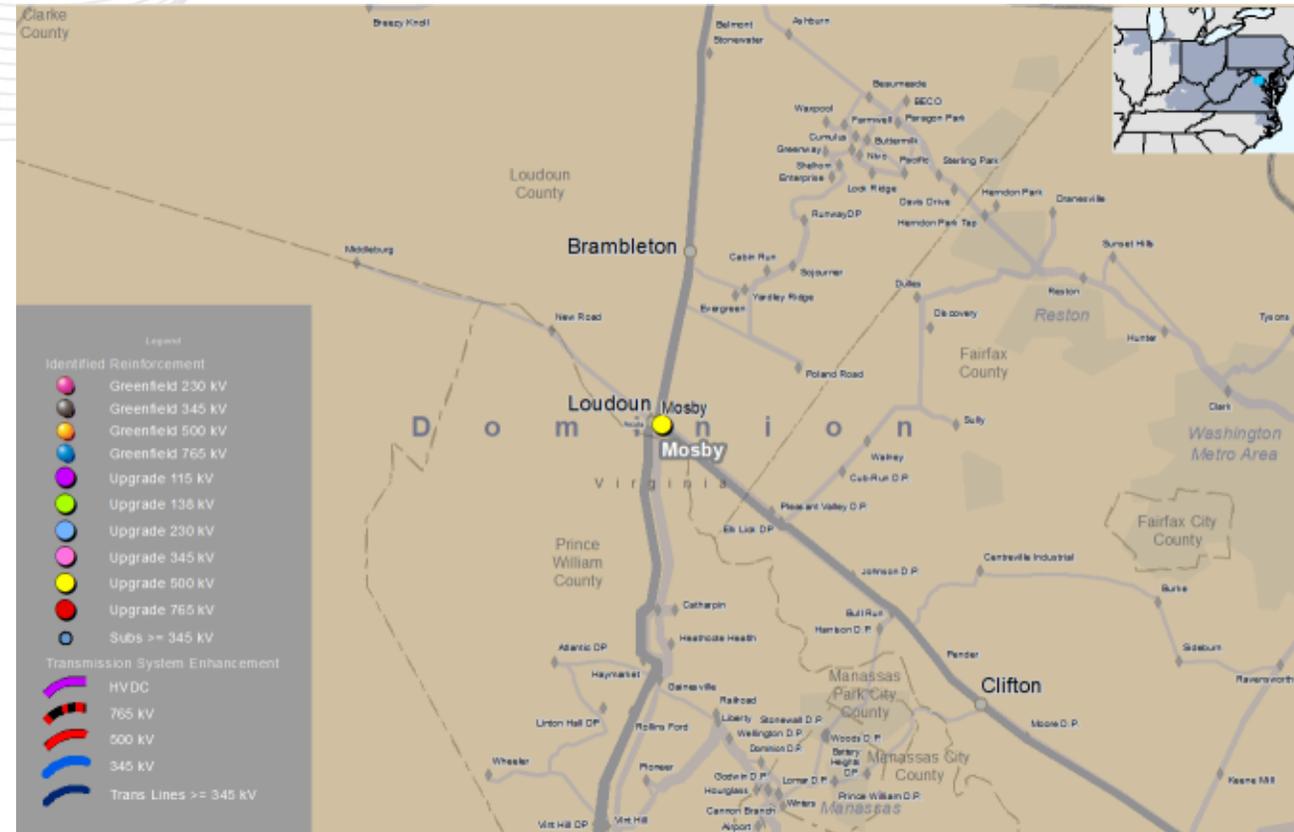
Required In-Service Date: 6/1/2032

Projected In-Service Date: 6/1/2032



Recommended Solution (2025-W1-253):

- Cut and loop Line #5008 into Mosby substation, which will result in two (2) 500 kV lines: Line #5008 Morrisville – Mosby and Line #9573 Mosby – Wishing Star Sub. The proposed structures to be installed are two (2) single circuit engineered steel double dead-end 3-pole structures and one (1) single circuit steel A-frame backbone structure. **\$6.686M (b4053.11)**
- Install two (2) 500kV breakers and all associated terminal equipment in the available bay adjacent to existing breaker XT590 to achieve a redundant breaker arrangement. Upgrade existing terminal equipment to 500kV 5000A, 63 kAIC standards including breaker (XT590), disconnect switches (59078, X74), leads, and buswork. **\$9.559M (b4053.12)**



Total Estimated Cost: \$16.25M

Required In-Service Date: 6/1/2032

Projected In-Service Date: 6/1/2032

Recommended Solution (2025-W1-306):

- Build a new 500kV line from Elmont - Kraken (approximately 31 miles). The new line will be constructed primarily of Double-Circuit 500kV/230kV monopole structures. The proposed route follows existing 230kV line 2032 from Elmont – Hanover – Four Rivers and 230kV line 256 from Four Rivers – Kings Dominion –St Johns – Kraken. The conductor and shield wire to be used will be triple bundled 1351 ACSS/TW/HS285 and dual DNO-10100 OPGW respectively. The 230kV line position on the double circuit structures will remain vacant to be installed as part of the supplemental project rebuilding 115kV lines 47 and 73.
\$147.855M (b4053.8)
- Construct one (1) new 500kV line terminal position at the existing Elmont substation.
\$6.040M (b4053.9)
- Construct one (1) new 500kV line terminal position at the proposed Kraken substation.
\$8.609M (b4053.10)

Existing Facility Rating:

#	Branch	SN/SE/SLDWN/WE/WLD (MVA)
1	500kV Line Elmont – Kraken	NA

Preliminary Facility Rating:

#	Branch	SN/SE/SLDWN/WE/WLD (MVA)
1	500kV Line Elmont – Kraken	4357/4357/50111/5155/5155/5928

Total Estimated Cost: \$162.50M

Required In-Service Date: 6/1/2032

Projected In-Service Date: 6/1/2032



Recommended Solution (2025-W1-339):

- Rebuild 500 kV line 576 from North Anna Substation to Vontay Substation. The existing structures shall be replaced within the existing ROW in-line using primarily 500/230kV 5-2KT tangent lattice towers, 500/230 kV 5-2 MA running angle lattice towers, and 500/230 kV 3-pole dead-end structures. The line will be rebuilt with 3-phase 3-1351 ACSS/TW/HS285 conductor and two (2) DNO-10100 OPGW wire. **\$102.7M (b4053.6)**
- Upgrade/install 6000A equipment at substation to support the new conductor termination. **\$2.158M (b4053.7)**

Existing Facility Rating:

#	Branch	SN/SE/SLDWN/WE/WLD (MVA)
1	500kV Line North Anna – Vontay	3396/3425/3939/3983/4018/4759

Preliminary Facility Rating:

#	Branch	SN/SE/SLDWN/WE/WLD (MVA)
1	500kV Line North Anna – Vontay	5109/5268/6057/5691/5867/6748

Total Estimated Cost: \$104.86M

Required In-Service Date: 6/1/2032

Projected In-Service Date: 6/1/2032



2025-W1-815: New HVDC Transmission Link from Heritage to Mosby

Recommended Solution (2025-W1-815):

- Construct a new bipolar +/- 525kV HVDC link connecting Heritage and Mosby Substations, where the link has a capability of transmitting 3000MW. **\$2271.696M (b4053.3)**
- Design and construct a new Voltage Source Converter (VSC) HVDC station at Heritage substation. **\$773.733M (b4053.4)**
- Design and construct a new Voltage Source Converter (VSC) HVDC station at Mosby substation. **\$745.422M (b4053.5)**



Total Estimated Cost: \$3790.85M

Required In-Service Date: 6/1/2032

Projected In-Service Date: 6/1/2032

2025-W1-916: Line 560 Possum Point to Burches Hill Rebuild

Recommended Solution (2025-W1-916):

- Rebuild 500kV line 560 from Possum Point Substation (structure 560/1A) to Burches Interconnection (structure 560/1F). The existing line consists of one (1) 500kV single circuit steel suspension H-frame structure. The proposed structure to be installed is a 500kV single circuit steel suspension H-frame structure. This project will not require any additional right of way due to the entire project being on Dominion property. **\$3.488M (b4053.2)**
- Uprate Line 560 terminal equipment at Possum Point substation so as not to limit the conductor rating. **\$0.404M (b4053.1)**
- Uprate terminal equipment at Burches Hill substation so as not to limit the conductor rating. **\$10.315M (b4053.29) (PEPCO scope)**

Existing Facility Rating:

#	Branch	SN/SE/SLDWN/WE/WLD (MVA)
1	500kV Line Possum Point – Burches Hill	3803/3803/4373/4832/4832/5287

Preliminary Facility Rating:

#	Branch	SN/SE/SLDWN/WE/WLD (MVA)
1	500kV Line Possum Point – Burches Hill	4087/4357/5011/4673/5155/5928

Total Estimated Cost: \$14.21M

Required In-Service Date: 6/1/2032

Projected In-Service Date: 6/1/2032





Dominion Transmission Zone: Baseline Scope Change: 500kV Line Yeat – Vint Hill Uprate

Scope Change (2022W3 – b3800.313):

- Reconductor existing 500kV line from Yeat to Vint Hill to 6000A.

Existing Facility Rating:

#	Branch	SN/SE/SLDWN/WE/WLD (MVA)
1	500kV Line Yeat – Vint Hill	4357/4357/5011/5155/5155/5929

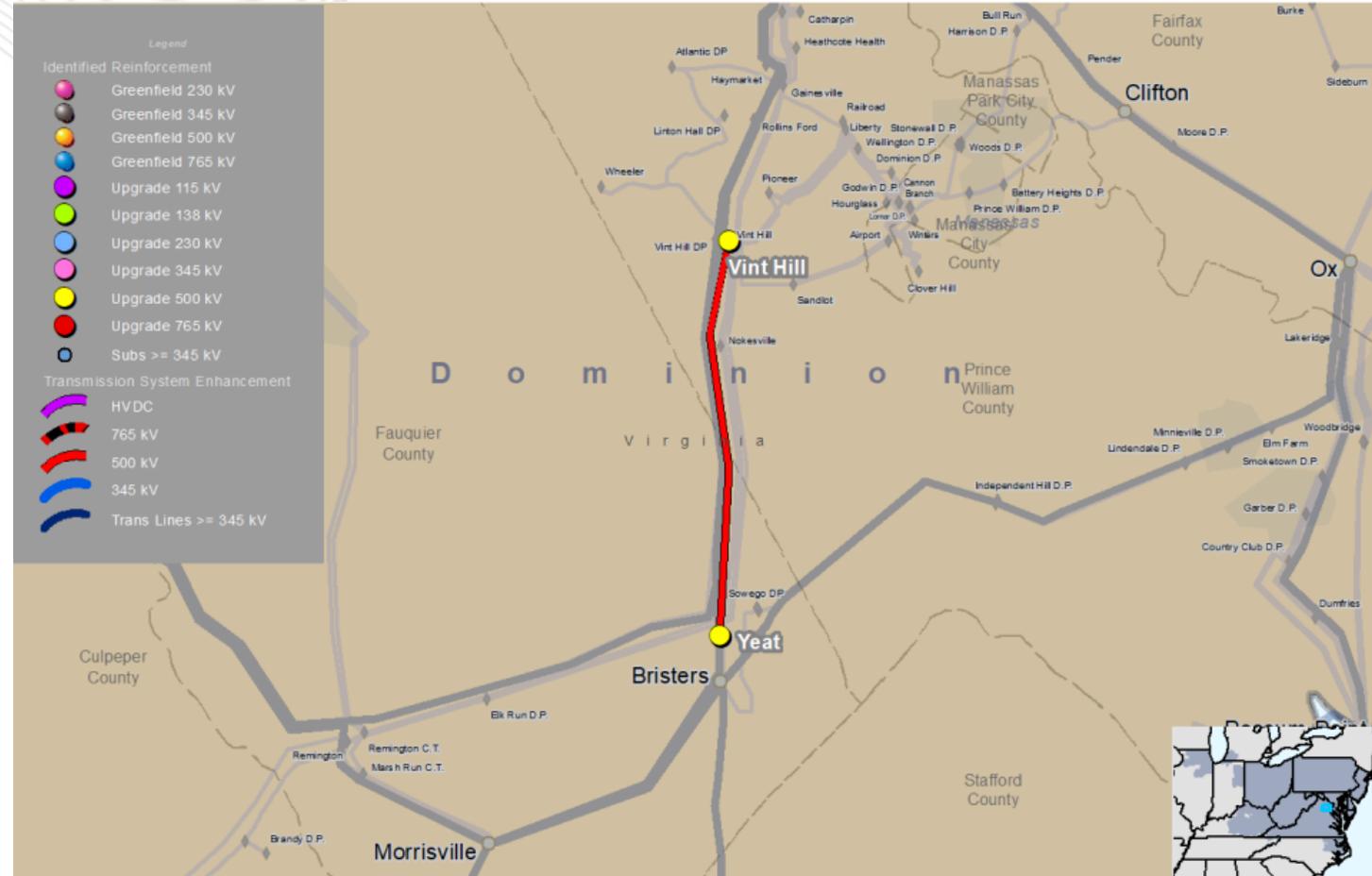
Preliminary Facility Rating:

#	Branch	SN/SE/SLDWN/WE/WLD (MVA)
1	500kV Line Yeat – Vint Hill	5109/5268/6057/5691/5867/6748

Total Estimated Cost: \$0M

Required In-Service Date: 6/1/2032

Projected In-Service Date: 6/1/2032



Recommended Solution (2025-W1-275):

- Clifton Sub 230kV: Replace 63kA breakers 205182, 2051T2063, 221282 with 80kA. **\$3.0M (b4053.30)**
- Clifton Sub 500kV: Replace 40kA breaker H1T559 with 63kA. **\$1.0M (b4053.31)**
- Elmont Sub 230kV: Replace 63kA breakers H592, L292, 203292, 207592, 28392-3, H692, L192 with 80kA. **\$7.0M (b4053.32)**
- Celestial Sub 230kV: Replace 63kA breakers 213732, 226132 with 80kA. **\$2.0M (b4053.33)**

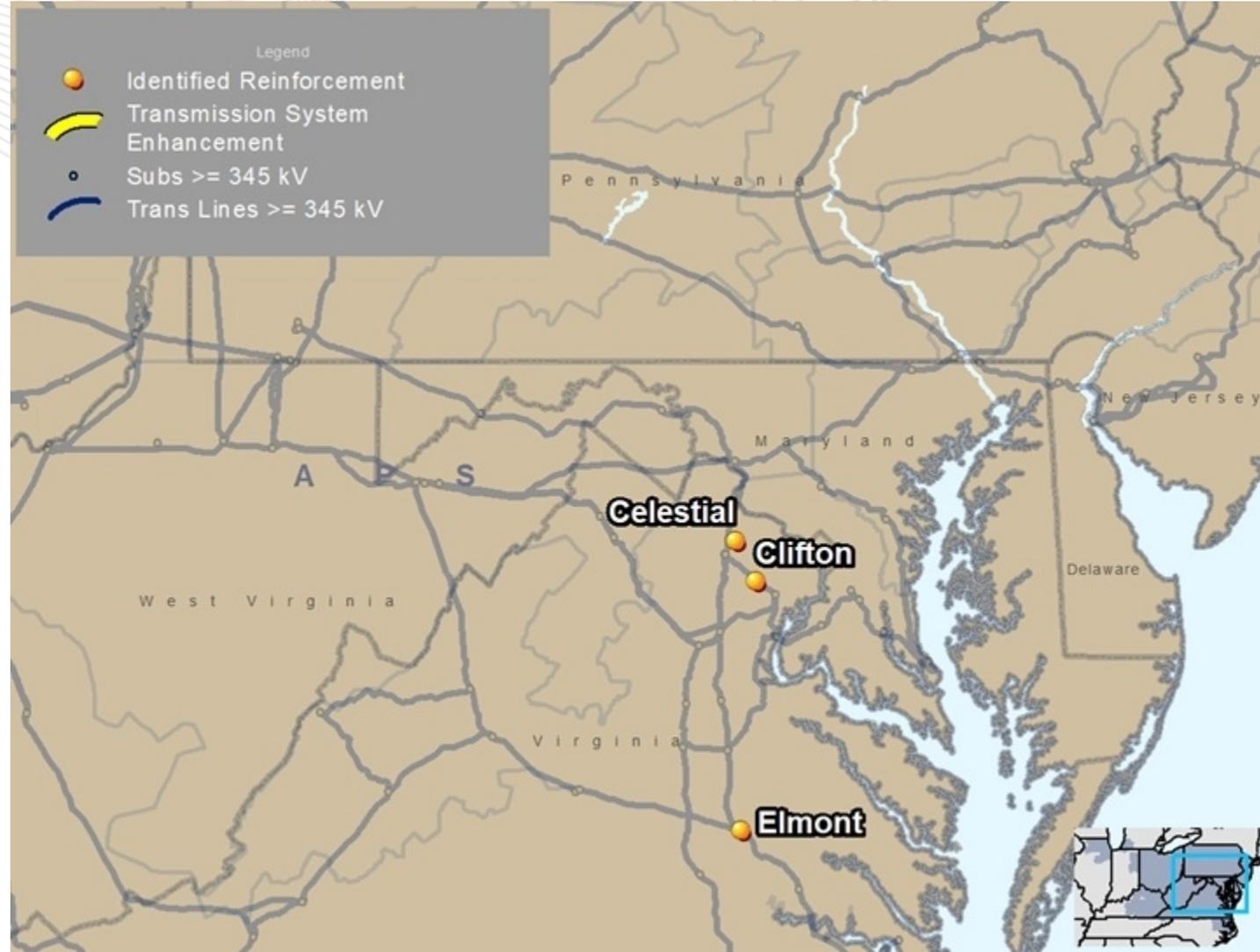
Existing and Preliminary Facility Rating:

Circuit Breaker	Breaker Qty	Existing Rating (kA)	Proposed Rating (kA)	Cost (\$M)
Clinton 230kV	3	63	80	3
Clinton 500kV	1	40	63	1
Elmont 230kV	7	63	80	7
Celestial 230kV	2	63	80	2

Total Estimated Cost: \$13.0M

Required In-Service Date: 6/1/2032

Projected In-Service Date: 6/1/2032



- The proposed HVDC link offers additional benefits (beyond transfer capability and lower ROW impacts) that were taken into consideration which include;
 - Reactive Power support: provides additional 1000 MVAR at each end
 - Transmission Headroom: avoids rebuilds of recently upgraded 500kV lines and enhances headroom on existing lines from under 10% to 35%
 - Short Circuit: avoiding equipment replacements (Breaker duty and Substation rebuilds)
 - Operational Flexibility: managing bulk transfers
 - Construction Outages: short duration outages for HVDC converter Stations integration
 - Black Start: capability and flexibility through utilizing HVDC grid-forming capabilities
 - Interconnection Coordination of needed upgrades for planned new generation – approximately \$440M of overlapping upgrades and potentially \$200M+ of avoided network upgrades



West Cluster (AEP / DAYTON / ATSI / DEOK)

Regional Transfers – Recommended Solutions (Second Reads)



AEP/ATSI/DAYTON/DEOK Transmission Zone: Baseline West Cluster Recommended Selection (2nd Read)

Process Stage: Recommended Solution

Criteria: Generator Deliverability, N-1-1

Assumption Reference: 2025 RTEP assumptions

Model Used for Analysis: 2025 Series RTEP 2030

Summer/Winter base cases

Proposal Window Exclusion: None

Problem Statement:

Major Drivers

- Load increase in Columbus area
- Load increase at Melissa area

Violations

- Thermal overloads in AEP/Dayton/ATSI
- Widespread voltage issues in AEP/Dayton/ATSI/DEOK
- Thousands of related Flowgates in the 2025 RTEP posting

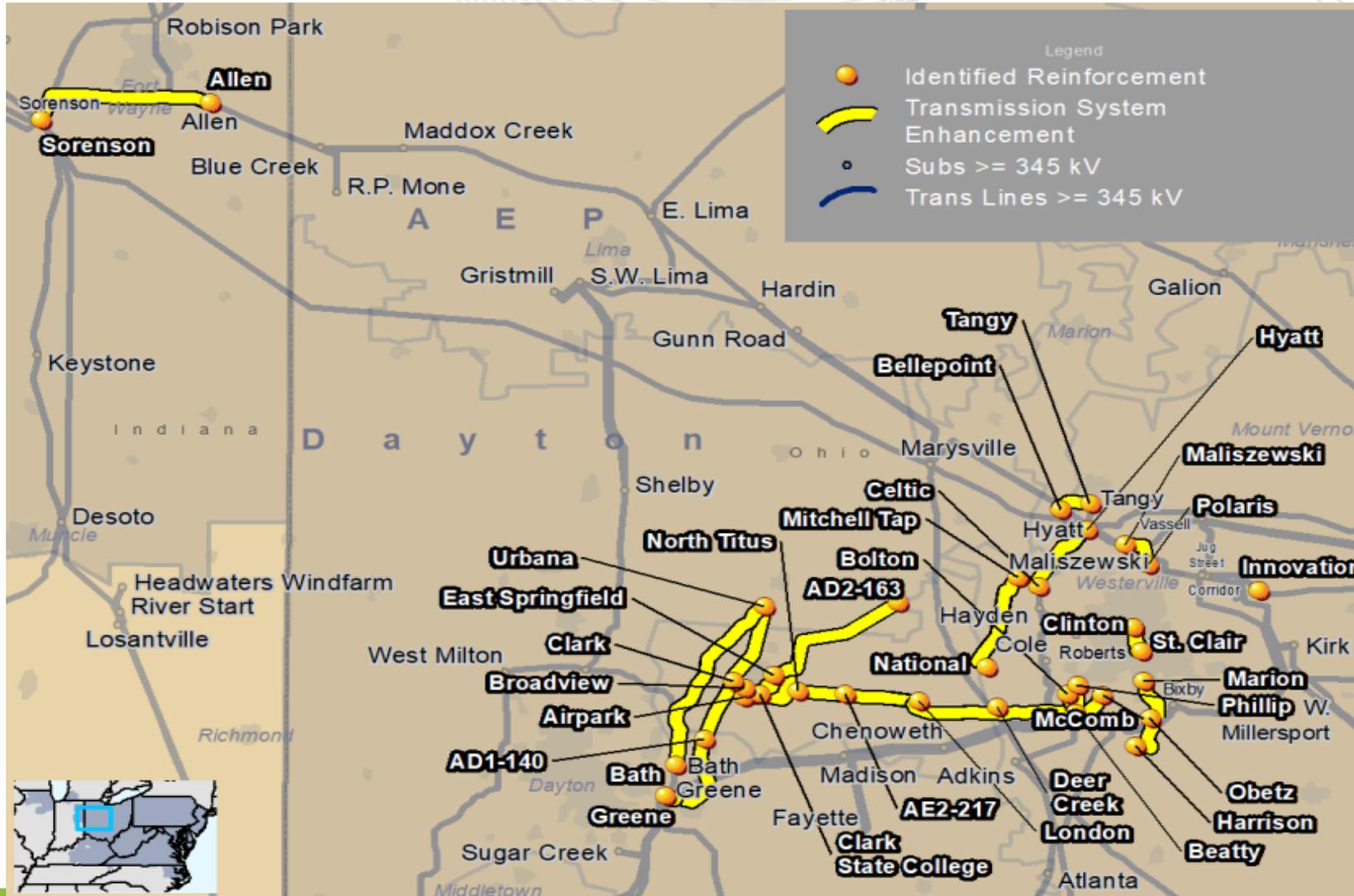




AEP/ATSI/DAYTON/DEOK Transmission Zone: Baseline West Cluster Recommended Selection (2nd Read)

Fr Name	To Name	CKT	kVs	Areas	Violation type
02LONDON	AE2-217_POI	1	138	ATSI	Summer N-1-1
02AIRPK+	02ESPRNG	1	138	ATSI	Summer N-1-1
02MELISSA	AE2-217_POI	1	138	ATSI	Summer N-1-1
05BEATTY	05MCCOMB	1	138	AEP	Summer N-1-1
05BEATTY	05PHILLIPI	1	138	AEP	Summer N-1-1
02LONDON	02N TITUS	1	138	ATSI	Summer N-1-1
02BELPT+	02TANGY	1	138	ATSI	Summer N-1-1
05BEATTY	05BOLTON	1	138	AEP	Summer N-1-1
02URECMITCHL	02NATIONAL	1	138	ATSI	Summer N-1-1
05CLINTO	05ST.CLX	1	138	AEP	Summer N-1-1
05INNOVATION	05INNOVAT2EQ	2	345/1.0	AEP	Summer N-1-1
05INNOVATION	05INNOVAT2EQ	2	138/1.0	AEP	Summer N-1-1
05INNOVATION	05INNOVAT1EQ	1	345/1.0	AEP	Summer N-1-1
05INNOVATION	05INNOVAT1EQ	1	138/1.0	AEP	Summer N-1-1
05MALIS	05POLARS	1	138	AEP	Summer N-1-1
02AIRPK+	02CLARK	1	138	ATSI	Summer N-1-1
02DEERCREEK	05BEATTY	1	138	ATSI/AEP	Summer N-1-1, Summer Gen Deliv
02LONDON	02DEERCREEK	1	138	ATSI	Summer N-1-1, Summer Gen Deliv
02BRDVIE	AD2-163_POI	1	138	ATSI	Summer N-1-1, Summer Gen Deliv
AD1-140 TAP	09GREENE	1	138	ATSI/Dayton	Summer N-1-1, Summer Gen Deliv
05HYATT	05CELTIC	1	345	AEP	Summer N-1-1, Summer Gen Deliv
02ESPRNG	02MELISSA	2	138	ATSI	Winter N-1-1, Summer/Winter Gen Deliv
02ESPRNG	02MELISSA	1	138	ATSI	Winter N-1-1, Summer/Winter Gen Deliv
02ESPRNG	02BRDVIE	1	138	ATSI	Winter N-1-1, Summer Gen Deliv
02BRDVIE	09URBANA	1	138	ATSI/Dayton	Winter N-1-1, Summer Gen Deliv
02CLARK	AD1-140 TAP	1	138	ATSI	Winter N-1-1, Summer Gen Deliv
09BATH	09URBANA	1	138	Dayton	Winter Gen Deliv
05HARRISON	05OBETZ	1	138	AEP	Summer Gen Deliv
05SORENS	05ALLEN	1	345	AEP	Summer Gen Deliv
05OBETZ	05MARION RD	1	138	AEP	Summer Gen Deliv

AEP/ATSI/DAYTON/DEOK Transmission Zone: Baseline West Cluster Recommended Selection (2nd Read)





Recommended Solution: Modified Proposal 570

Existing/Preliminary Ratings

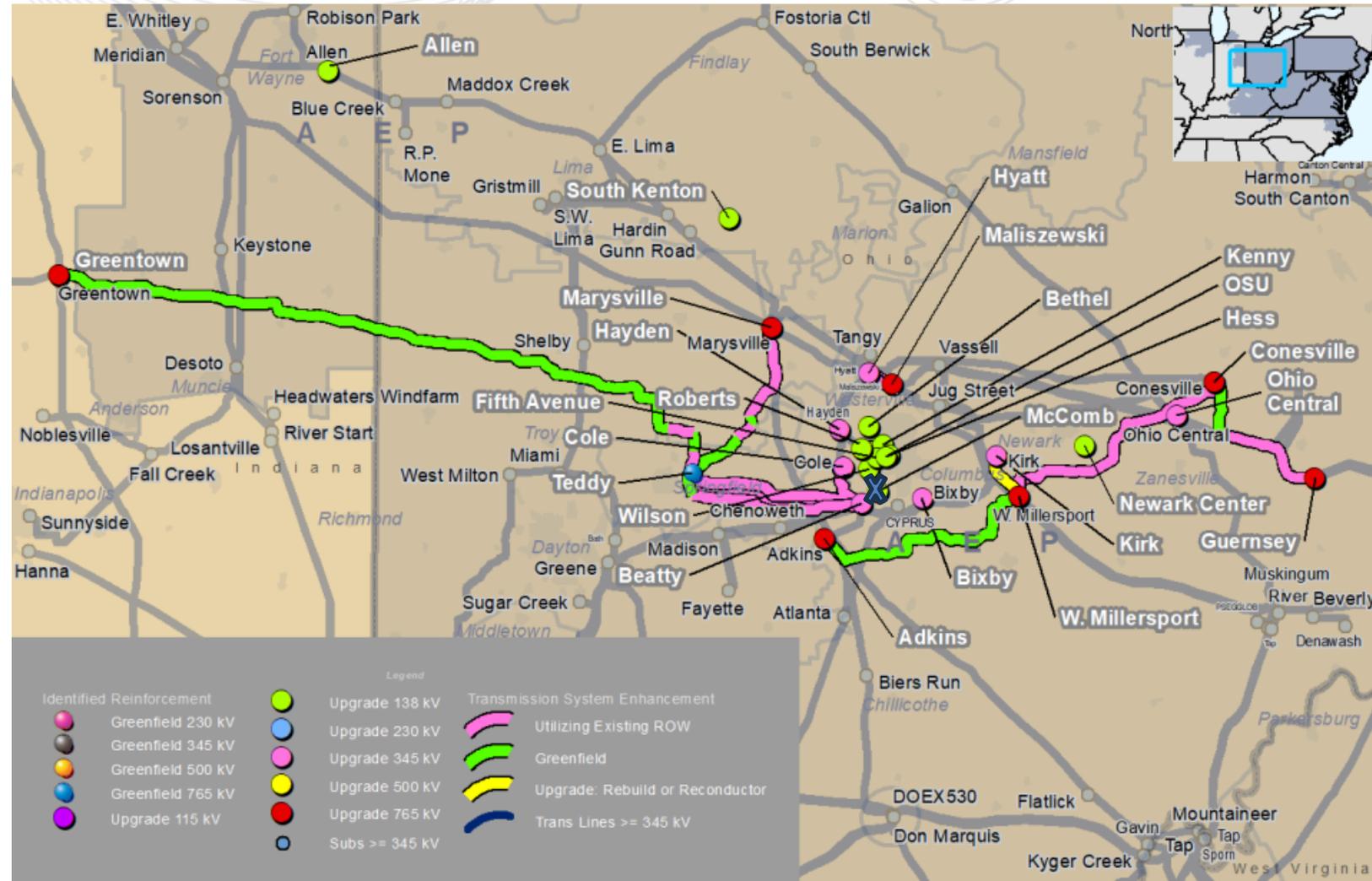
Recommended Solution: Modified Proposal 570

Details are in the following slides

Estimated Cost: \$2,768.0M

Required In-Service Date: 6/1/2030

Projected In-Service Date: In the following table





Recommended Solution: Modified Proposal 570

Baseline ID	Project Description	Estimated Cost (Millions)	Projected ISD
b4068.1	Greentown 765 kV substation scope (AEP) Create a new 765KV line position with three 100 Mvar single-phase reactors. Install two 765 kV circuit breakers.	\$ 45,294,123	10/31/2031
b4068.2	Greentown - Teddy 765 kV Line: Construct a 60 mile long 765kV AC overhead transmission line between the existing Greentown 765 kV substation and the proposed Teddy 765 kV Substation. (AEP Portion) The total line length is 137 miles of for the Greentown to Teddy 765 kV line.	\$ 356,218,094	10/31/2031
b4068.3	Greentown - Teddy 765 kV Line: Construct a 49.92 mile long 765kV AC overhead transmission line between the existing Greentown 765 kV substation and the proposed Teddy 765 kV Substation. (DAYTON Portion) The total line length is 137 miles of for the Greentown to Teddy 765 kV line.	\$ 179,979,584	10/31/2031
b4068.4	Greentown - Teddy 765 kV Line: Construct a 27.08 mile long 765kV AC overhead transmission line between the existing Greentown 765 kV substation and the proposed Teddy 765 kV Substation. (ATSI Portion) The total line length is 137 miles of for the Greentown to Teddy 765 kV line.	\$ 97,588,930	10/31/2031
b4068.5	Teddy 765/345 kV Substation Scope Construct a new 765/345KV greenfield substation interconnecting the new 765KV Marysville line and the new 765KV Greentown line with three 100 MVar single-phase reactors on each 765 kV line. Install nine 765 kV circuit breakers. Install two 765/345KV, 2250MVA transformer. Install nine 345 kV circuit breakers.	\$ 222,773,008	10/31/2030



Recommended Solution: Modified Proposal 570 (CONT')

Baseline ID	Project Description	Estimated Cost (\$)	Projected ISD
b4068.6	Teddy 765/345 kV Substation Install two 345KV capacitor banks at Teddy Substation	\$5,561,874	10/31/2030
b4068.7	Teddy - Marysville 765 kV: Construct a 35.4 mile long 765kV AC overhead transmission line between the proposed 765 kV Teddy substation and the existing 765 kV Marysville substation. (FE Portion)	\$45,501,757	10/31/2030
b4068.8	Teddy - Marysville 765 kV: Construct a 35.4 mile long 765kV AC overhead transmission line between the proposed 765 kV Teddy substation and the existing 765 kV Marysville substation. (AEP Portion)	\$130,956,276	10/31/2030
b4068.9	Marysville 765 kV Substation Scope Create a new 765KV line position. Install two 765KV circuit breakers. Create a new 765KV line position to relocate the existing 765KV Sorenson line. Install one 765KV circuit breaker. Add one 765/345KV, 2250MVA transformer.	\$112,013,419	10/1/2032
b4068.10	Marysville 765 kV Substation Add one 765KV STATCOM & Add two 345KV capacitor banks	\$169,815,905	10/31/2030
b4068.11	Teddy - Beatty single circuit 345 kV: Construct a new 18.66 mile long 345 kV line between the proposed Teddy 345 kV substation and existing Beatty 345 kV substation on a shared structure with Teddy - Cole single circuit 345 kV. (FE portion) The total length of Teddy - Beatty 345 kV circuit is 32 miles.	\$50,190,680	10/31/2030



Recommended Solution: Modified Proposal 570 (CONT')

Baseline ID	Project Description	Estimated Cost (\$)	Projected ISD
b4068.12	<p>Teddy - Beatty single circuit 345 kV: Construct a new 13.34 mile long 345 kV line between the proposed Teddy 345 kV substation and existing Beatty 345 kV substation on a shared structure with Teddy - Cole single circuit 345 kV. (AEP portion)</p> <p>The total length of Teddy - Beatty 345 kV circuit is 32 miles.</p>	\$37,402,130	10/31/2030
b4068.13	<p>Teddy - Cole single circuit 345 kV: Construct a new 18.66 mile long 345 kV line between the proposed Teddy 345 kV substation and existing Cole 345 kV substation on a shared structure with Teddy - Beatty single circuit 345 kV. (FE portion)</p> <p>The total length of Teddy - Cole 345 kV circuit is 41.7 miles.</p>	\$50,190,680	10/31/2030
b4068.14	<p>Teddy - Cole single circuit 345 kV: Construct a new 32 mile long 345 kV line between the proposed Teddy 345 kV substation and existing Cole 345 kV substation on a shared structure with Teddy - Beatty single circuit 345 kV. (AEP portion)</p> <p>The total length of Teddy - Cole 345 kV circuit is 41.7 miles.</p>	\$37,402,130	10/31/2030
b4068.15	<p>Teddy - Cole single circuit 345 kV: Install second circuit on the vacant side of the existing 9.7 mile long 345kV AC overhead transmission line between the existing Cole 345 kV Substation and the existing Beatty 345 kV Substation.</p> <p>The total length of Teddy - Cole 345 kV circuit is 41.7 miles.</p>	\$21,630,661	10/31/2030
b4068.16	<p>Cole 345 kV Substation Scope Create a new 345KV line position to interconnect the new 345KV Teddy line.</p>	\$1,000,000	10/31/2030
b4068.17	<p>Beatty 345 kV Substation Scope Create a new 345KV line position to interconnect the new 345KV Teddy line. Install two 345KV circuit breakers.</p>	\$3,857,100	10/31/2030



Recommended Solution: Modified Proposal 570 (CONT')

Baseline ID	Project Description	Estimated Cost (\$)	Projected ISD
b4068.18	Guernsey 765 kV Substation Scope Create a new 765KV line position to interconnect the new 765KV Conesville line. Install one 765KV circuit breaker.	\$5,541,762	10/31/2030
b4068.19	Guernsey - Conesville 765 kV: Construct a new 32 mile long single circuit 765 kV AC overhead transmission line between the existing Guernsey 765 kV Substation and the new 765 kV Conesville Substation.	\$166,168,865	10/31/2030
b4068.20	West Millersport Substation Scope Construct a new 765 kV West Millersport yard. Install four circuit breakers. Install one 765/345KV, 2250MVA transformer. Install one 345 kV circuit breaker.	\$118,108,319	10/31/2031
b4068.22	Ohio Center - Conesville 345 kV: Wreck Ohio Center - Conesville 345 kV circuit to facilitate the Conesville - West Millersport 765 kV line. Note: The cost for Conesville - West Millersport 765 kV is a different component	\$1,464,055	6/30/2028
b4068.23	Ohio Center - Bixby 345 kV: Wreck part of Ohio Center - Bixby 345 kV circuit around West Millersport 345 kV to facilitate the Conesville - West Millersport 765 kV line. Note: The cost for Conesville - West Millersport 765 kV is a different component	\$3,858,538	6/30/2028
b4068.21	Ohio Central 345 kV scope Retire a segment of the Bixby to Ohio Central 345 kV line and install approximately 3 miles of greenfield single circuit 345 kV line from structure 284 to West Millersport substation.	\$12,000,001	10/31/2031



Recommended Solution: Modified Proposal 570 (CONT')

Baseline ID	Project Description	Estimated Cost (\$)	Projected ISD
b4068.25	Bixby 345 kV Substation Scope New relaying at Bixby 345 kV substation.	\$75,000	10/31/2031
b4068.26	West Millersport - Adkins 765 kV: Construct a new 38 mile long single circuit 765kV AC overhead transmission line between the new 765 kV West Millersport substation and the new 765 kV Adkins substation.	\$201,833,315	10/31/2031
b4068.27	West Millersport - Kirk 345 kV: Rebuild 6.37 mile section of the double circuit West Millersport-Kirk 345kV circuit	\$24,300,000	10/31/2031
b4068.28	Hyatt - Maliszewski Double Circuit 345 kV: Rebuild 5.25 mile section of the double circuit Ohio Central - East Lima 345 kV line from Hyatt Station to Maliszewski Station. Rebuild portion of the Hyatt - Maliszewski 138 kV line	\$34,125,000	10/31/2031
b4068.29	Hayden - Cole 345 kV: Rebuild 7.89 mile of Beatty - Hayden 345 kV line.	\$37,872,000	10/31/2031
b4068.30	Newark 138 kV Center Station Scope Replace wavetrap and limiting bus conductor at Newark Center substation.	\$700,000	10/31/2031



Recommended Solution: Modified Proposal 570 (CONT')

Baseline ID	Project Description	Estimated Cost (\$)	Projected ISD
b4068.24	Ohio Central 138 kV scope Extend existing Ohio Central 345kV Extension by one span to cut into the existing Conesville - Newark Center 138kV line to loop the existing Conesville – Newark Center 138kV Line into Ohio Central Station by installing four new 3-pole steel pole structures.	\$3,500,001	10/31/2031
b4068.31	Allen 138 kV Substation Scope Replace bus conductor at Allen station.	\$50,000	10/31/2031
b4068.32	Roberts - Kenny 138kV Rebuild: Retire 3.18 miles Roberts - Kenny 138kV underground line and install new underground cable for increased require ratings.	\$66,364,219	10/31/2031
b4068.33	Wilson - Fifth Avenue 138kV line: Perform sag remediation on the Wilson - Fifth Avenue 138 kV line.	\$18,255,715	10/31/2031
b4068.34	Bethel 138 kV Substation Scope: Replace one 138KV circuit breaker.	\$500,000	10/31/2031
b4068.35	OSU 138 kV Station Scope: Replace one 138KV circuit breaker.	\$500,000	10/31/2031



Recommended Solution: Modified Proposal 570 (CONT')

Baseline ID	Project Description	Estimated Cost (\$)	Projected ISD
b4068.36	Hess 138 kV Substation Scope: Replace one 138KV circuit breaker to alleviate CT thermal limit.	\$700,000	10/31/2031
b4068.37	South Kenton 138 kV Substation scope: Replace line side disconnect switches and bus tie switch on East Lima line at South Kenton substation.	\$110,000	10/31/2031
b4068.38	Meadow Lake 345 kV Substation Scope: Replace four 345 kV circuit breakers.	\$4,000,000	10/31/2031
b4068.39	Conesville 765 kV Substation Scope: Upgrade the existing Conesville substation to include a 765 kV yard and expand the 345 kV yard. Install six 765 kV circuit breakers. Install one 765/345KV, 2250MVA transformer. Install one circuit 345 kV circuit breaker. Replace Wavetrap and circuit switcher in 138 kV yard.	\$140,968,702	10/31/2030
b4068.40	Conesville - West Millersport 765 kV: Construct a new 49.1 mile long single circuit 765kV AC overhead transmission line between the new Conesville 765 kV substation and the new West Millersport 765 kV substation.	\$243,654,861	10/31/2031
b4068.41	Adkins 765 kV Substation Scope Construct a 765KV yard at Adkins Substation. Install seven 765 kV circuit breakers. Install three 100MVar single-phase reactors on each 765 kV line.	\$102,977,072	10/31/2031



Recommended Solution: Modified Proposal 570 (CONT')

Baseline ID	Project Description	Estimated Cost (\$)	Projected ISD
b4068.42	Ohio Central Station Scope: Install two new 138 kV circuit breakers.	\$3,000,000	10/31/2031
b4068.43	Kammer Dumont Structures: Lower the existing Kammer to Dumont 765 kV line between structure 169 and 170 to facilitate crossing the proposed Conesville to Guernsey 765kV Line.	\$2,000,000	10/31/2030
b4068.44	Ohio Central - Fostoria Central Structure: Remove structure 10 and replace with lower structure to lower the line.	\$1,000,000	10/31/2031
b4068.45	Gavin - Marysville Structures: Raise the existing Gavin to Marysville 765kV line between structures 358 and 359 to facilitate crossing the proposed Teddy to Beatty 345kV Line.	\$3,000,000	10/31/2030
b4068.46	East Springfield - London Structures: Lower the existing First Energy East Springfield 138kV line between structures 29 and 30 on the proposed Teddy - Beatty 345kV Line.	\$1,000,000	10/31/2030
b4068.47	Beatty - Hayden Structures: Lower the existing Beatty - Hayden 345kV line between structures 2 and 3 to facilitate crossing the proposed Teddy – Beatty 345kV Line.	\$3,000,000	10/31/2030



Recommended Solution: Modified Proposal 570

Existing/Preliminary Ratings

Circuit	Existing Ratings (SN/SE/WN/WE) (MVA)	Preliminary Ratings (SN/SE/WN/WE) (MVA)
Greentown - Teddy 765 kV line	N/A	8197/8197/10350/10350
Teddy - Marysville 765 kV line	N/A	6625/6625/6625/6625
Teddy 765/345 kV Transformer 1	N/A	2240/2523/2565/2664
Teddy 765/345 kV Transformer 2	N/A	2240/2523/2565/2664
Marysville 765/345 KV Transformer 1	N/A	2240/2523/2240/2523
Teddy - Beatty 345 kV line	N/A	1894/2254/2103/2390
Teddy - Cole 345 kV line	N/A	1385/1385/1750/1750
Guernsey - Conesville 765 kV line	N/A	5300/5300/5300/5300
Conesville - West Millersport 765 kV line	N/A	5300/5300/5300/5300
Conesville 765/345 kV Transformer 1	N/A	2240/2523/2565/2664
West Millersport 765/345 kV Transformer 1	N/A	2240/2523/2565/2664
West Millersport - Adkins 765 kV line	N/A	6600/6600/6625/6625
Meadowbrook - Reynolds 345 kV line 1	1868/1868/2315/2315	1859/2246/2347/2387
Meadowbrook - Reynolds 345 kV line 2	1868/1868/2315/2315	1868/2246/2315/2315
Kenny - Roberts 138 kV line	213/311/221/318	282/377/356/429
Newark Center - Conesville 138 kV line	N/A	348/407/431/477
Bixby - West Millersport 345KV line	N/A	1385/1841/1750/2092
West Millersport - Kirk 345 kV line	1132/1132/1437/1437	1385/1790/1750/1790
Wilson - Fifth Ave 138 kV line	219/223/227/281	223/310/281/349
Fifth Ave - Hess South 138 kV line	187/207/207/207	187/240/247/285
Hayden - Cole 345 kV line	1409/1409/1781/1781	1385/1503/1750/2092
Hyatt - HyattSW2 345 kV line	971/1419/1234/1585	1385/1841/1750/2092
HyattSW2 - Maliszewski 345 kV line	1483/1690/1875/2137	1483/1841/1875/2092
Allen - Tillman 138 kV line	293/341/370/406	323/451/408/506
South Kenton - Lynn 138 kV line	164/180/185/185	185/185/185/185

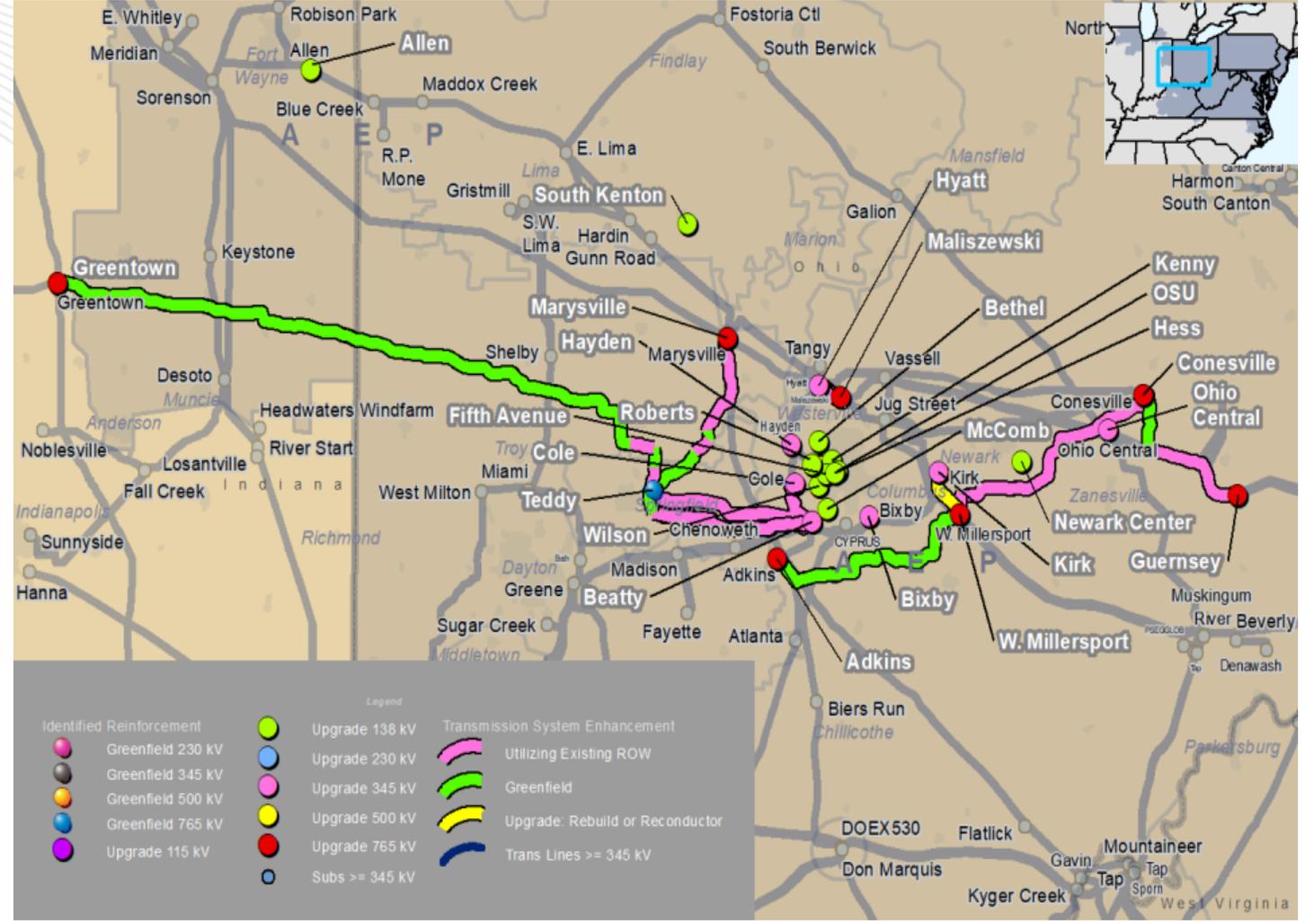


2025 Window 1 Cost Summary

MAAC Regional Cluster Solution - NextEra/Exelon Proposal 2025-W1-237			
PJM Proposal ID	Component Title	Proposed Cost (\$M)	Independent Cost (\$M)
237	Kammer - Buttermilk Falls 765kV	\$694.72	\$718.20
237	Buttermilk Falls - Mountain Stone 765kV	\$633.35	\$680.40
237	Mountain Stone-Juniata 500kV	\$5.32	\$6.84
237	Mountain Stone 765kV Substation	\$166.94	\$134.01
237	Buttermilk Falls 765kV Substation	\$170.29	\$178.88
237	South Bend - Keystone 500kV terminal equipment upgrade	\$4.68	\$4.39
237	Keystone-Juniata 500 kV terminal equipment upgrade	\$4.68	\$4.39
237	Mountaineer-Belmont 765 kV terminal equipment upgrade	\$6.75	\$6.35
237	Kammer substation upgrade	\$13.50	\$14.56
237	Juniata substation upgrade	\$9.95	\$20.96
237	Sunbury 500 kV substation upgrades	\$4.98	\$7.43
237	Conemaugh circuit breaker upgrades	\$23.42	\$20.92
Total Cost Estimate		\$1,738.59	\$1,797.32



West Regional Cluster Solution - Transource/FE Proposal 2025-W1-570 (Modified)		
Component Title	Proposed Cost (\$M)	Independent Cost (\$M)
Greentown Station Expansion	\$45.29	\$45.29
Greentown - Teddy 765 kV Line	\$633.79	\$863.10
Teddy 765/345 kV Station	\$228.33	\$265.15
Teddy - Marysville 765 kV	\$176.46	\$223.02
Marysville Station Upgrade	\$281.83	\$309.52
Teddy - Beatty DCT 345 kV	\$175.19	\$246.46
Cole Station Upgrade	\$1.00	\$2.26
Beatty Station Upgrade	\$3.86	\$4.71
Guernsey Station Upgrade	\$5.54	\$22.93
Guernsey - Conesville 765 kV	\$166.17	\$201.60
West Millersport Station Upgrade	\$118.11	\$114.52
Bixby - West Millersport 345 kV	\$12.00	\$17.67
Bixby Station Upgrade	\$0.08	\$0.14
West Millersport - Adkins 765 kV	\$201.83	\$263.97
West Millersport - Kirk 345 kV	\$24.30	\$35.85
Hyatt - Maliszewski Double Circuit 345 kV	\$34.13	\$30.21
Hayden - Cole 345 kV	\$37.87	\$36.04
Newark Center Station Upgrade	\$0.70	\$0.70
Ohio Central Extension	\$3.50	\$3.07
Allen Station Upgrade	\$0.05	\$0.07
Roberts - Kenny 138kV Rebuild	\$66.36	\$44.05
Wilson - Fifth Avenue 138kV line	\$18.26	\$1.23
Bethel Station Upgrade	\$0.50	\$0.88
OSU Station Upgrade	\$0.50	\$0.88
Hess 138 kV Station Upgrade	\$0.70	\$1.25
South Kenton Station	\$0.11	\$0.96
Meadow Lake Station Circuit Breaker	\$4.00	\$5.48
Teddy - Cole 345 kV #2 Circuit	\$21.63	\$6.30
Conesville Station Expansion	\$140.97	\$150.86
Conesville - West Millersport 765 kV	\$248.98	\$309.33
Adkins Station Expansion	\$102.98	\$188.15
Ohio Central Station Upgrade	\$3.00	\$1.87
Kammer Dumont Structures	\$2.00	\$6.07
Ohio Central - Fostoria Central Structure	\$1.00	\$0.86
Gavin - Marysville Structures	\$3.00	\$2.21
East Springfield - London Structures	\$1.00	\$1.96
Beatty - Hayden Structures	\$3.00	\$2.04
Total Cost Estimate	\$2,768.00	\$3,410.66



Category	Proposal Cost Estimate (\$M)	Independent Cost Estimate (\$M)
In-Zone Related Total	\$2,303.60	N/A
West Regional Cluster Solution	\$2,768.00	\$3,410.66
MAAC Regional Cluster Solution	\$1,738.59	\$1,797.32
South Regional Cluster Solution	\$4,832.45	\$5,026.47
Regional Transfer Related Total	\$9,339.05	\$10,234.45
2025 RTEP Total	\$11,642.64	

Cancellations



b3737.23 Cancellation: Richmond-Waneeta 230 kV Underground Rebuild

B3737.23: Previously presented at 11/4/2022 TEAC

Criteria: Summer & Winter Generator Deliverability

Problem Statement:

The Richmond-Waneeta 230 kV line is overloaded for an N-1 outage, and the Cardiff-Lewis 138 kV, Lewis No. 2-Lewis No. 1 138 kV and Cardiff-New Freedom 230 kV lines are overloaded for N-2 outages.

Recommended Solution: Option 1a – Proposal 127 (Partial)

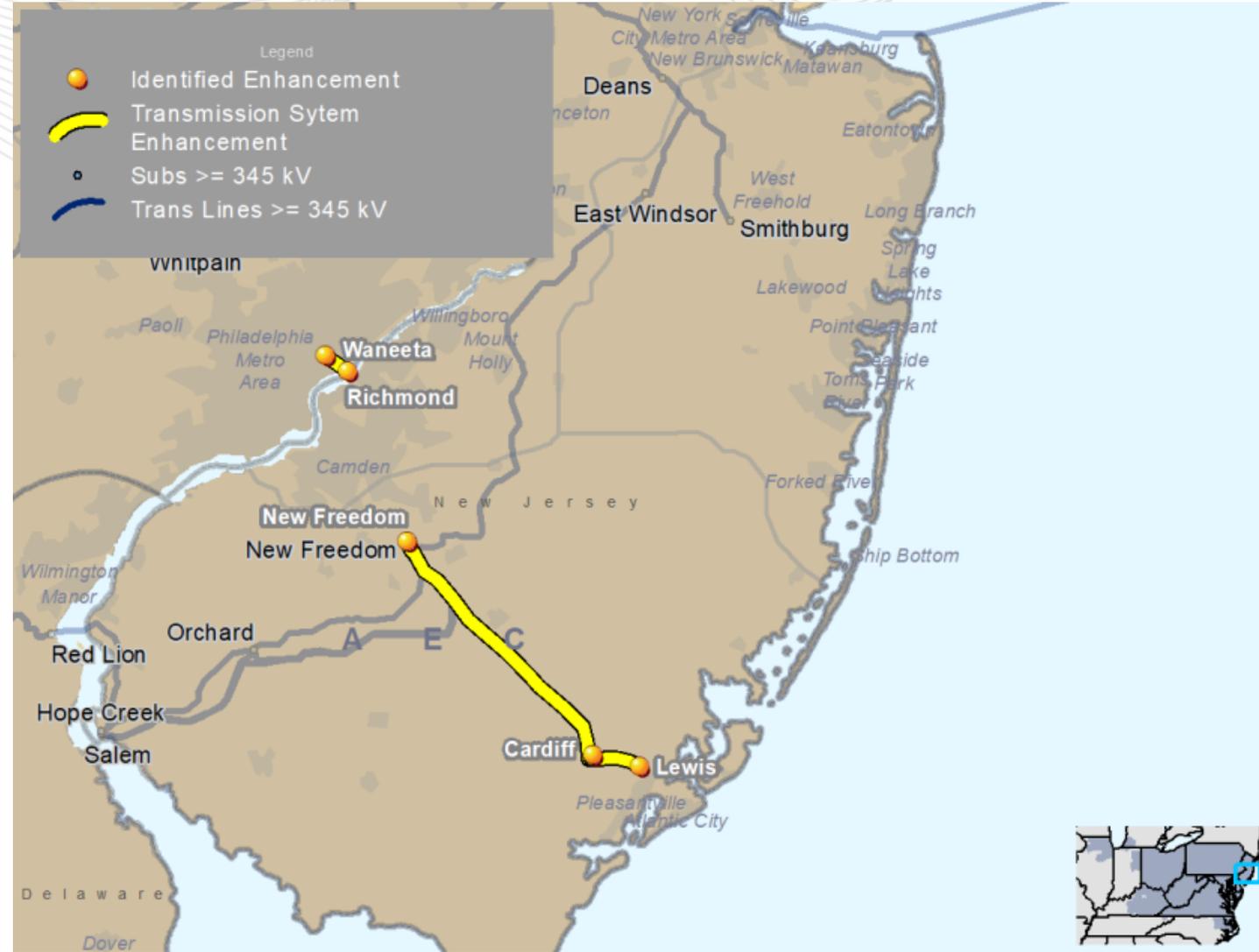
- Rebuild the underground portion of Richmond-Waneeta 230 kV (0.95 miles) (b3737.23)

Required IS Date (b3737.23): 6/1/2029

Estimated Cost (b3737.23): \$16 M

Reason for Cancellation: PJM Board-approved Project b3907.2 (2024 Window 1, Proposal 12) to rebuild the entire Richmond to Waneeta 230 kV line, including both the 0.95 miles underground portion, and 2.23 miles overhead portion, supersedes b3737.23 with higher ratings. b3907.2 has a total cost of \$29.4M, and a projected in-service date of 6/1/2029.

The NJ BPU concurs with the NJ SAA Project b3737.23 cancellation.





b3983.1 Cancellation: Ringgold 138 kV Breaker "138 BUS TIE" Replacement

B3983.1: Previously presented at 11/14/2025 SRRTEP-West

Criteria: Short Circuit

Assumption Reference: 2025 RTEP assumptions

Model Used for Analysis: 2025 Series RTEP 2030 Short Circuit base case

Proposal Window Exclusion: Below 200 kV

Problem Statement:

2025-W1-SC-77: In the 2030 RTEP Short Circuit base case, the Ringgold 138 kV breaker "138 BUS TIE" is identified as overloaded.

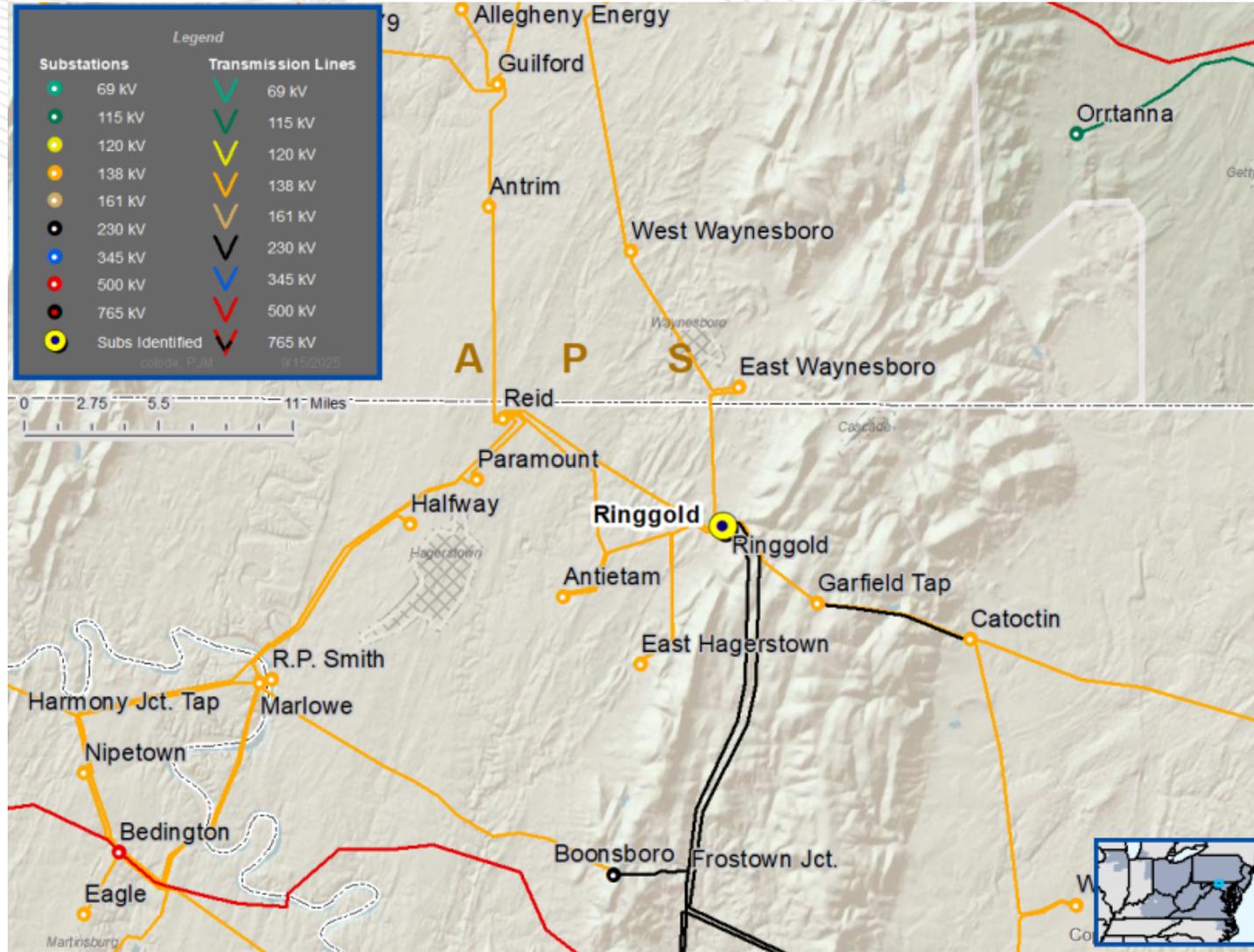
Recommended Solution:

Replace the overloaded Ringgold 138 kV circuit breaker "138 BUS TIE" with a 40 kA circuit breaker. **(b3983.1)**

Required IS Date: 6/1/2030

Estimated Cost: \$0.957M

Reason for Cancellation: Reactivated Project b2743.8 (9A West) to replace Ringgold Substation 138 kV breakers '138 BUS TIE' and 'RCM0' with 40 kA breakers, supersedes the b3983.1 project.





2022 Window 3 Project Cost & Progress Update



NextEra MidAtlantic Resiliency Link 'MARL' Project Summary (following August 2024 Board Approved Scope Changes)

502 Jct – Woodside 500 kV (NextEra MARL Projects)

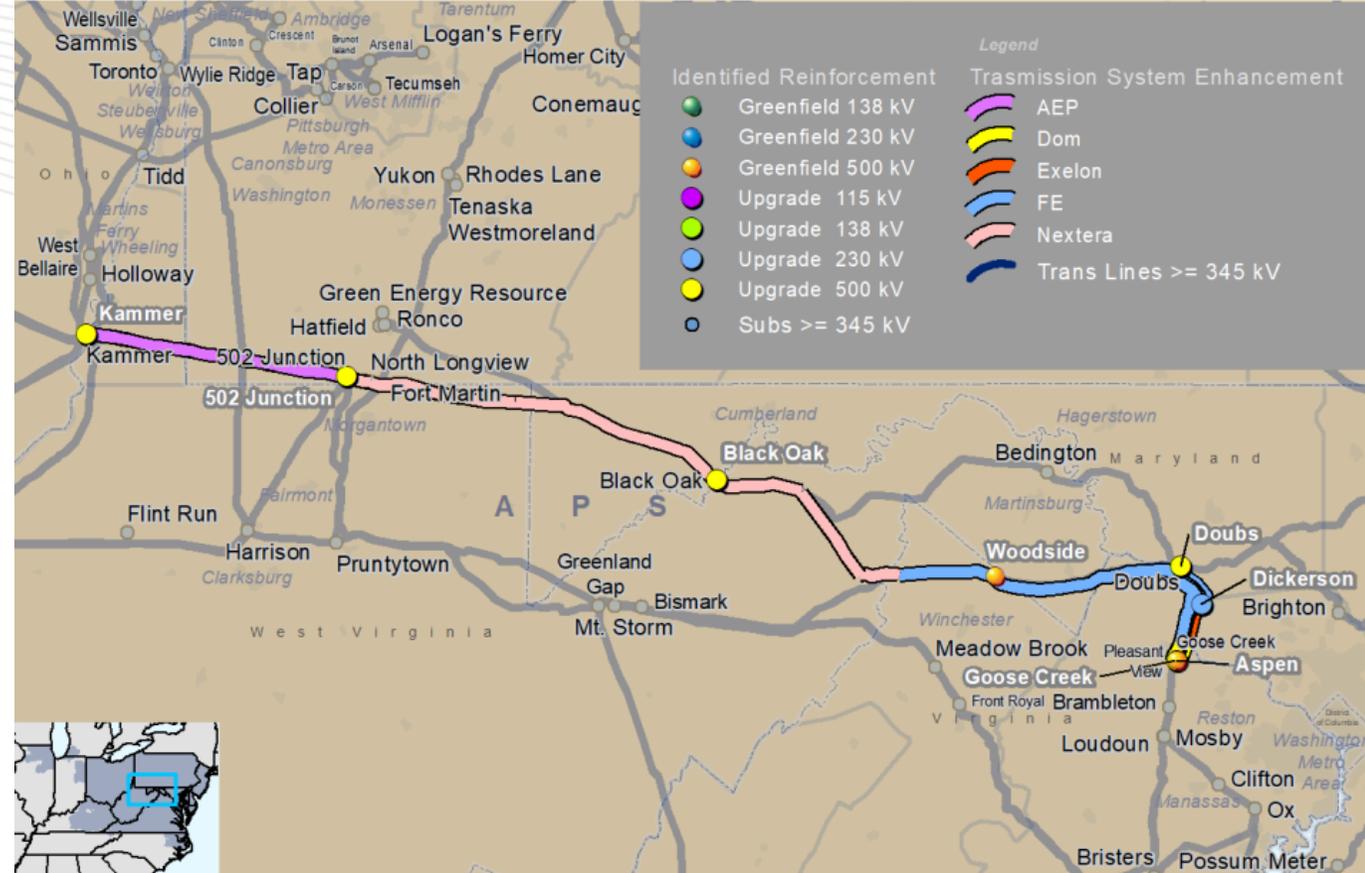
- **b3800.102:** New 500 kV line from existing 502 Junction substation to the demarcation point between FE/NEET around Gore substation (bypass Black Oak) (NEET Portion) - \$315.65M
- **b3800.106 – b3800.110:** Woodside substation adjacent to existing Stonewall 138 kV substation - \$80.04M
- **b3800.113, b3800.115, b3800.117:** Woodside reactive components, and NEET scope for Doubs to Bismark line terminations into Woodside - \$45.26M

Total Cost Estimate: \$440.95M

PJM Independent Cost Estimate: \$832.52M (Basis for security required in NextEra MARL Project Designated Entity Agreement 'DEA')

Project Cost Cap: \$440.95M (threshold above which NextEra will earn reduced ROE per their cost containment commitment)

All cost estimates expressed in 2023\$



502 Jct – Woodside 500 kV (NextEra MARL Projects)

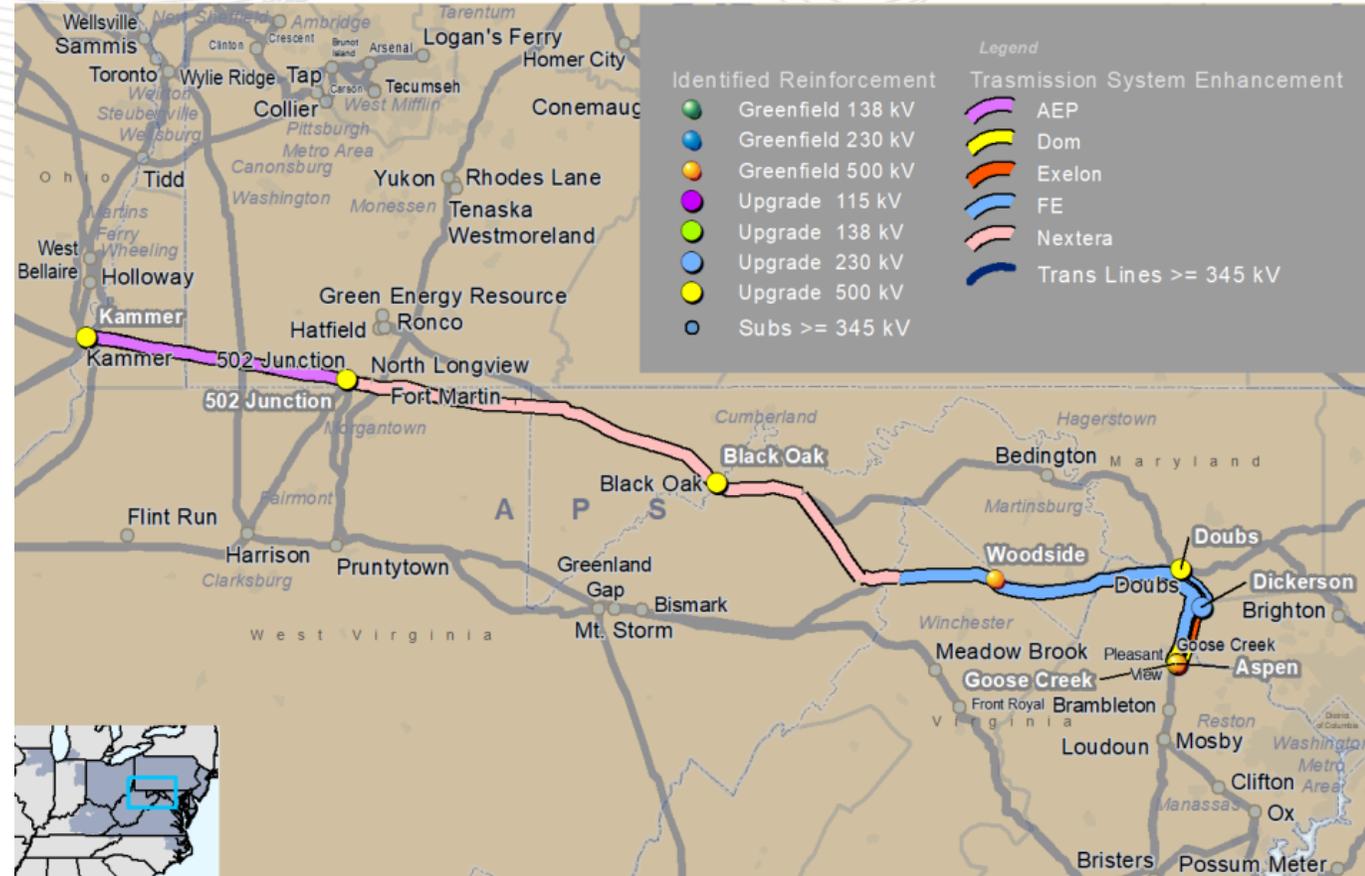
- **b3800.102:** New 500 kV line from existing 502 Junction substation to the demarcation point between FE/NEET around Gore substation (bypass Black Oak) (NEET Portion) - ~~\$315.65M~~ **\$632.60M**
- **b3800.106 – b3800.110:** Woodside substation adjacent to existing Stonewall 138 kV substation - ~~\$80.04M~~ **\$130.10M**
- **b3800.113, b3800.115, b3800.117:** Woodside reactive components, and NEET scope for Doubs to Bismark line terminations into Woodside - ~~\$45.26M~~ **\$82.10M**

Total Cost Estimate: ~~\$440.95M~~ **\$844.80M**

PJM Independent Cost Estimate: **\$832.52M** (Basis for security required in NextEra MARL Project DEA) **Unchanged**

Project Cost Cap: **\$440.95M** (threshold above which NextEra will earn reduced ROE per their cost containment commitment) **Unchanged**

All cost estimates expressed in 2023\$



Rationale for NextEra MARL Project Cost Increases

- NextEra's current cost estimate of the MARL Project is informed by detailed 30% design and engineering, which identified necessary changes to project components compared to original planning level analysis.
- Such changes were driven by refinements to project route alternatives and engineering assessments of substation site conditions, among other factors.
- Actual vendor quotes received through competitive bidding for long lead time equipment have been higher than budgetary quotes received during the conceptual design phase.
- In-depth market analyses were performed to calculate fair market value for land rights and adjusted to incentivize voluntary transactions.
- NextEra estimates an additional \$115.4 million of contingency to cover risk-based costs, including potential route changes and market uncertainty.
- These cost increases do not affect NextEra's cost containment commitment to original Project Cost Caps specified in the NextEra MARL Project DEA.

- The following milestones have been achieved on NextEra's MARL Project:
 - NextEra performed extensive community outreach and received over 1,200 comments from surveys and open houses for consideration. In addition, NextEra conducted more than 300 meetings with local stakeholders and landowners that have resulted in substantial modifications to the proposed route to address landowner and community concerns and minimize environmental and community impacts.
 - NextEra refined multiple preliminary draft route options to a proposed route and five alternative routes that incorporate extensive public and stakeholder input.
 - Frederick County, Virginia issued a determination that the Woodside Substation is consistent with the county's plans (i.e., a 2232 Consistency Determination), and NextEra accelerated the in-service date for the substation from December 2031 to December 2028, which is reflected in the amended NextEra MARL Project DEA milestones.
 - Project is on track to submit applications in January 2026 to the commissions in Pennsylvania, West Virginia, Maryland, and Virginia to meet DEA in-service dates.



15 Year Analysis Result



15 Year Analysis Result – 2025 RTEP

- Objective:
 - Identify long lead needs (≥ 230 kV) to support projected load growth in years 6 through 15.

- Result:
 - 25 potential overloads at 230 kV/345 kV in years 6 through 10.
 - One potential overloads at 500 kV in years 15.

- Solution:
 - No long-lead solutions needed for the identified potential violations.
 - Performed comprehensive scenario-based analysis to incorporate broader variables beyond the traditional approach for a more robust long-term assessment

Season	Contingency	From Bus	From Name	To Bus	To Name	CKT	KVs	Areas	100% Year
Summer	Single	314522	6CHCKTUK	313818	6BENCHRCH	1	230/230	345/345	2031
Summer	Single	231001	EDGE MR 5	231000	CLAY_230	1	230/230	235/235	2032
Summer	Single	231001	EDGE MR 5	214236	LINWOOD85	1	230/230	235/230	2033
Summer	Single	270747	ESS W407K;OT	270753	ESS W407M;OT	1	345/345	222/222	2033
Summer	Single	270733	ELECT JCT;3R	270747	ESS W407K;OT	1	345/345	222/222	2033
Summer	Single	214220	CHIREACT_39	213490	CHICHST2	1	230/230	230/230	2033
Summer	Single	313818	6BENCHRCH	313866	6COPELAND	1	230/230	345/345	2032
Summer	Single	270753	ESS W407M;OT	270813	LOMBARD ;2R	1	345/345	222/222	2034
Summer	Single	208012	LMBE	208025	MACR	1	230/230	229/229	2033
Summer	Single	213519	CONOWG01	231006	COLOR_PE	1	230/230	230/235	2033
Summer	Single/Tower	245769	05ADKINS	243453	05BEATTY	1	345/345	205/205	2032
Summer	Single	314540	6POOLSVL	314421	6WINCHST	1	230/230	345/345	2033
Summer	Single	314398	6NP NEWS	314407	6SHELBNK	1	230/230	345/345	2035
Summer	Single	314929	8FRONT ROYAL	314916	8MORRSVL	1	500/500	345/345	2040
Summer	Tower	288572	05ORAORA	243229	05OLIVE	1	345/345	205/205	2032
Summer	Tower	242938	05MARQUI	246888	05BIERSR	1	345/345	205/205	2032
Winter	Single	242865	05JEFRSO	248000	06CLIFTY	1	345/345	205/206	2031
Winter	Single	270694	CHERRY VA; B	270883	SILVER LK; R	1	345/345	222/222	2035
Winter	Single	316171	6POCATY	314481	6LANDSTN	1	230/230	345/345	2032
Winter	Single	314766	6LOUISA	313425	6FOXBRKLN	1	230/230	345/345	2032
Winter	Single	313425	6FOXBRKLN	313930	6SOUTHALL	1	230/230	345/345	2032
Winter	Single	314777	6S ANNA	313052	6DESPER	1	230/230	345/345	2033
Winter	Single	313052	6DESPER	313046	6LOUISA PUMP	1	230/230	345/345	2033
Winter	Single	313046	6LOUISA PUMP	314766	6LOUISA	1	230/230	345/345	2033
Winter	Tower	208120	SU10	208113	SUSQ	1	230/230	229/229	2034
Light Load	Single	314287	6CHESTF B	314260	6VARINA	1	230/230	345/345	2031

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Reliability Analysis Update



Member Hotline

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(866) 400 – 8980

custsvc@pjm.com

Version No.	Date	Description
1	Jan. 2, 2026	<ul style="list-style-type: none"> Initial slides posted
2	Jan. 5, 2026	<ul style="list-style-type: none"> Slides #75 – 79, Added Appendix I Slide #80, Changed original Appendix to Appendix II Slide #71, Updated the table Slide #51, Updated Projected IS Date for b4068.22 and .23

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Appendix 1:

2025 RTEP Window 1 Constructability and Cost Risk Assessments



South Regional Projects - Constructability Risk Assessment

South Regional Projects - Constructability Risk Assessment

Proposal ID	Proposing Entity	Proposal Description	Proposal Cost Estimates	Independent Cost Estimates	Cost Estimate Risks	Cost Containment Risks	Schedule Risks	Constructability Risks	ROW/Land Acquisition Risks	Outage Coordination Risks	Proposing Entity Experience & Capability Risk	Proposed ISD	New HVDC (Miles)	New 765 kV (Miles)	New 500 kV (Miles)	New EHV Total (Miles)	New EHV Greenfield (Miles)
275	VEPCO	HVDC backbone - Portfolio 1A	\$4,819.51	\$5,013.49	Low	Medium-High	Low-Medium	Low-Medium	Low	Low-Medium	Medium-High	6/1/2032	185	0	32.05	217.05	0
705	VEPCO	765kV backbone - Portfolio 2A	\$2,864.73	\$2,534.62	Low	Medium-High	Medium-High	Medium-High	High	Low-Medium	Medium	6/1/2032	0	152.3	95.01	247.31	210.8
616	VEPCO	500kV backbone - Portfolio 3	\$2,454.11	\$2,169.69	Low	Medium-High	Medium	Medium	Medium	Low-Medium	Low	6/1/2032	0	0	266.58	266.58	135.21
260	LS Power	Virginia Transmission Project	\$3,515.95	\$3,299.64	Low	Medium	High	High	High	Low	Low	6/1/2030	0	0	468.8	468.8	468.8
331	Transource/FE	Virginia Area Seven Year Solution 1	\$2,895.32	\$3,156.93	Low	Medium	Medium-High	Medium-High	Medium-High	Medium	Low	6/1/2031	0	211.2	100.5	311.7	311.7
781	Transource/FE	Virginia Area Seven Year Solution 2	\$1,959.44	\$2,140.08	Low	Medium	Medium-High	Medium-High	Medium-High	Low-Medium	Low	10/1/2032	0	137.6	100.5	238.1	238.1
938	Transource/FE	Dominion Regional Solution	\$3,426.93	\$3,600.49	Low	Medium	High	Medium-High	High	Low	Low	6/1/2030	0	374	36	410	410



MAAC - PPL Projects - Constructability Risk Assessment

MAAC - PPL Projects - Constructability Risk Assessment

Proposal ID	Proposing Entity	Proposal Description	Proposal Cost Estimate (\$M)	Independent Cost Estimate (\$M)	Cost Estimate Risks	Cost Containment Risks	Schedule Risks	Constructability Risks	ROW/Land Acquisition Risks	Outage Coordination Risks	Proposing Entity Experience & Capability Risk	Proposed ISD	New HVDC (Miles)	New 765 kV (Miles)	New 500 kV (Miles)	New EHV Total (Miles)	New EHV Greenfield (Miles)
853	PPL	Portfolio Proposal 3: Year 2032 + 4 GW Area 229 Essential Reliability Solution	\$797.94	\$917.20	Low-Medium	Low	Low	Low	Low-Medium	Low-Medium	Low	6/1/2030	0	0	93	93	42
290	PPL	Siegfried - Drakestown 500 kV line (PA segment)	\$88.16	\$32.44	Low	Low	Low	Low	Low	Low	Low	5/1/2030	0	0	24	24	0
552	PPL Translink	Siegfried - Drakestown 500 kV line (brownfield NJ segment route)	\$194.25	\$185.17	Low	High	Medium	Medium	Medium-High	Low	Low	5/1/2030	0	0	20	20	20
771	NextEra/Exelon	Montour to Slykerville Reinforcement	\$539.25	\$637.66	Low-Medium	Medium	Medium	Medium	Medium-High	Low	Low	12/1/2030	0	0	26	26	26
871	NextEra/Exelon	Blockhouse Creek to Susquehanna and Montour to Stoney Creek	\$1,136.38	\$1,408.26	Low-Medium	Medium	Medium	Medium	High	Low	Low	12/1/2030	0	0	65	65	65
20	LS Power	Tri-Segment 500kV Transmission Project	\$494.29	\$692.85	Medium	Medium	Medium	Medium	Medium-High	Low	Low	6/1/2030	0	0	46.3	46.3	46.3



MAAC Regional Projects - Constructability Risk Assessment

MAAC Regional Projects - Constructability Risk Assessment

Proposal ID	Proposing Entity	Proposal Description	Proposal Cost Estimate (\$M)	Independent Cost Estimate (\$M)	Cost Estimate Risks	Cost Containment Risks	Schedule Risks	Constructability Risks	ROW/Land Acquisition Risks	Outage Coordination Risks	Proposing Entity Experience & Capability Risk	Proposed ISD	New HVDC (Miles)	New 765 kV (Miles)	New 500 kV (Miles)	New EHV Total (Miles)	New EHV Greenfield (Miles)
237	NextEra/Exelon	Kammer to Juniata	\$1,738.59	\$1,797.32	Low	Medium	Medium	Medium	Medium-High	Low	Low-Medium	6/1/2031	0	222	1.2	223.2	223.2
687	NextEra/Exelon	Kammer to Juniata to Spicewood 765 kV	\$3,238.71	\$3,537.17	Low	Medium	Medium-High	Medium-High	Medium-High	Low	Low-Medium	12/1/2031	0	322	27.2	349.2	349.2
578	MAITLIT	PPL Load Addition Proposal - Keystone - Susquehanna Dual 500 kV Single Circuits with Jack's Mt.	\$2,389.93	\$2,648.18	Low	Medium-High	Medium-High	Medium-High	Medium-High	Medium	Low	6/1/2030	0	0	408	408	408



West Regional Projects - Constructability Risk Assessment

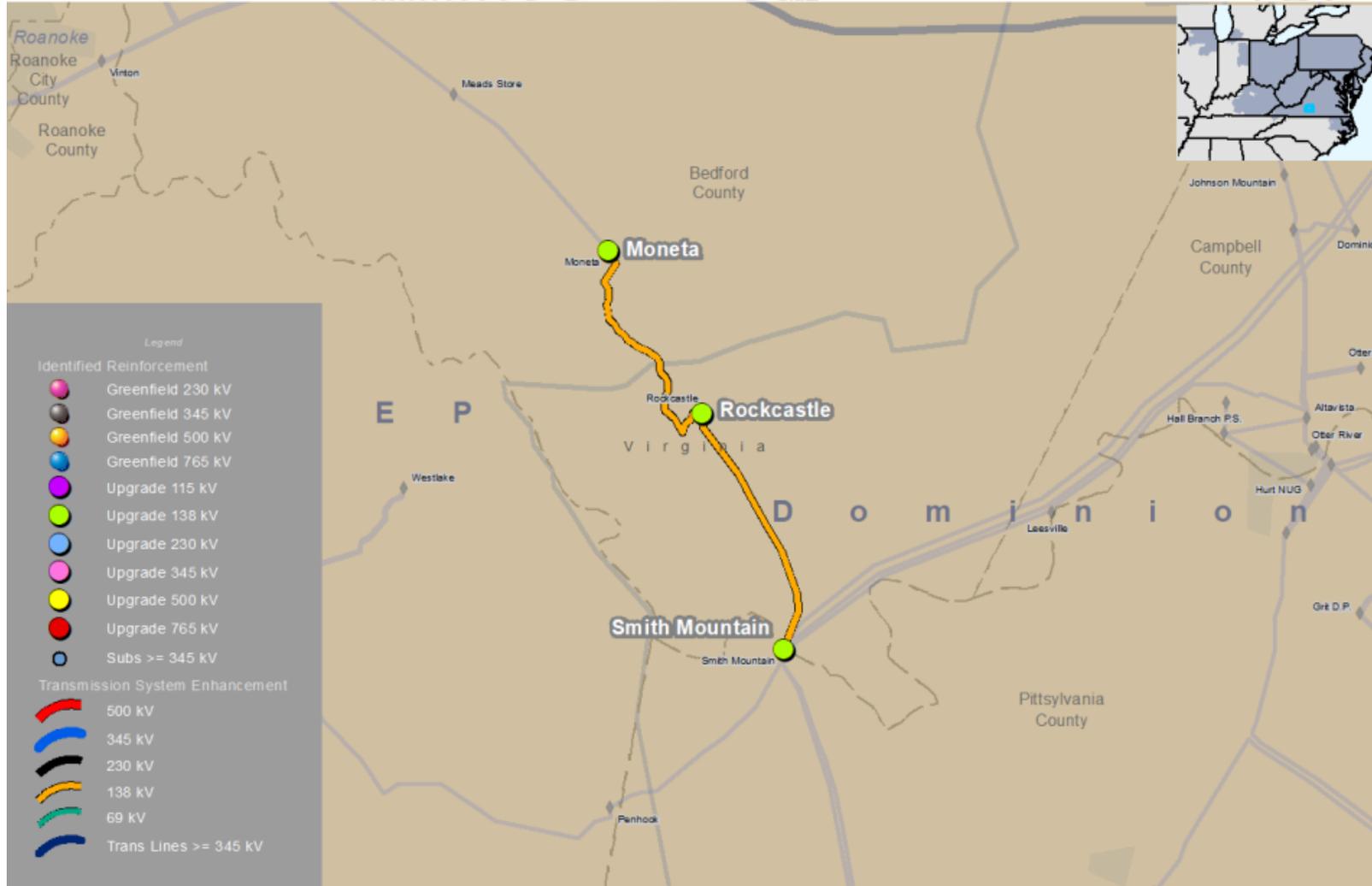
West Regional Projects - Constructability Risk Assessment

Proposal ID	Proposing Entity	Proposal Description	Proposal Cost Estimate (\$M)	Independent Cost Estimate (\$M)	Cost Estimate Risks	Cost Containment Risks	Schedule Risks	Constructability Risks	ROW/Land Acquisition Risks	Outage Coordination Risks	Proposing Entity Experience & Capability Risk	Proposed ISD	New HVDC (Miles)	New 765 kV (Miles)	New 345 kV (Miles)	New EHV Total (Miles)	New EHV Greenfield (Miles)
239	Transource/FE	345 kV Solution Phase 1 and Phase 2	\$1,492.41	\$2,035.48	Medium	Medium	Medium	Medium	Medium-High	Low	Low	6/1/2030	0	119	69.6	188.6	132.5
334	Transource/FE	West Glade Run 765/345 kV Solution	\$1,690.26	\$2,353.66	Medium	Medium	Medium	Medium	Medium-High	Low	Low	6/1/2030	0	119	97.3	216.3	177.2
570	Transource/FE	Ohio Seven Year Solution	\$2,775.19	\$3,418.68	Low-Medium	Medium	Medium	Medium	Medium-High	Low	Low	10/1/2031	0	291.5	35	326.5	277.4
109	NextEra/Exelon	Muckshaw - Johnstown 765kV	\$3,402.57	\$4,170.25	Low-Medium	Medium	Medium-High	Medium-High	High	Low	Low-Medium	6/1/2031	0	290	61.5	351.5	351.5
152	NextEra/Exelon	Gwynneville - Johnstown 765kV	\$2,921.53	\$4,087.27	Medium	Medium	Medium-High	Medium-High	High	Low	Low-Medium	12/1/2031	0	216	65	281	281
619 & 241	PSEGRT/AES Ohio/PPL	345kV Solution + 765kV Solution (Alternative) + STATCOM Solution (Add-on)	\$2,086.01	\$2,425.51	Low-Medium	Low-Medium	Medium	Medium-High	High	Low-Medium	Medium	6/1/2032	0	145.8	28.7	174.5	174.5
543	LS Power	Greene - South Bird Transmission Project	\$121.45	\$157.56	Medium	Medium	Low-Medium	Medium	High	Low	Low	6/1/2030	0	0	21.6	21.6	21.6

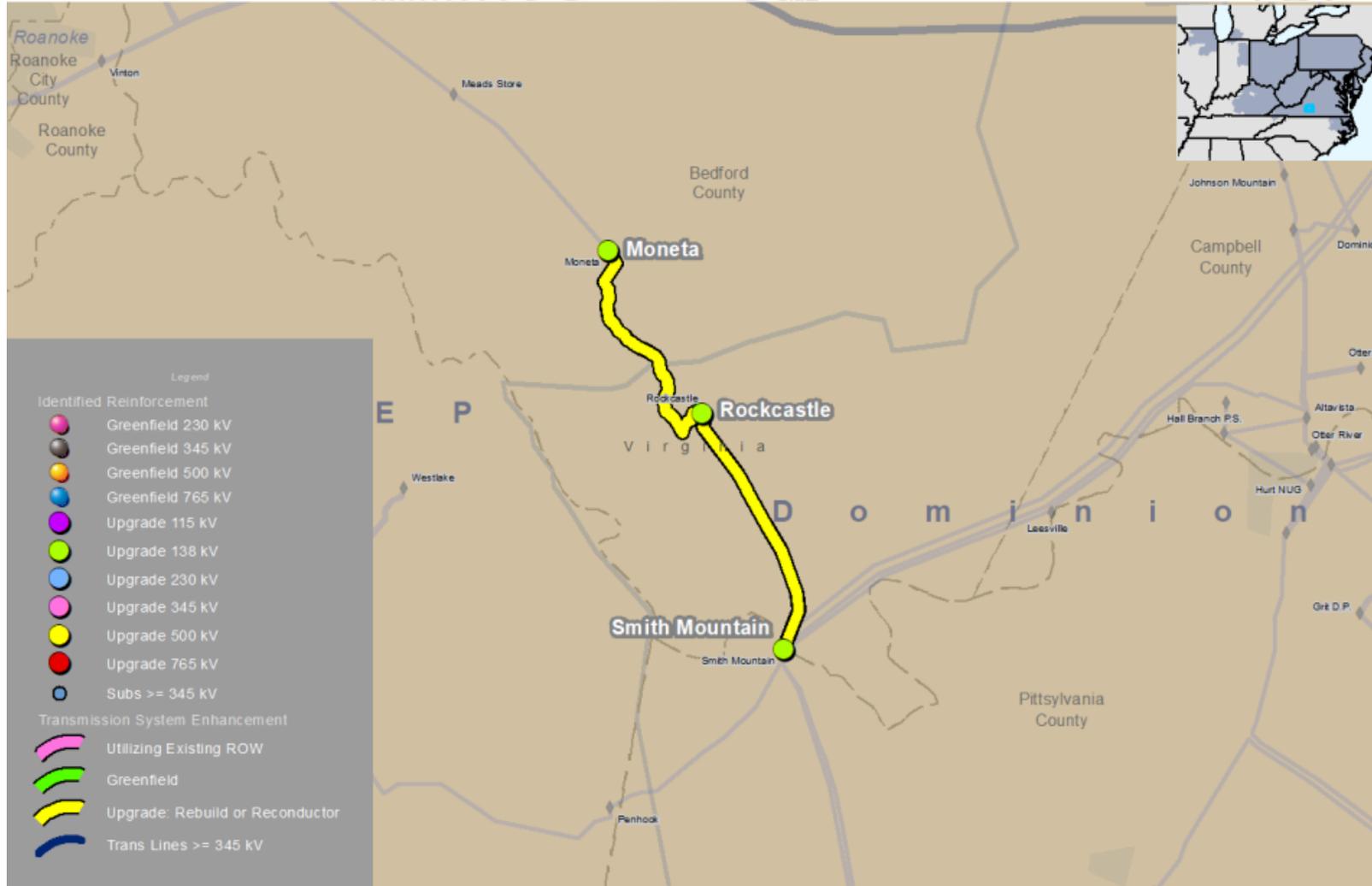
Appendix 2: Proposal Maps

Note: These maps are only intended to illustrate the general electrical connectivity of the projects and should not be relied upon for exact geographical substation locations, line routes, or scope of work.

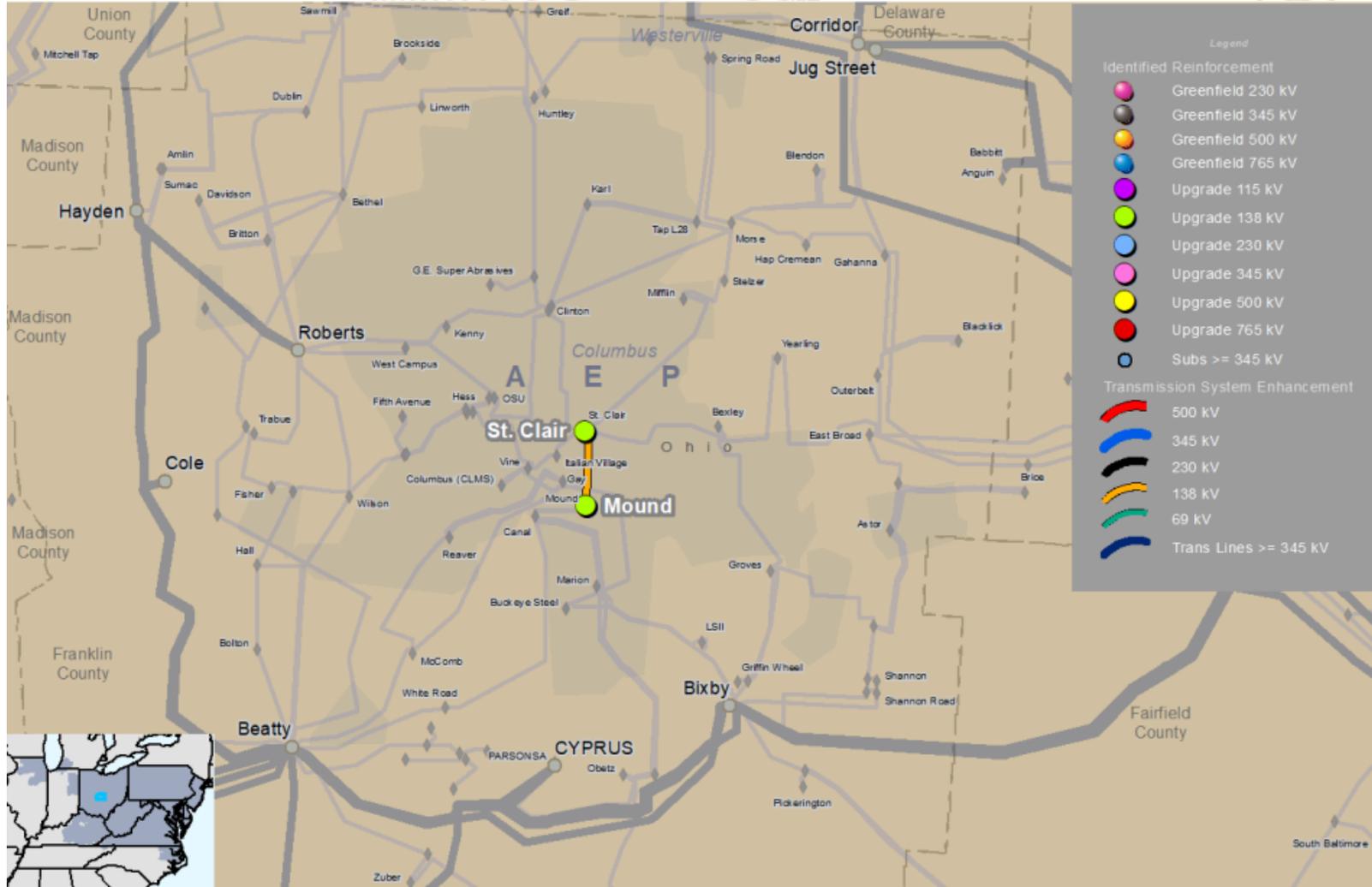
AEPSCT (AEP)



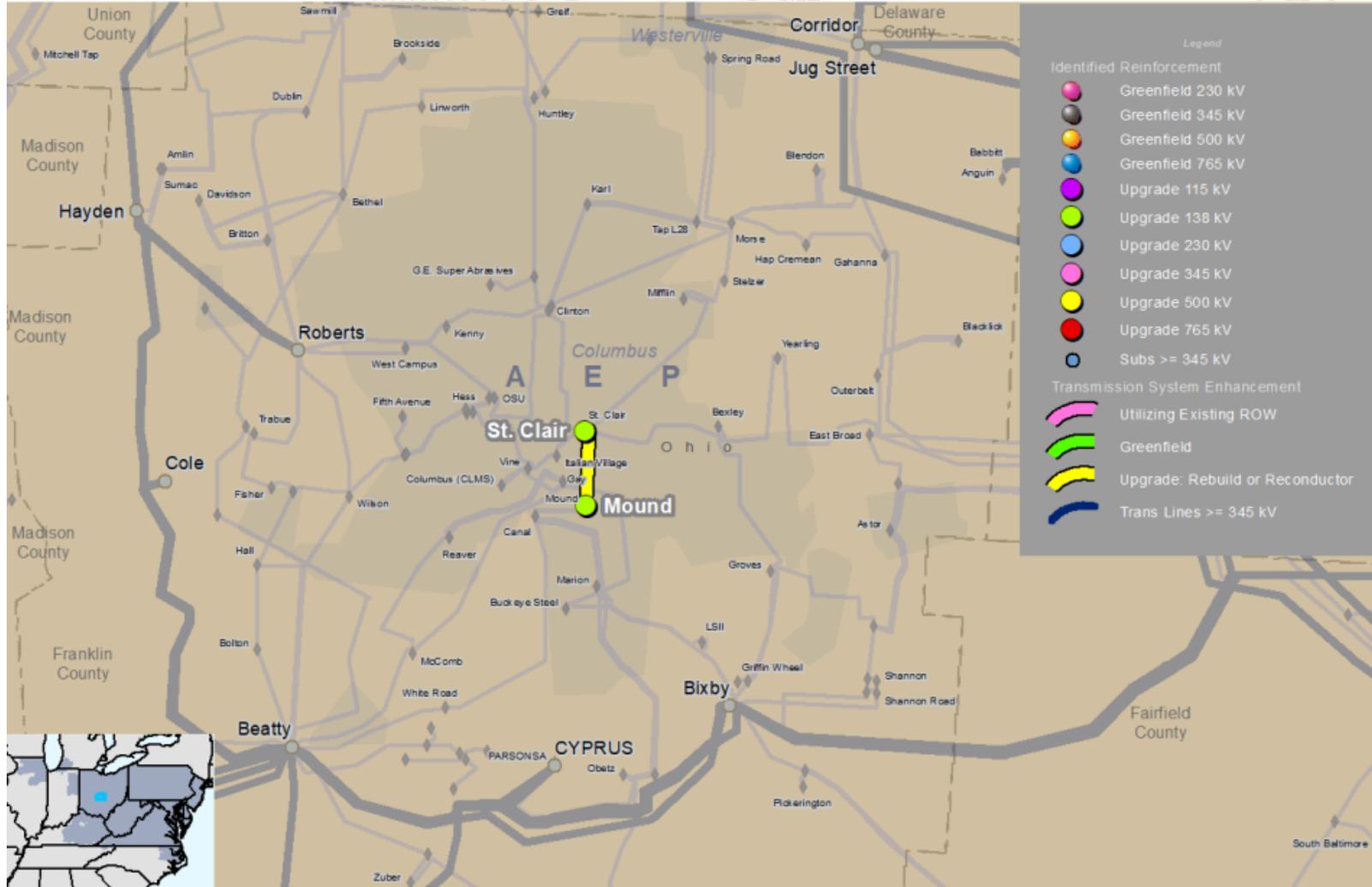
This map is only intended to illustrate the general electrical connectivity of the projects and should not be relied upon for exact geographical substation locations or line routes.



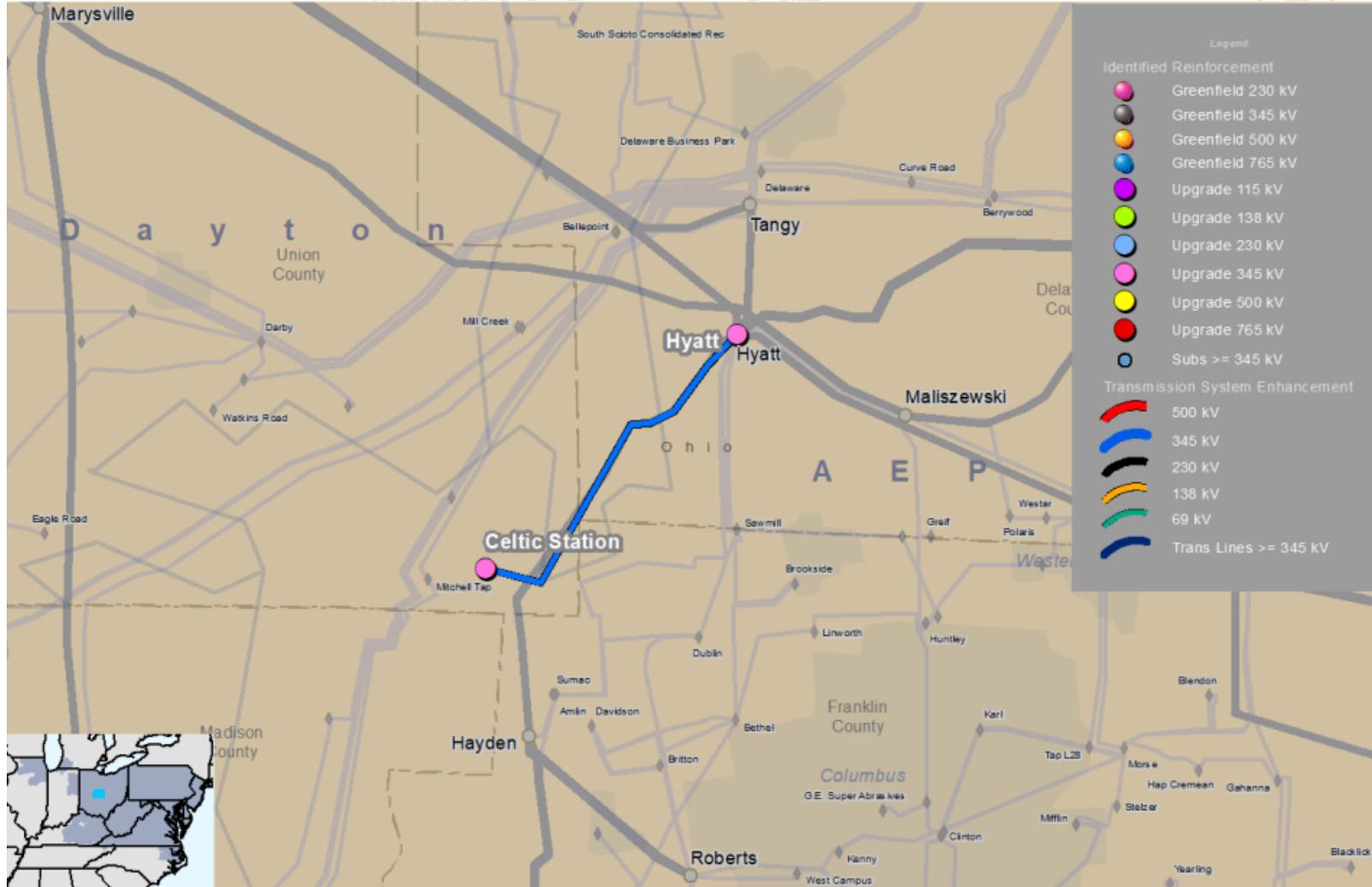
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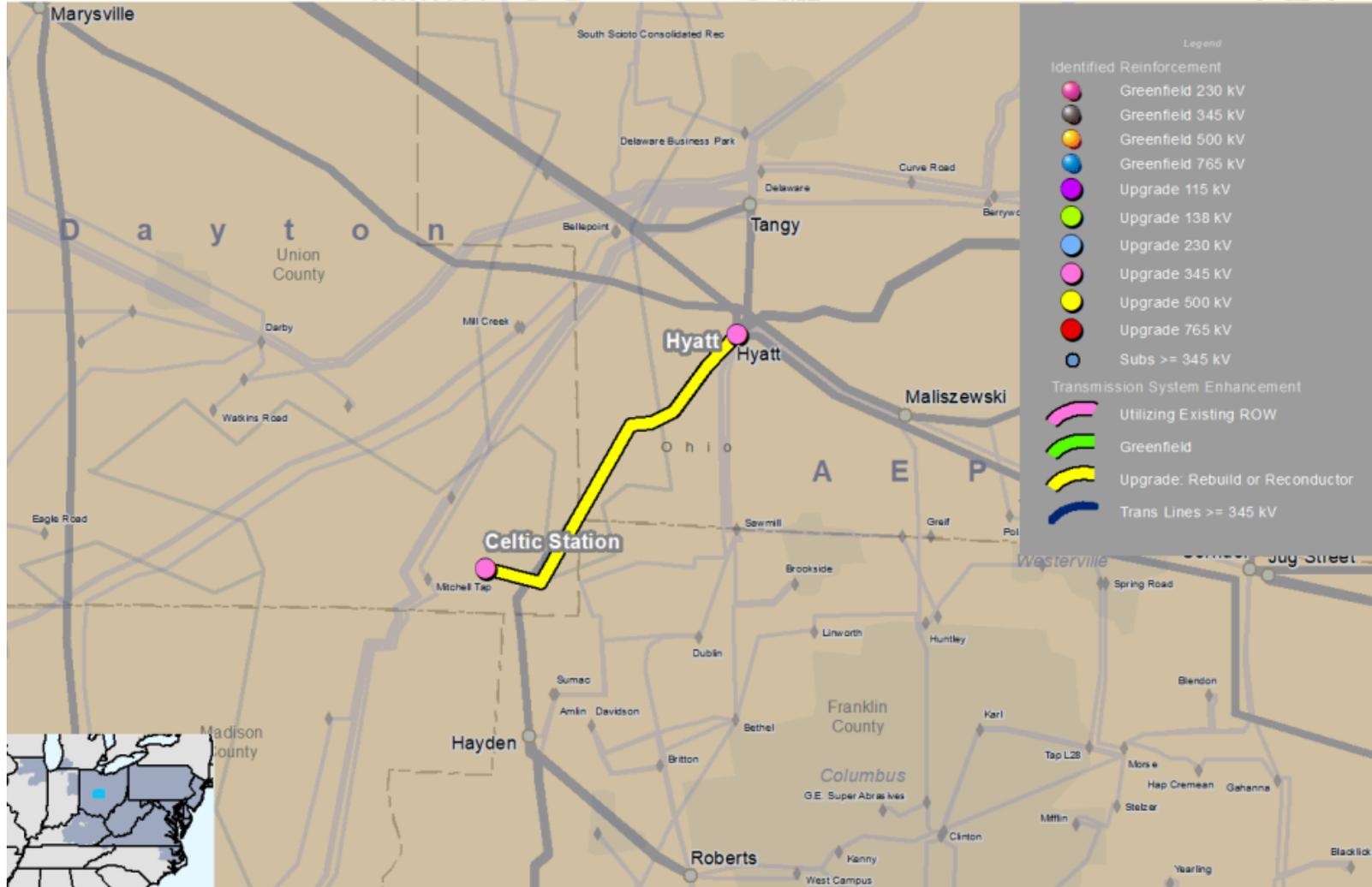
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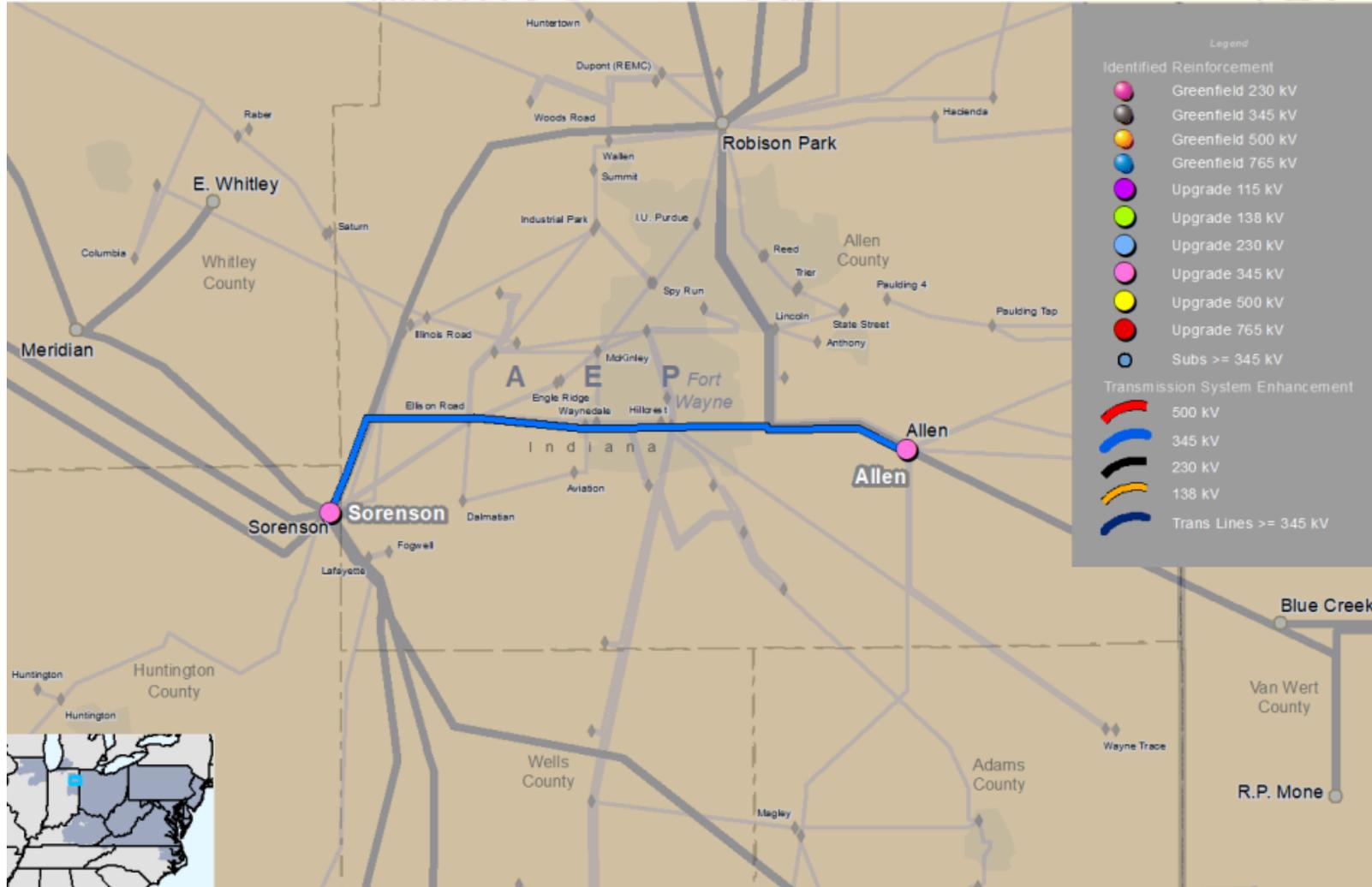
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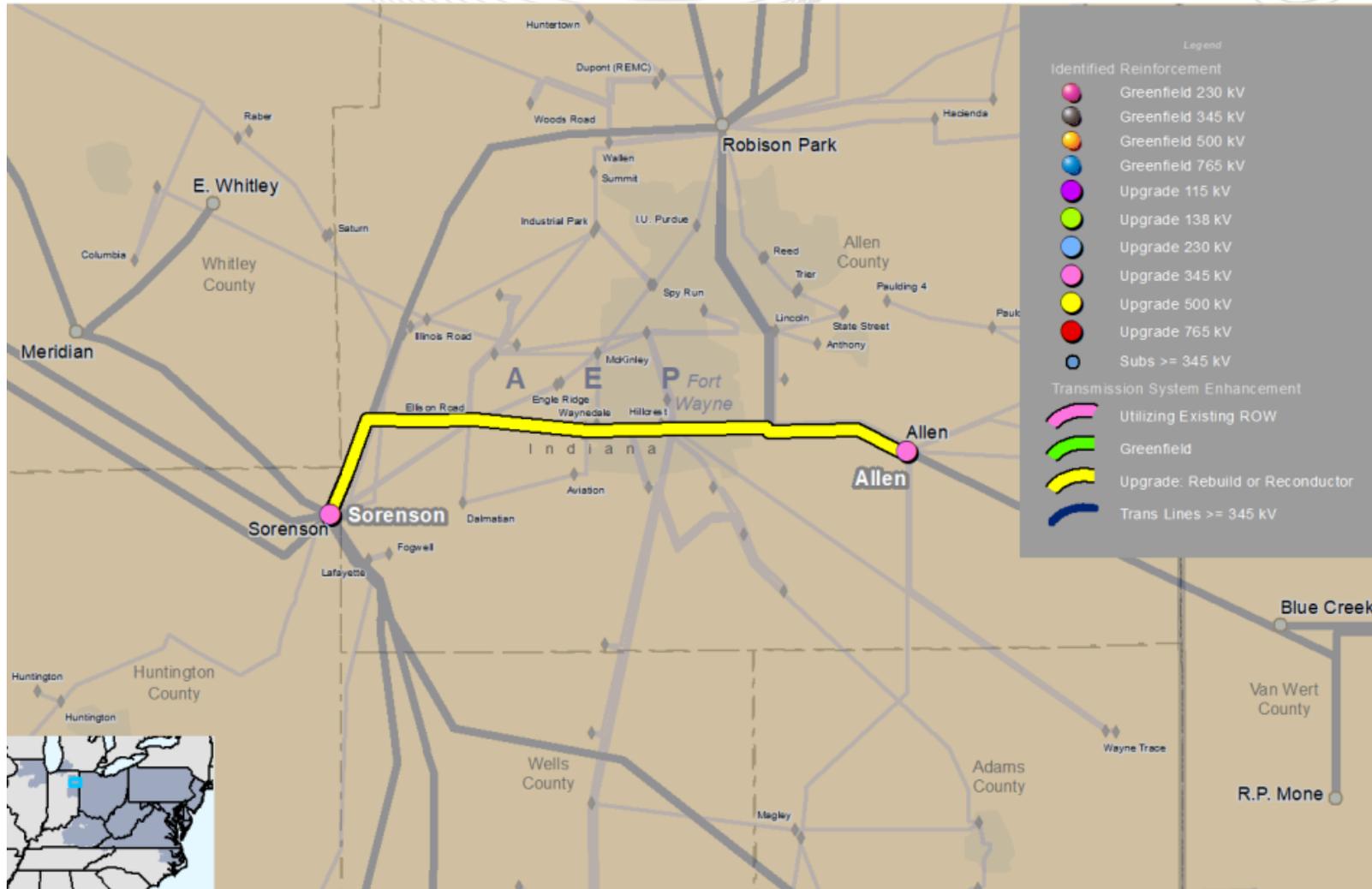
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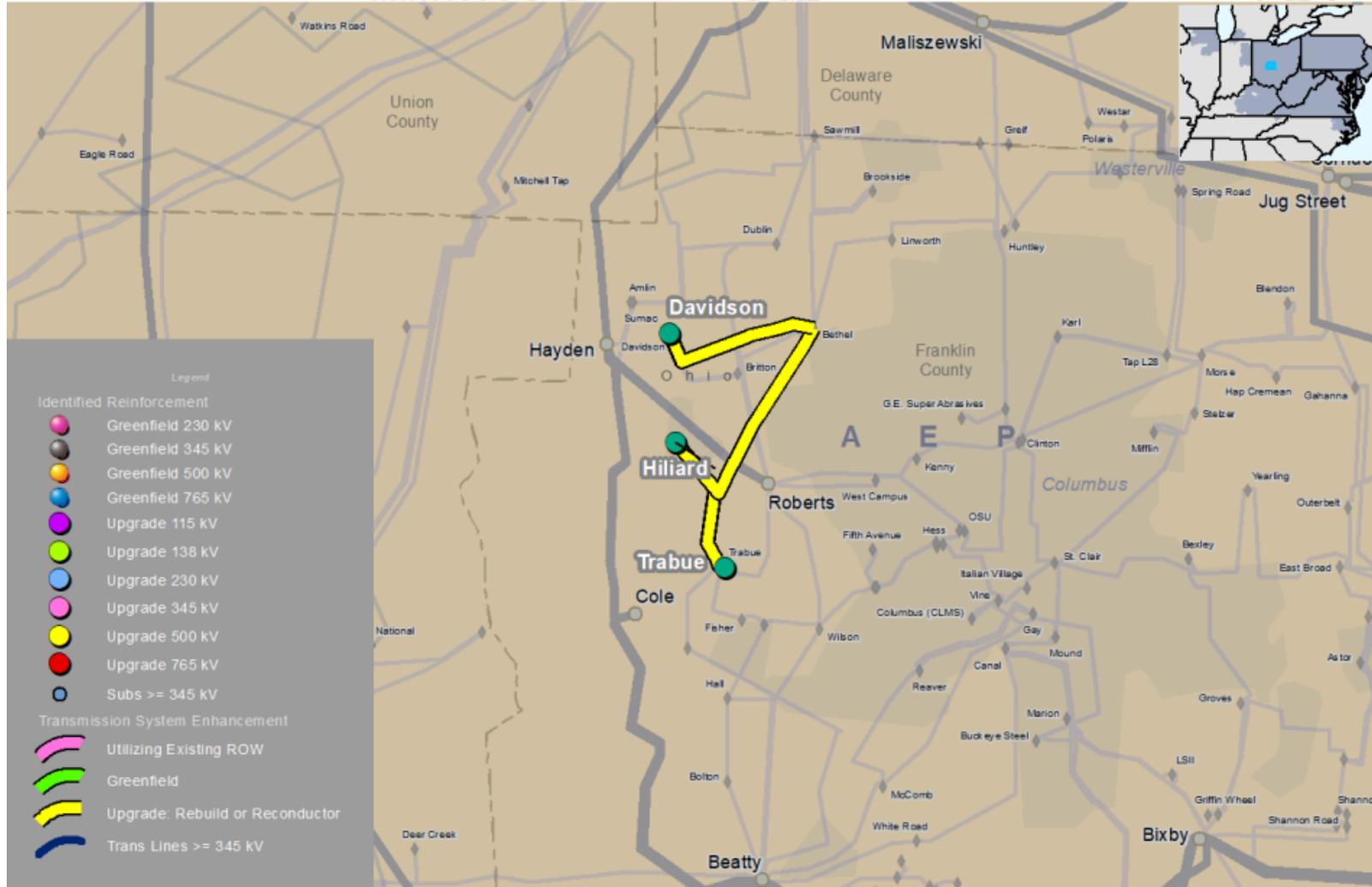
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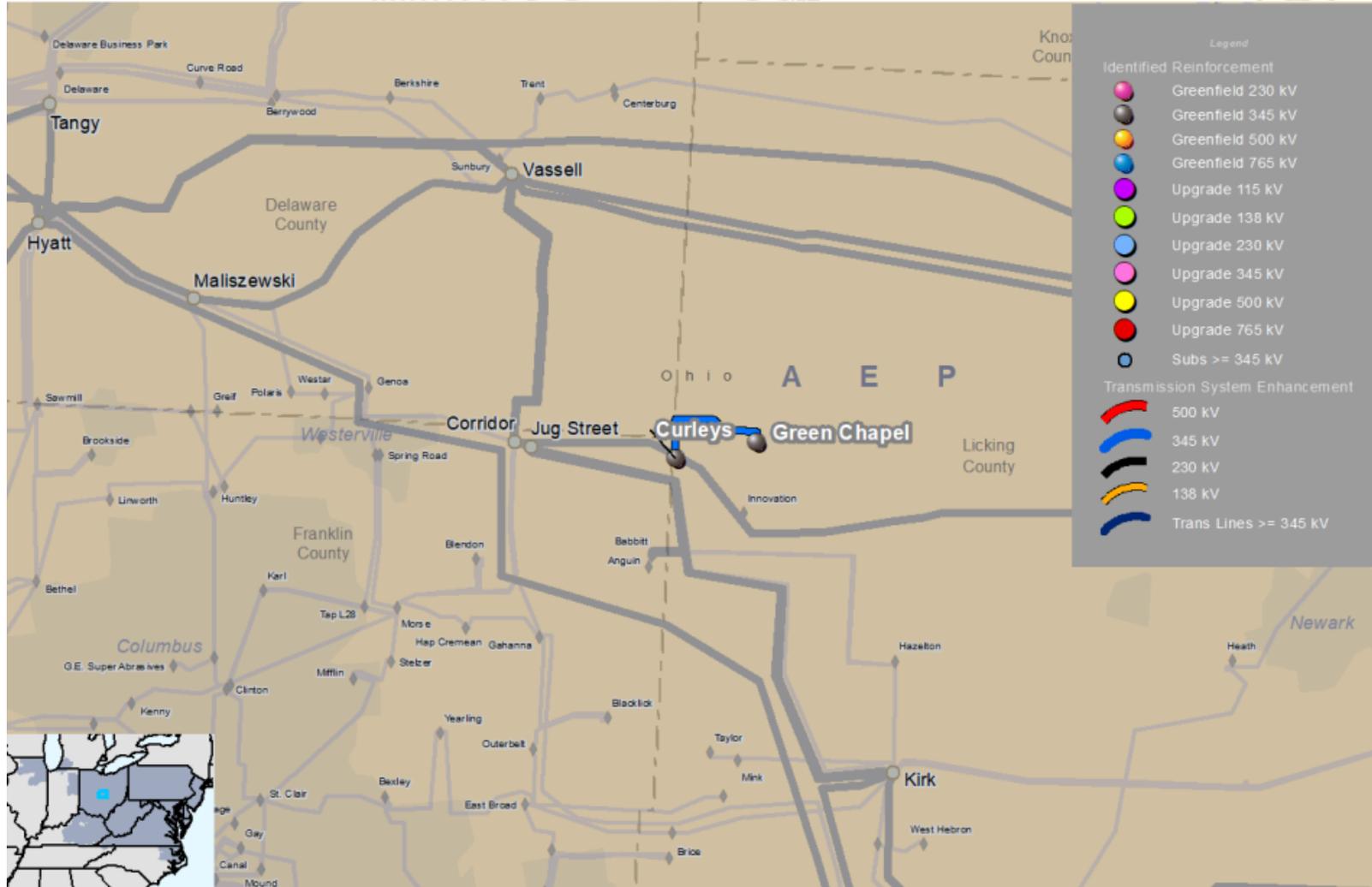
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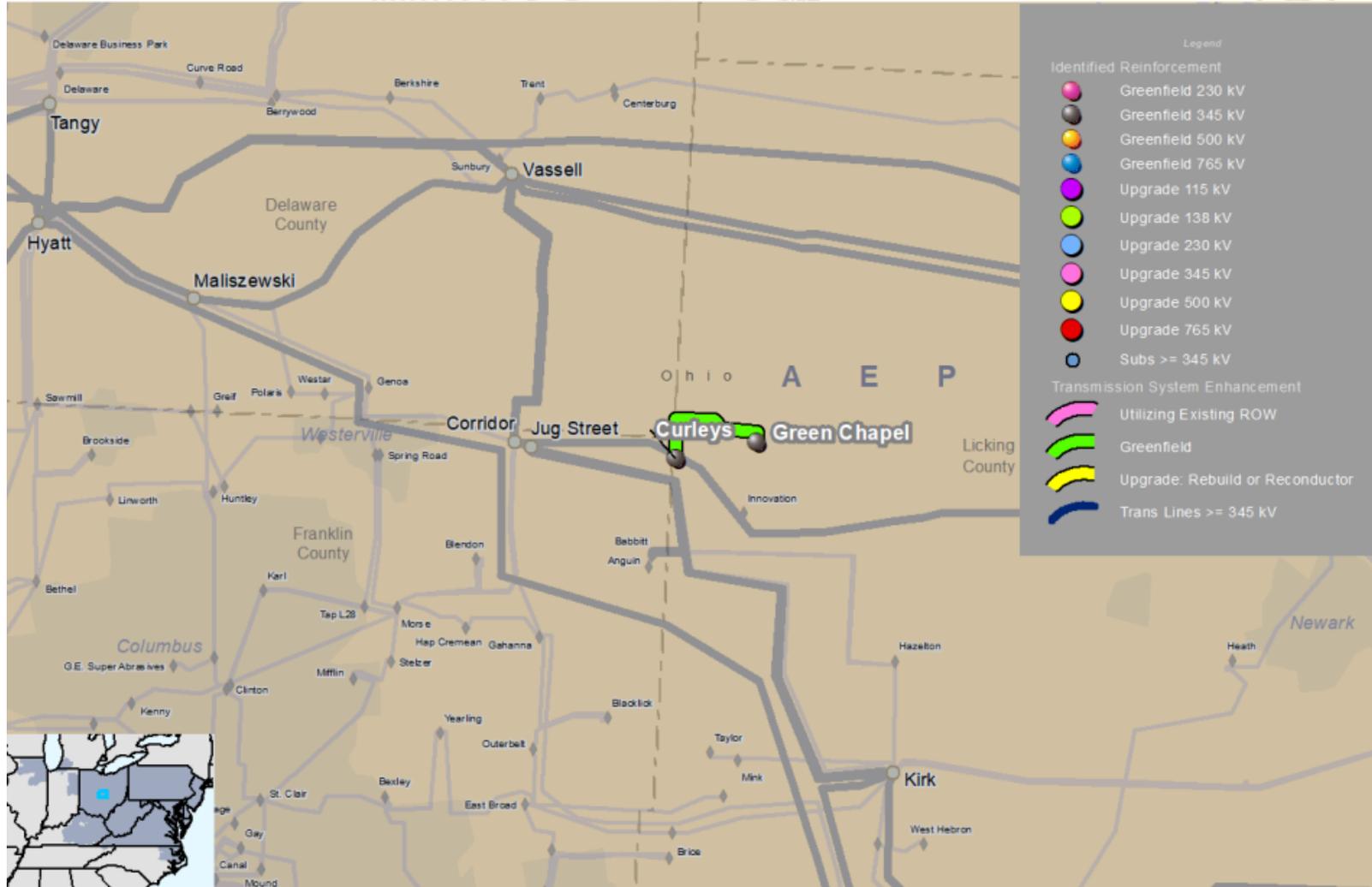
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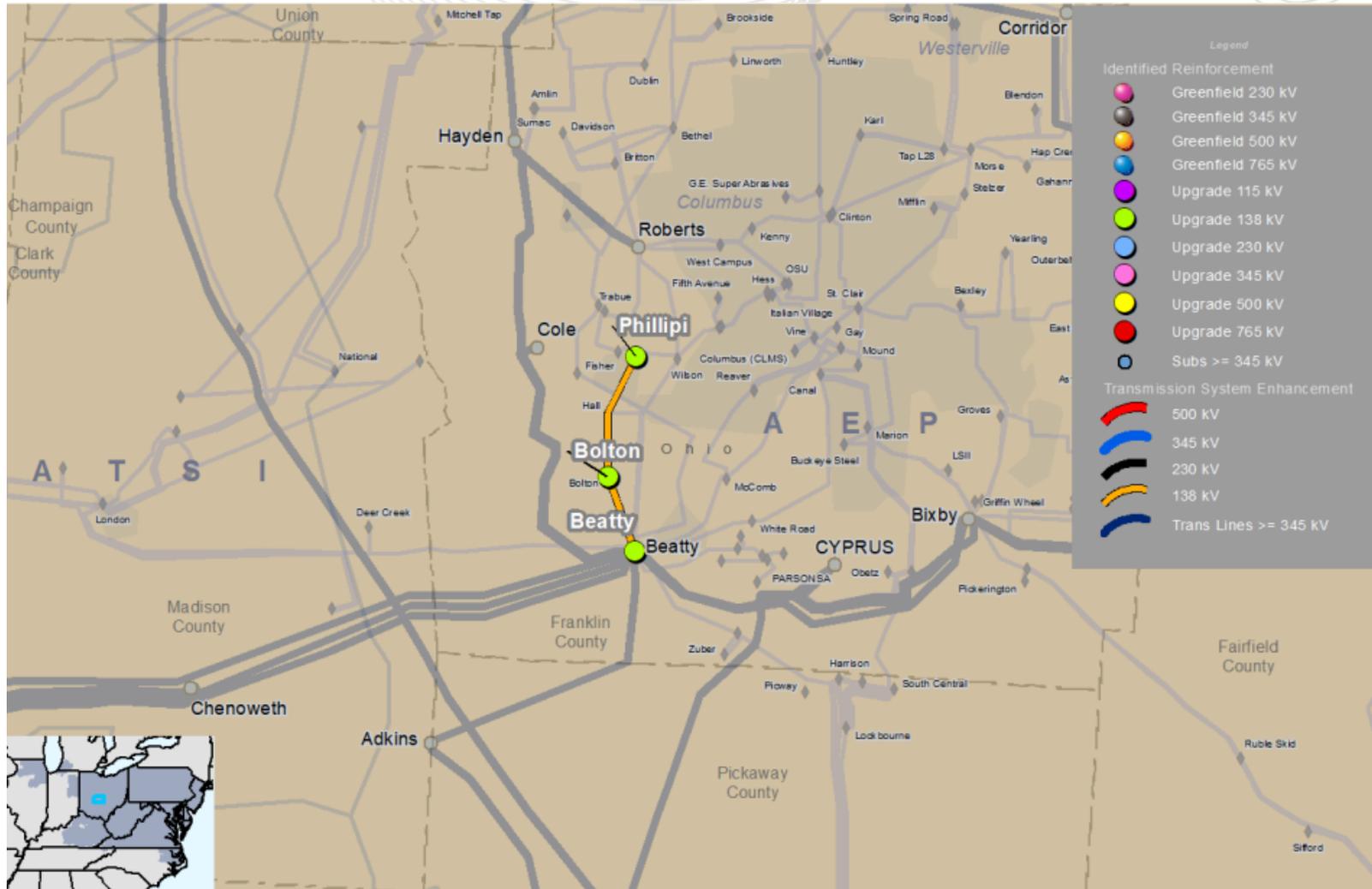
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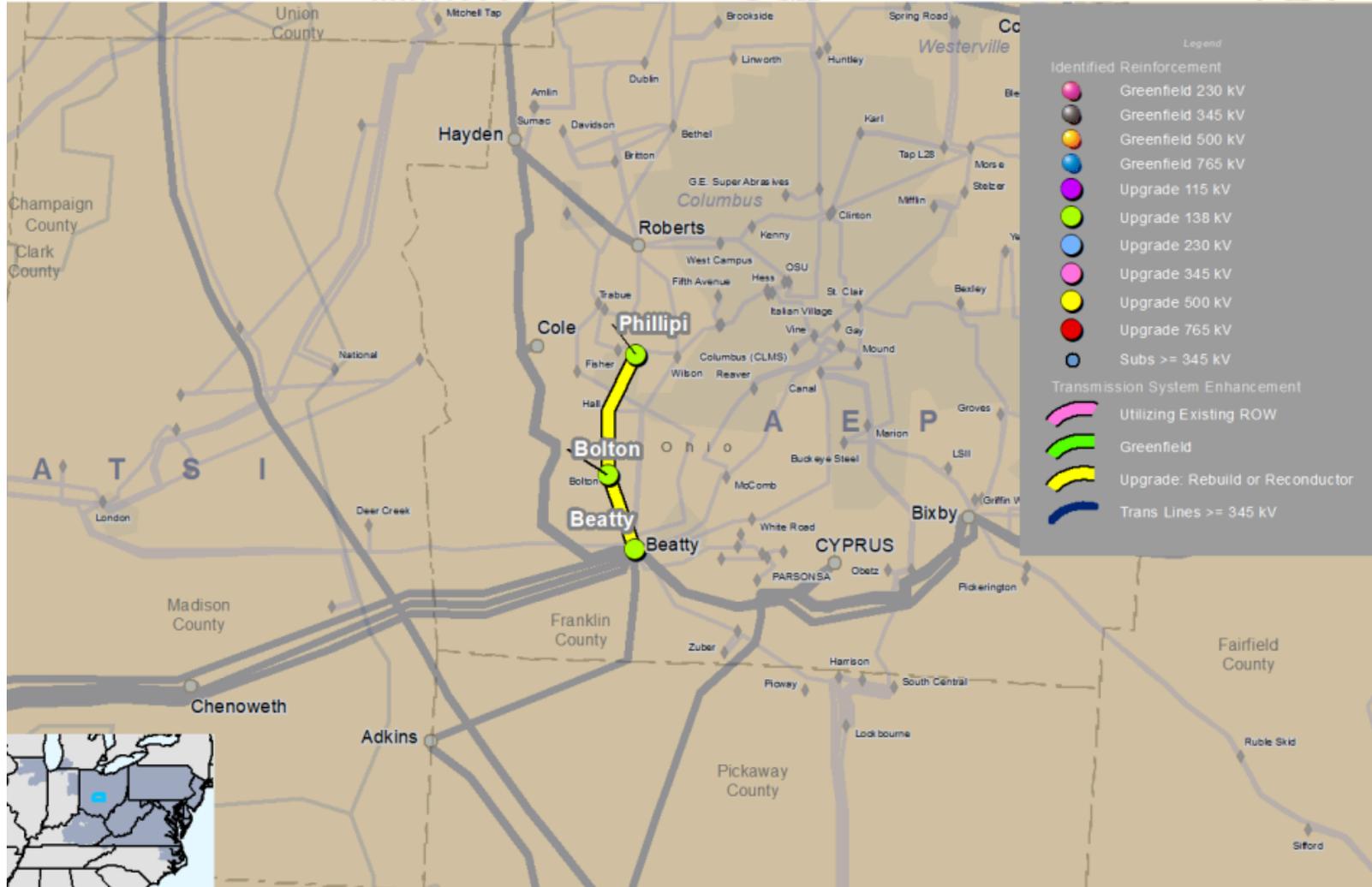
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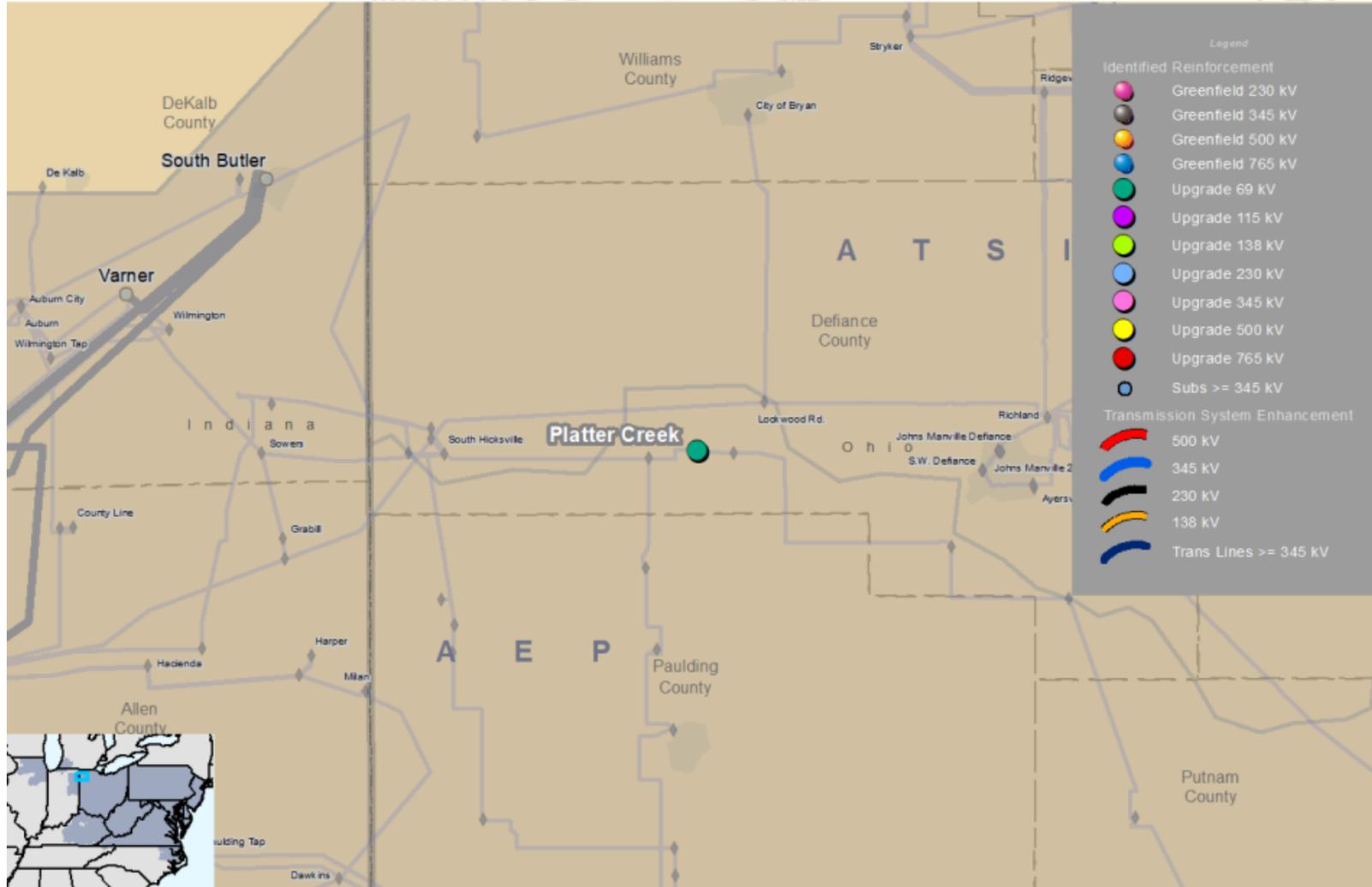
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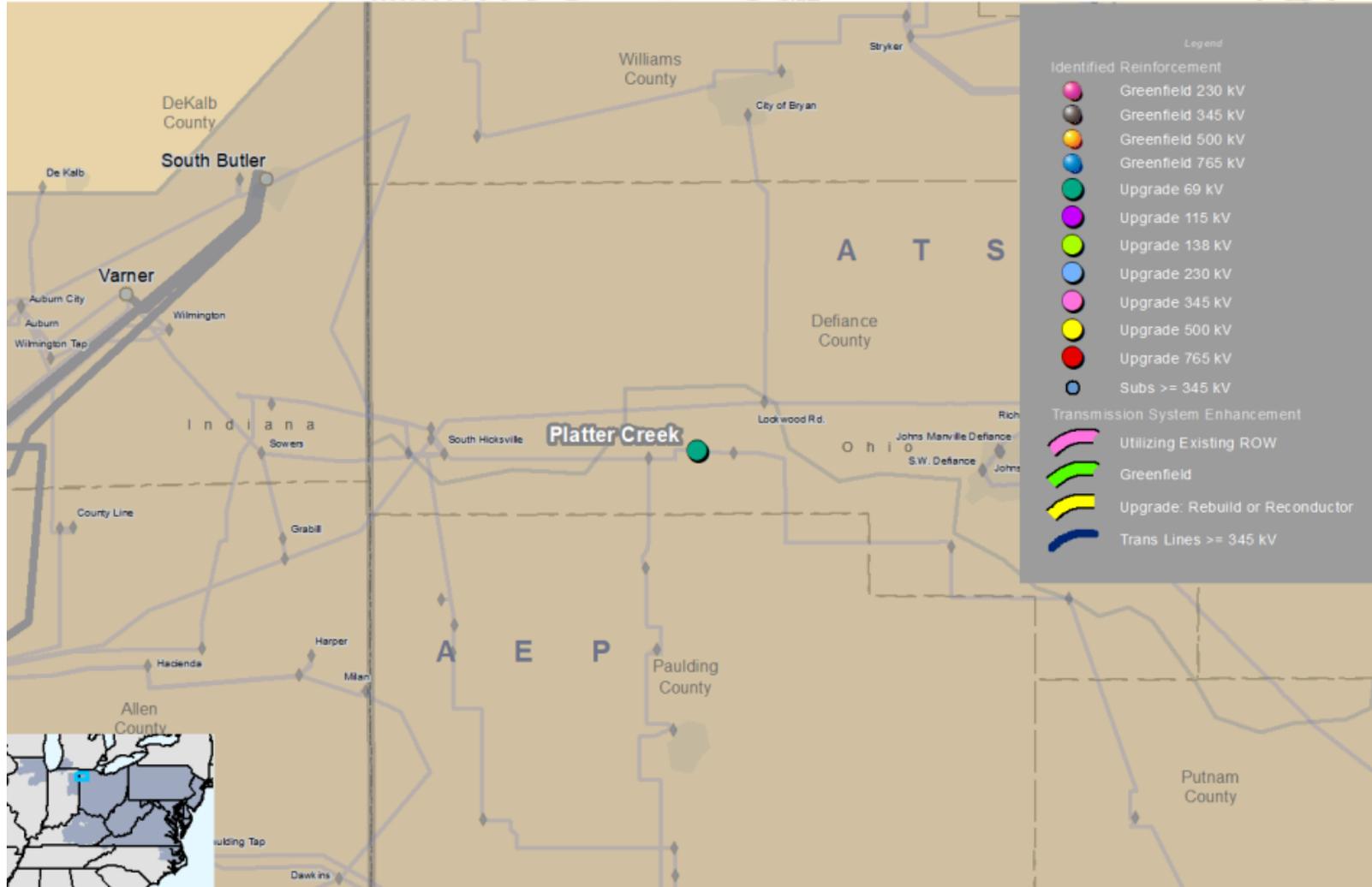
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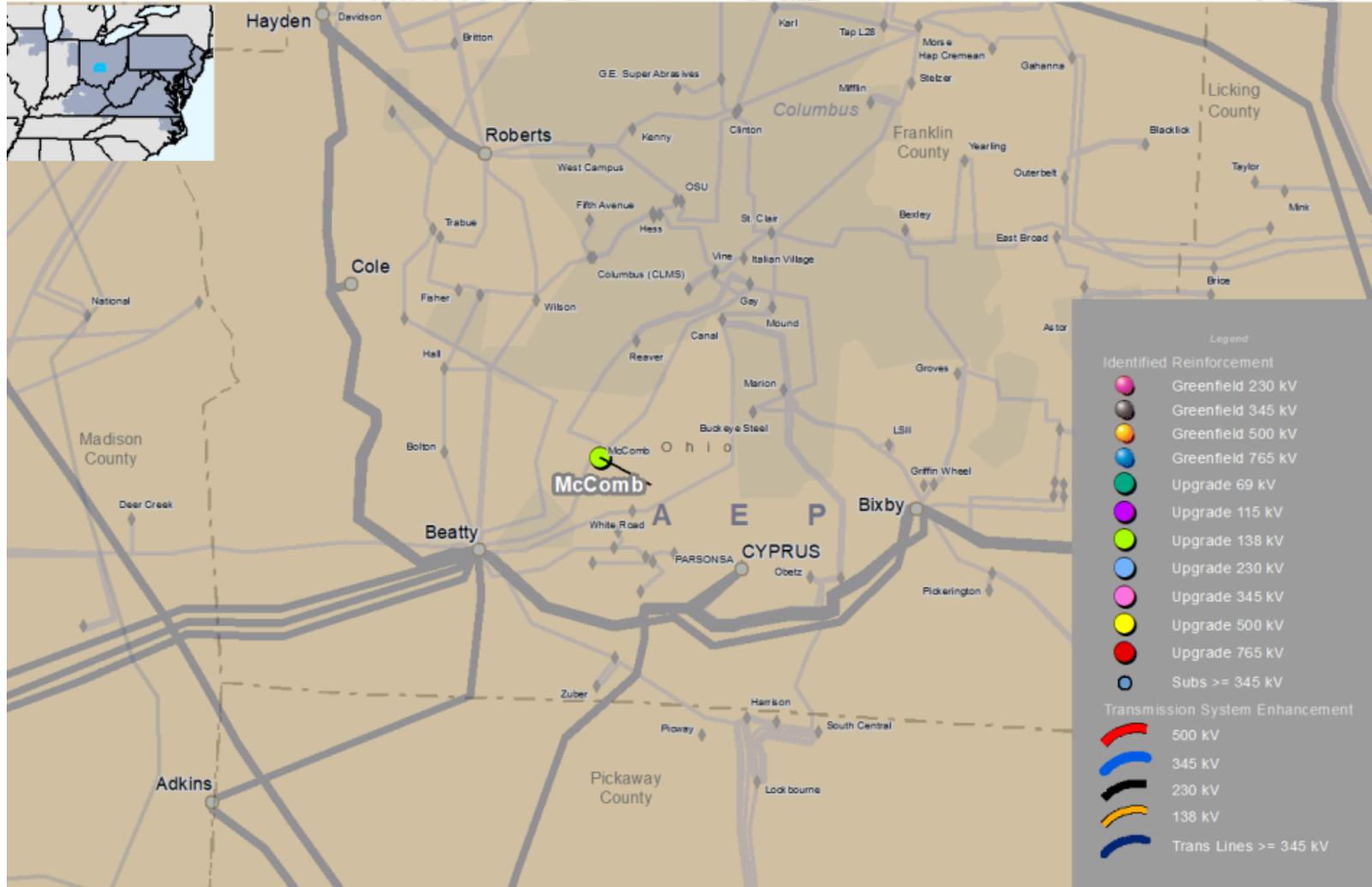
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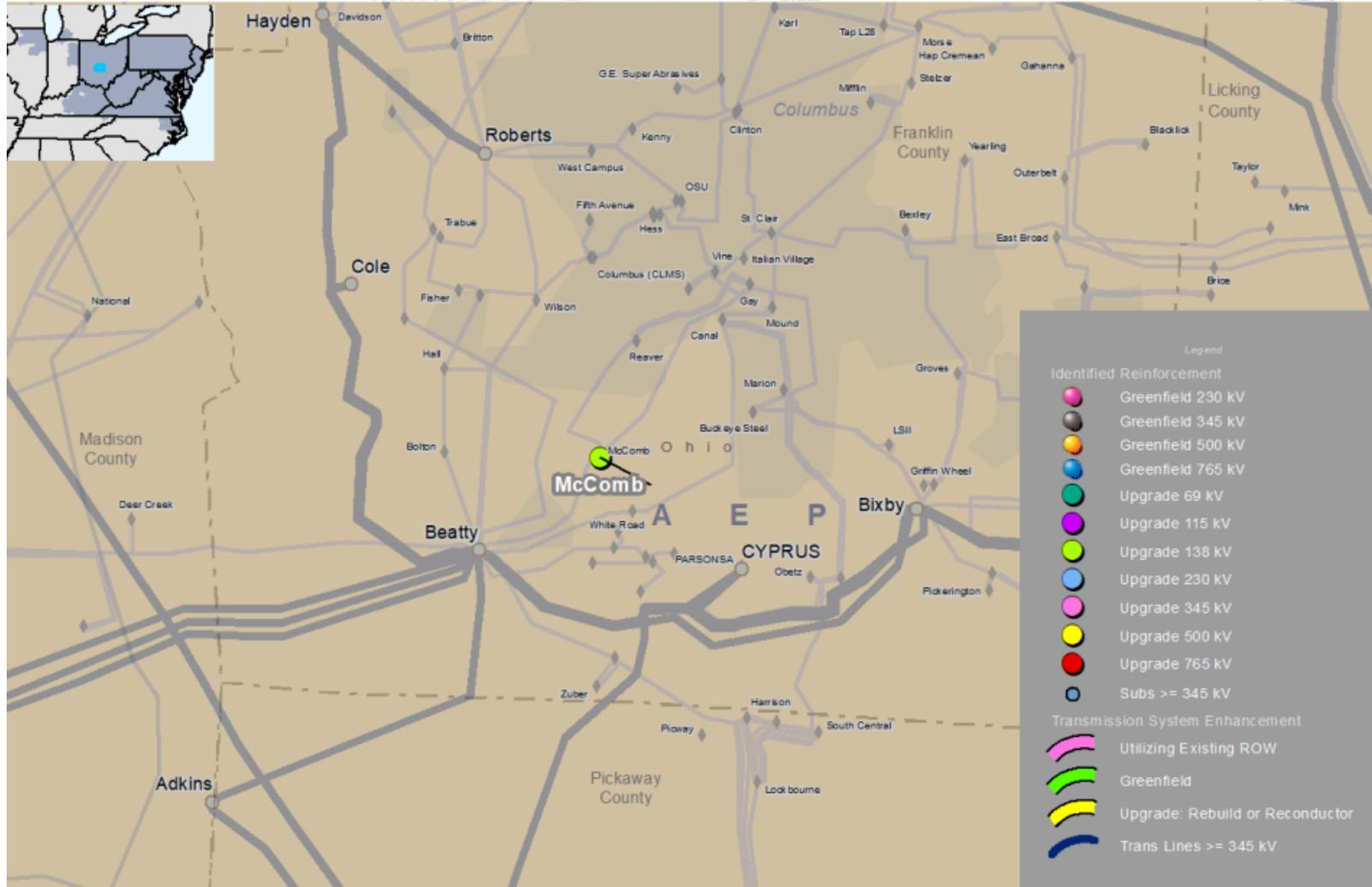
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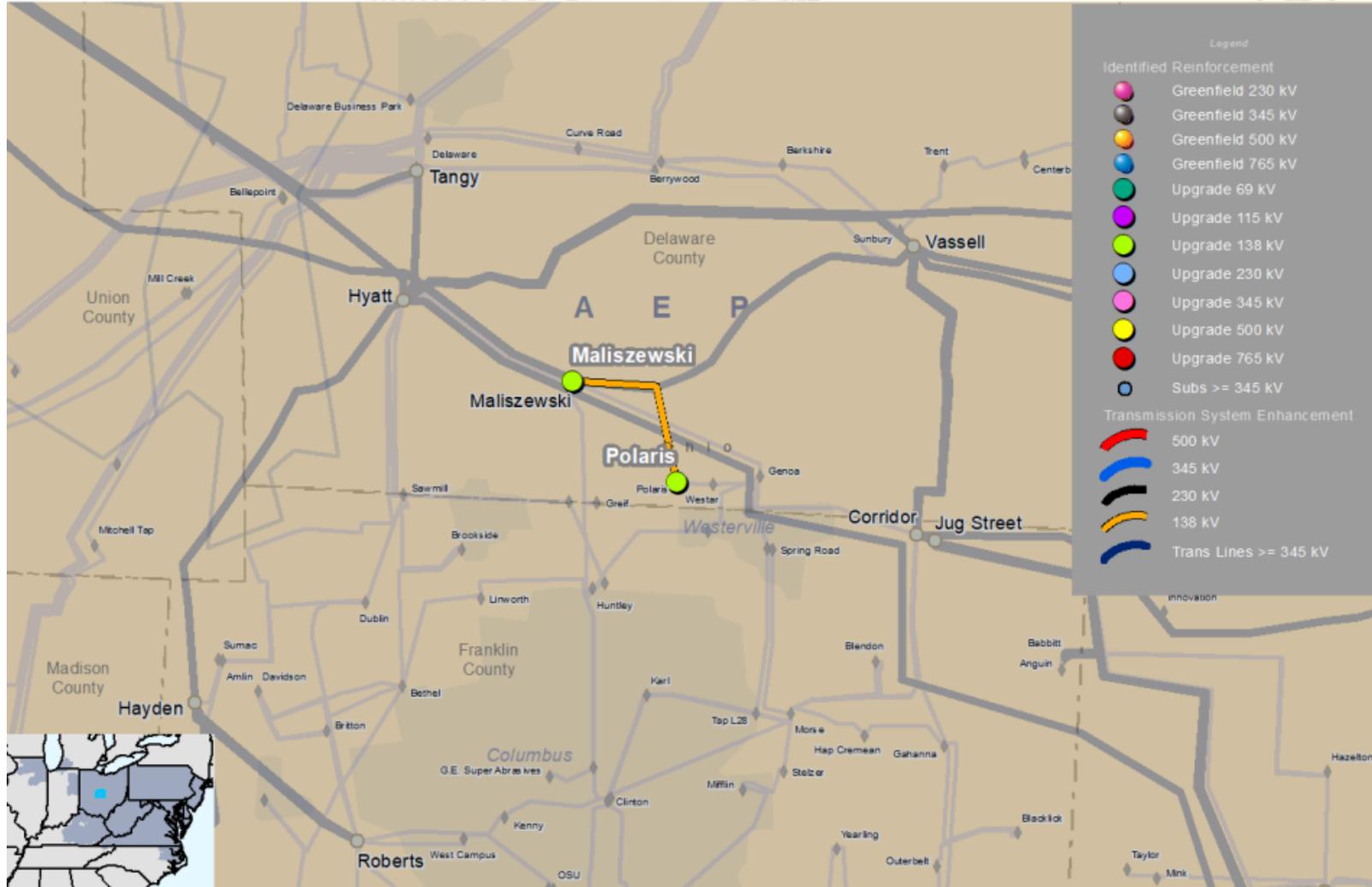
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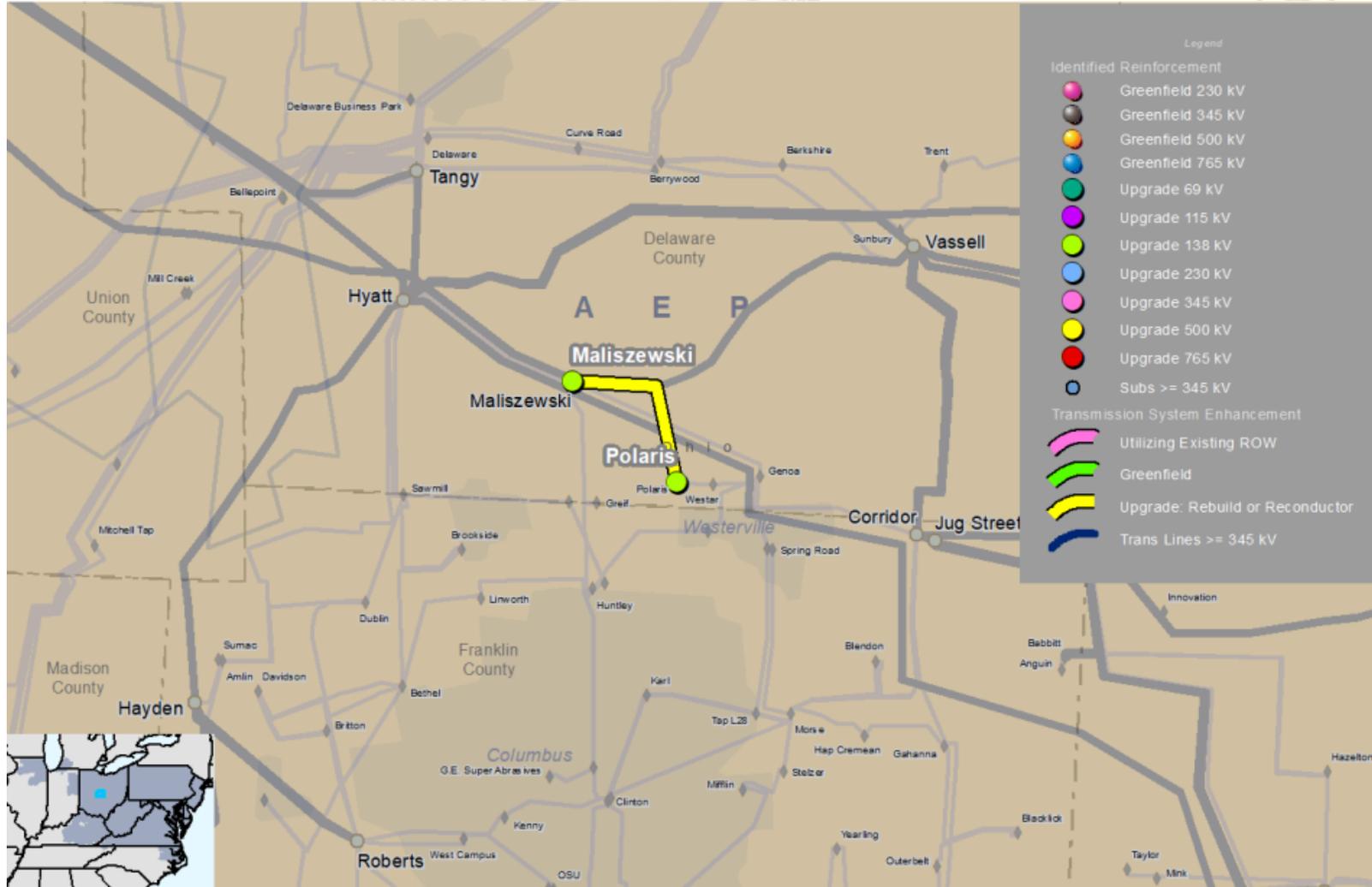
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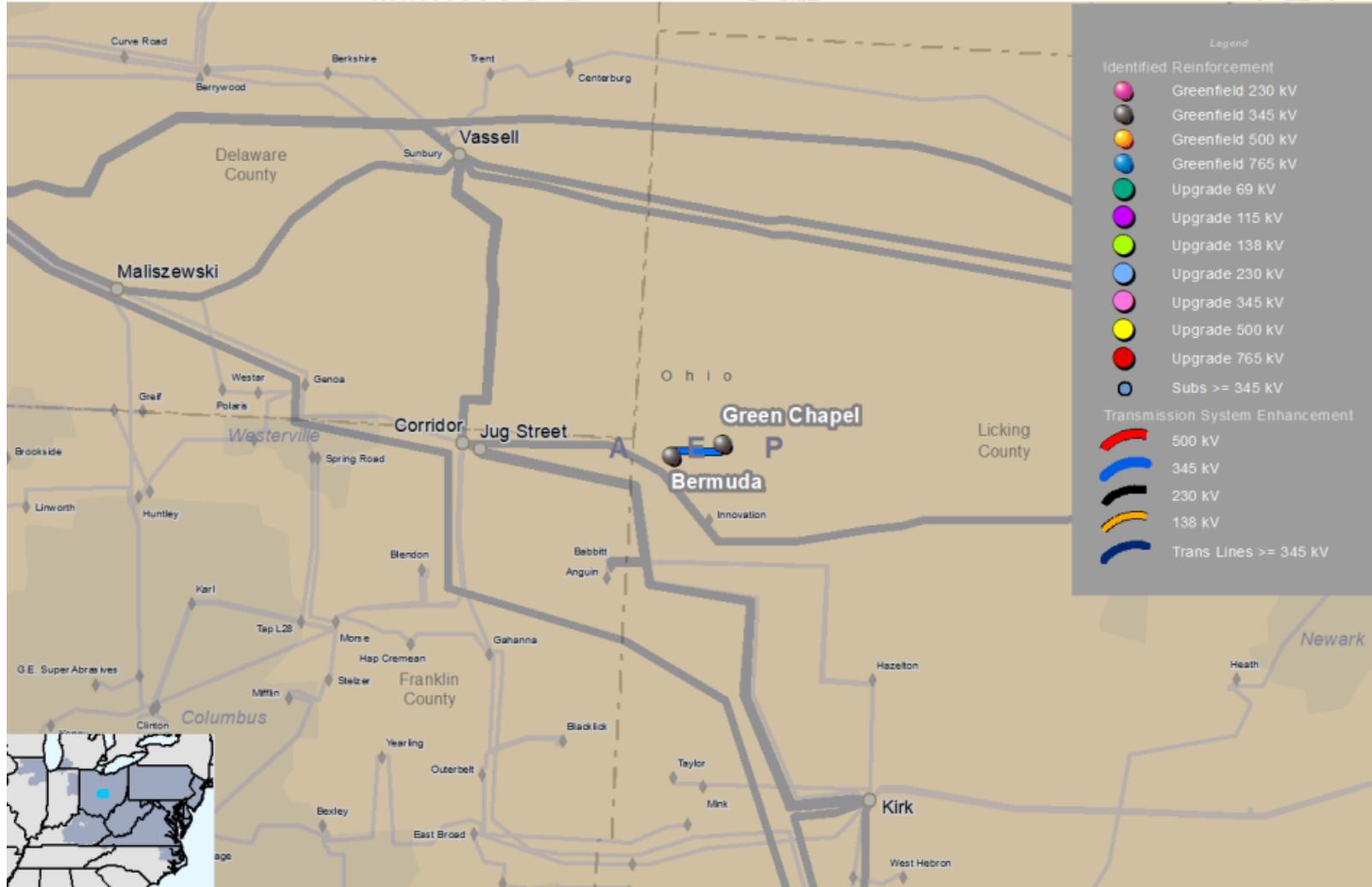
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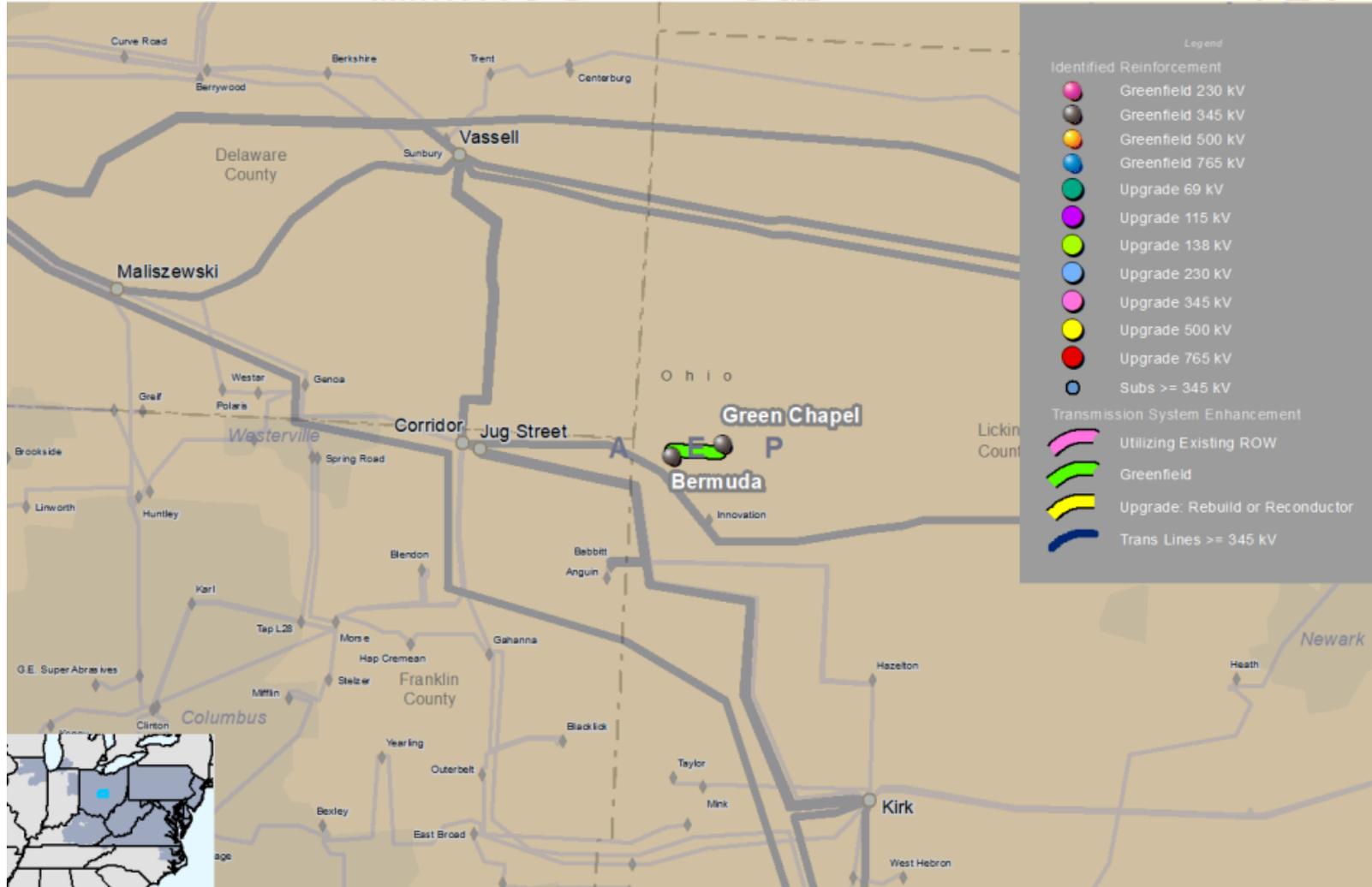
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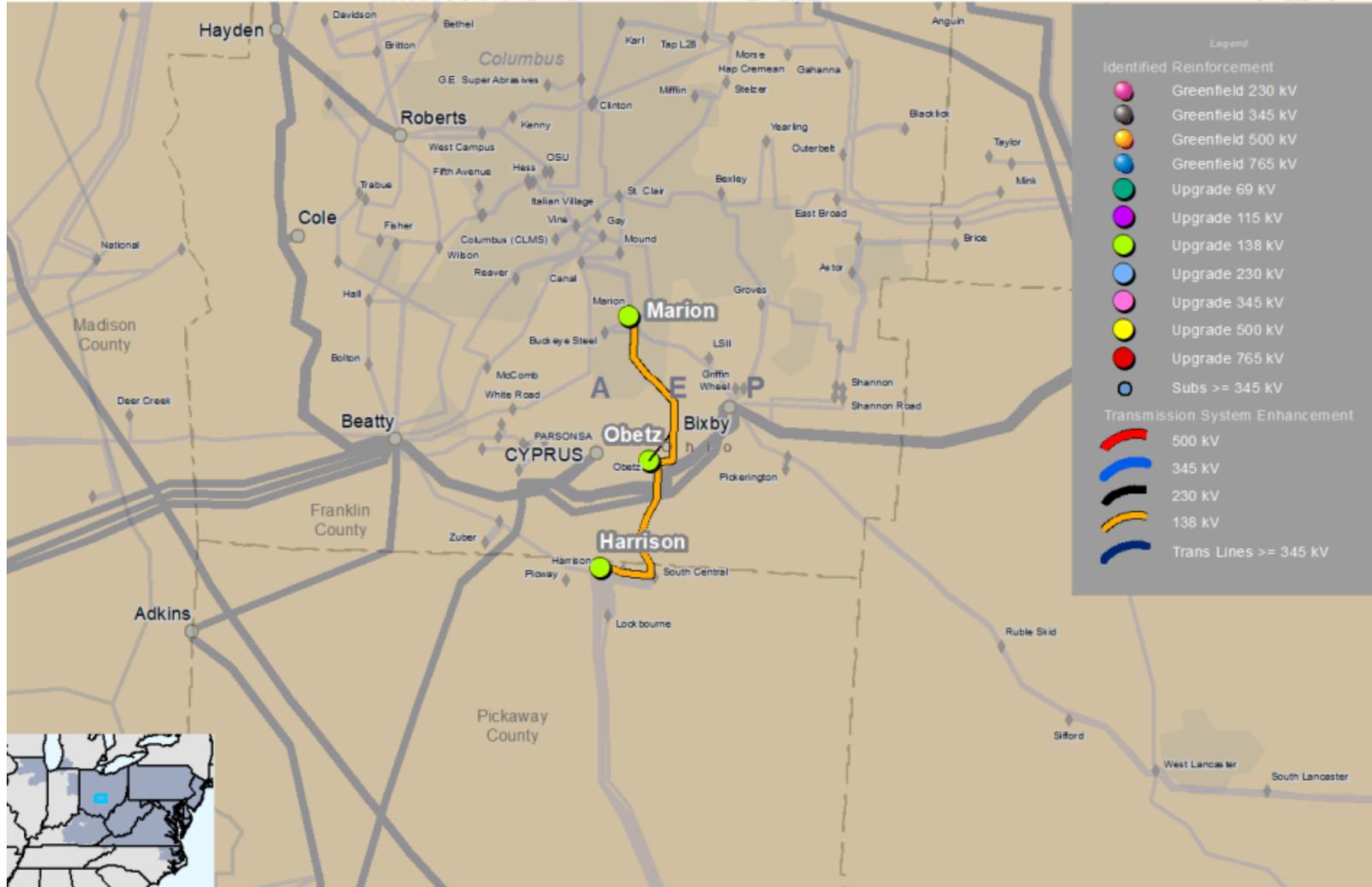
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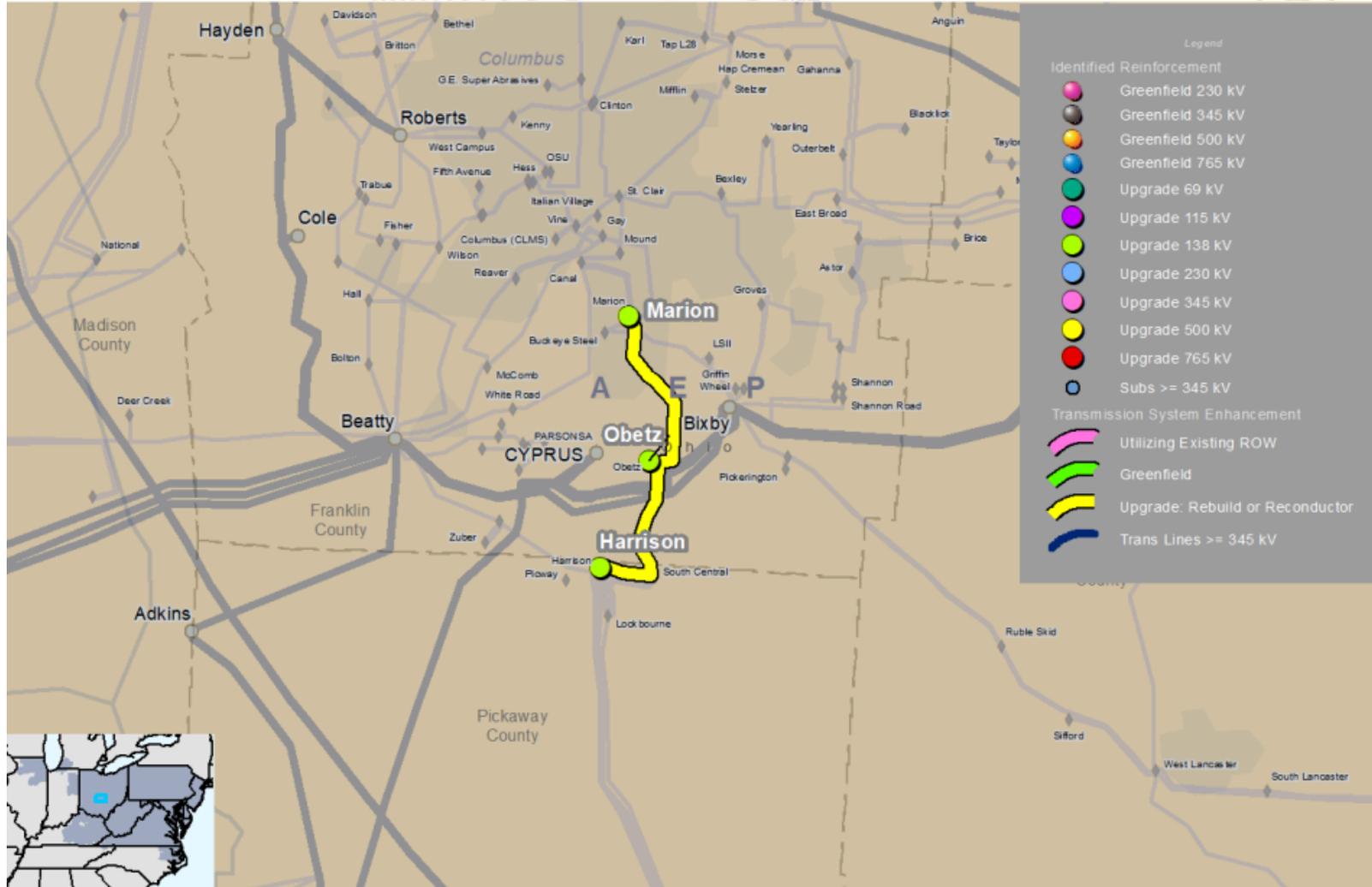
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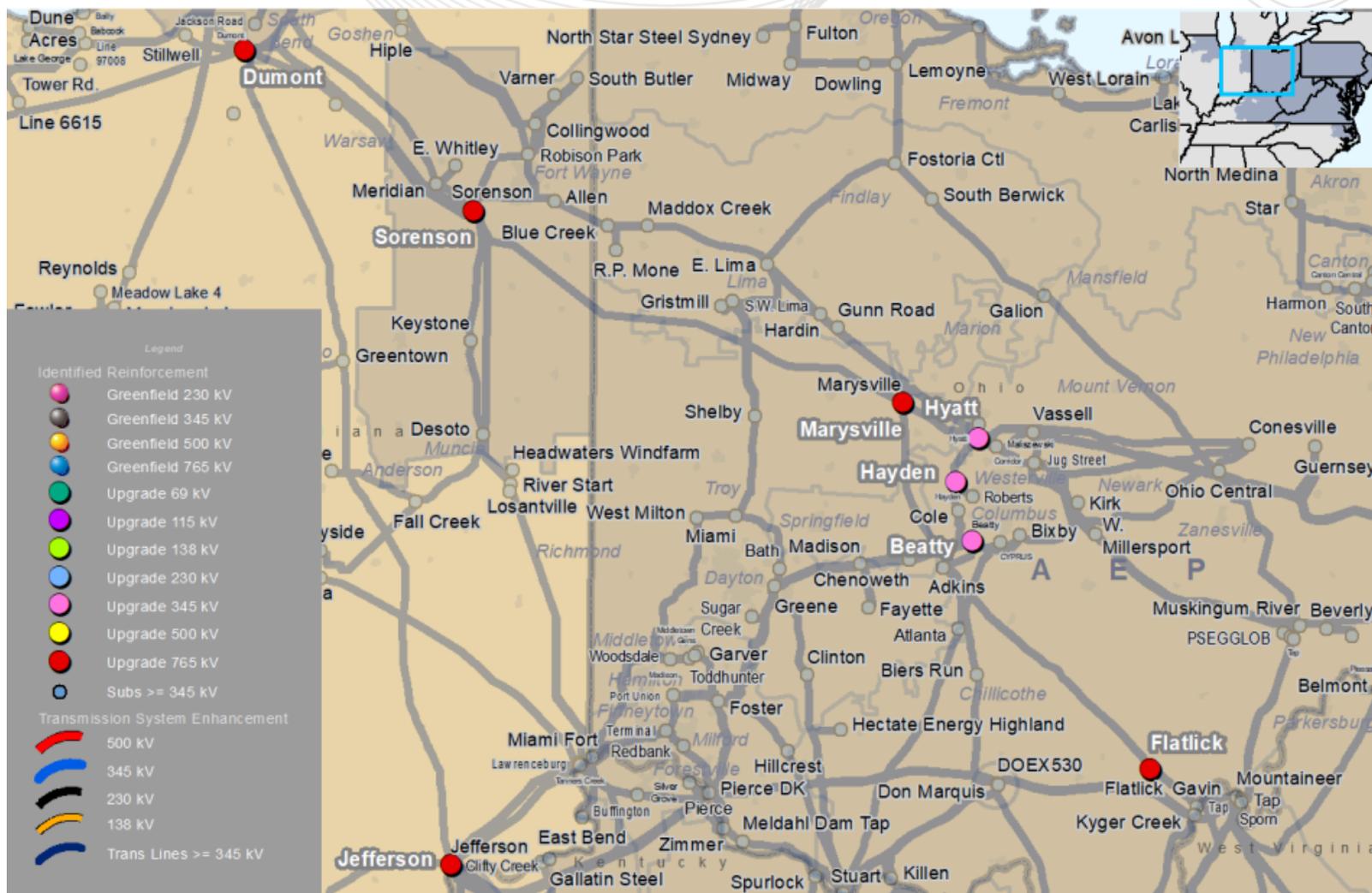
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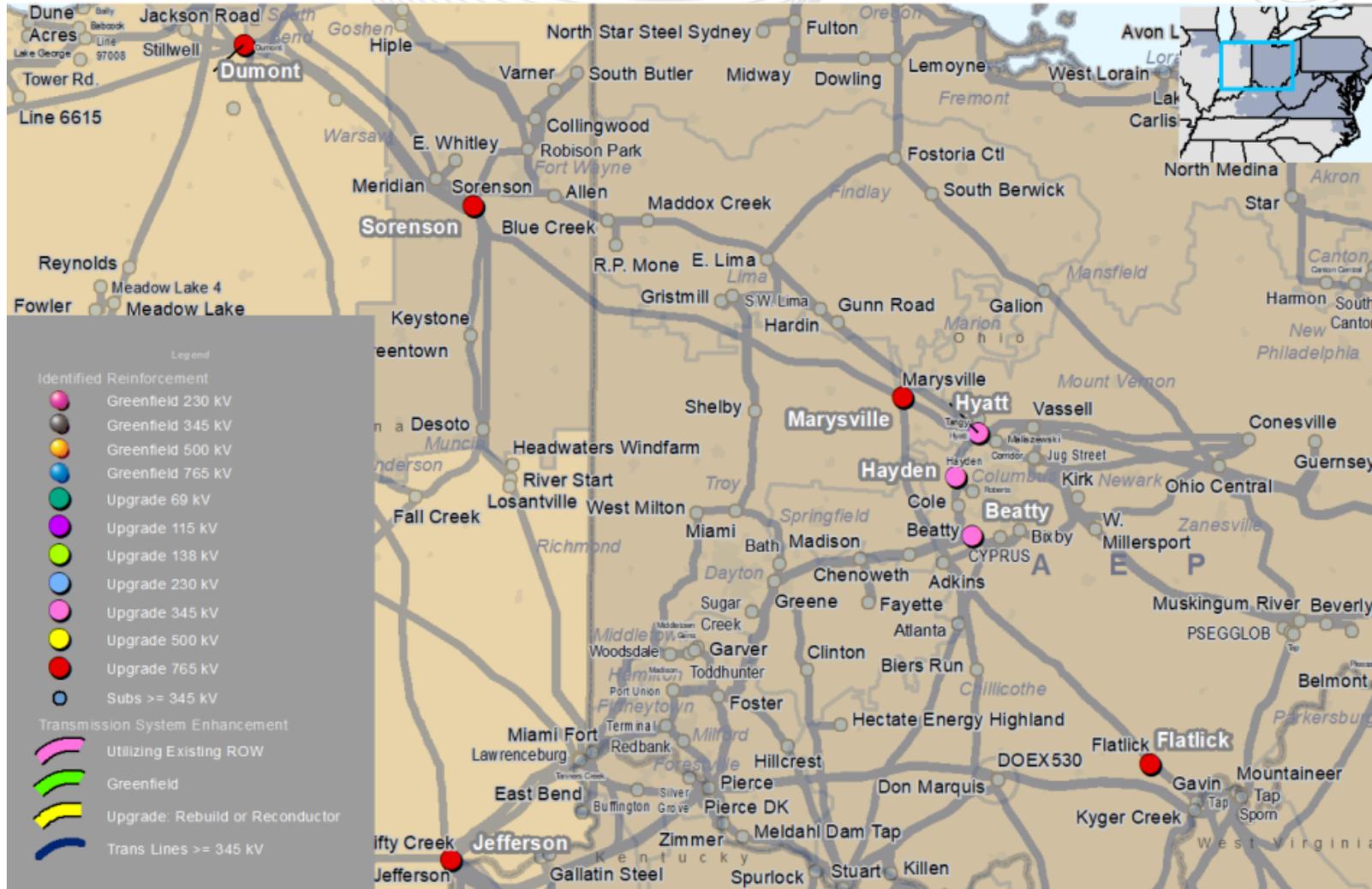
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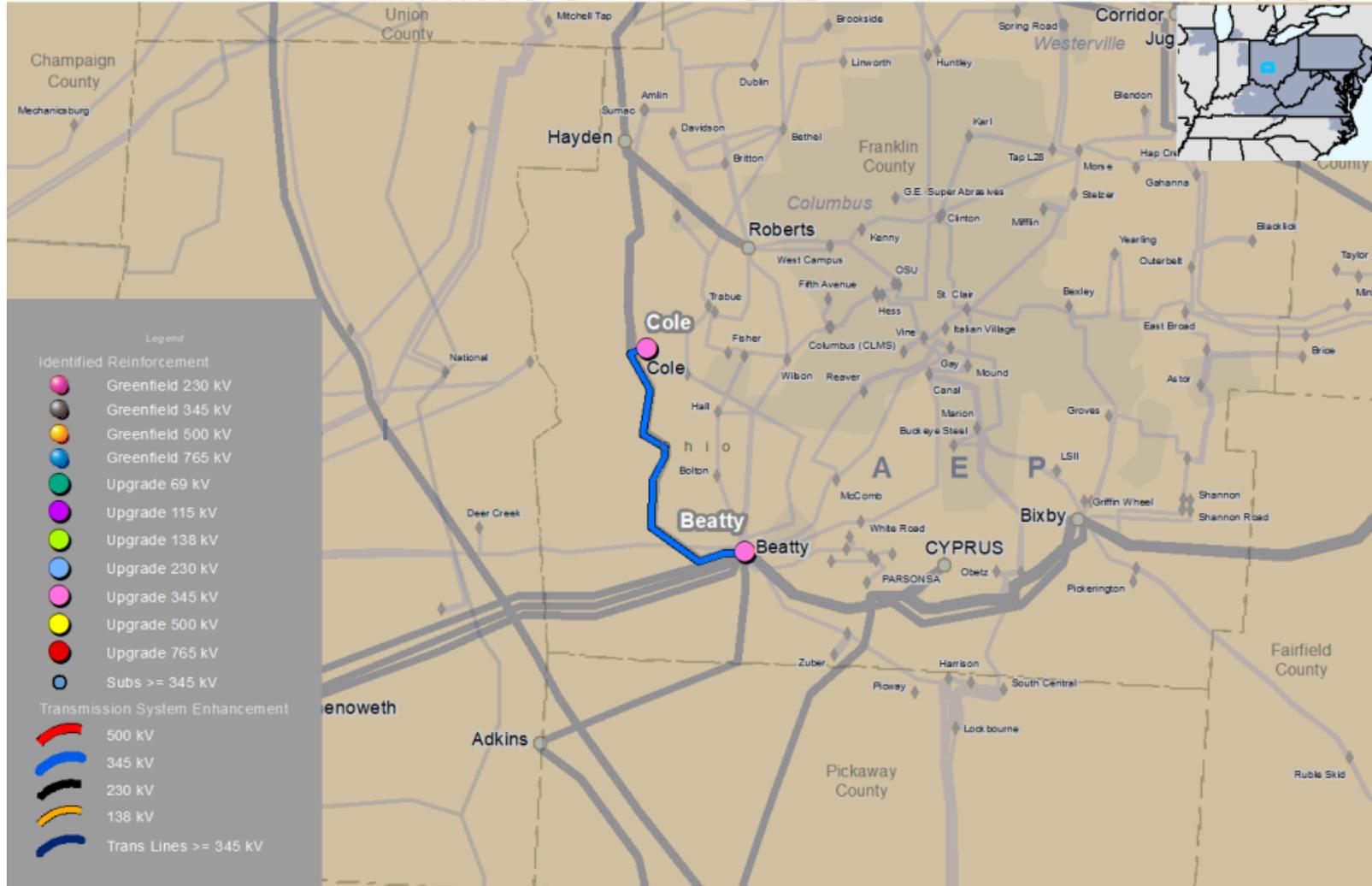
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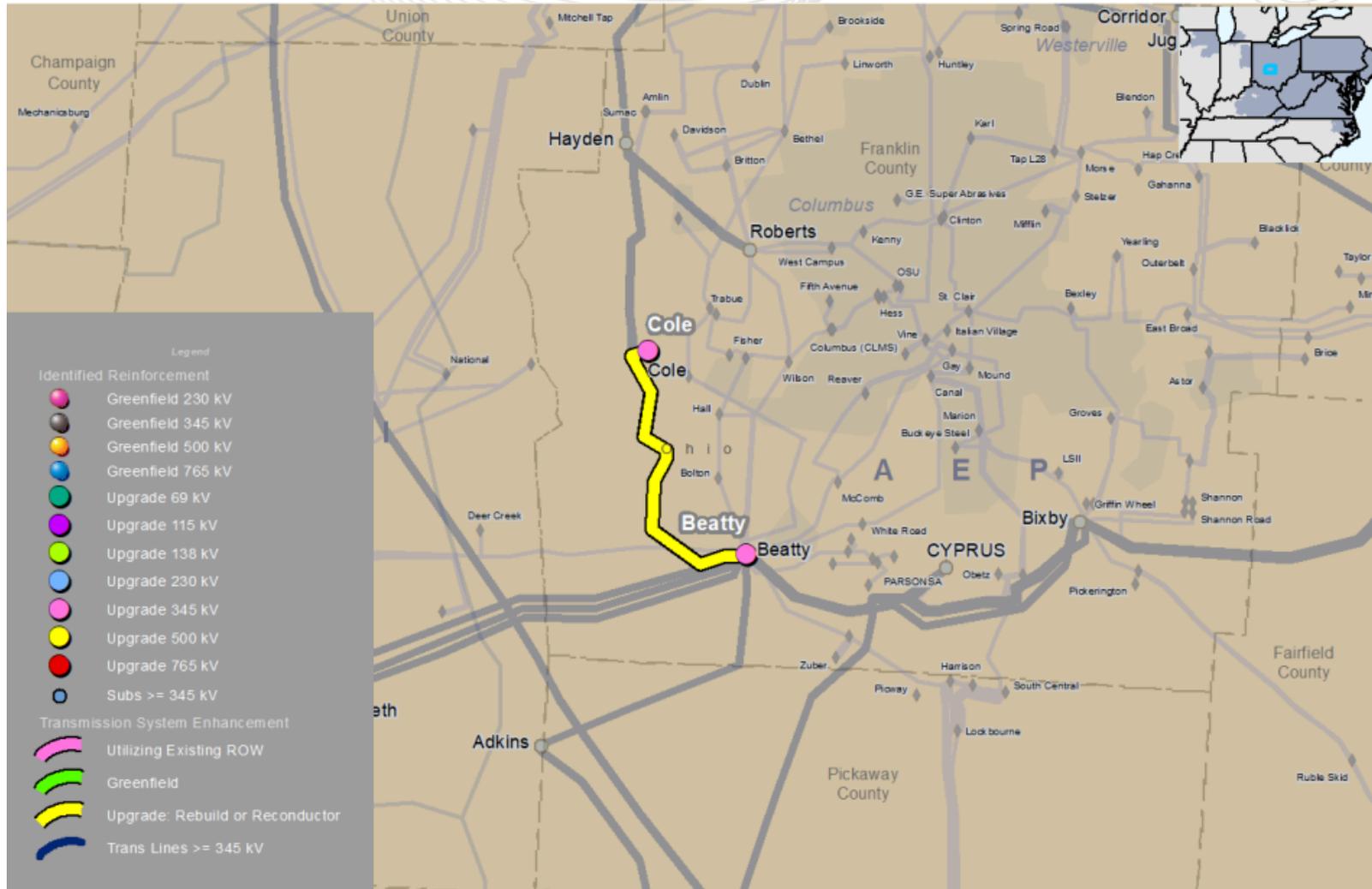
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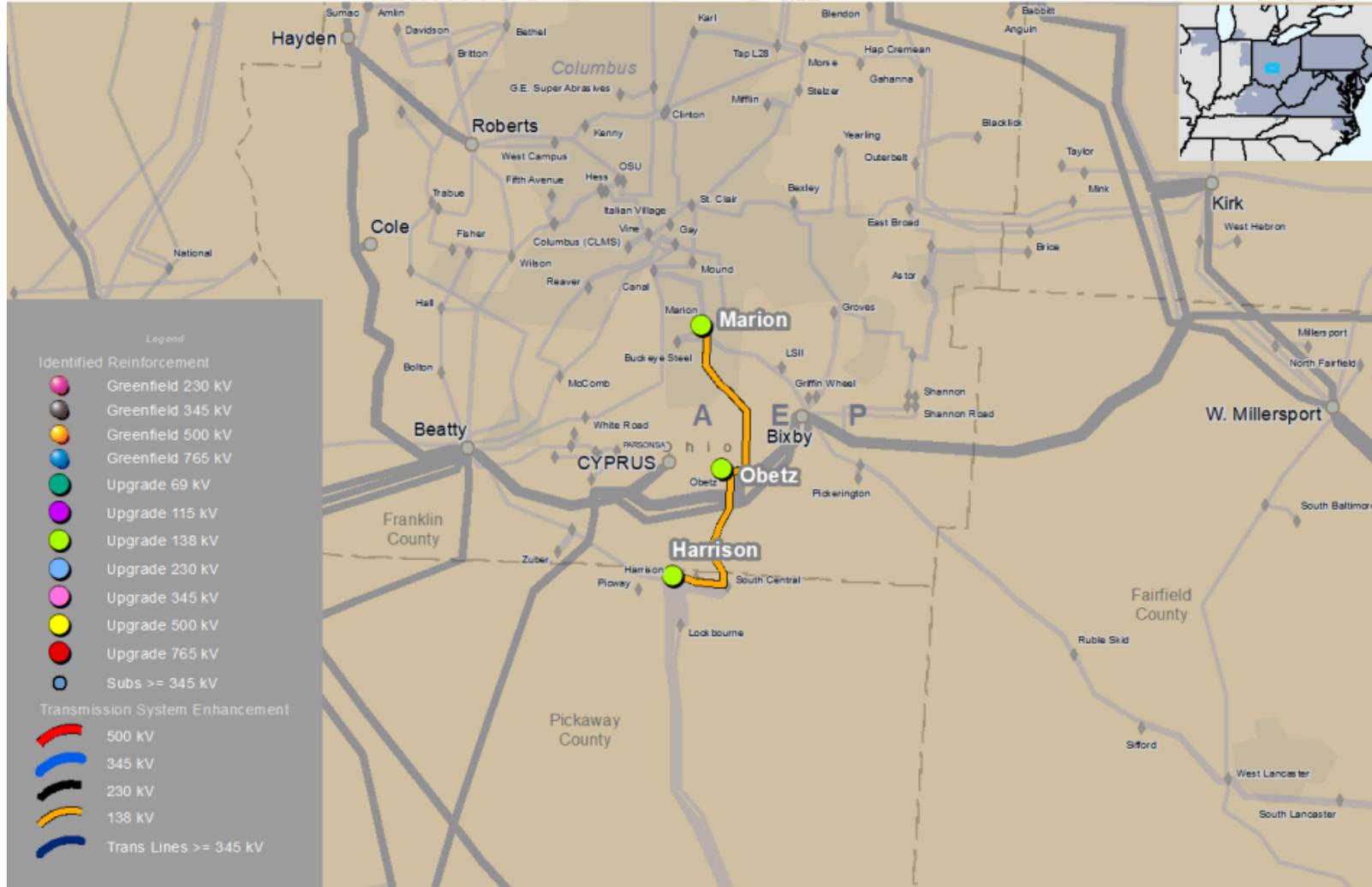
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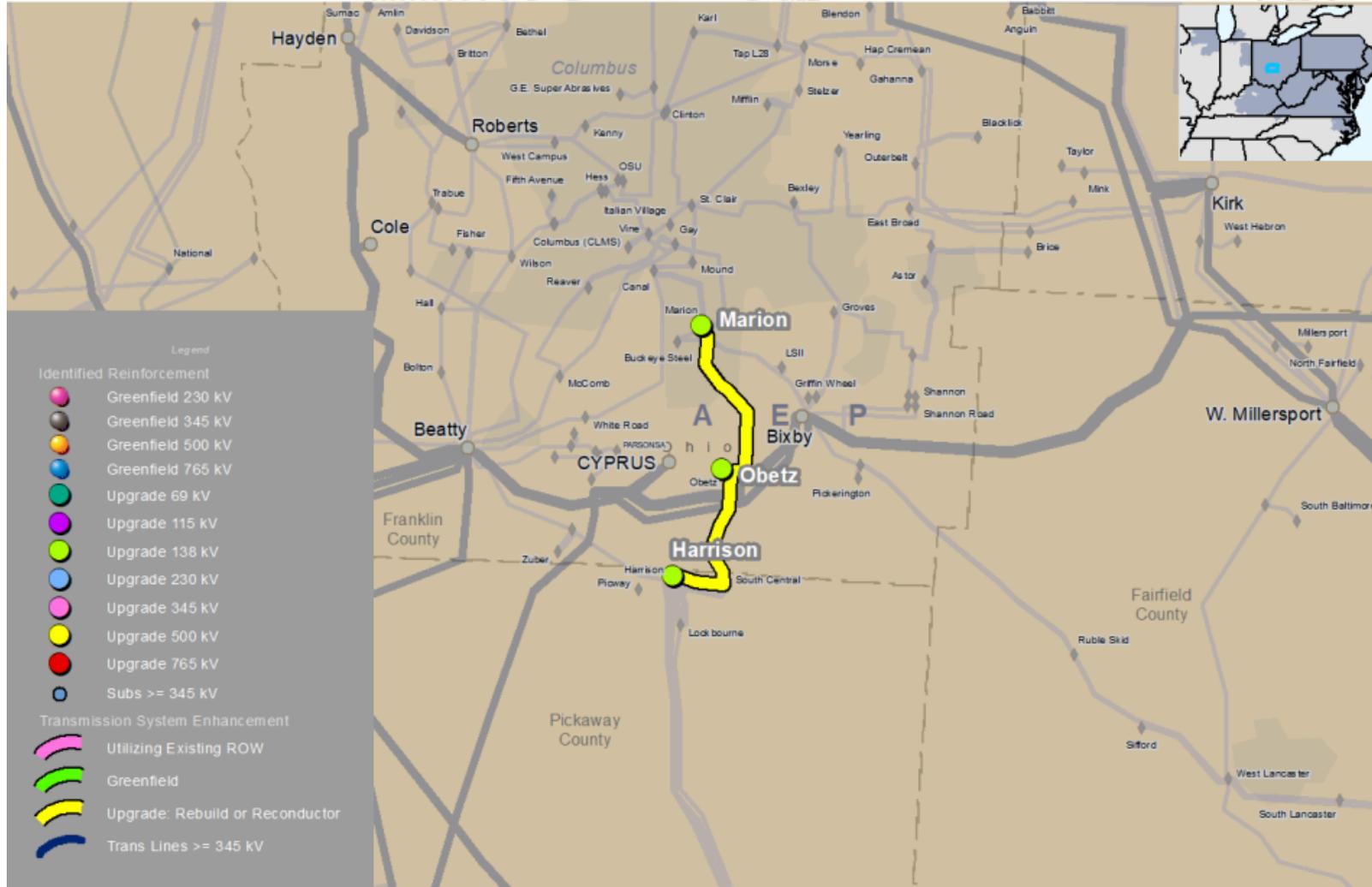
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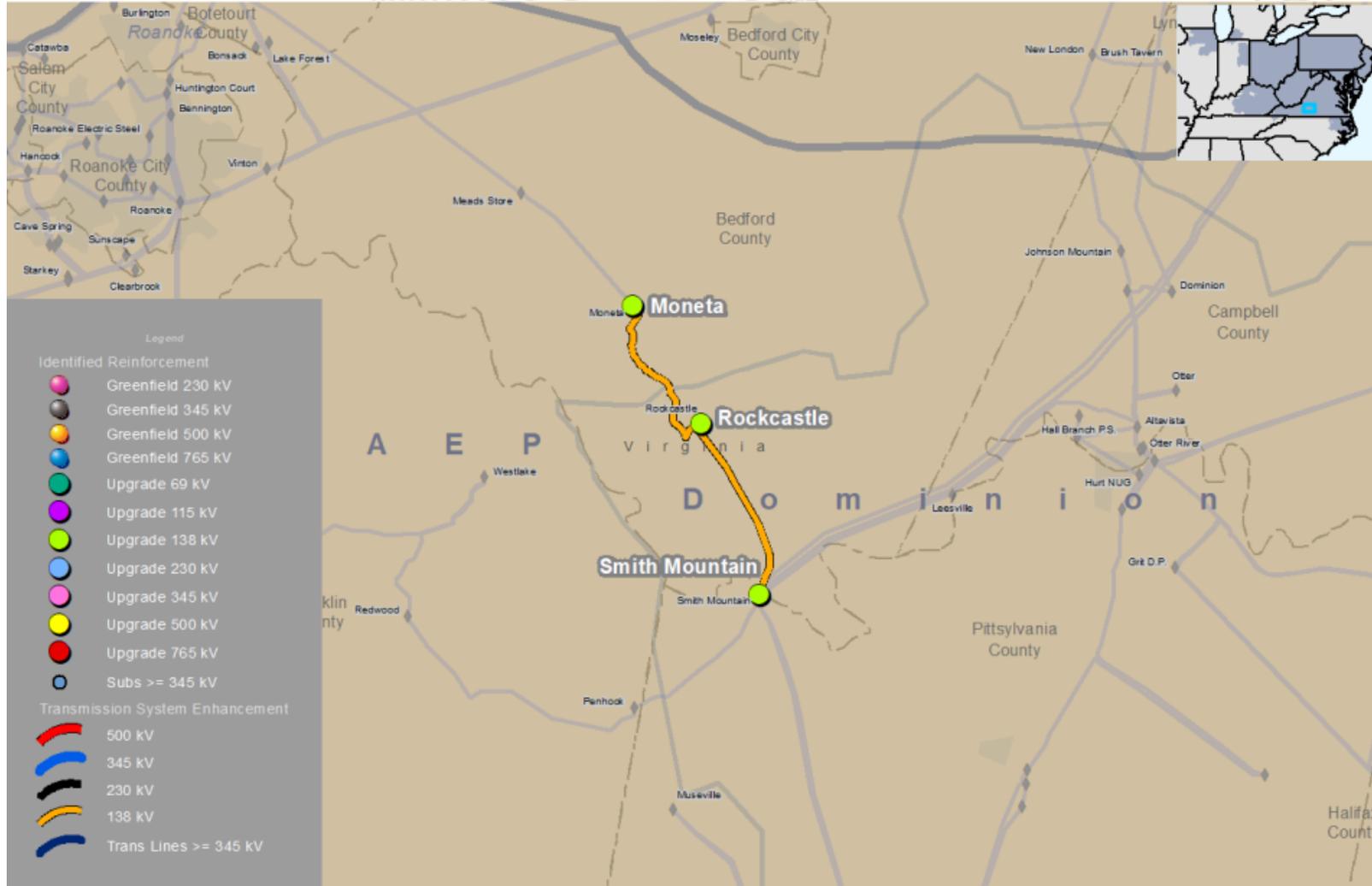
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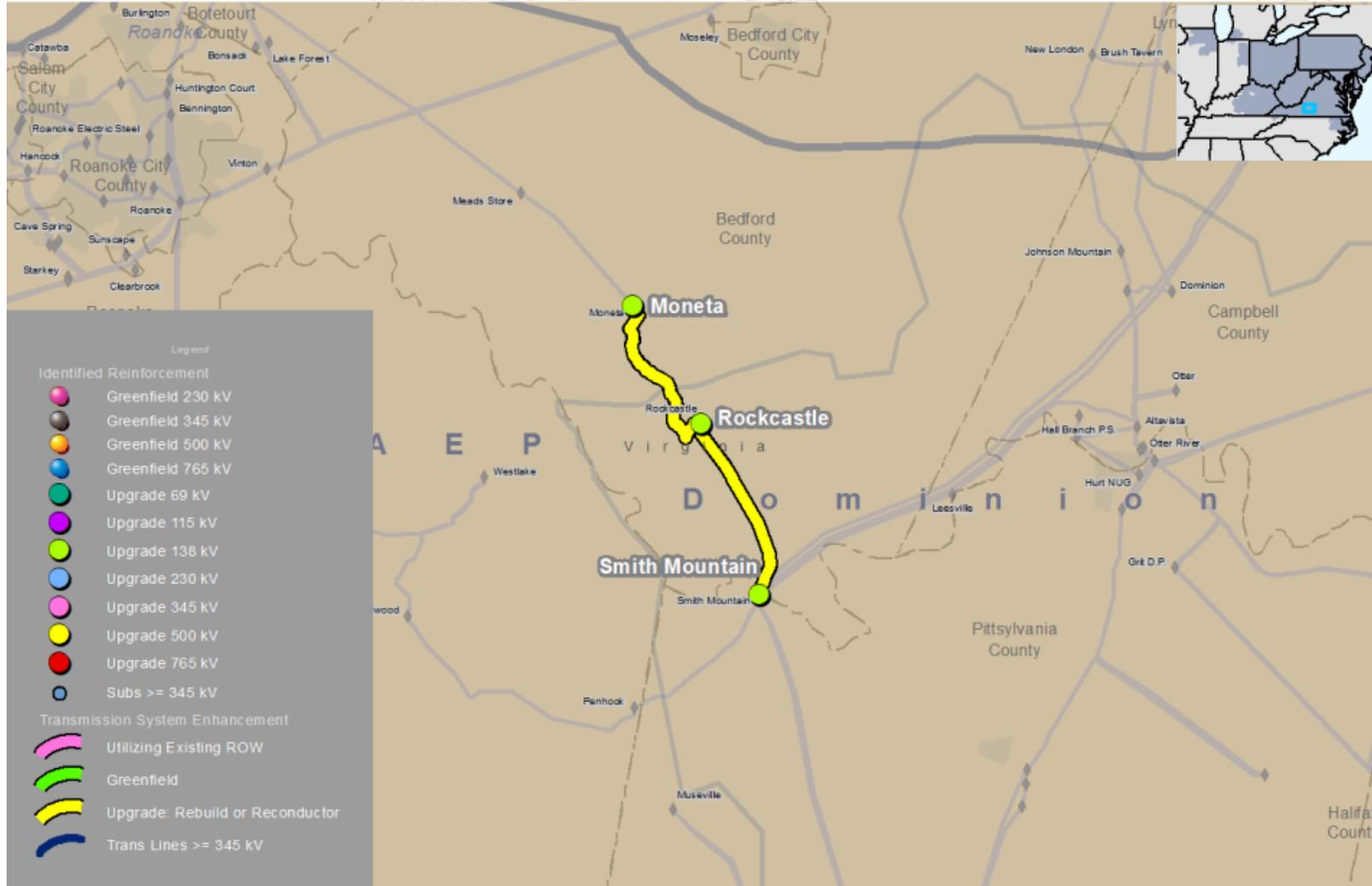
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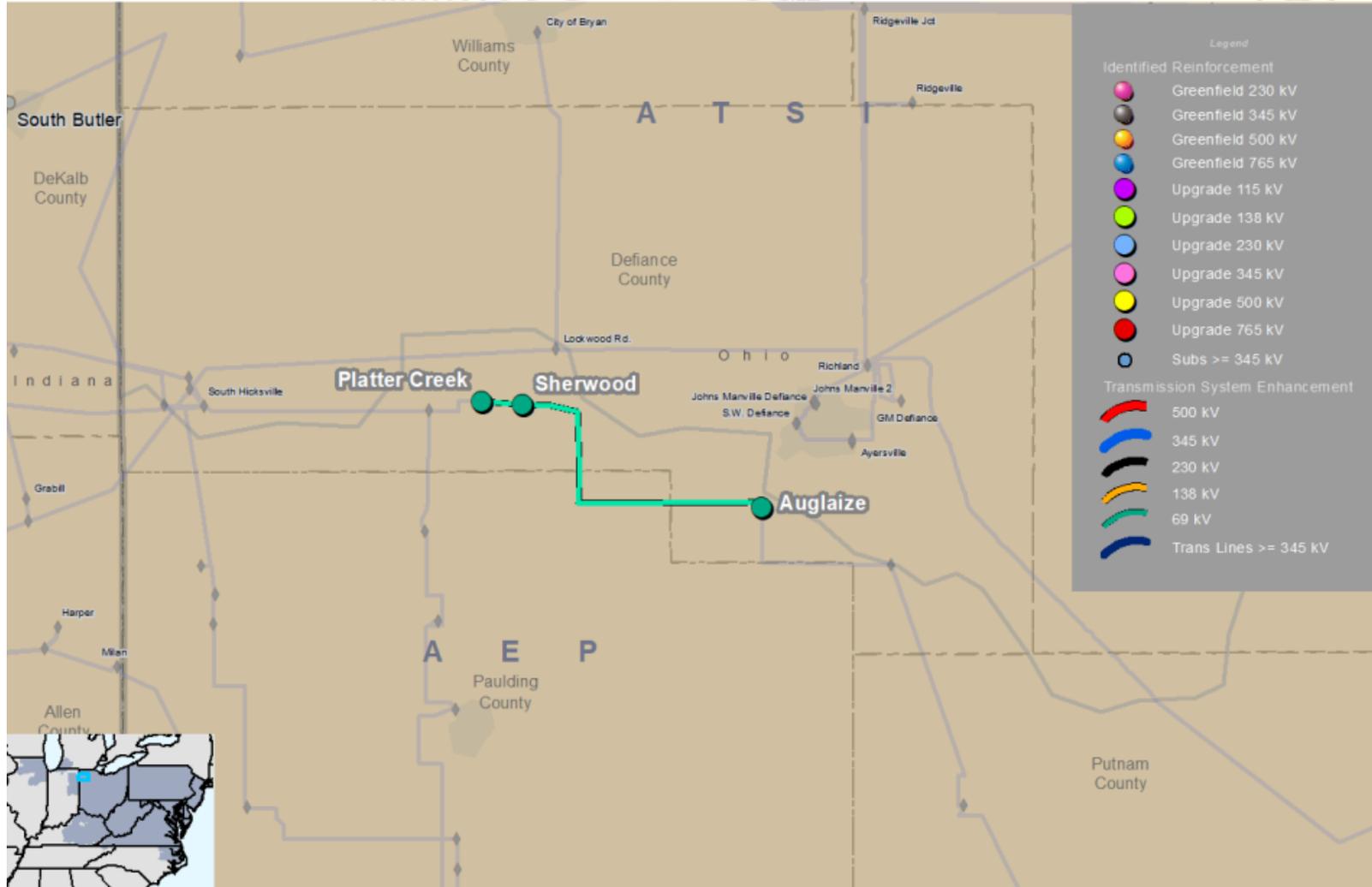
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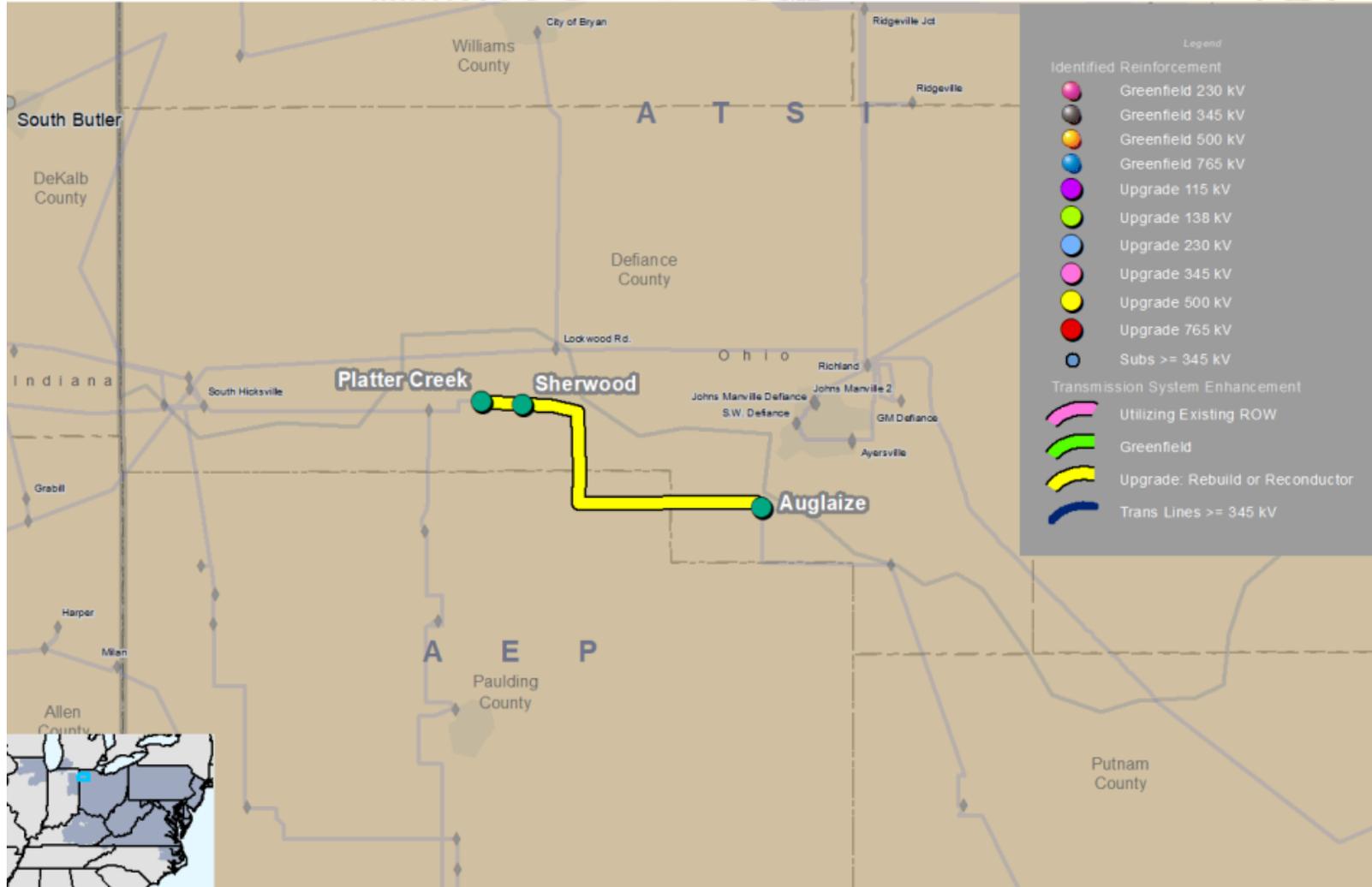
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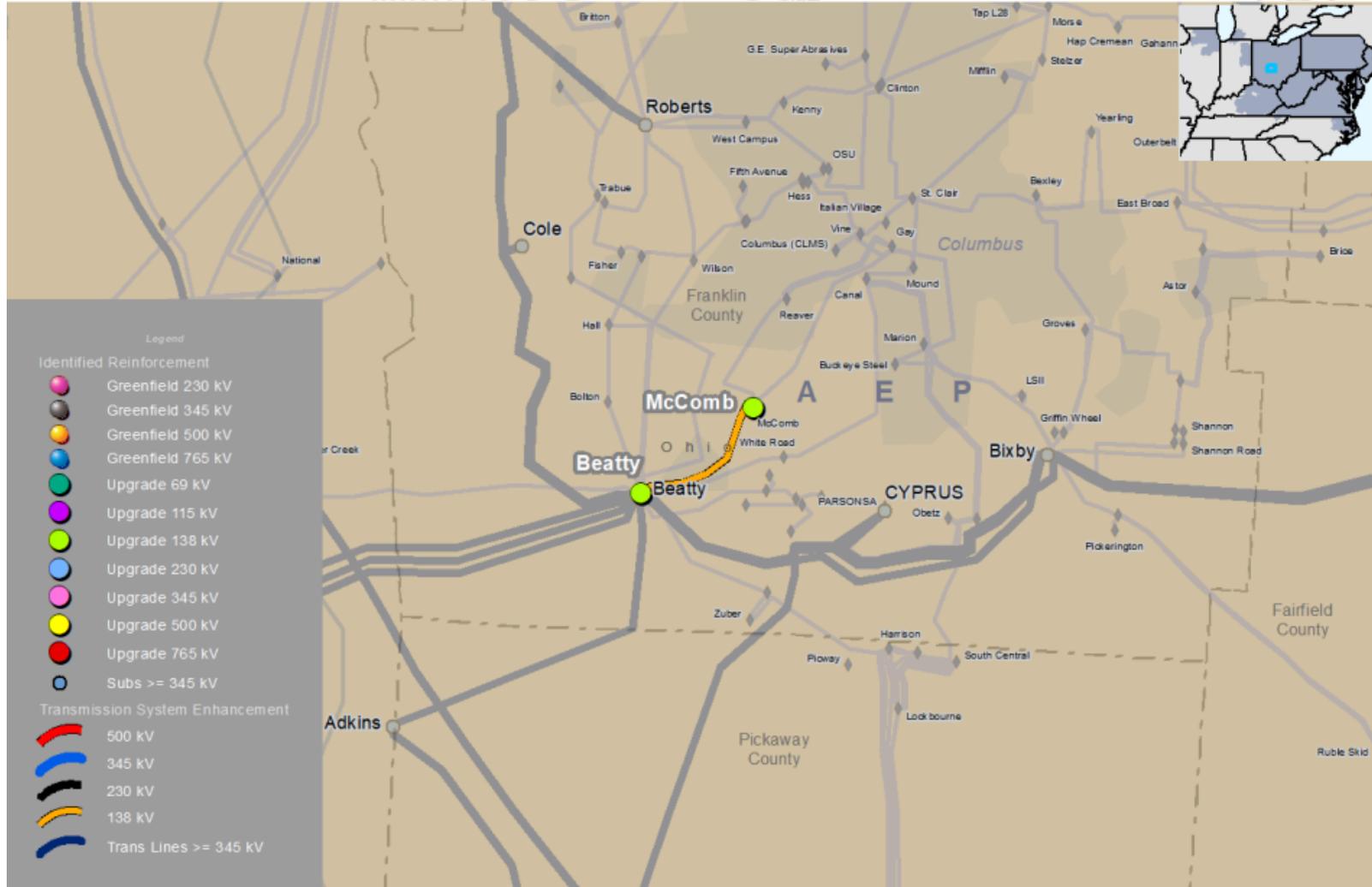
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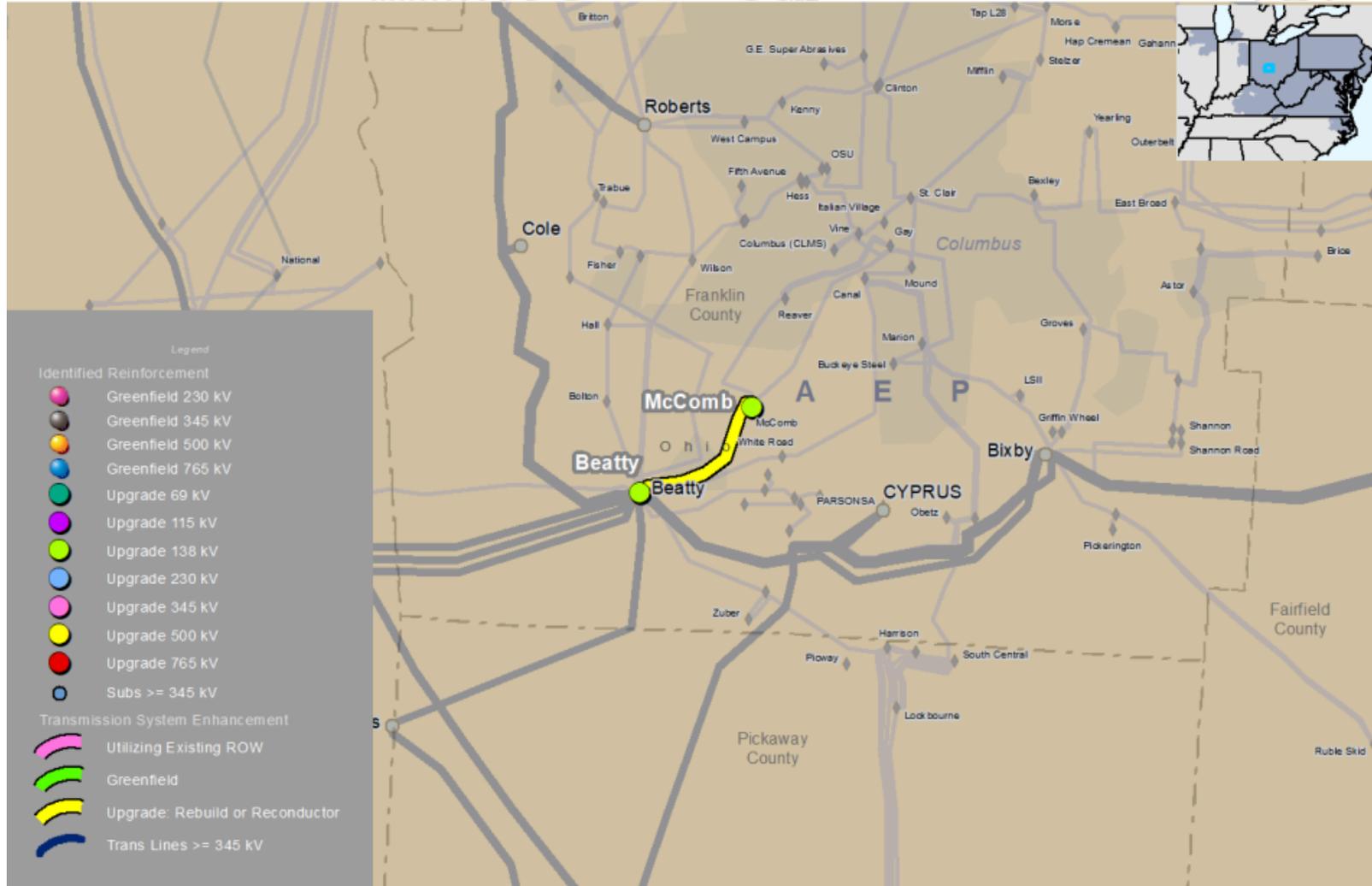
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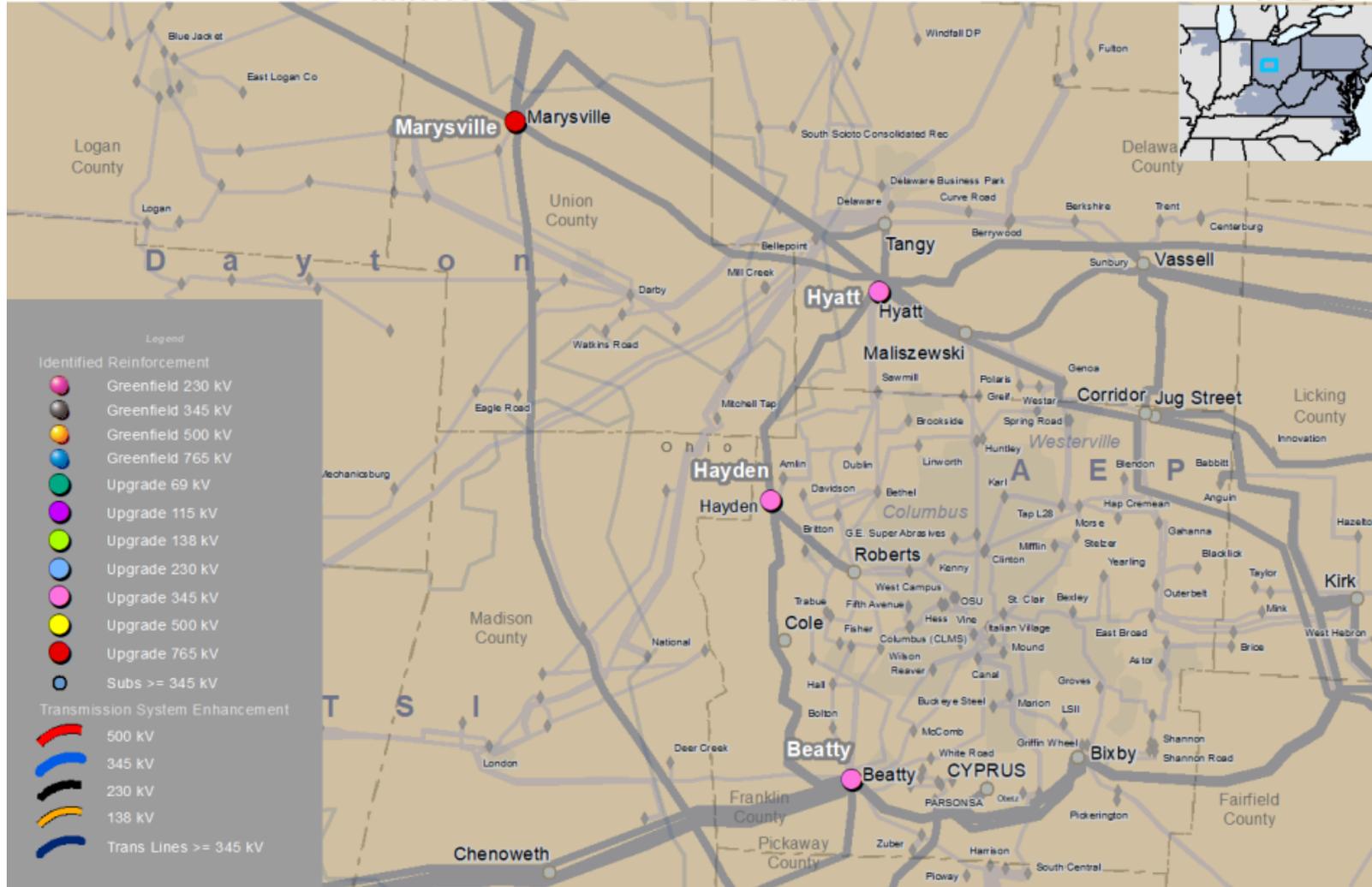
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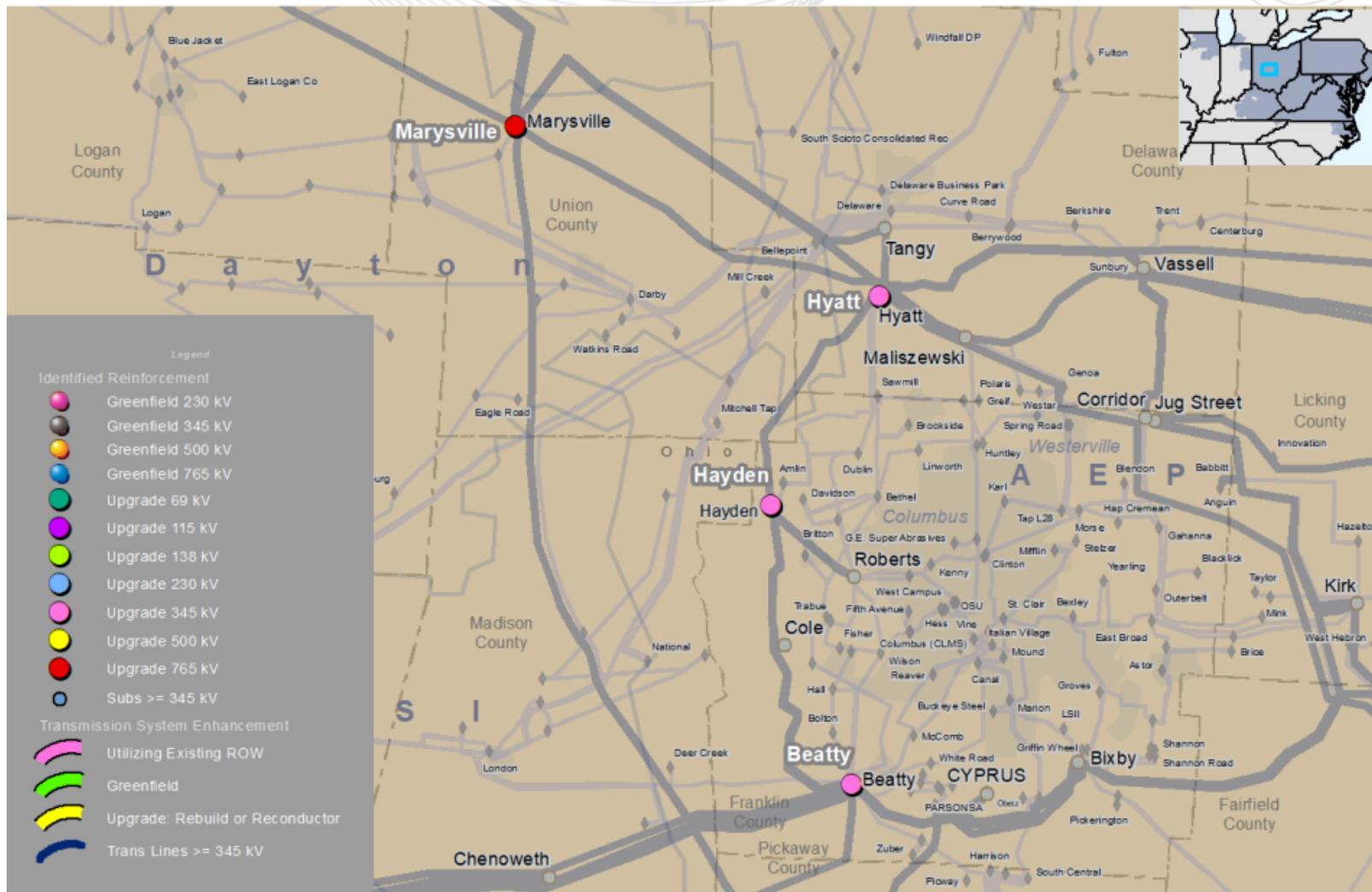
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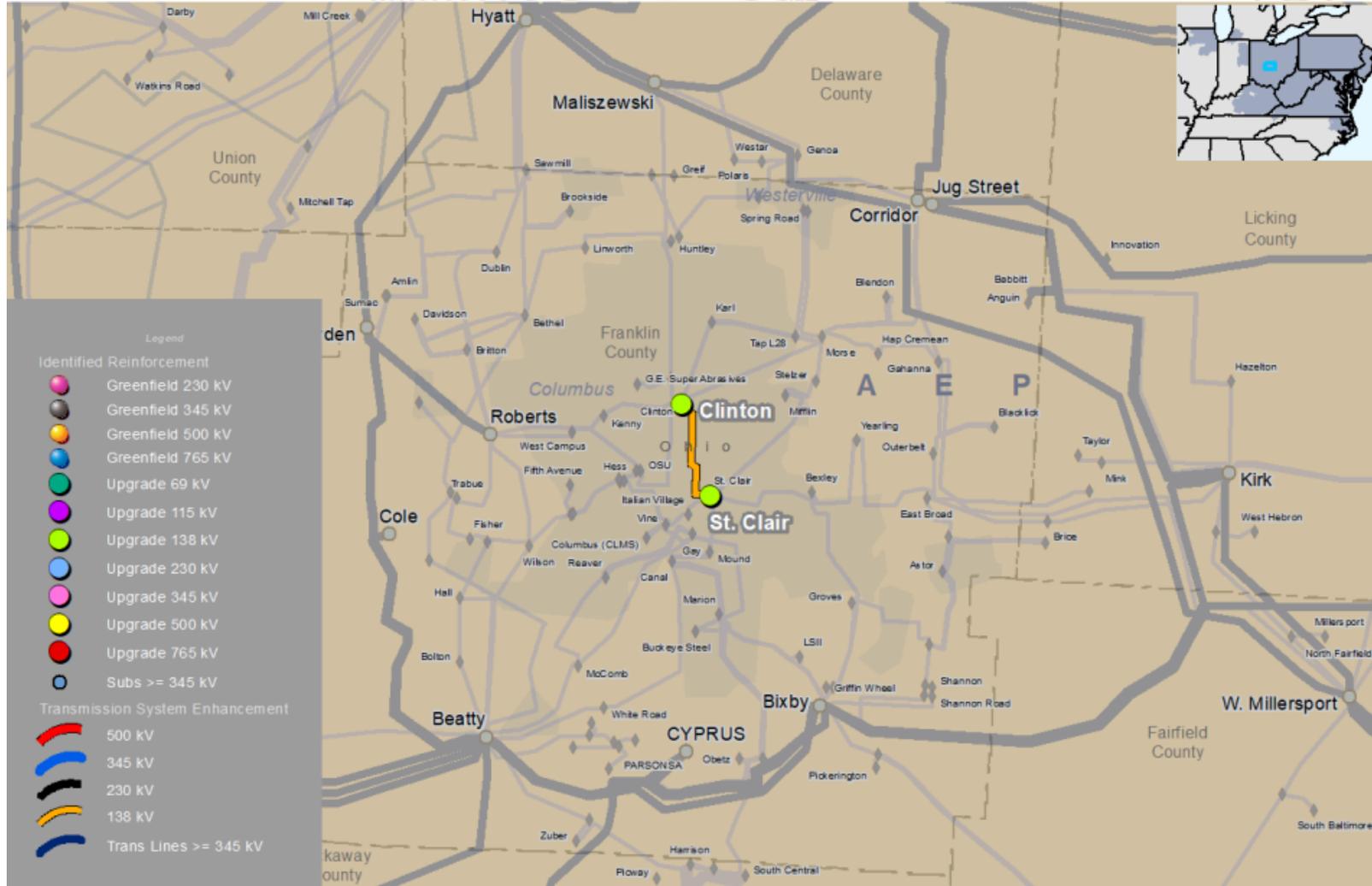
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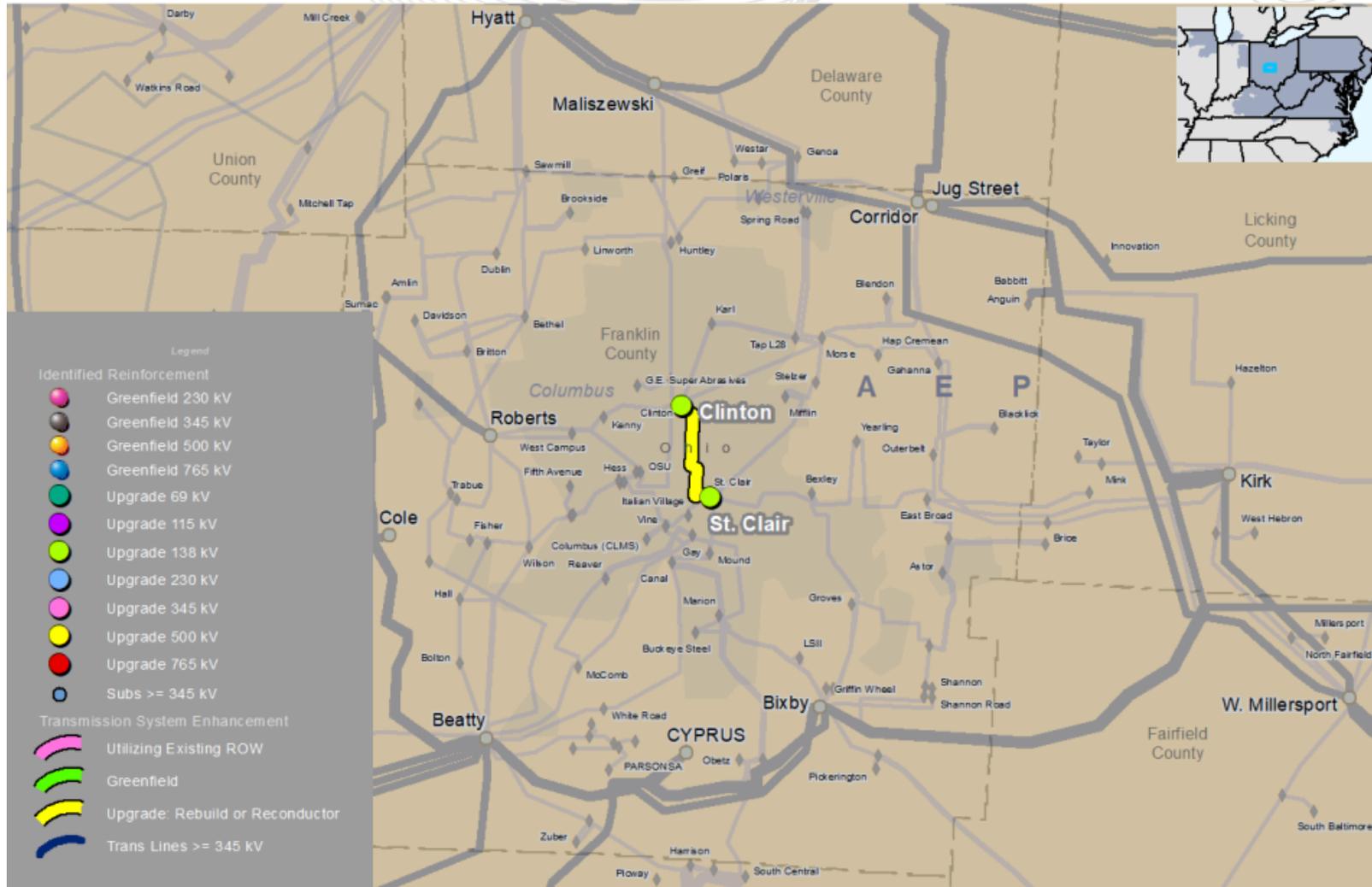
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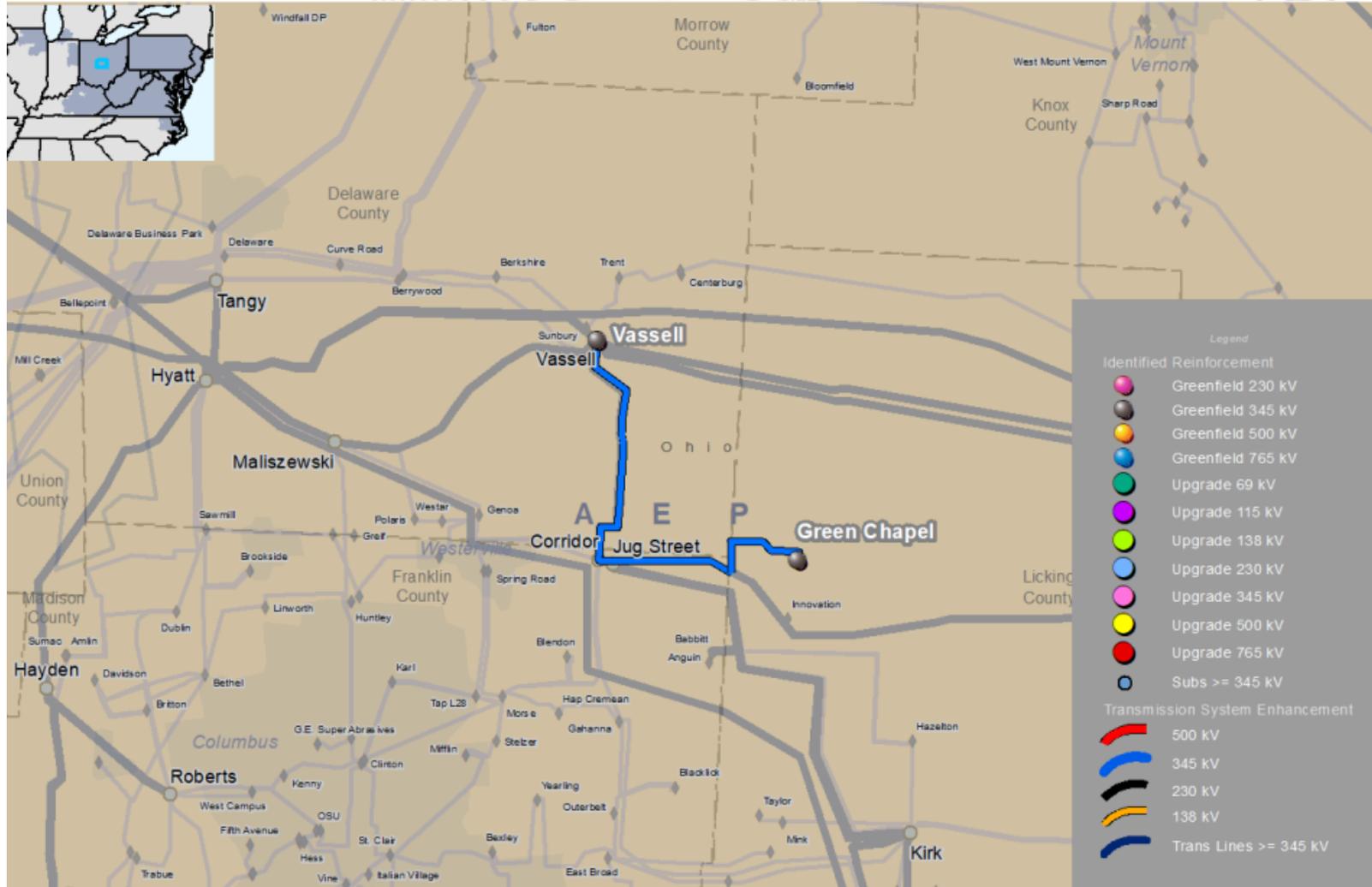
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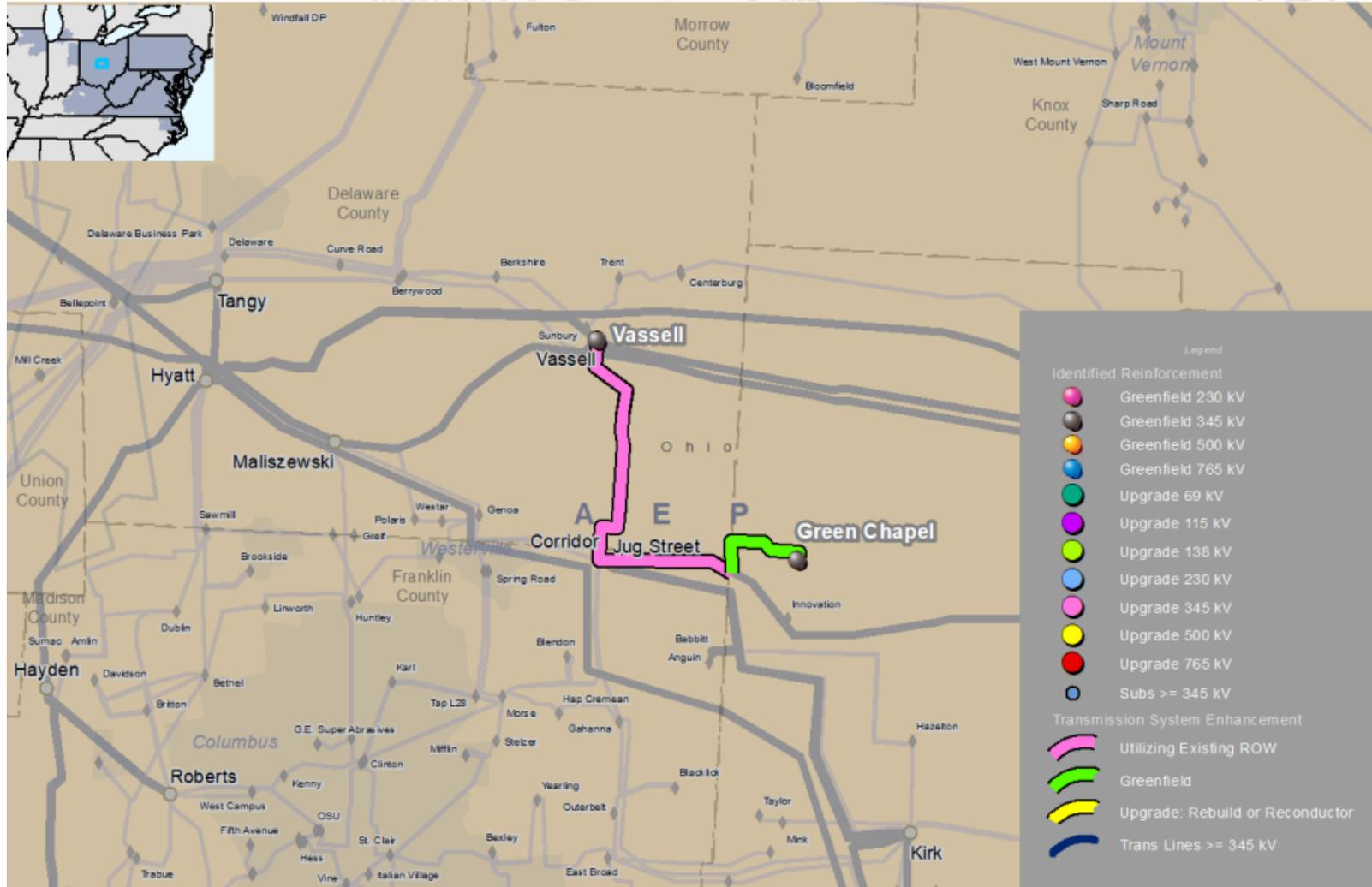
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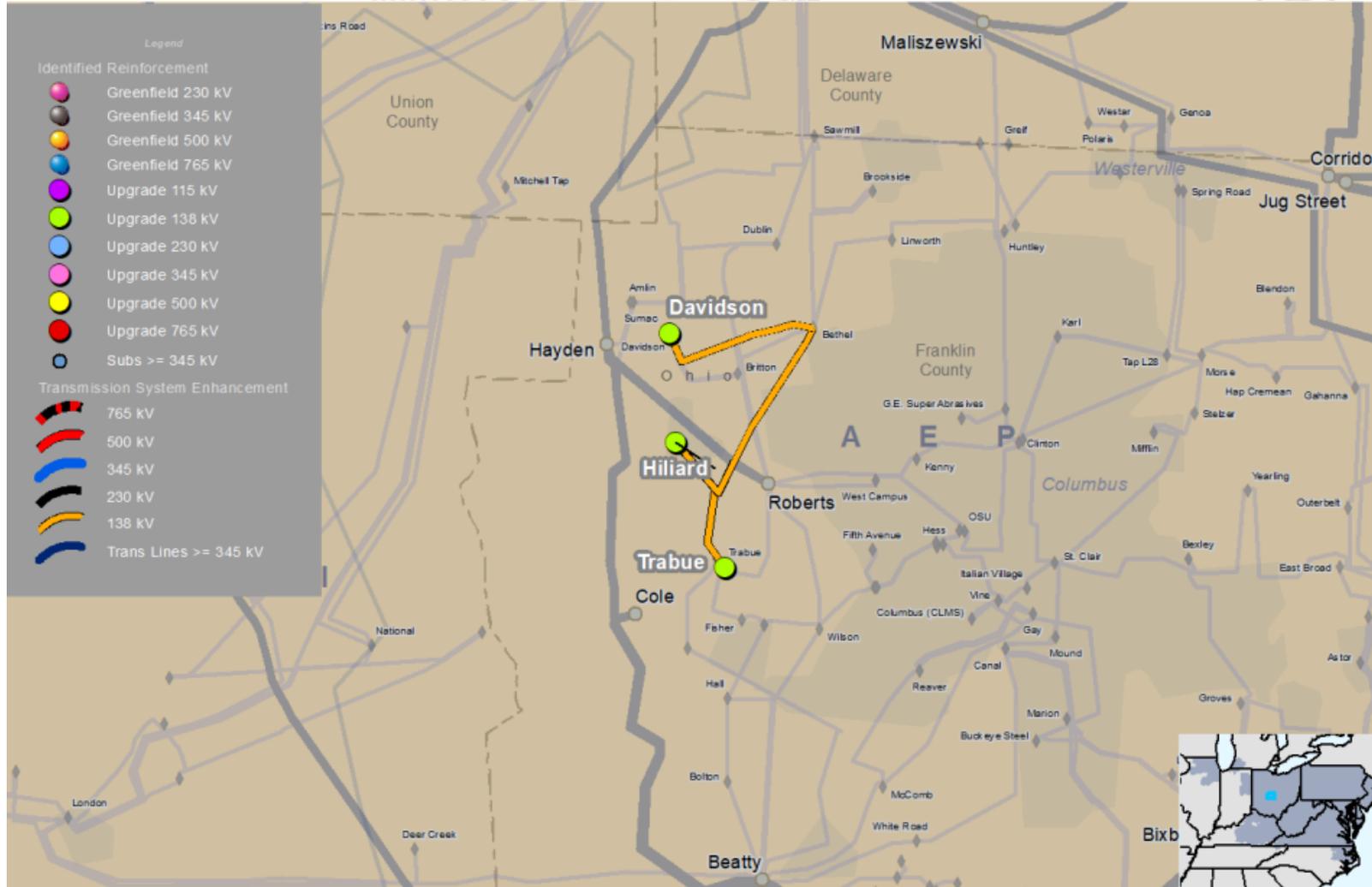
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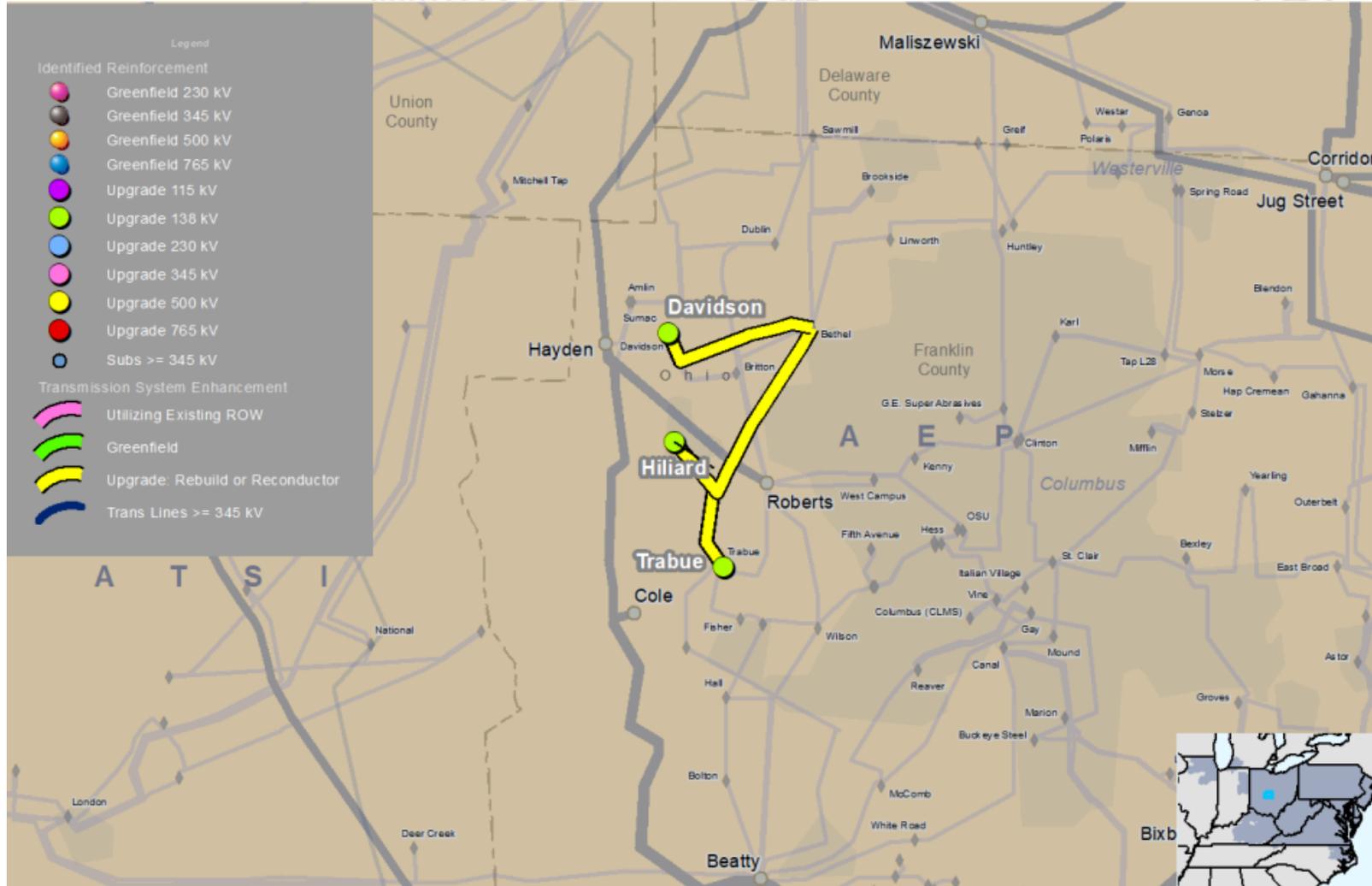
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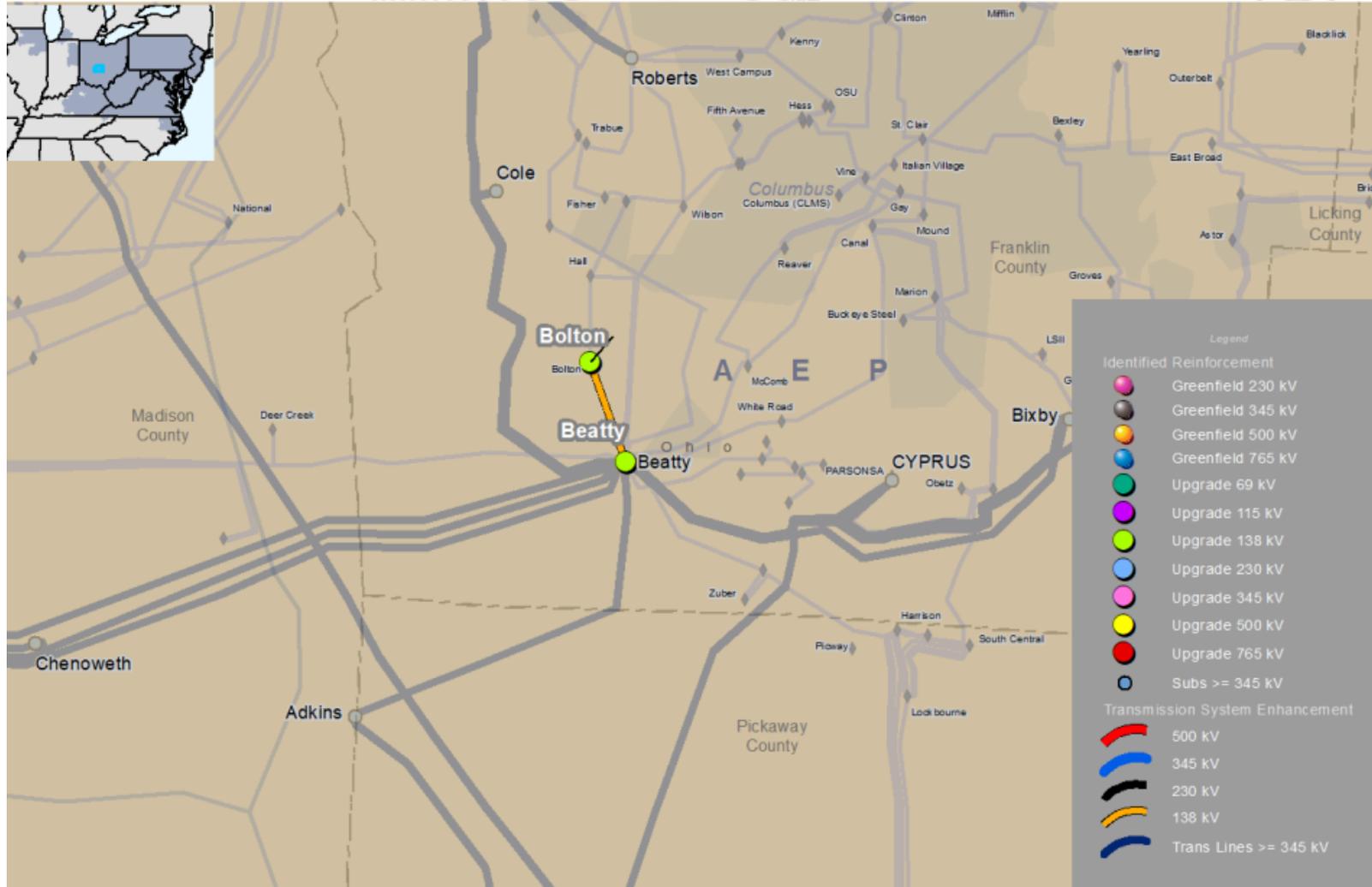
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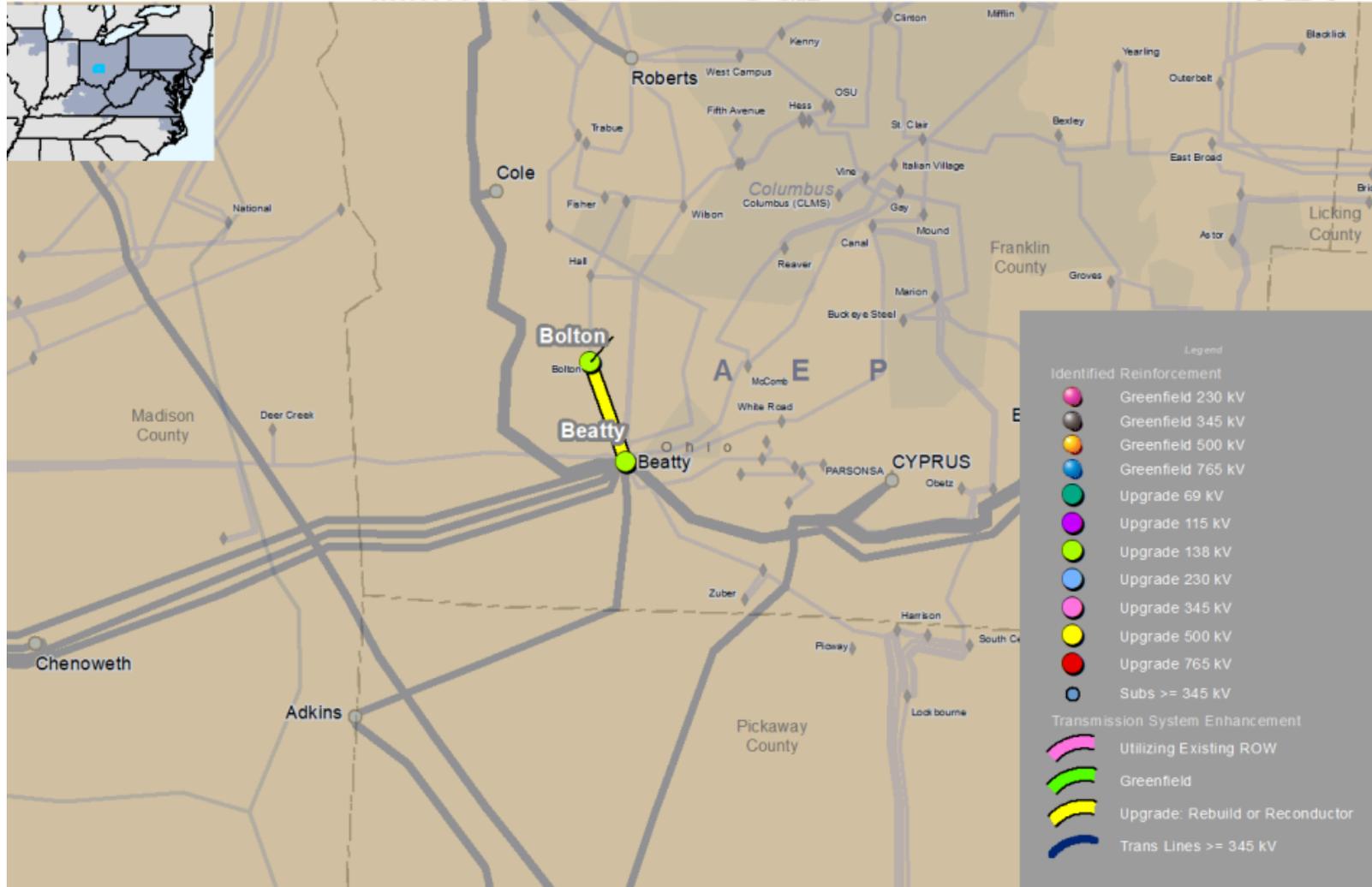
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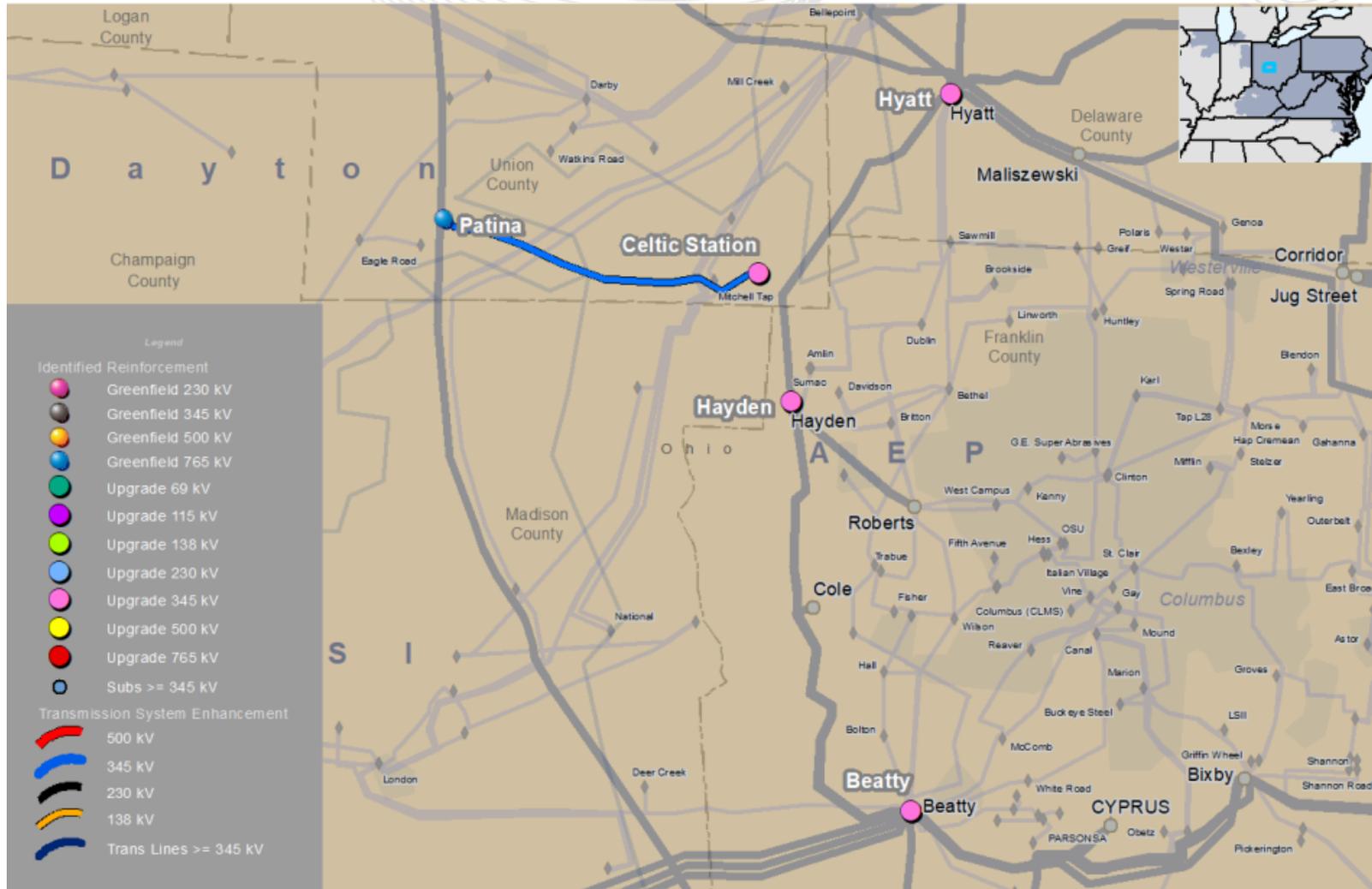
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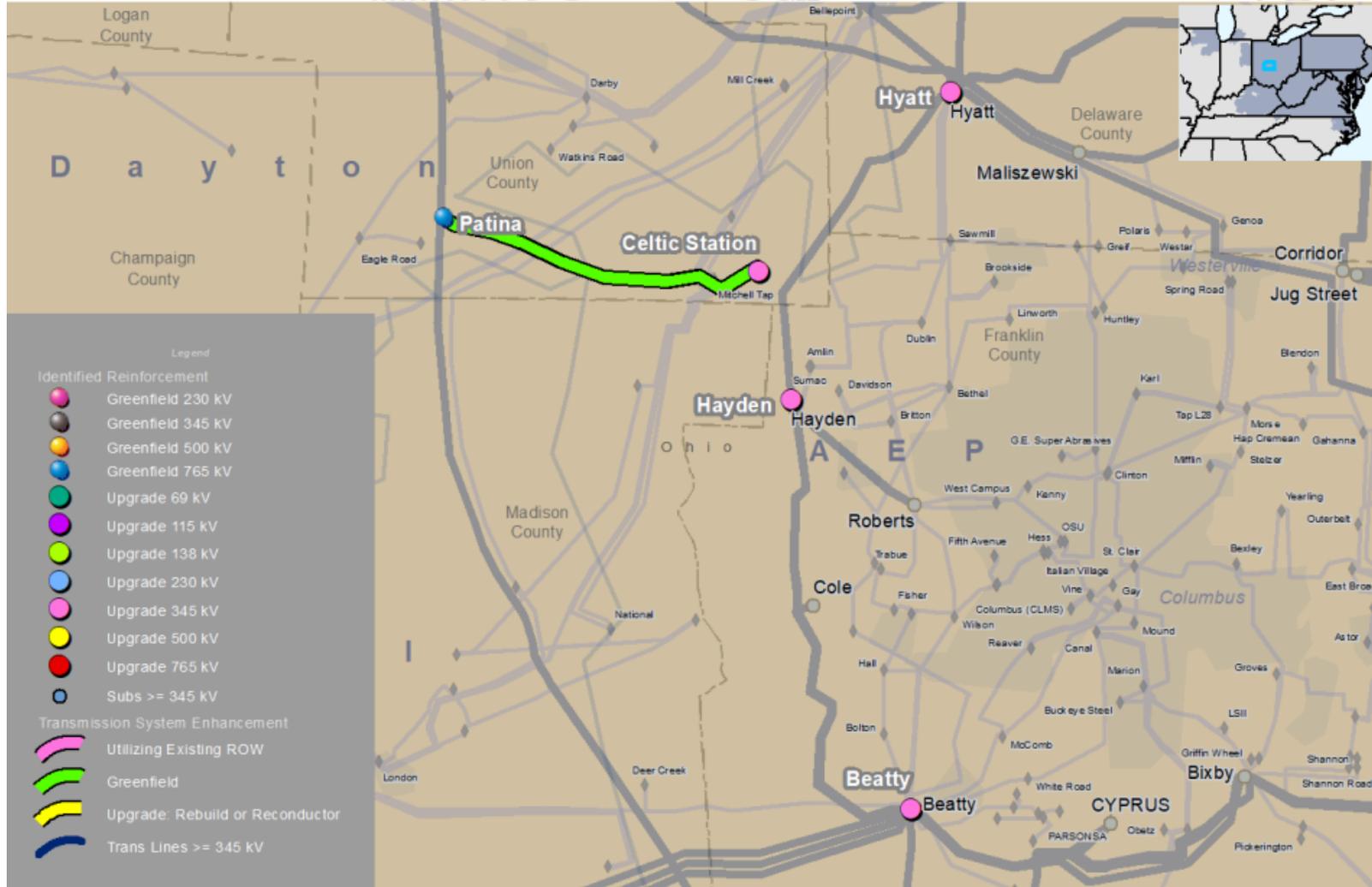
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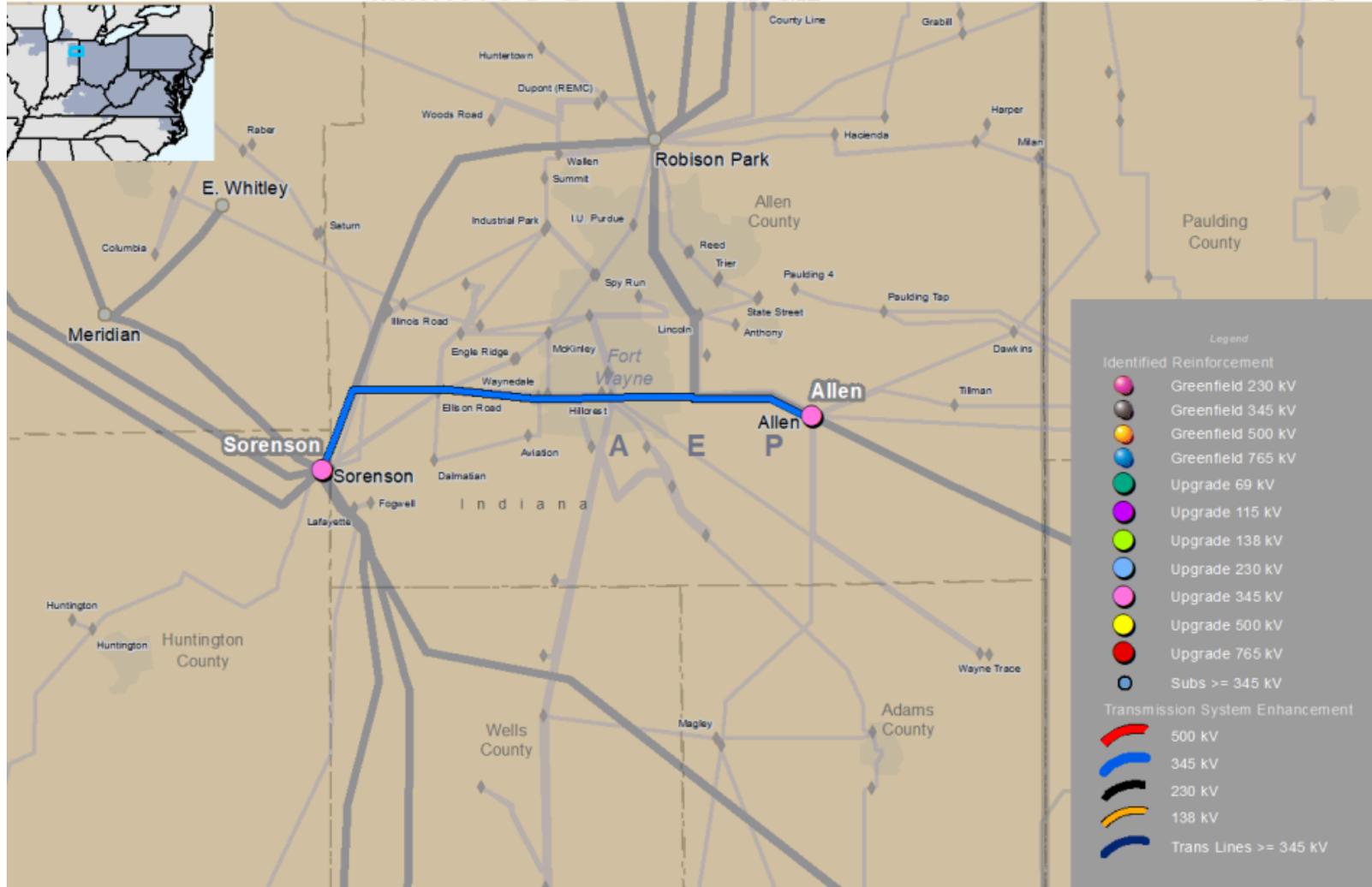
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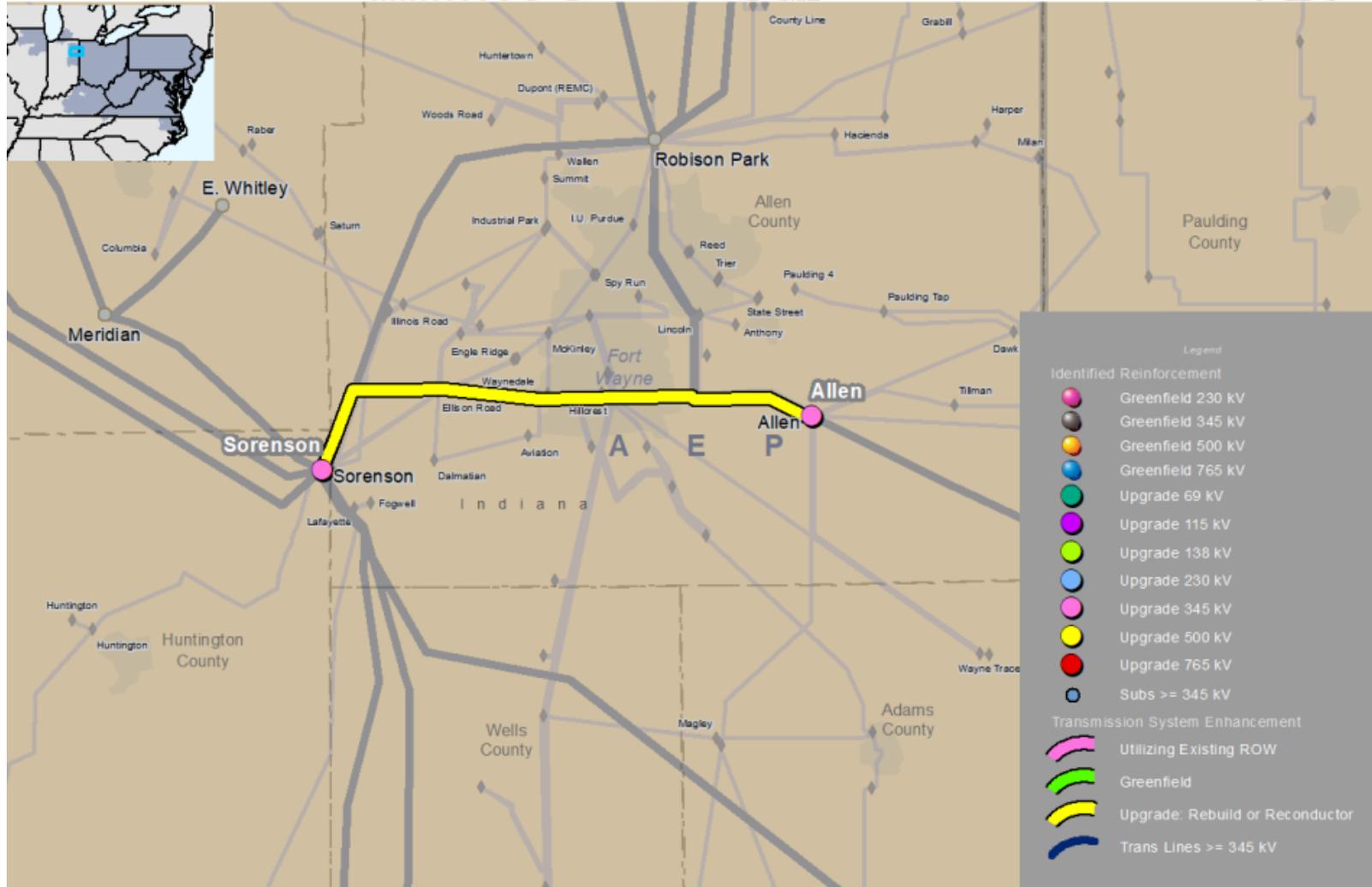
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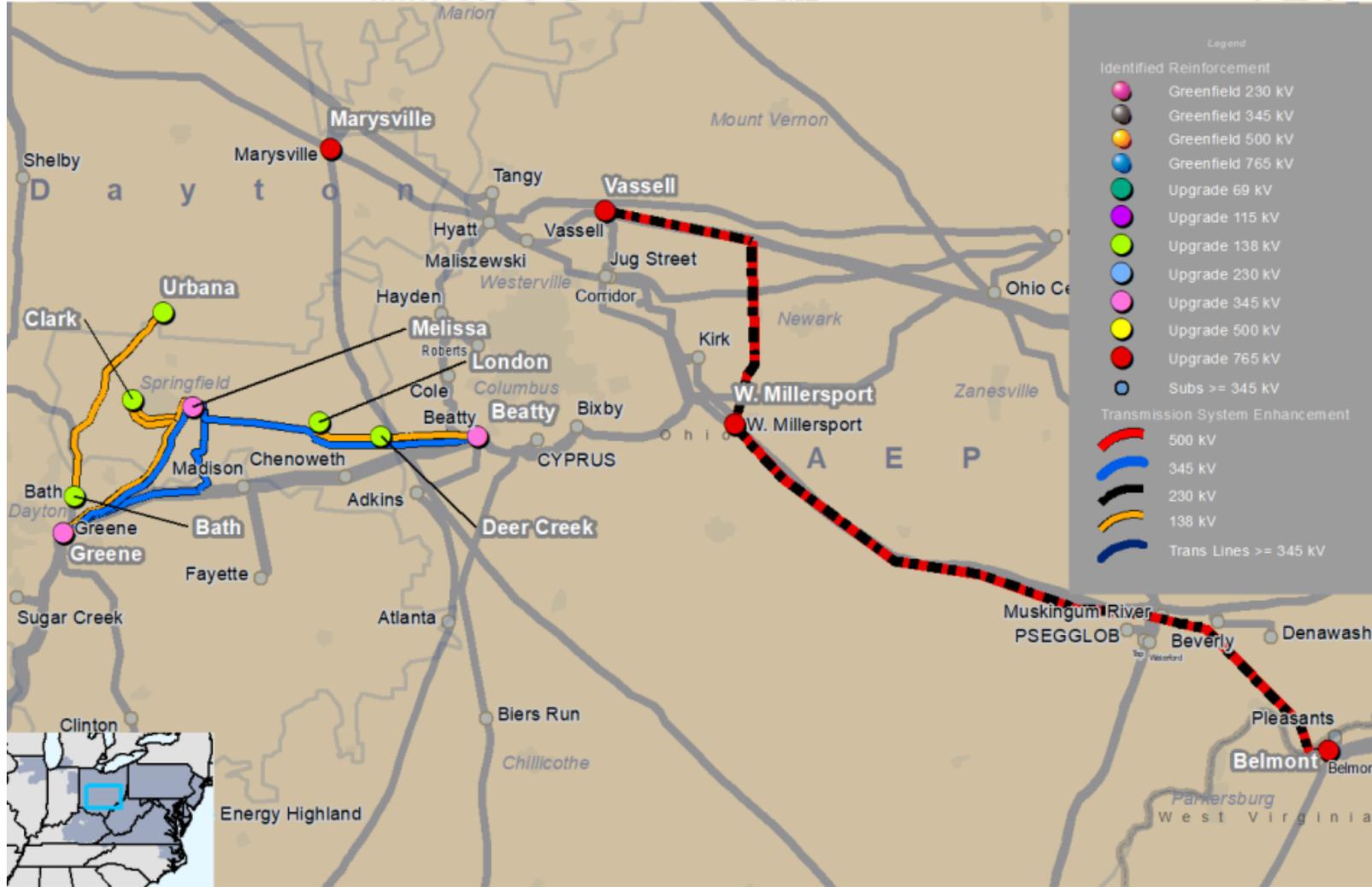


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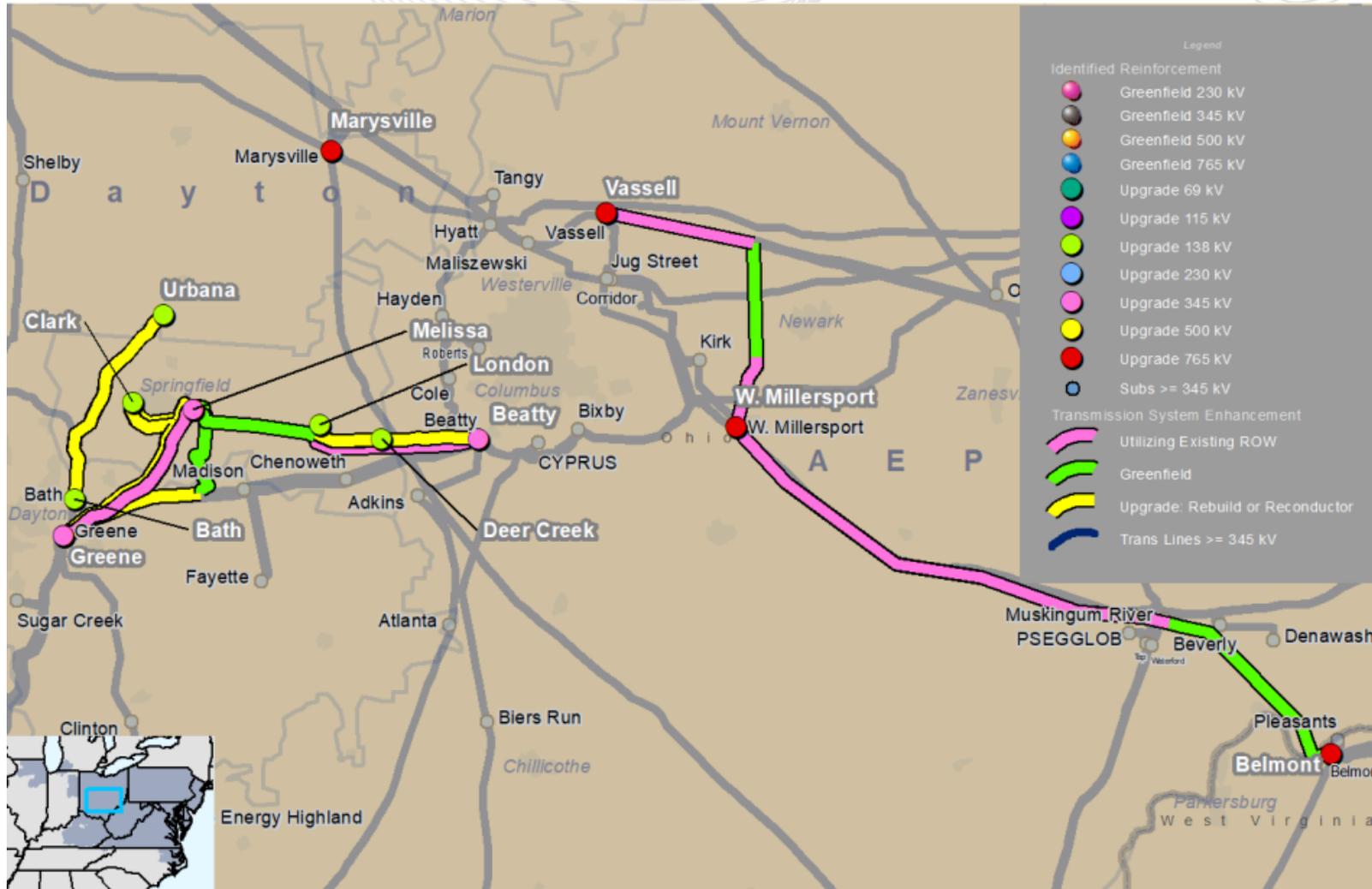


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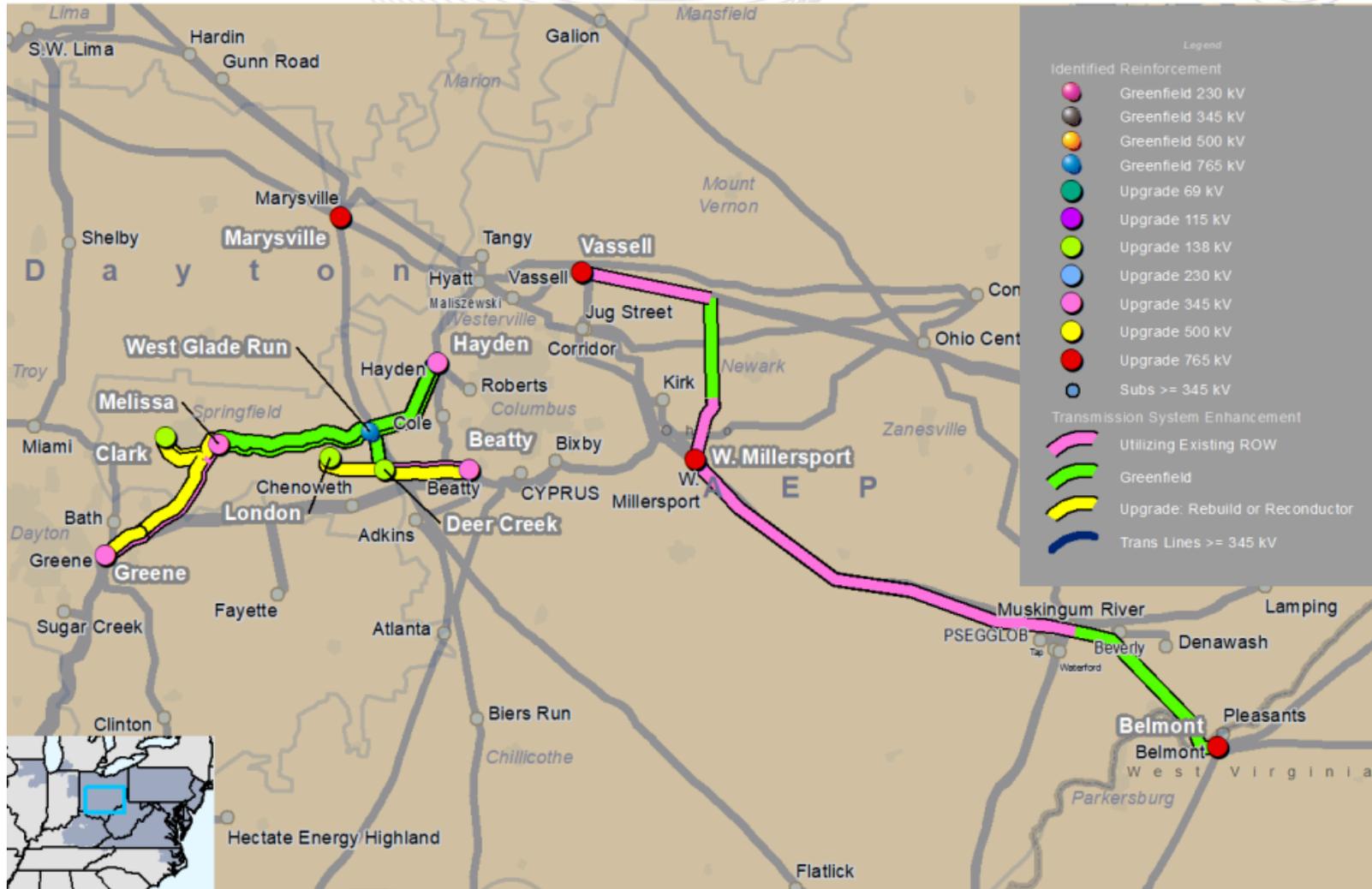
ATSI (FirstEnergy)



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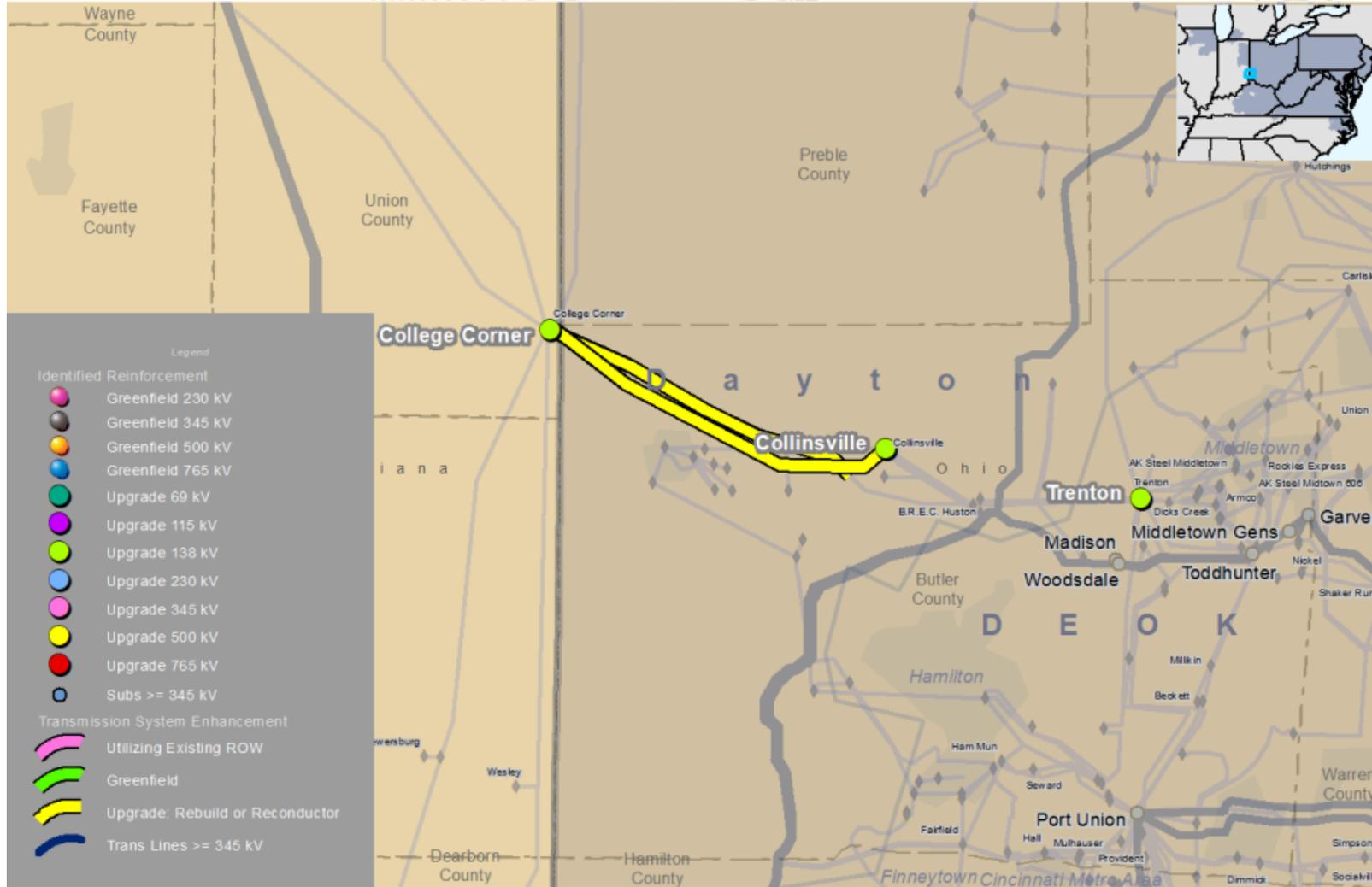


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CINSI (DEOK)

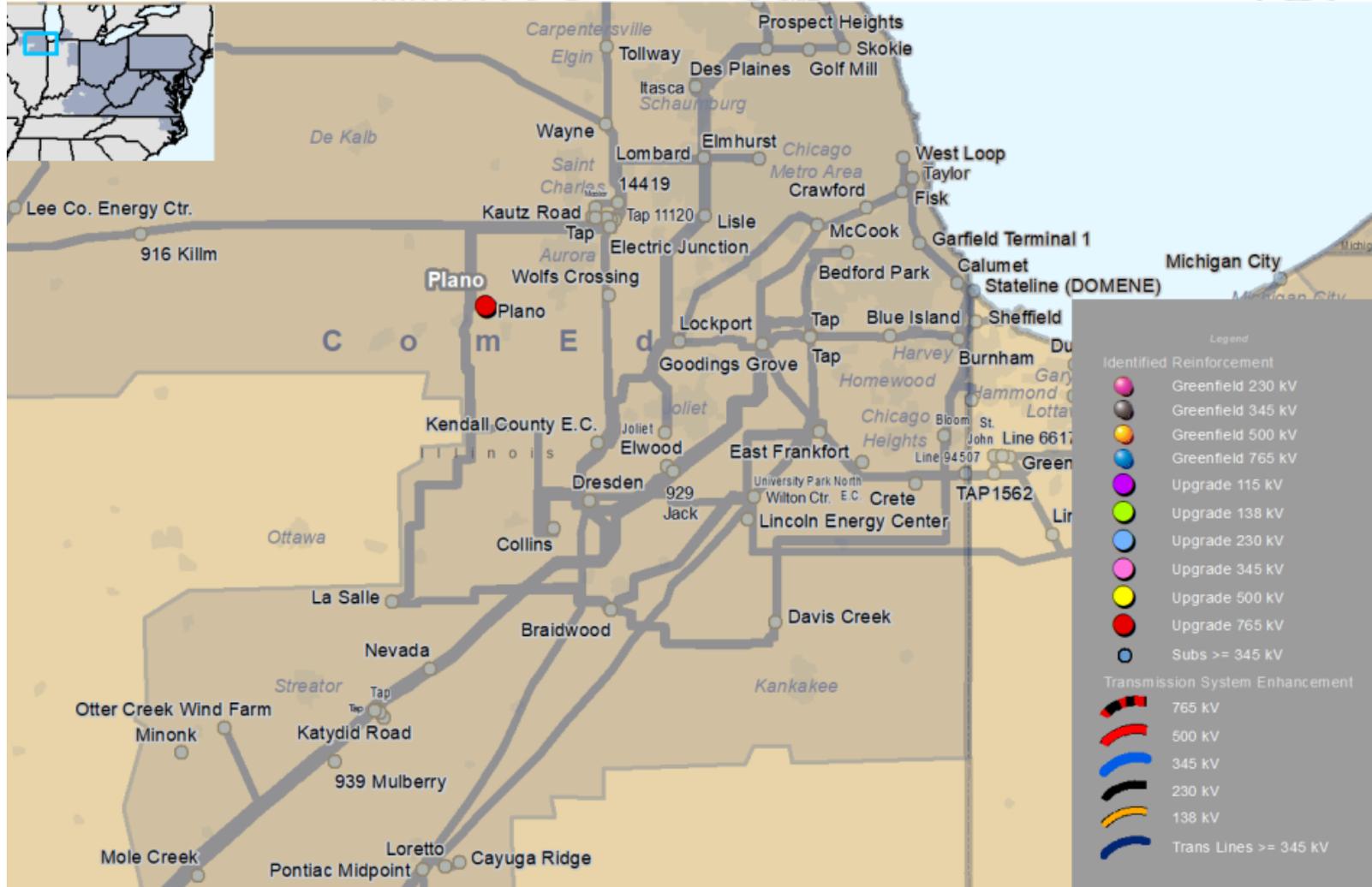


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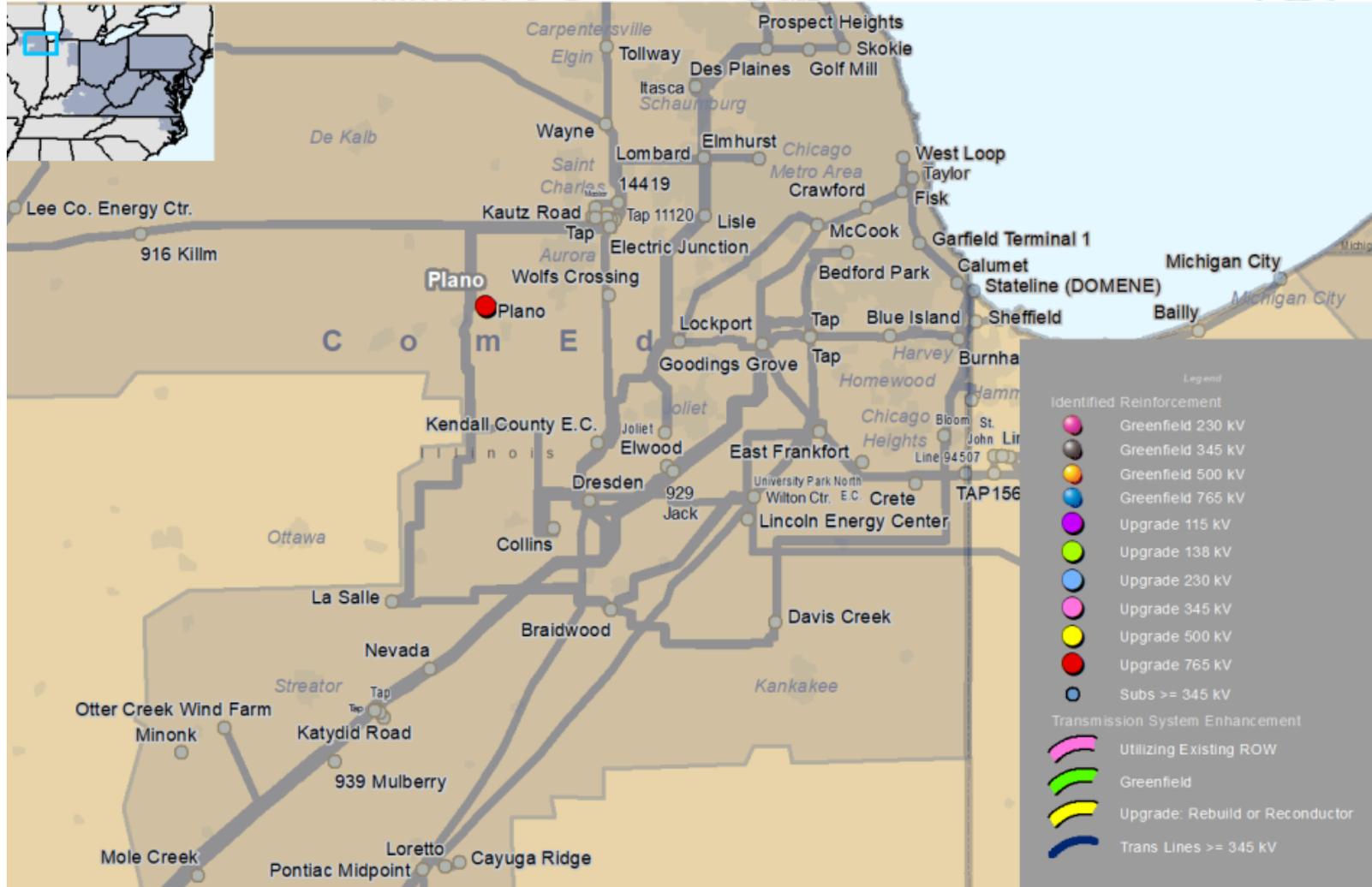


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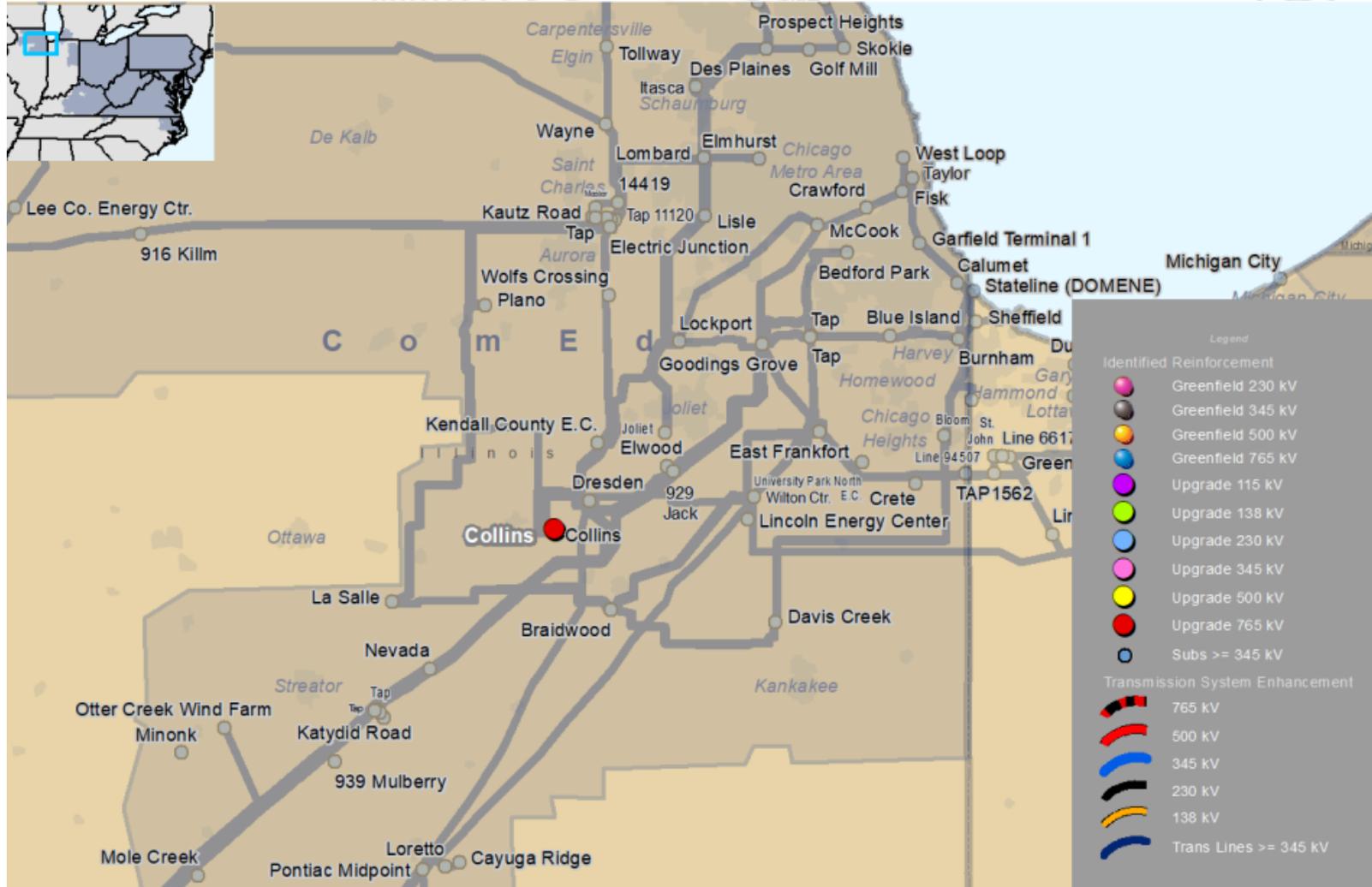
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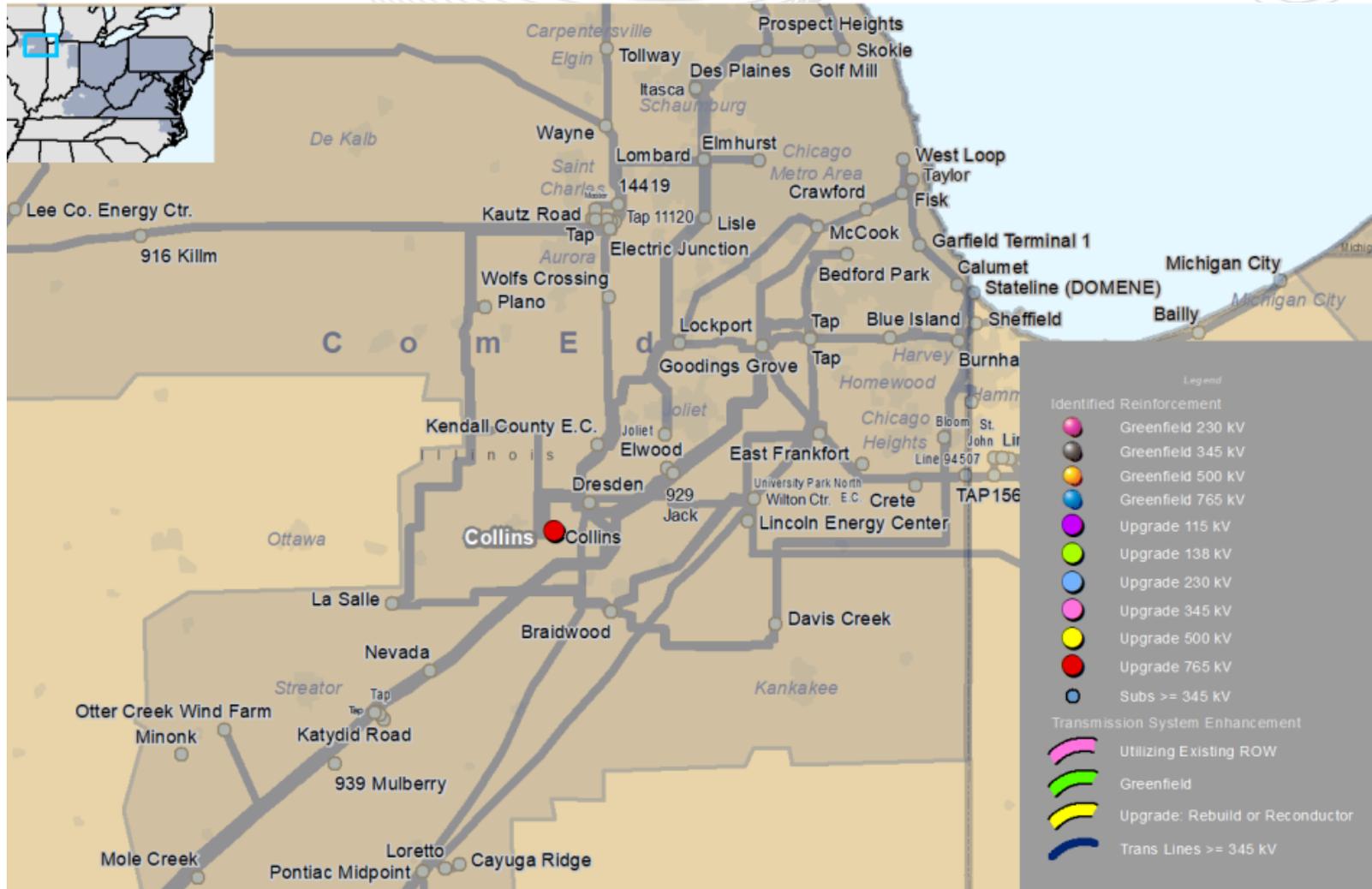
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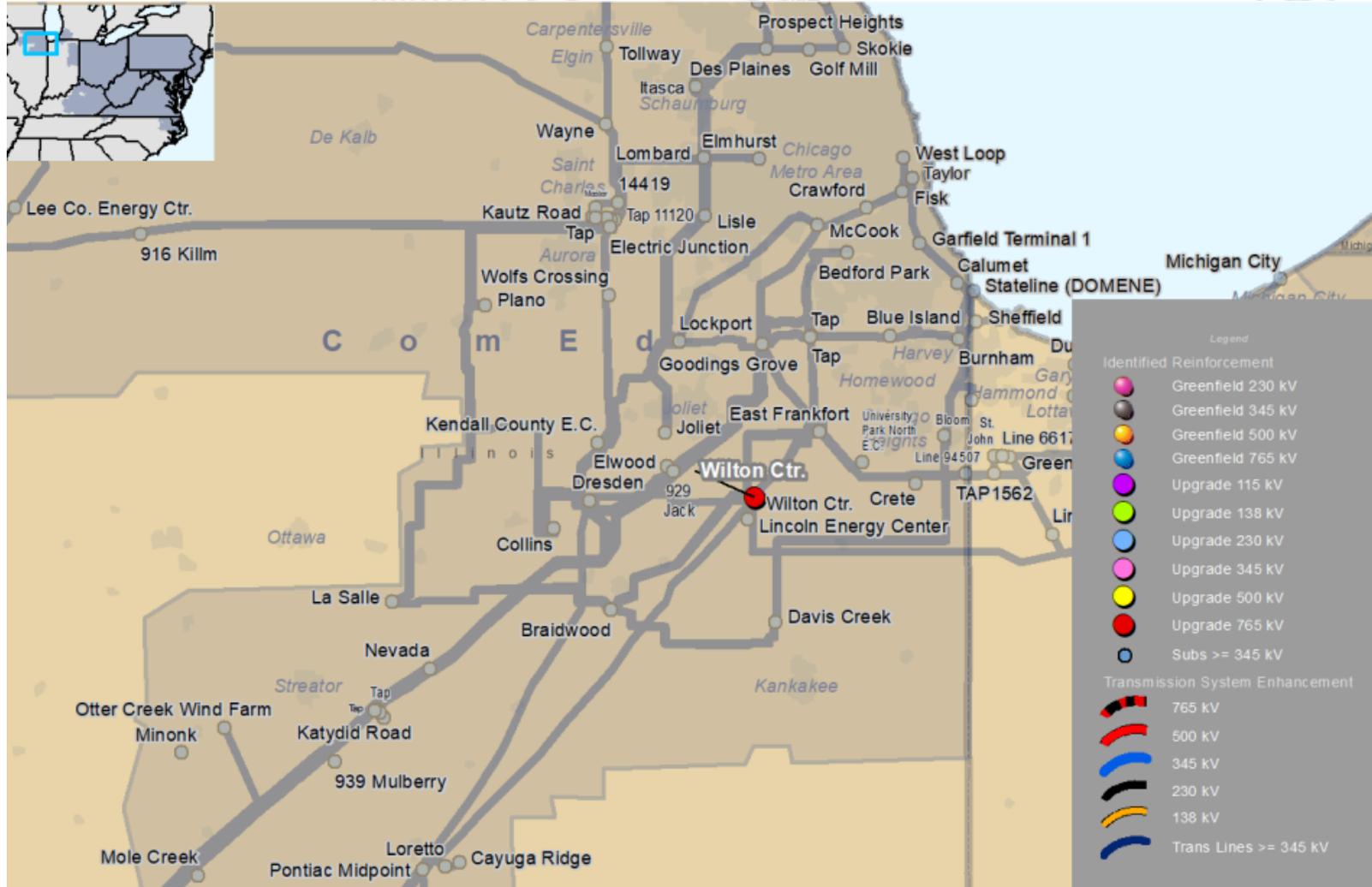
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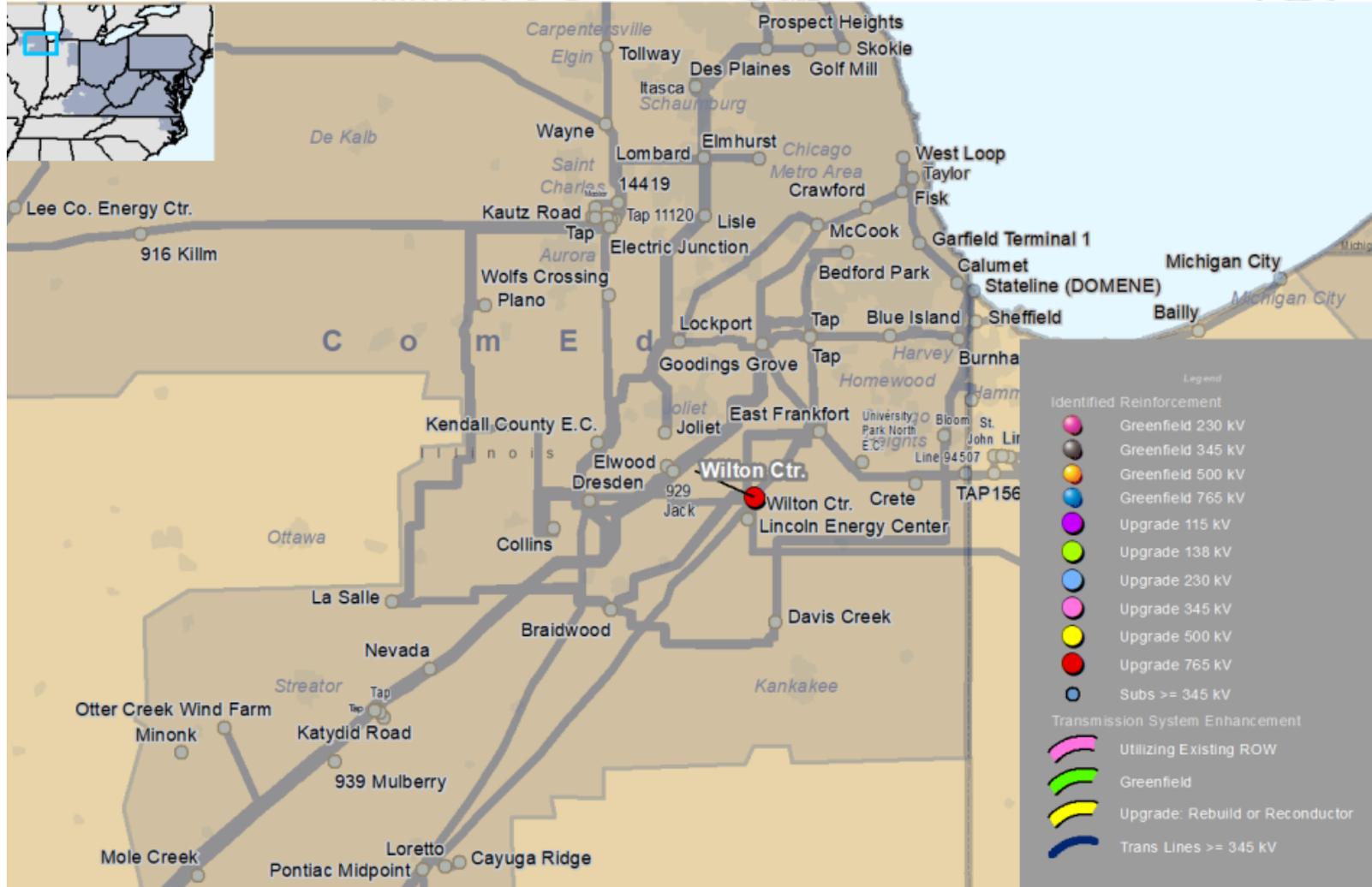
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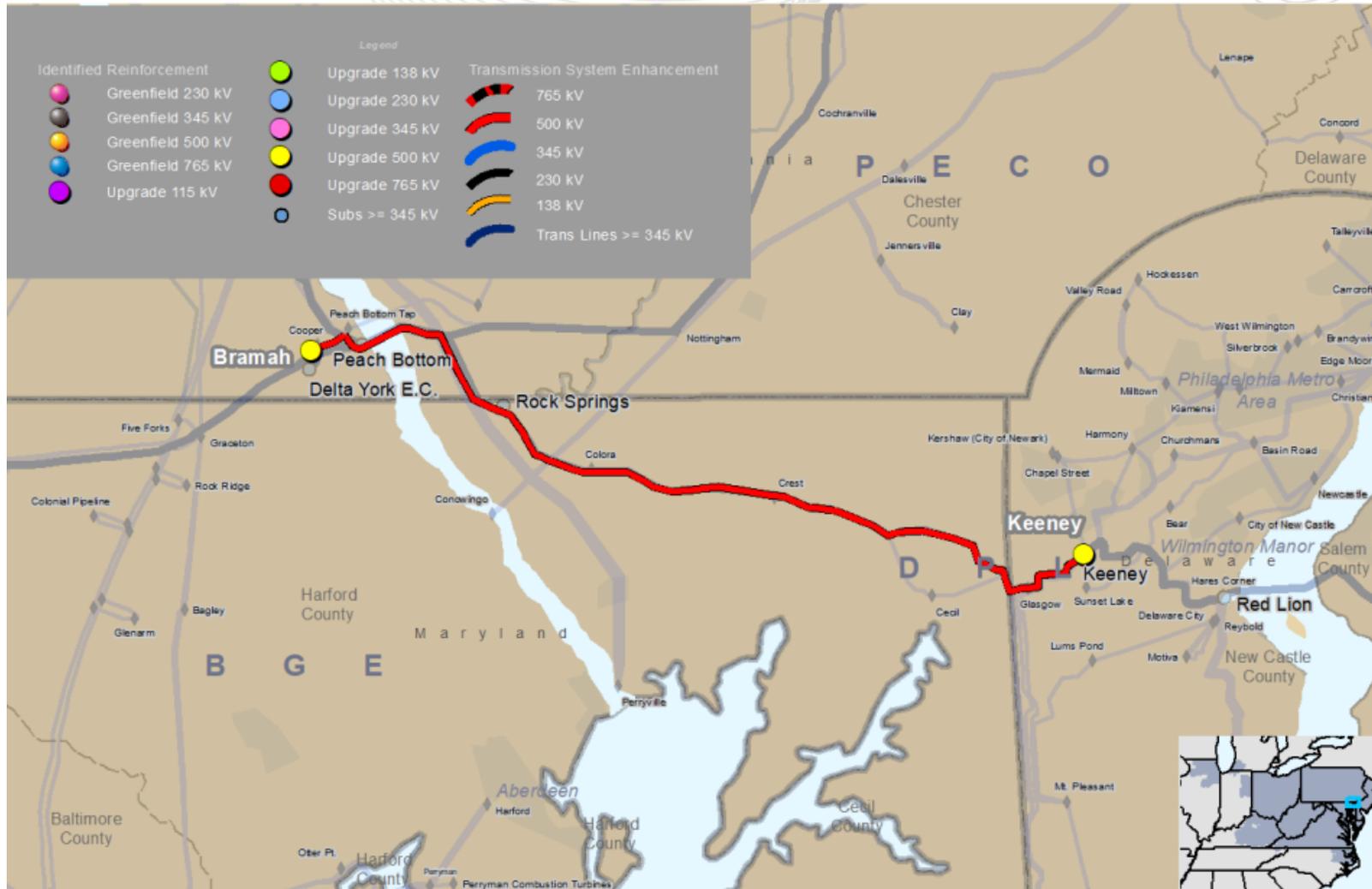


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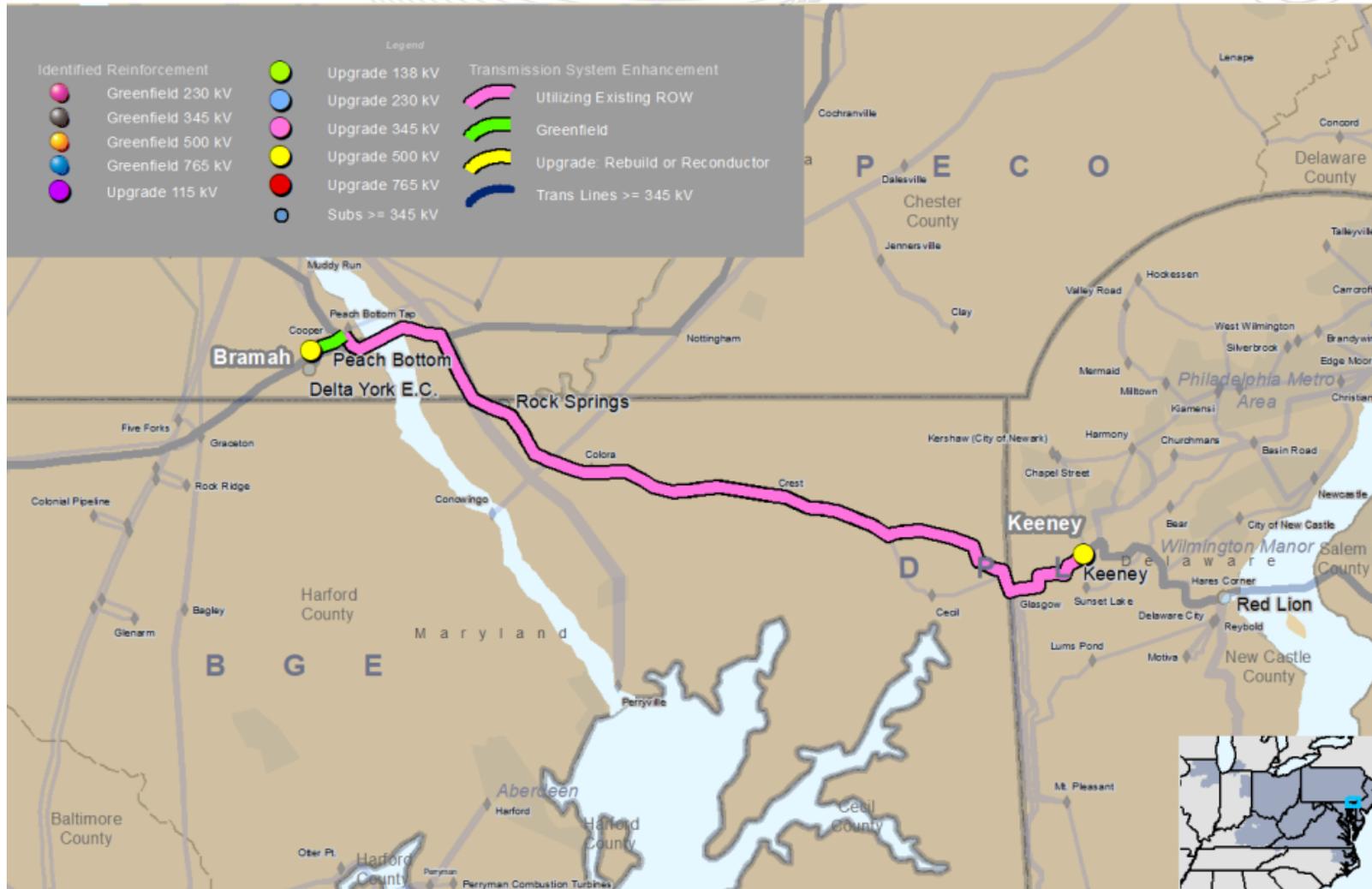


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DPL (Exelon)



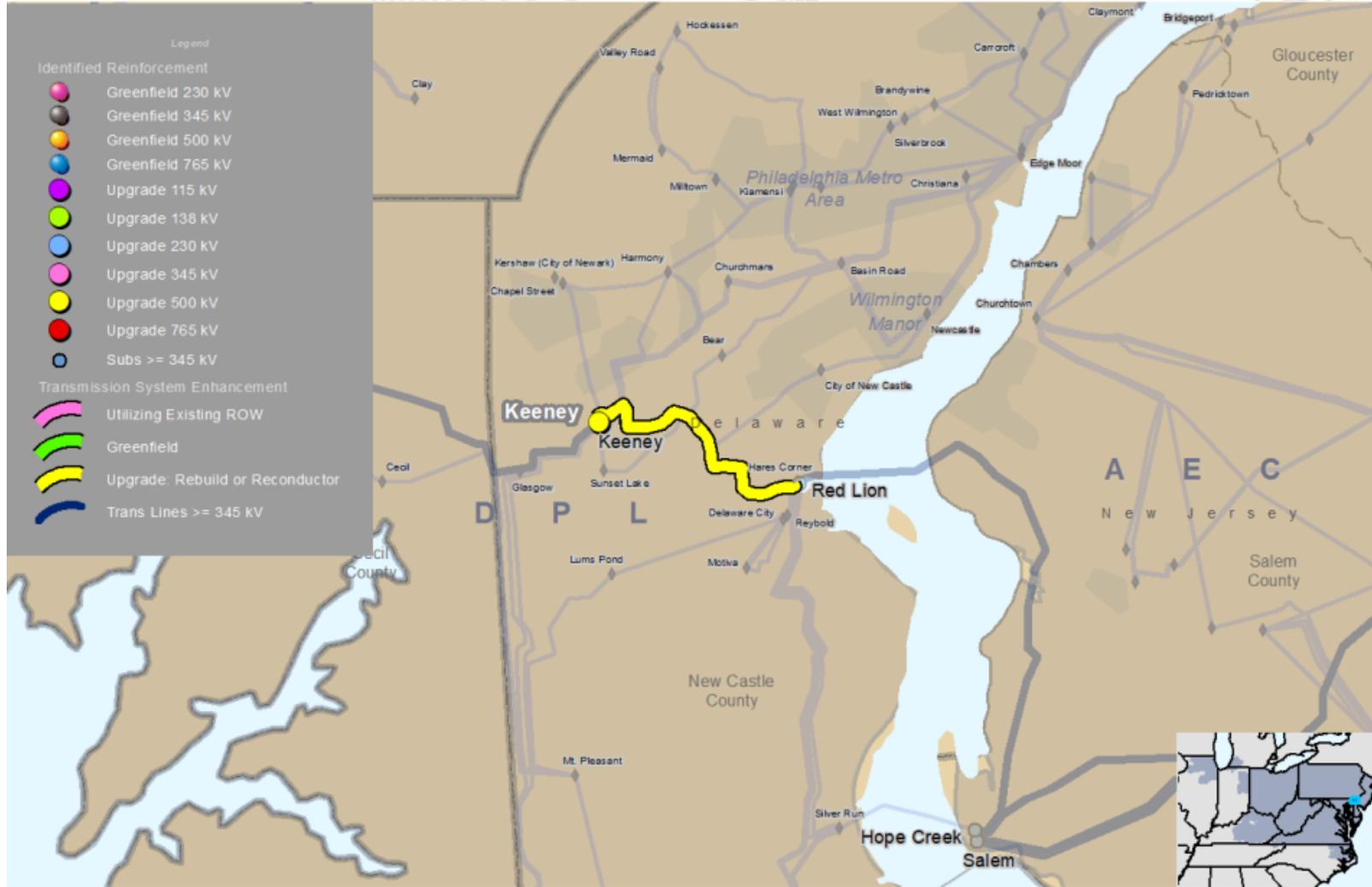
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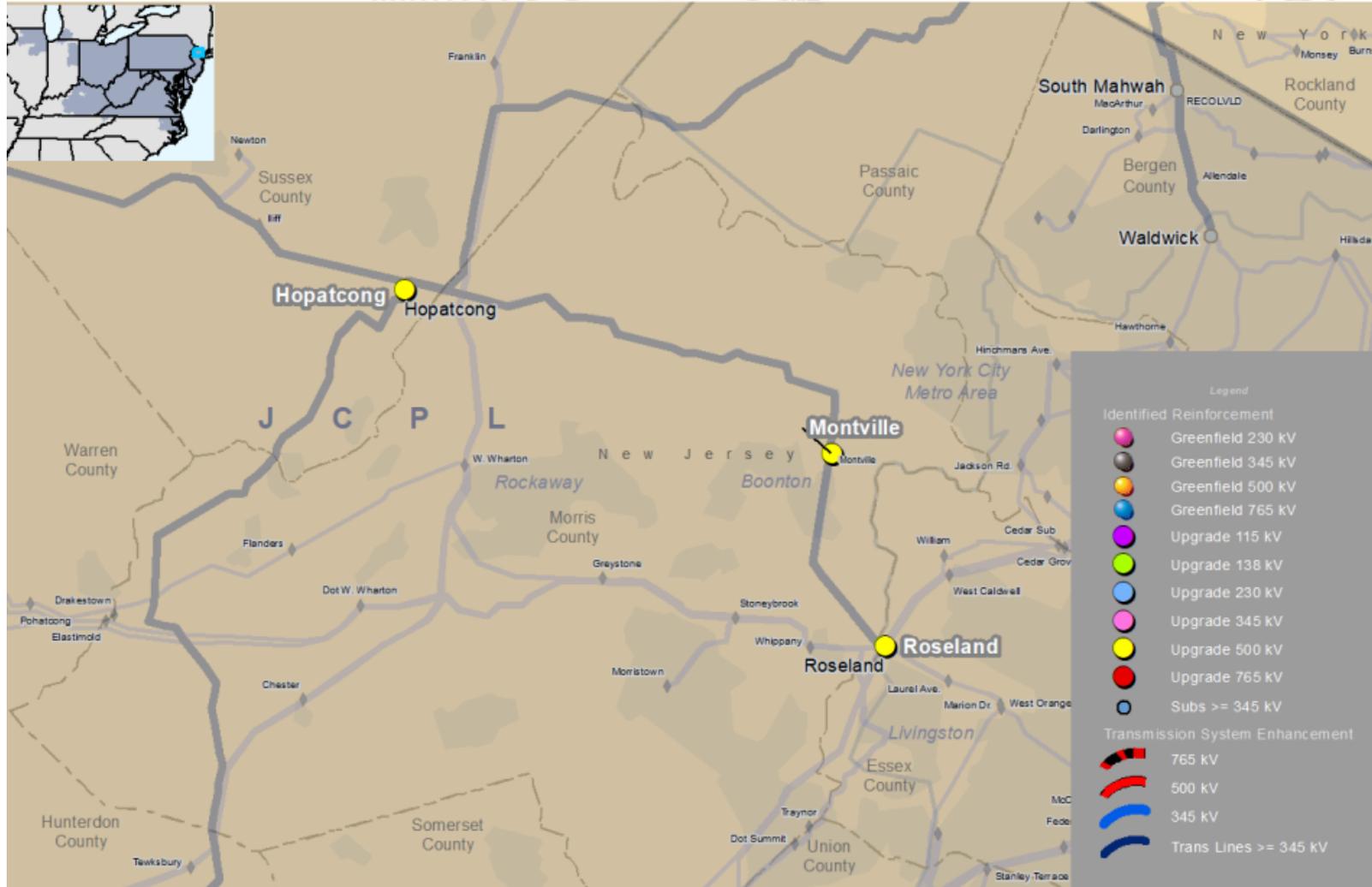


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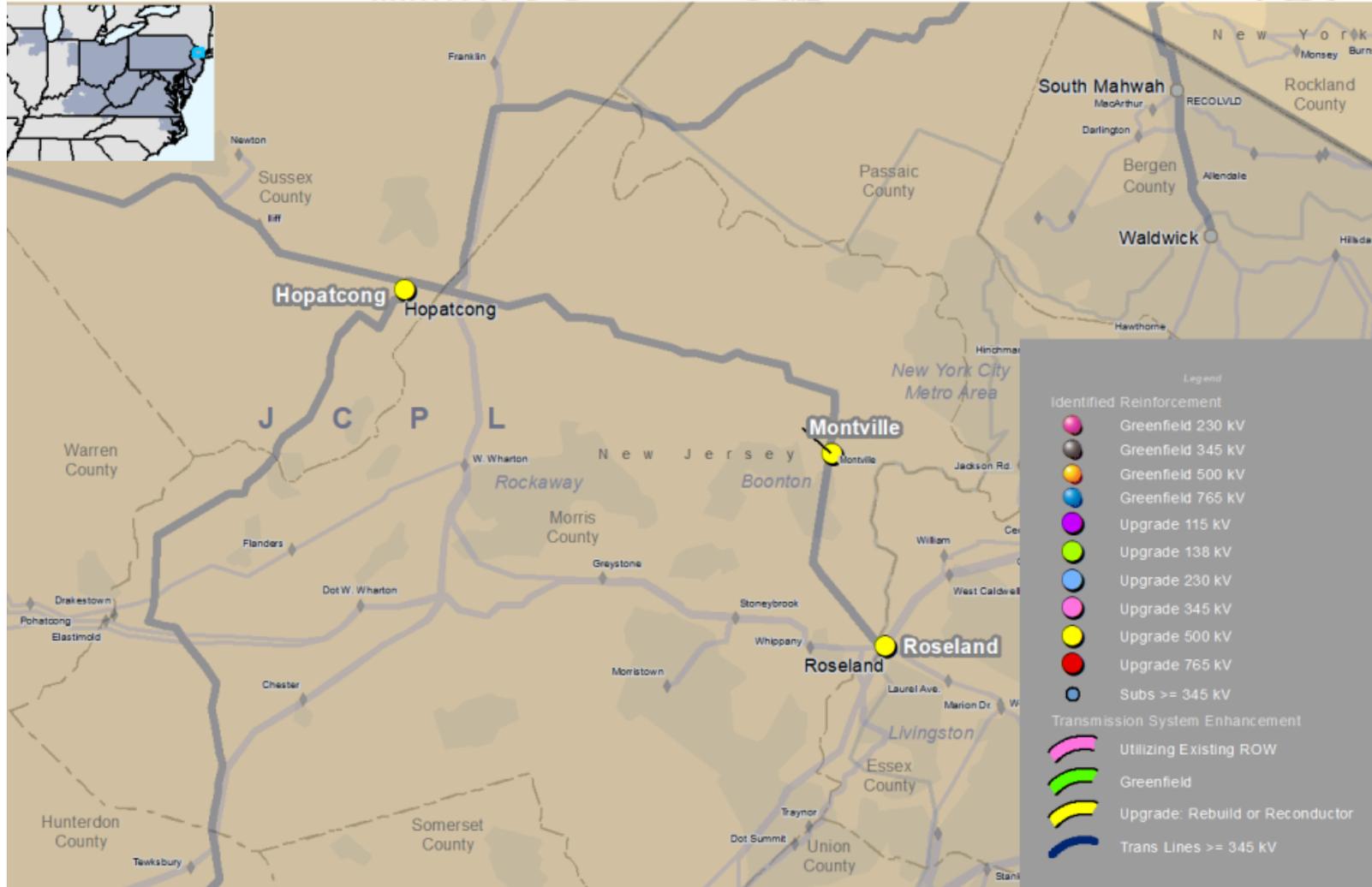


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JCPL (FirstEnergy)



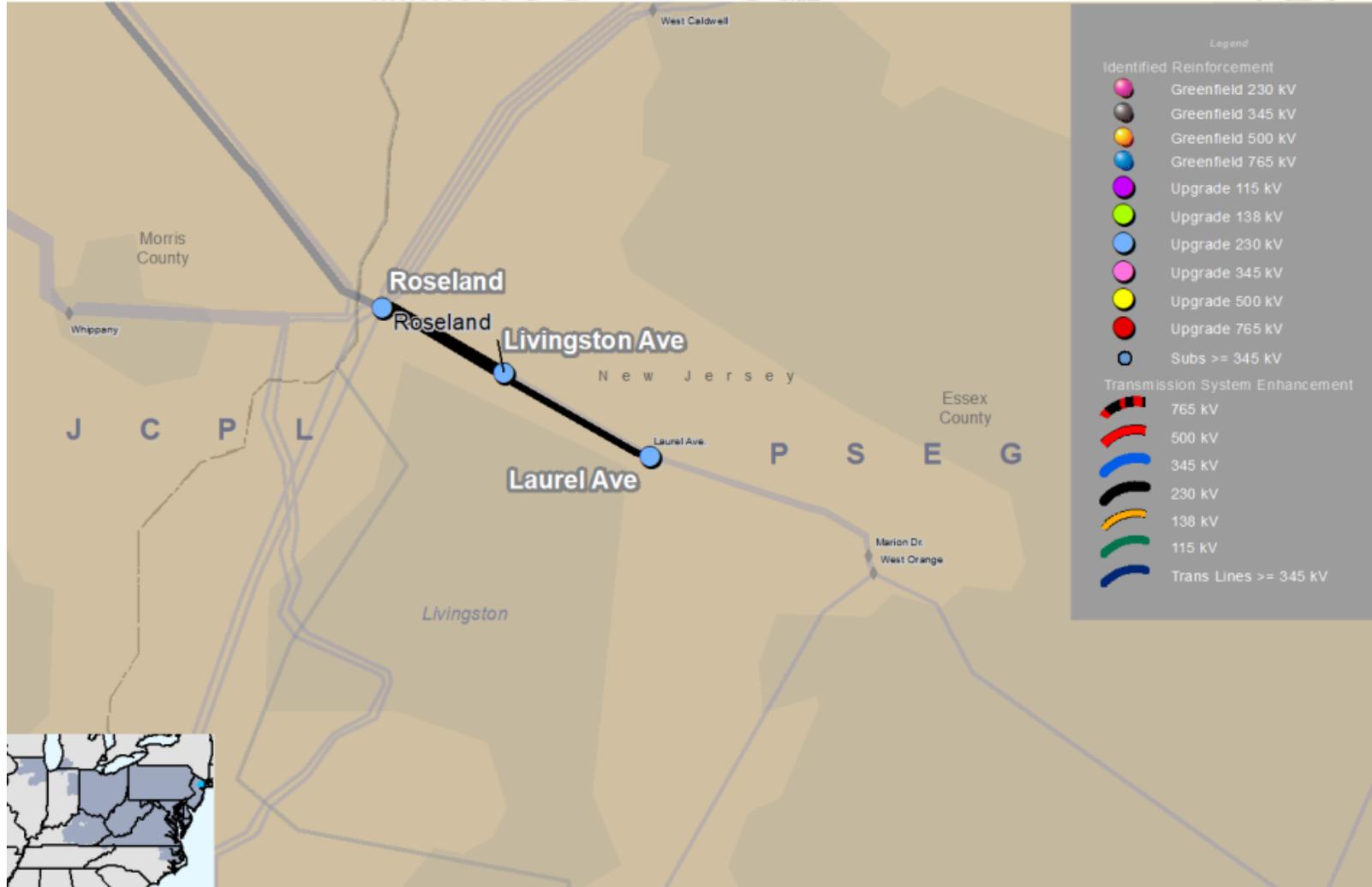
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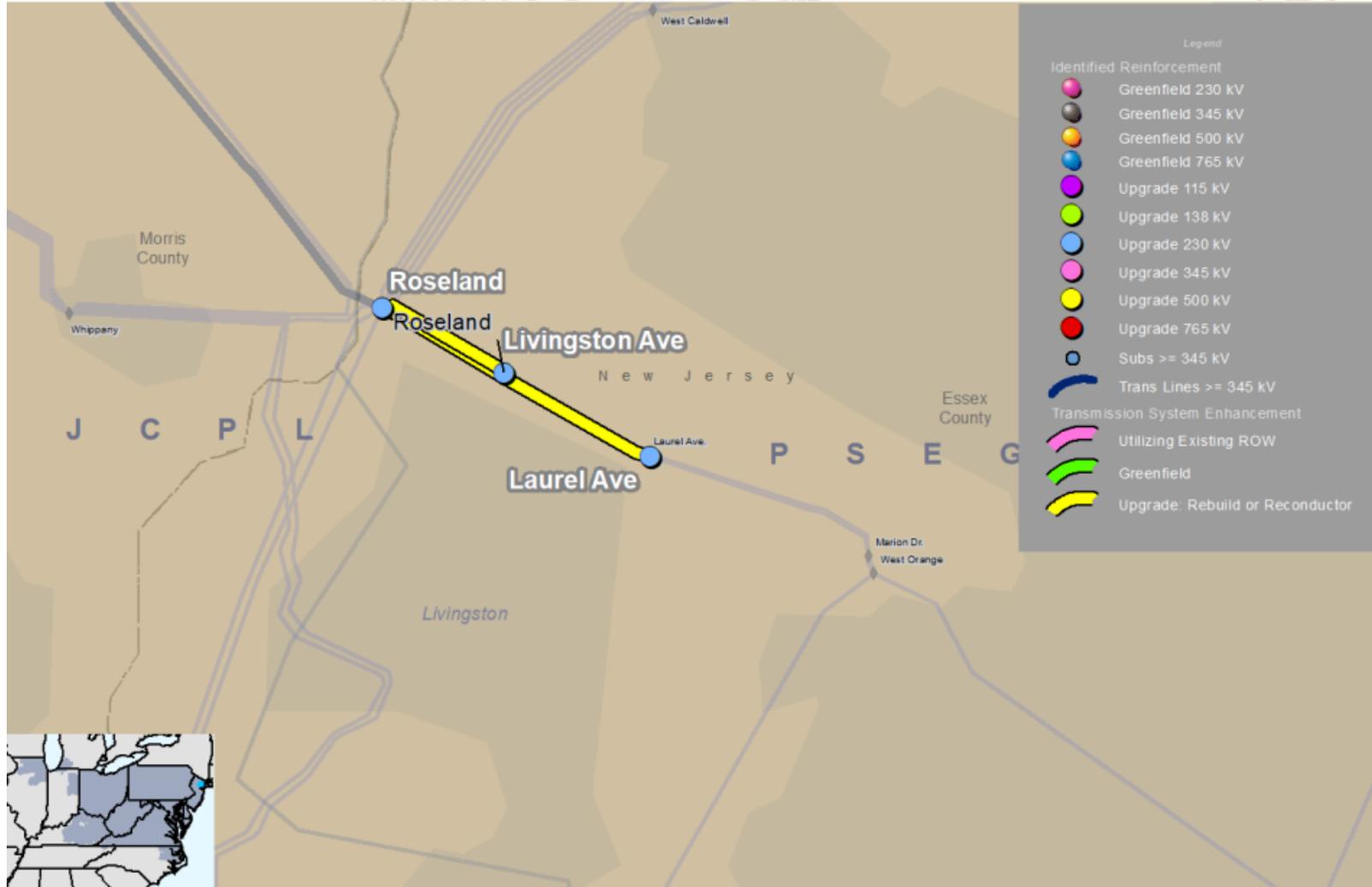
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PSEG



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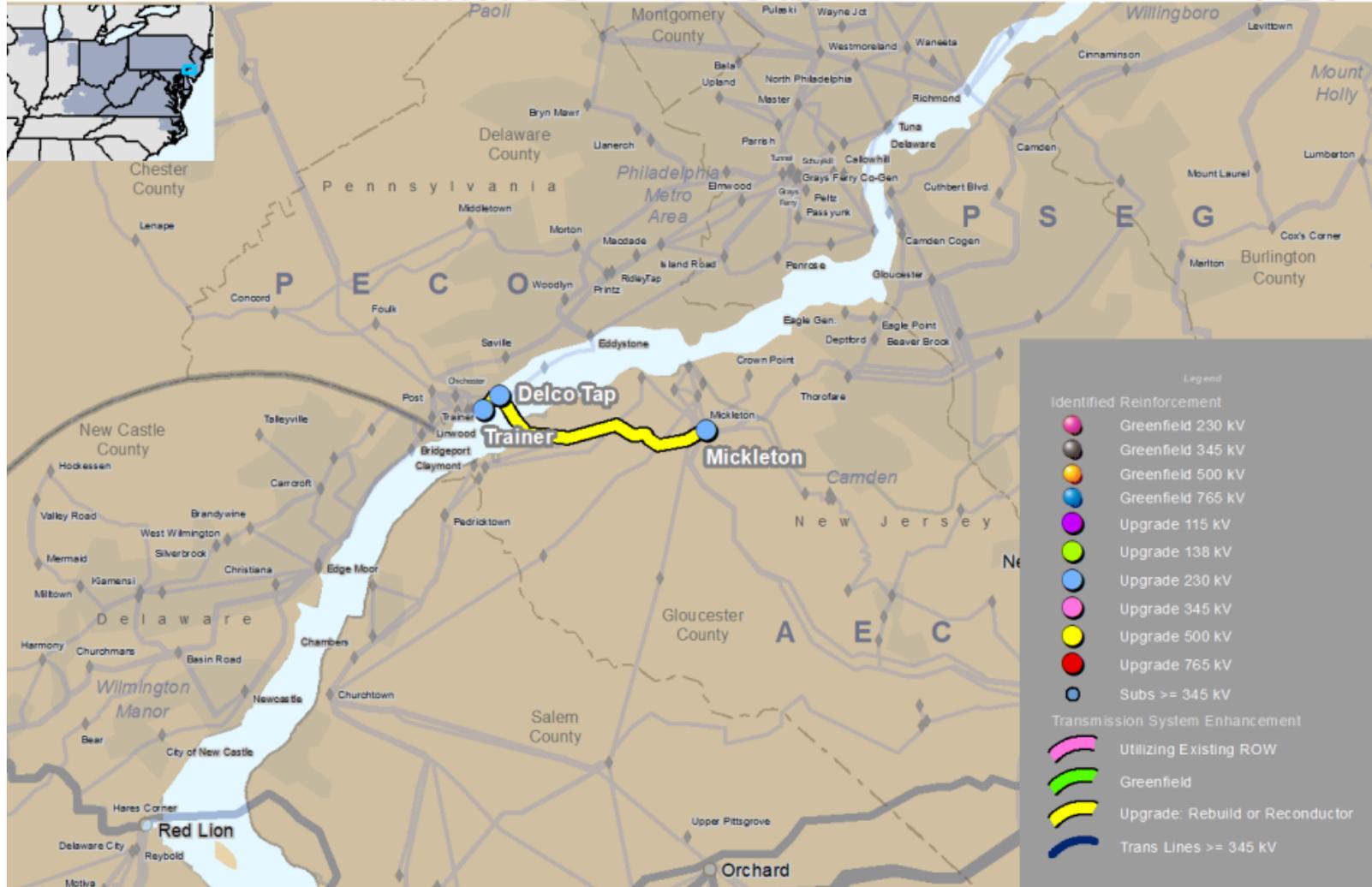


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PECO (Exelon)



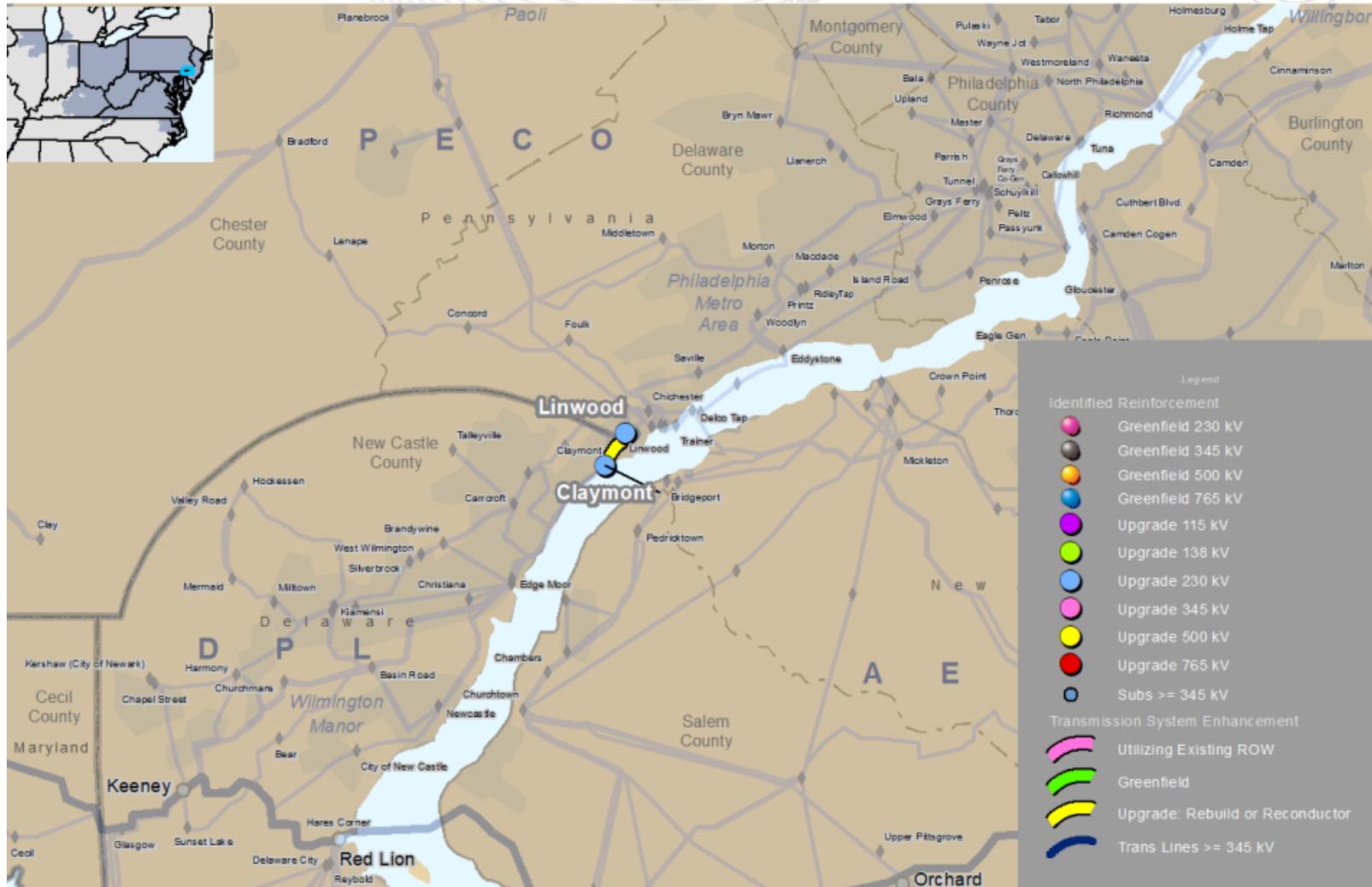
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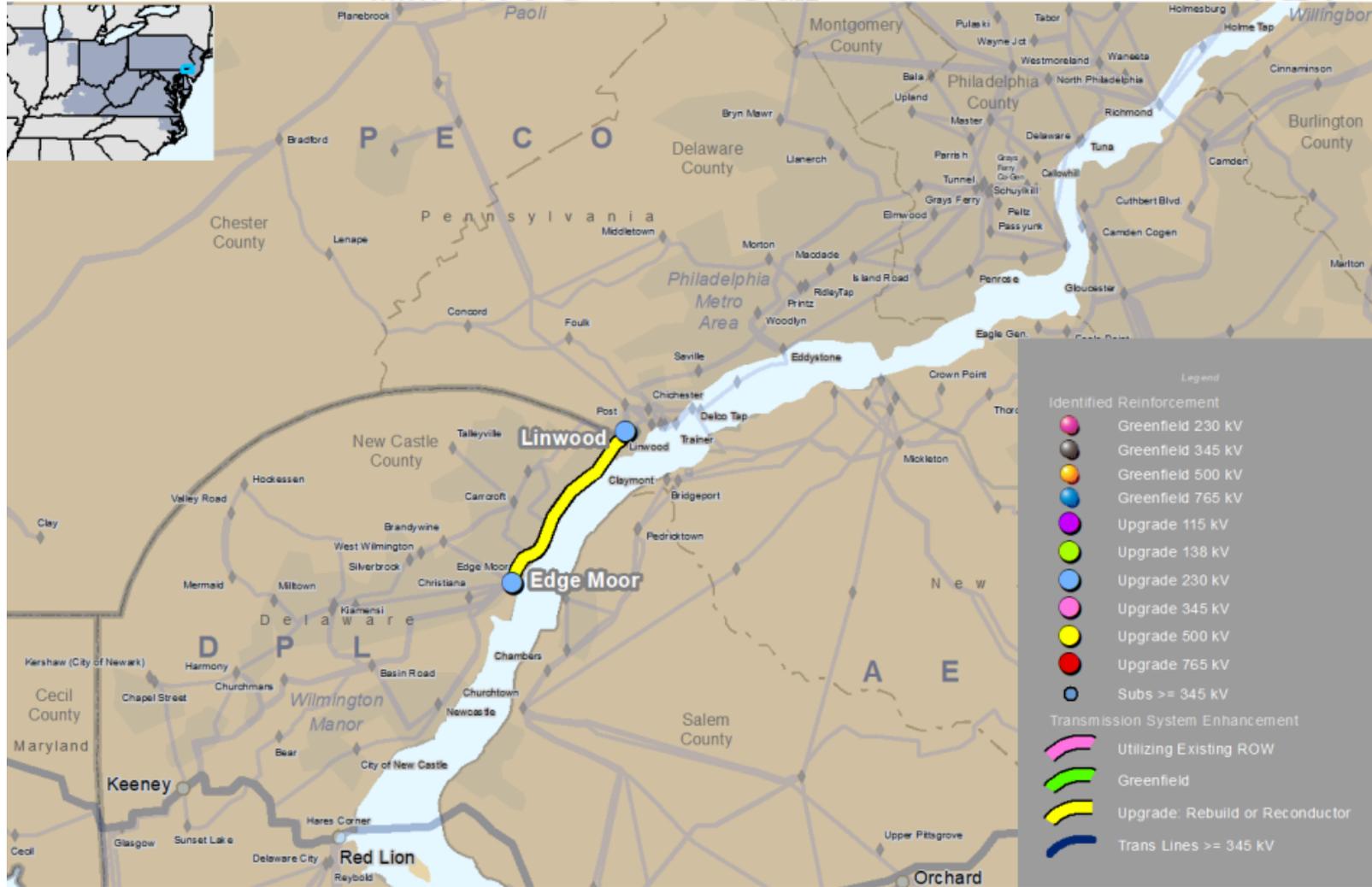
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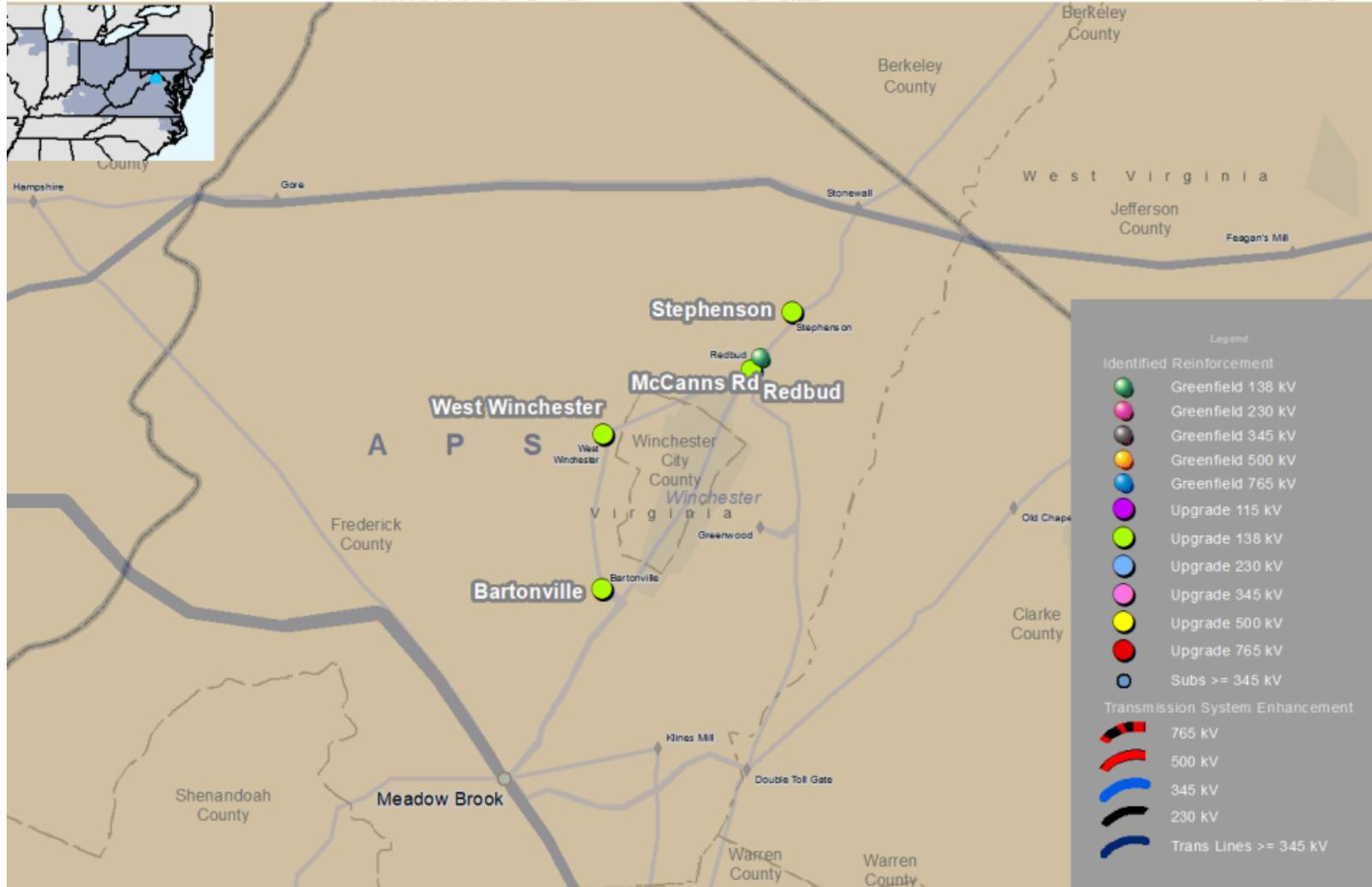


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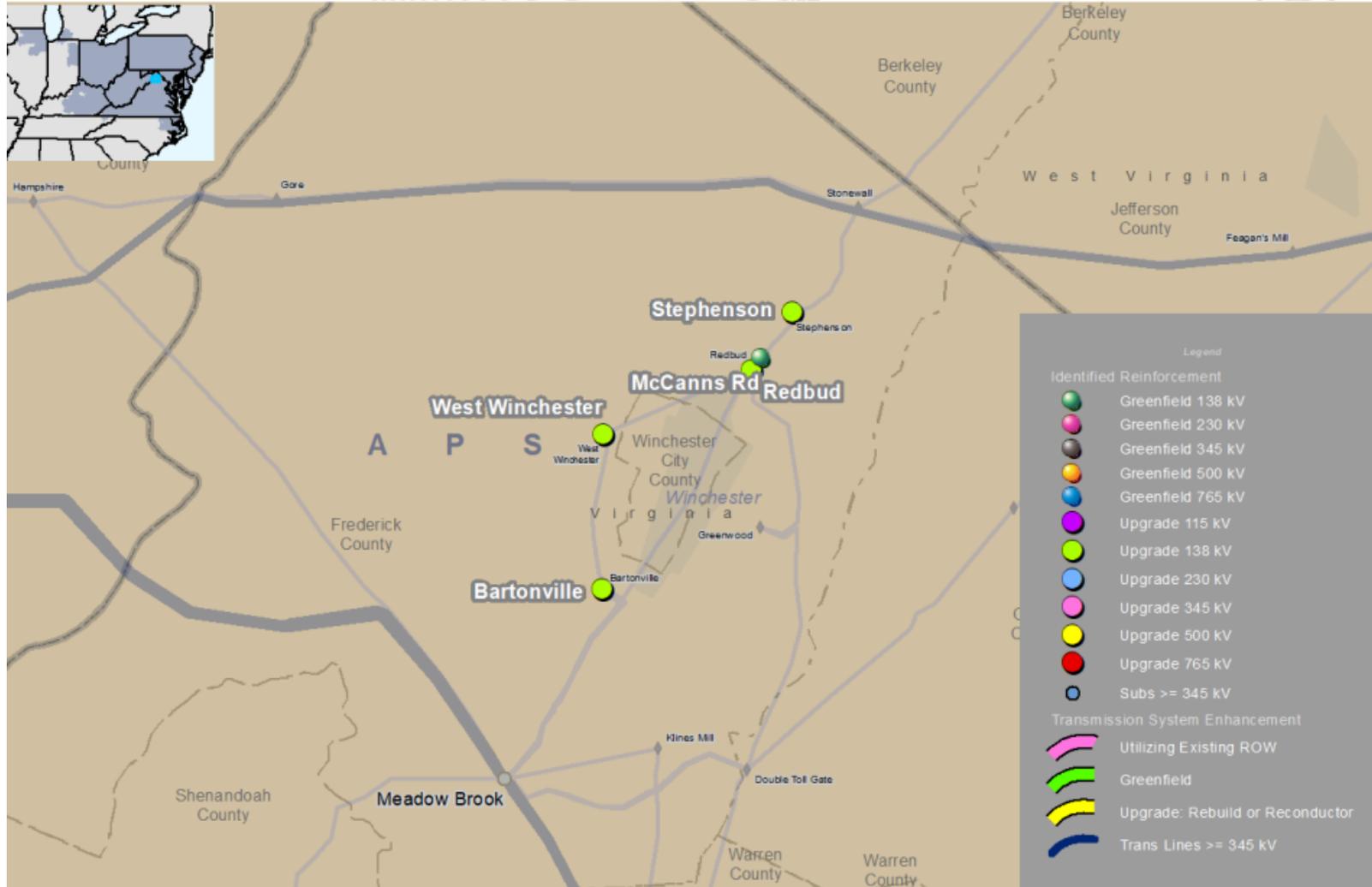


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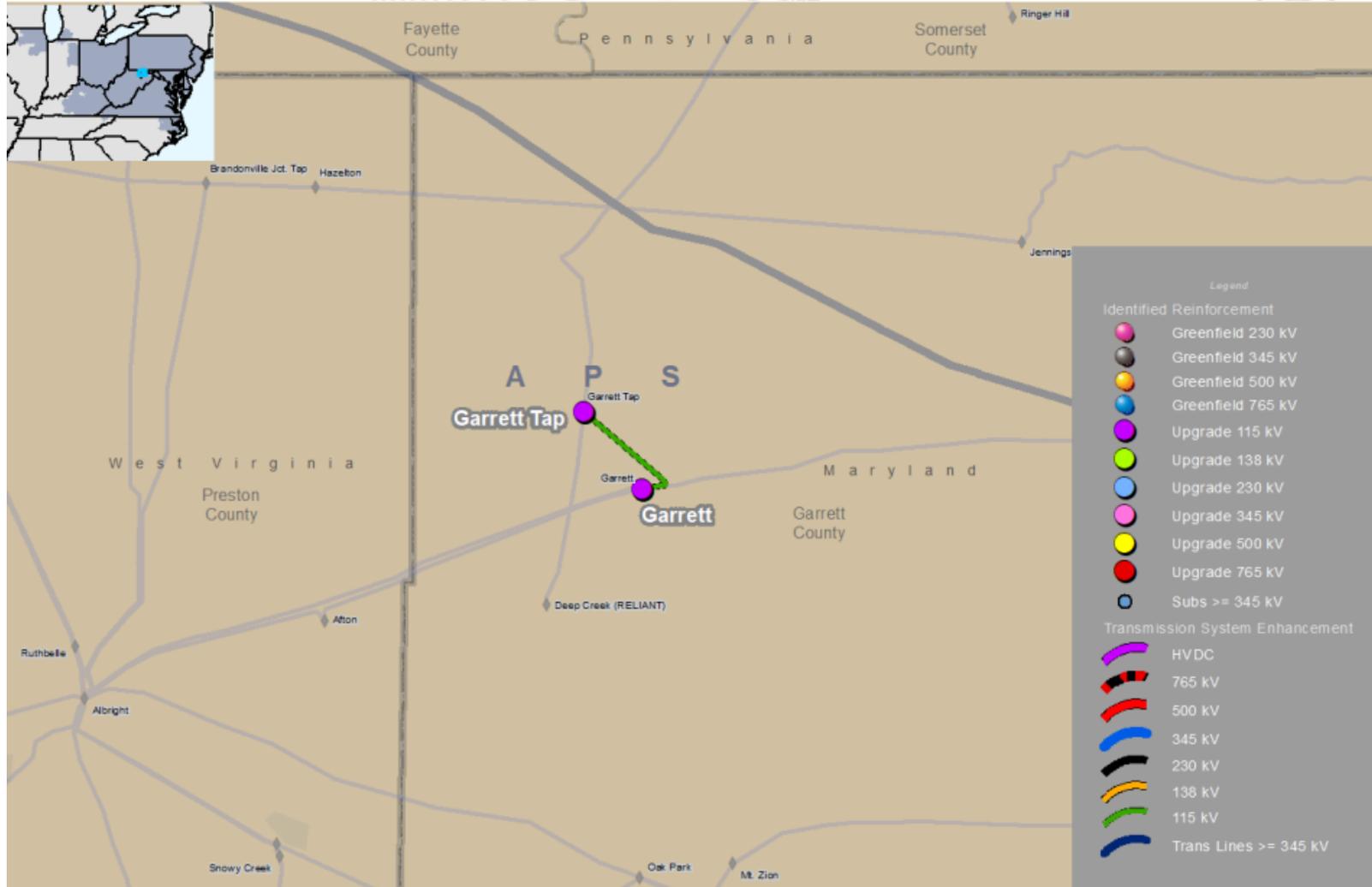
POTOED (FirstEnergy)



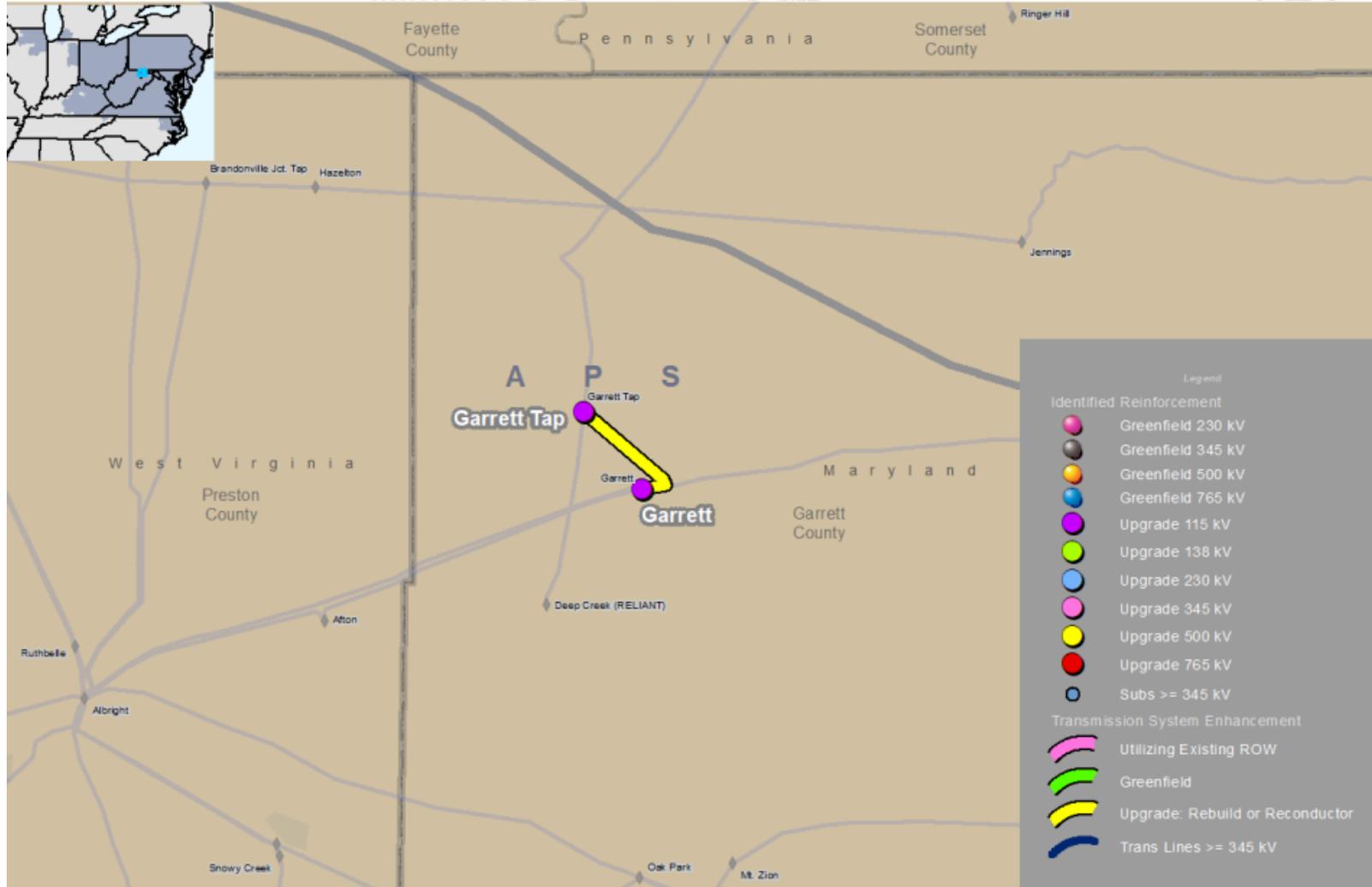
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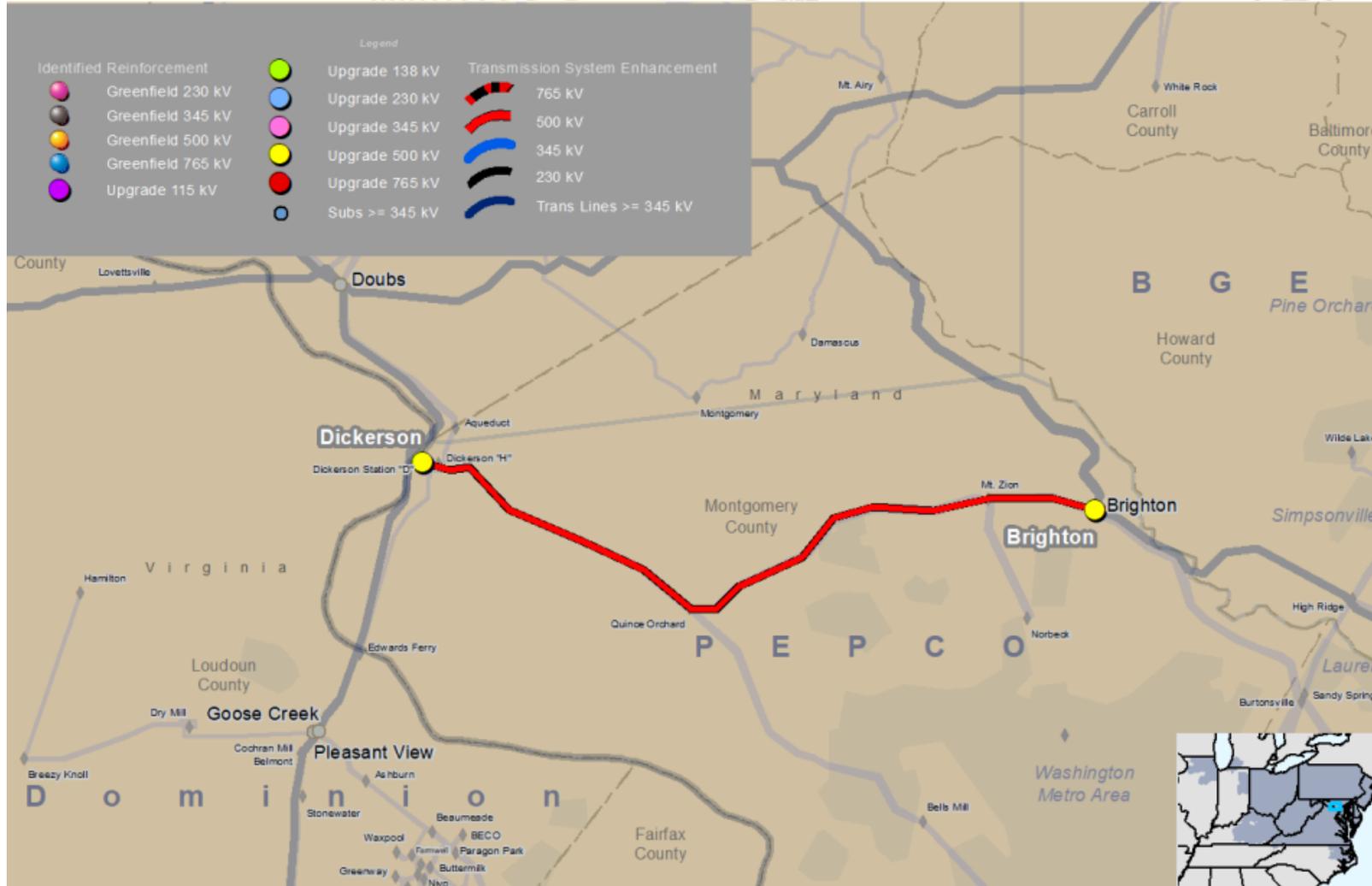


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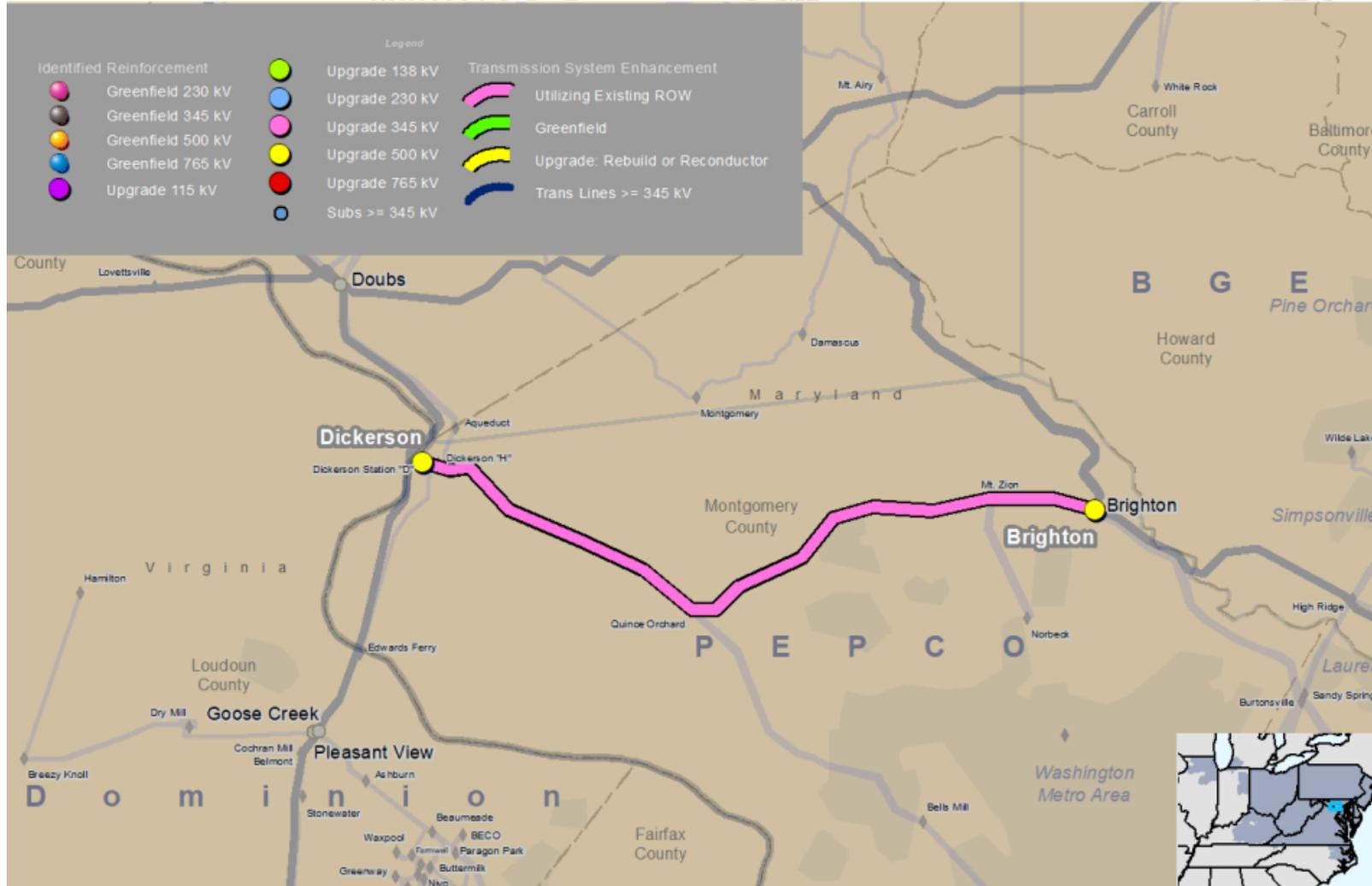


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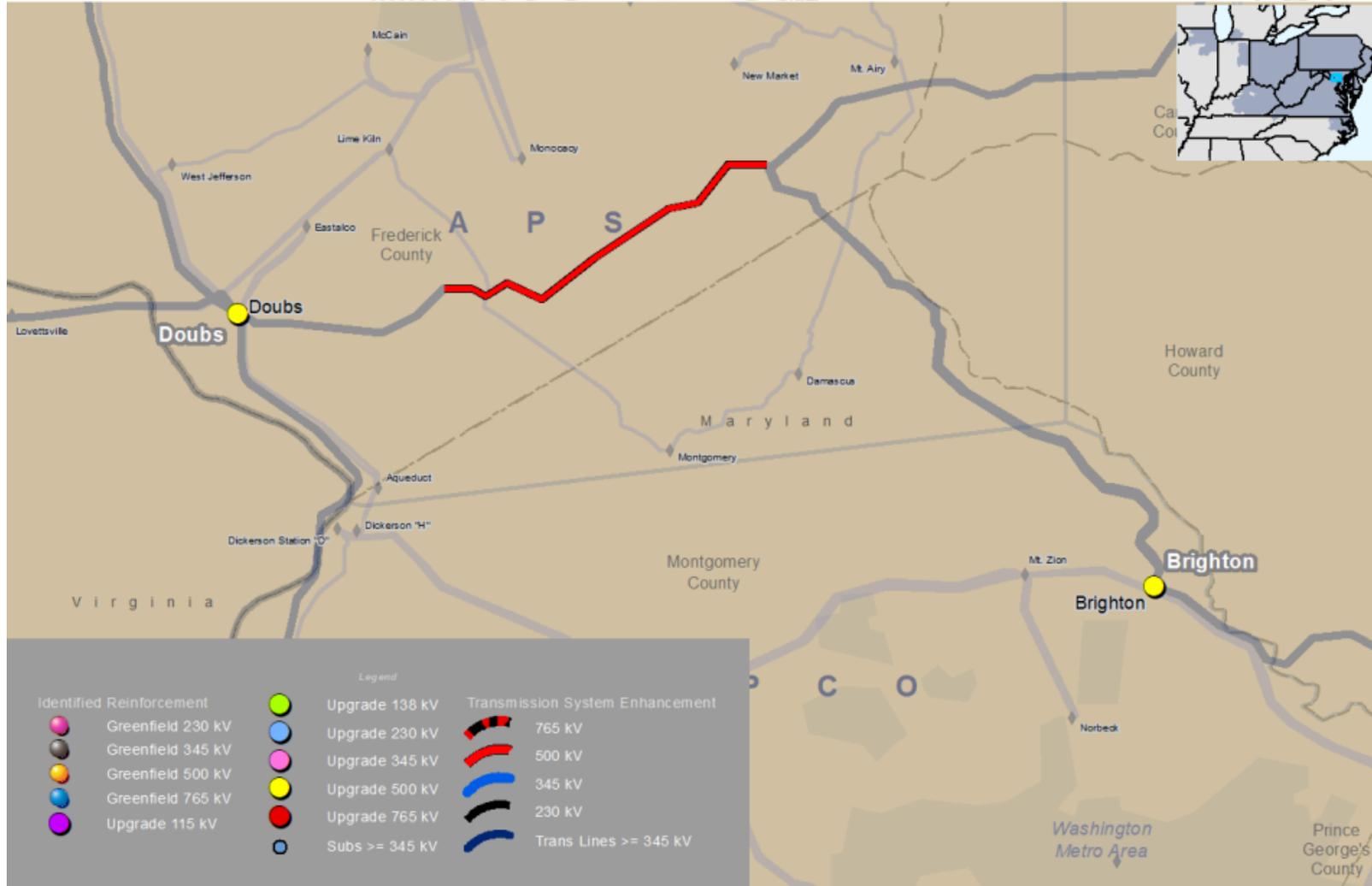
PEPCO (Exelon)



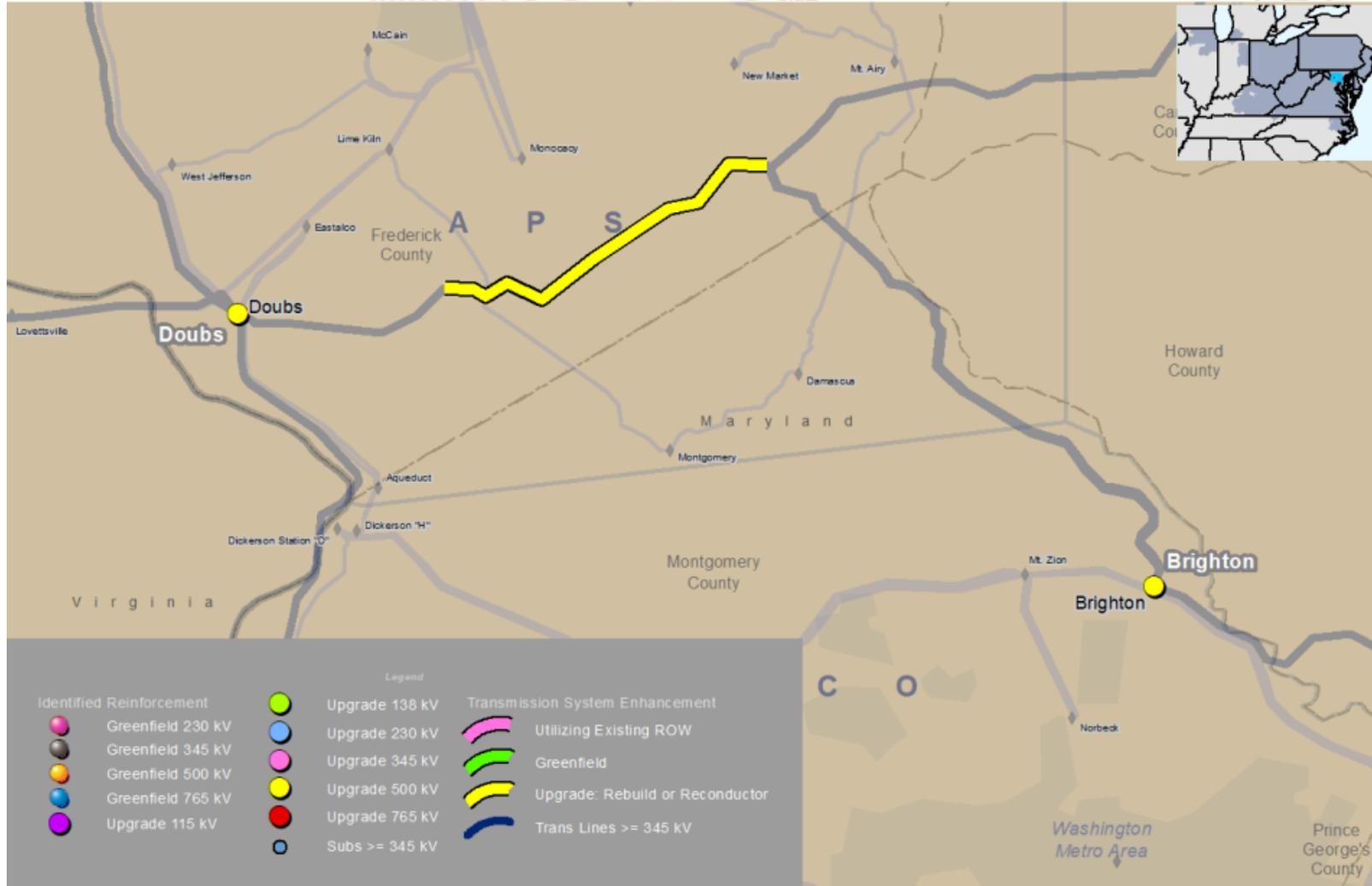
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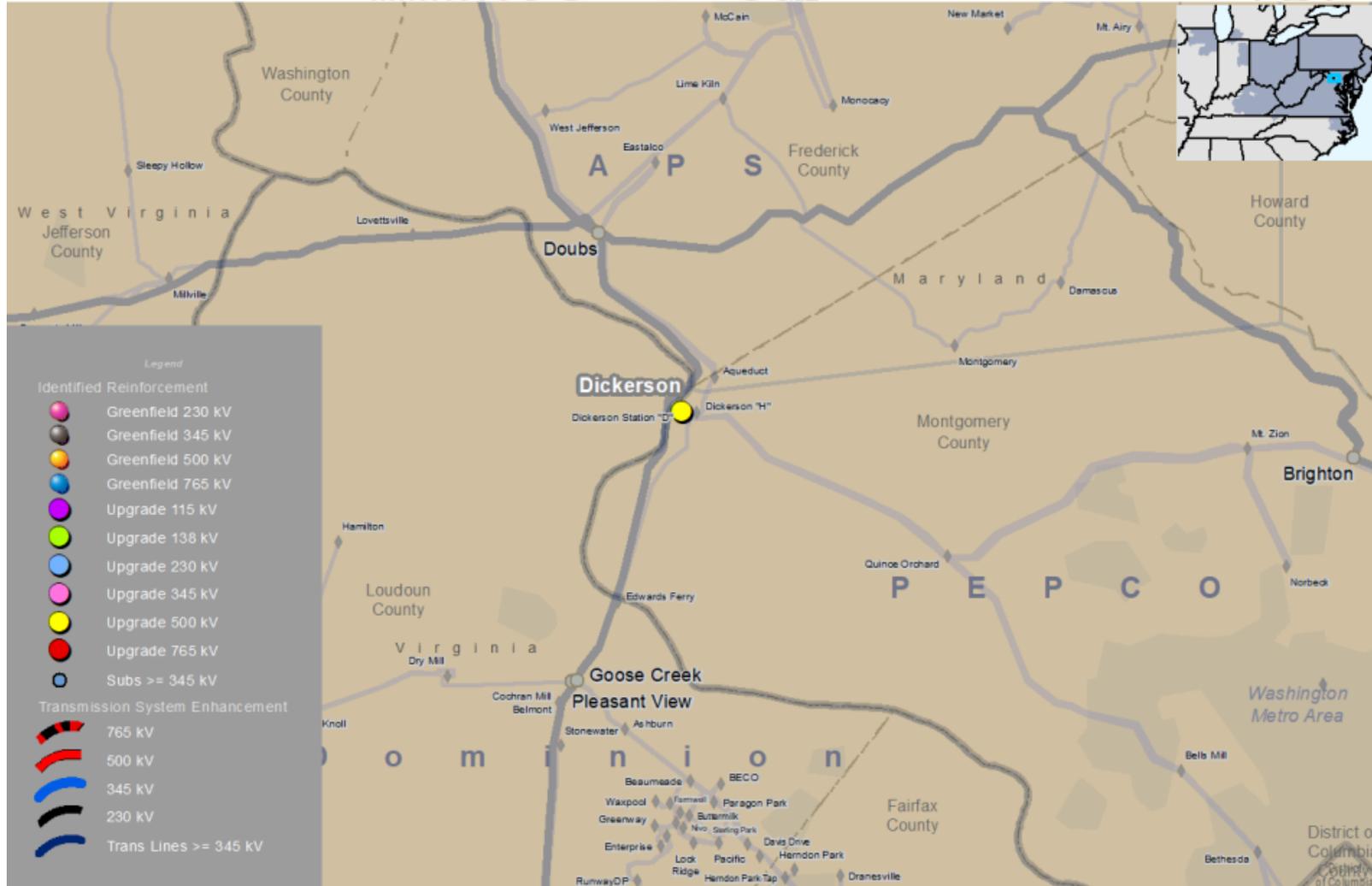
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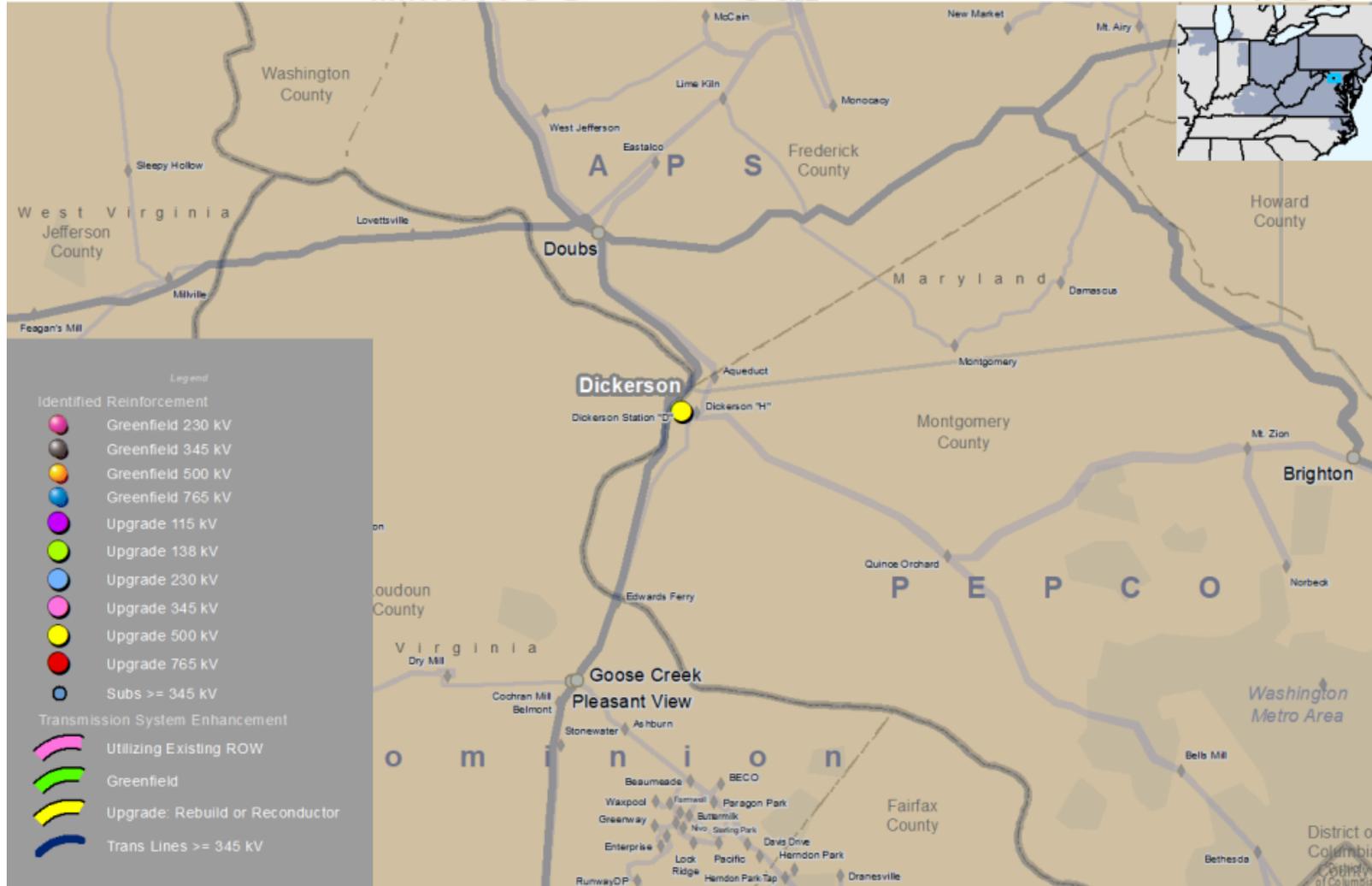
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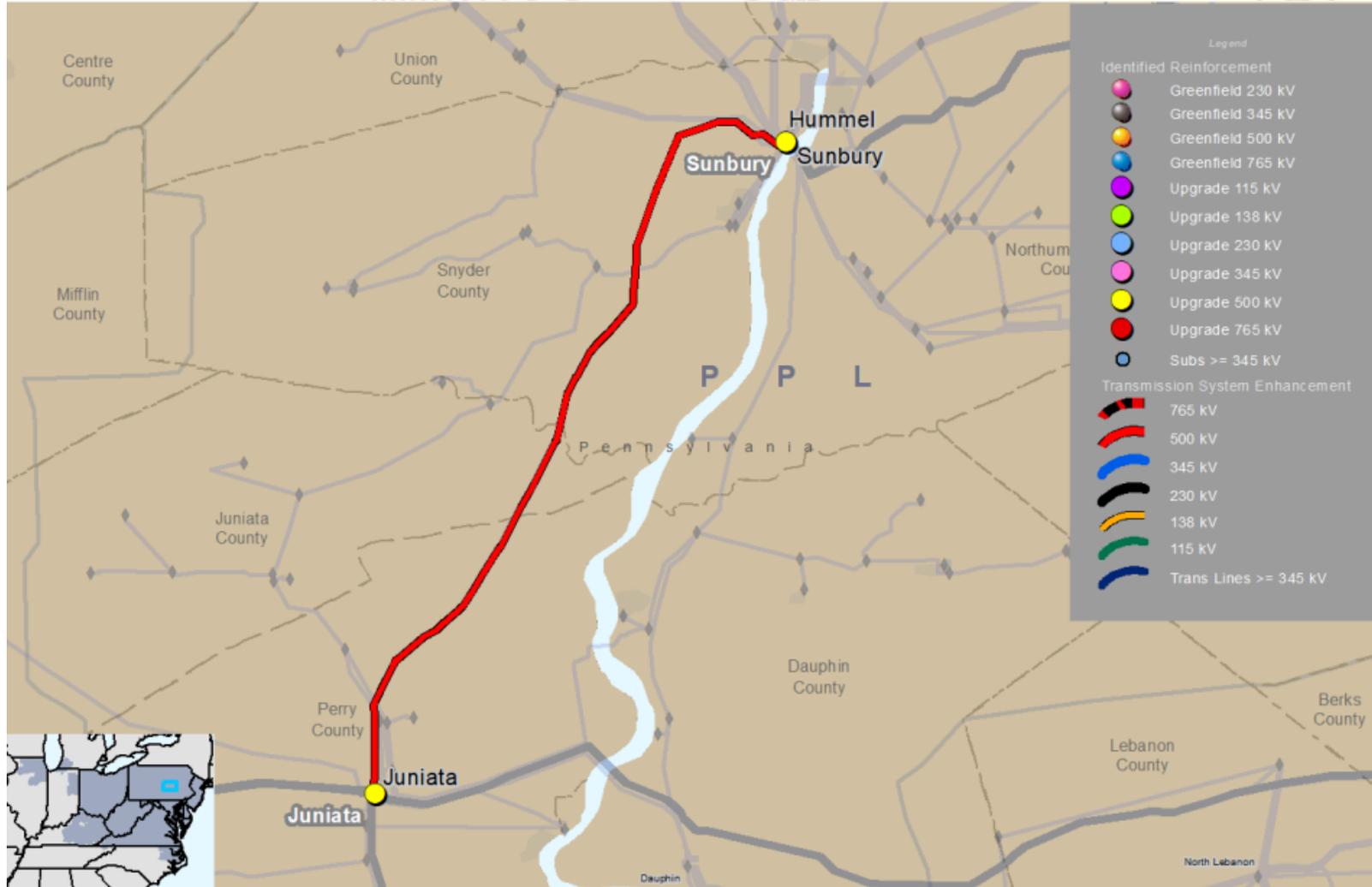


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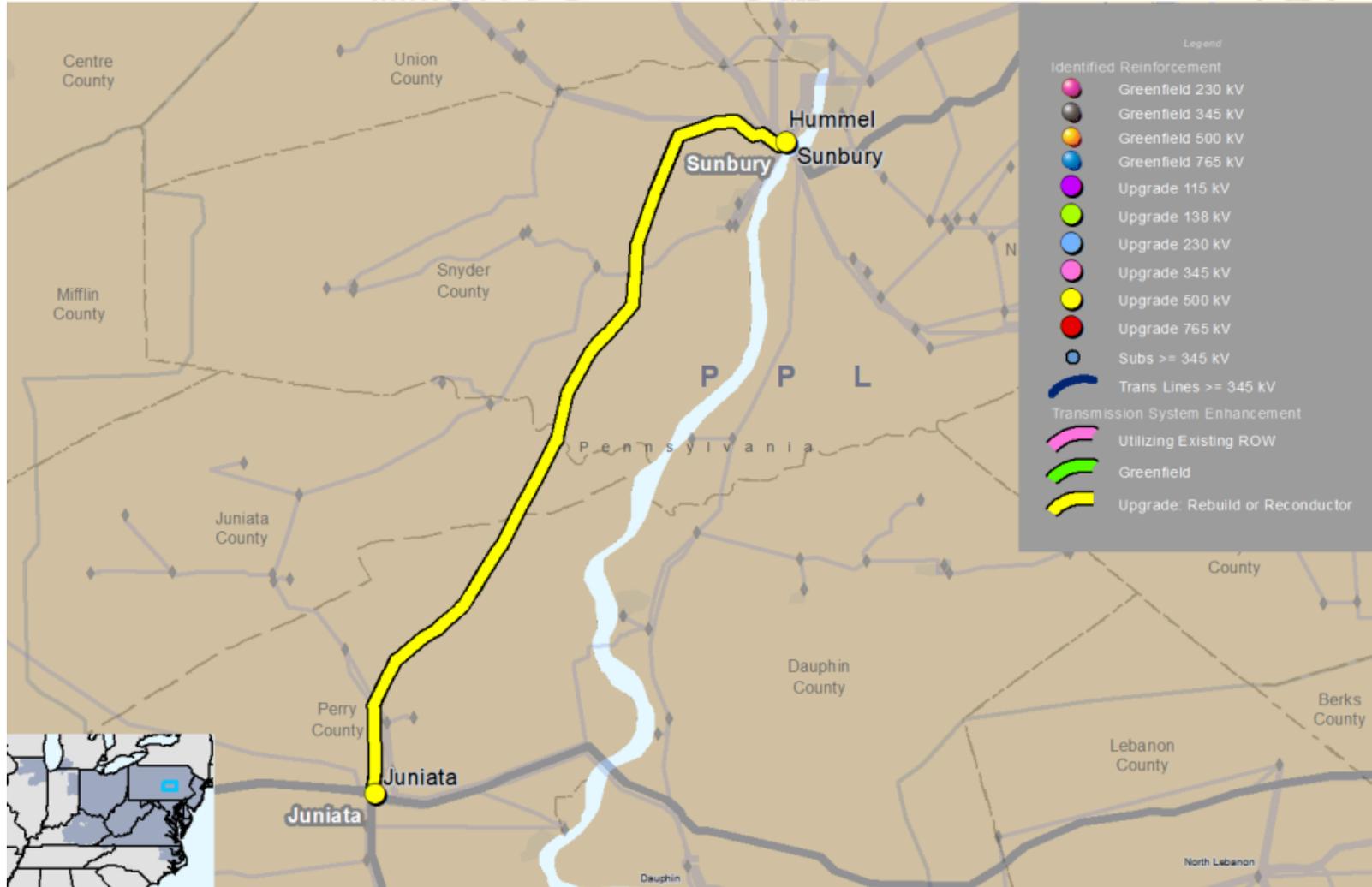


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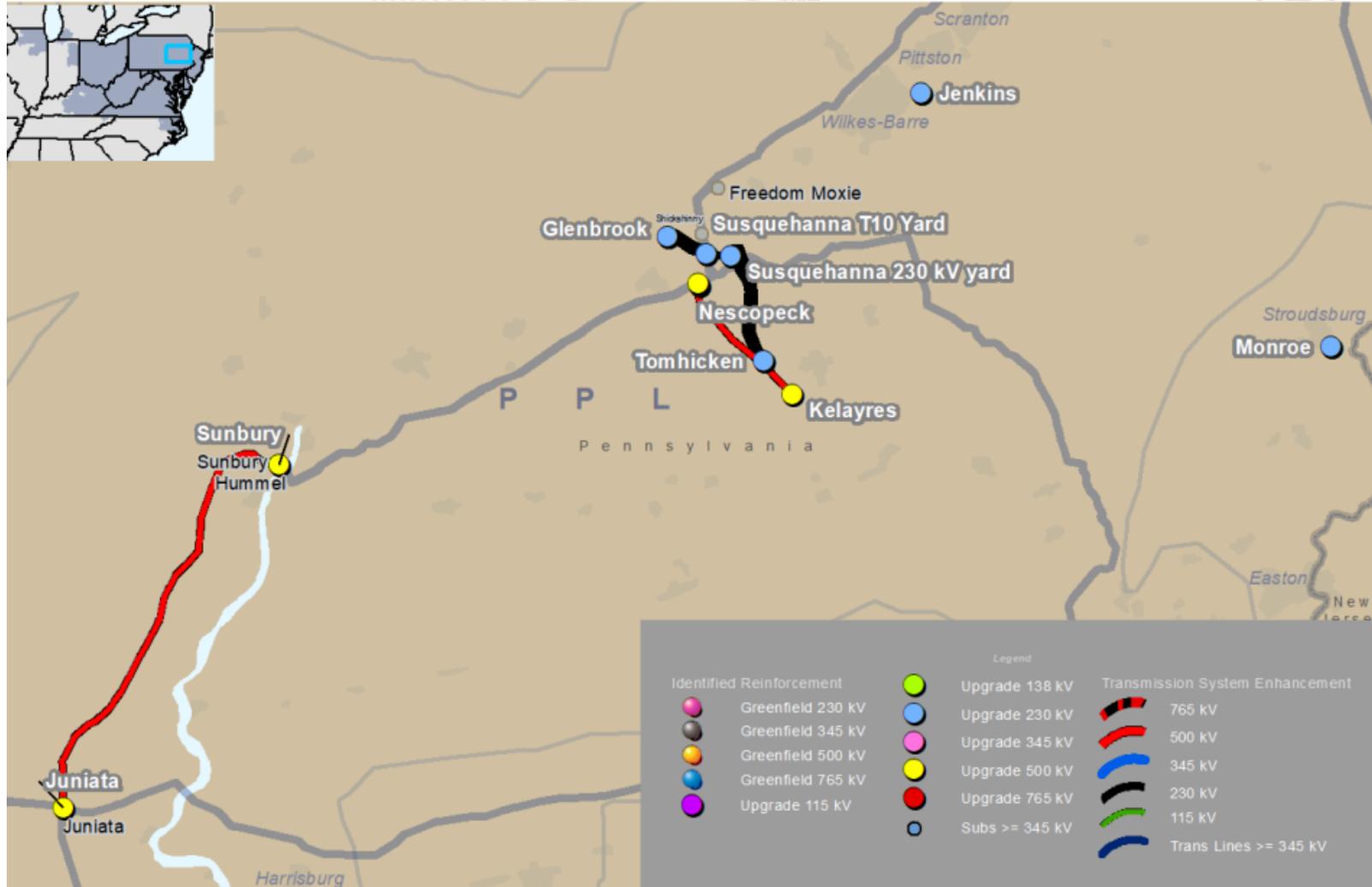
PPLTO (PPL)



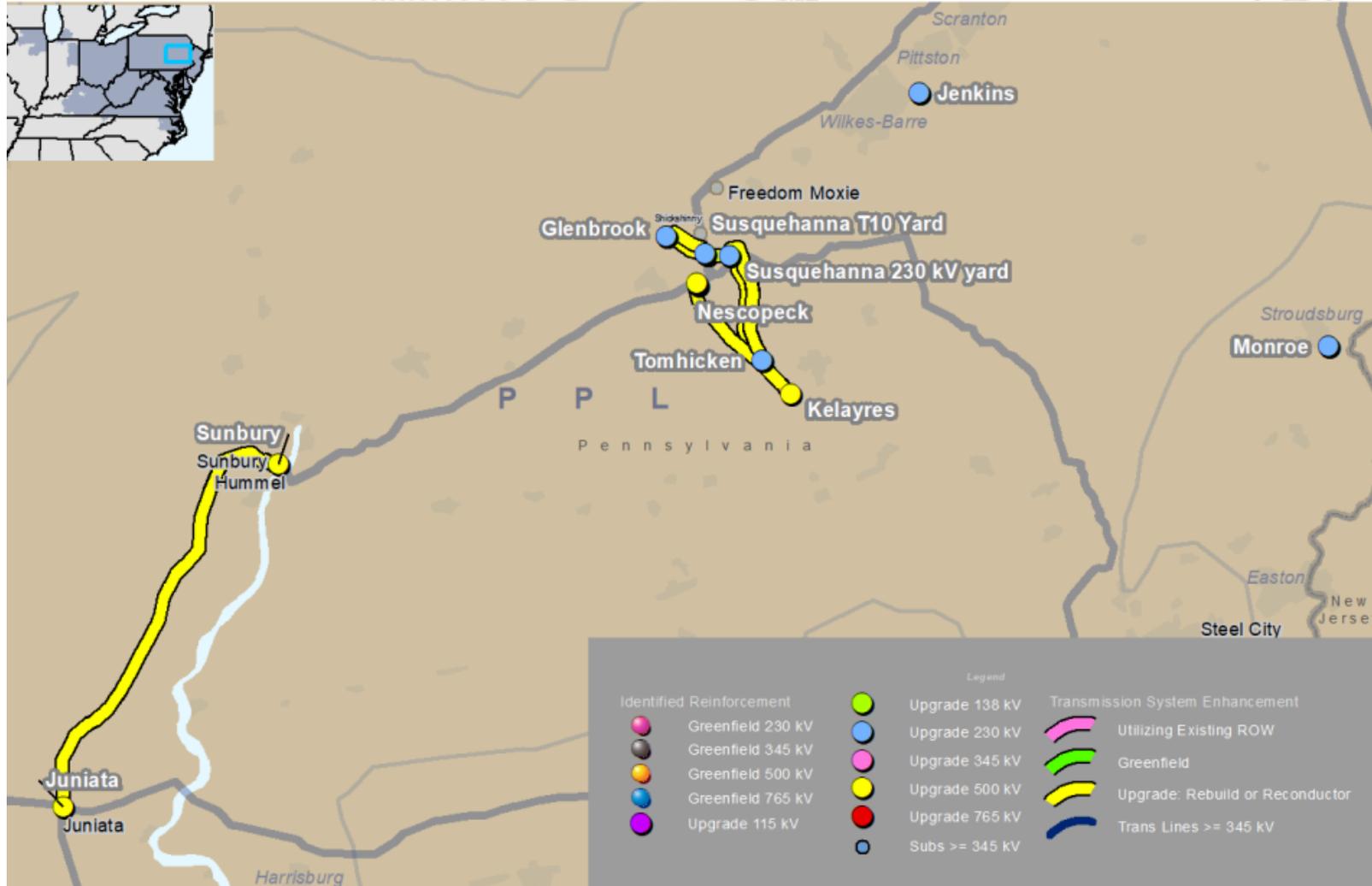
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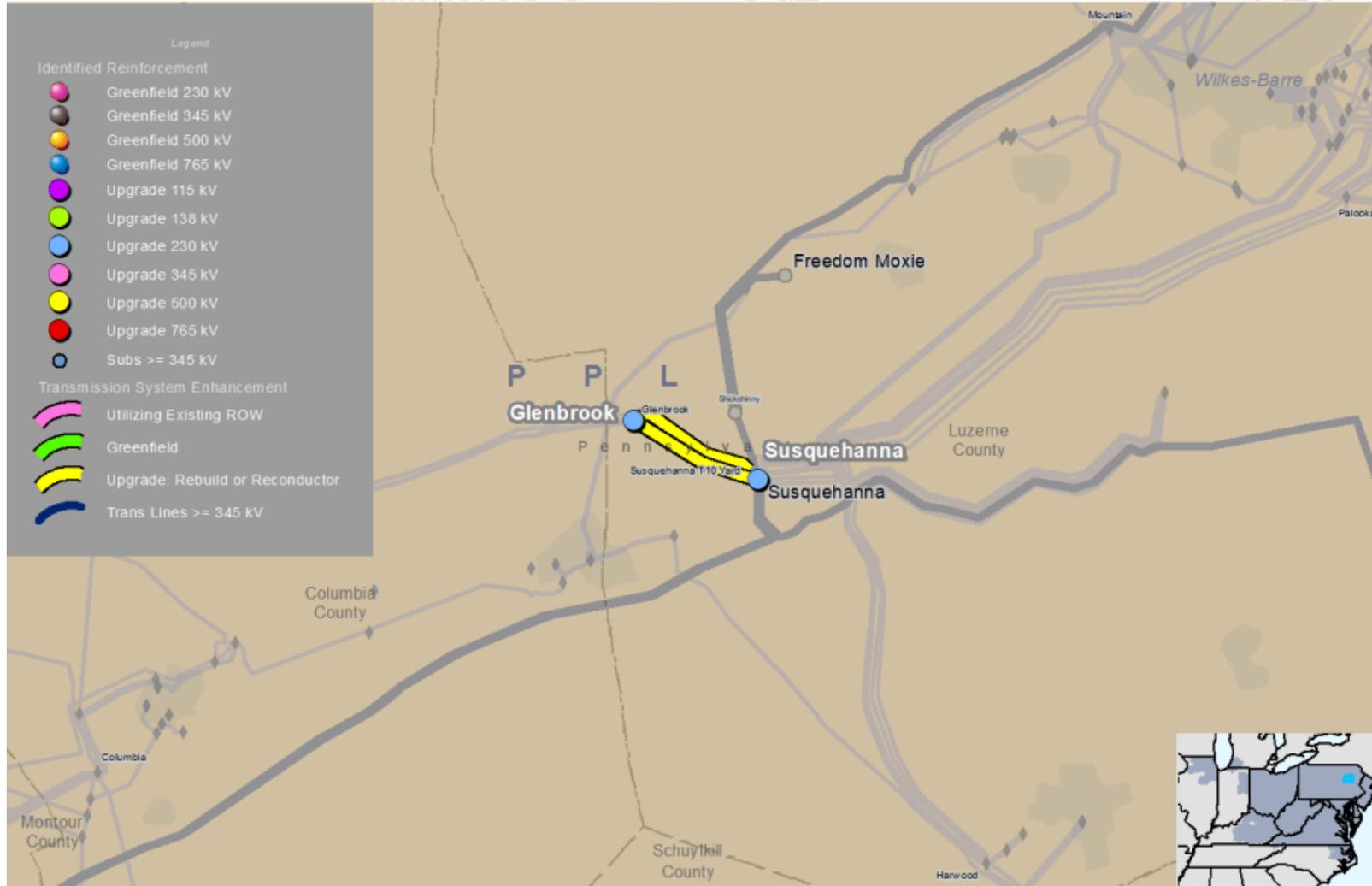
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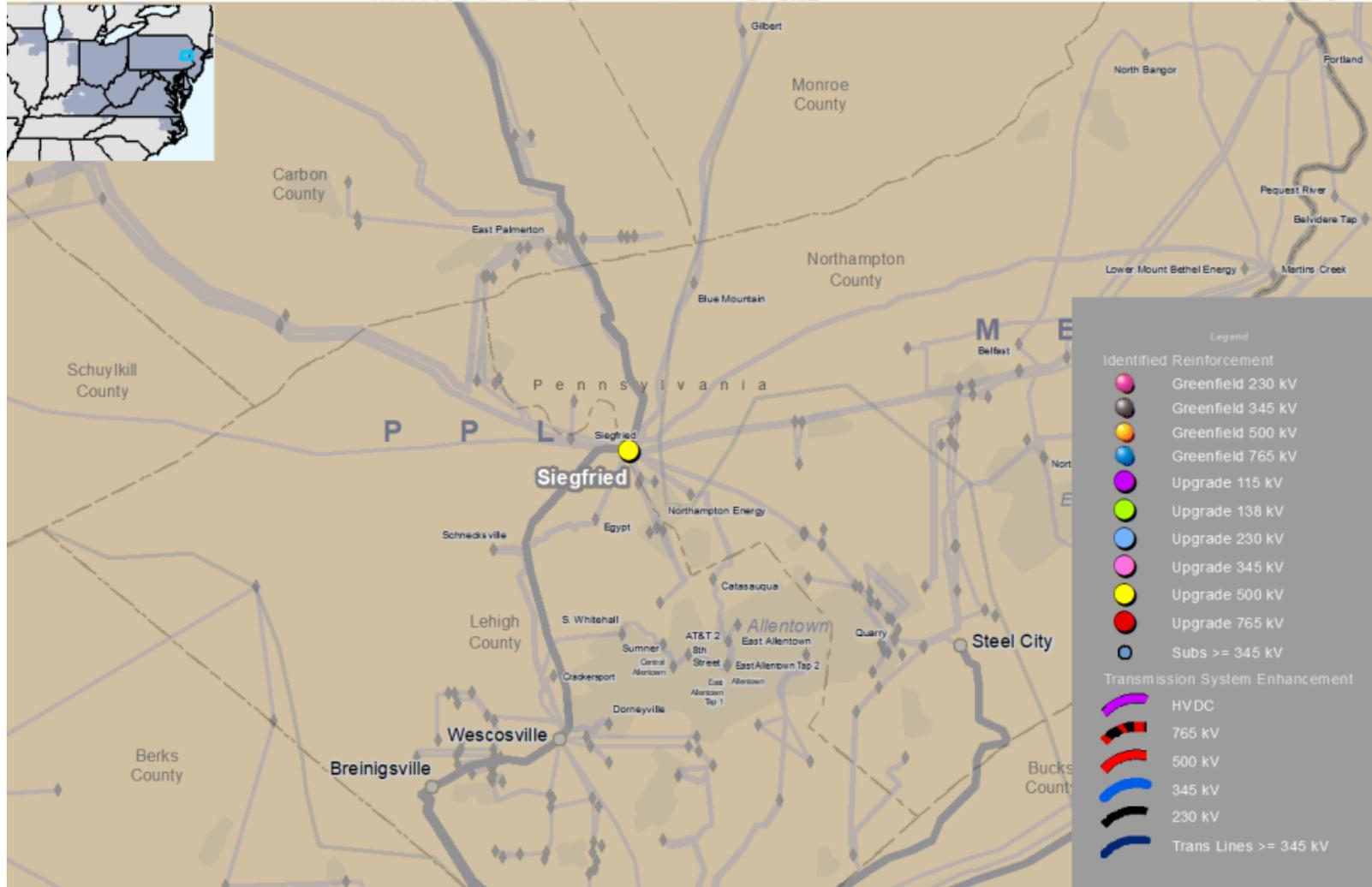
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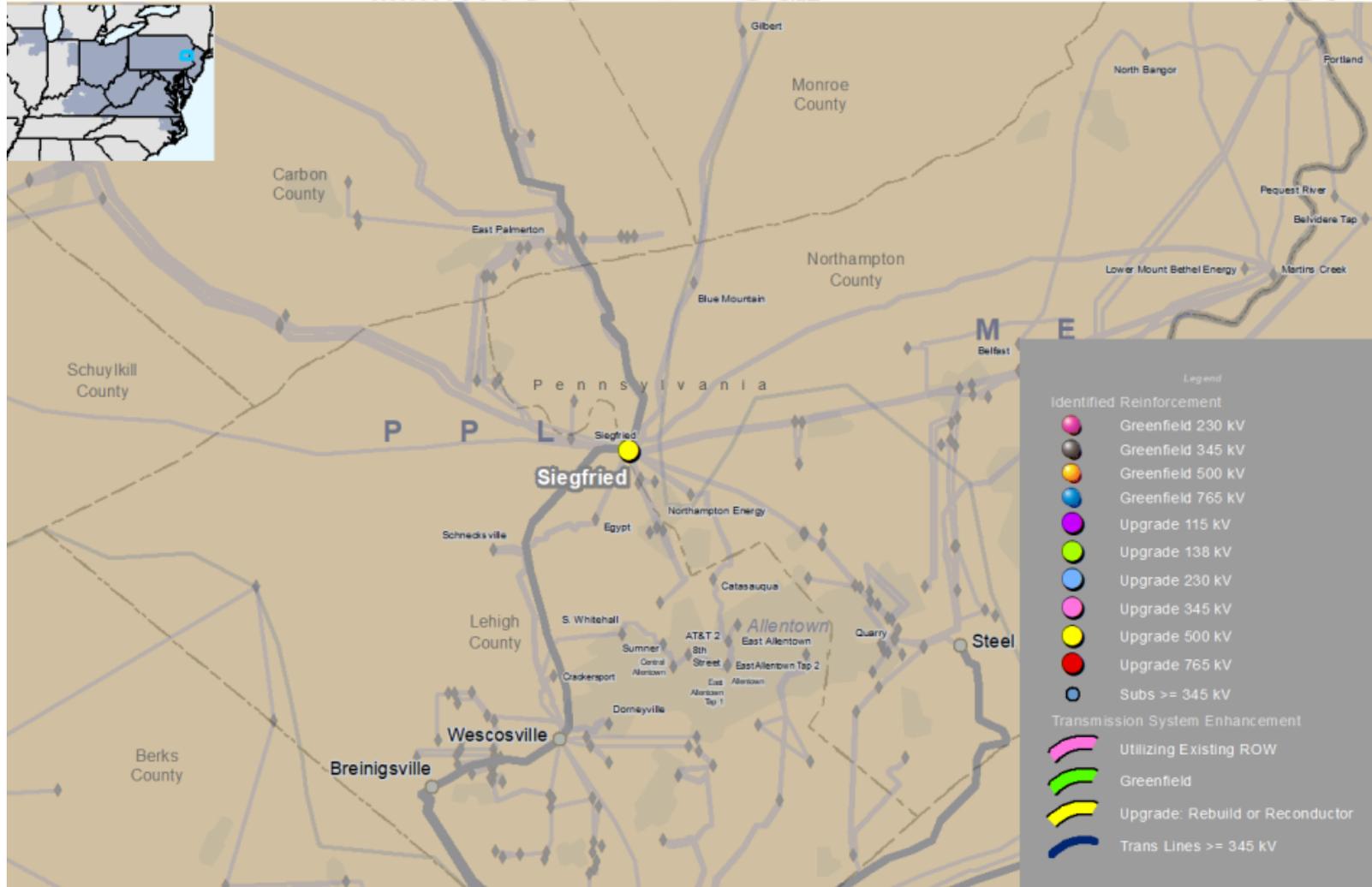
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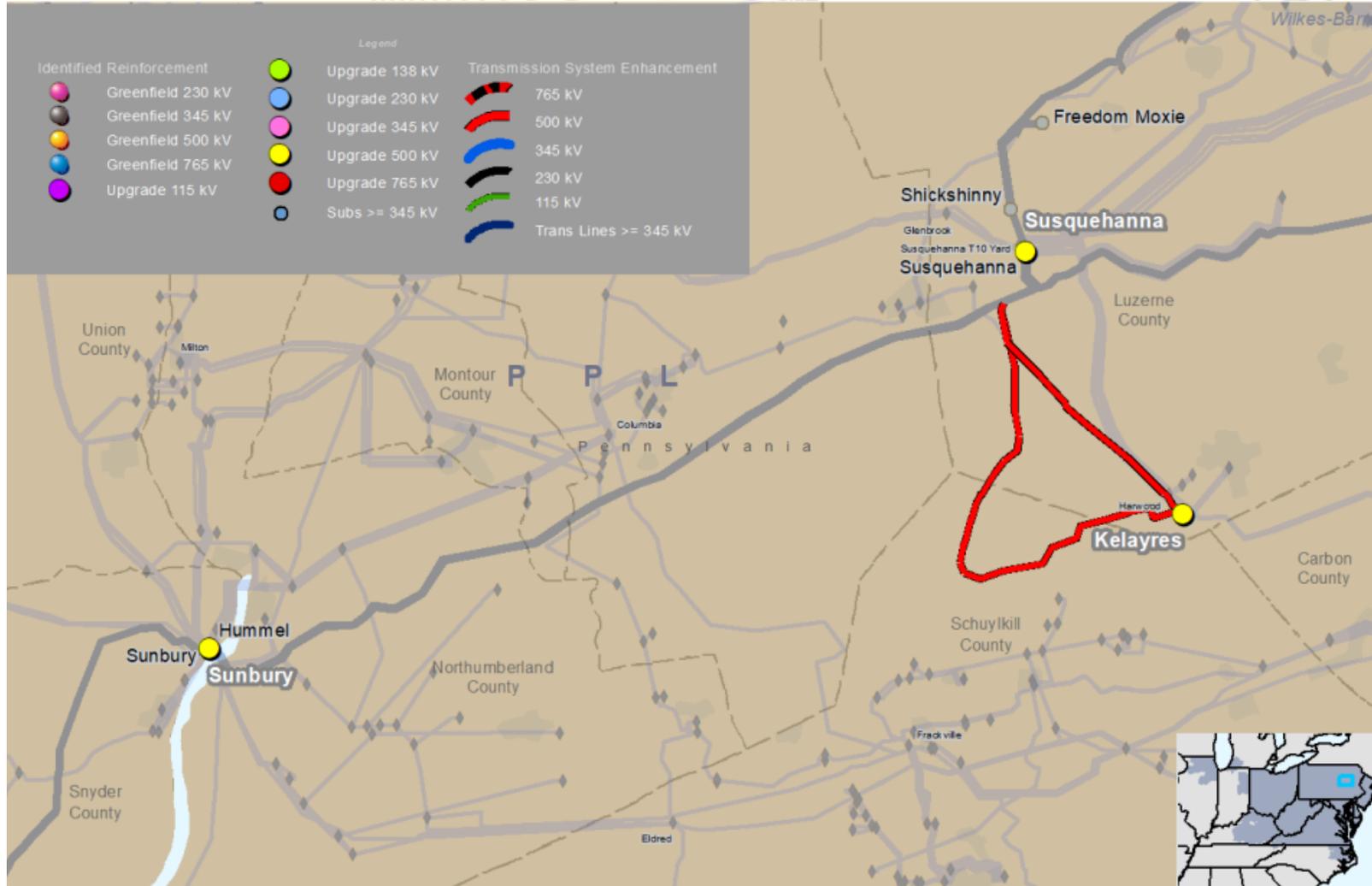
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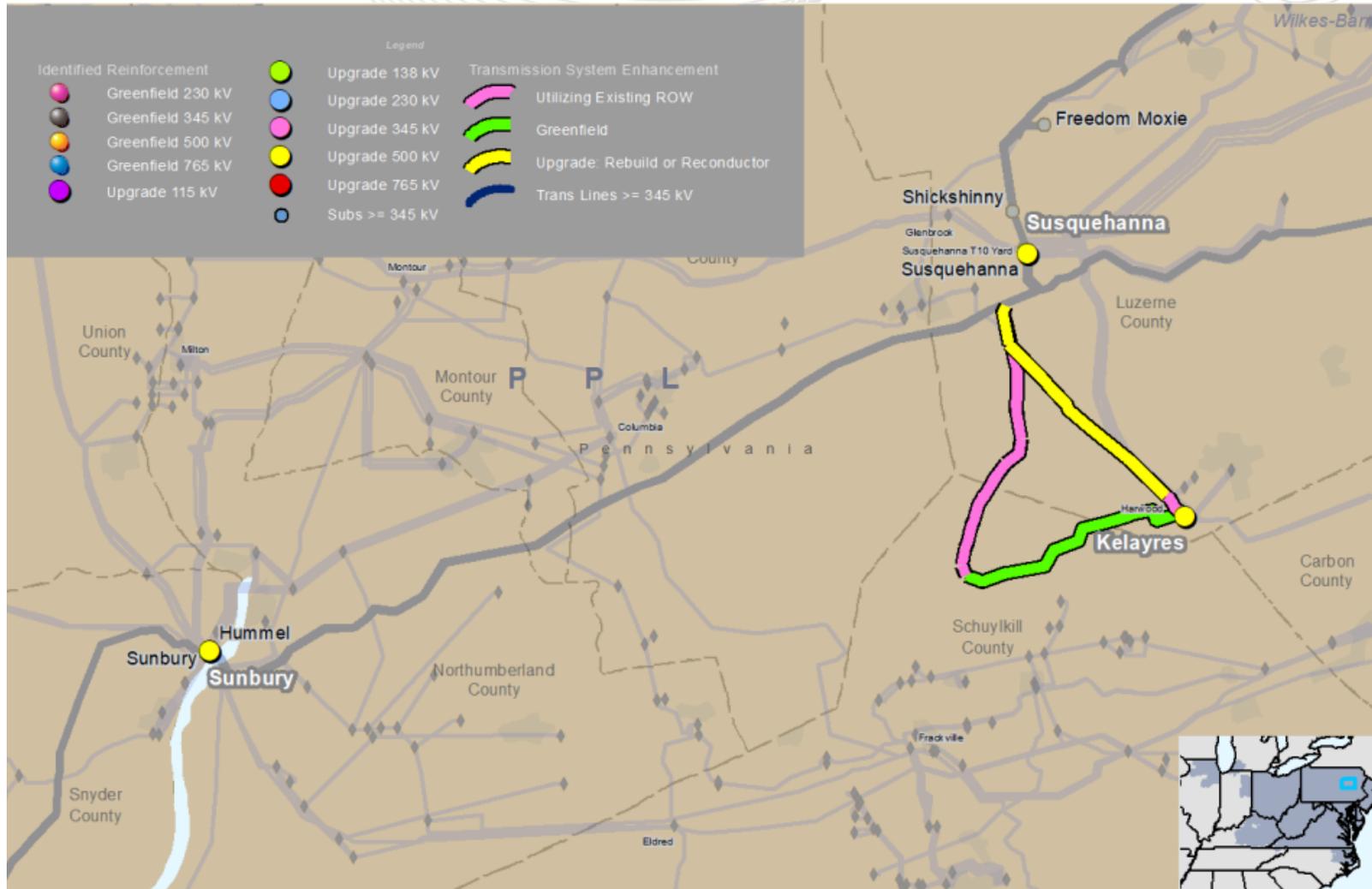
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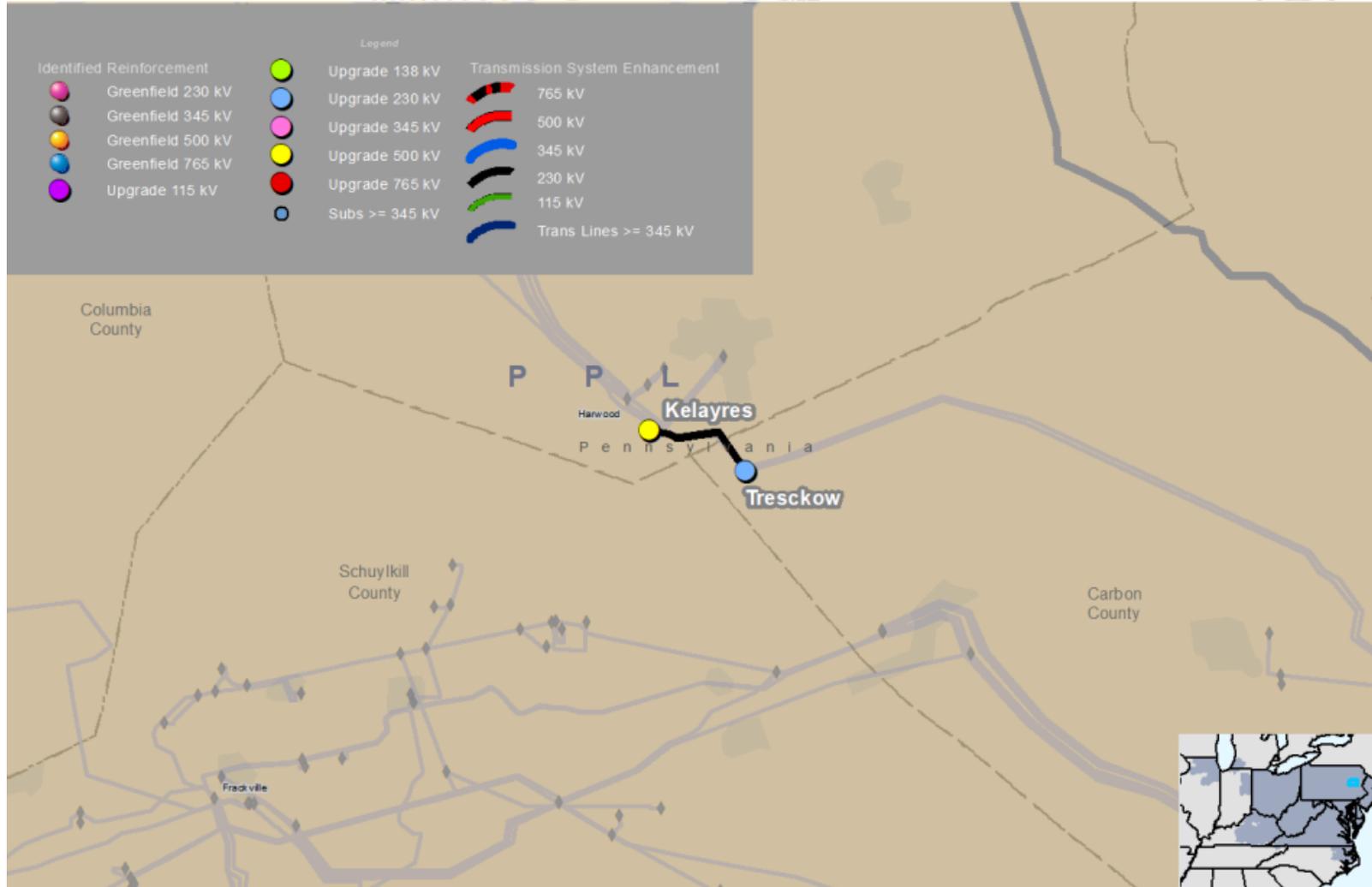
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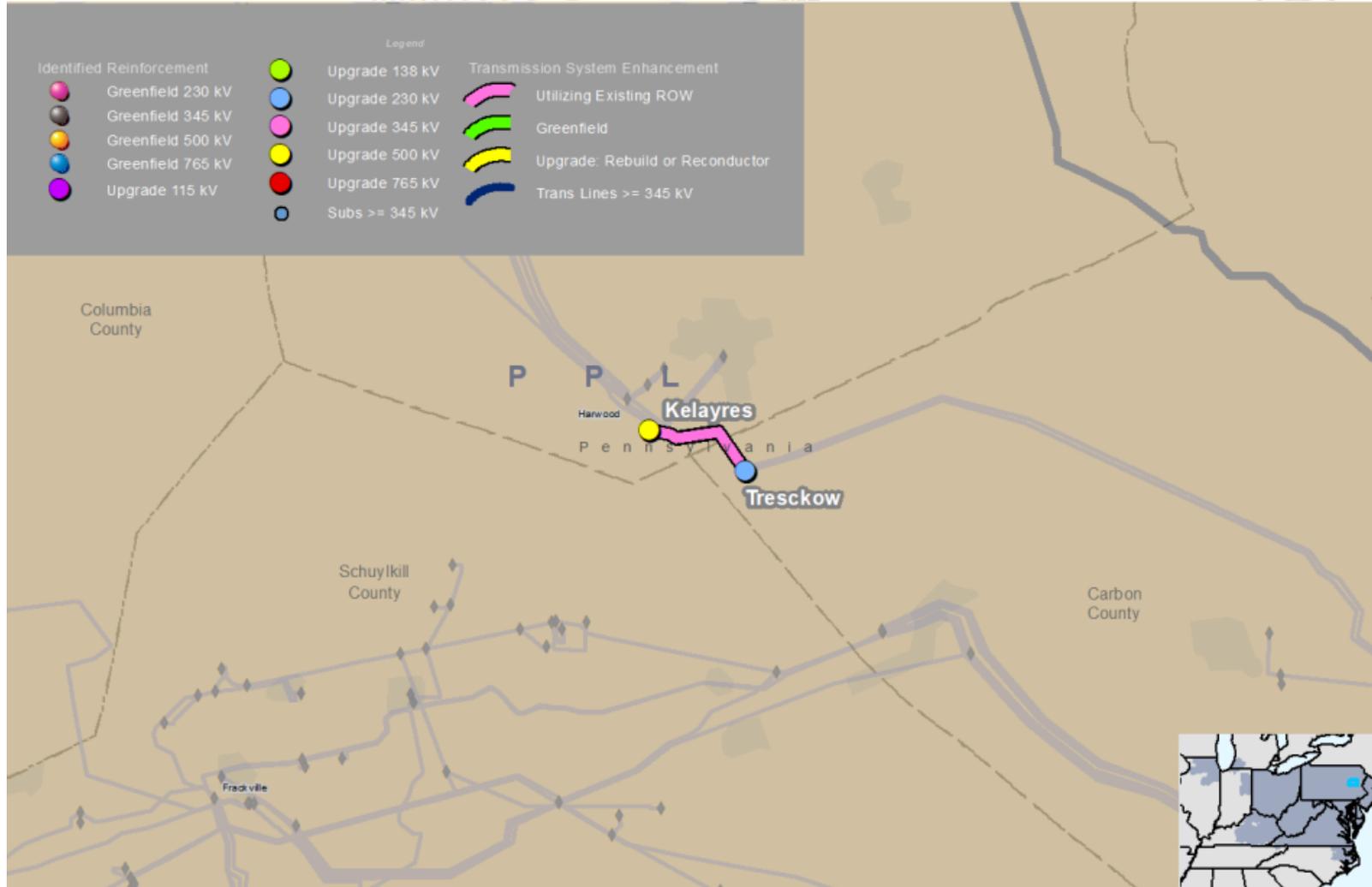
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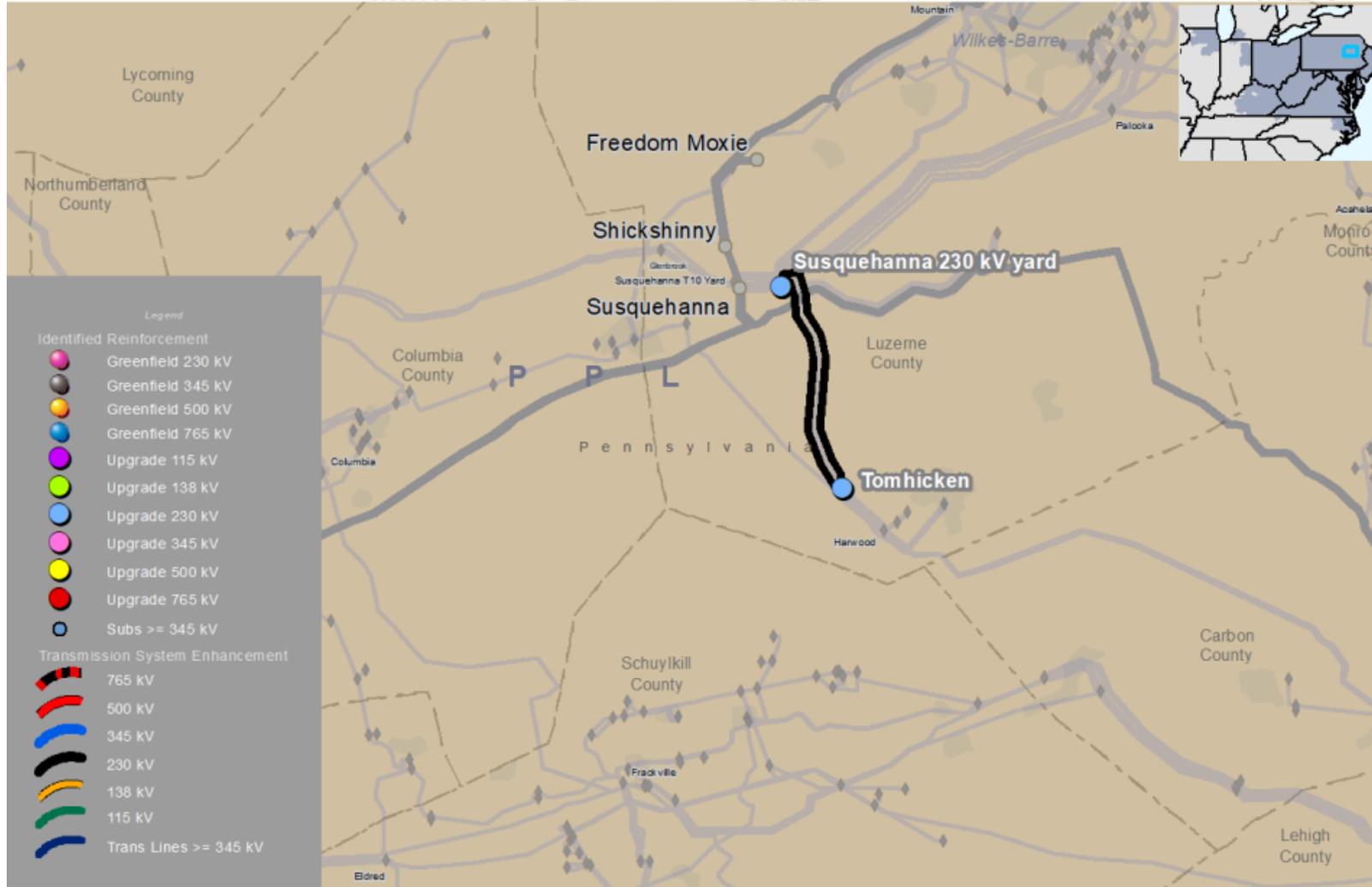
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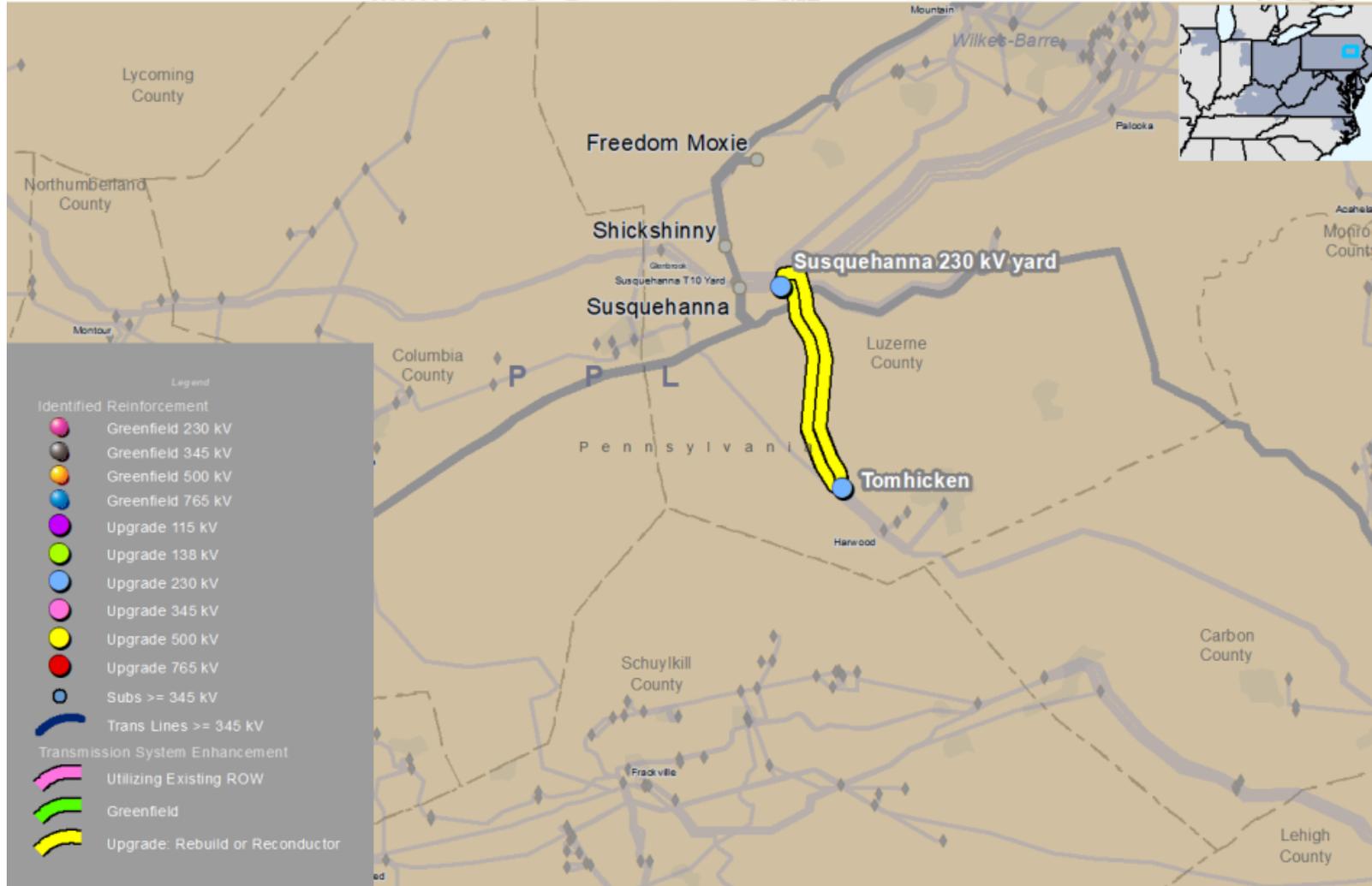
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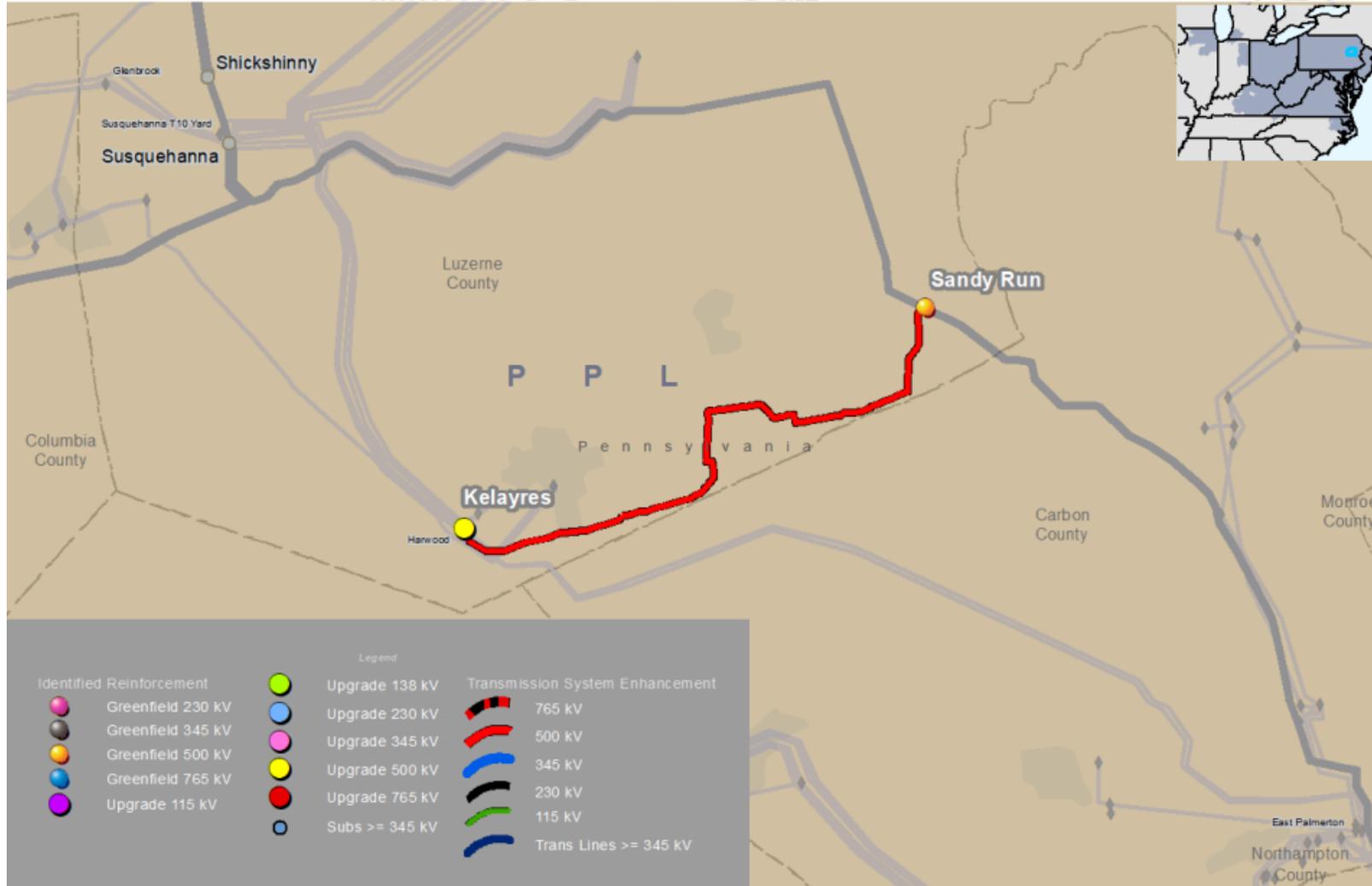
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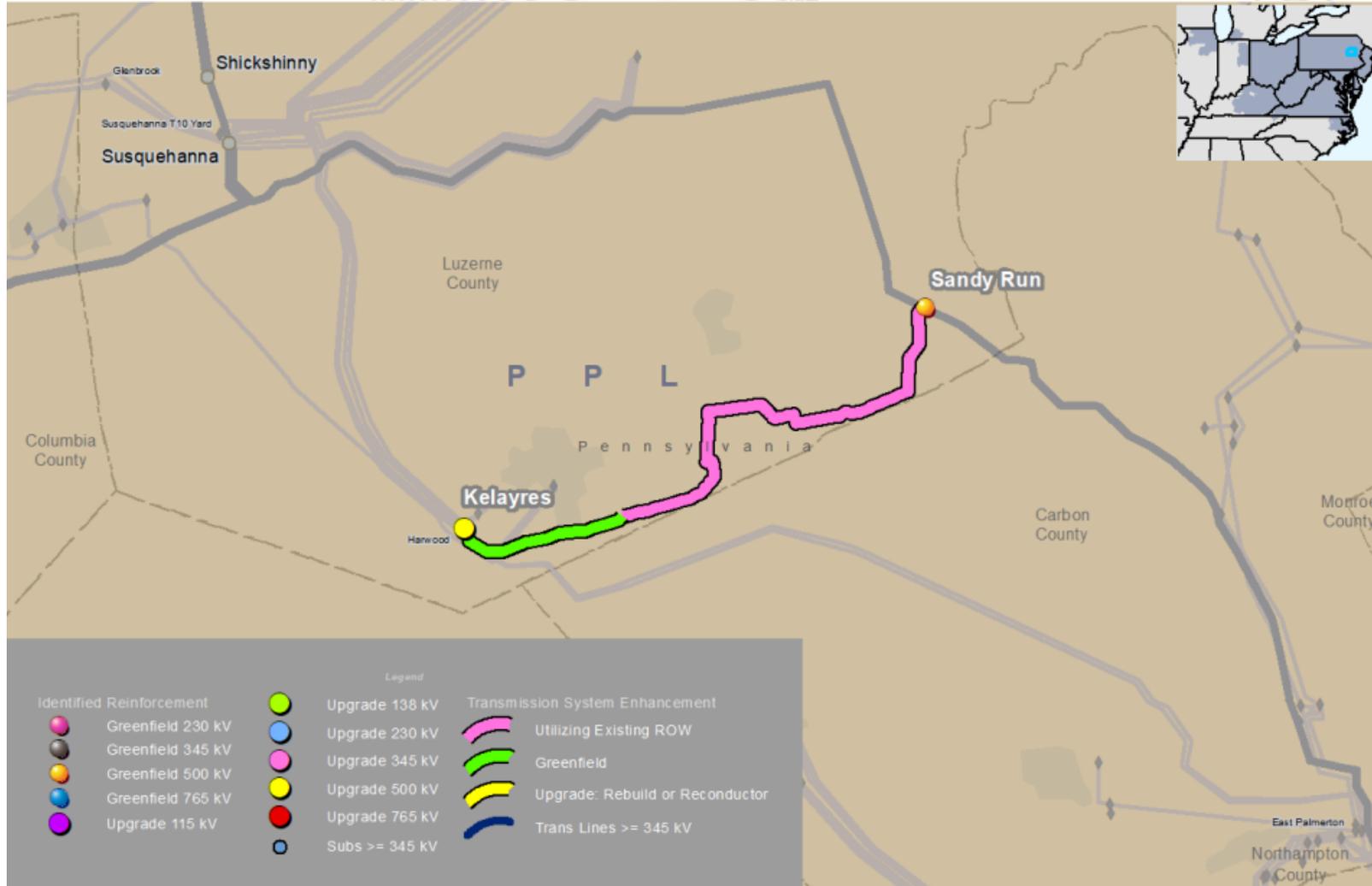
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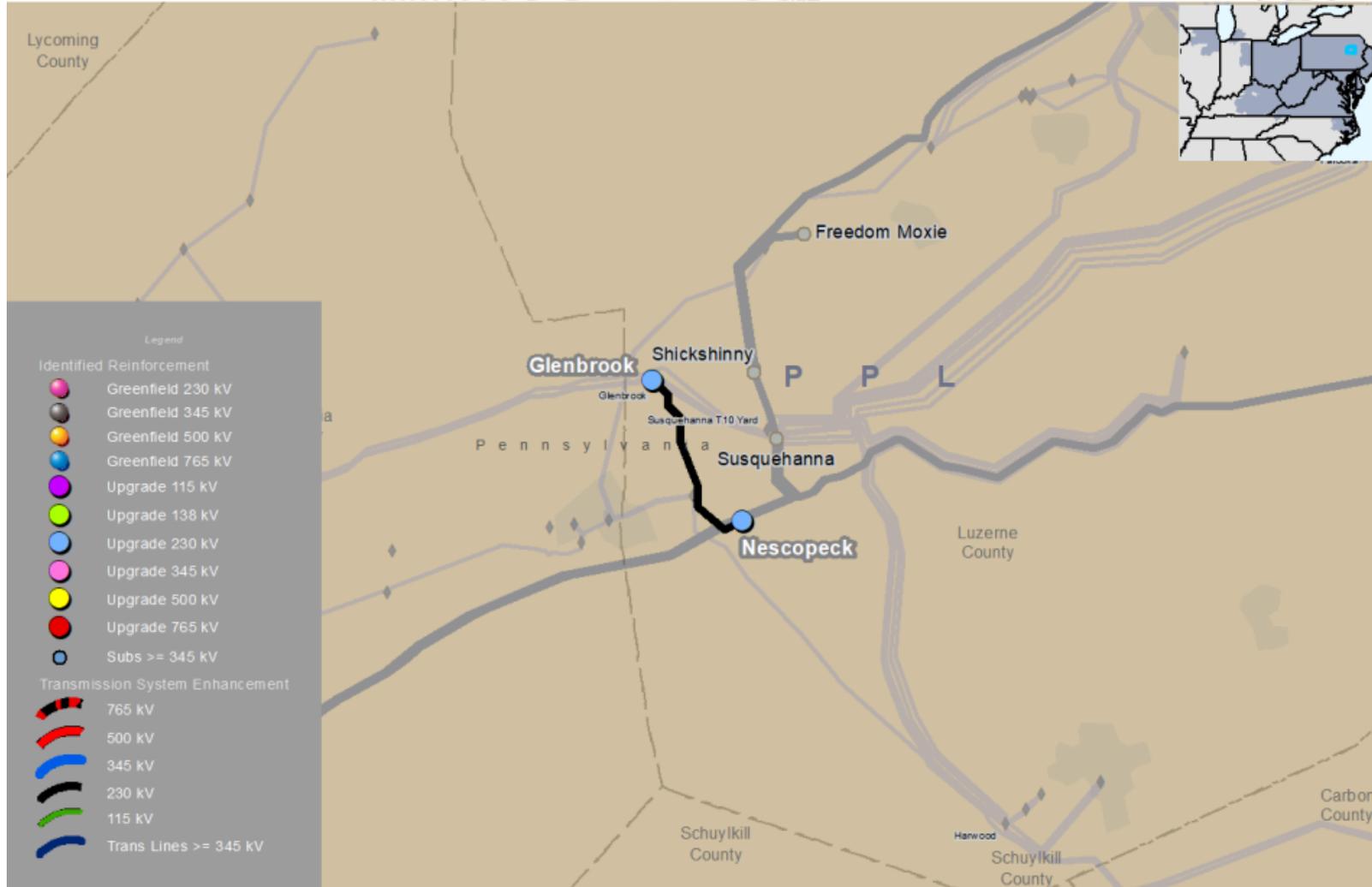
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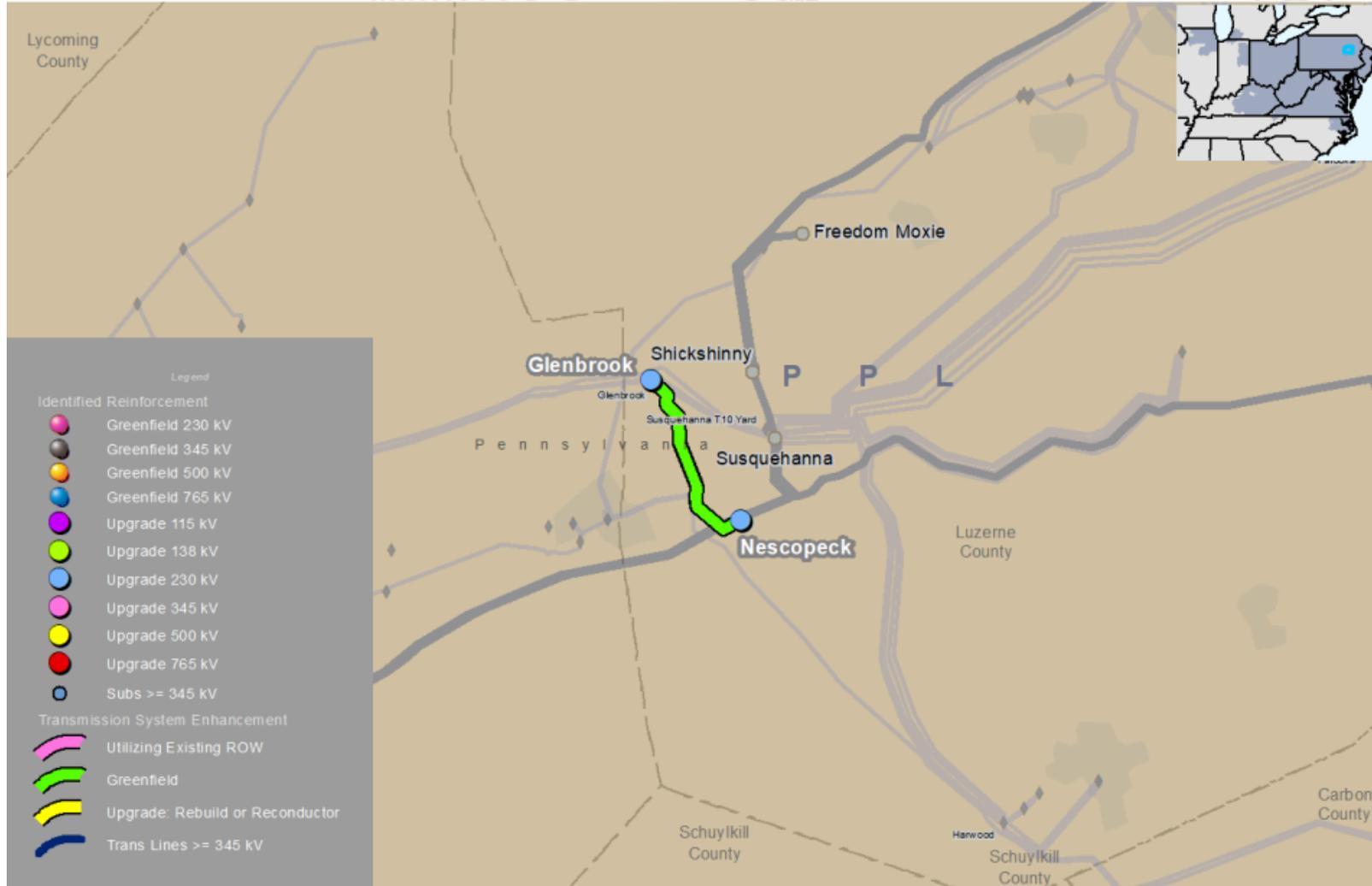
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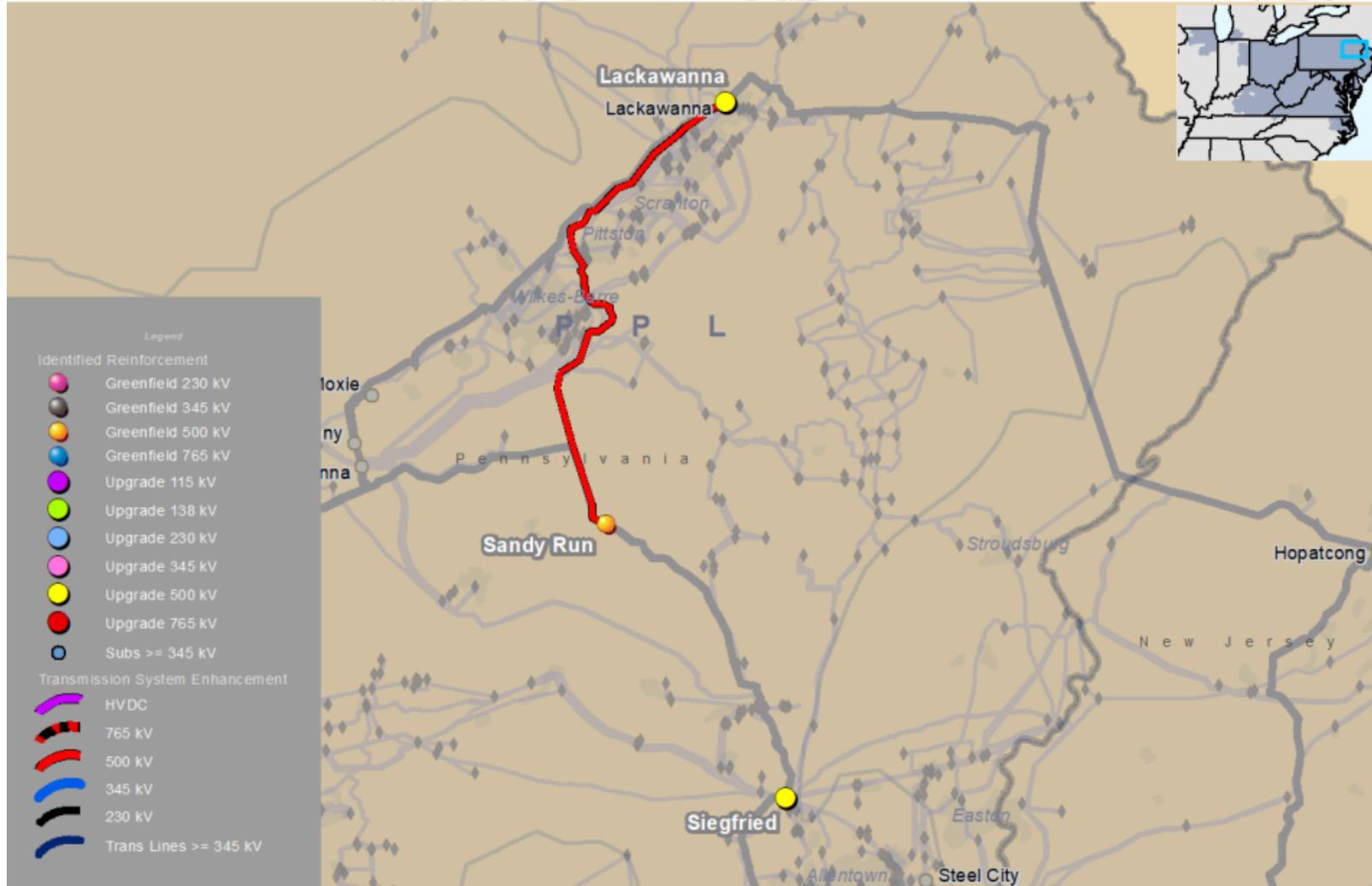
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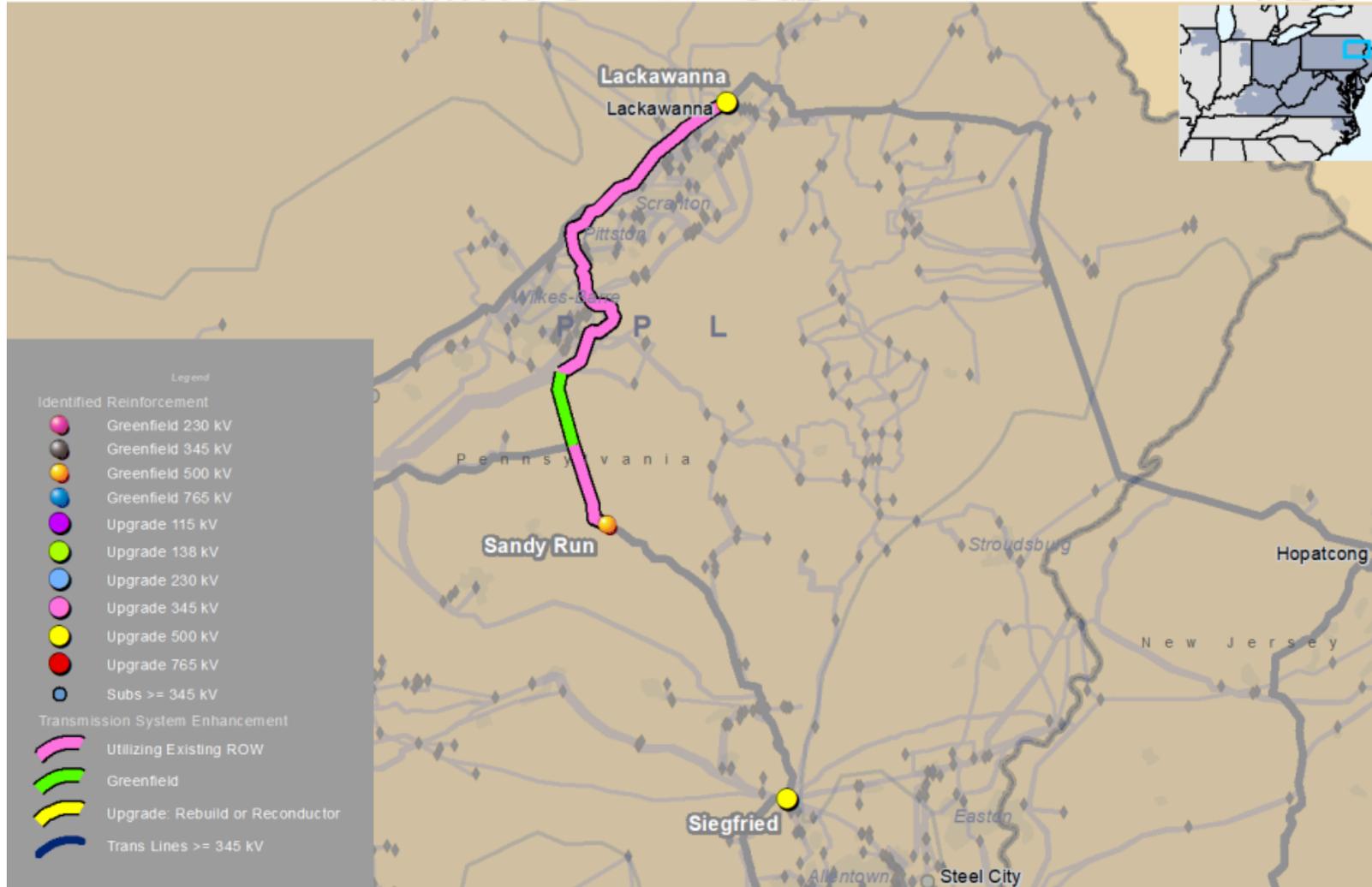
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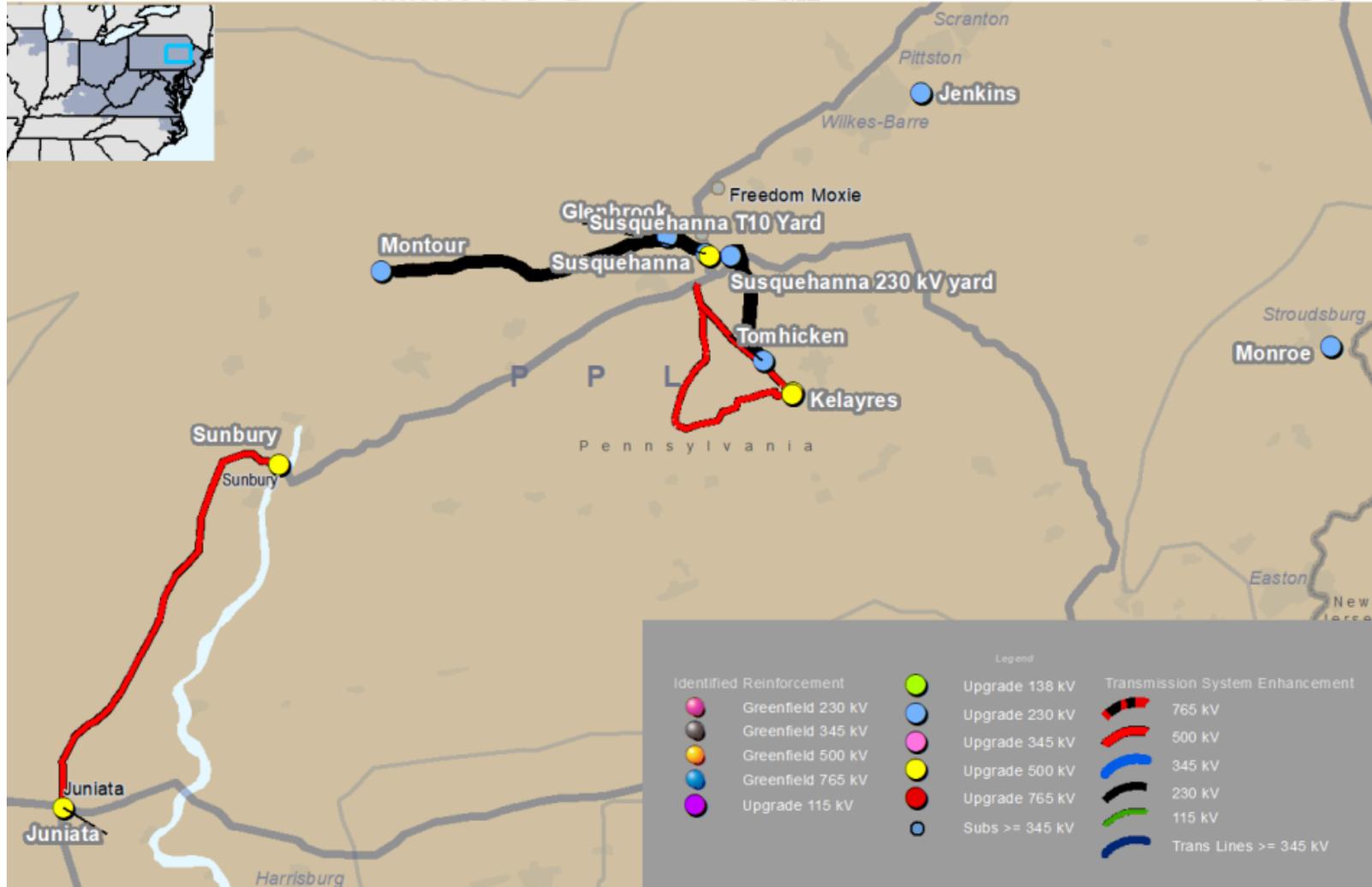
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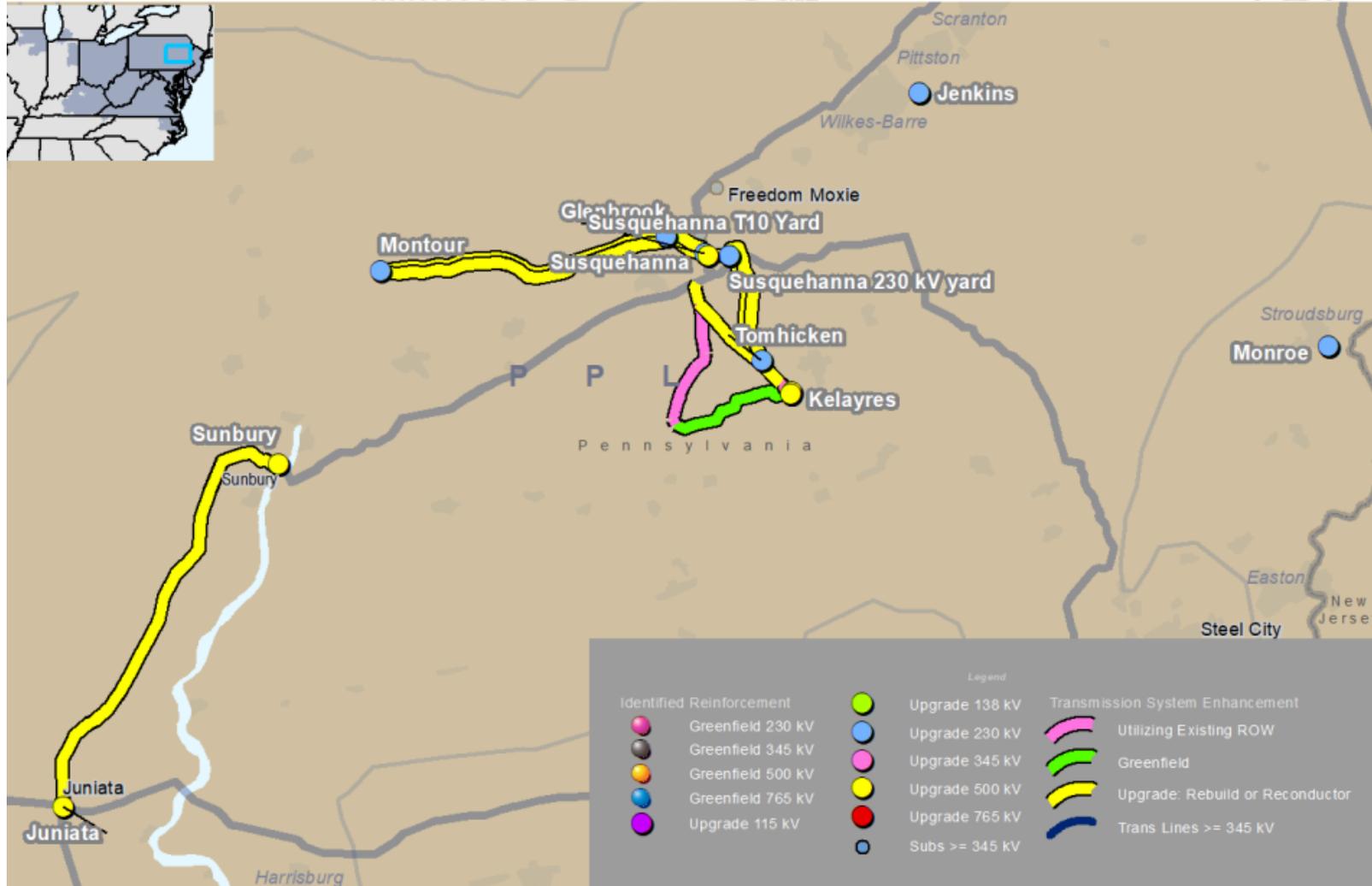
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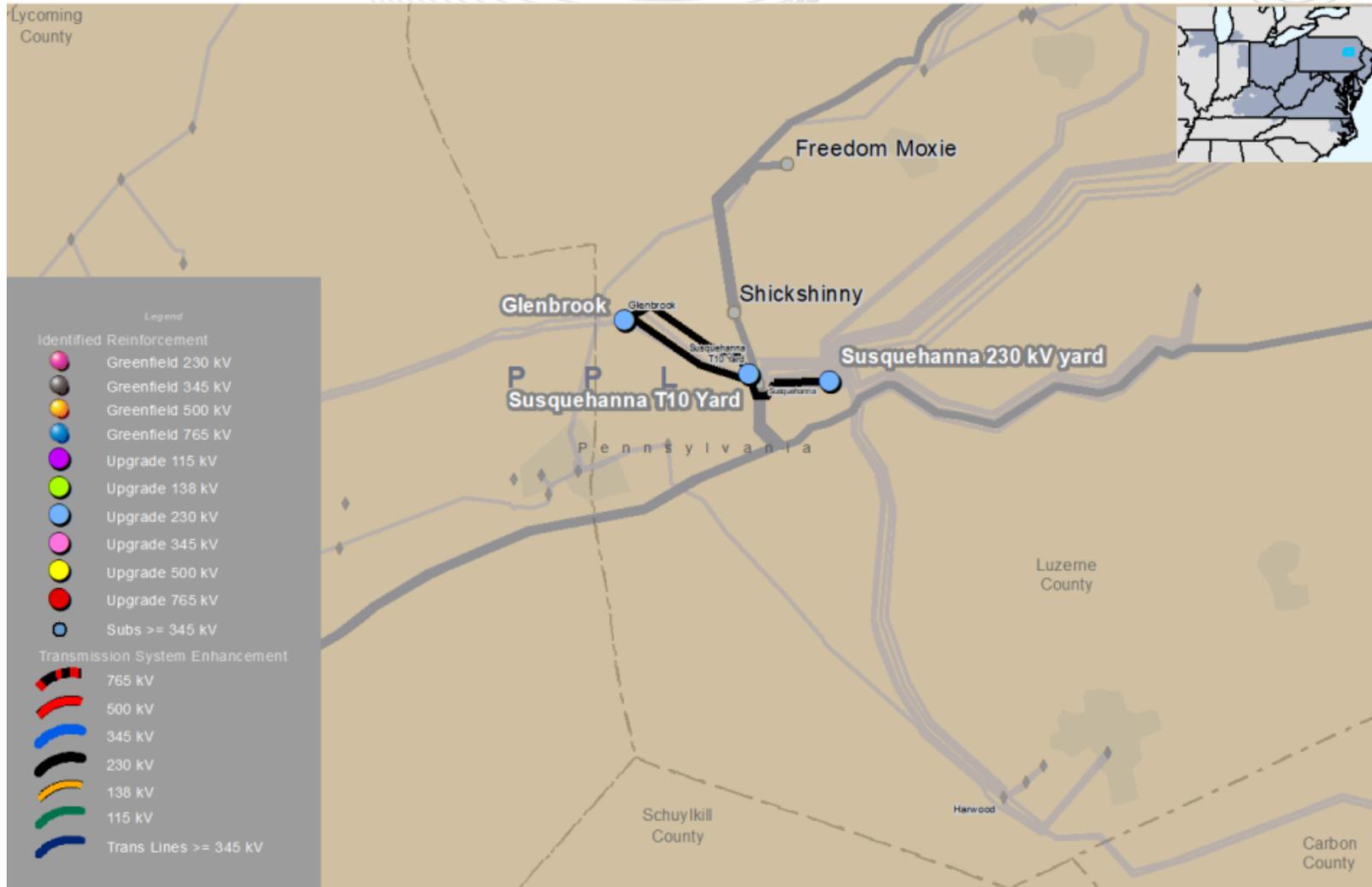
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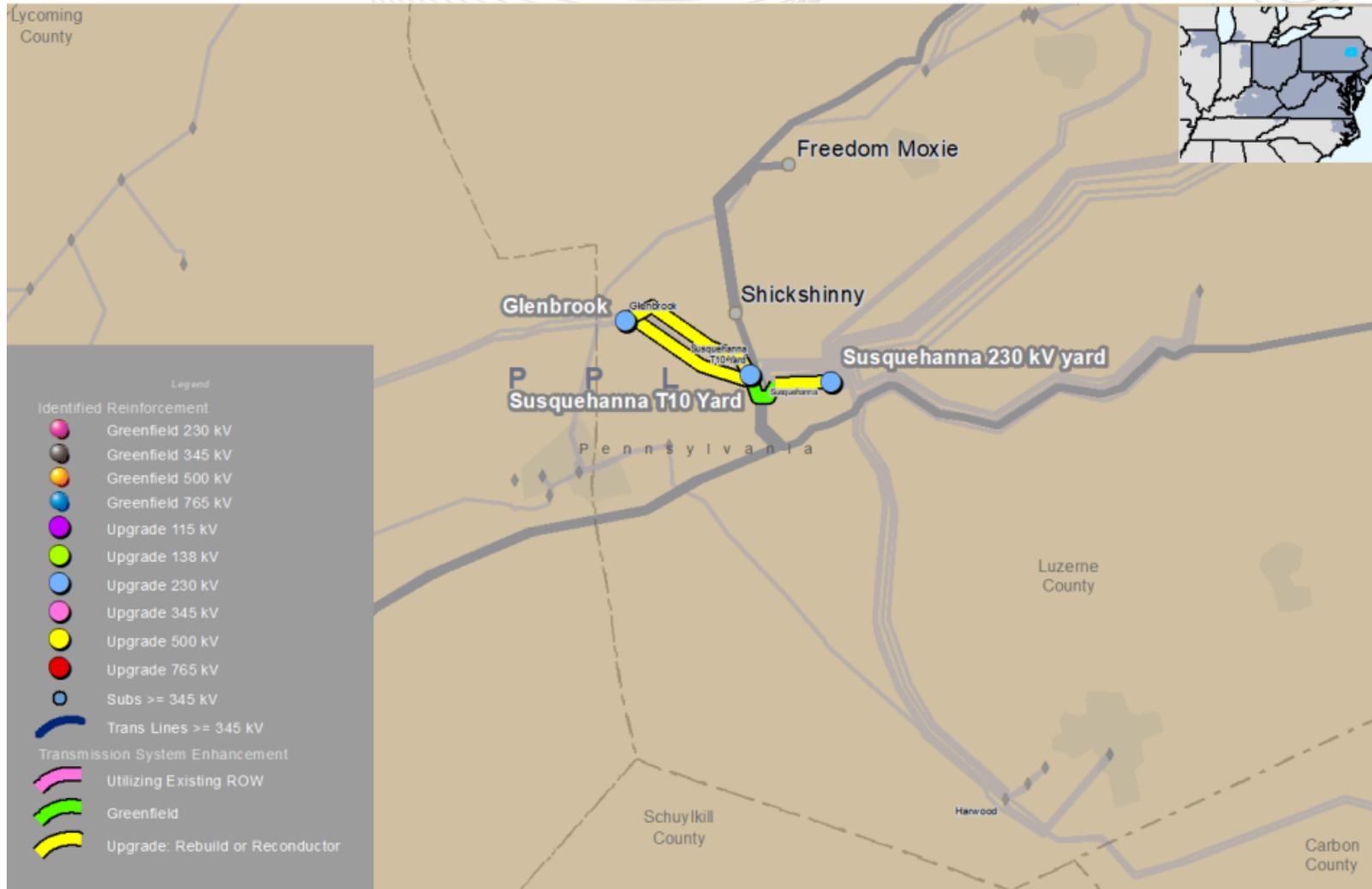
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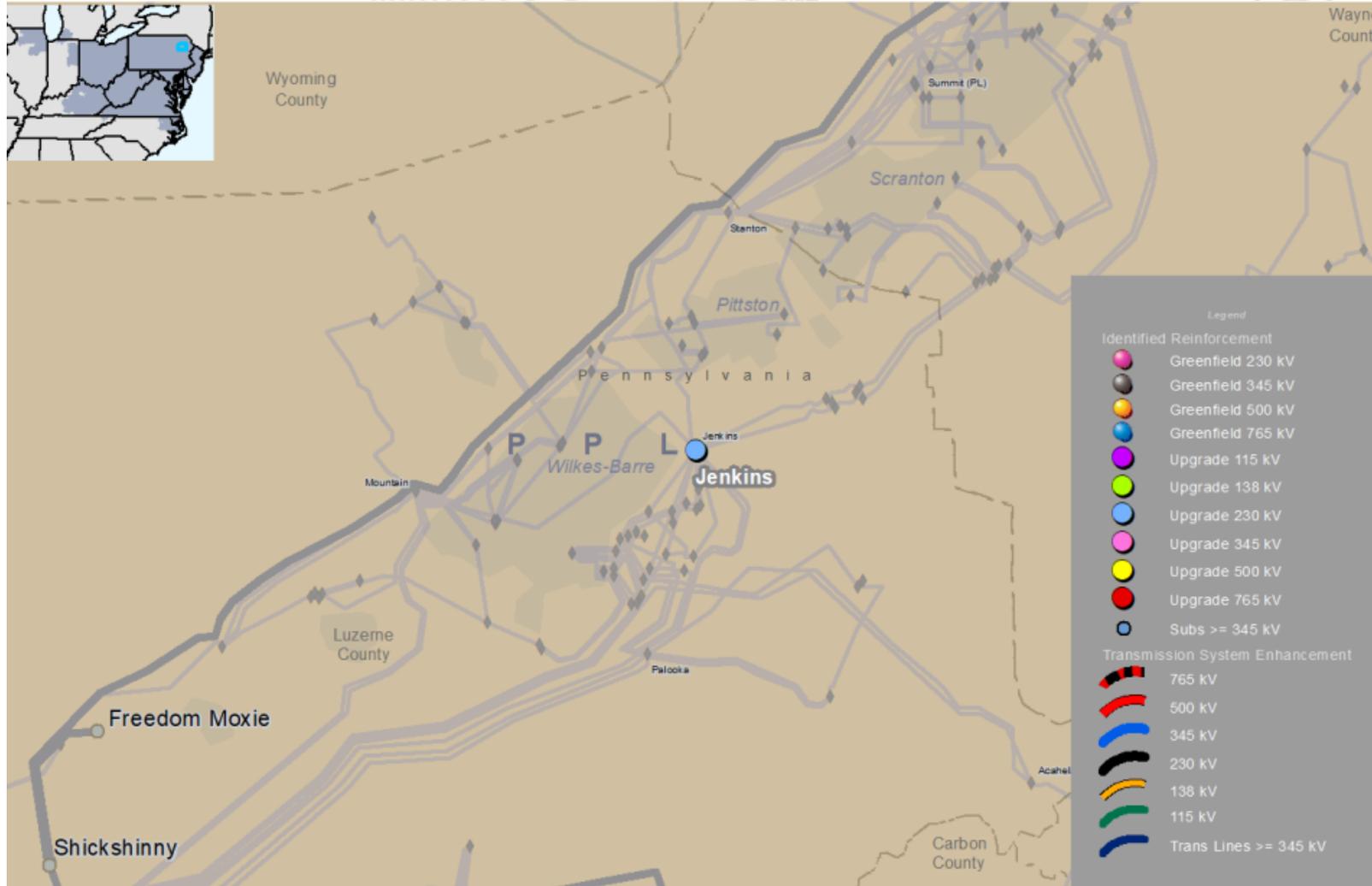
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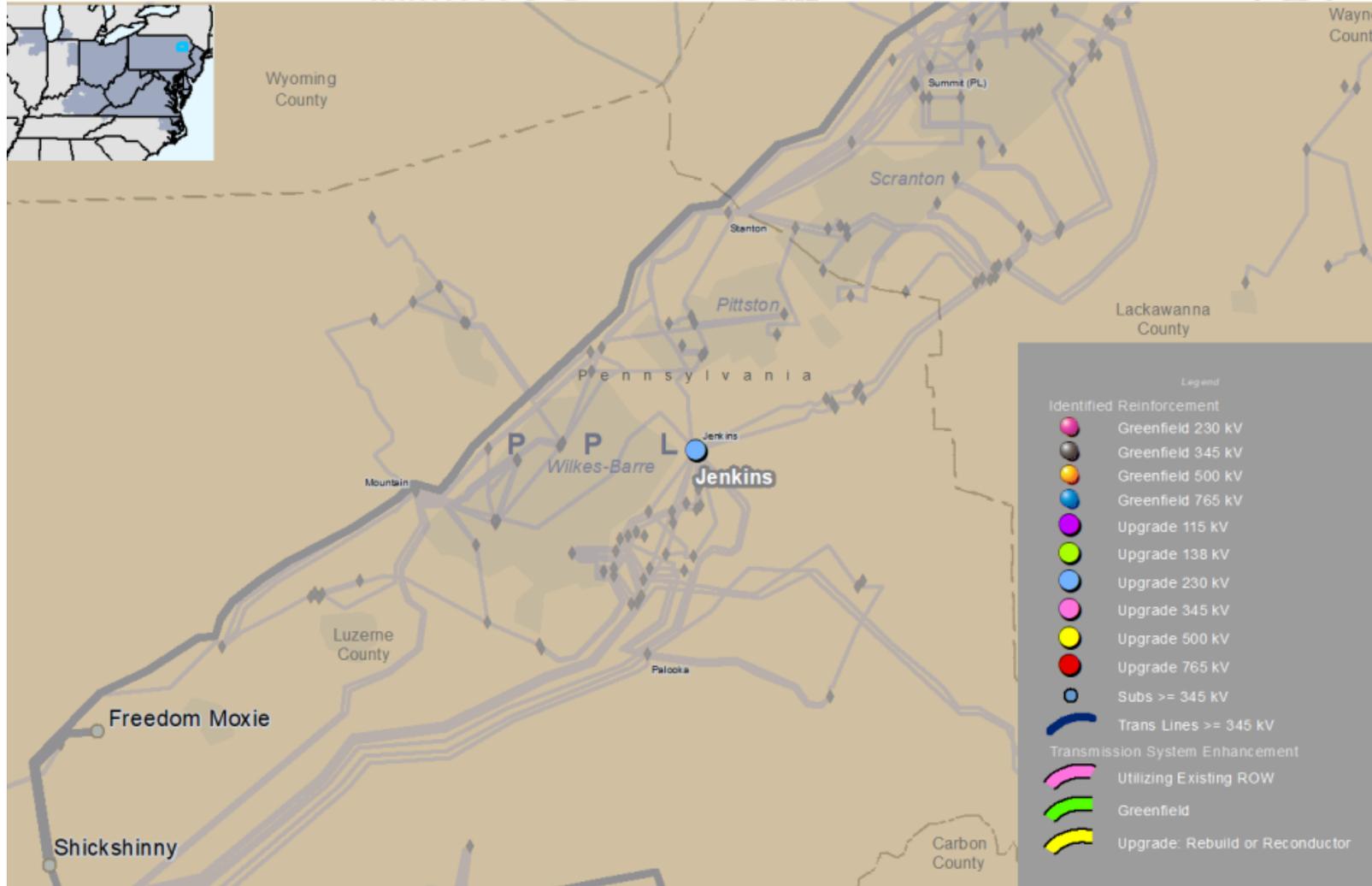
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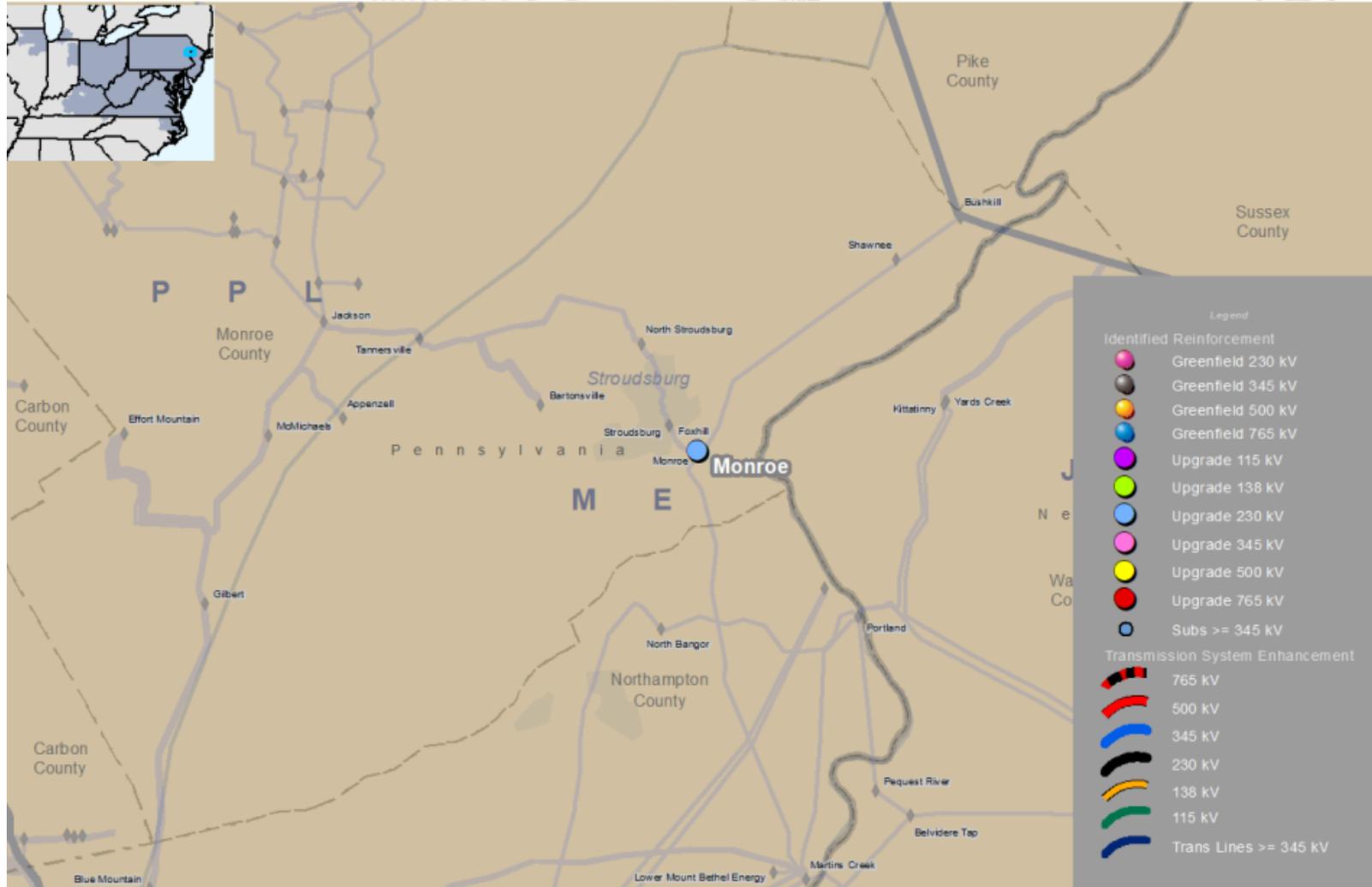
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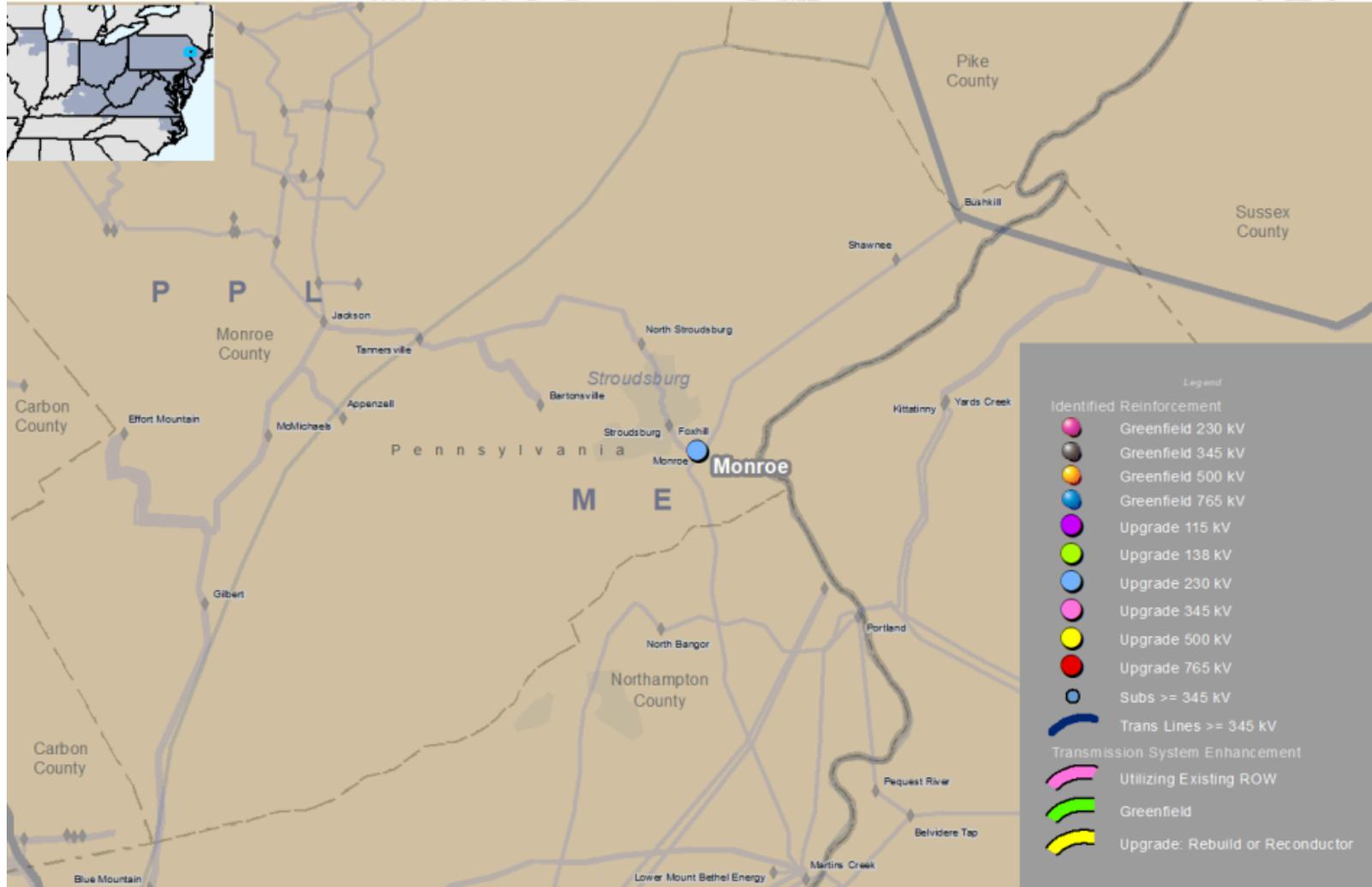
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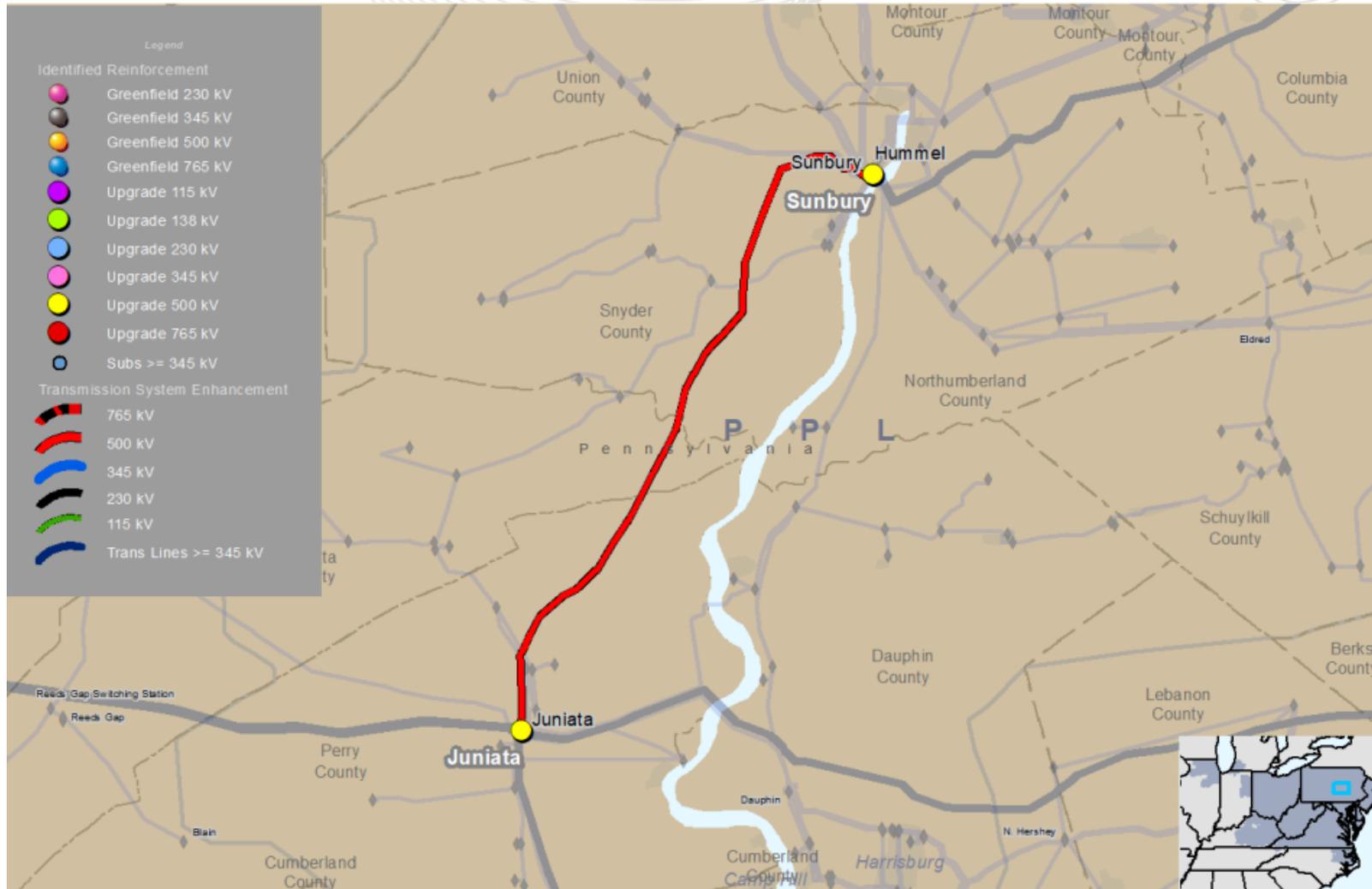
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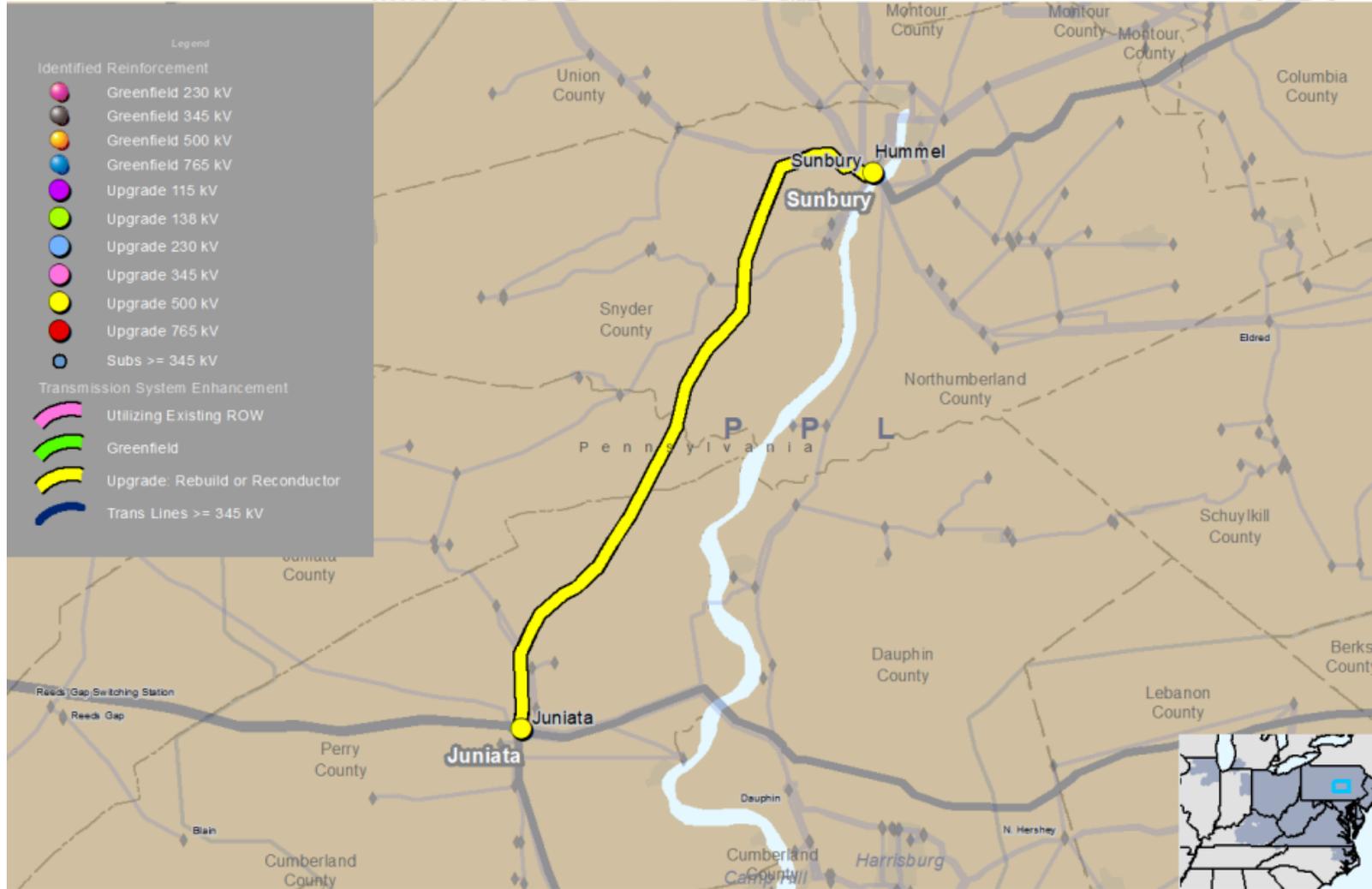
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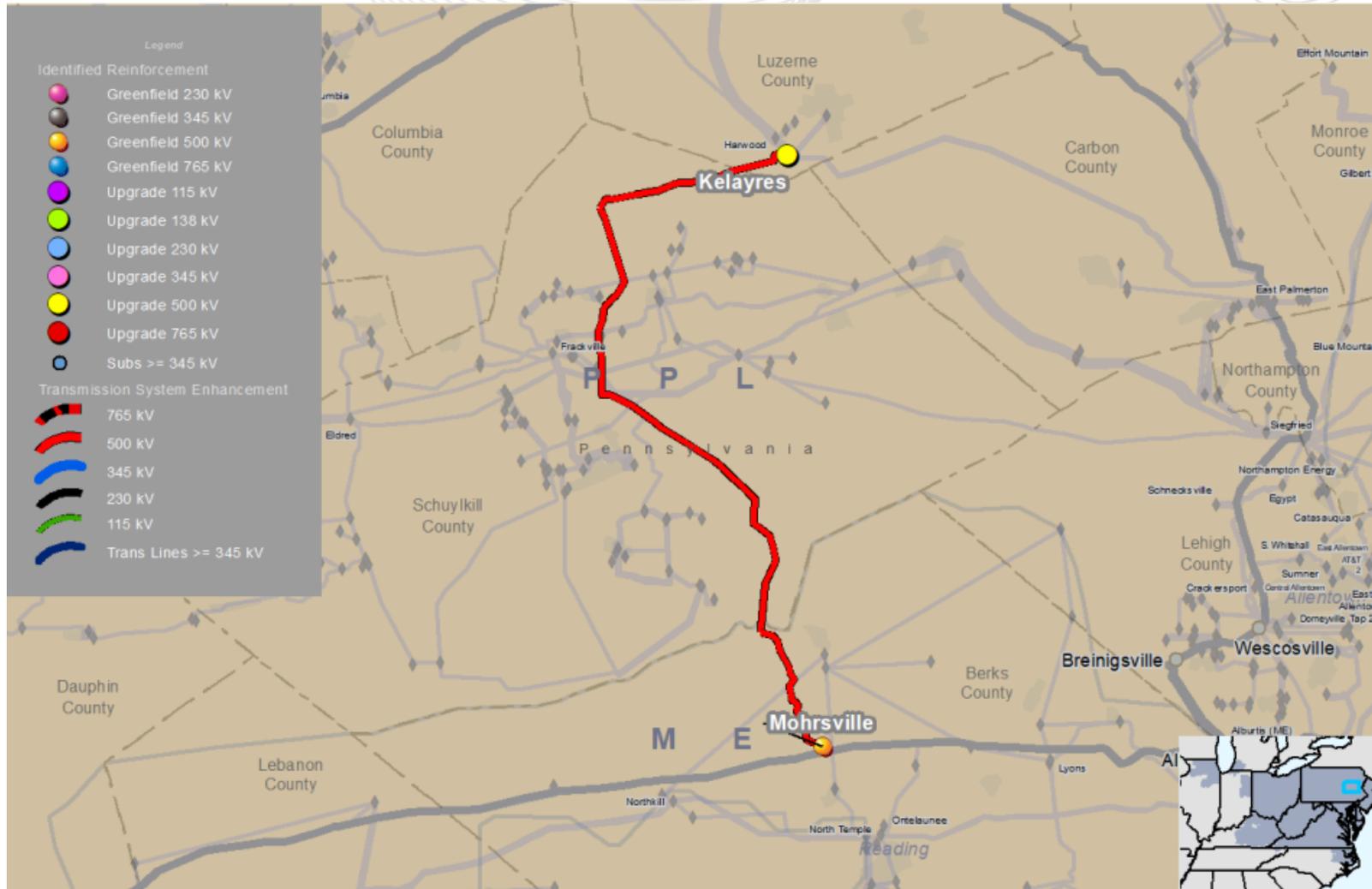
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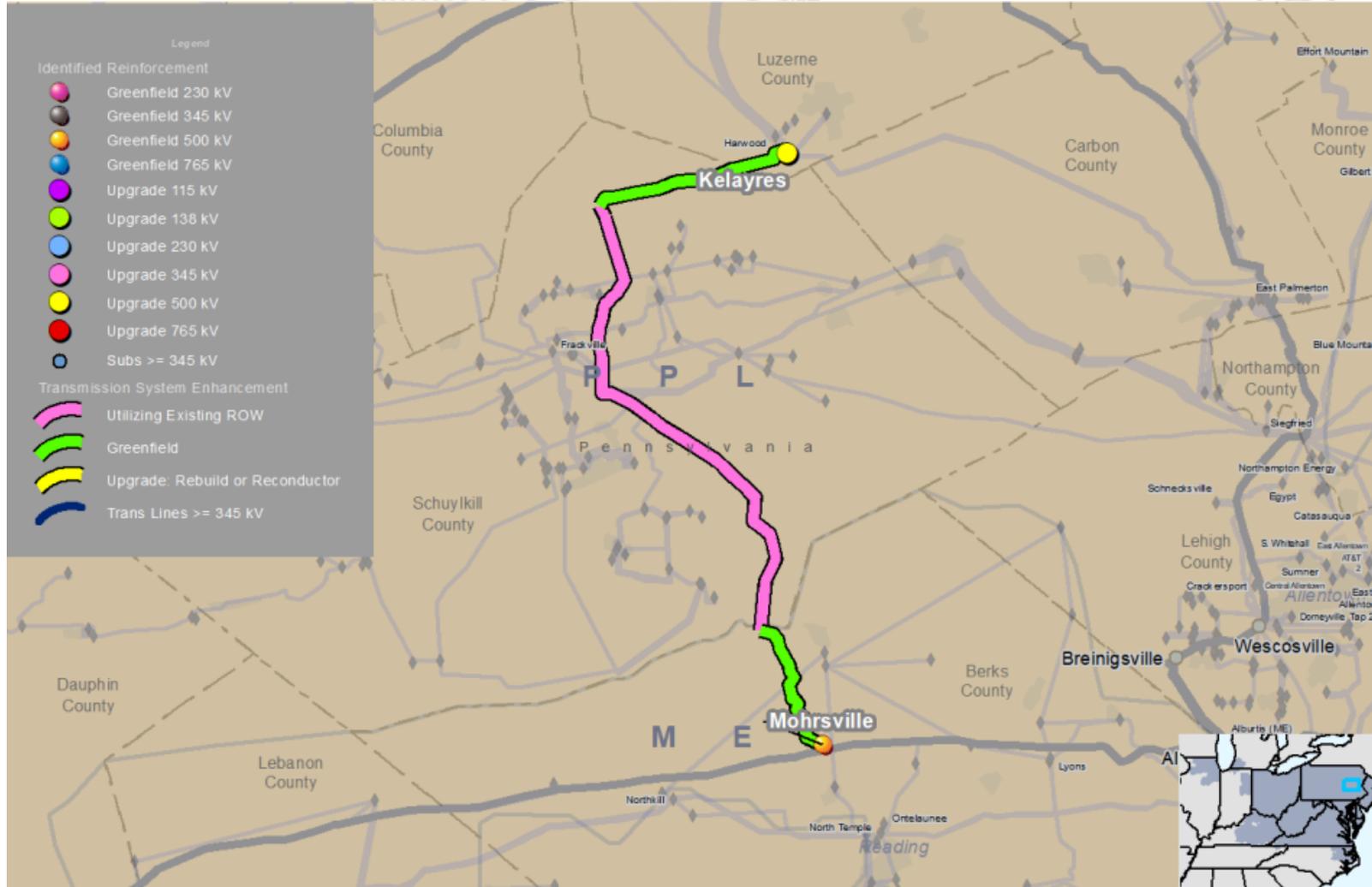
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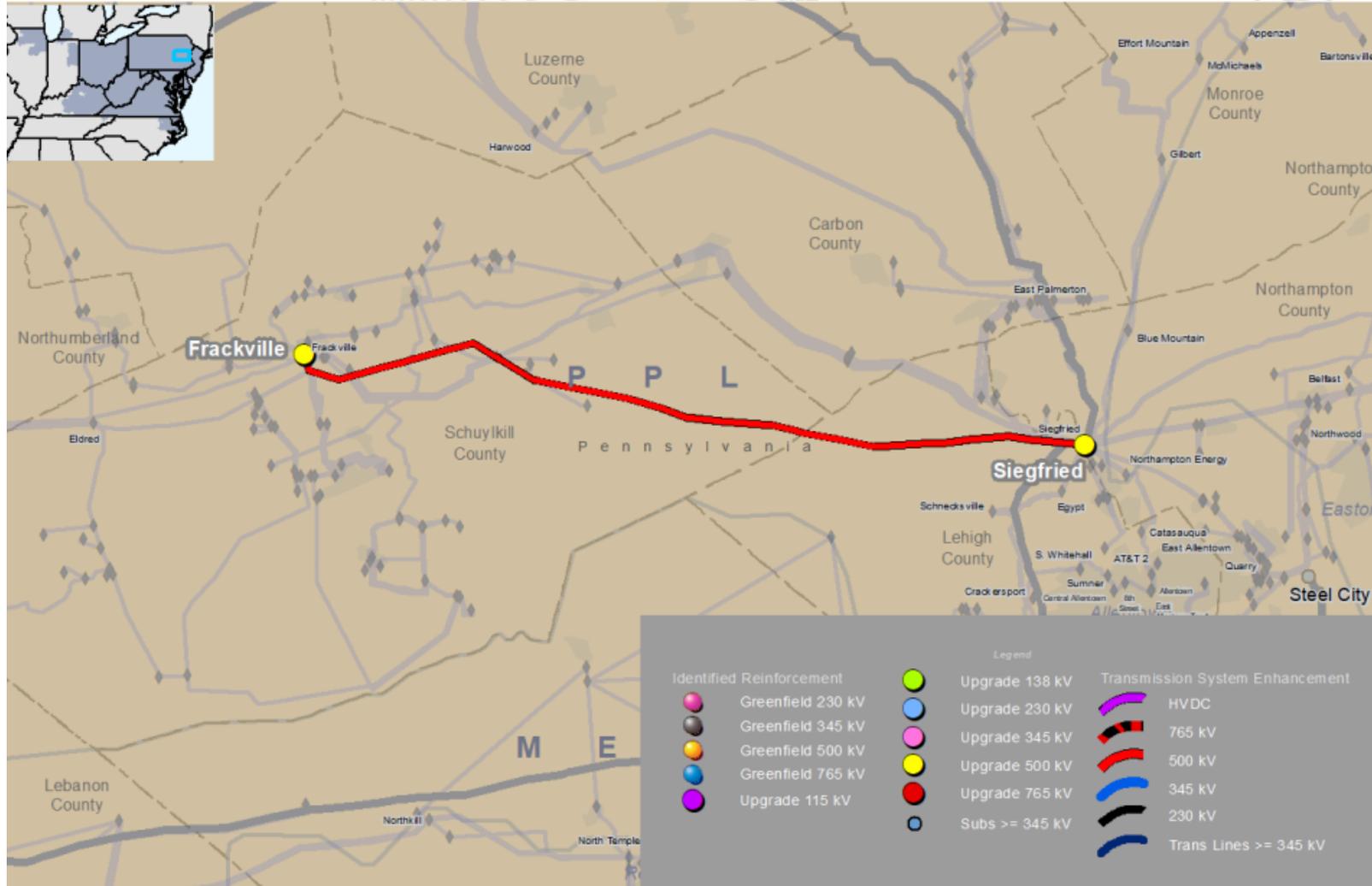
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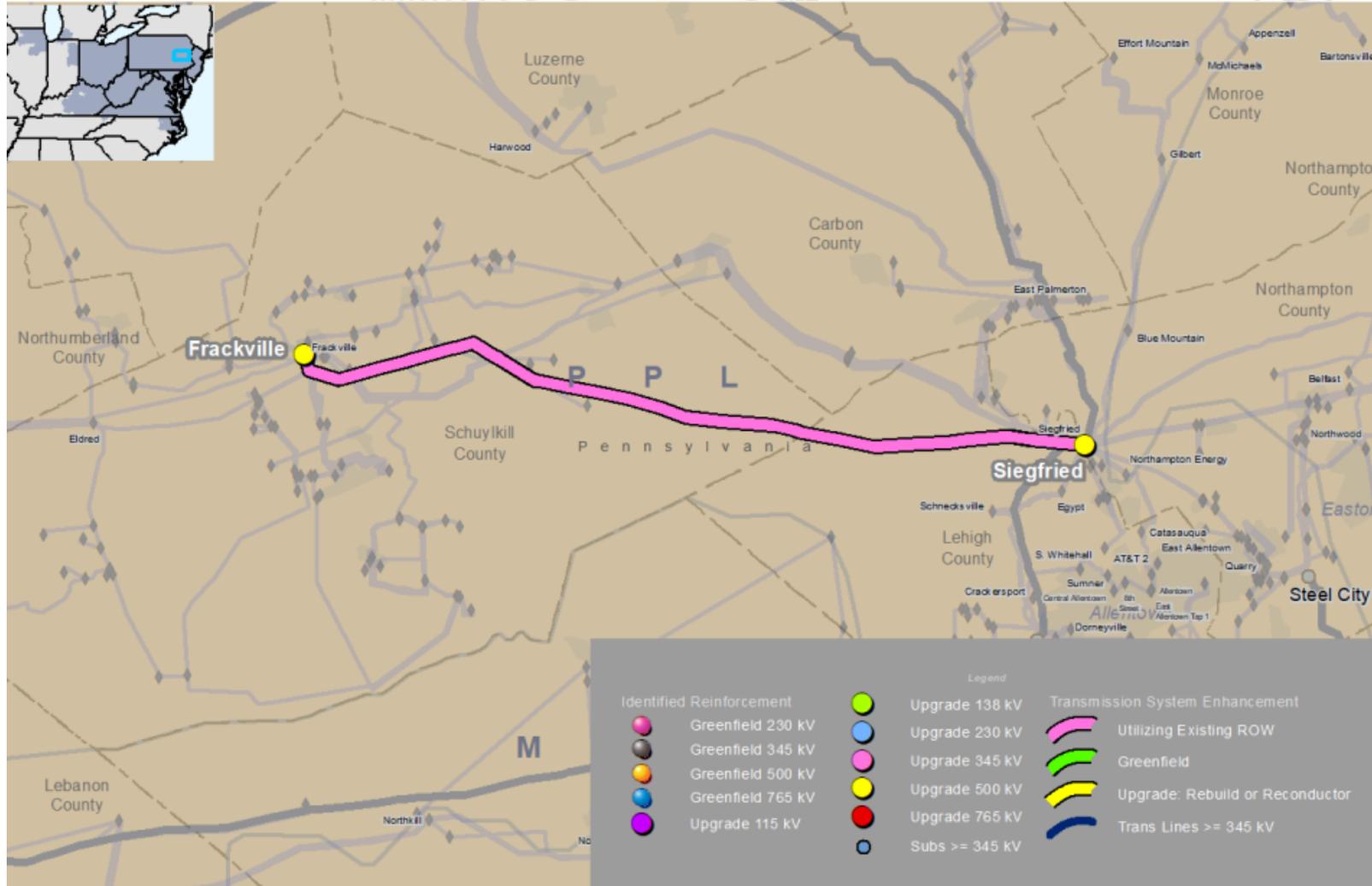
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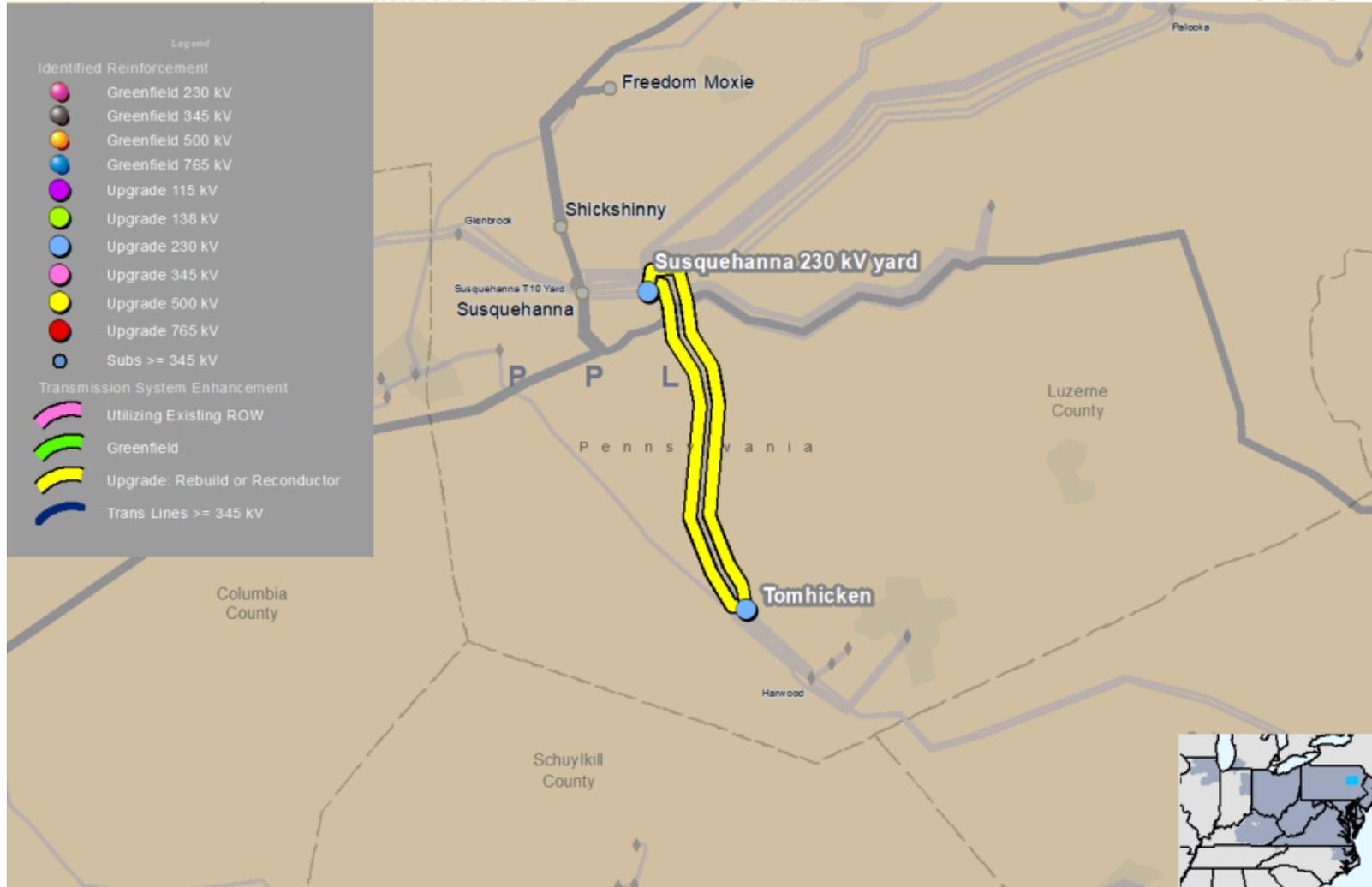
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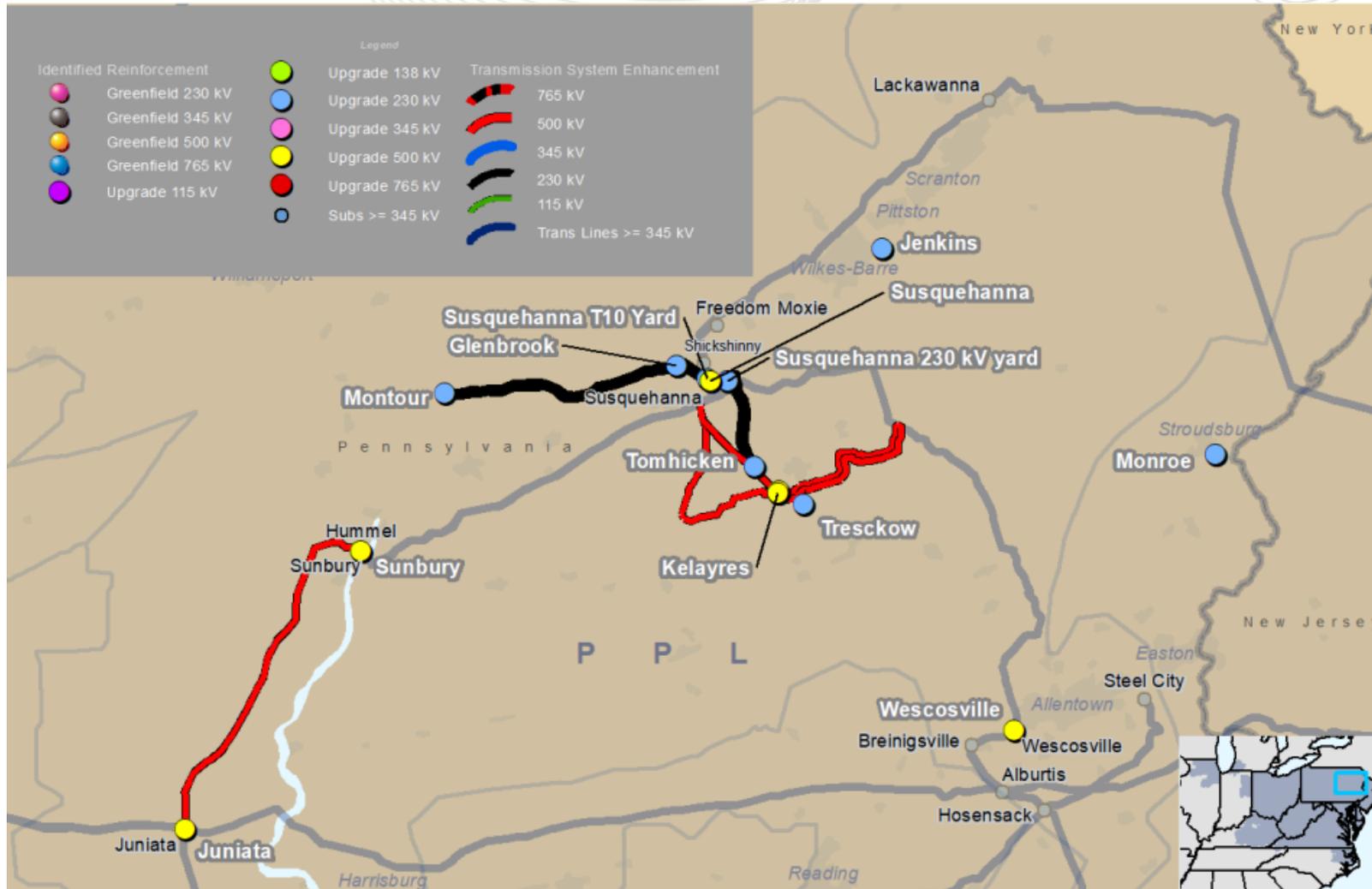
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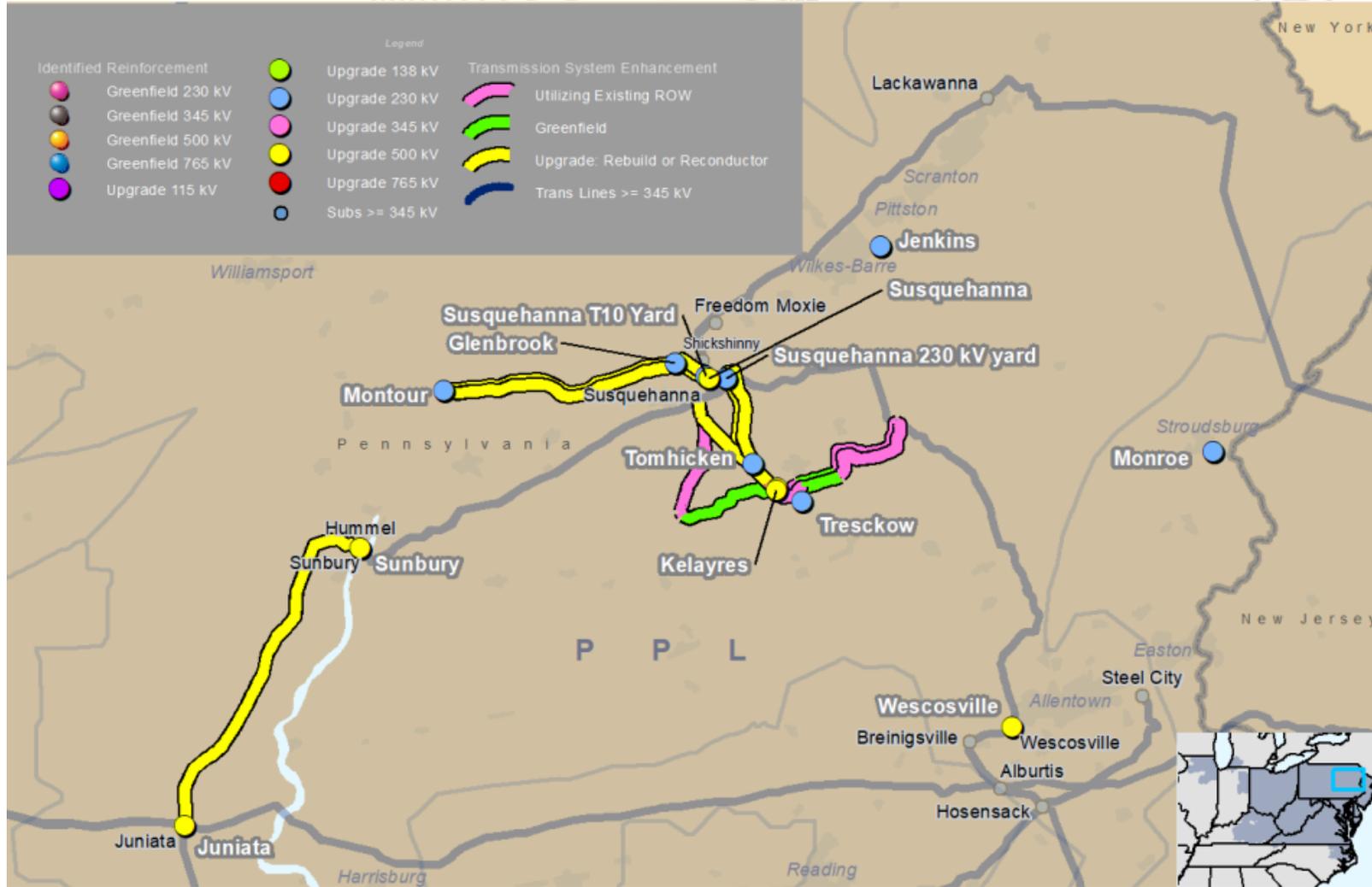
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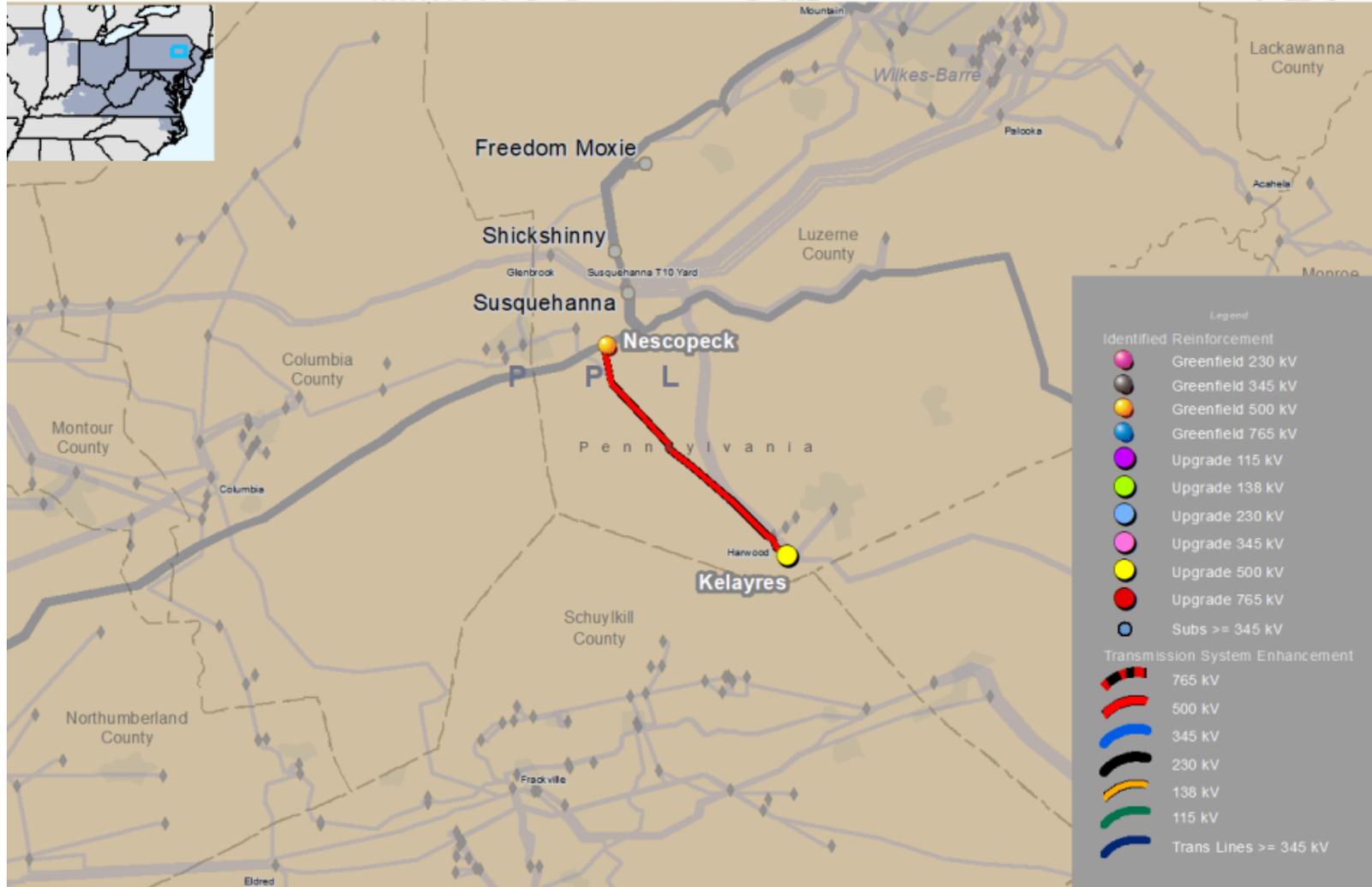
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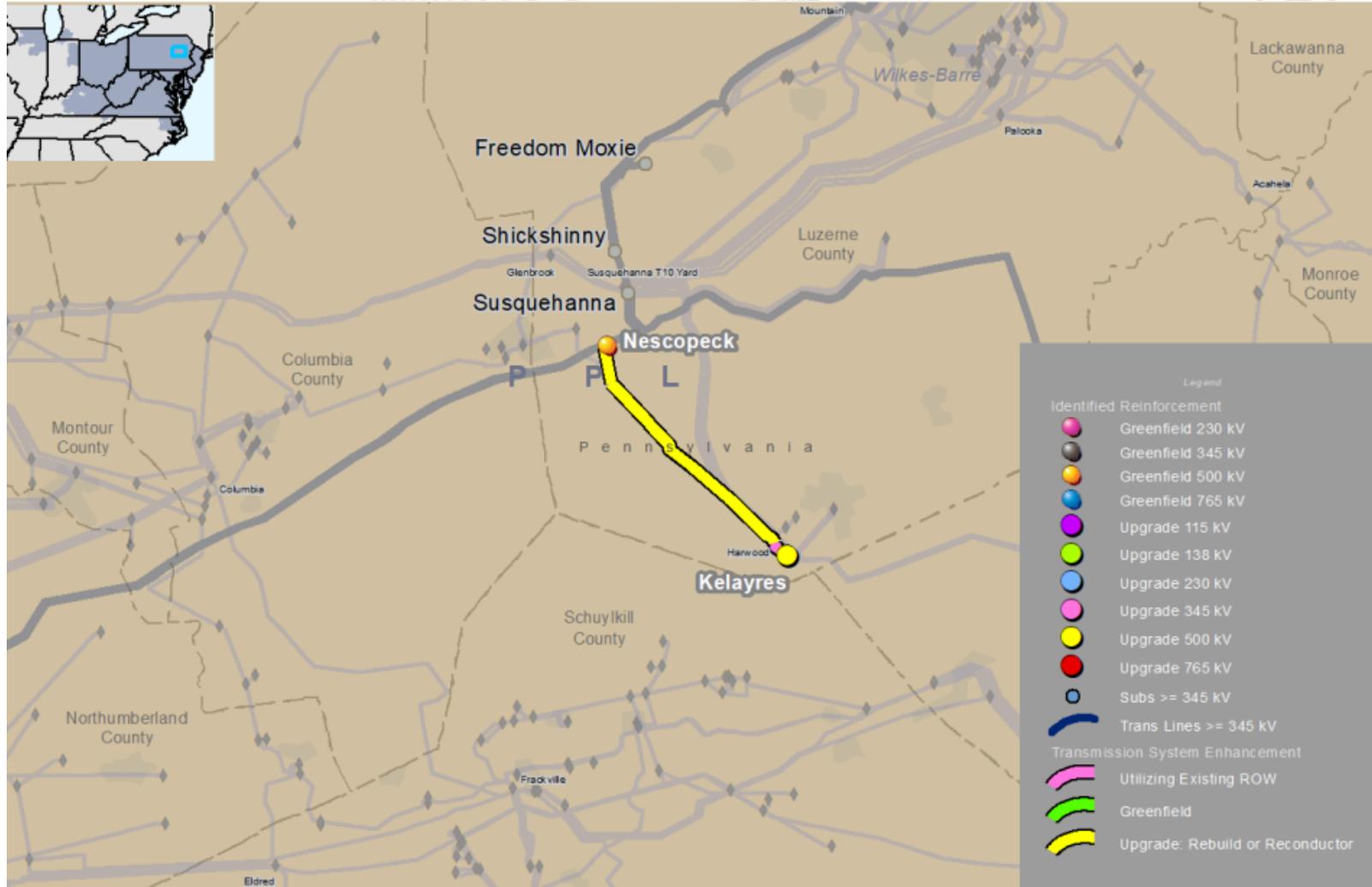
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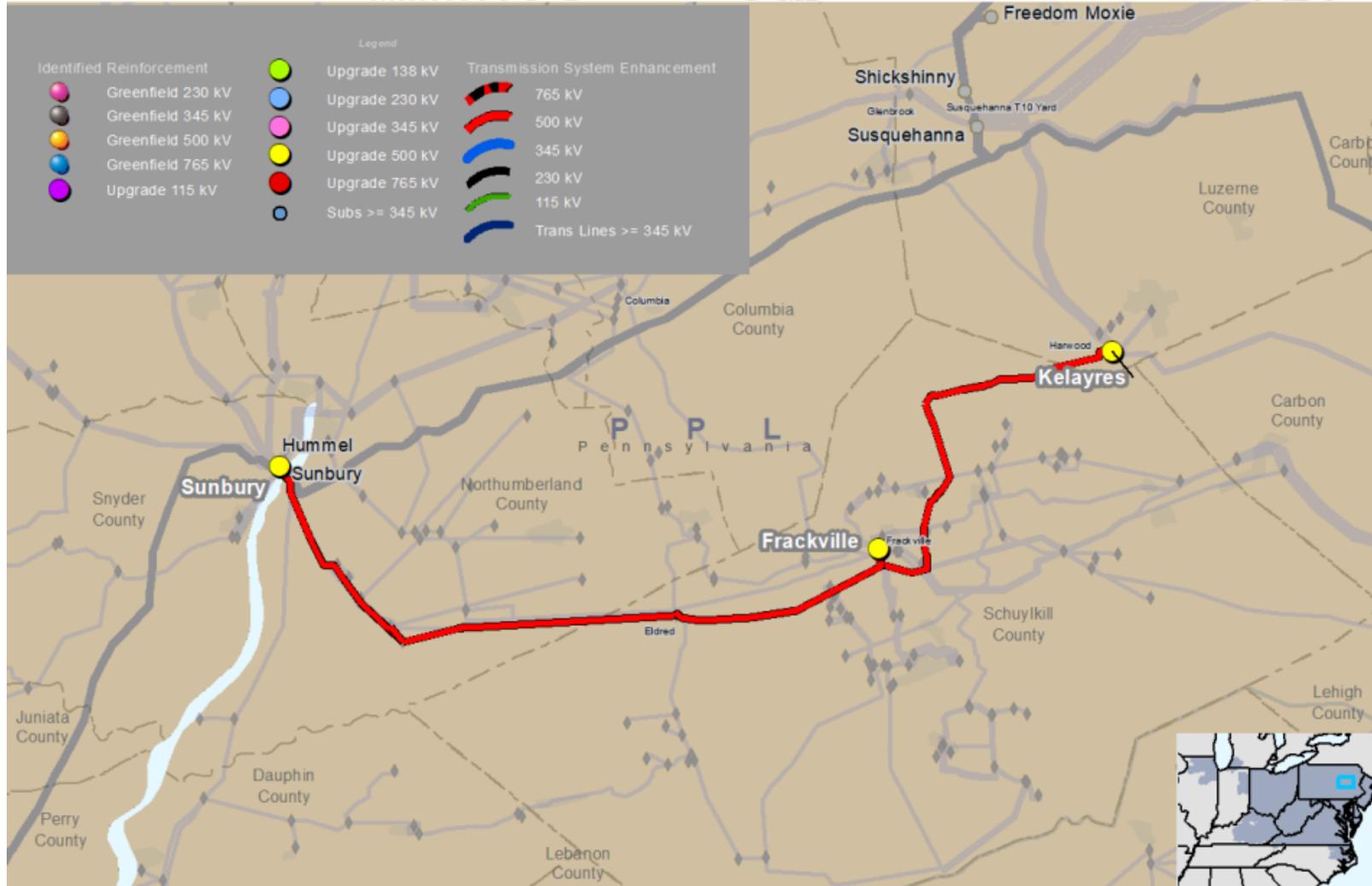
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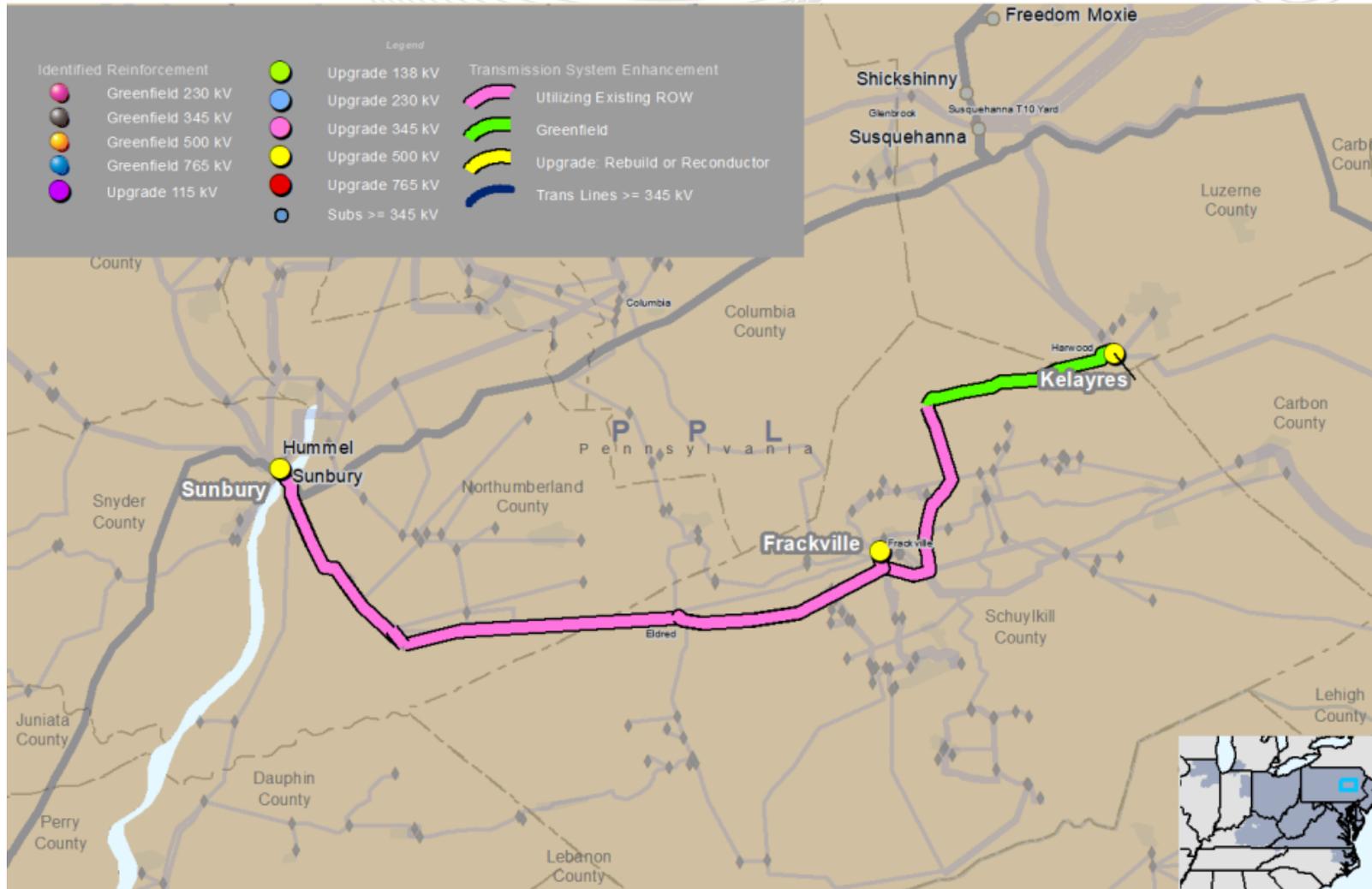
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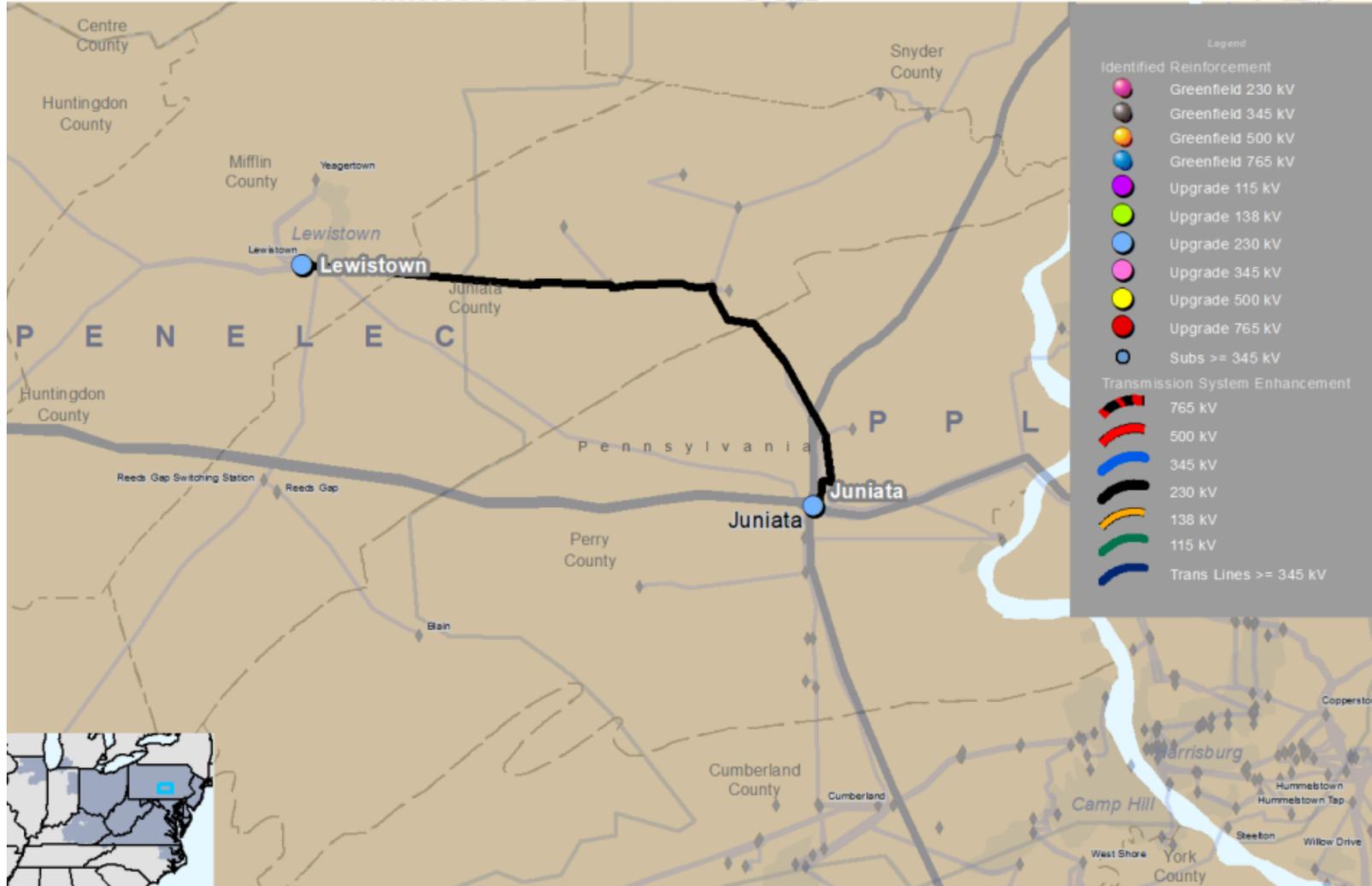
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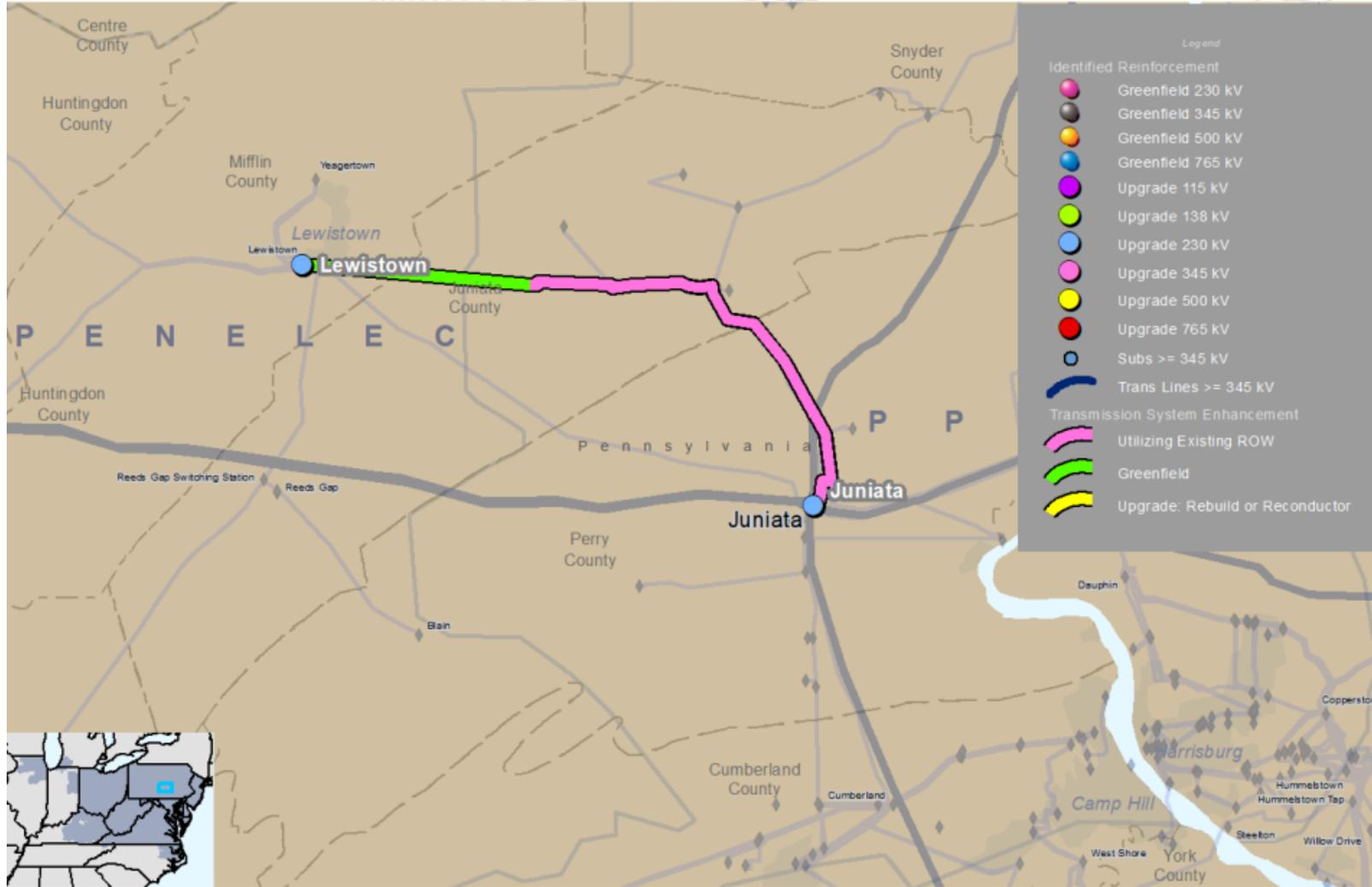
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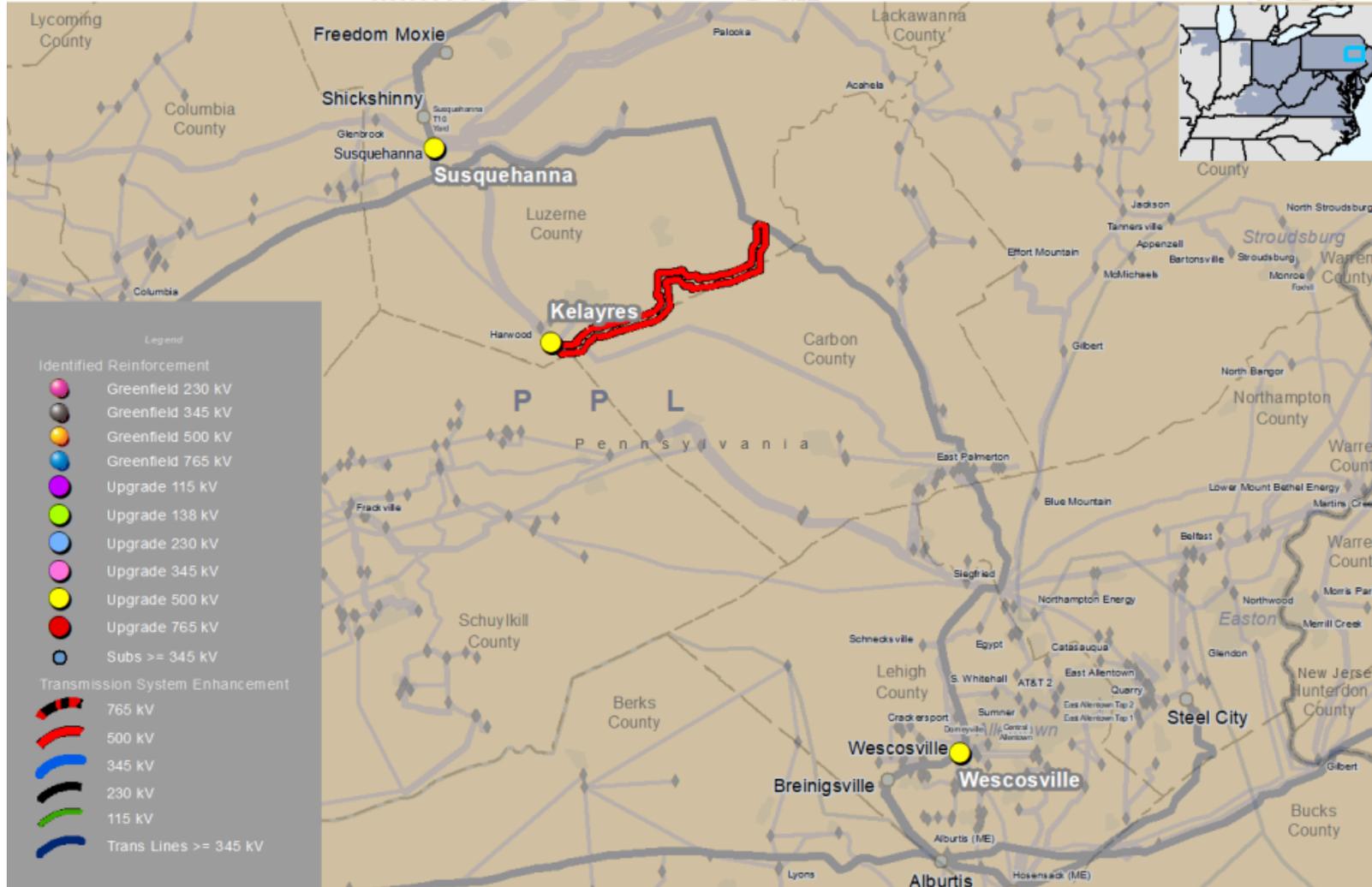
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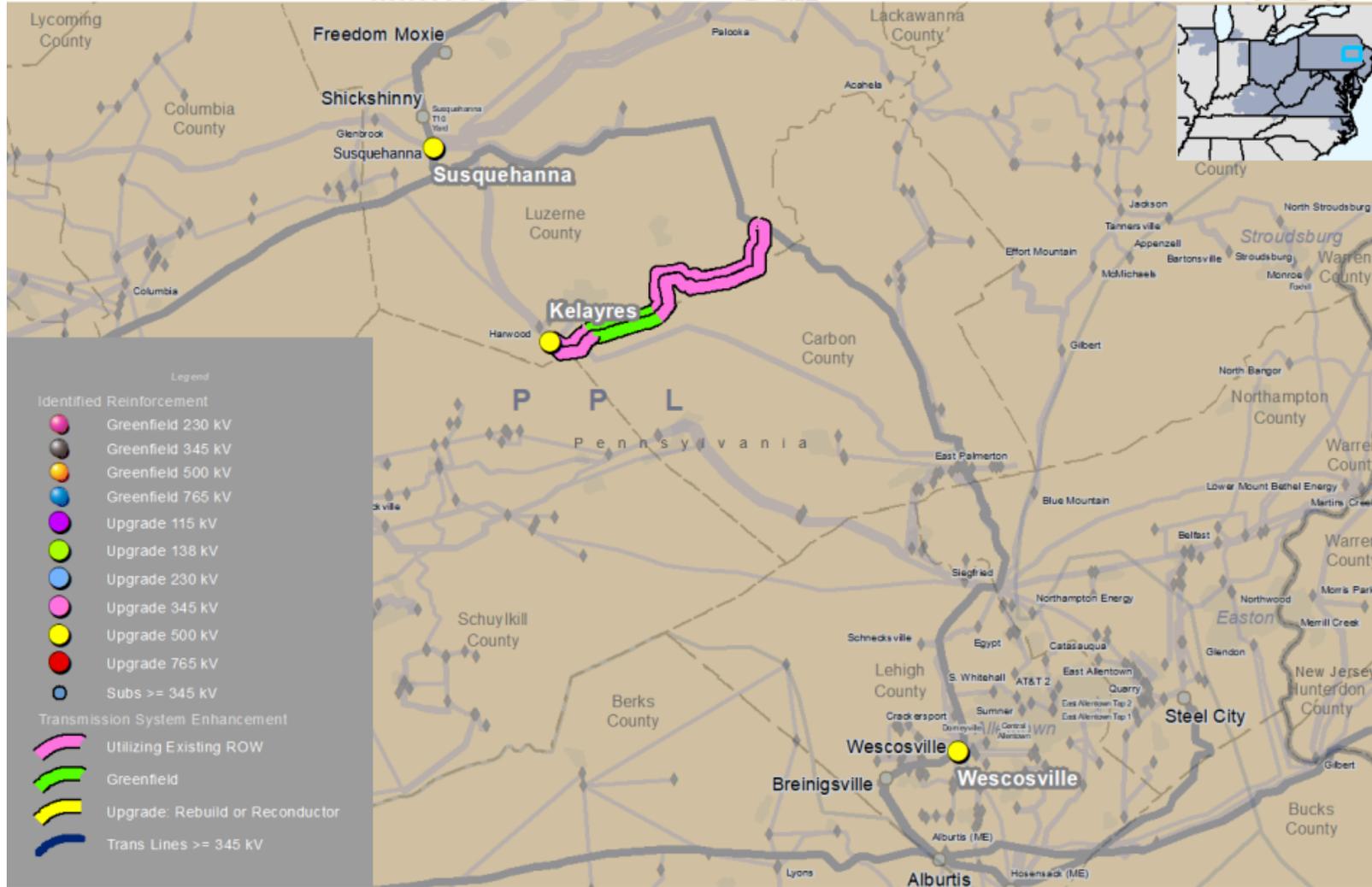
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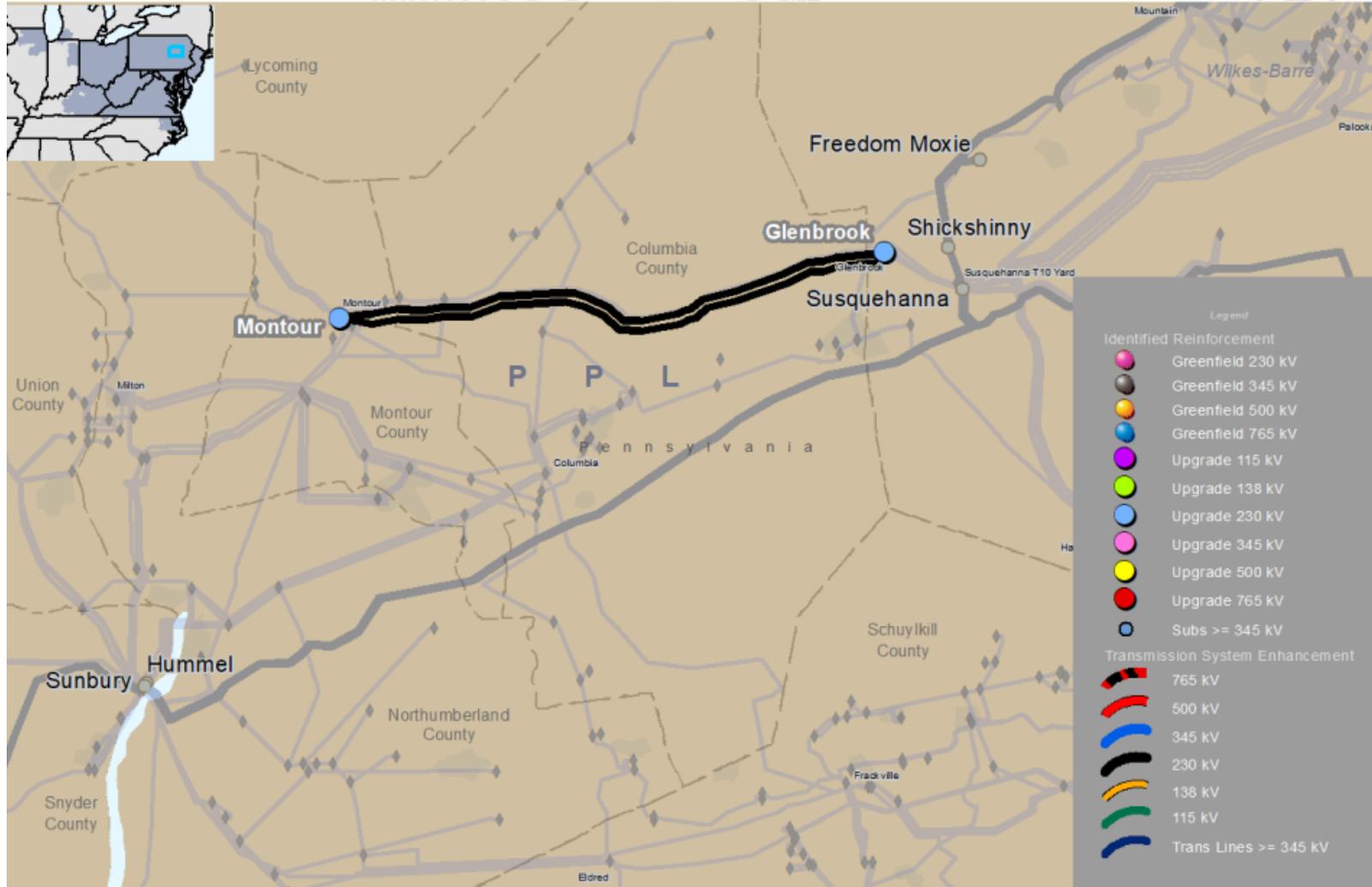
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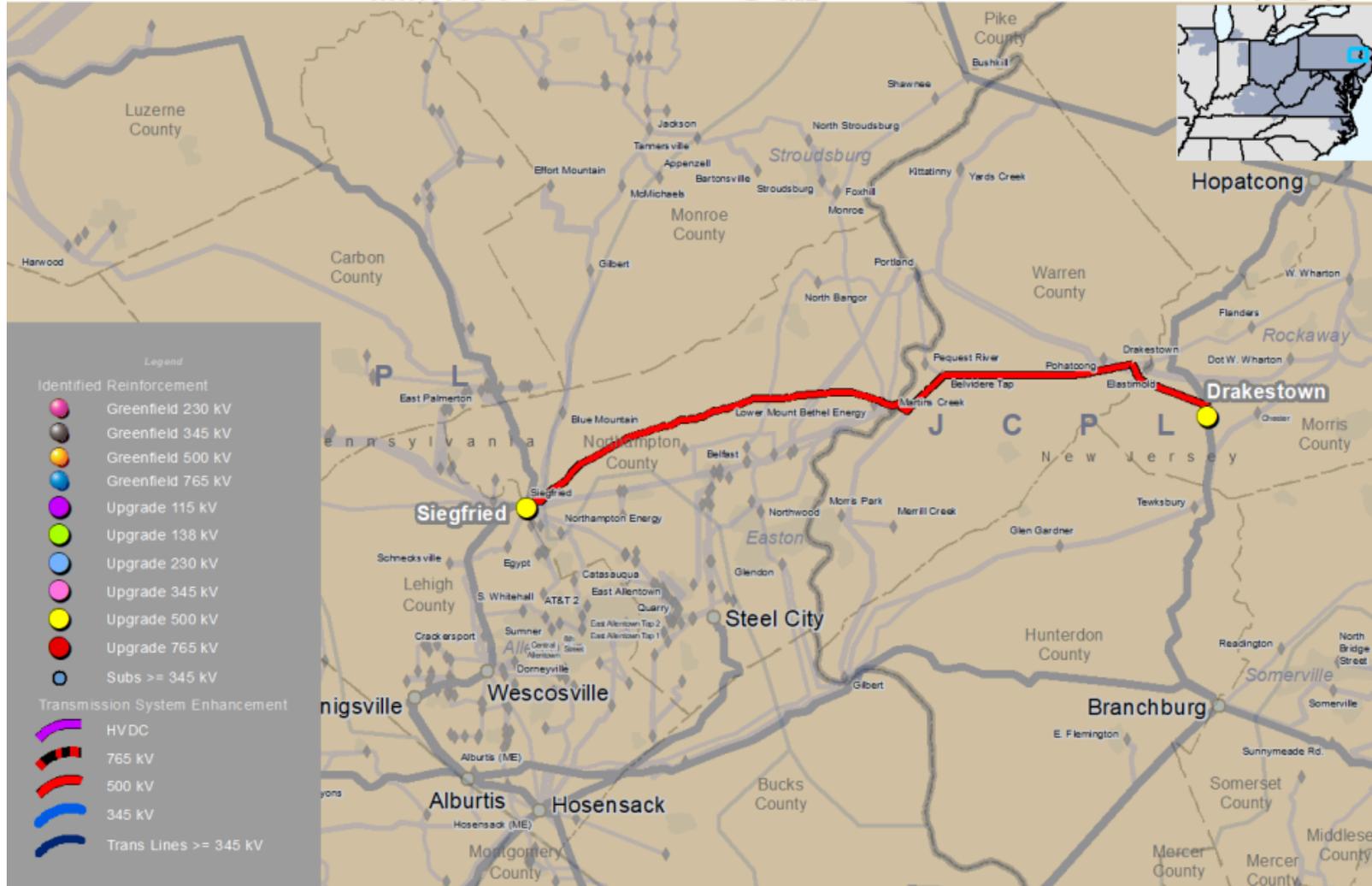
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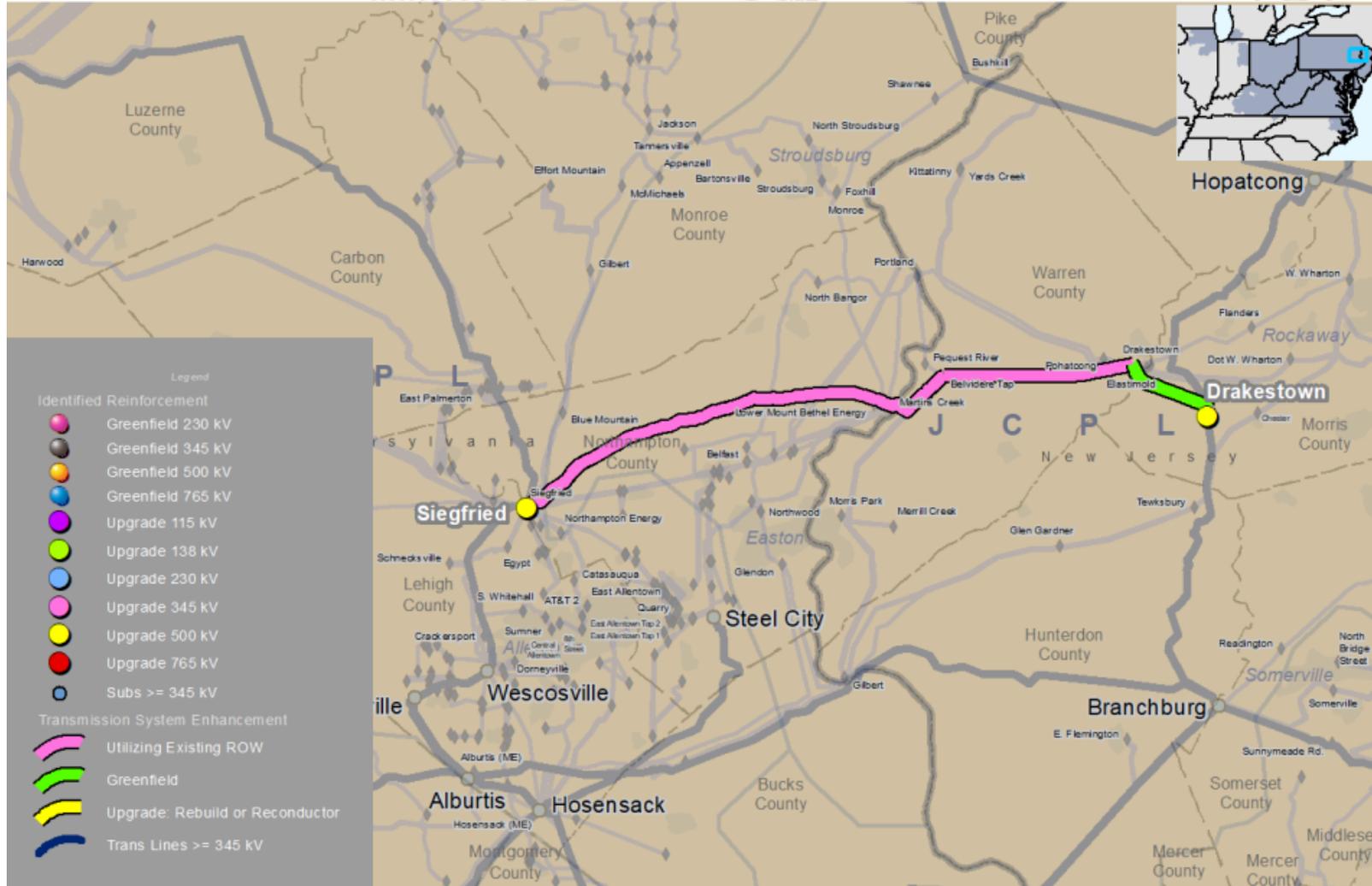
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PPLTO & TRNSLK

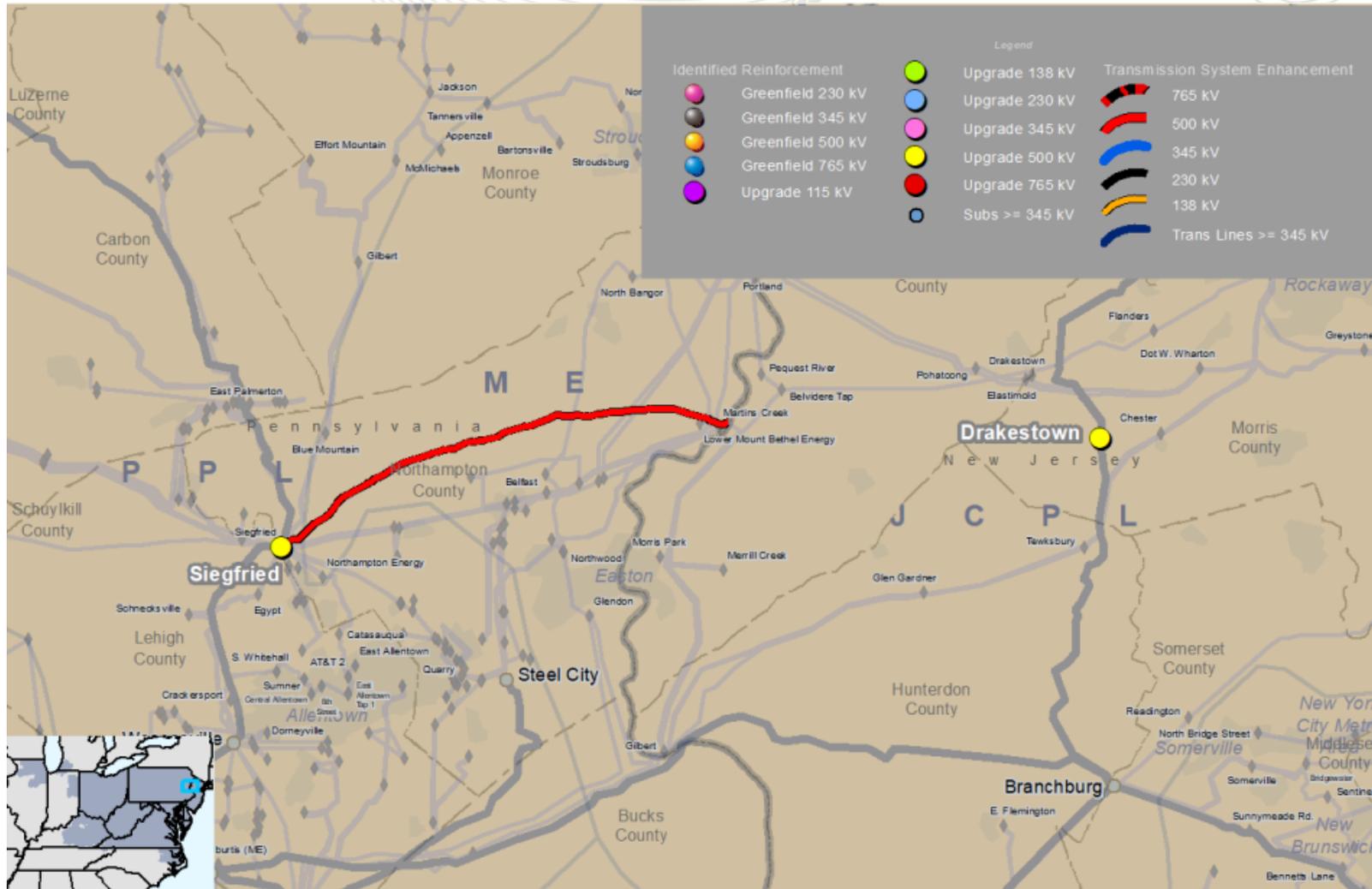
(Connected Proposals by PPL and Translink)



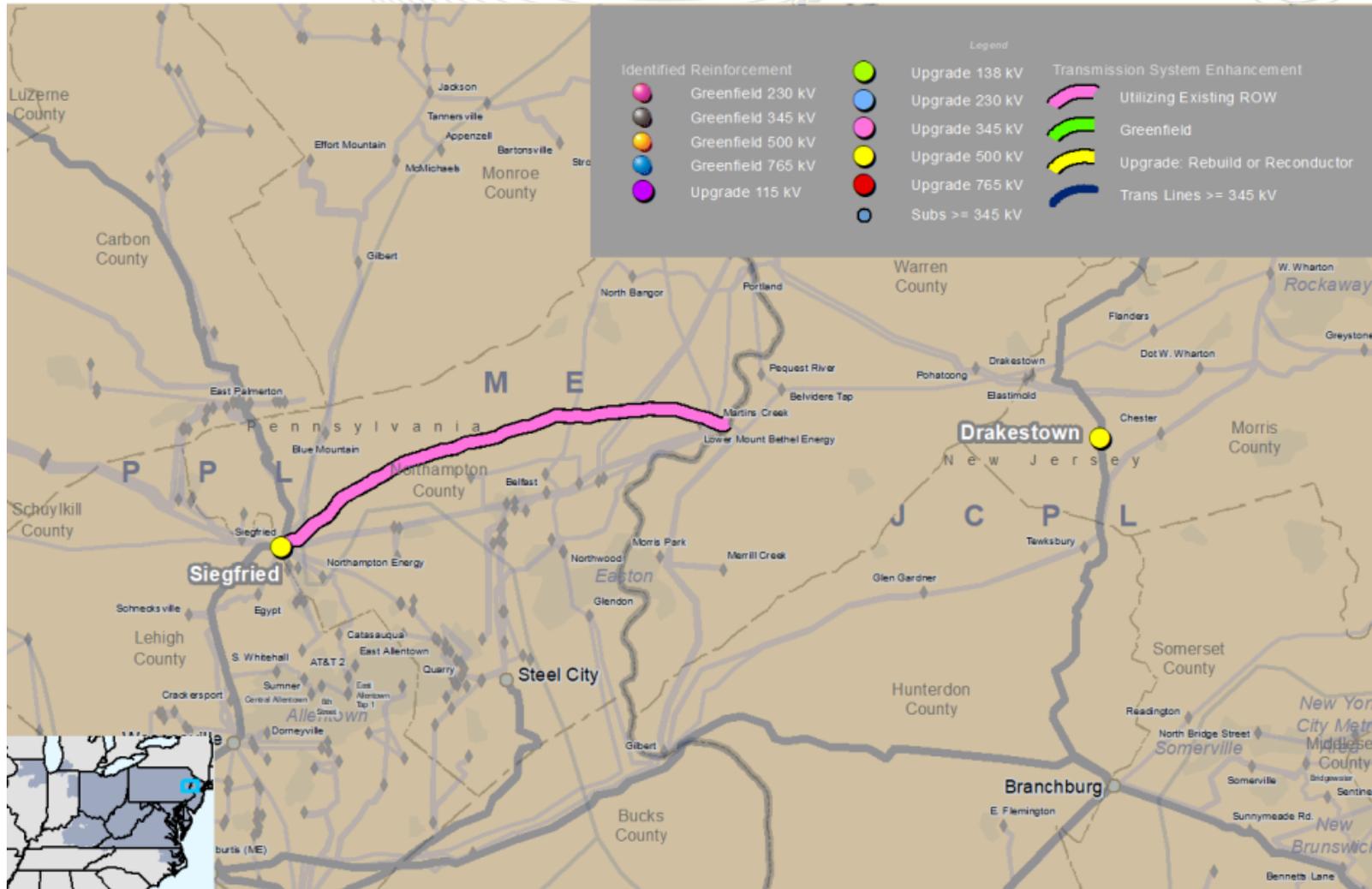
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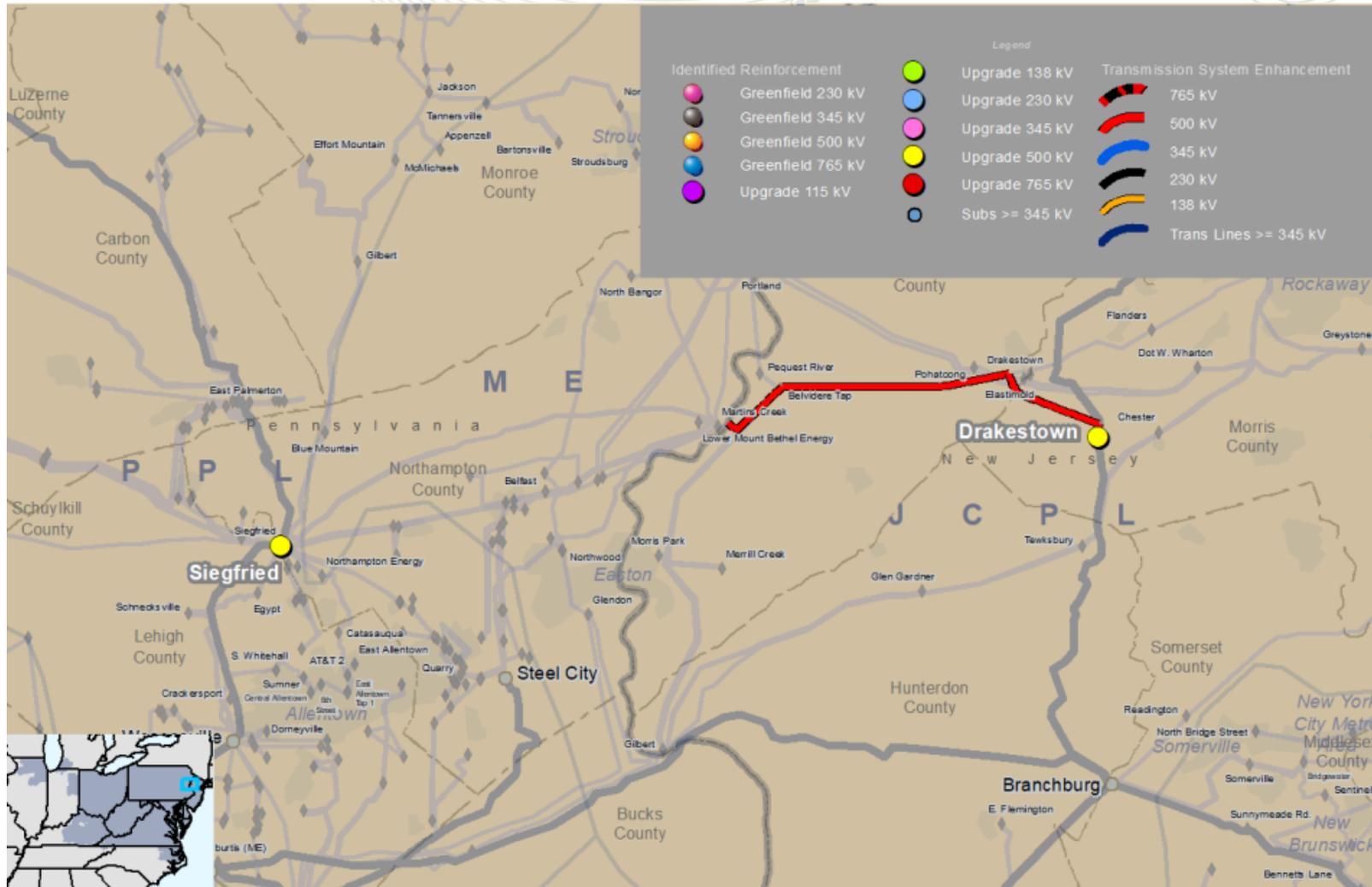
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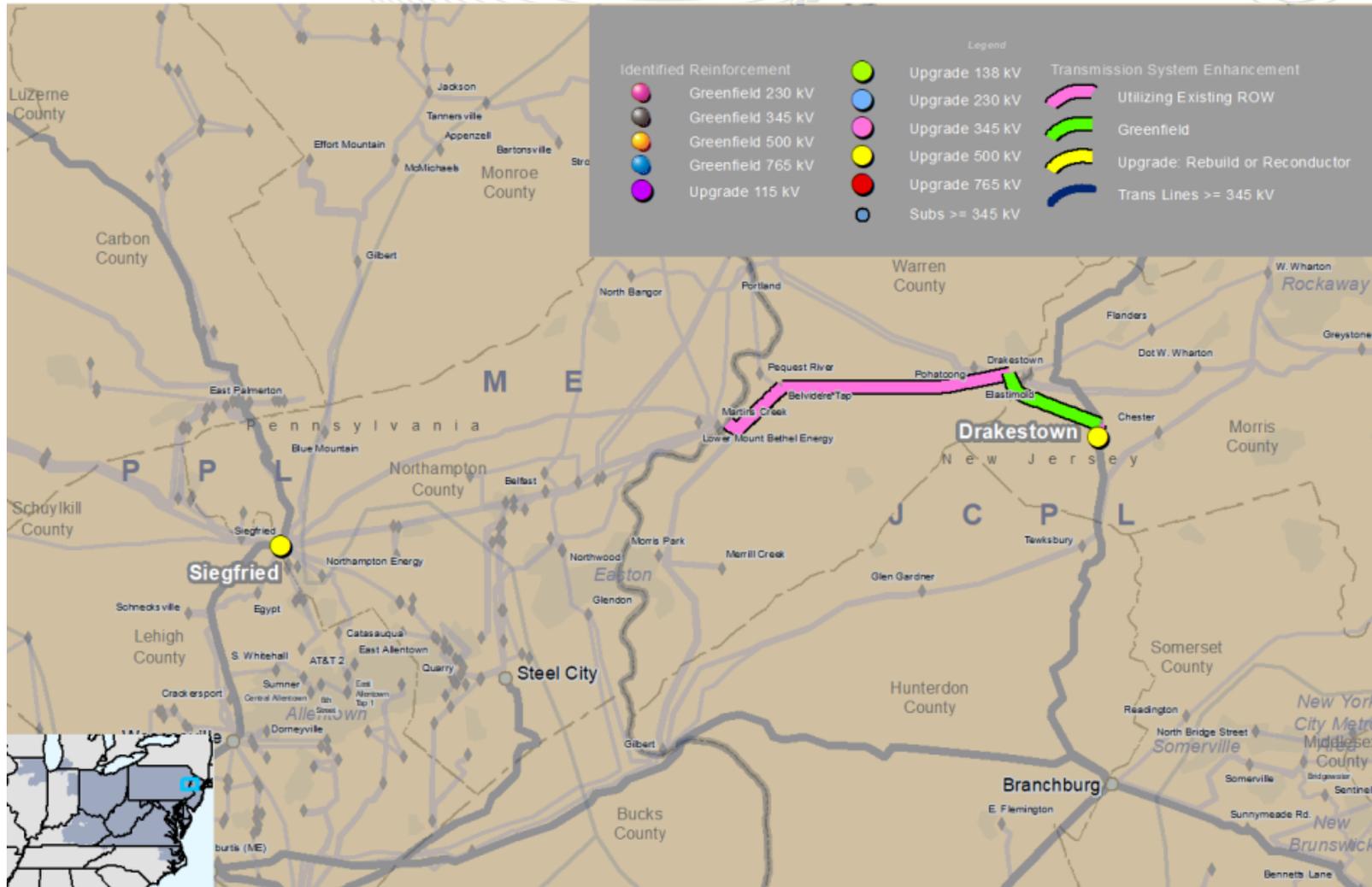
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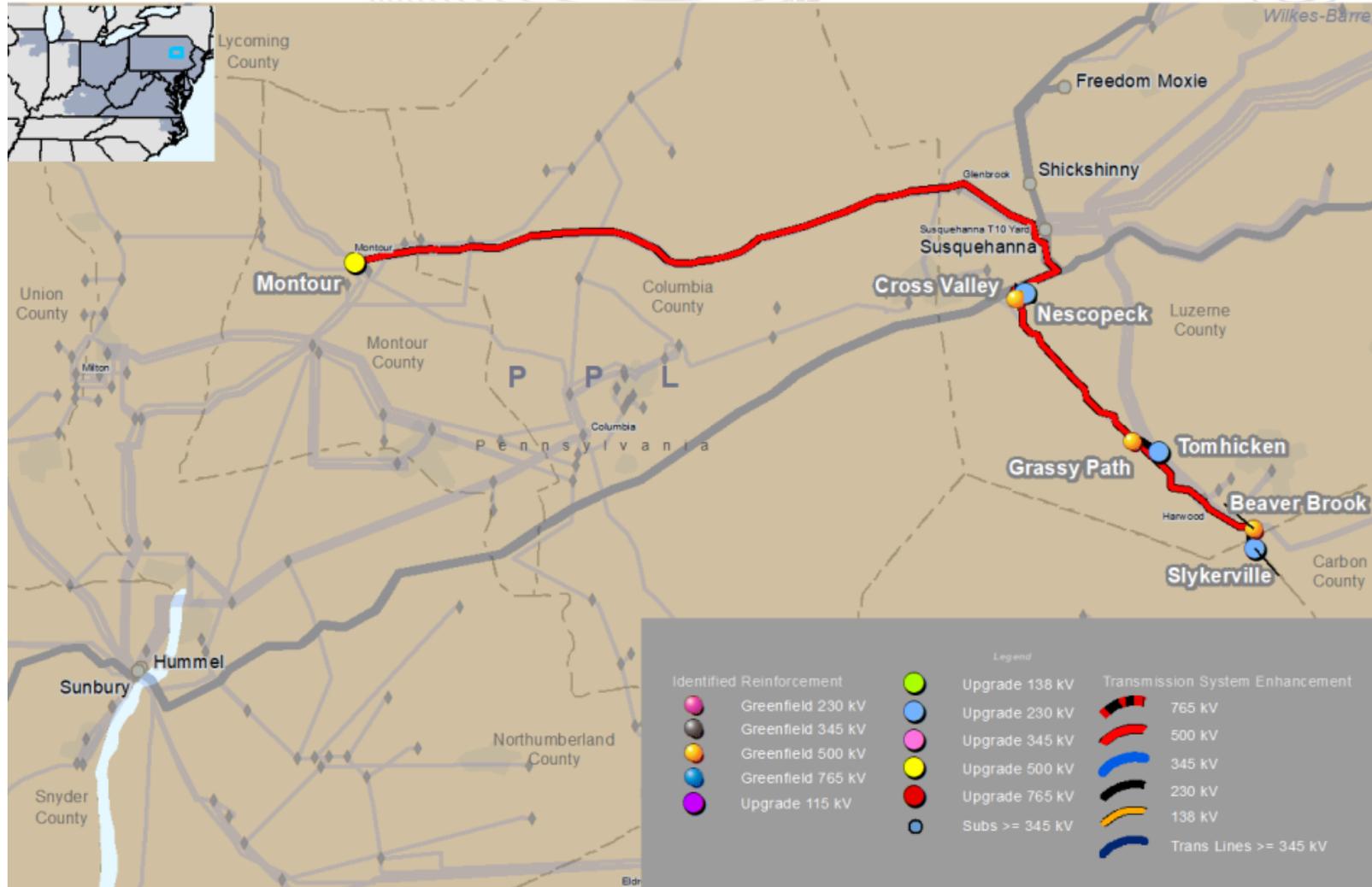


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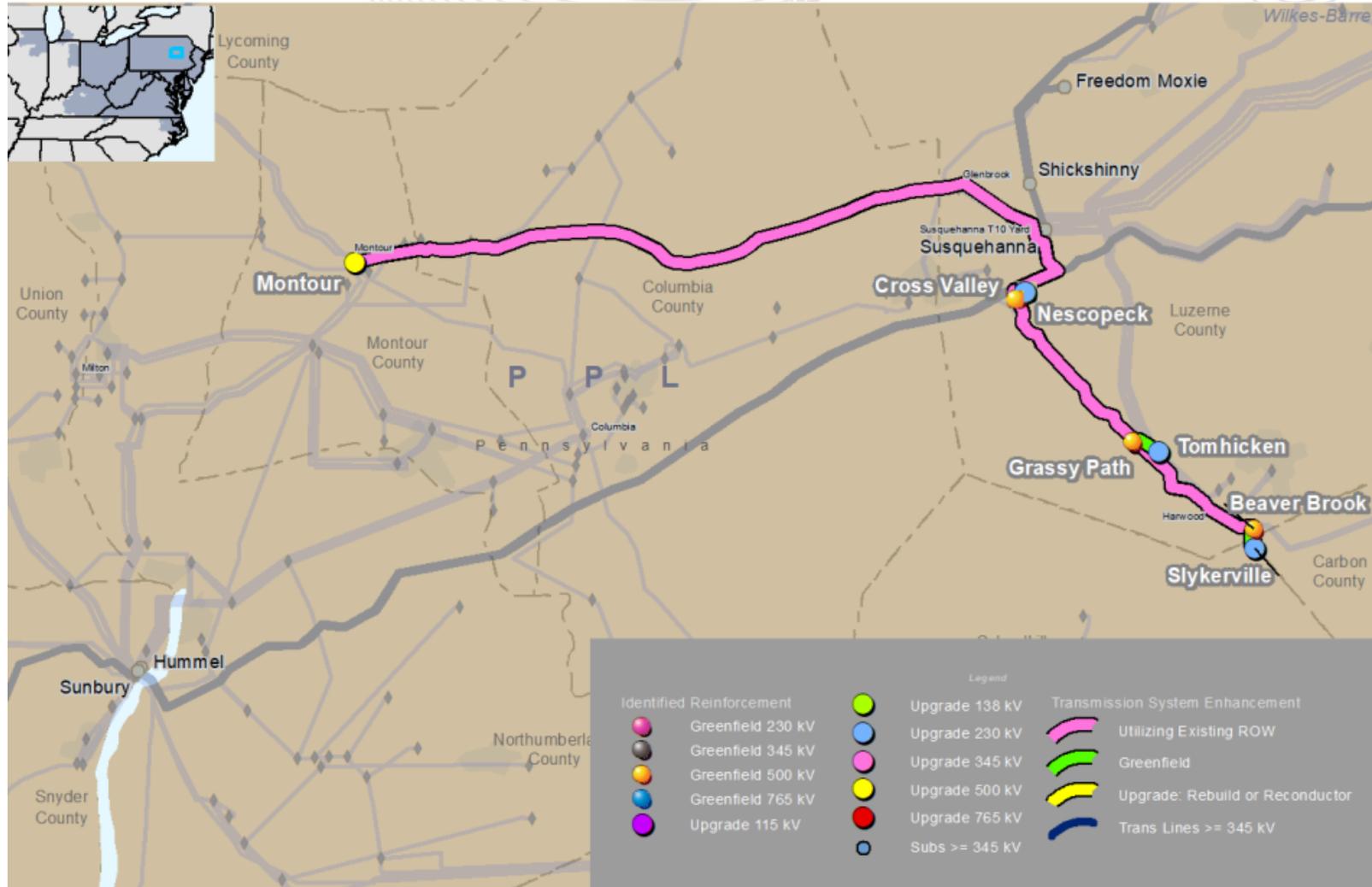


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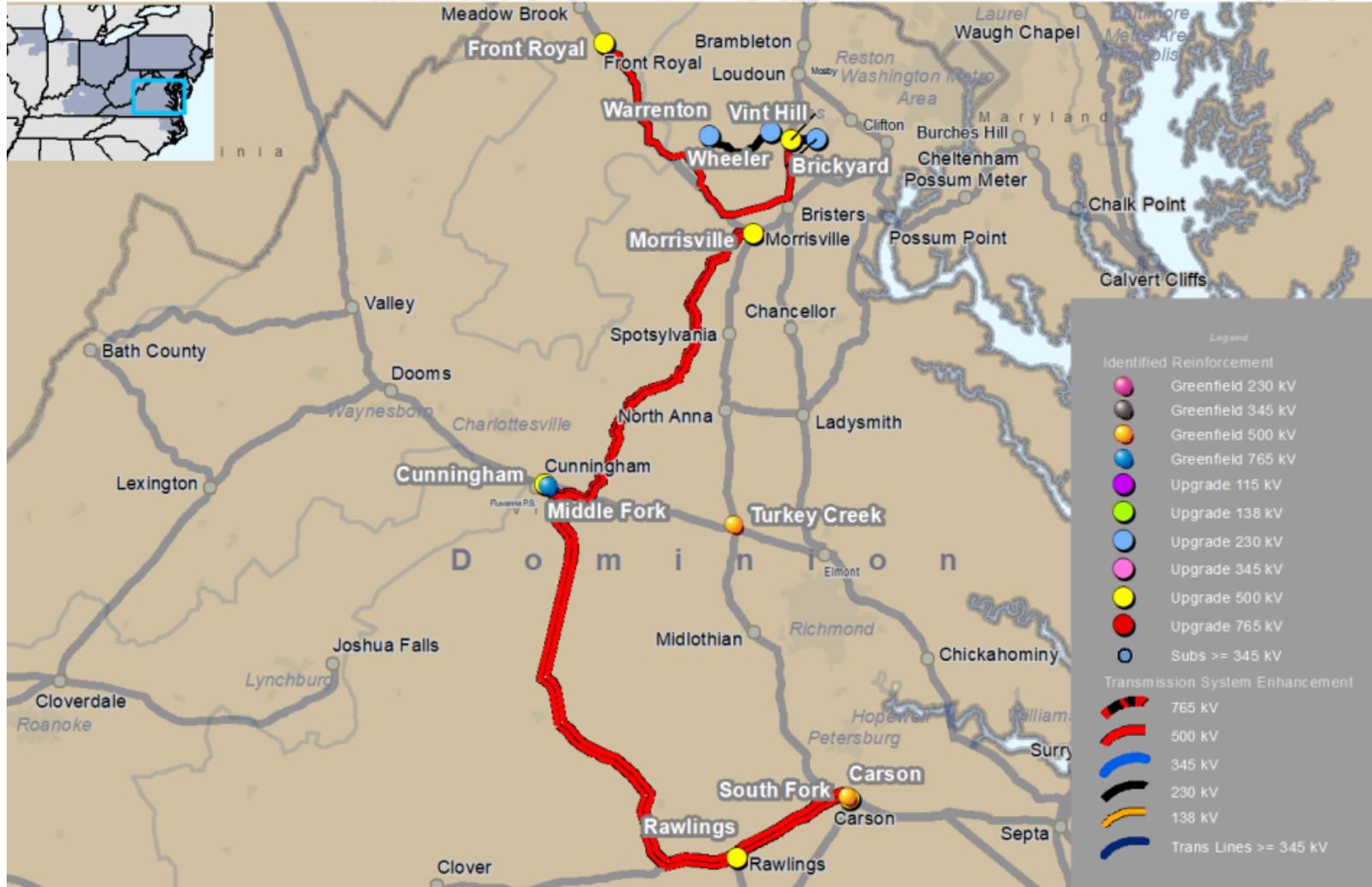
CNTLTM (LS Power)



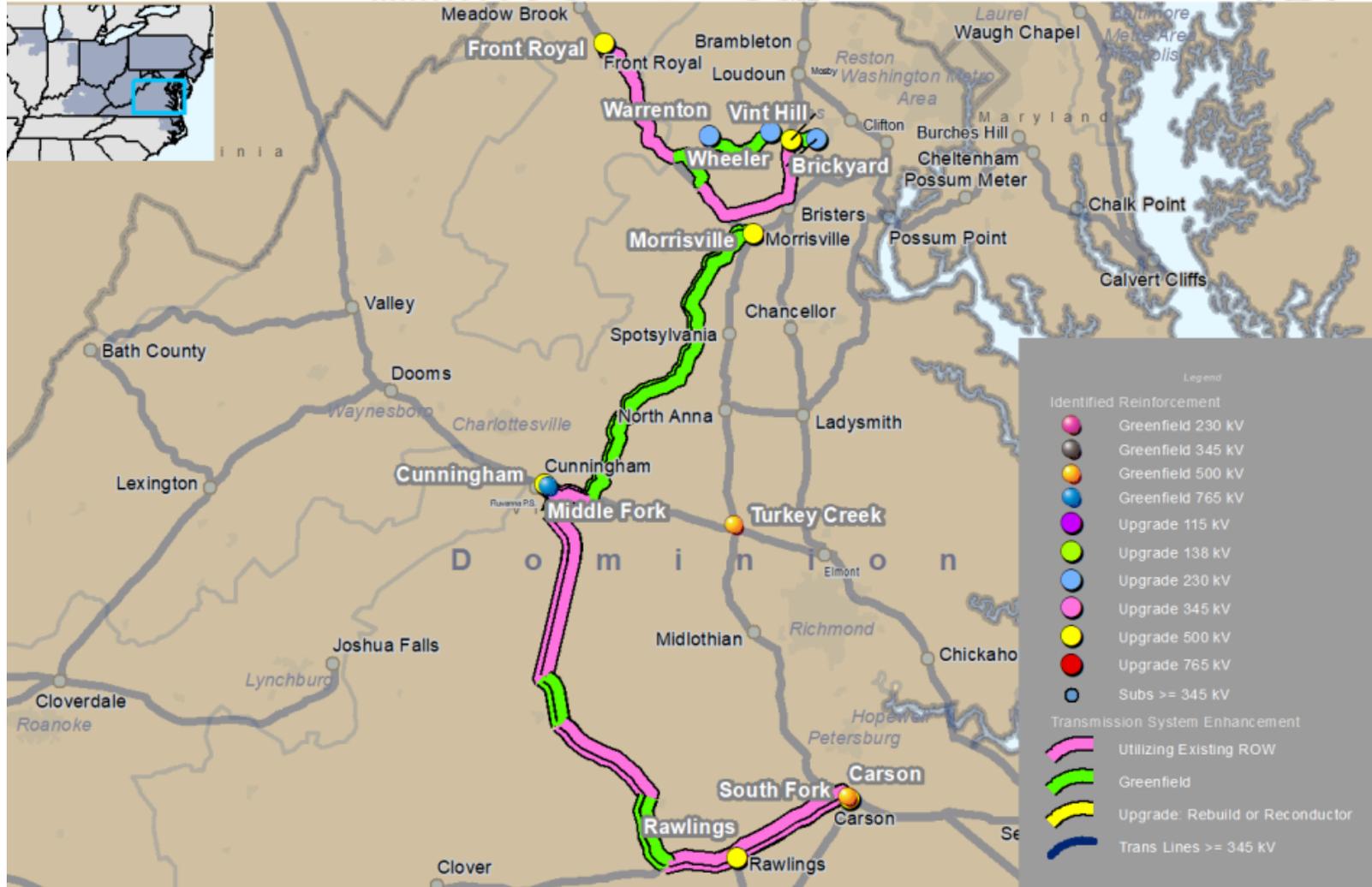
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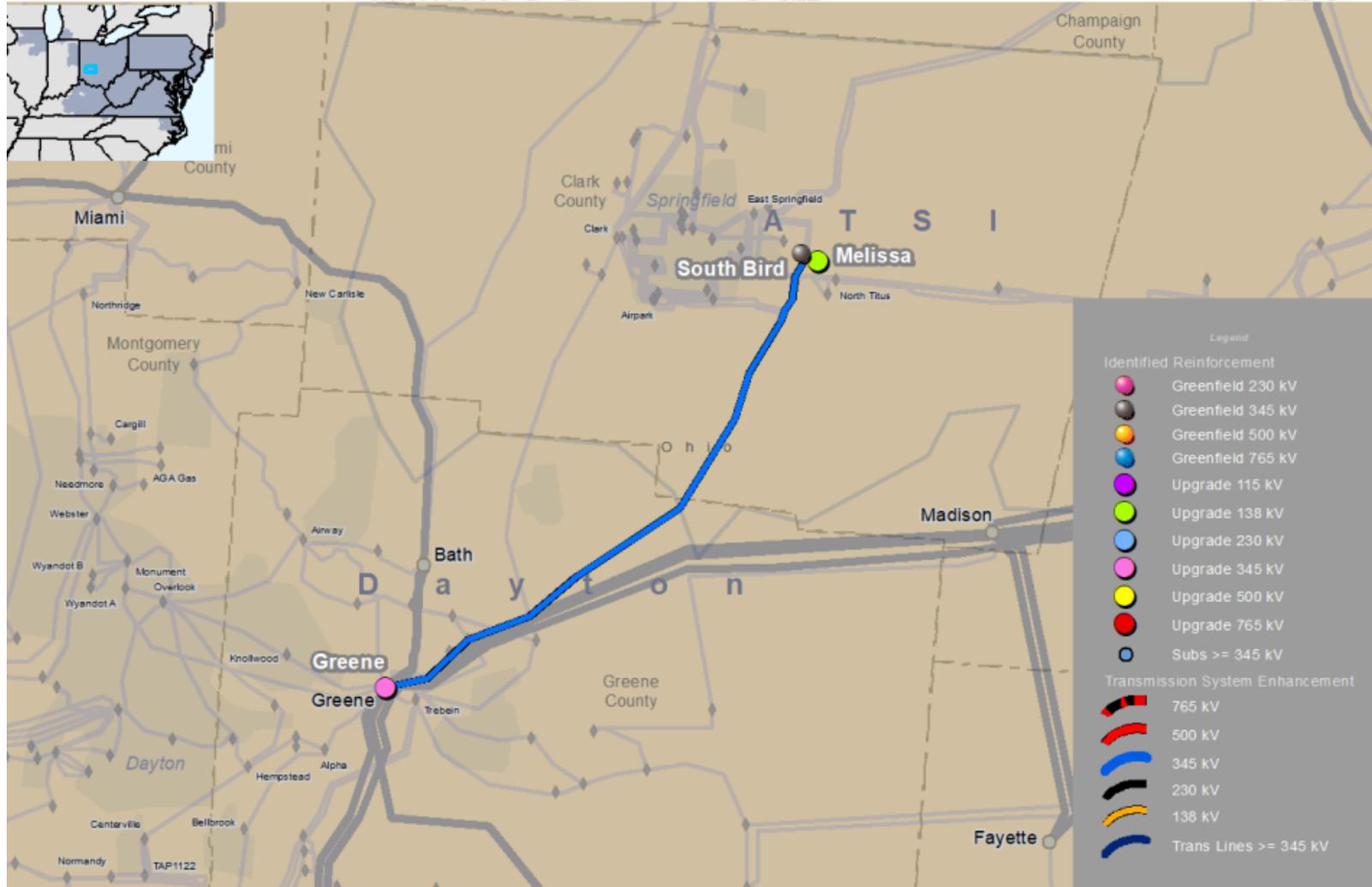
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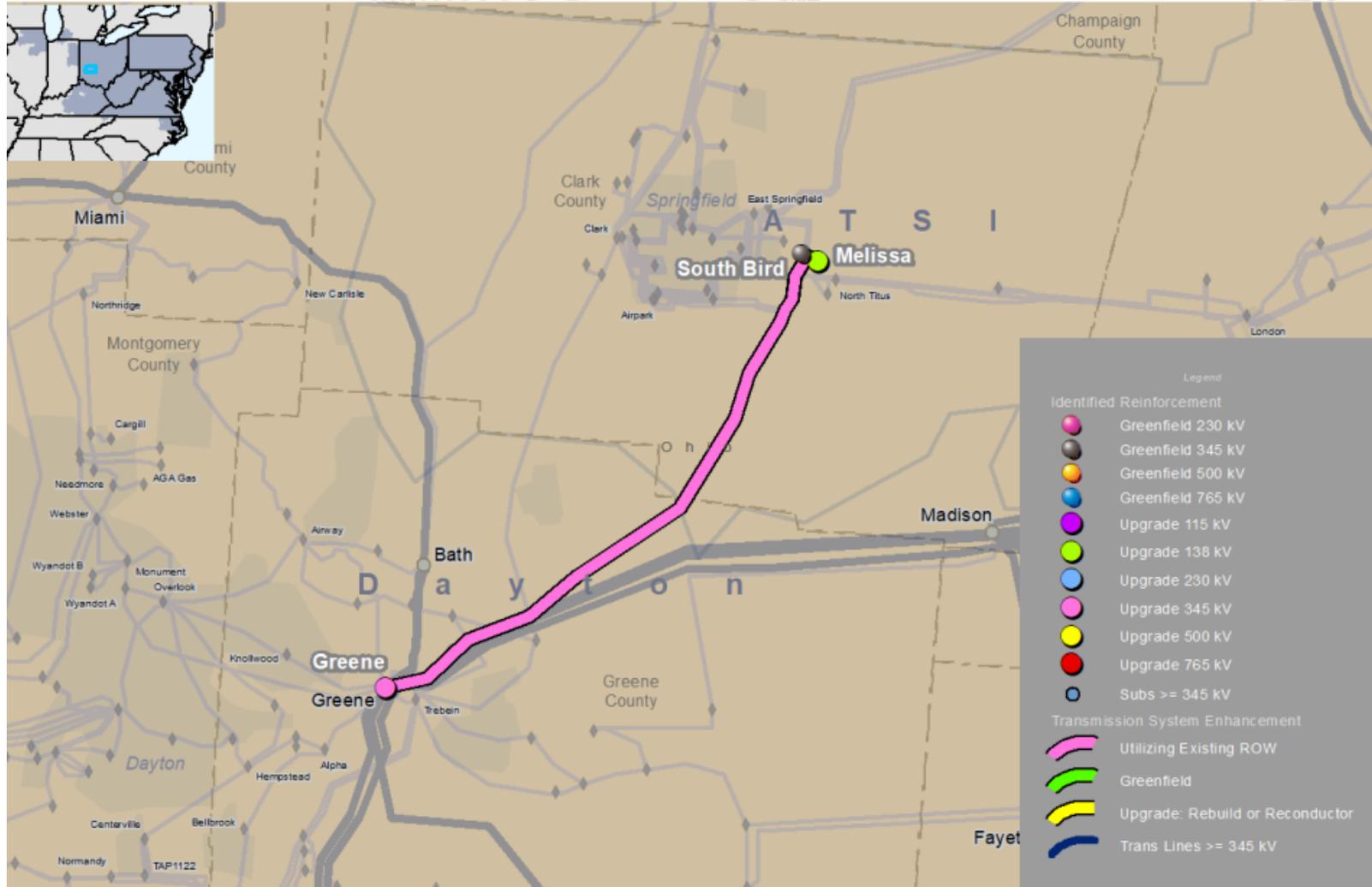
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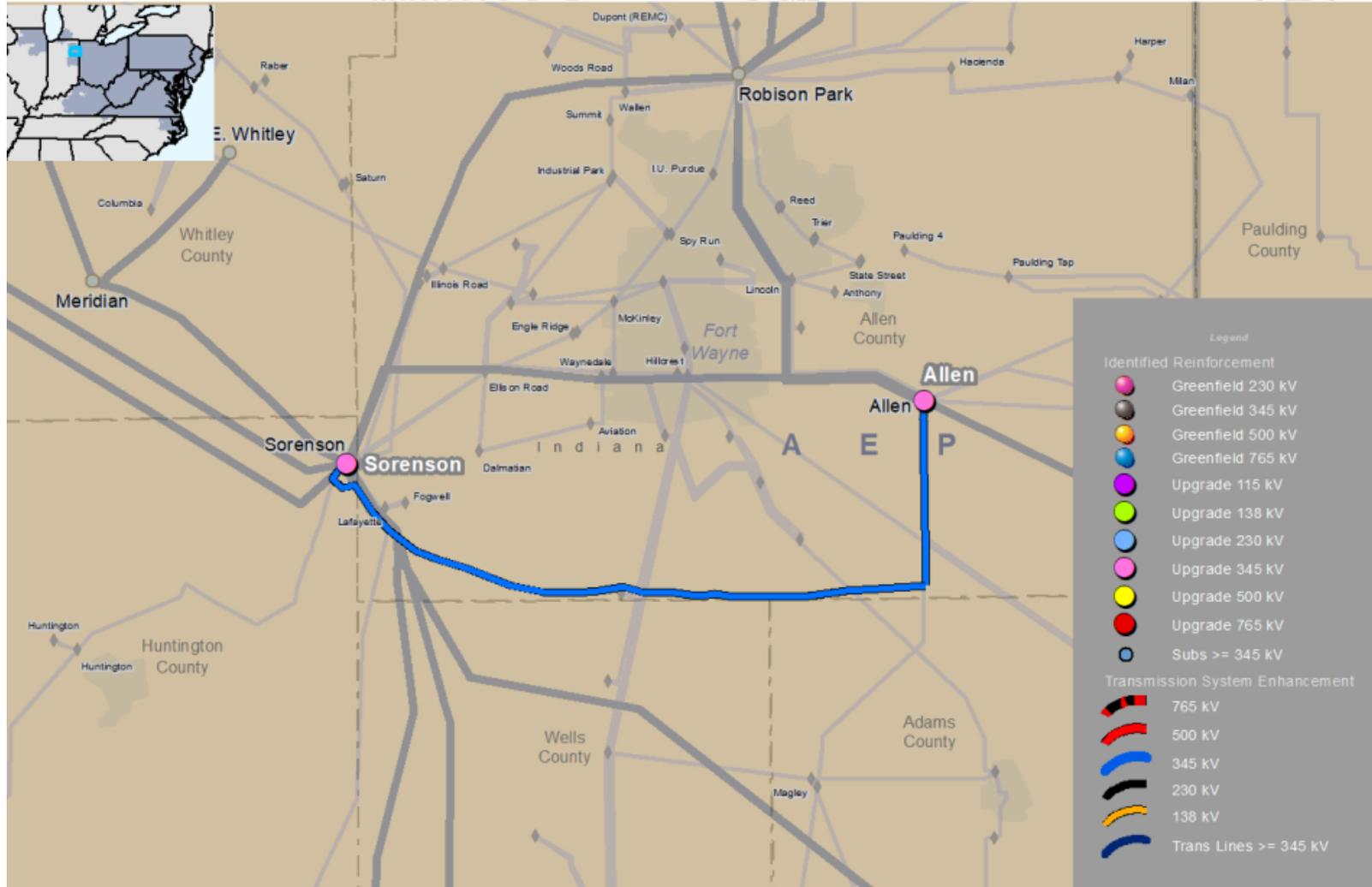
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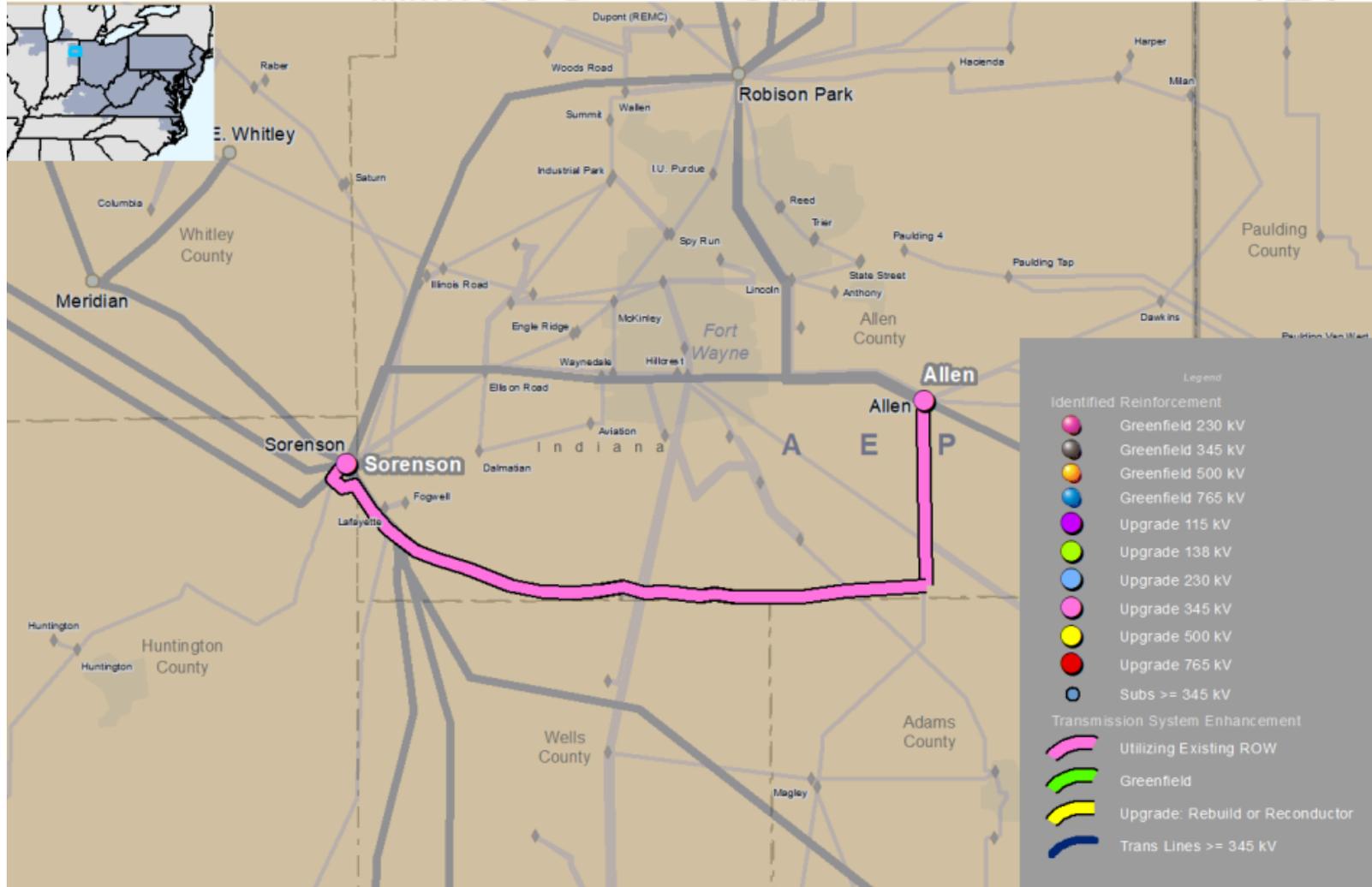
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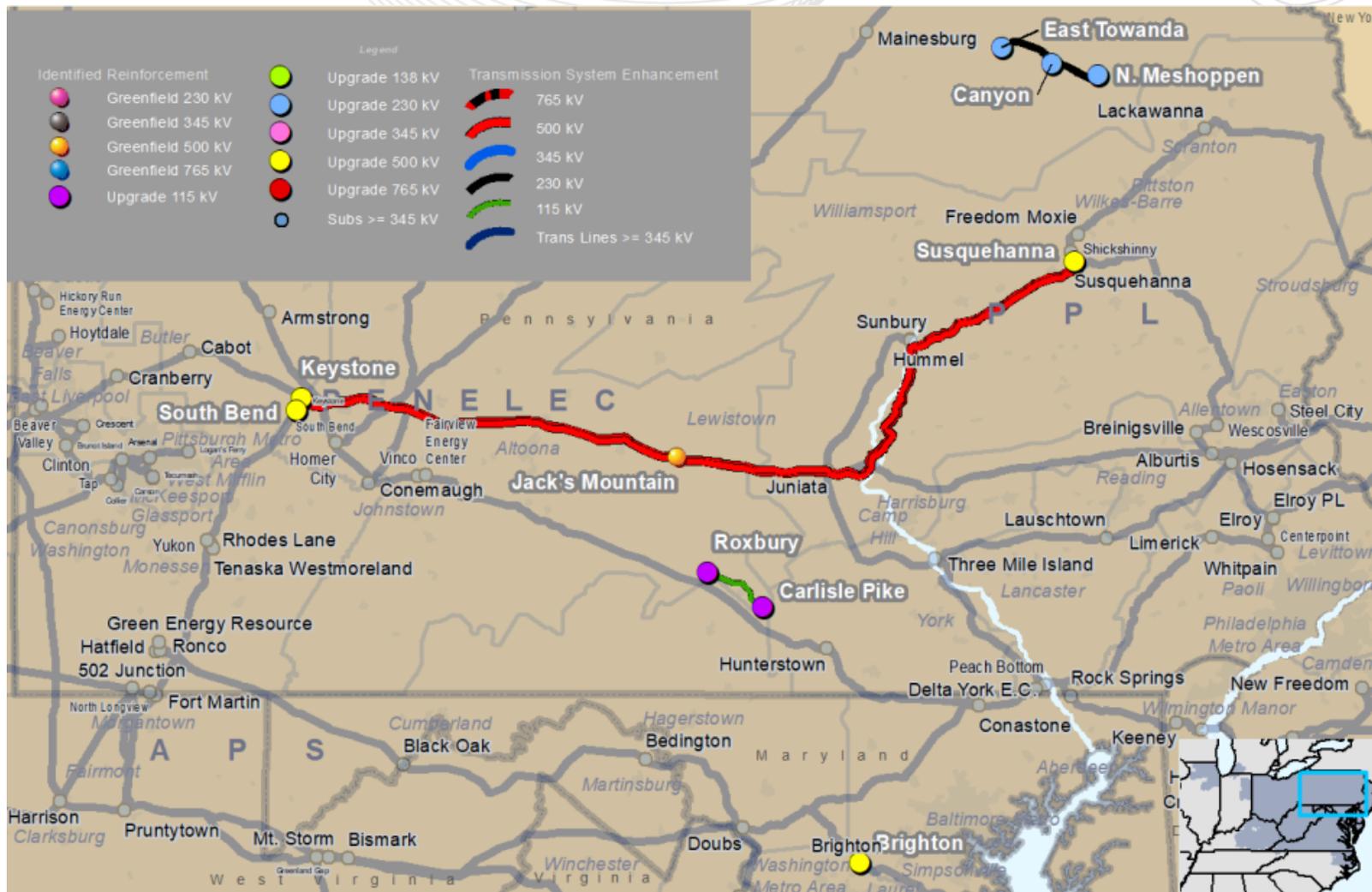


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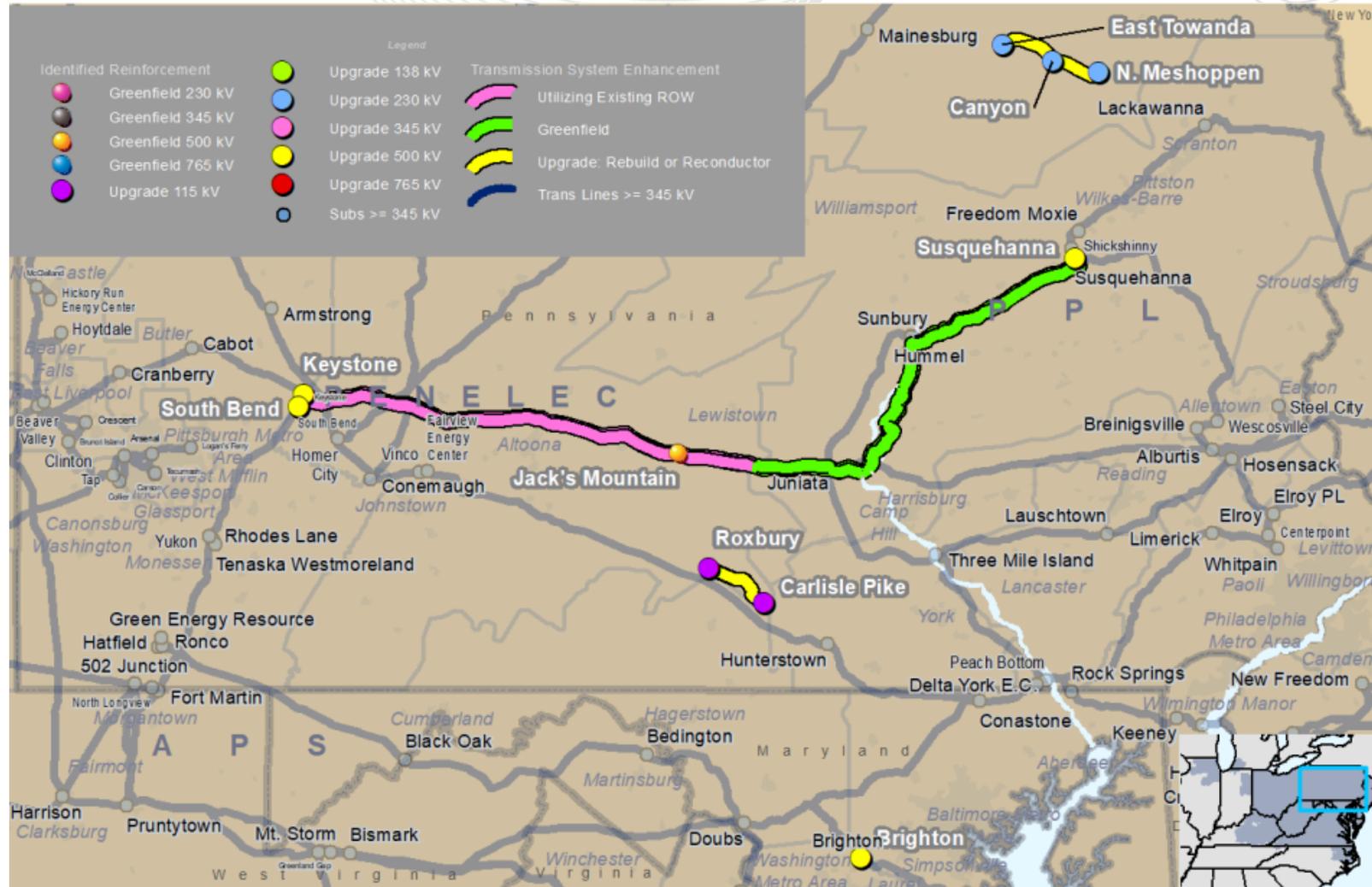


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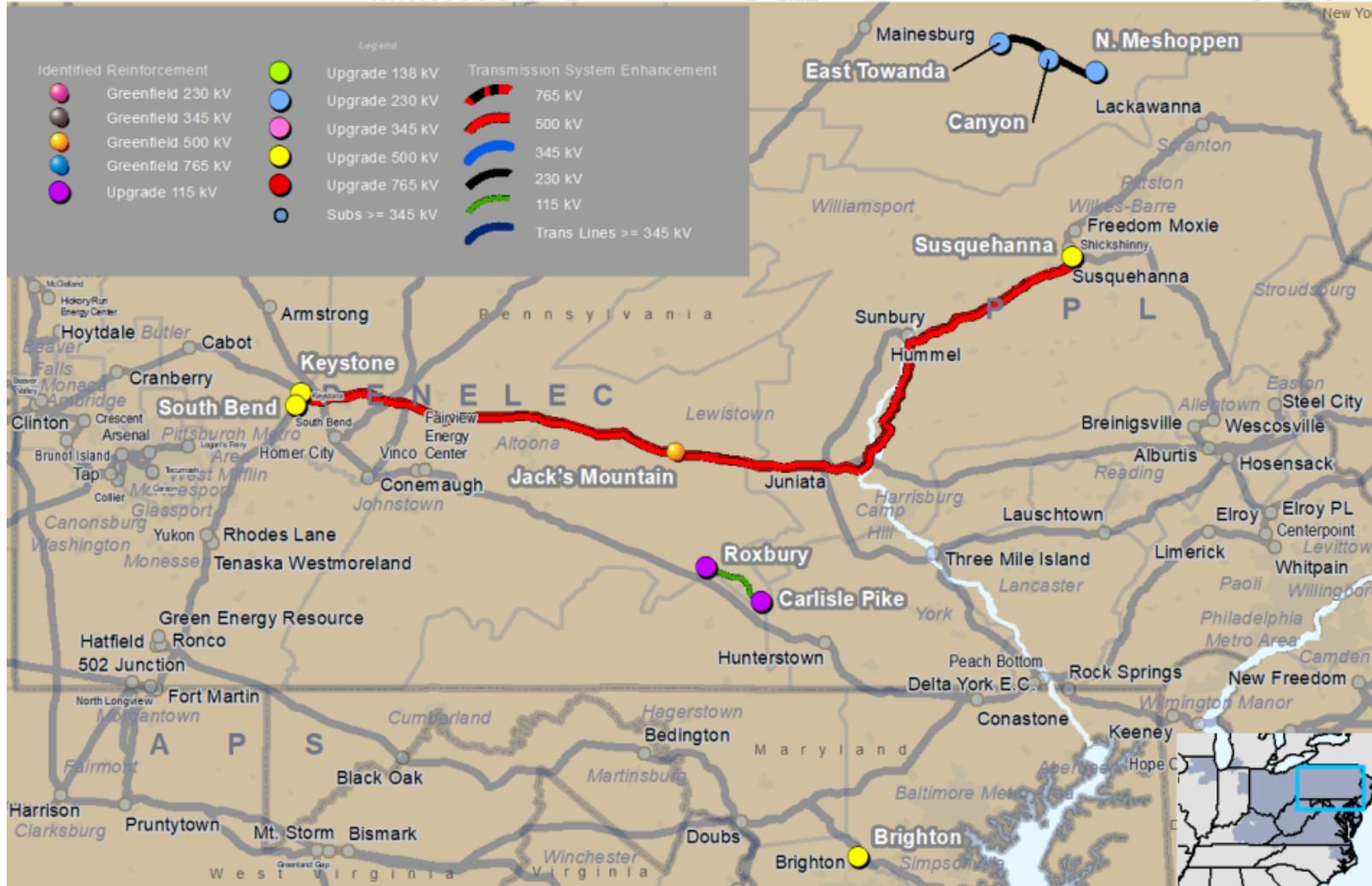
MATLIT (FirstEnergy)



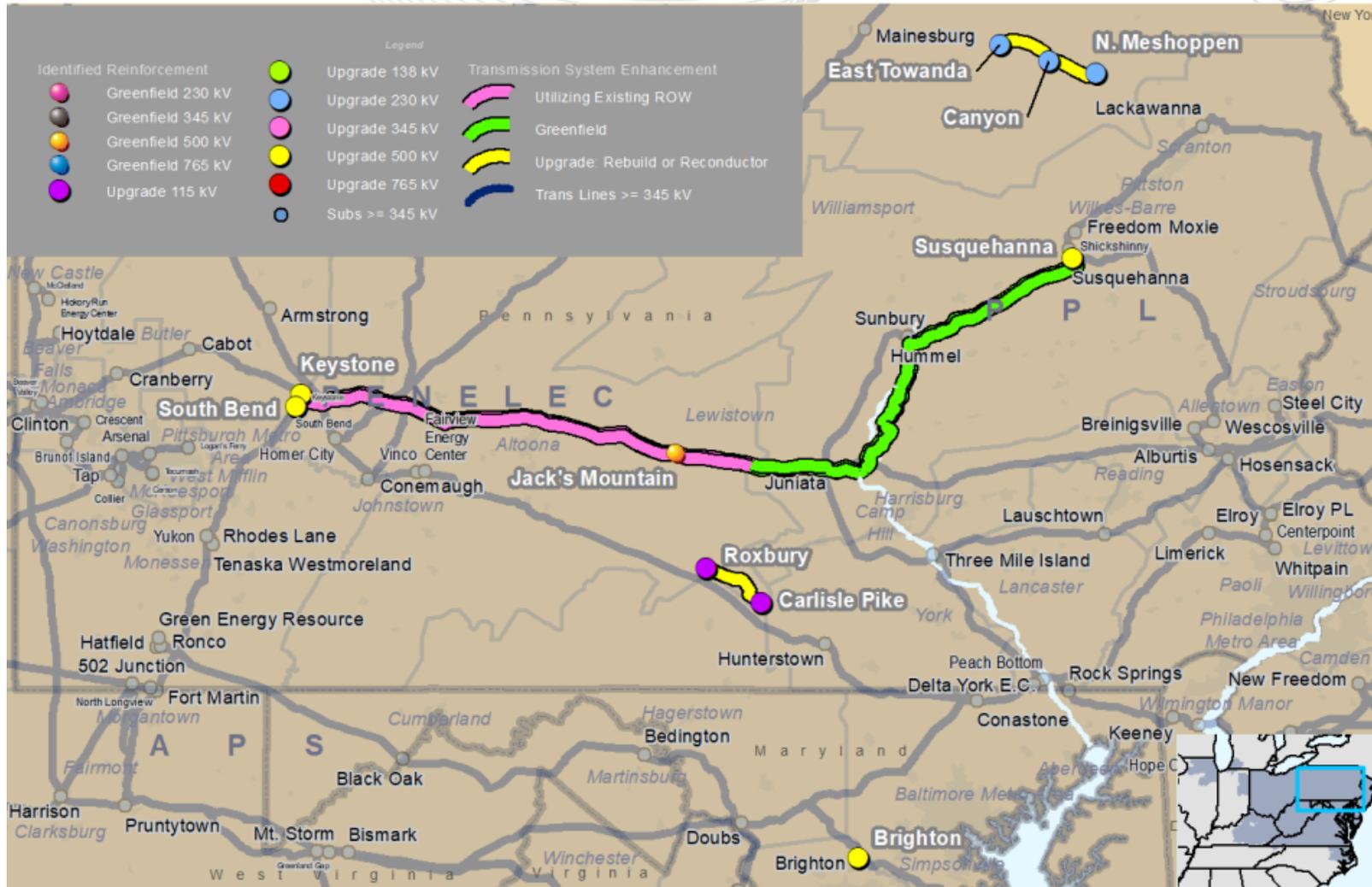
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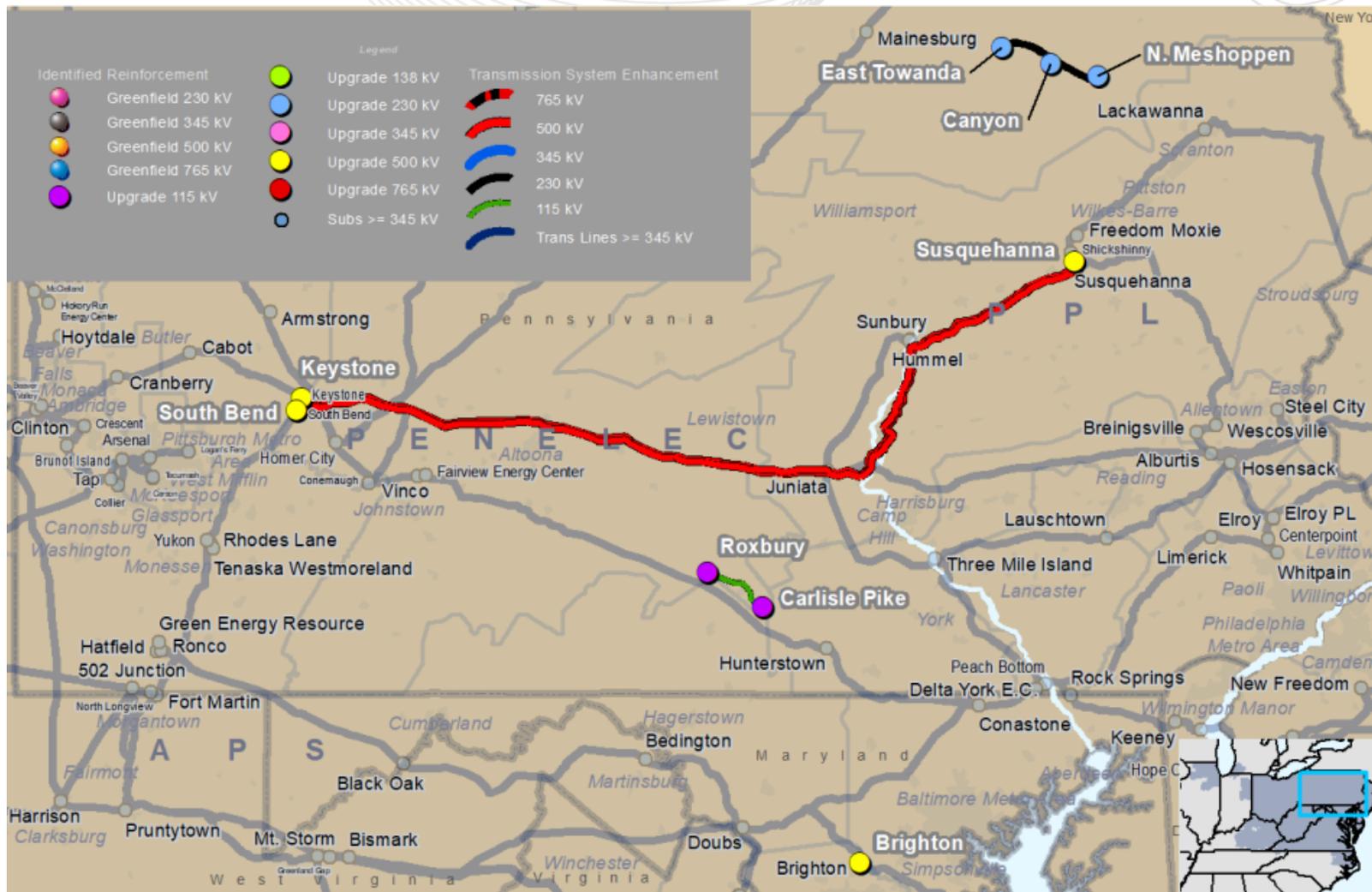
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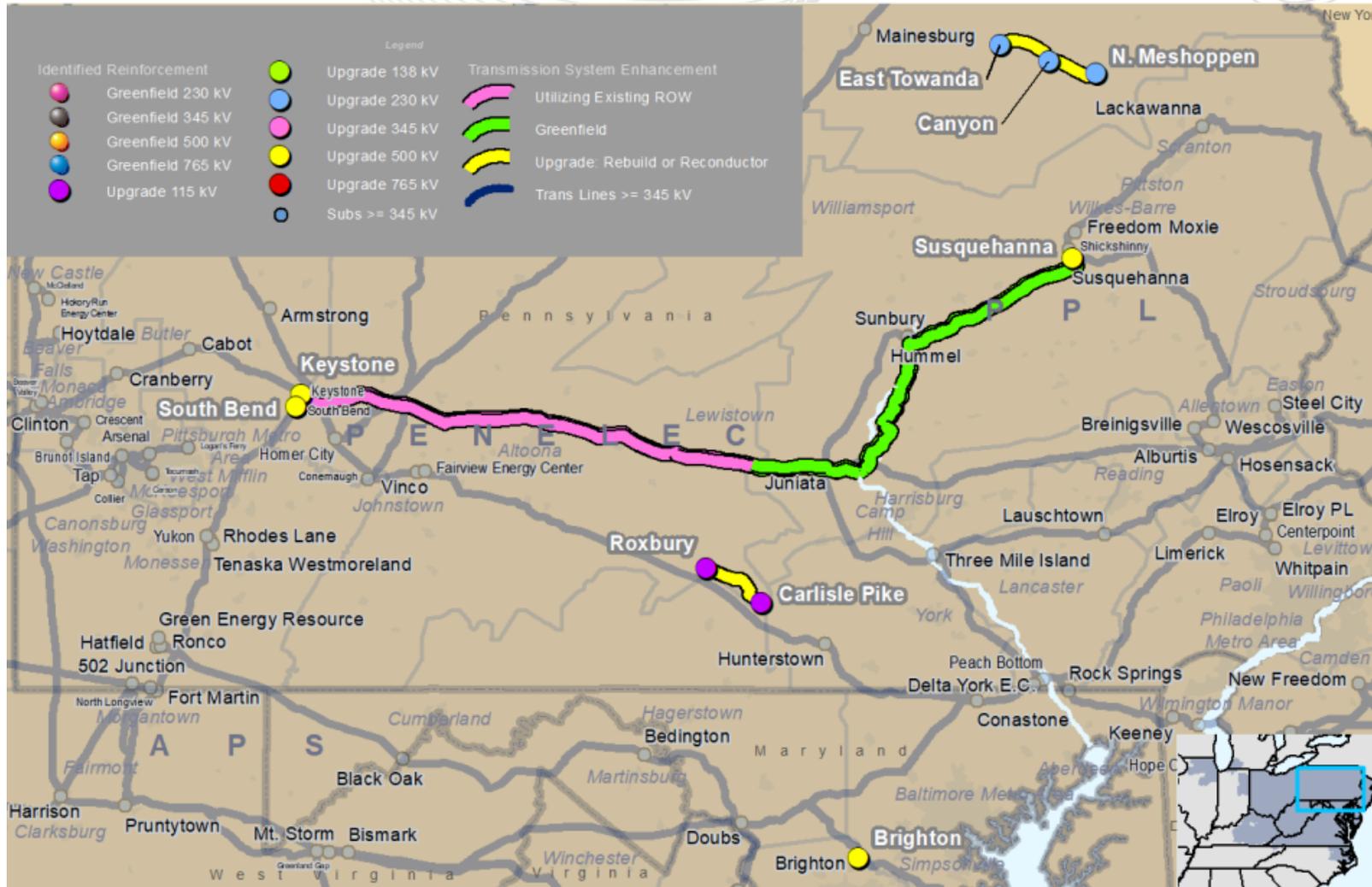
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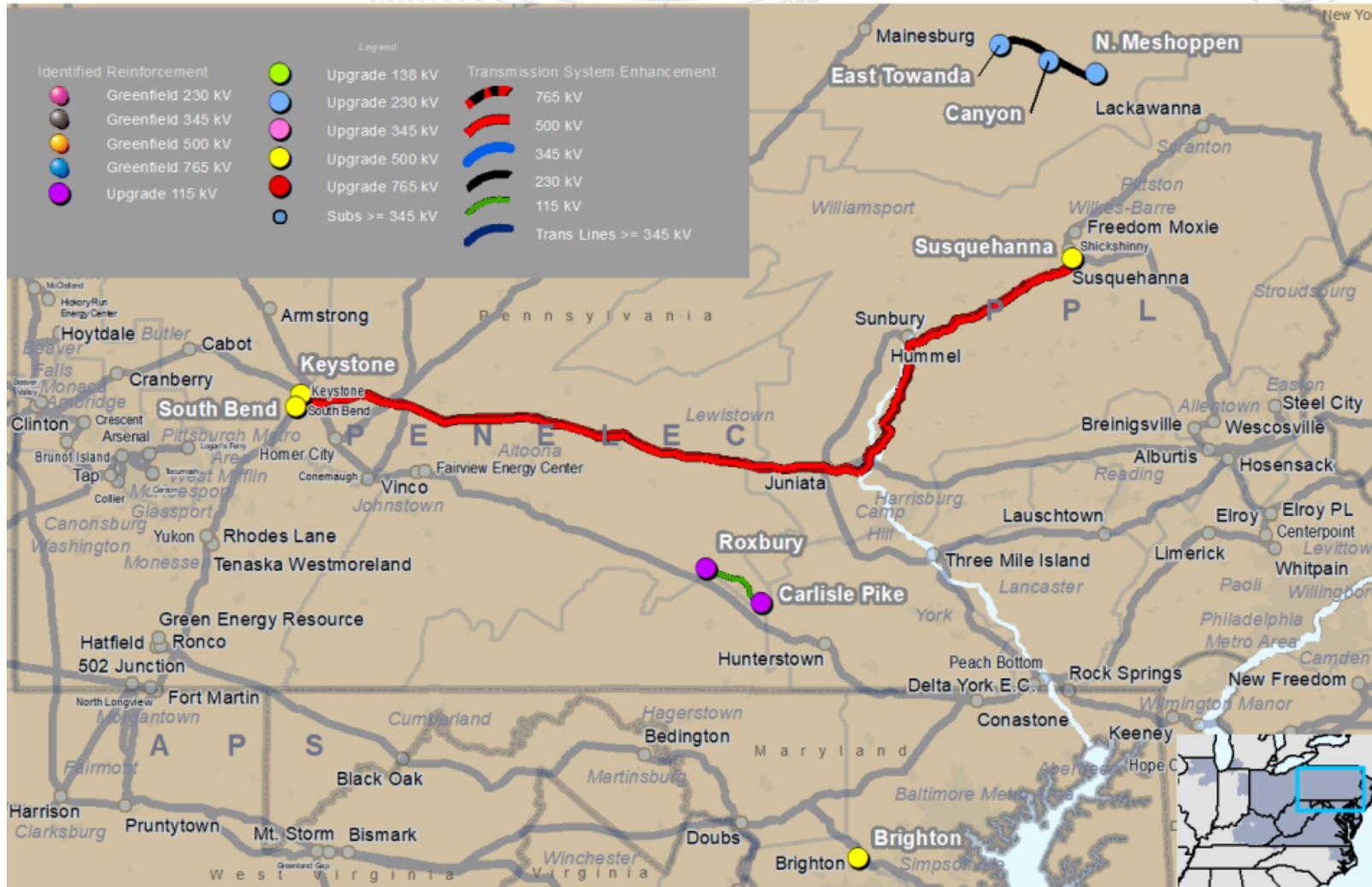
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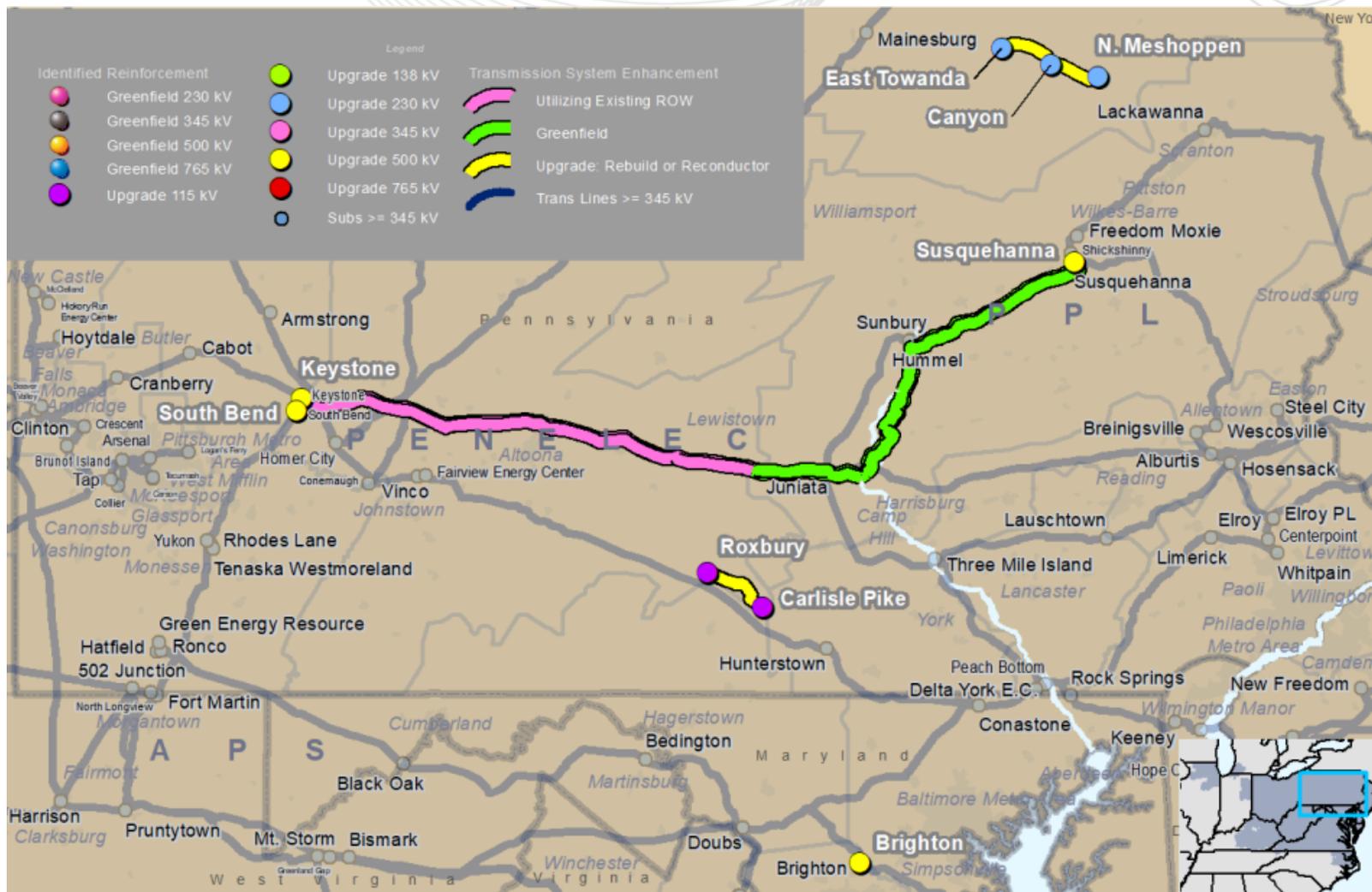
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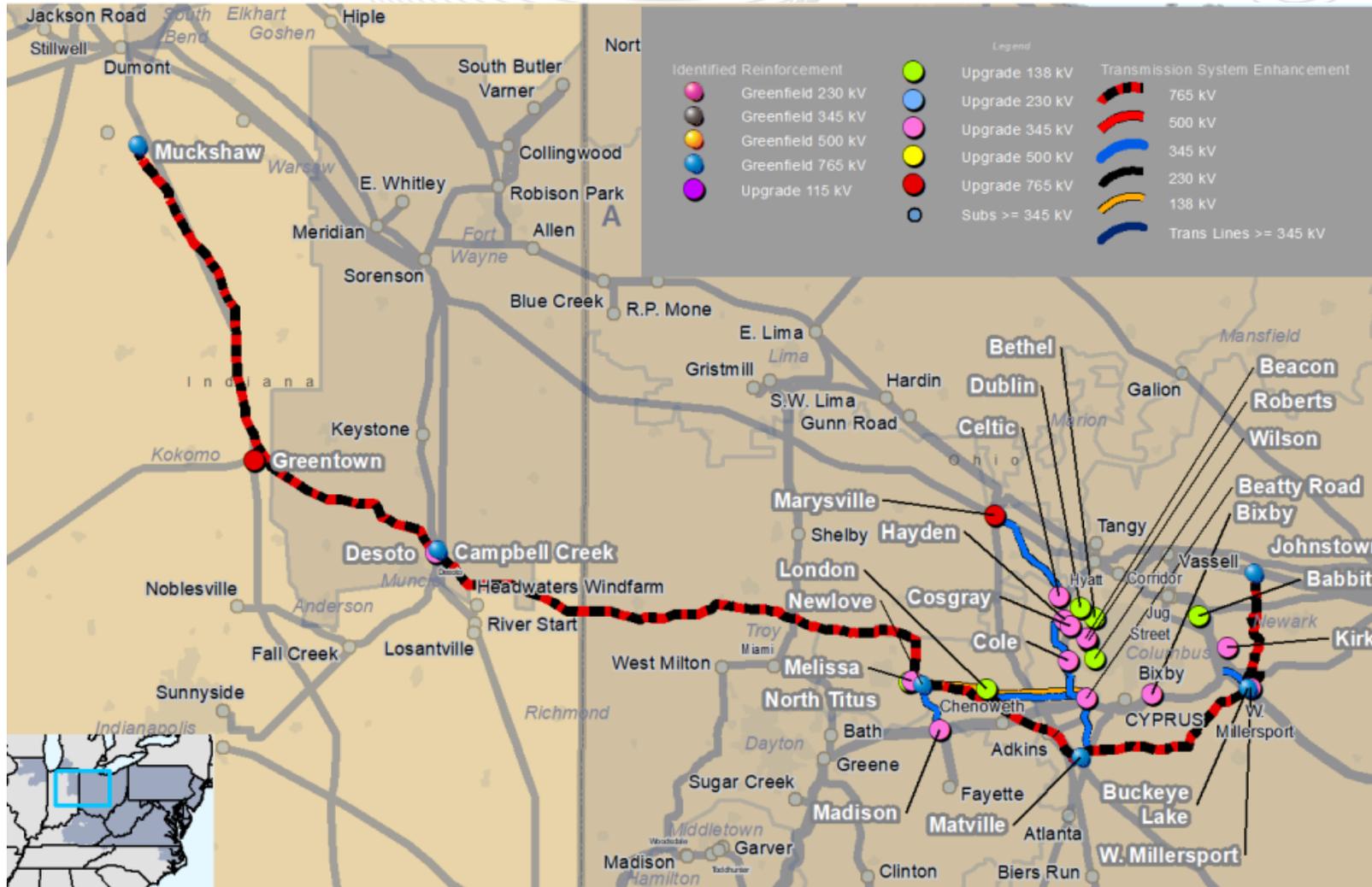


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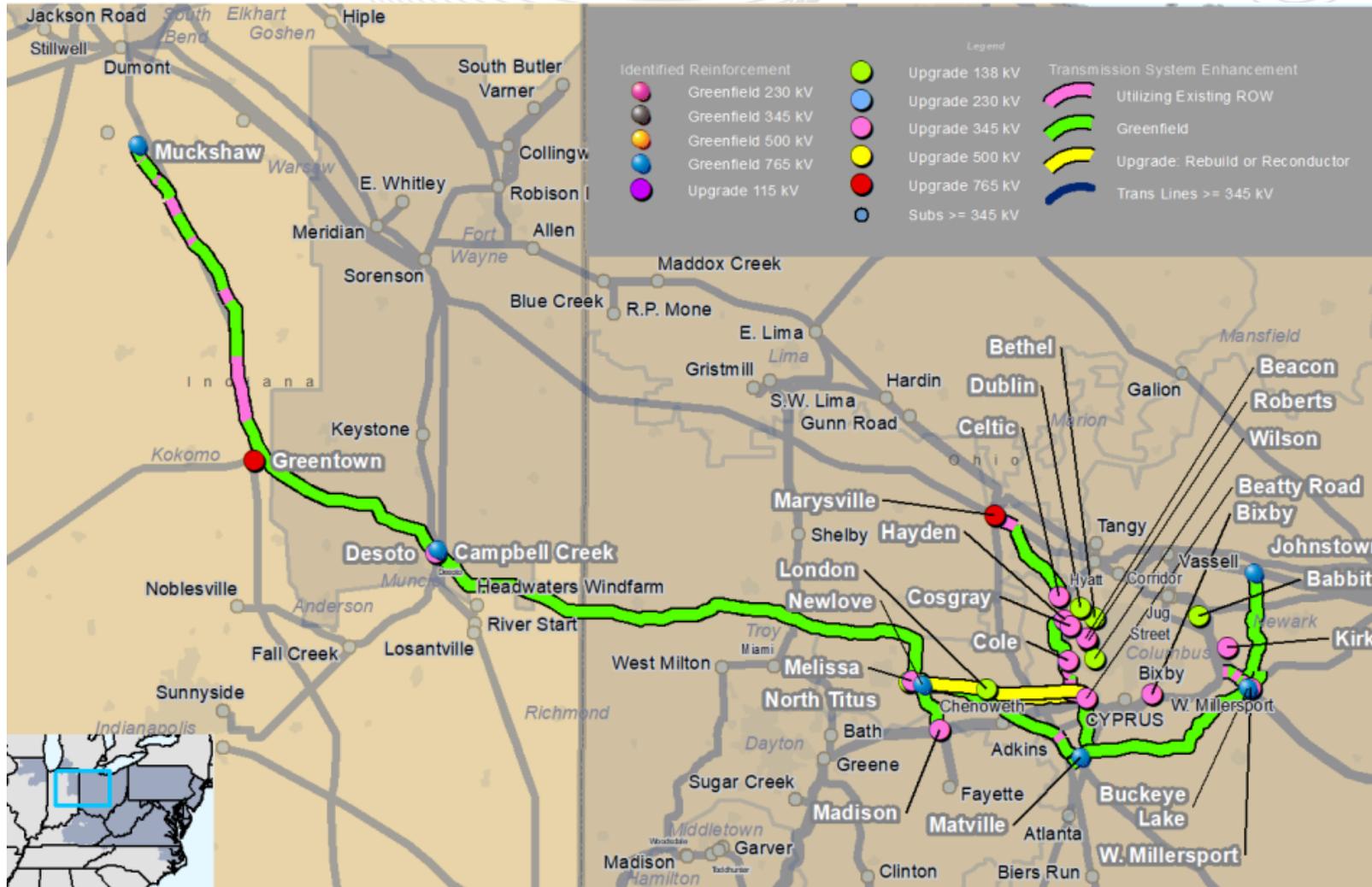


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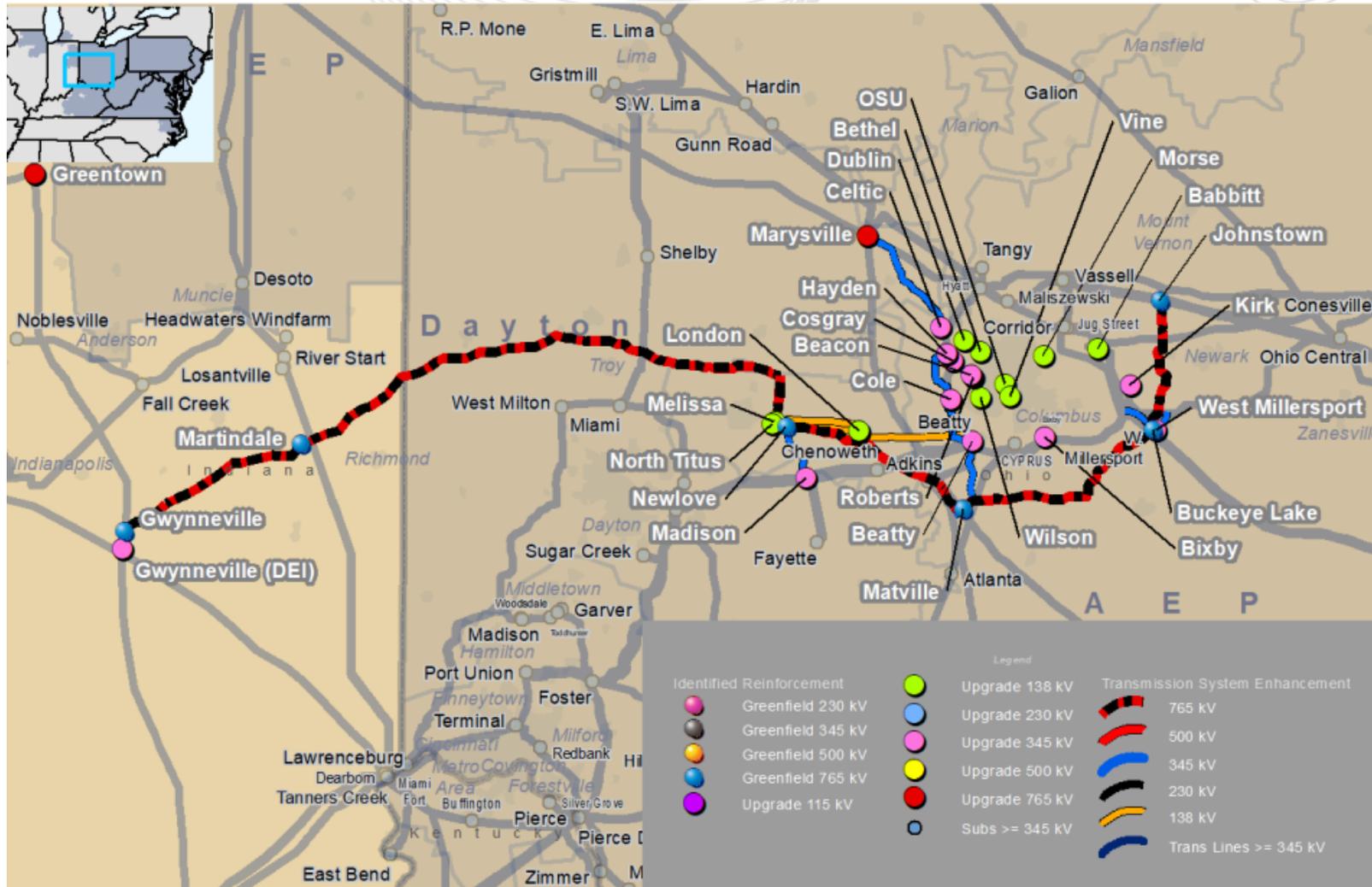
NXTMID (NextEra)



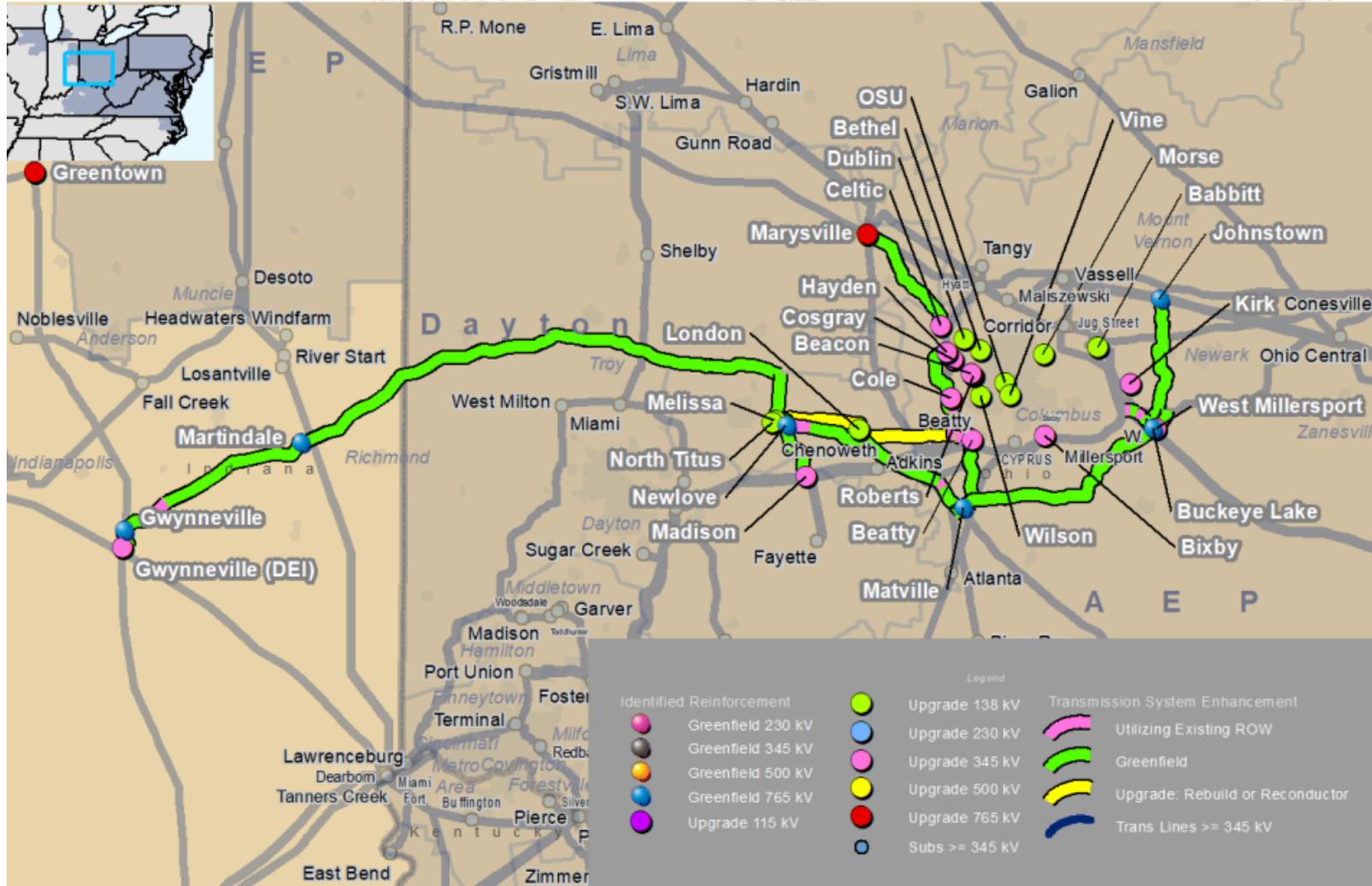
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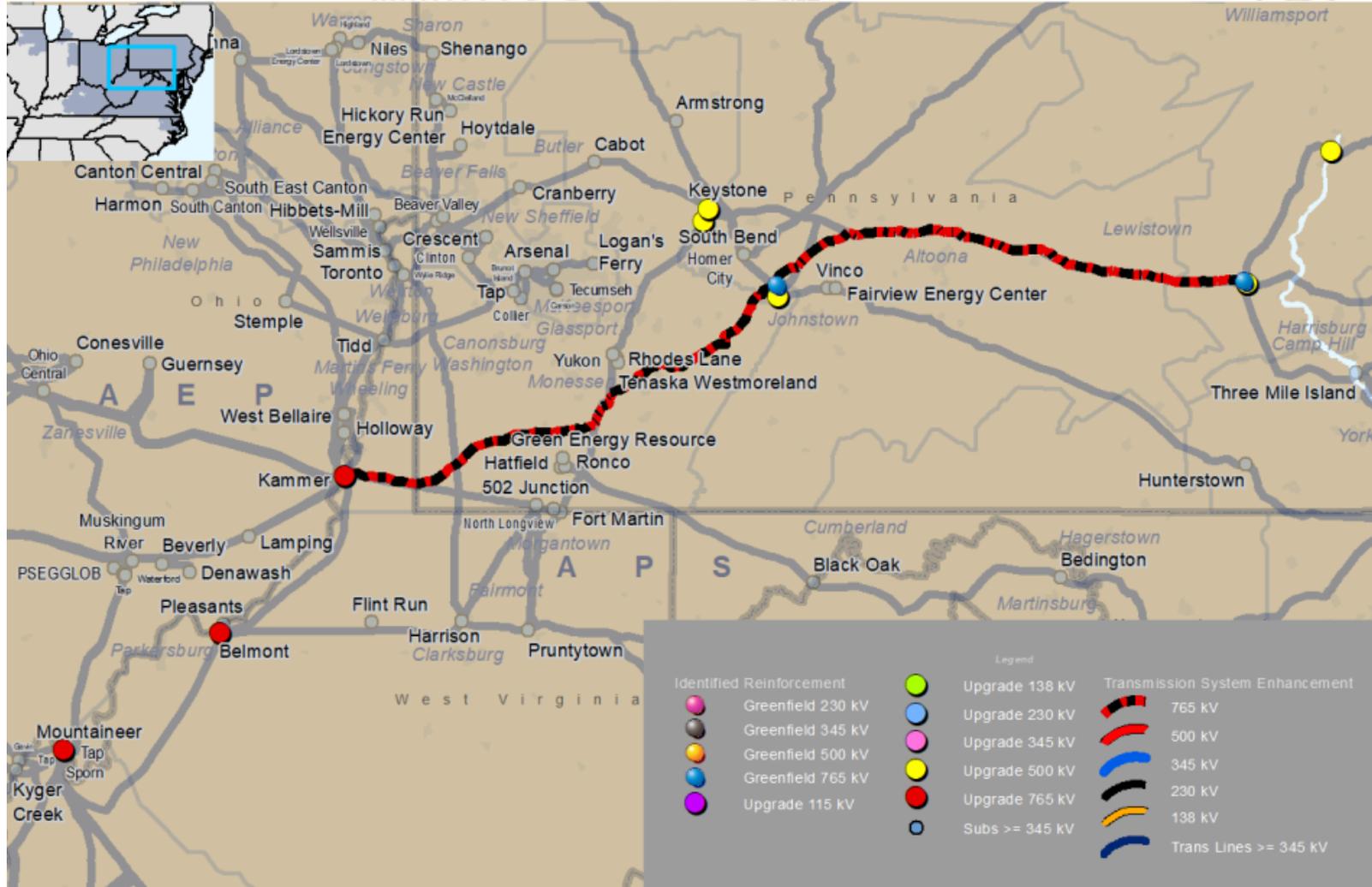
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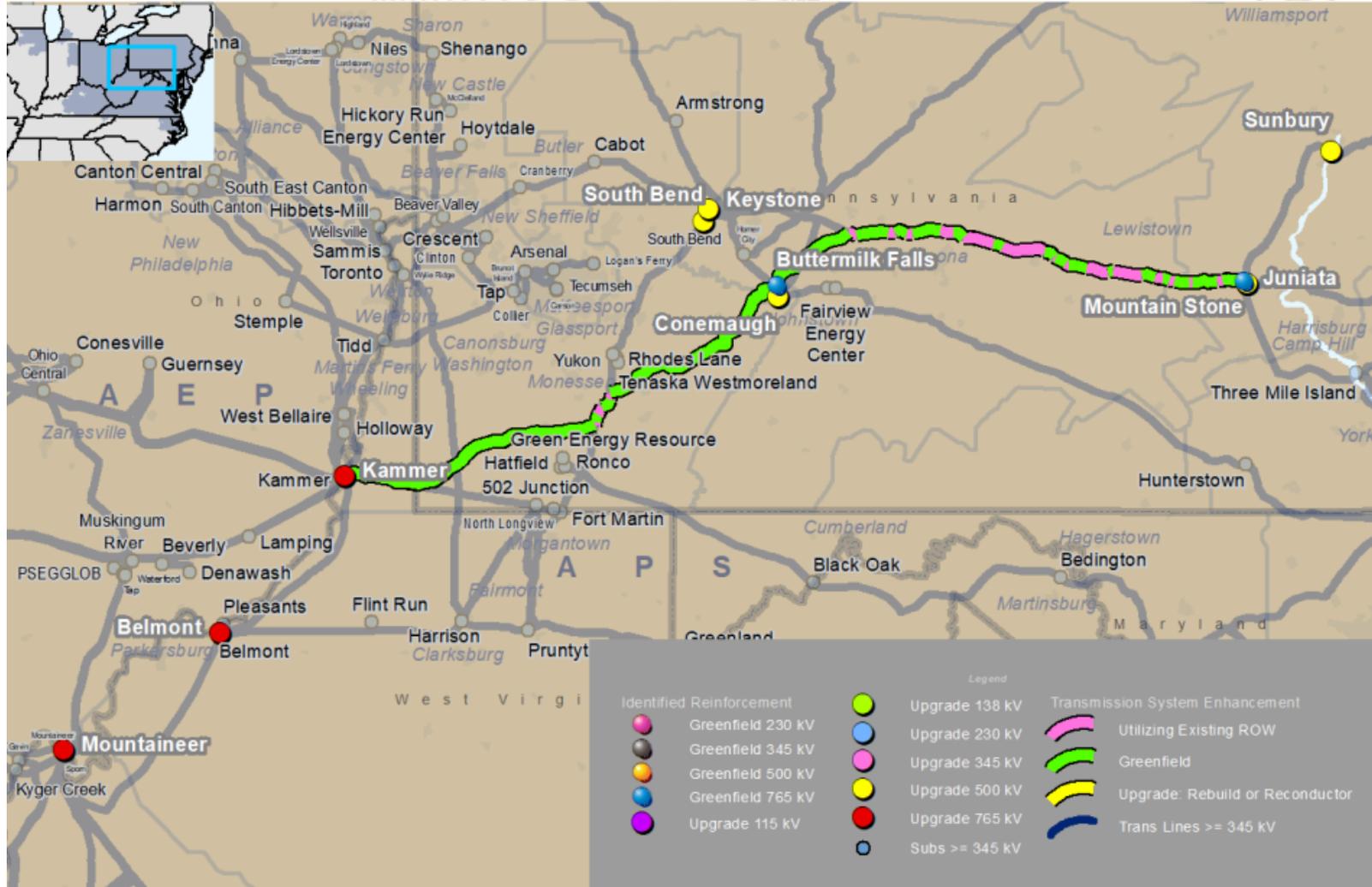
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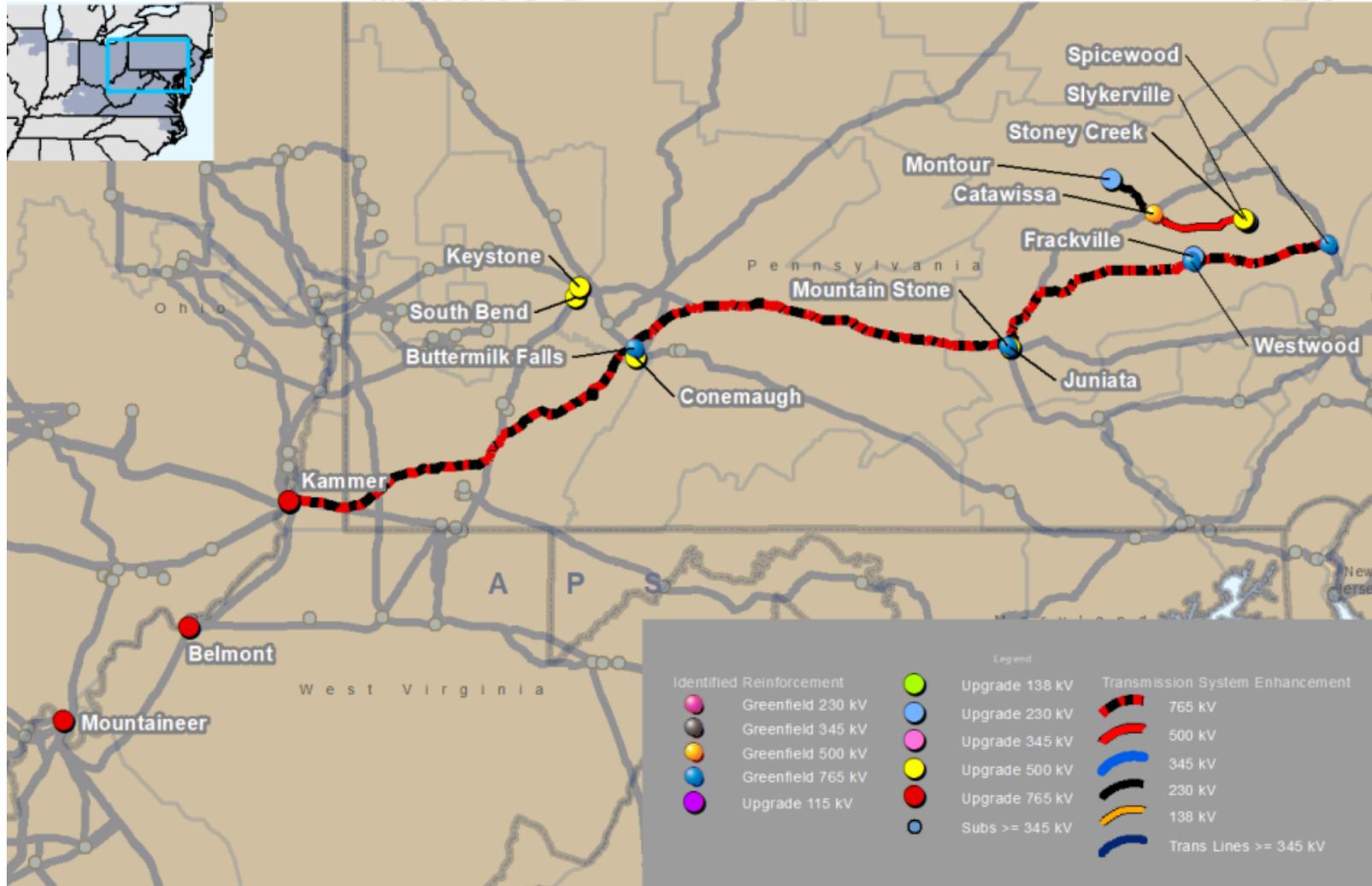
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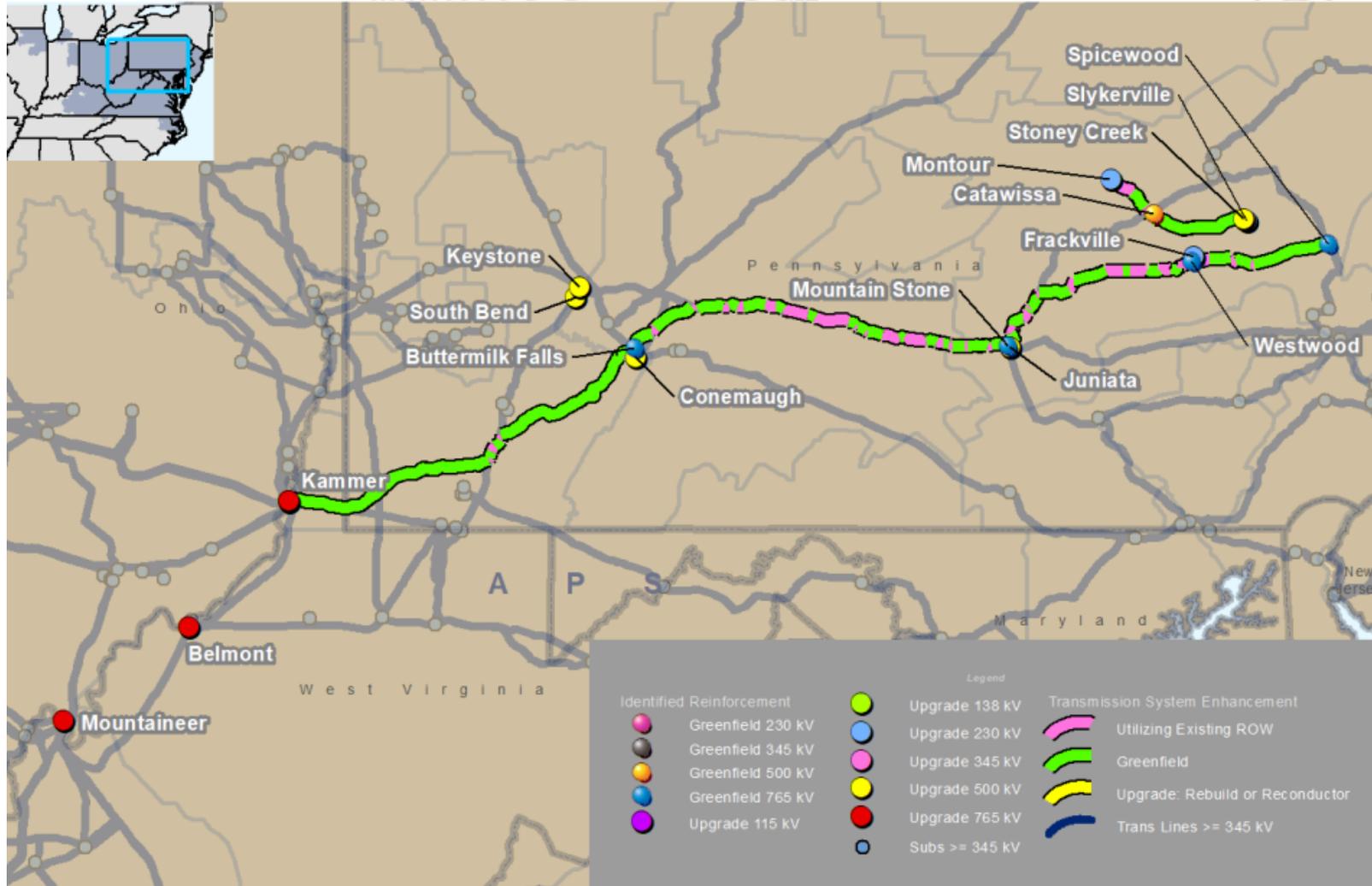
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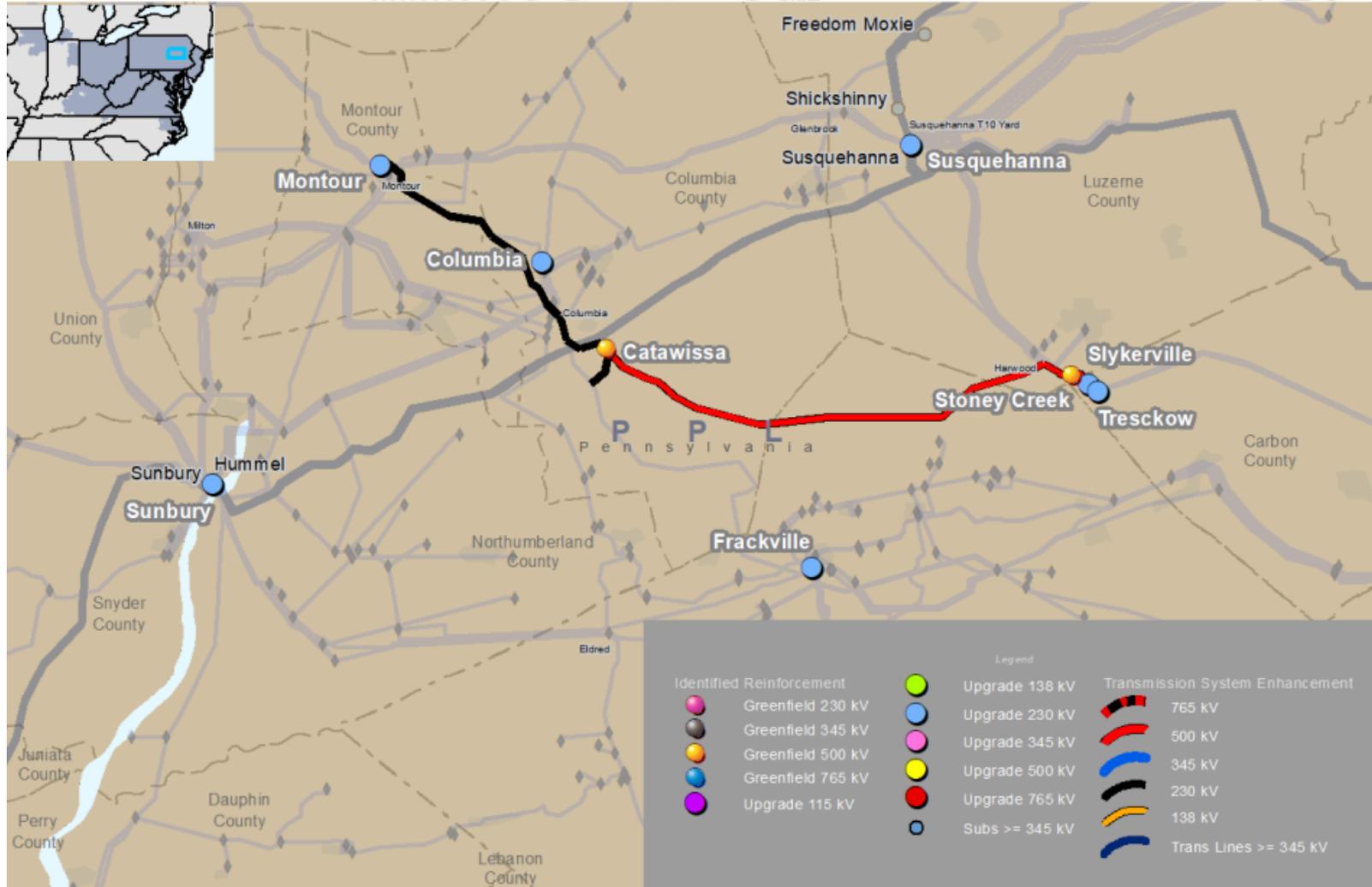
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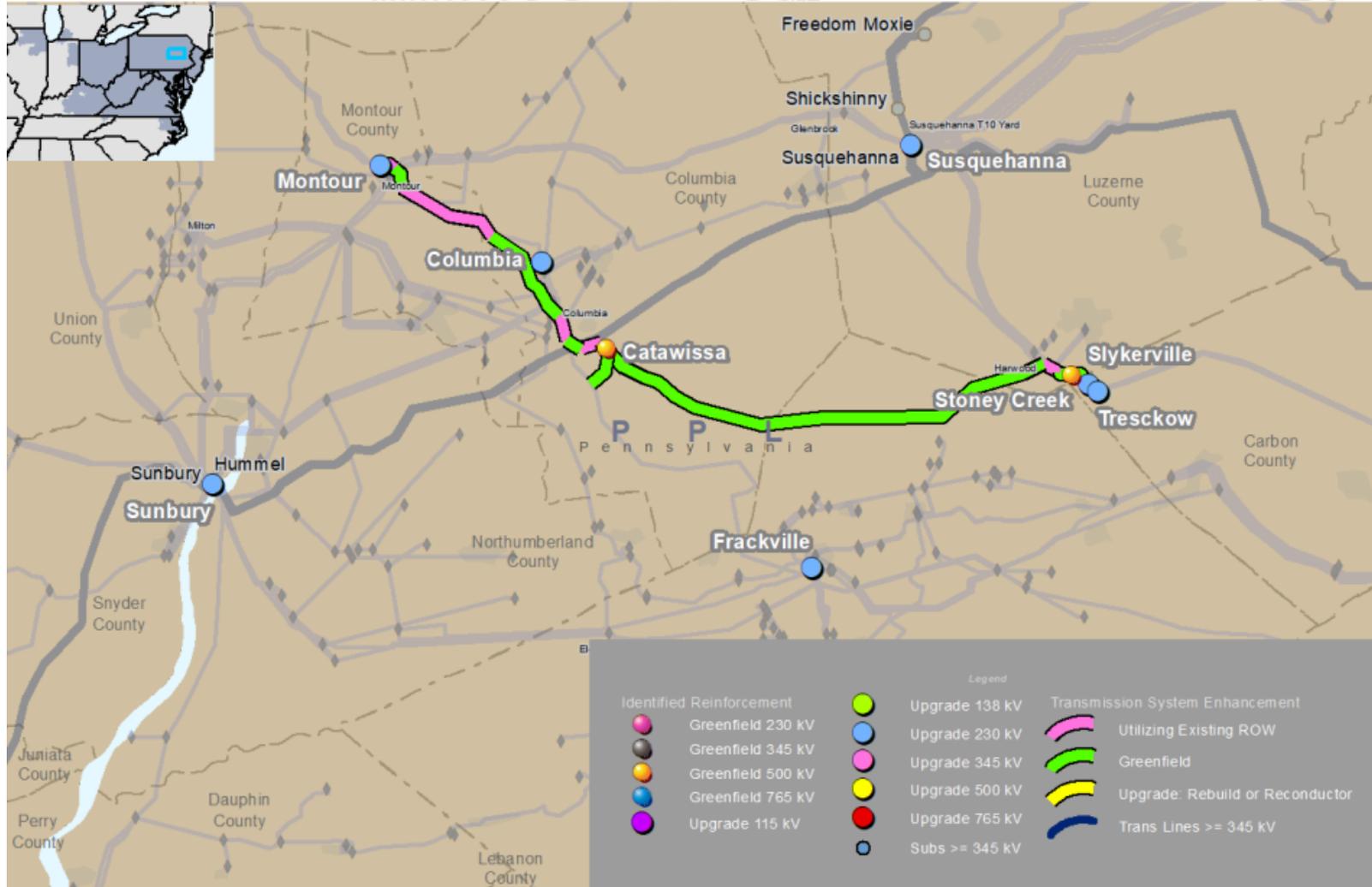
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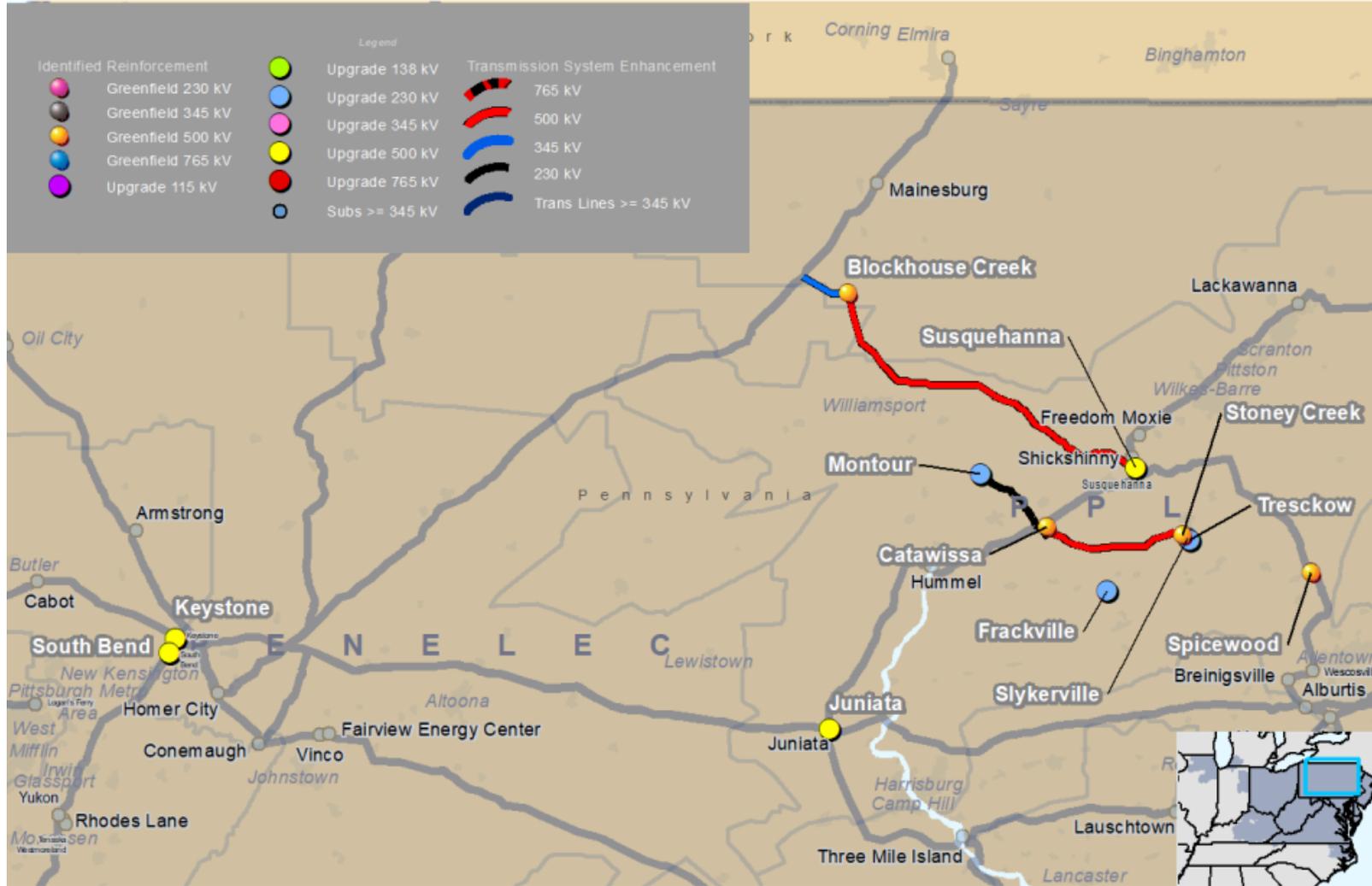
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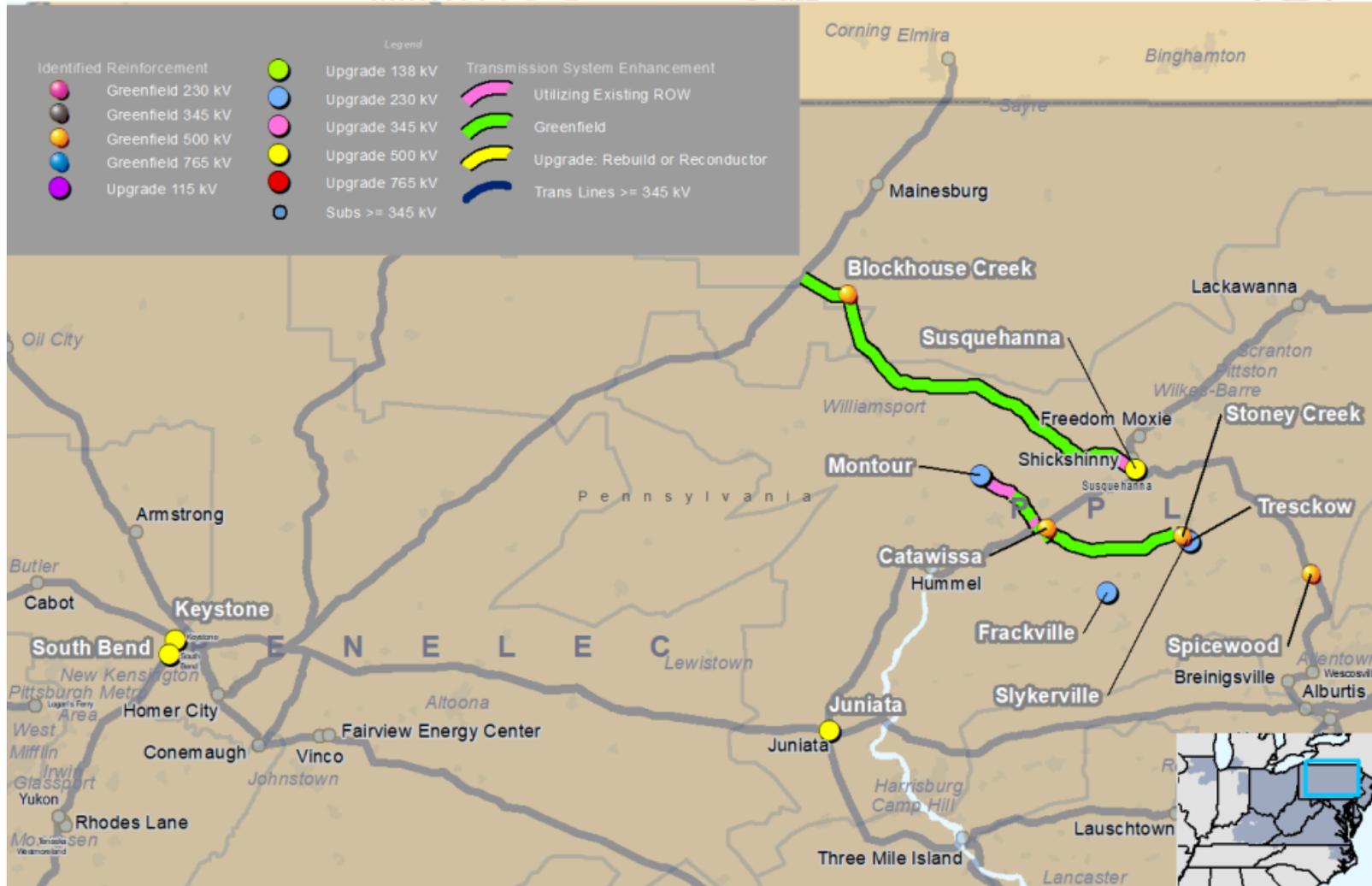
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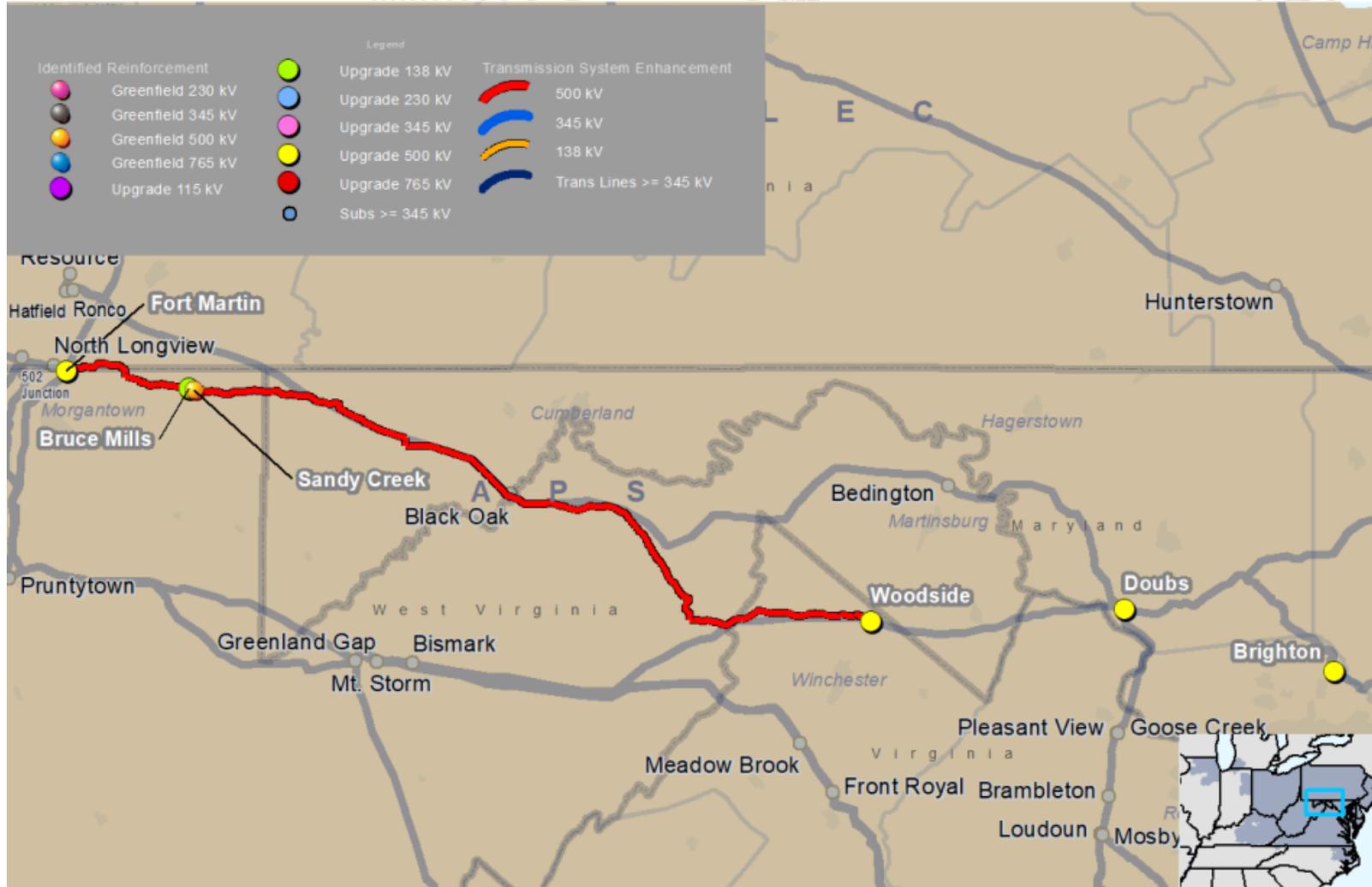
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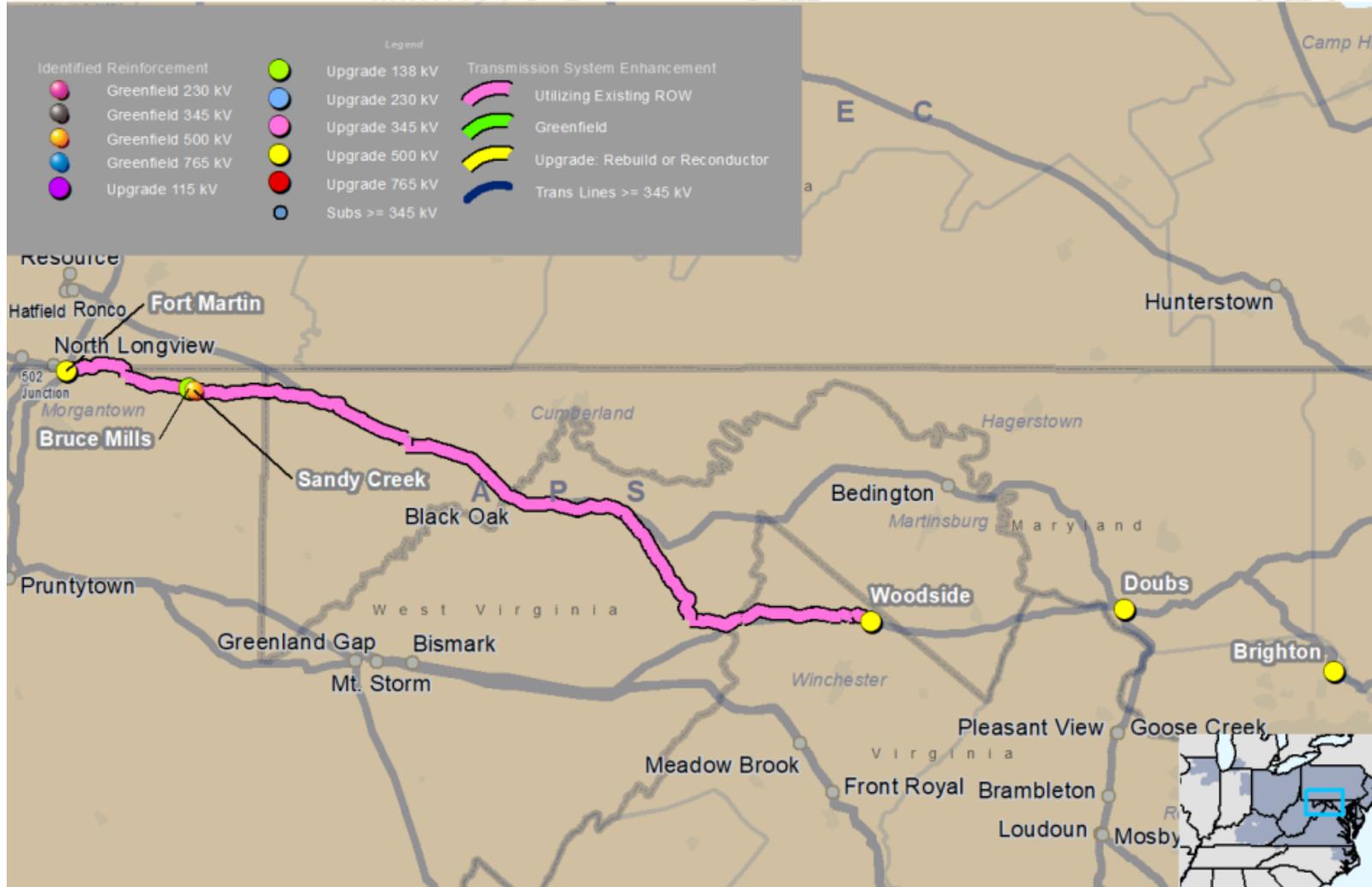
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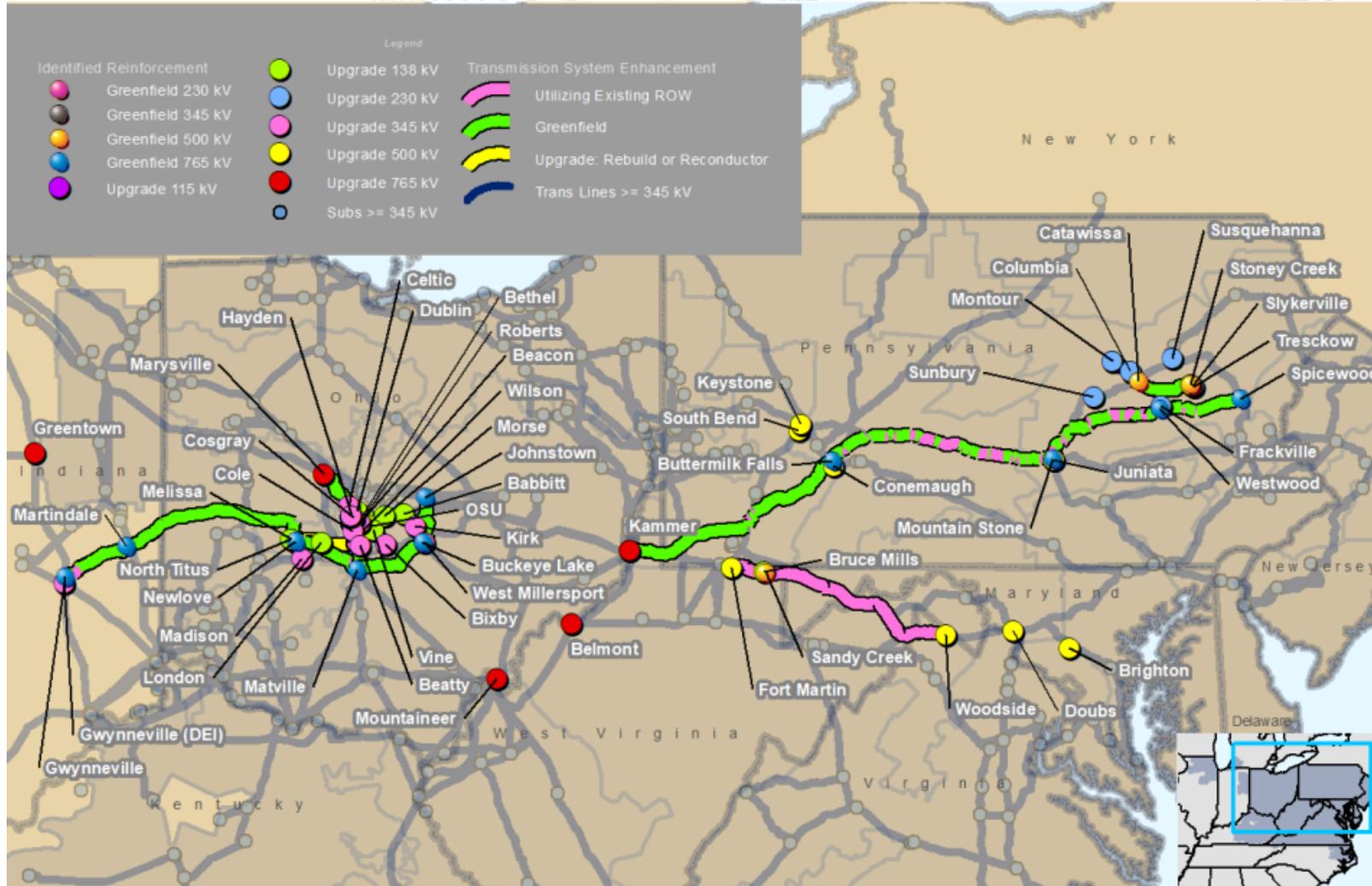
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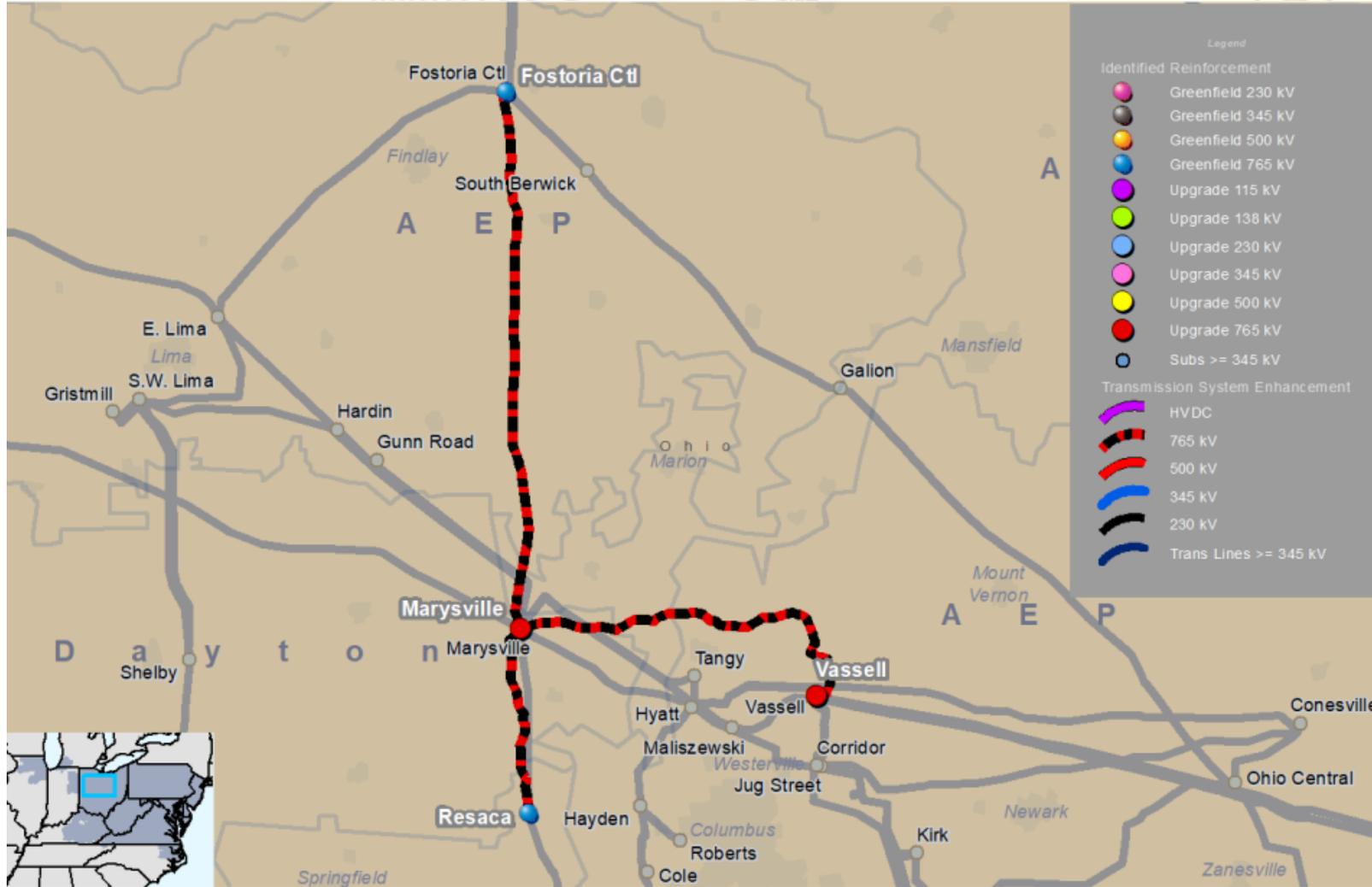


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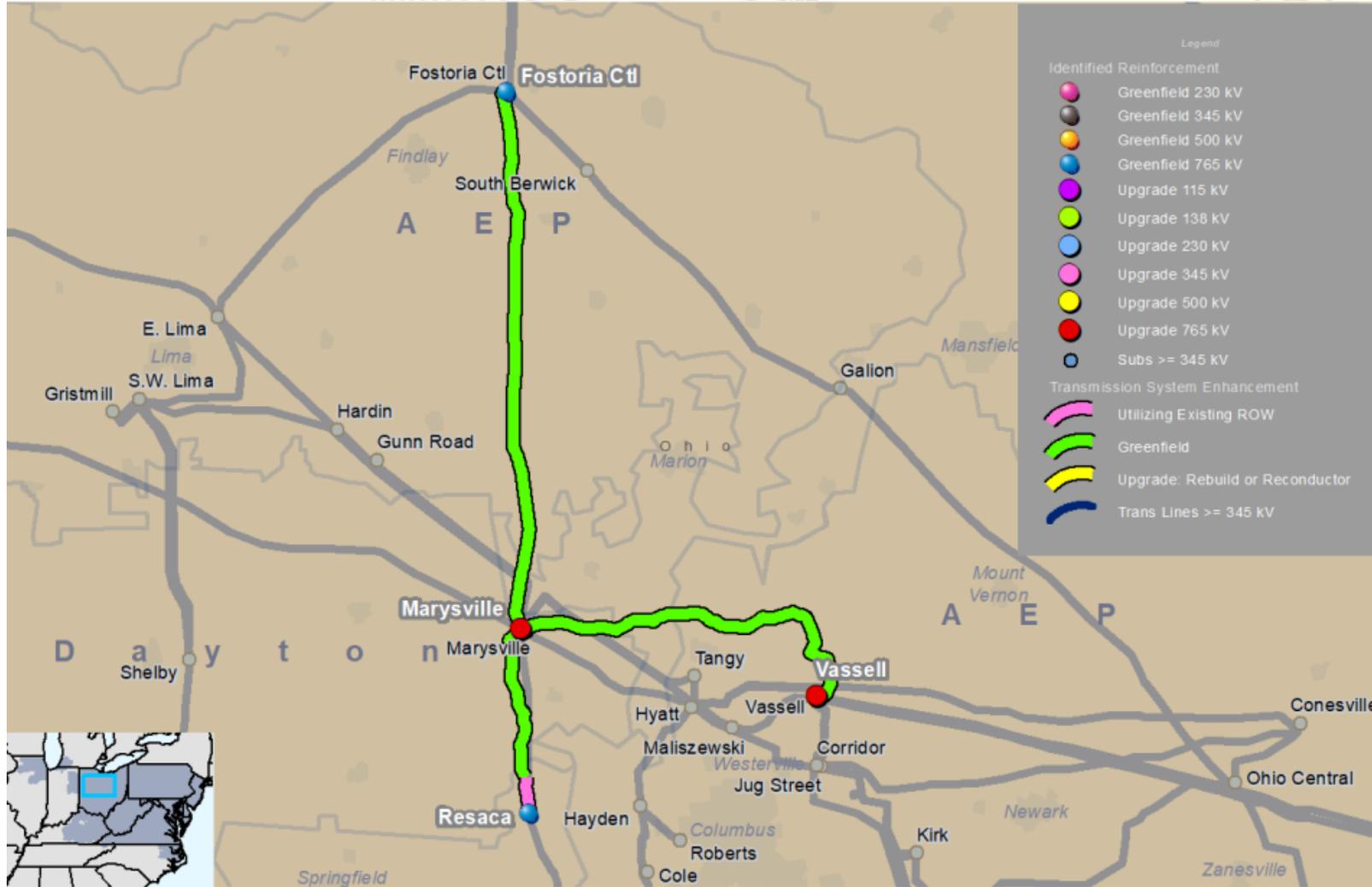


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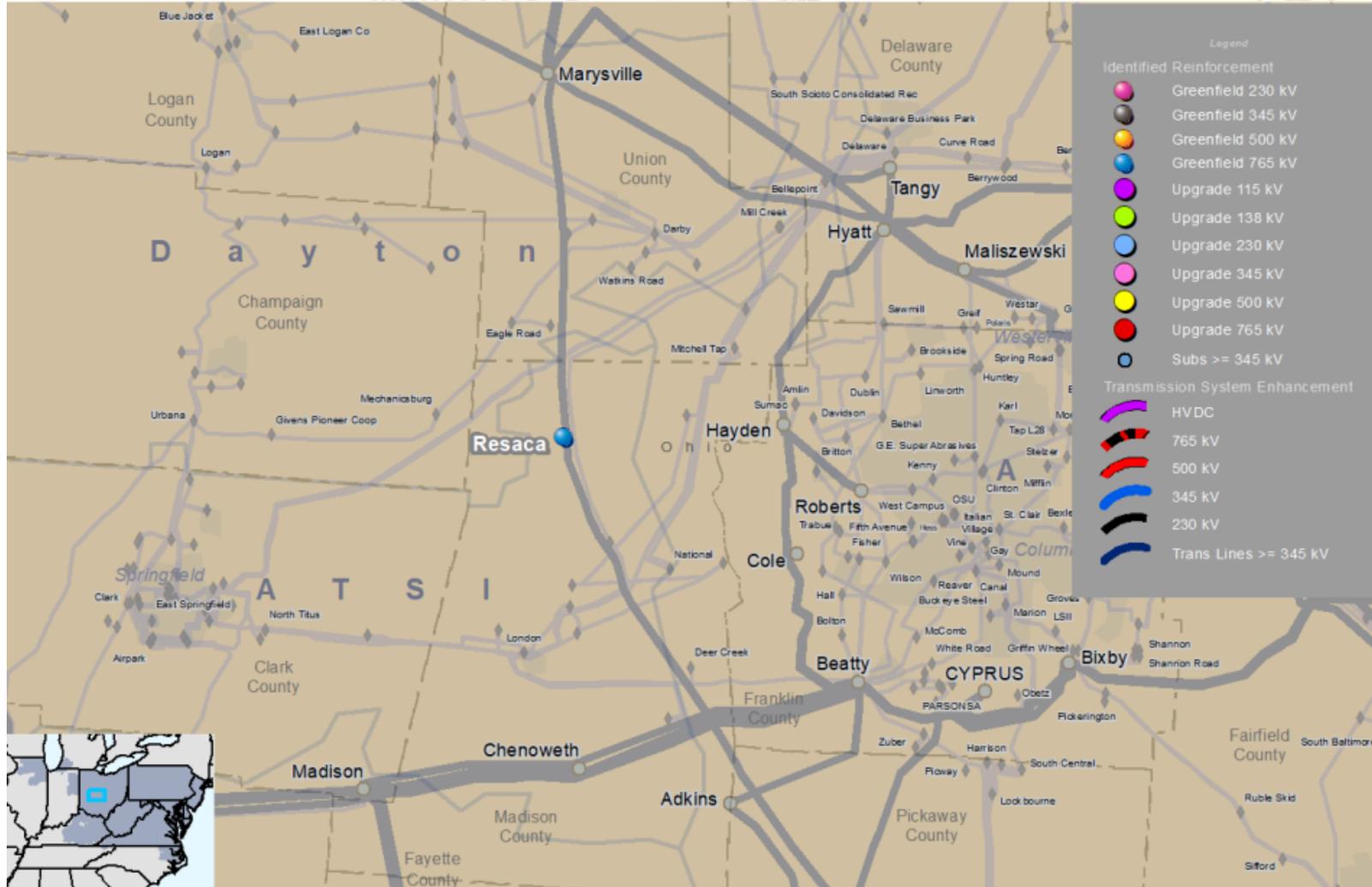
PSEGRT (PSEG)



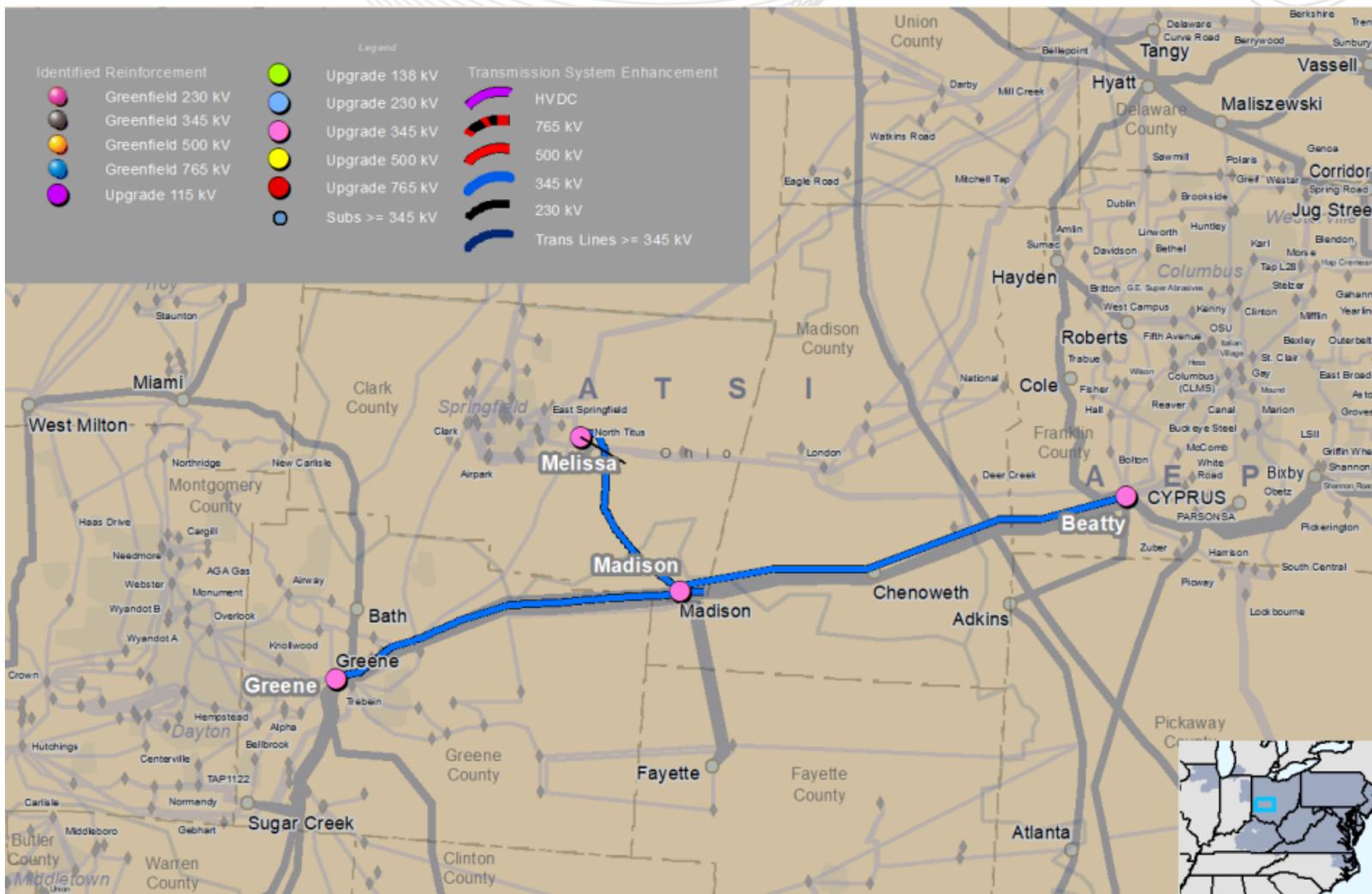
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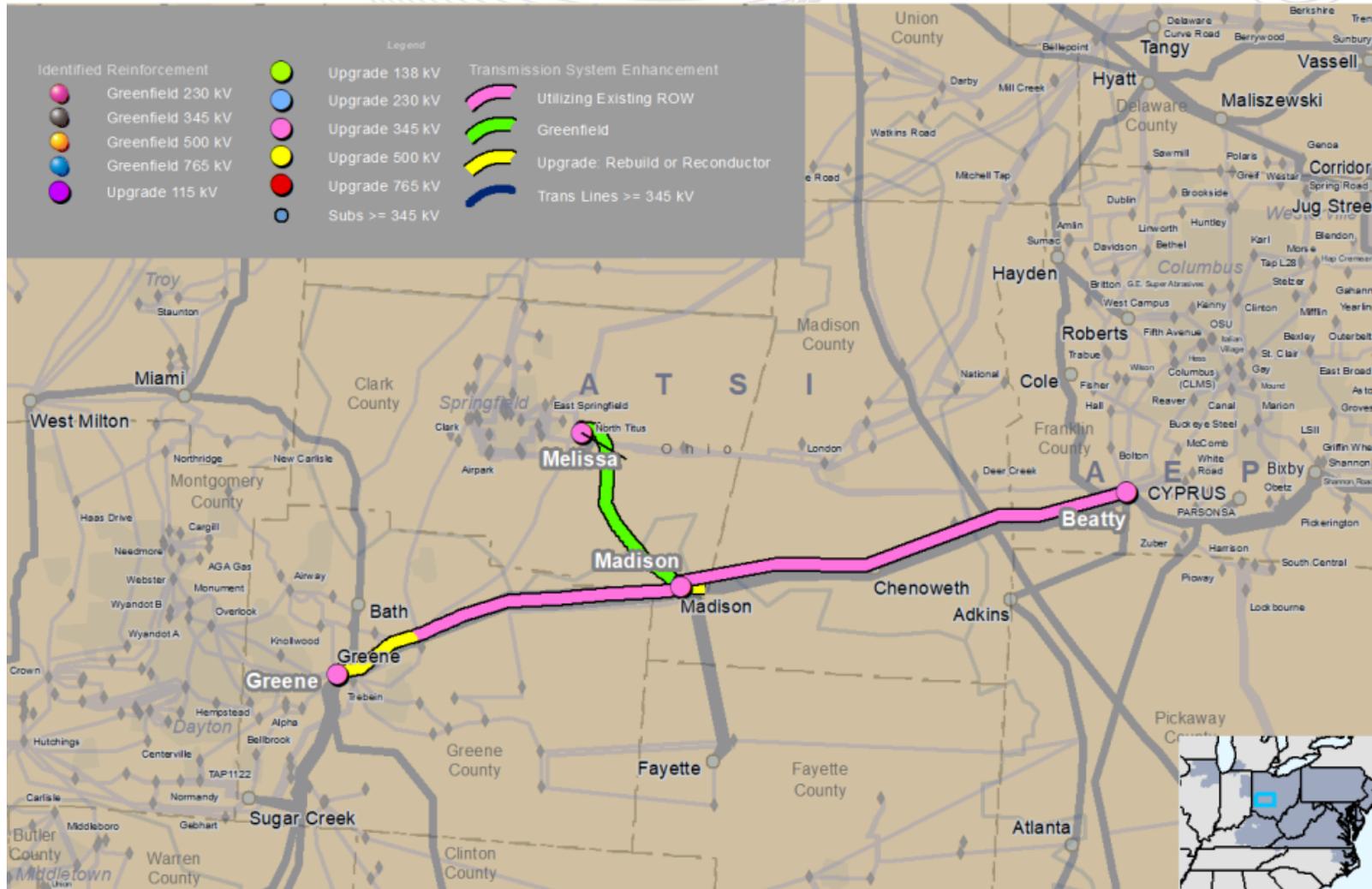
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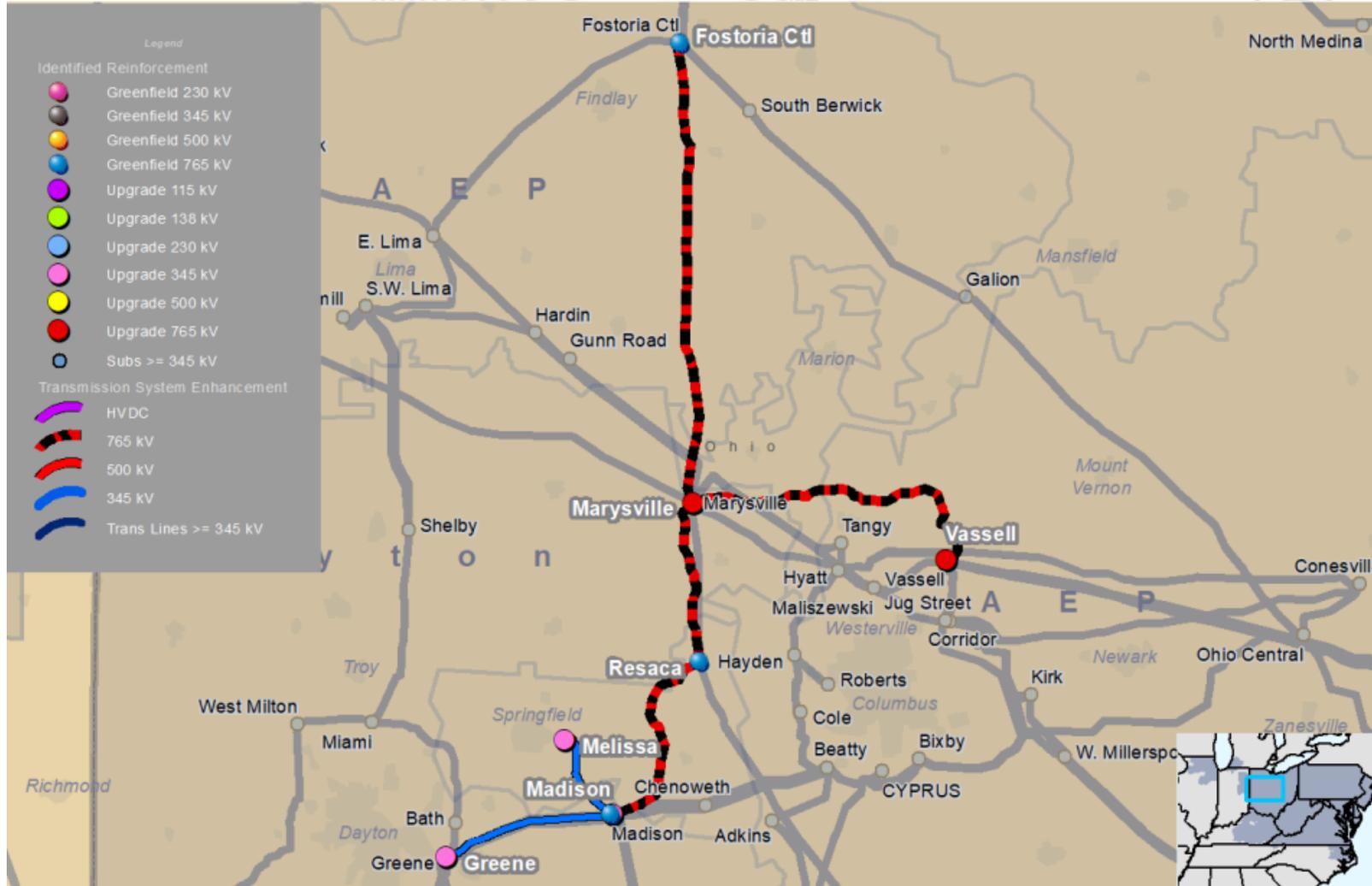
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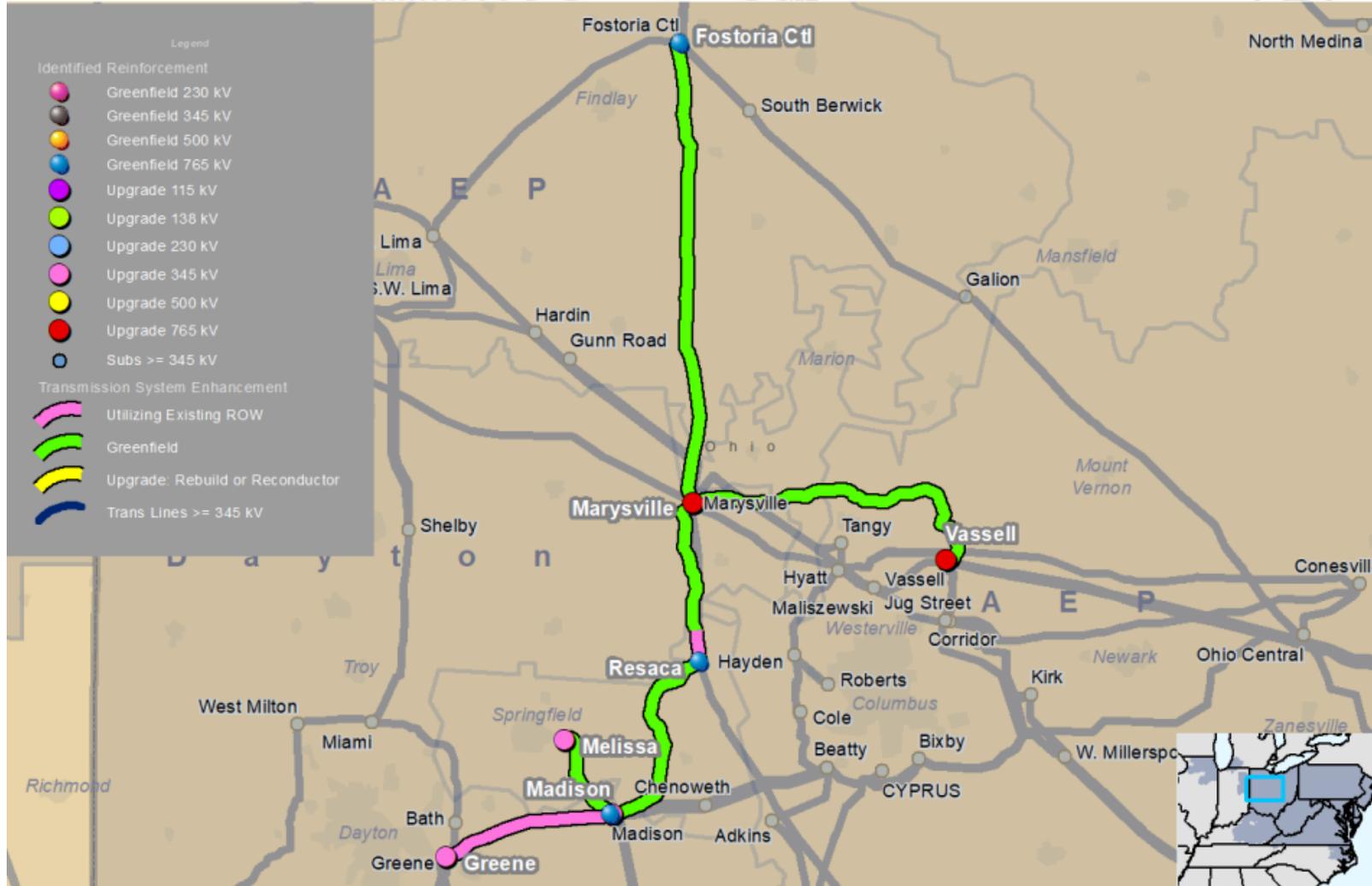
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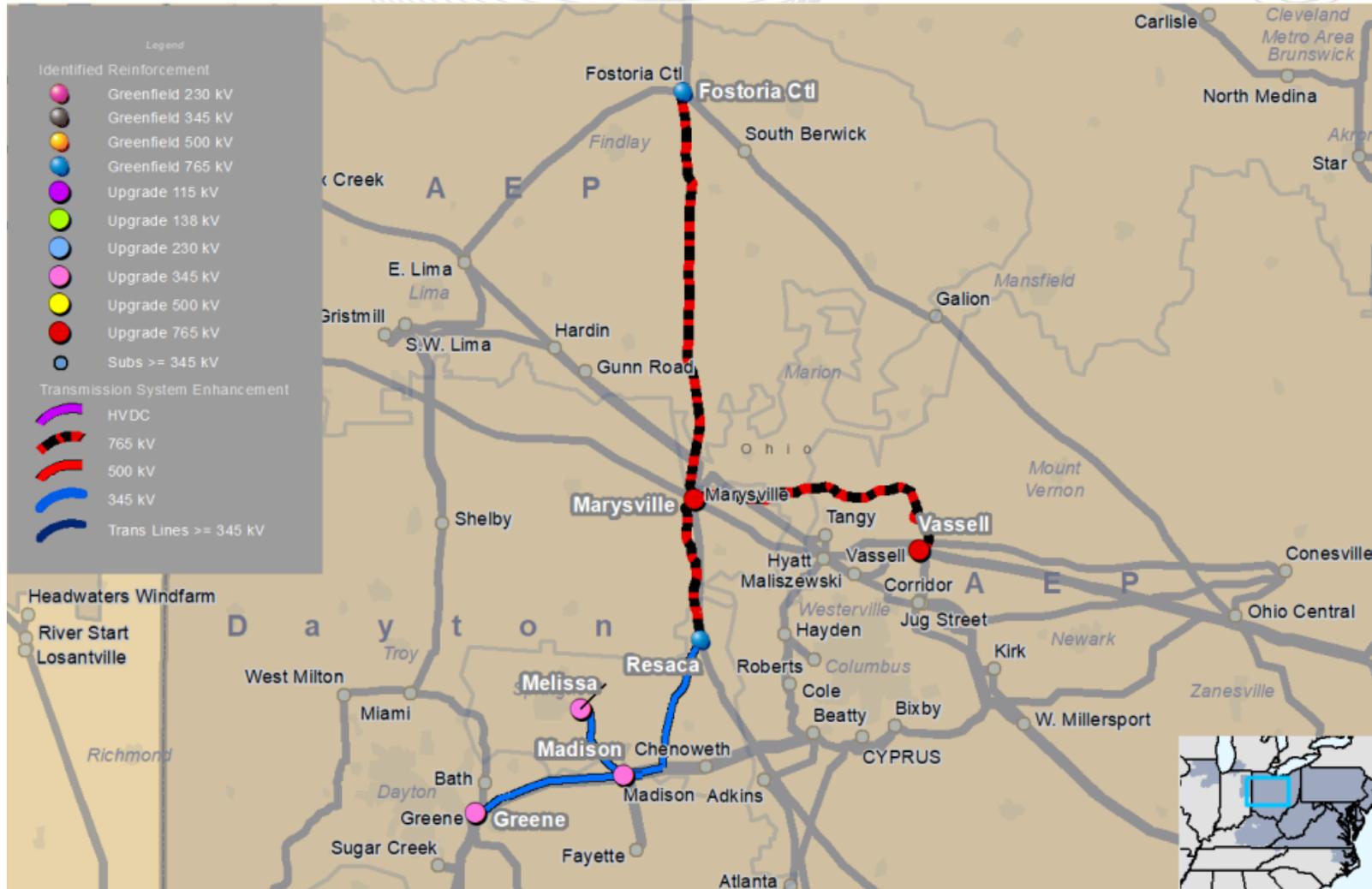
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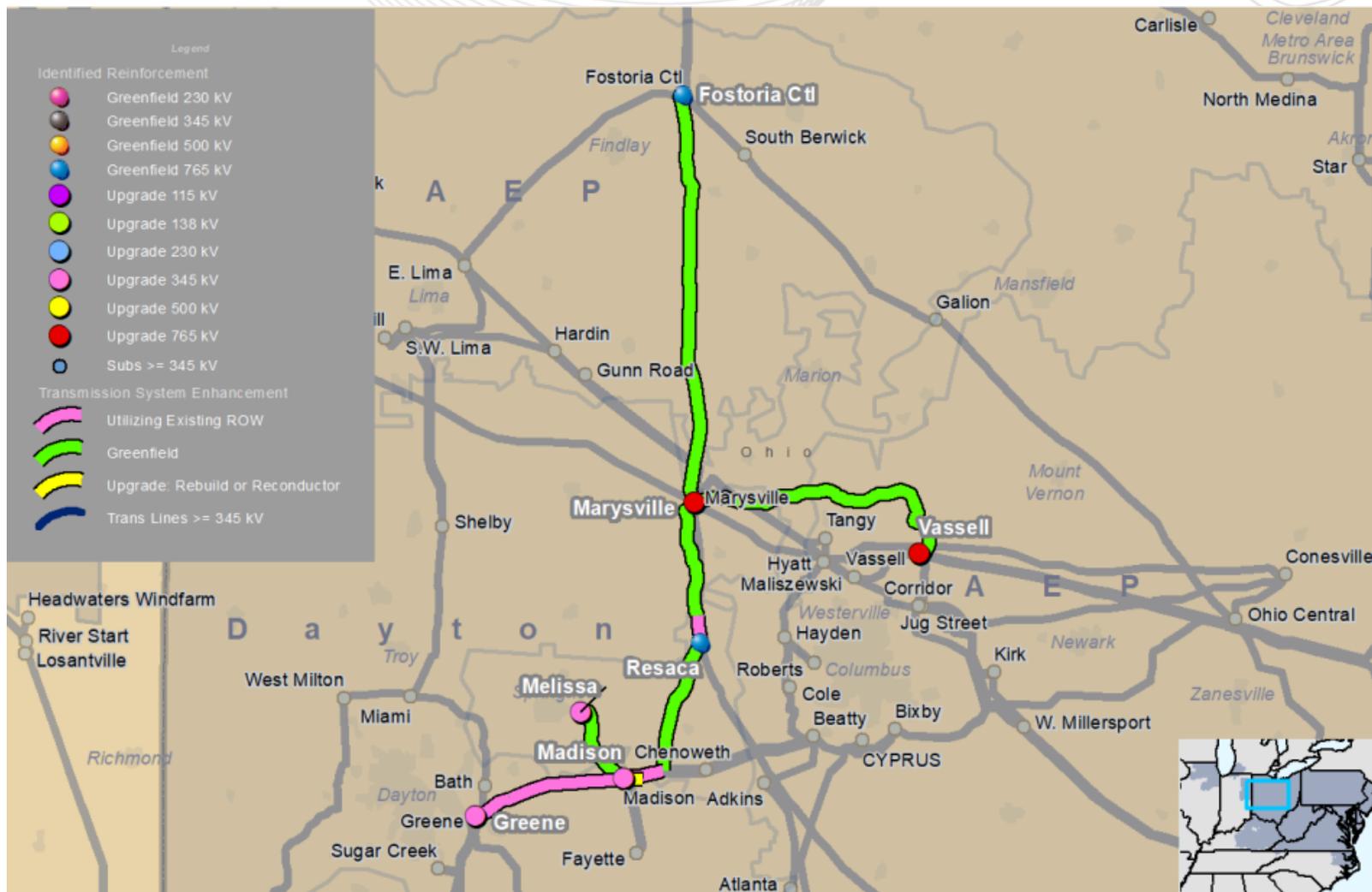
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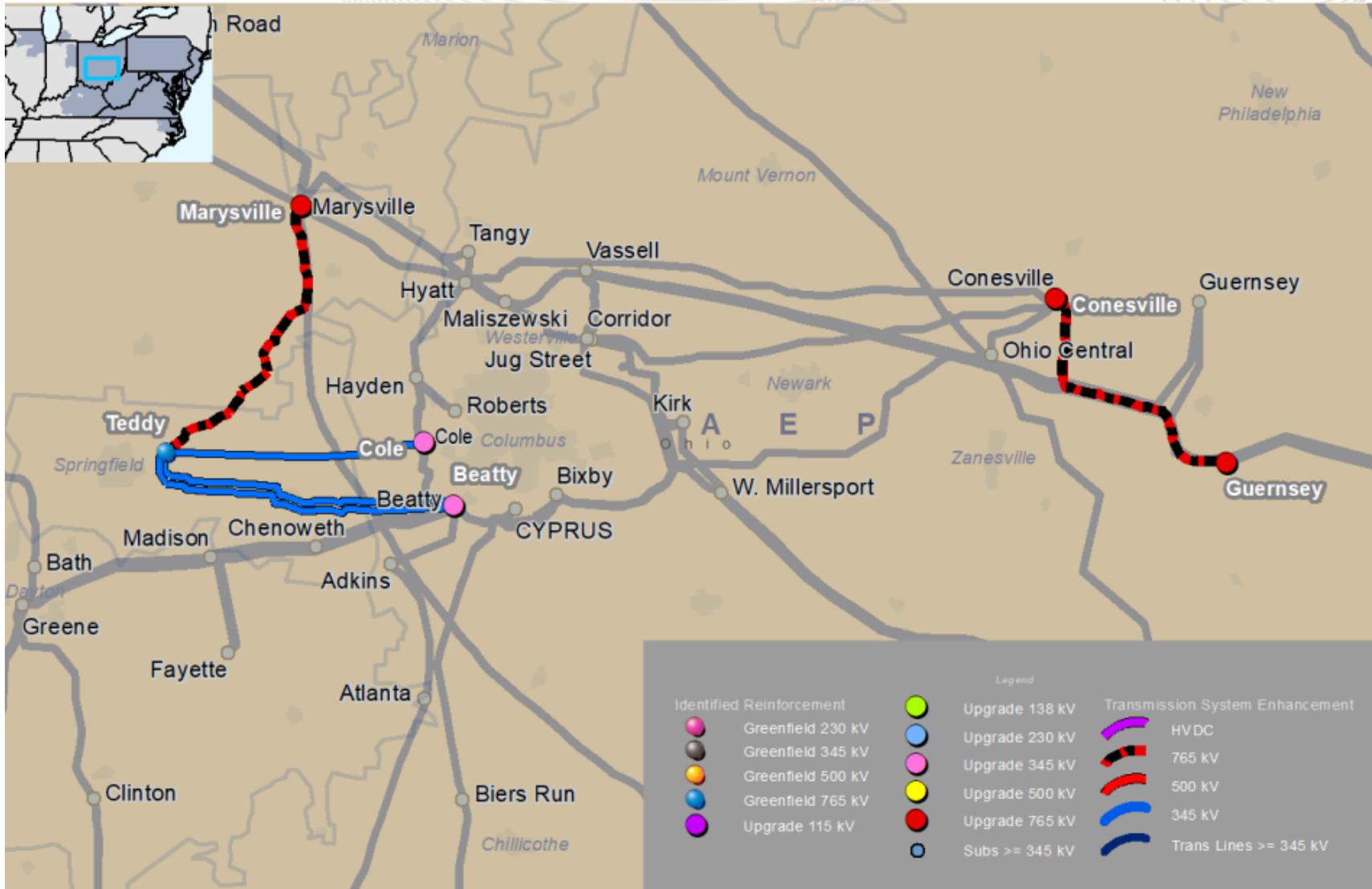


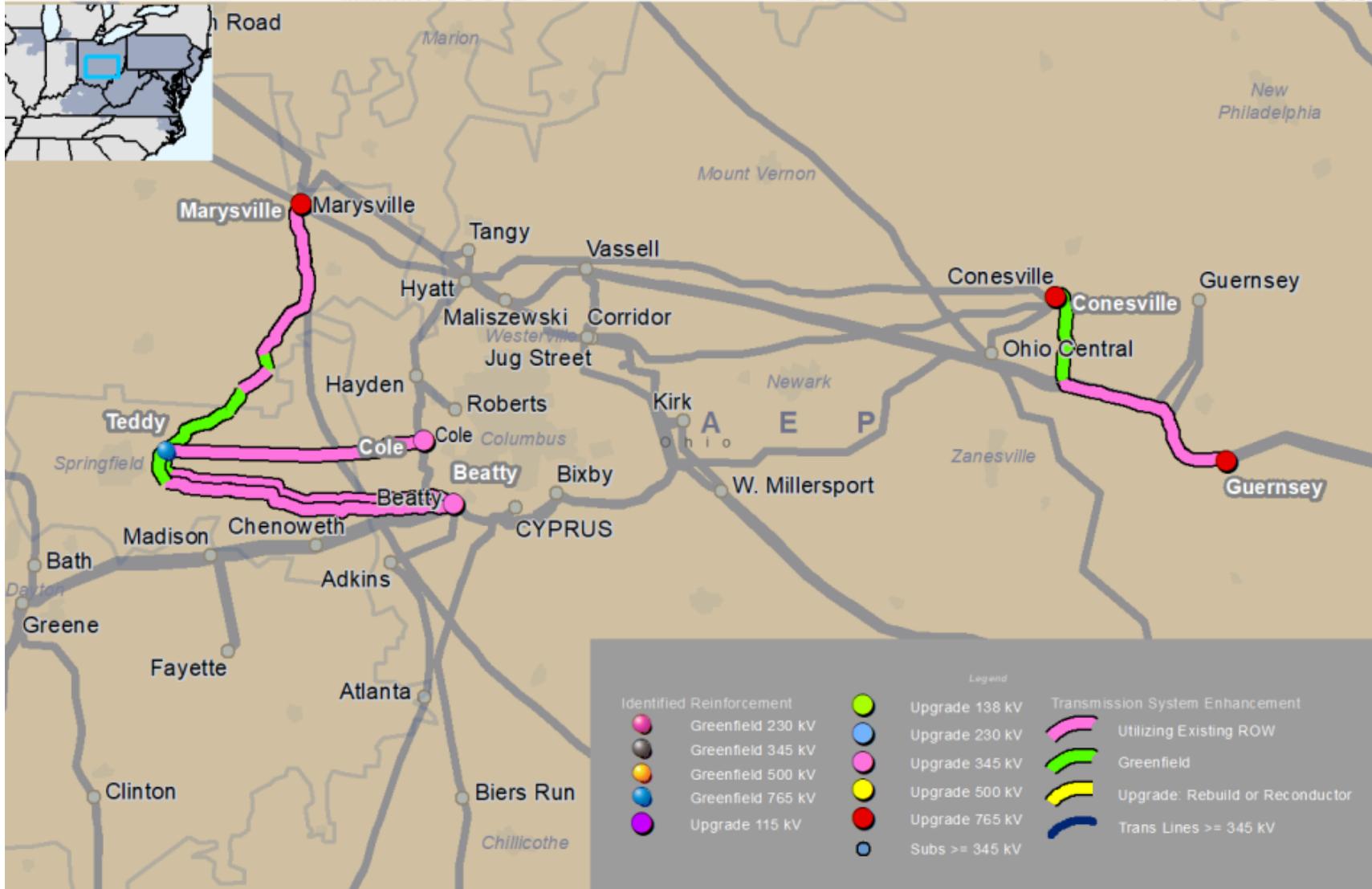
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TRANSRC (Transource)



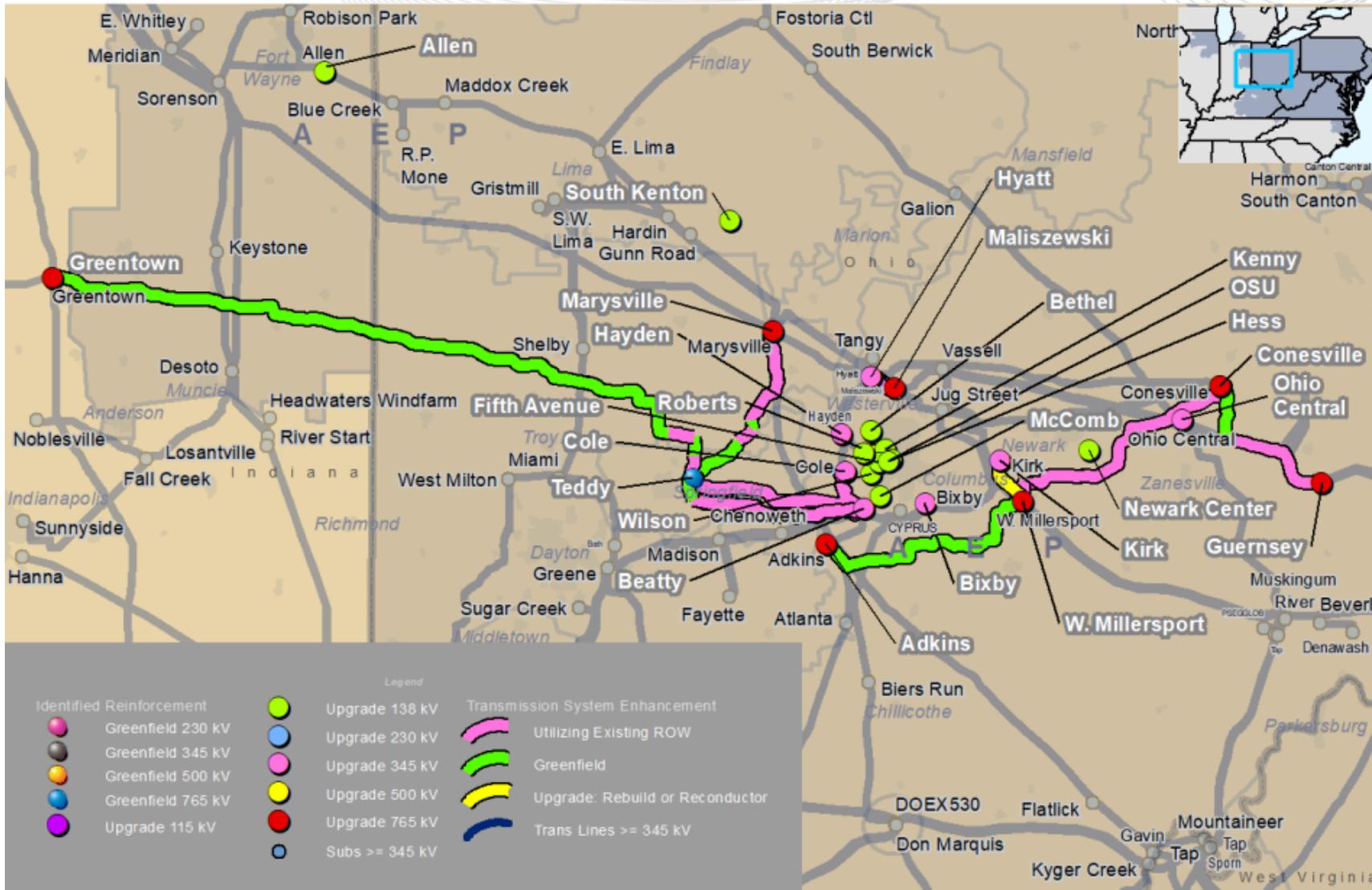


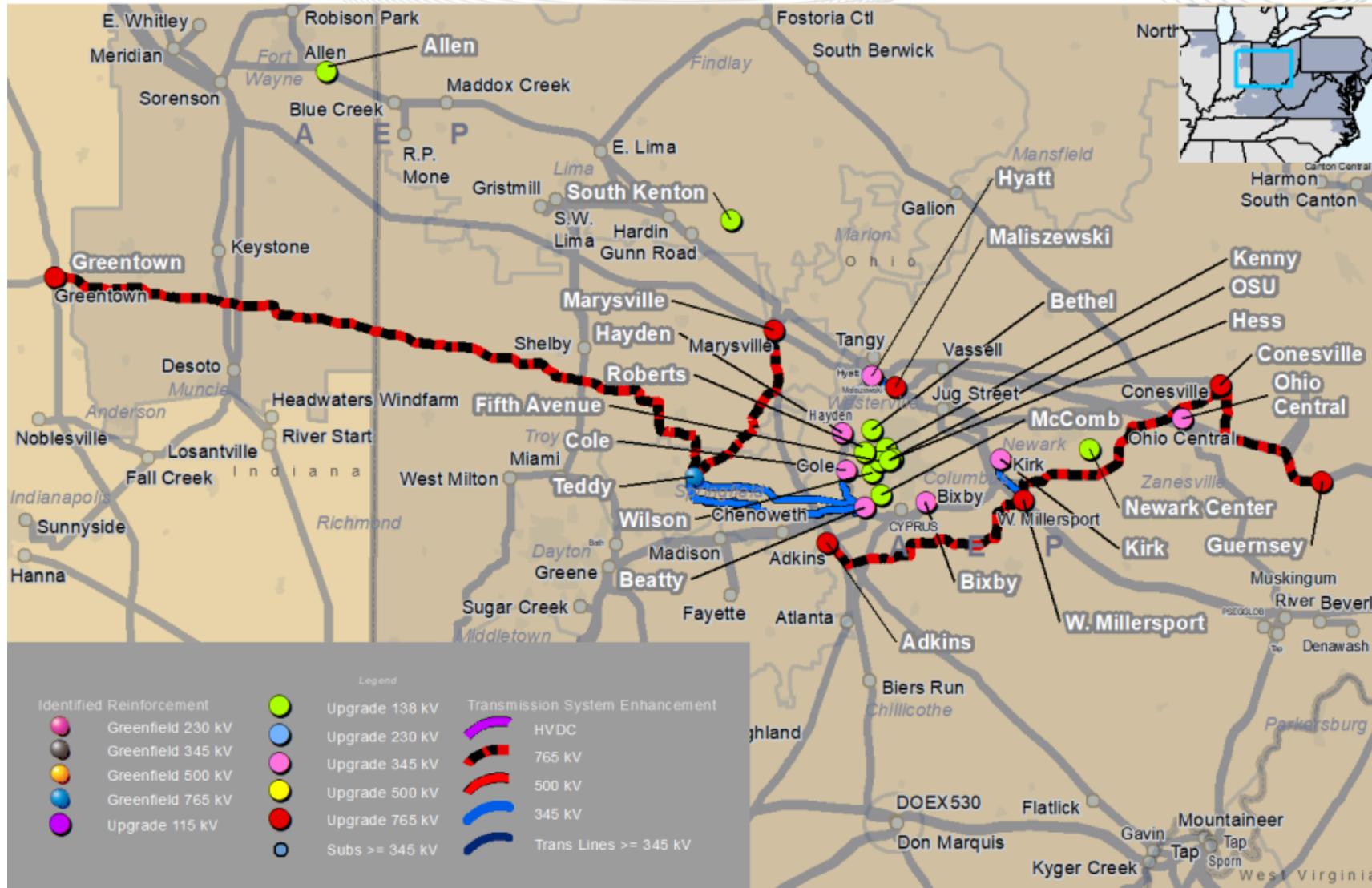


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TRAIL (FirstEnergy)

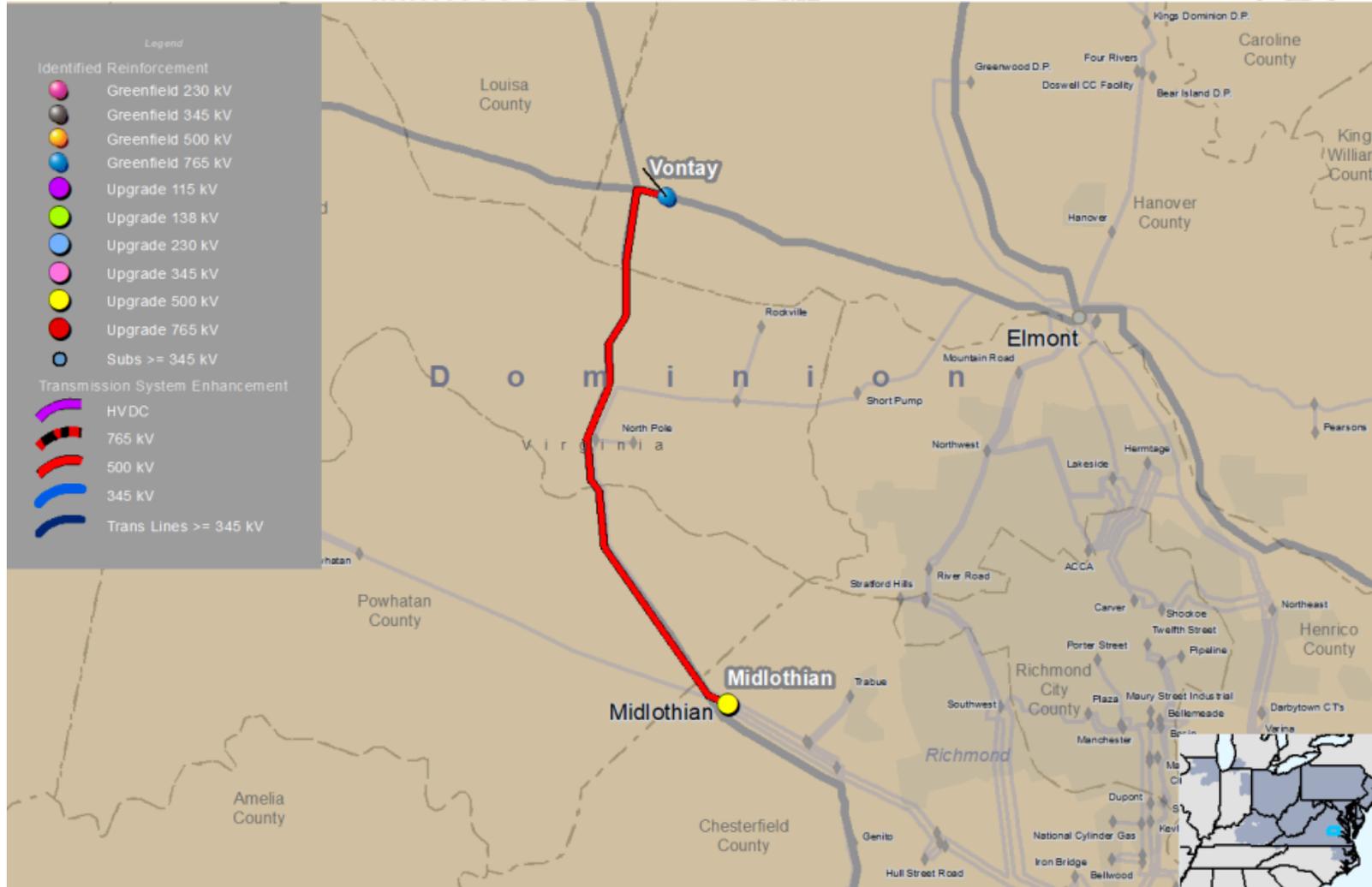


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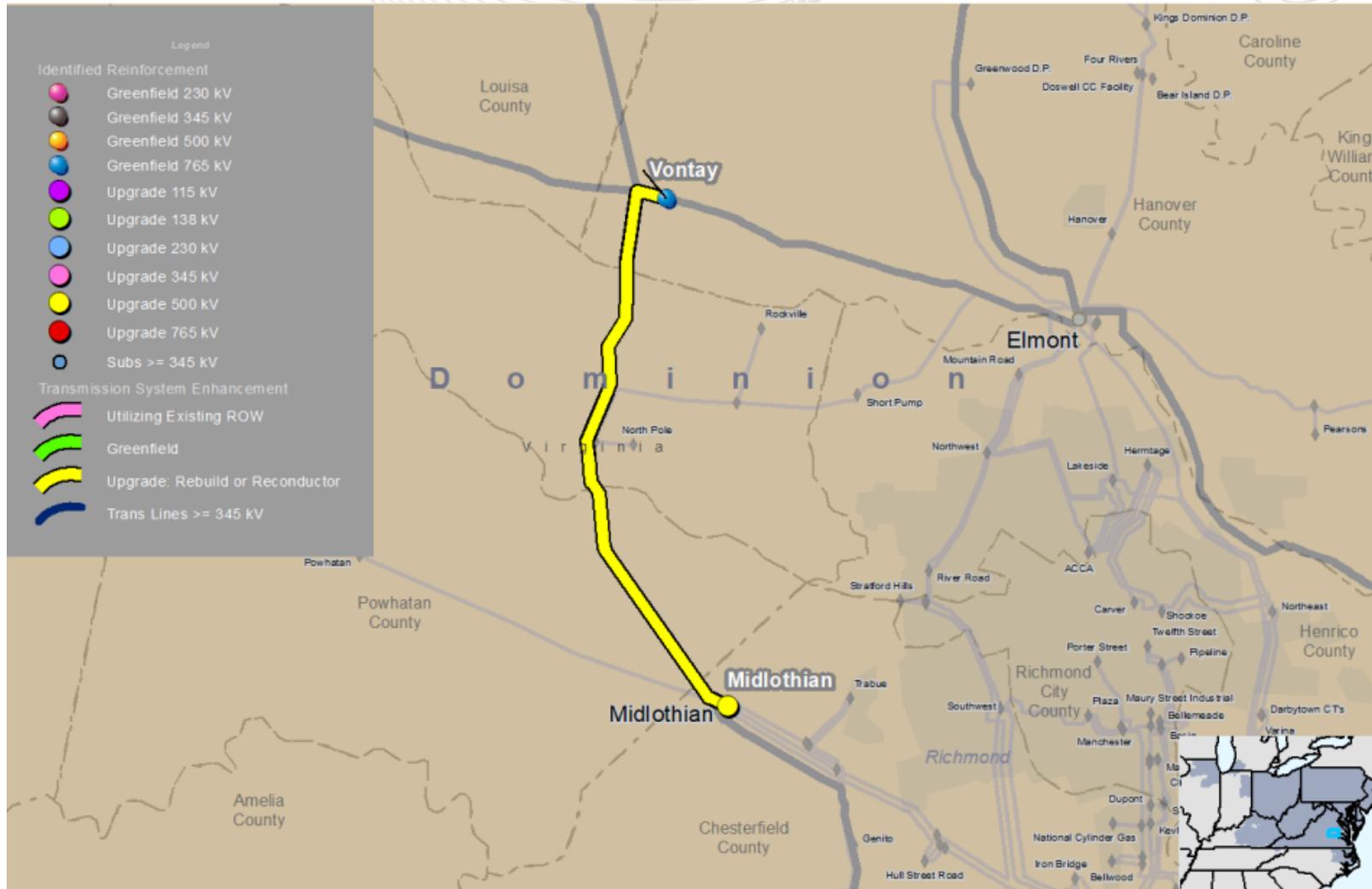


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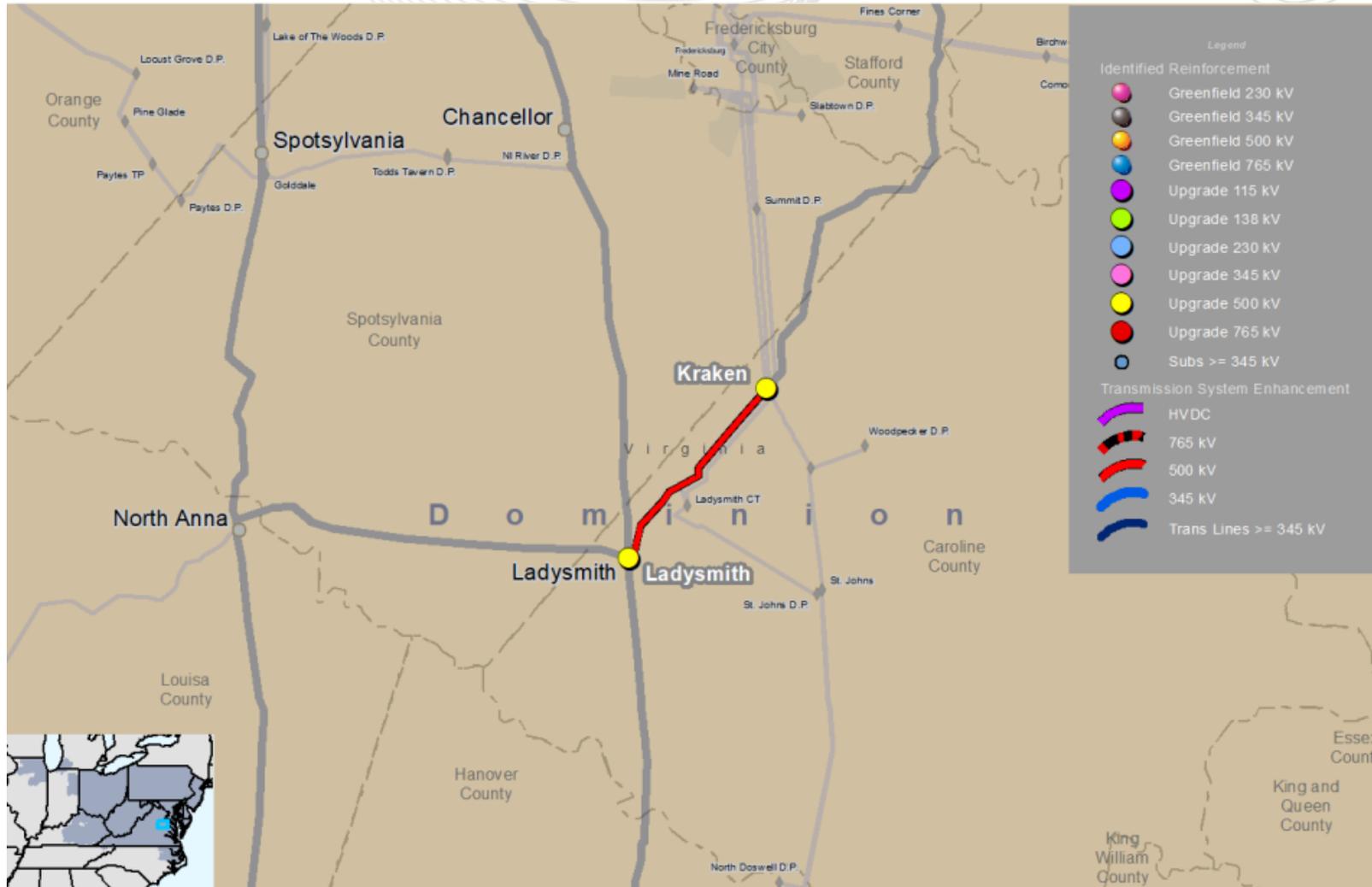
VEPCO (Dominion)



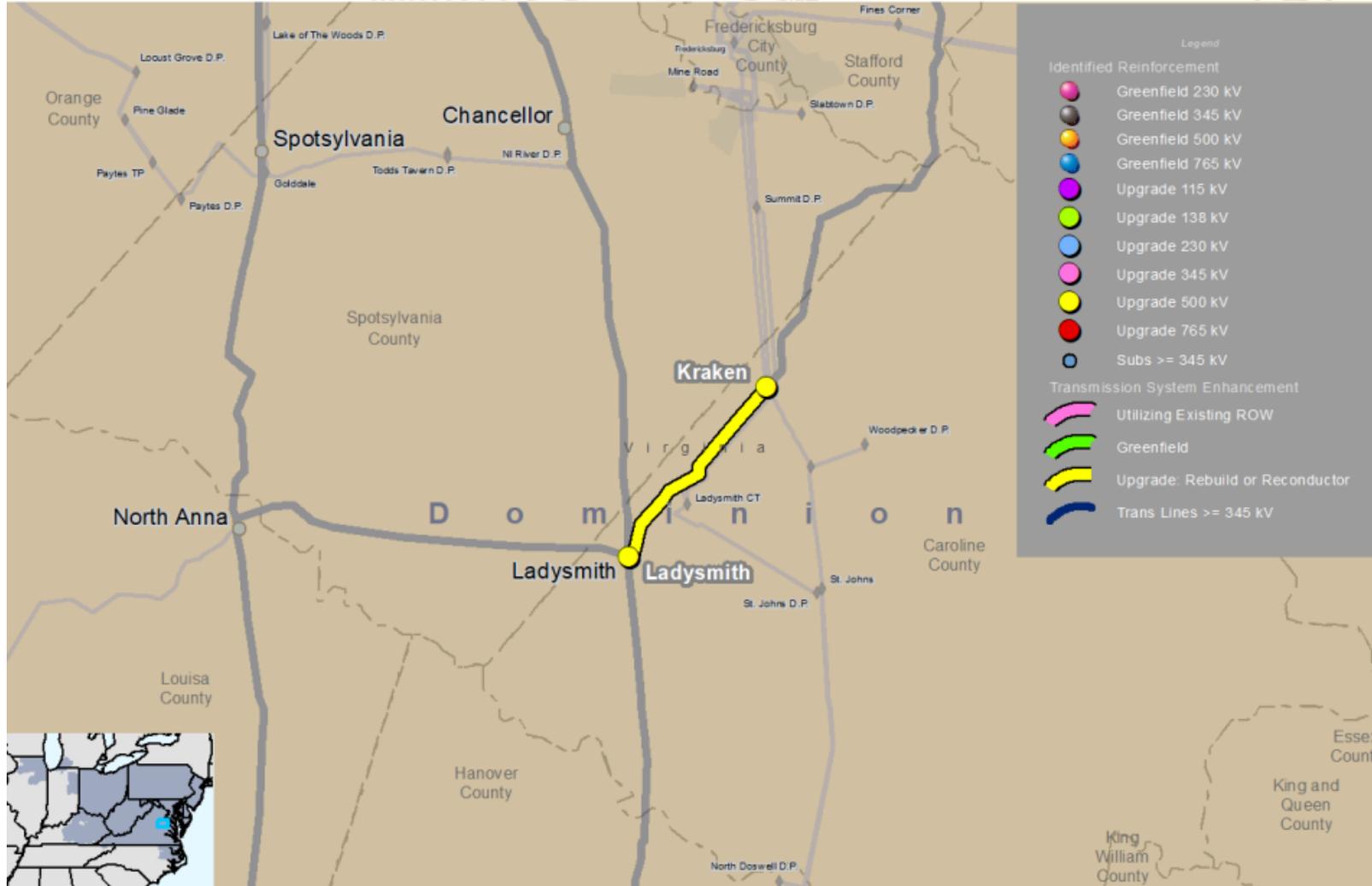
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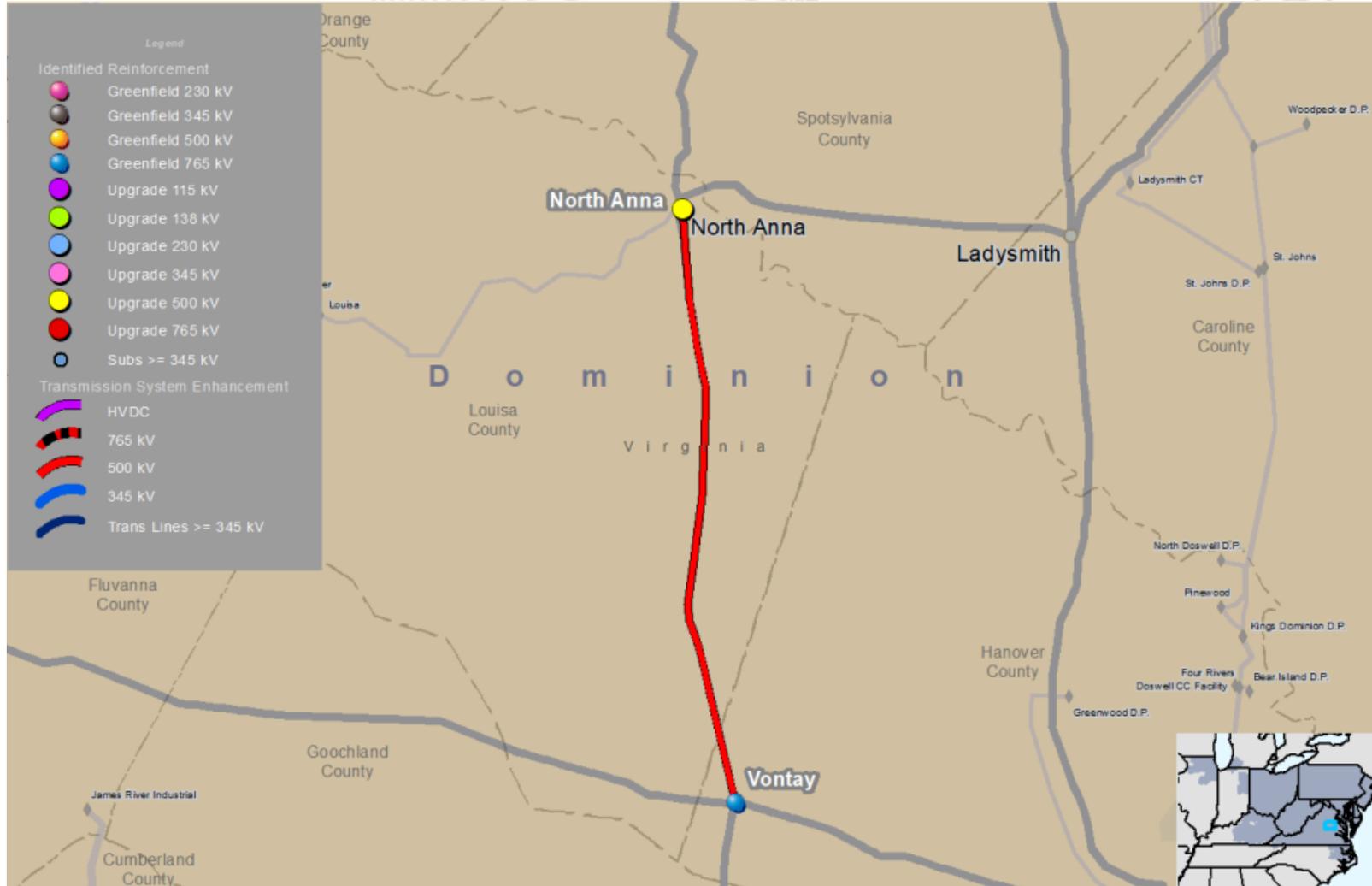
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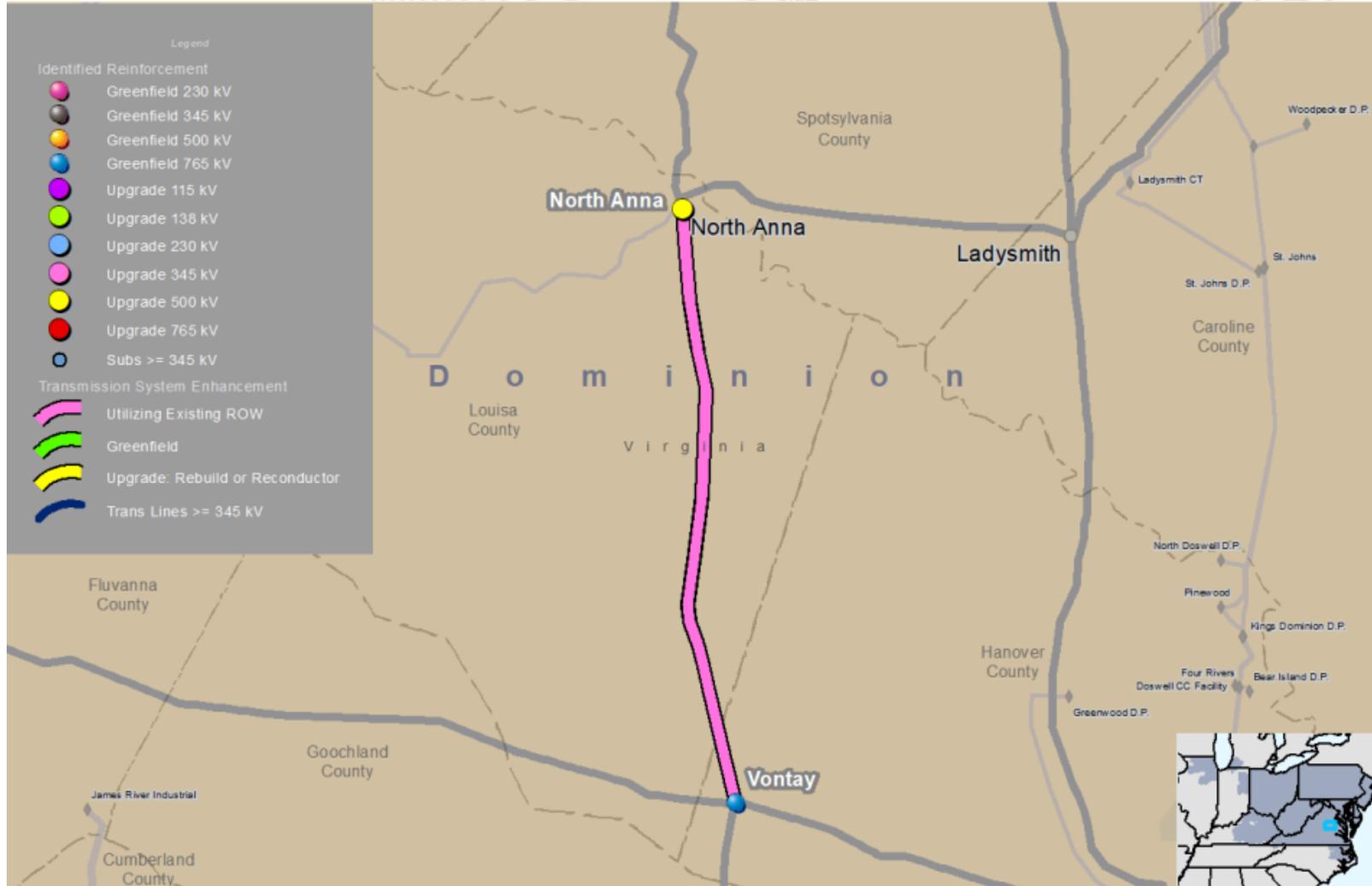
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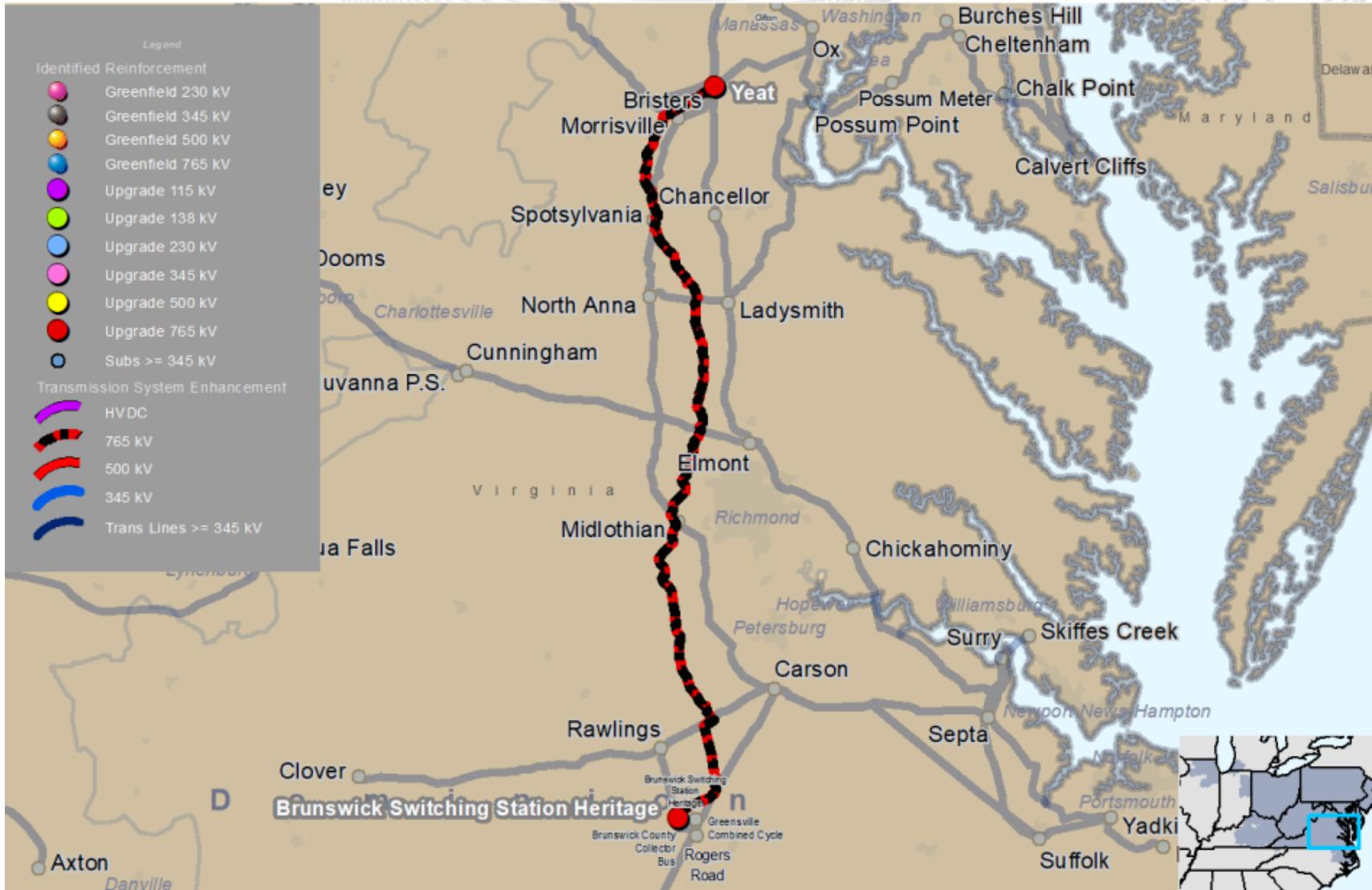
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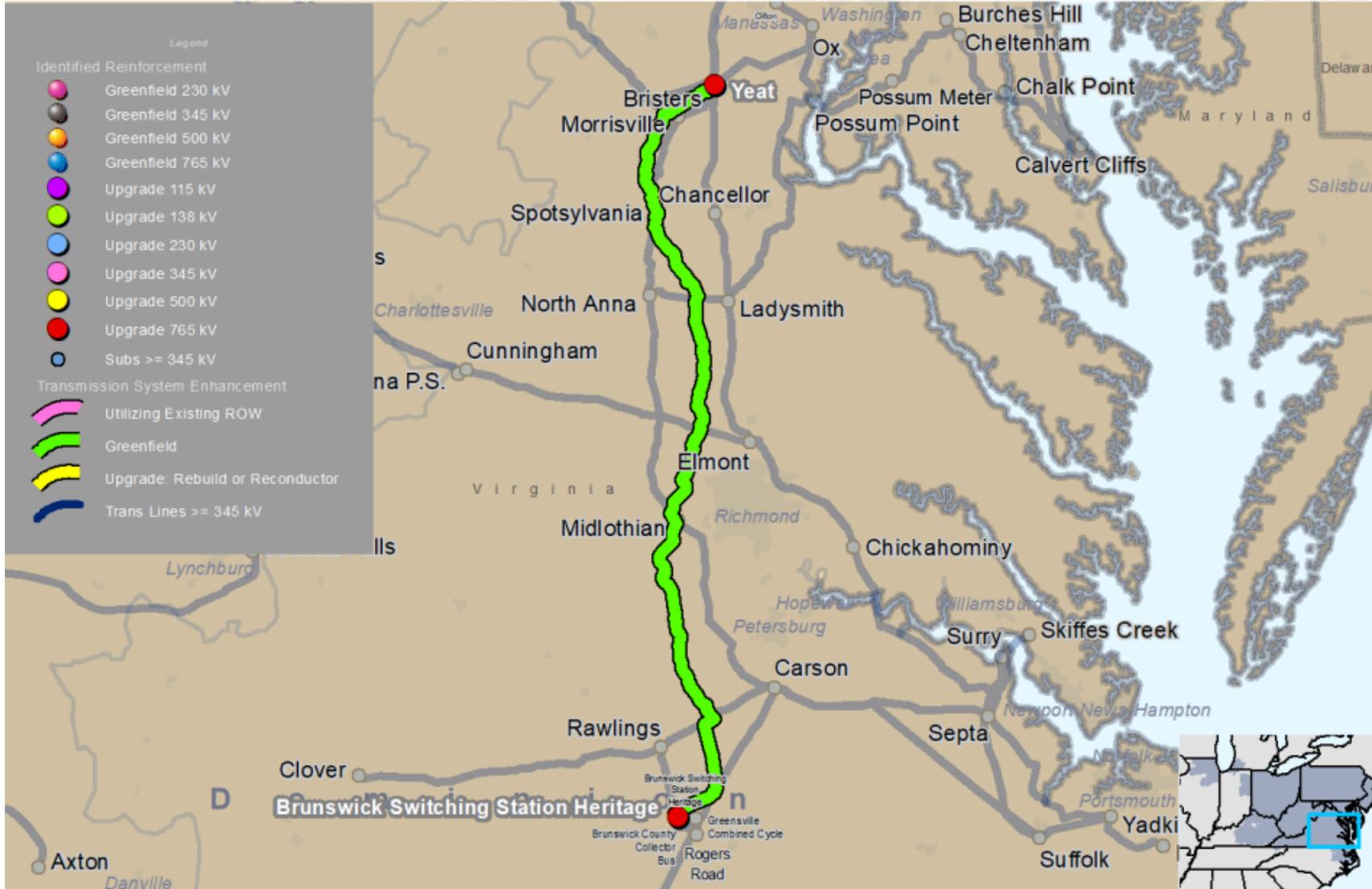


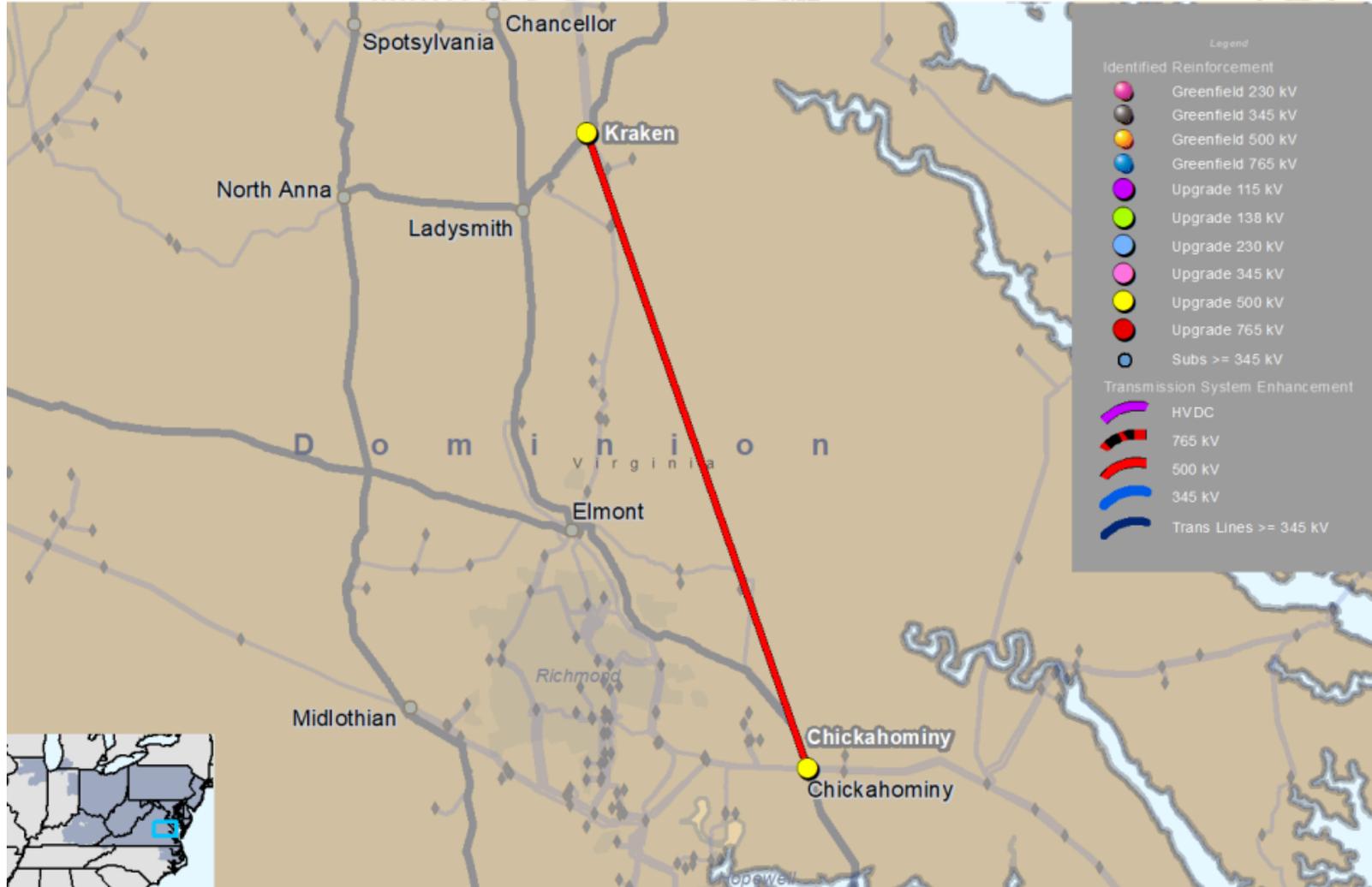
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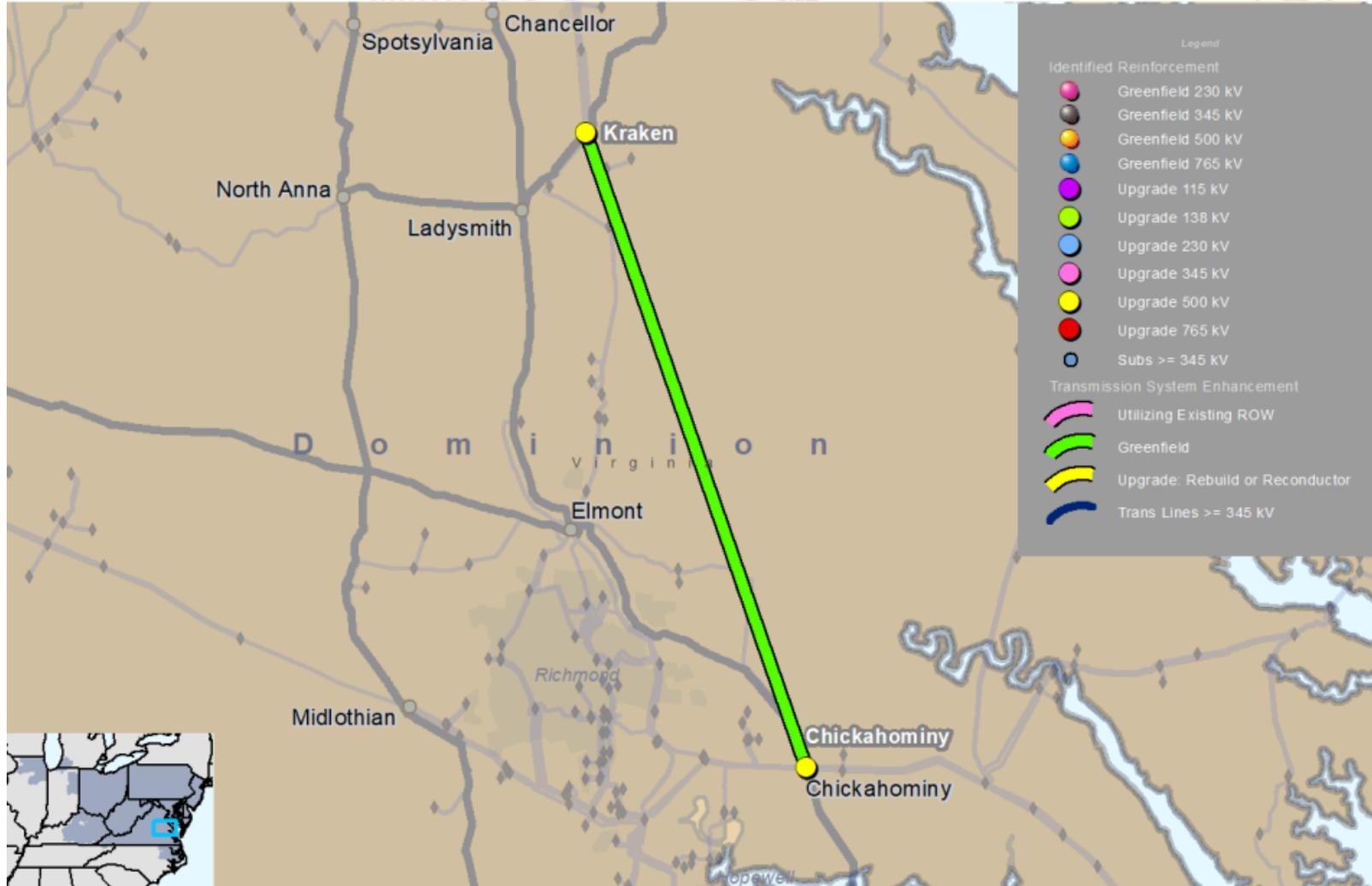
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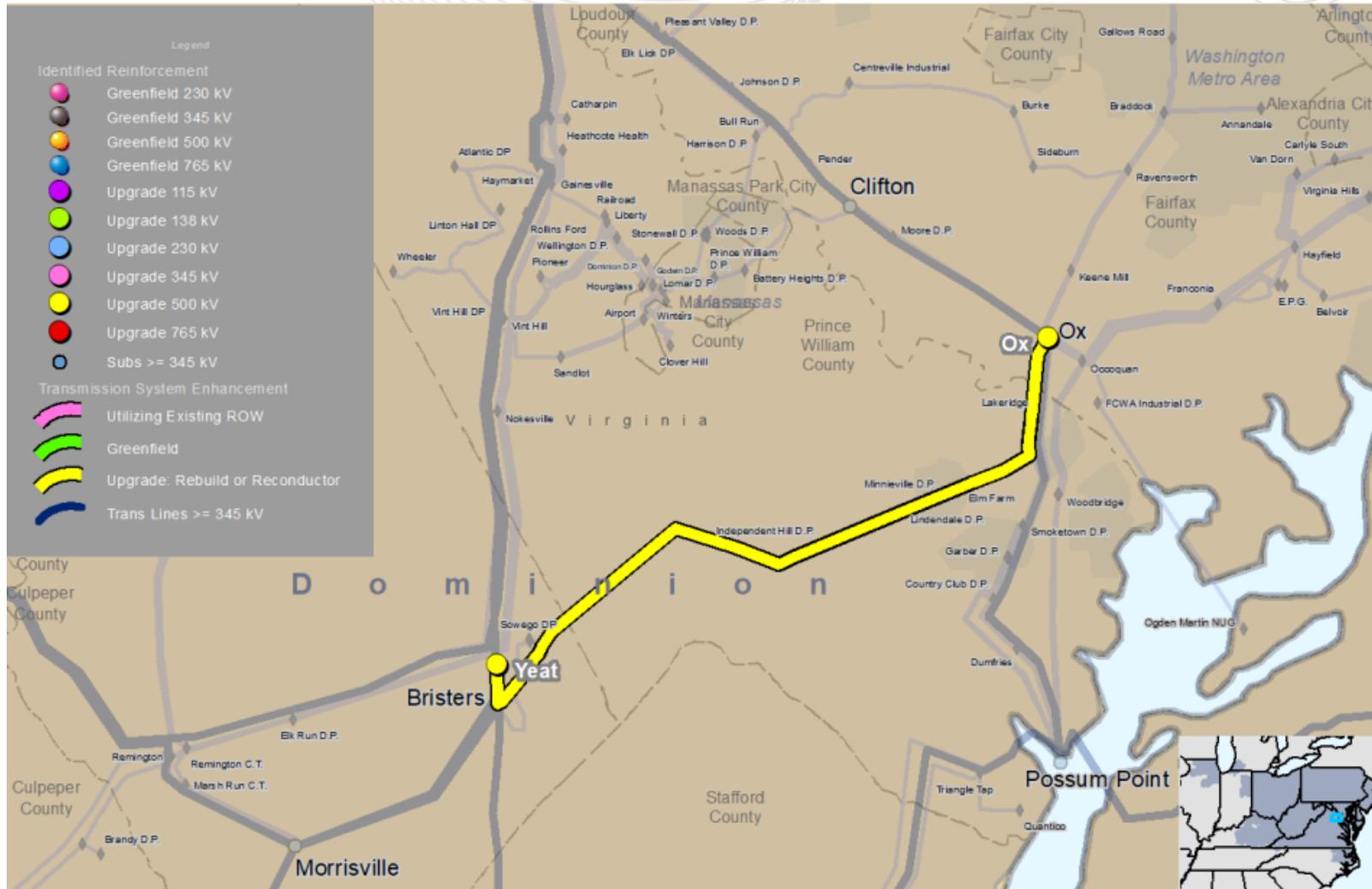
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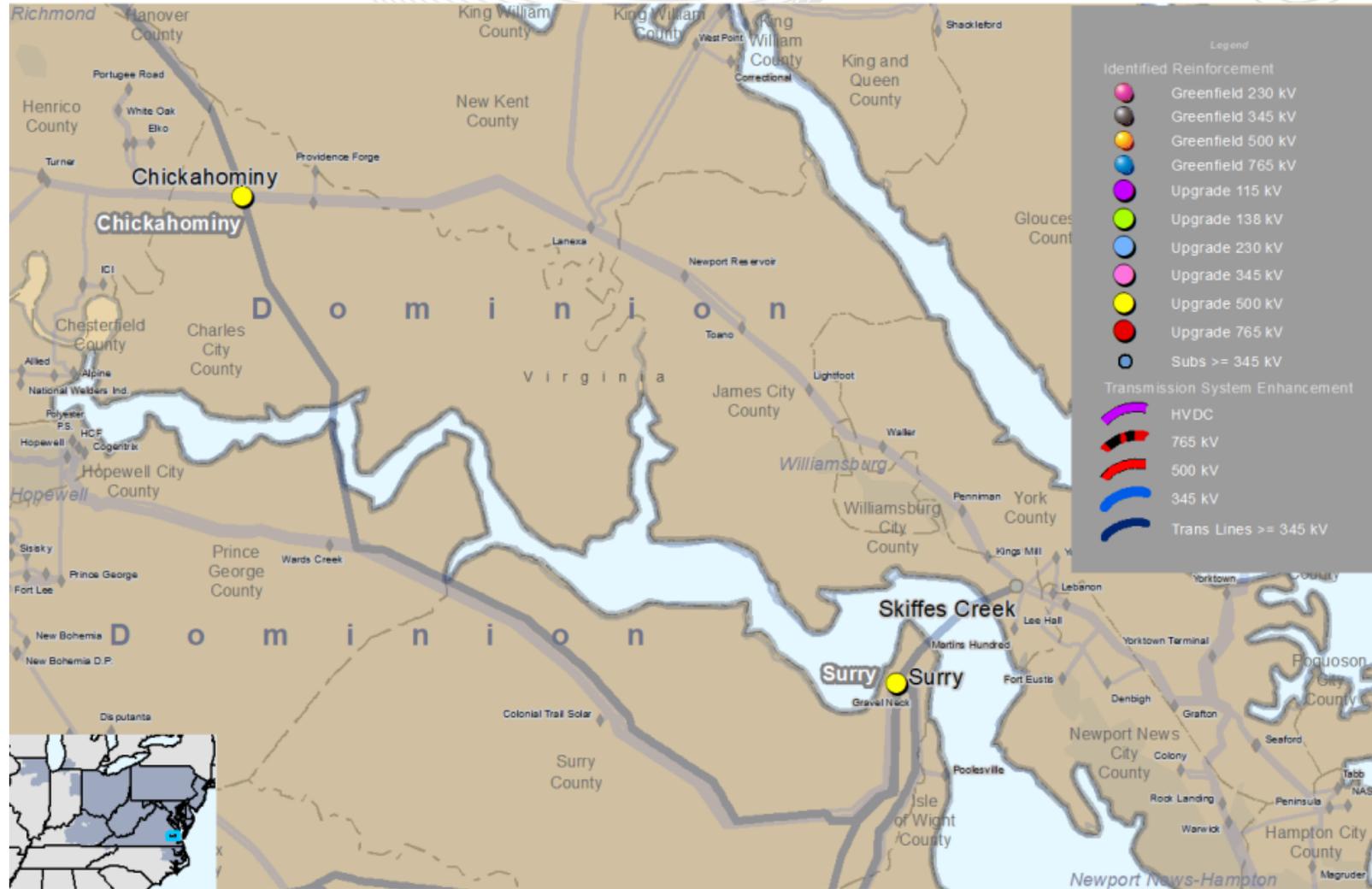
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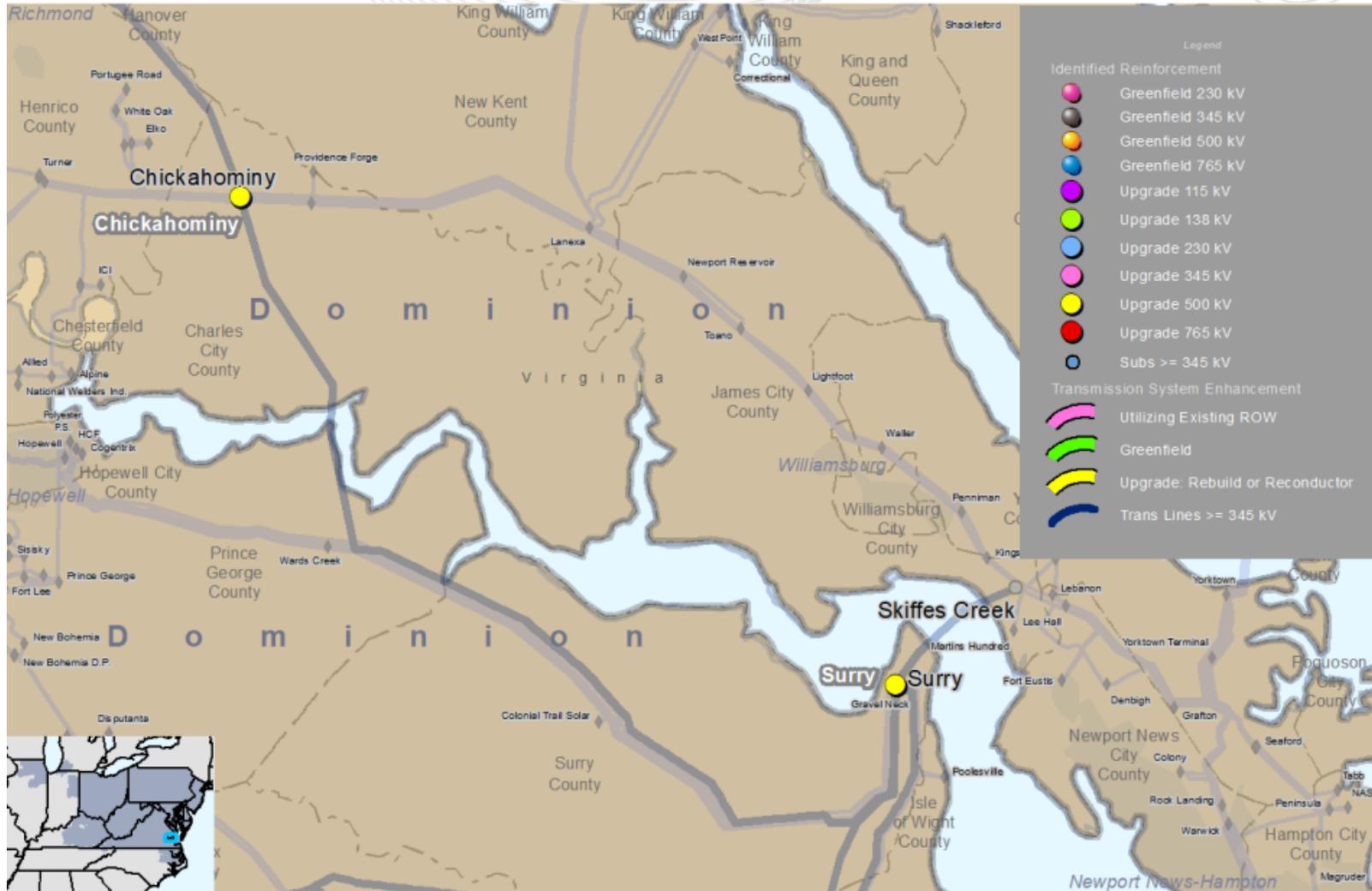
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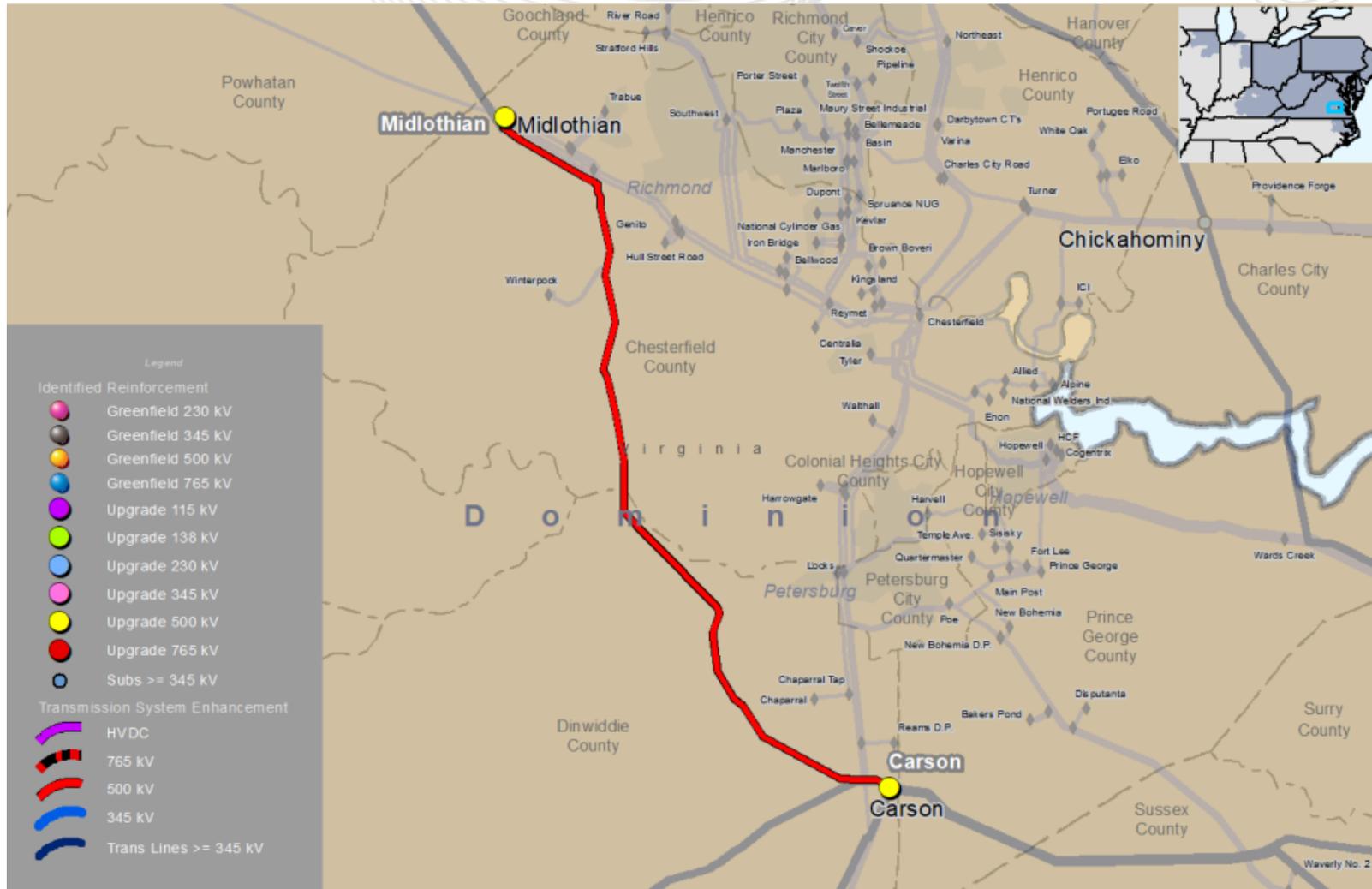
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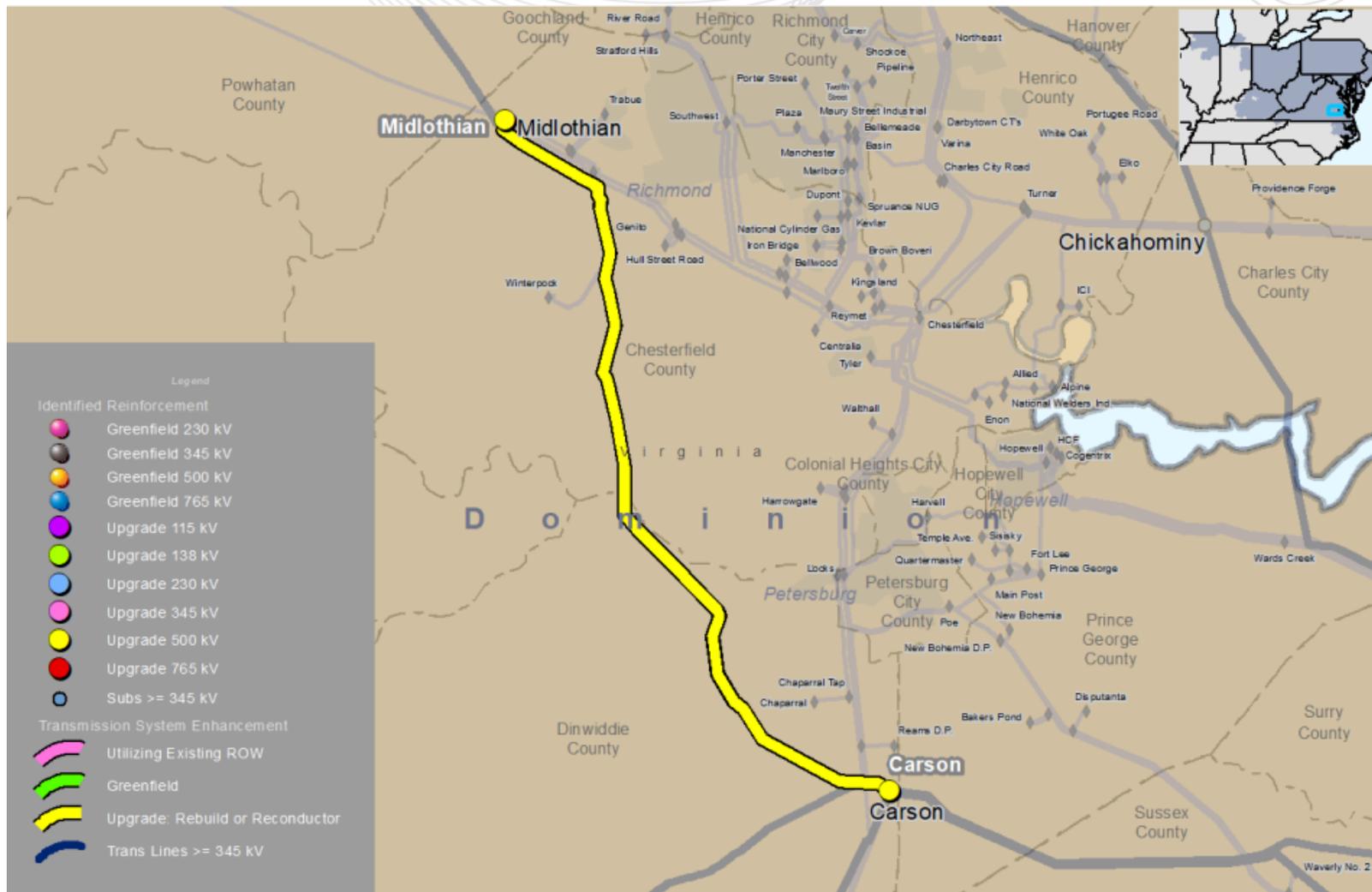
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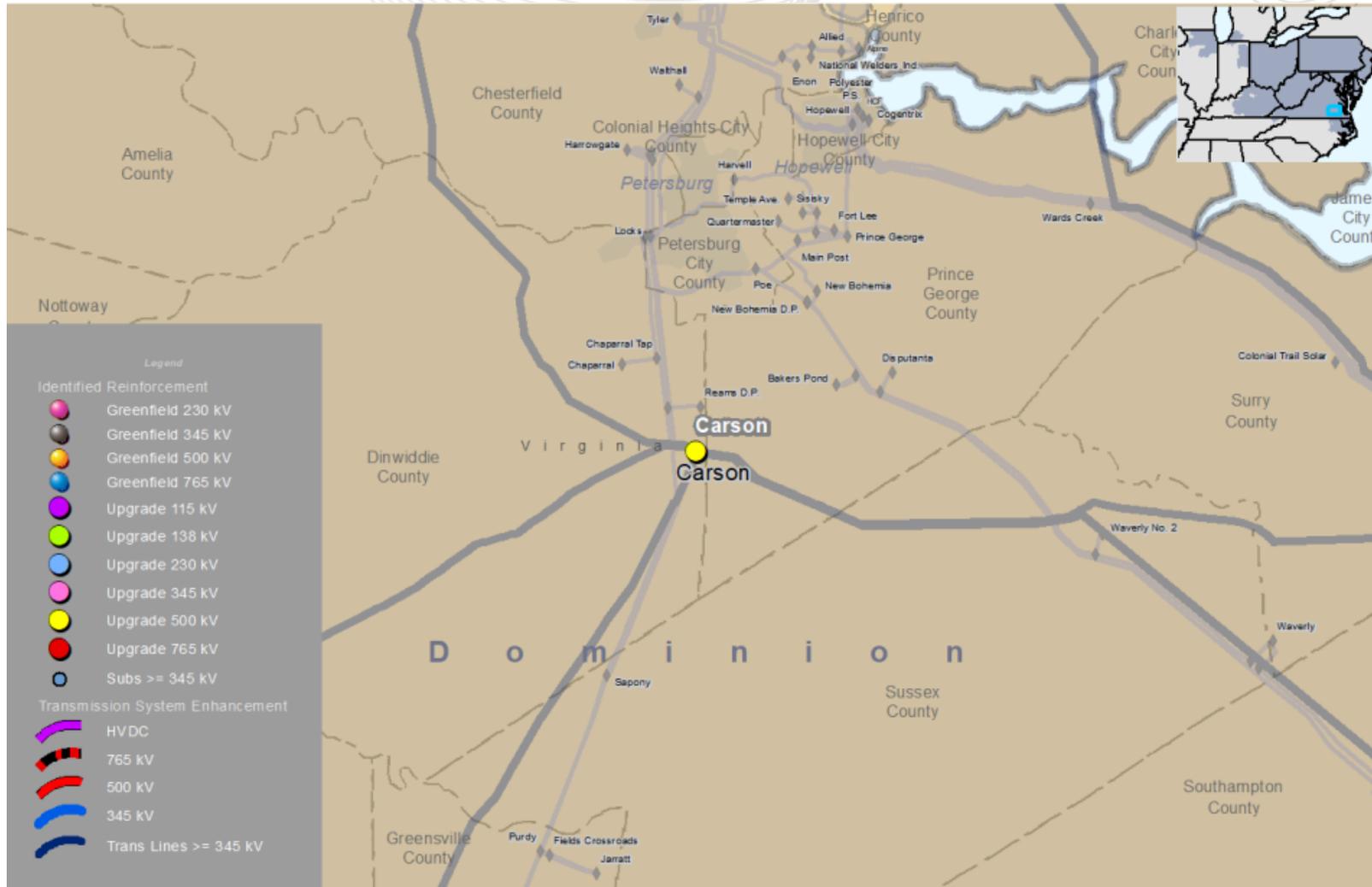
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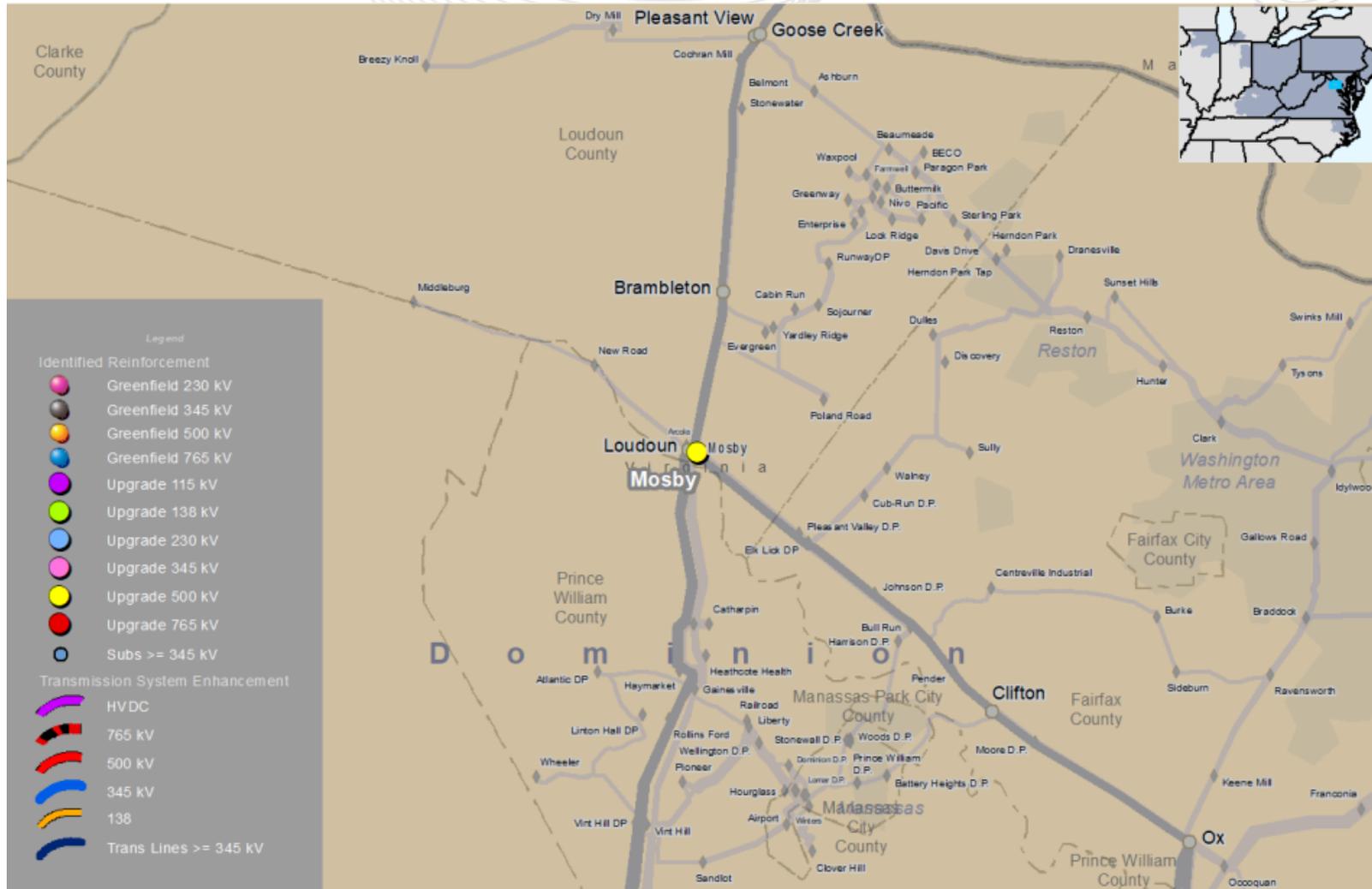
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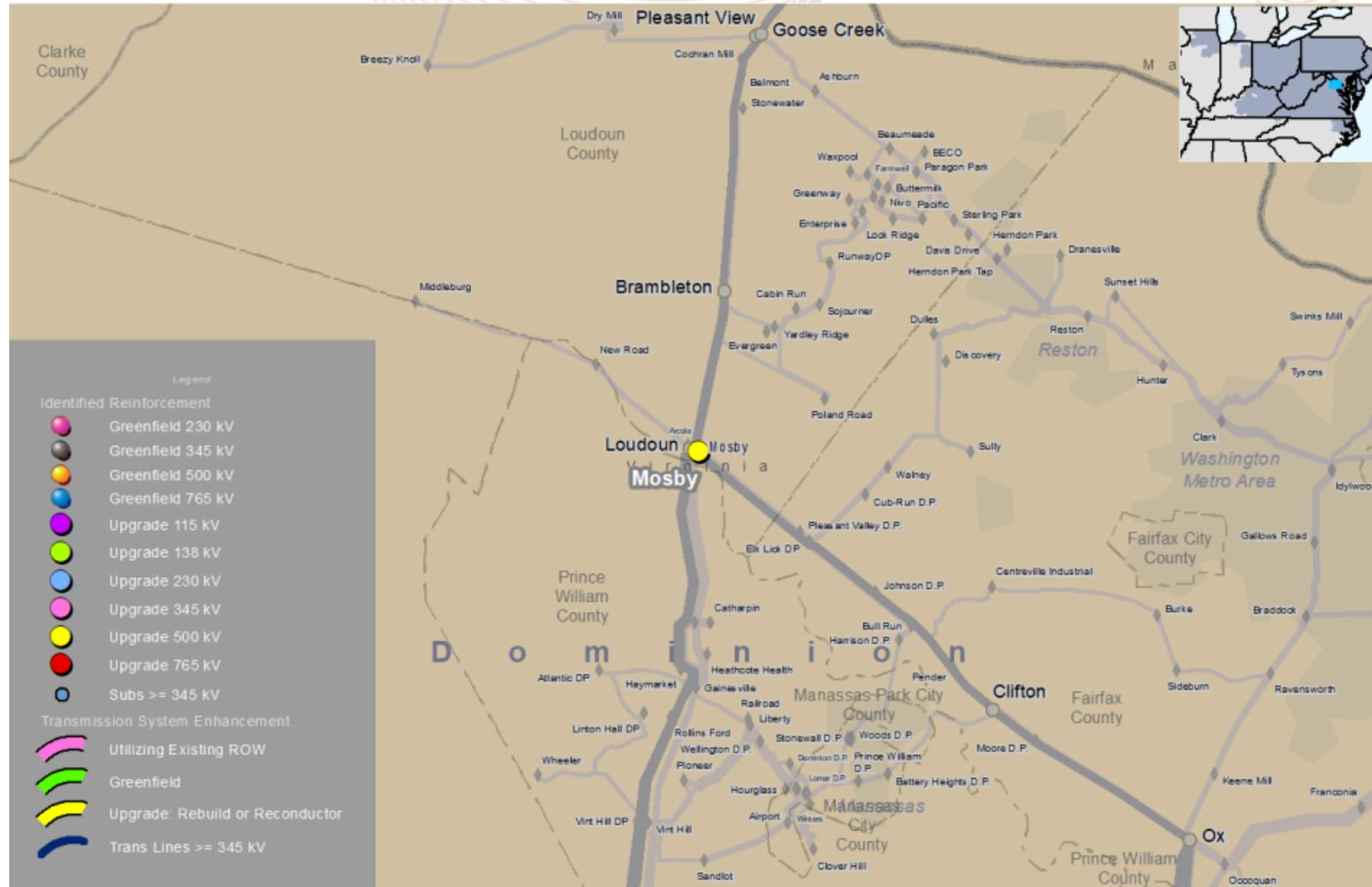
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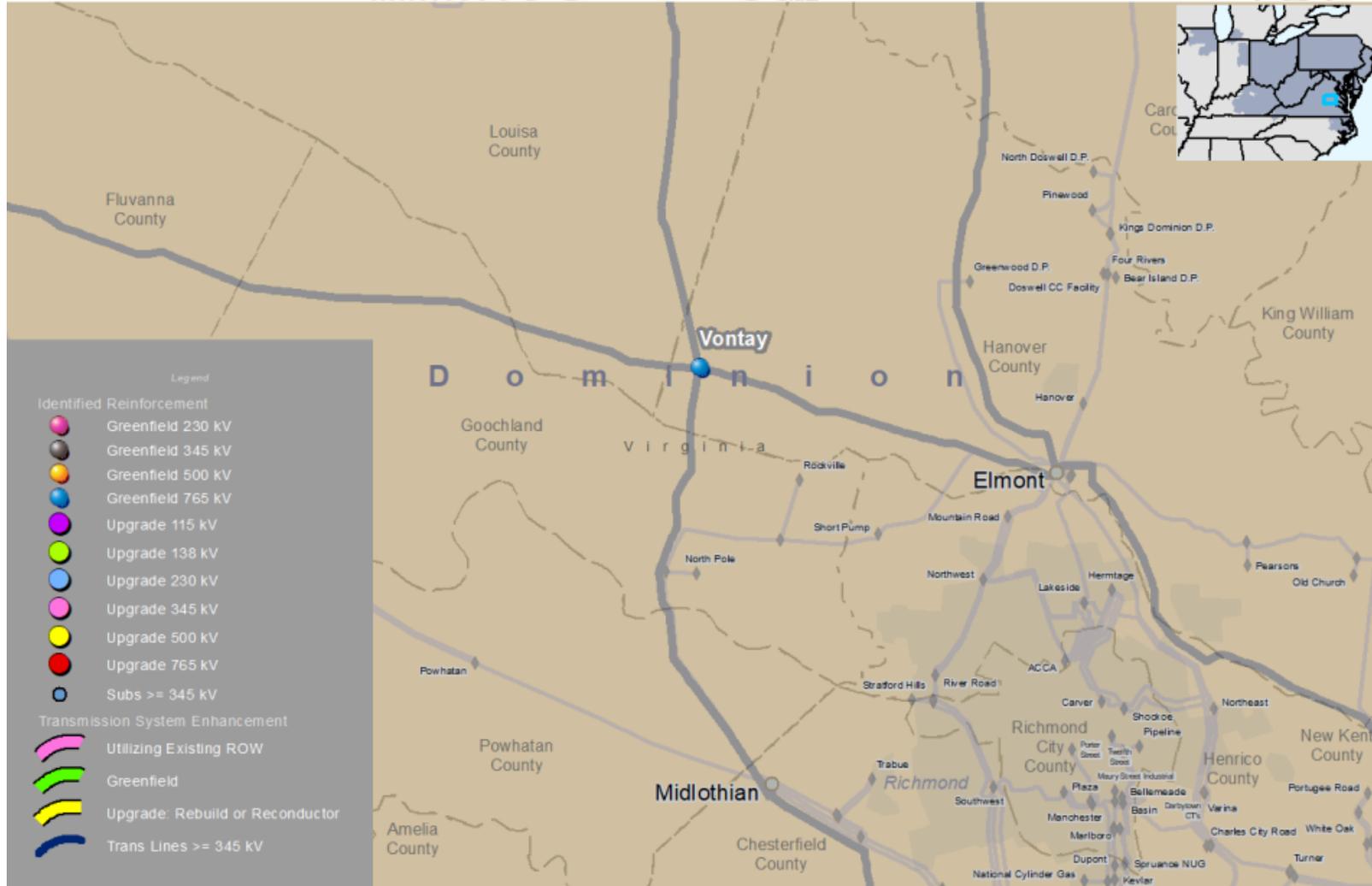
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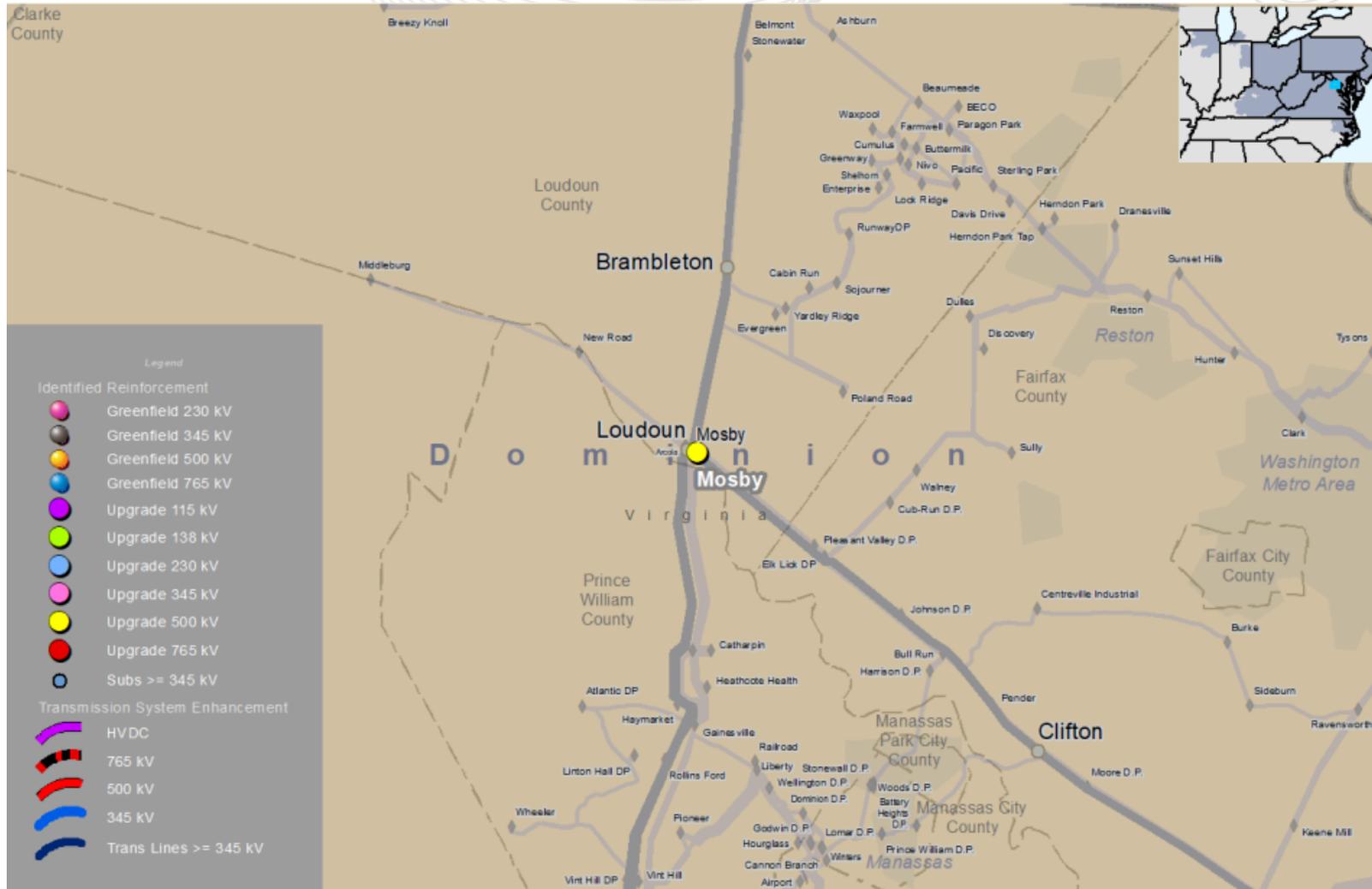
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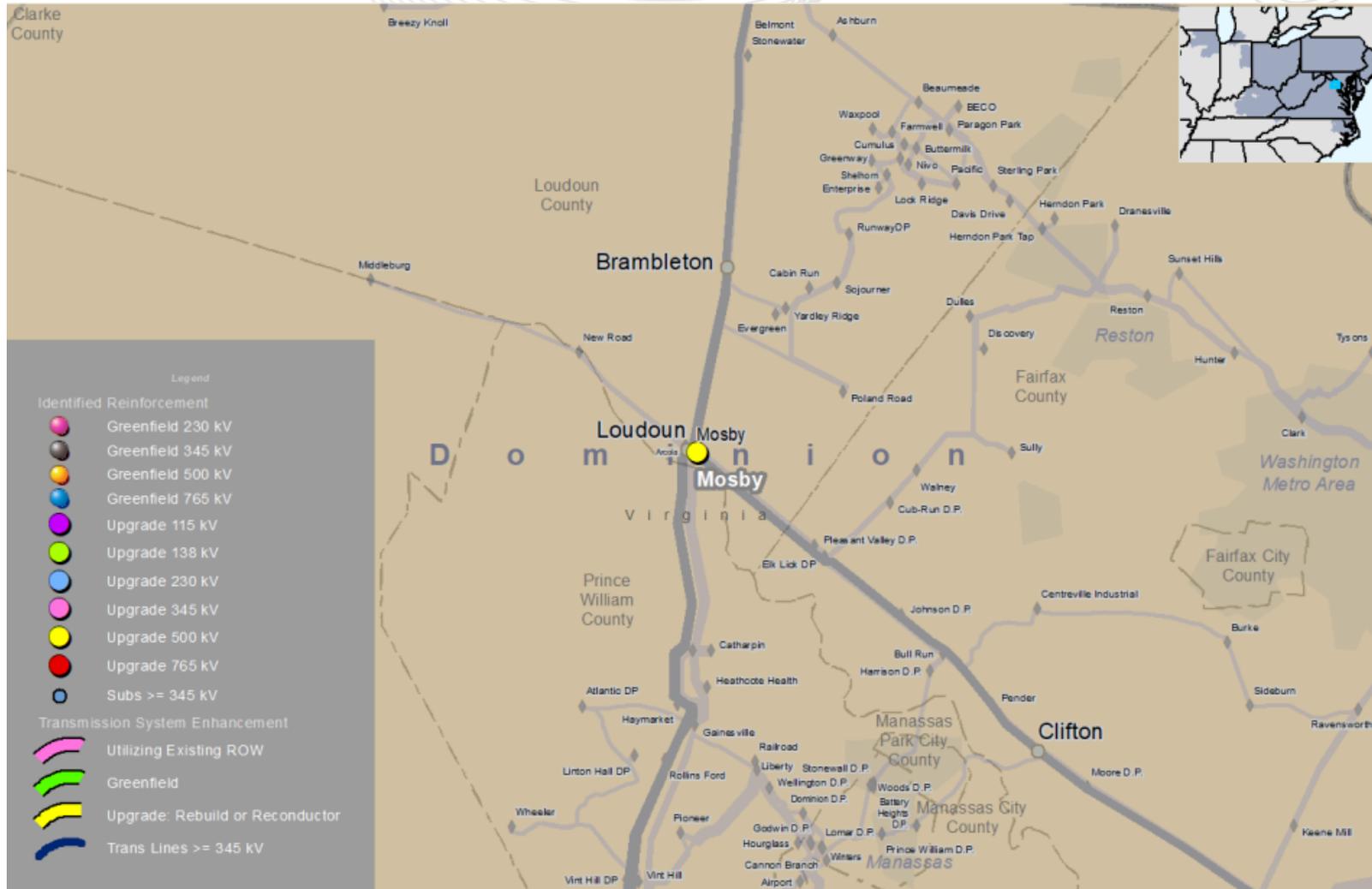
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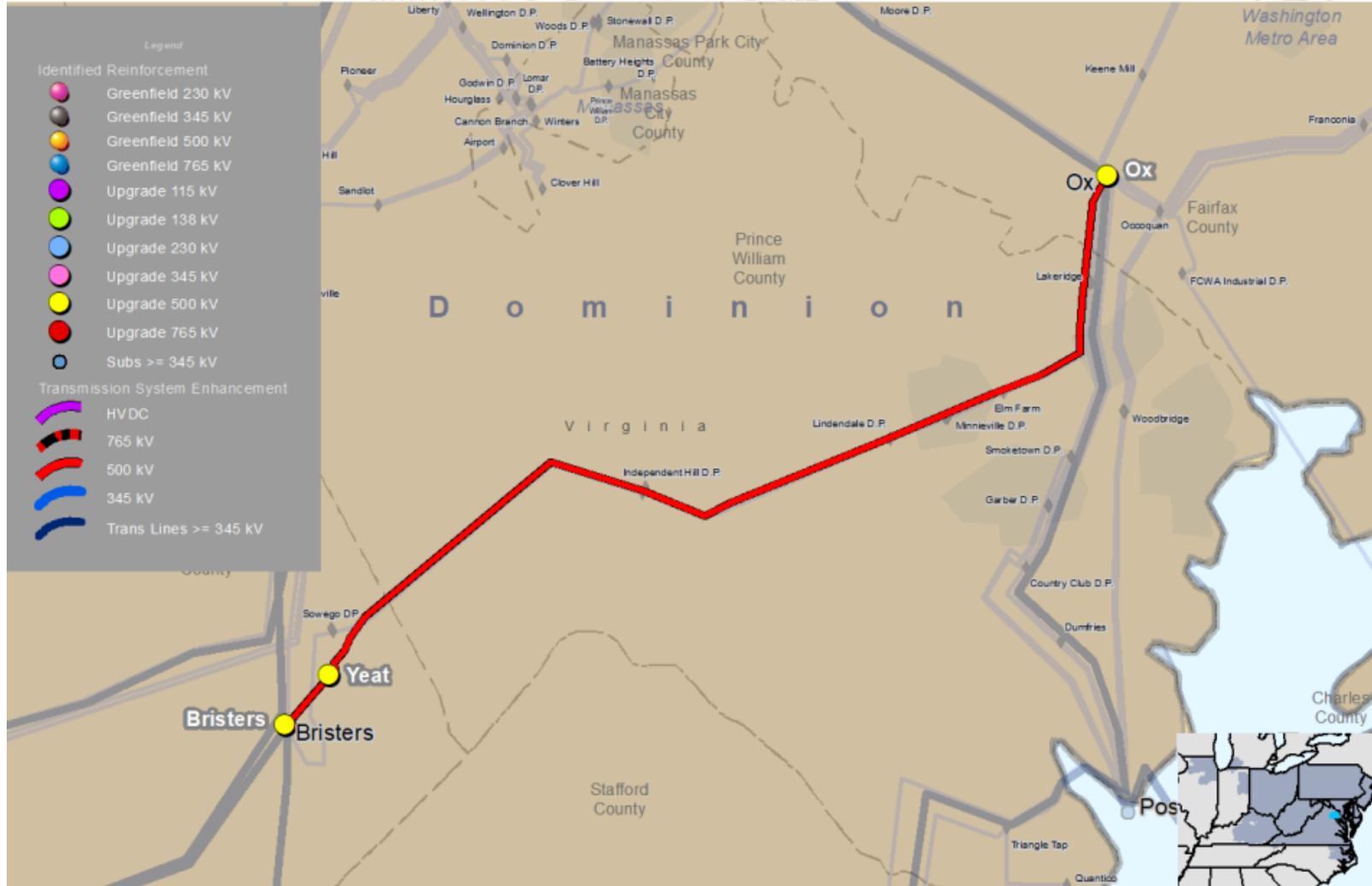
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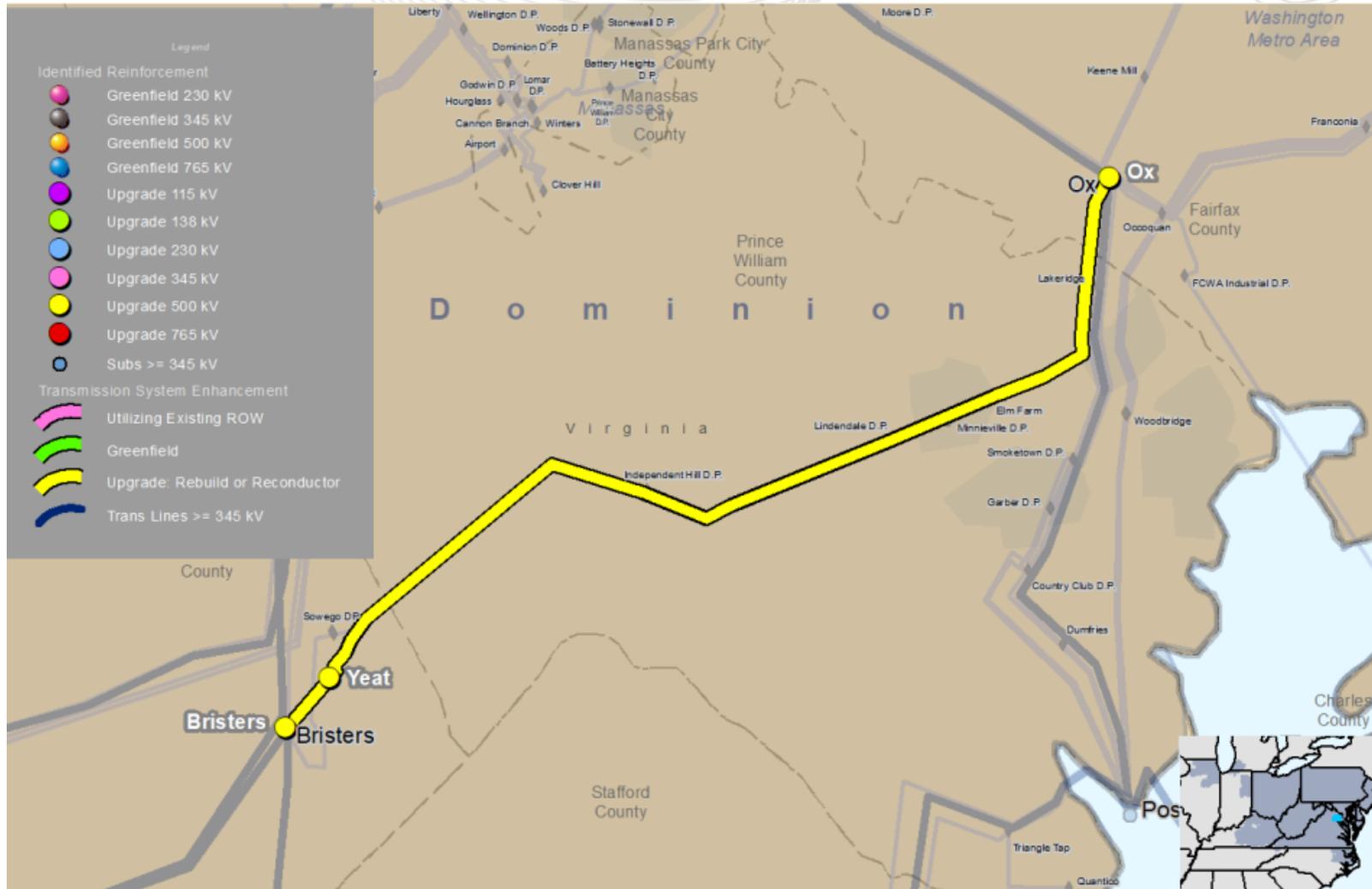
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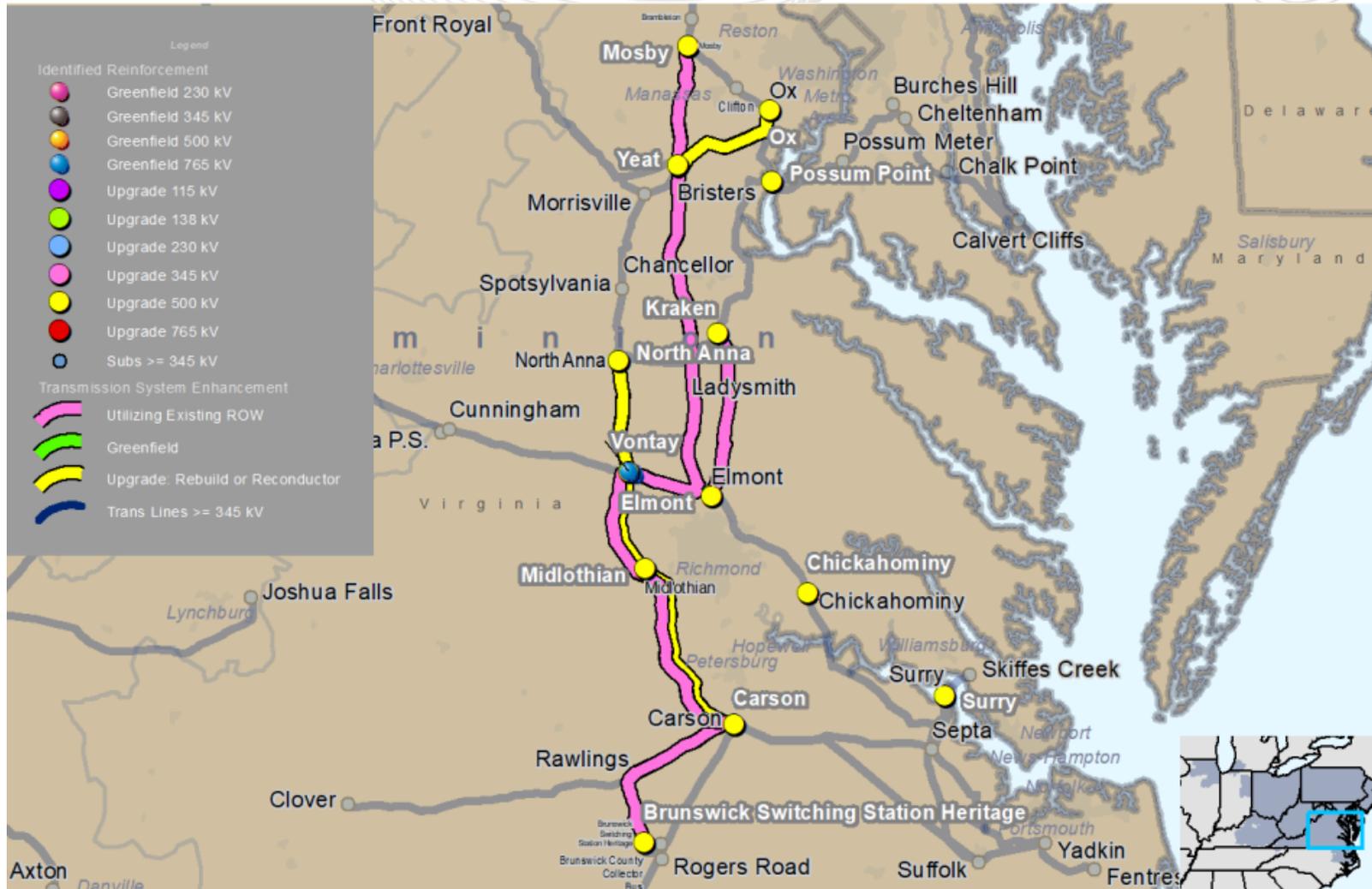
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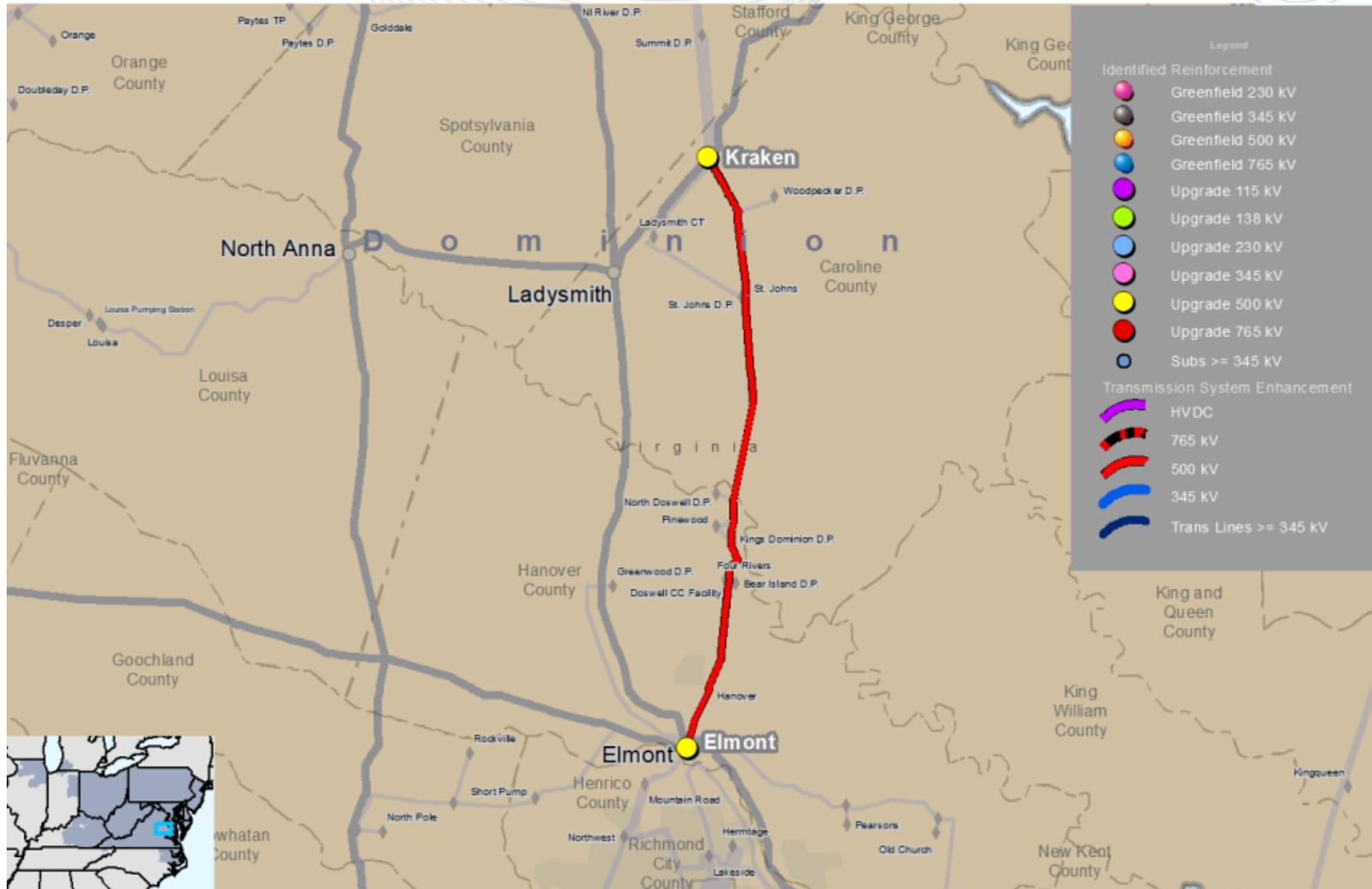
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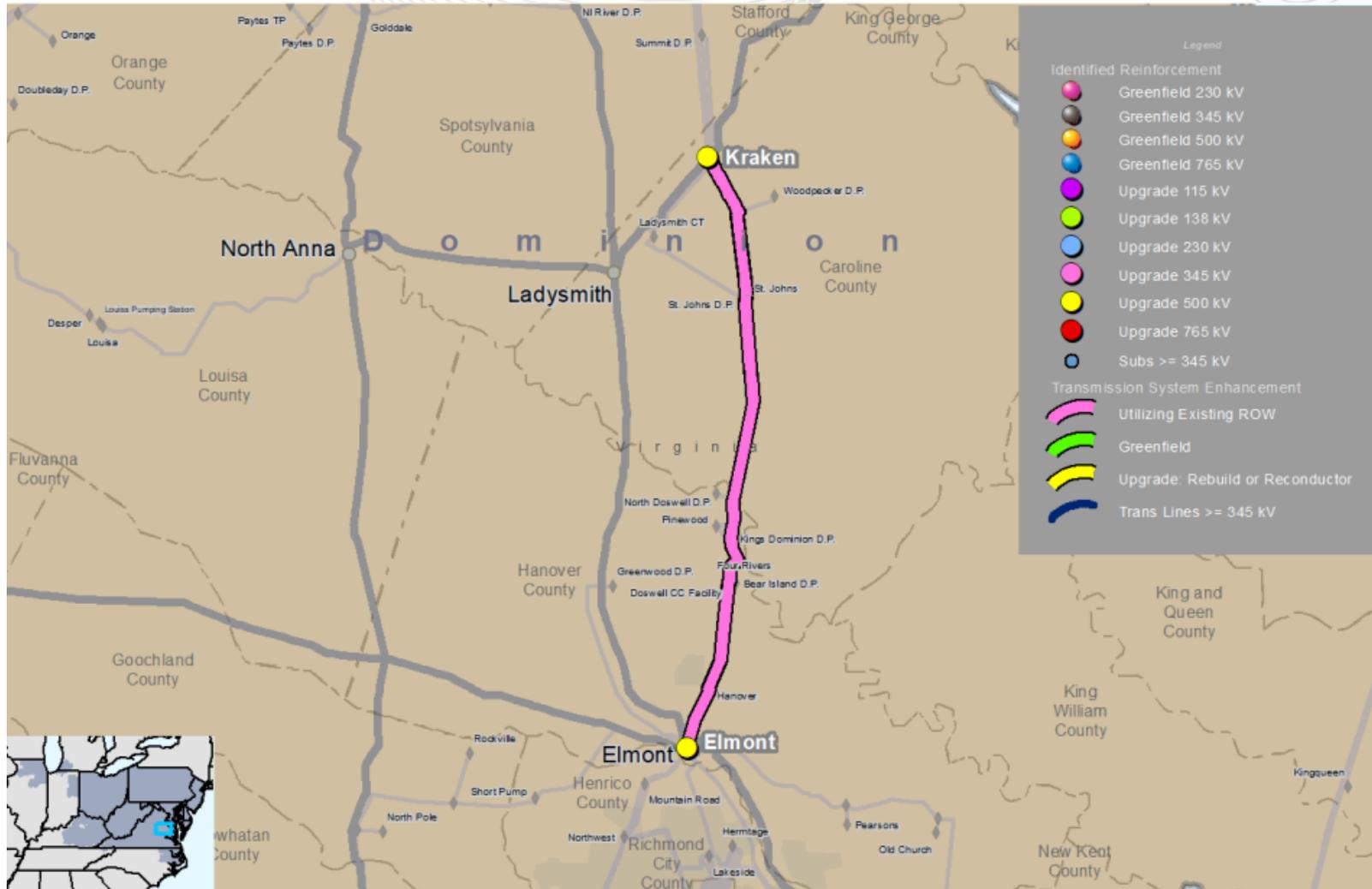
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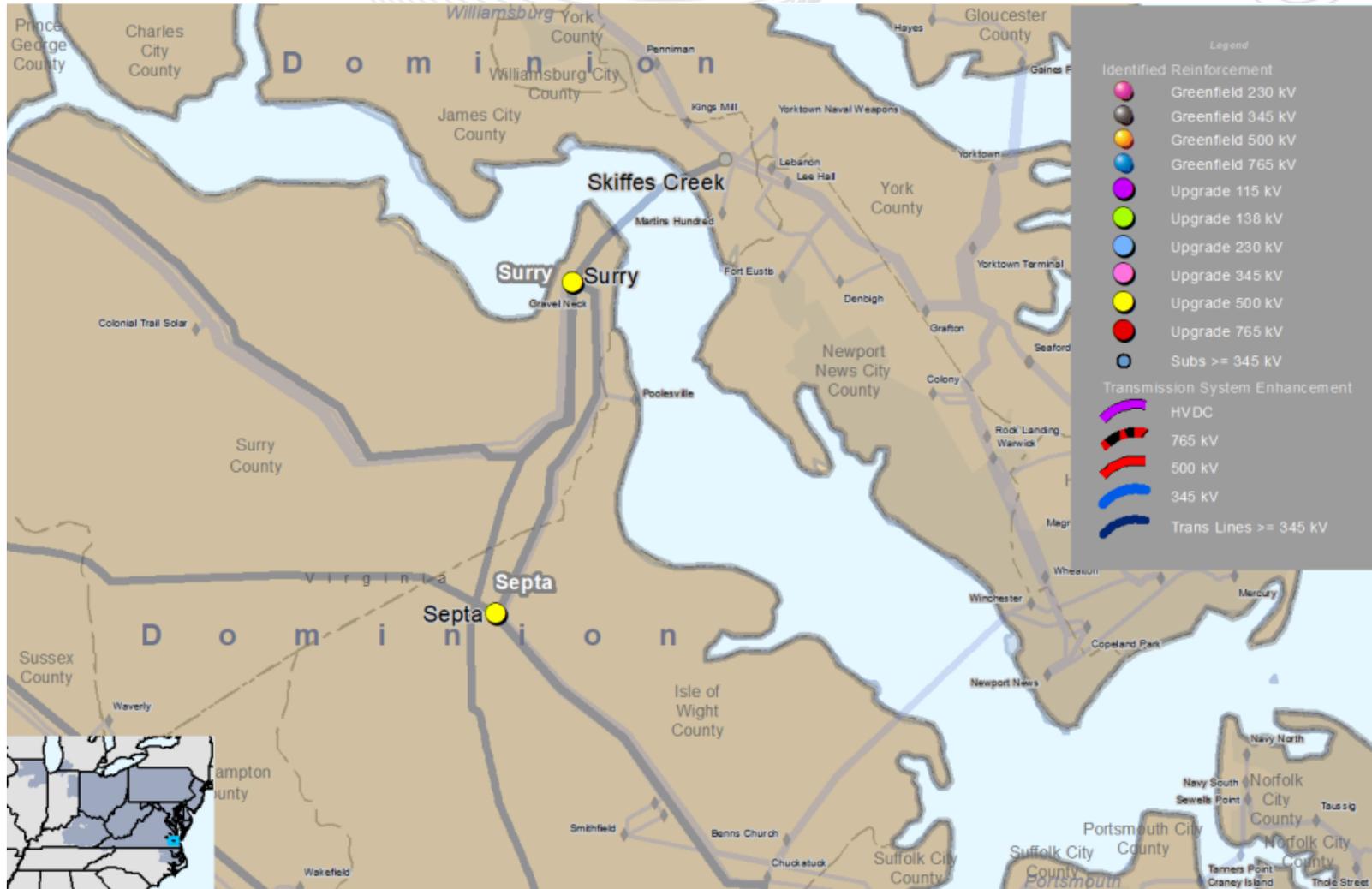
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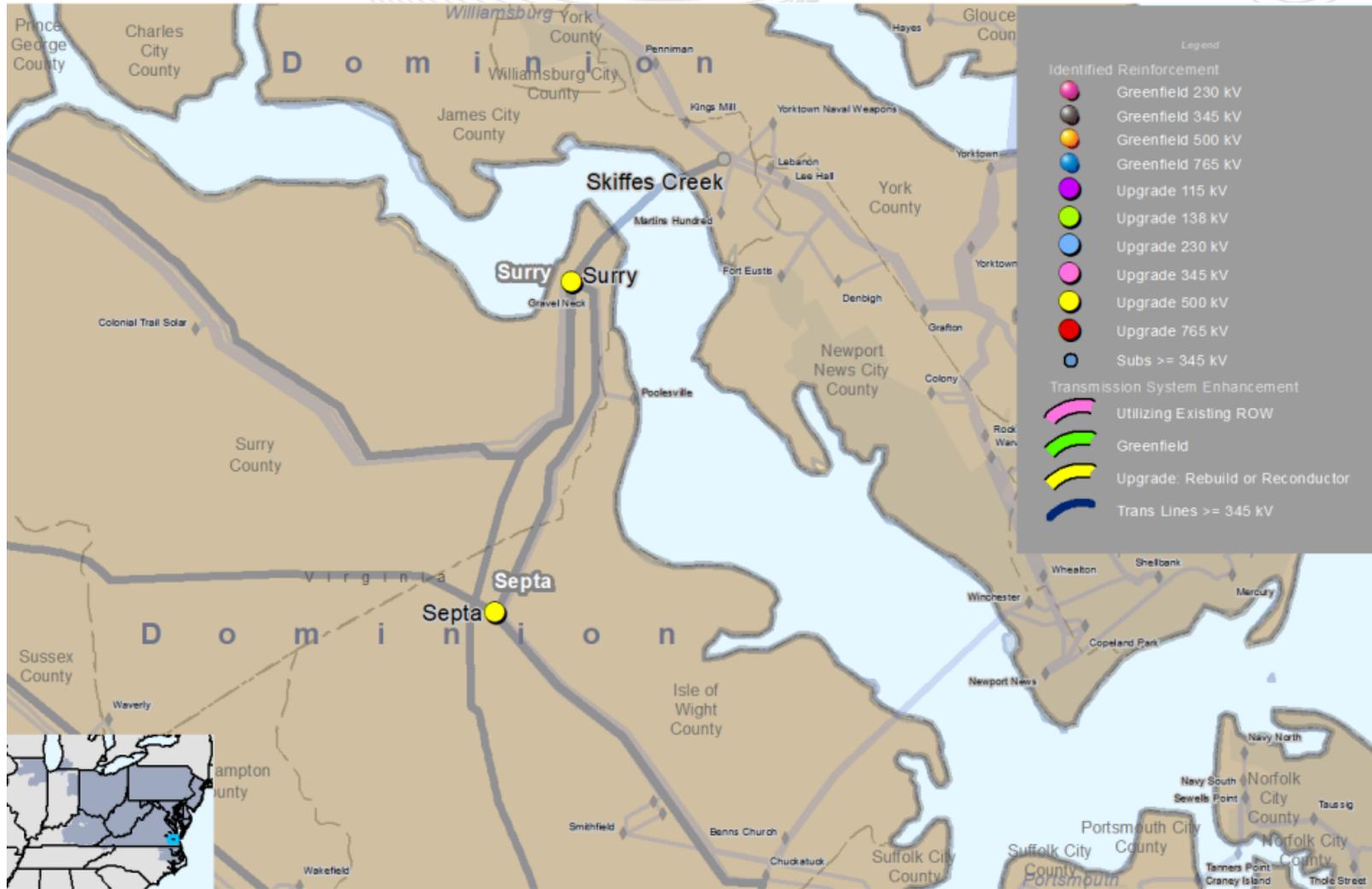
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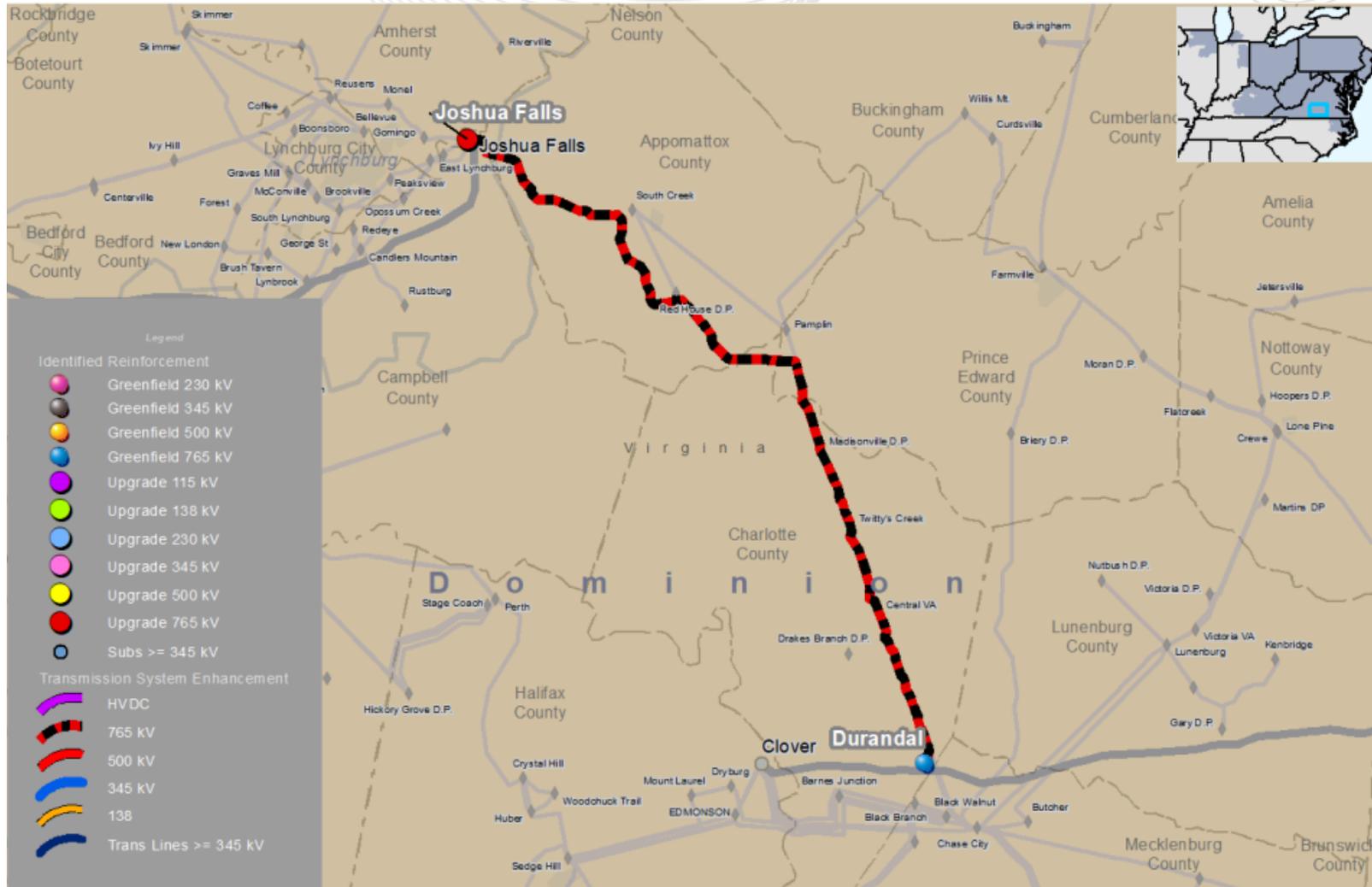
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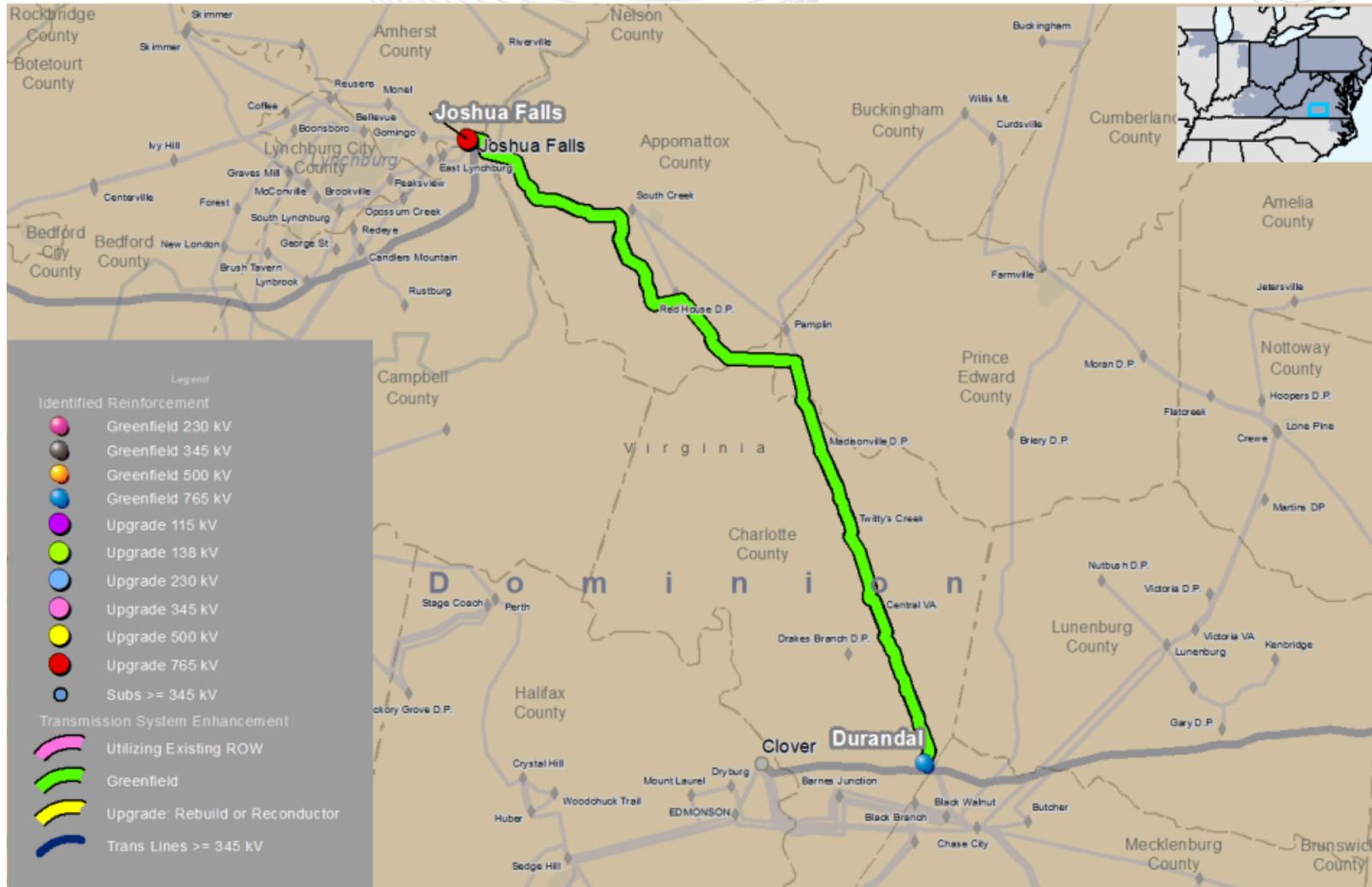
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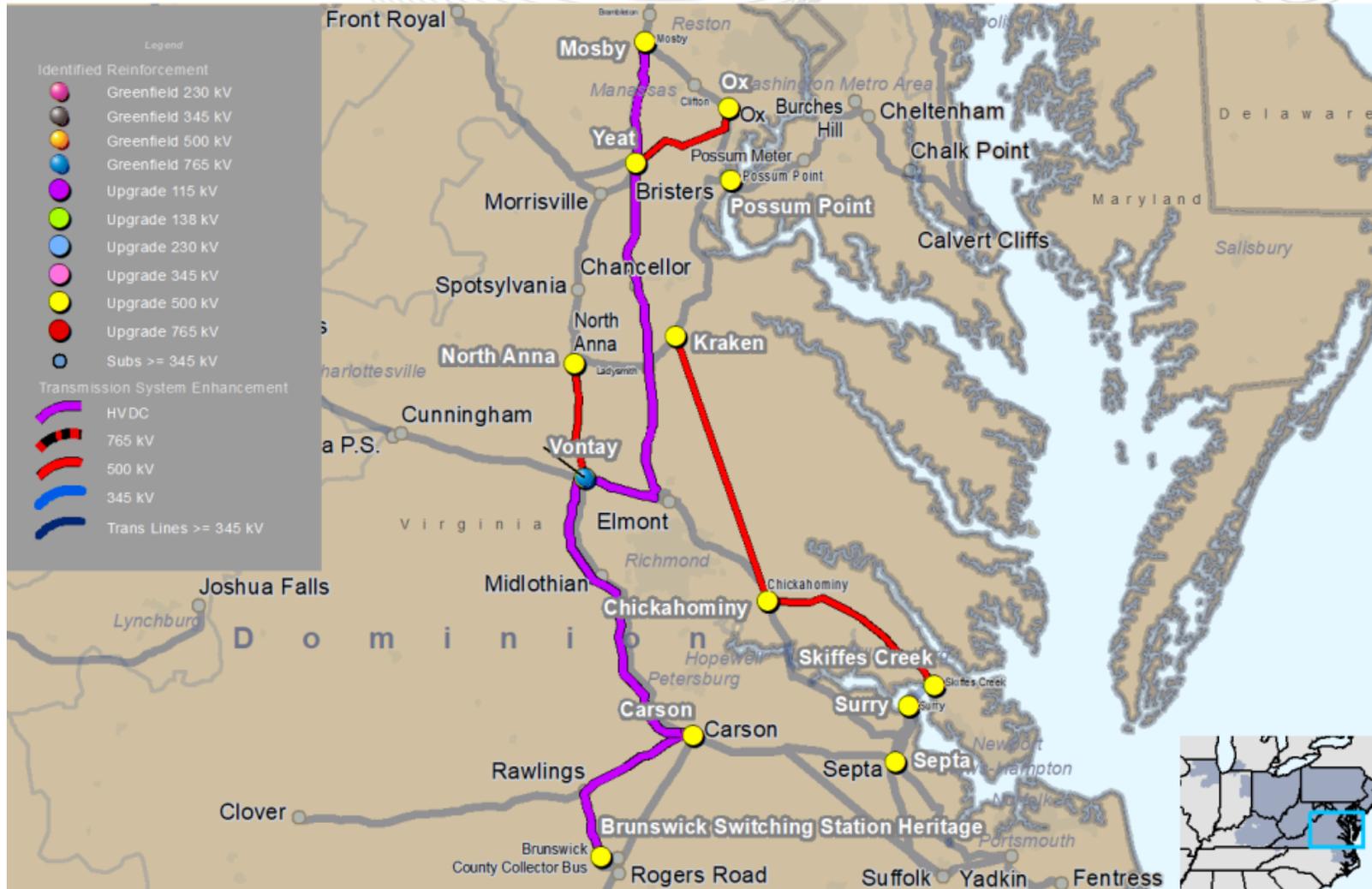
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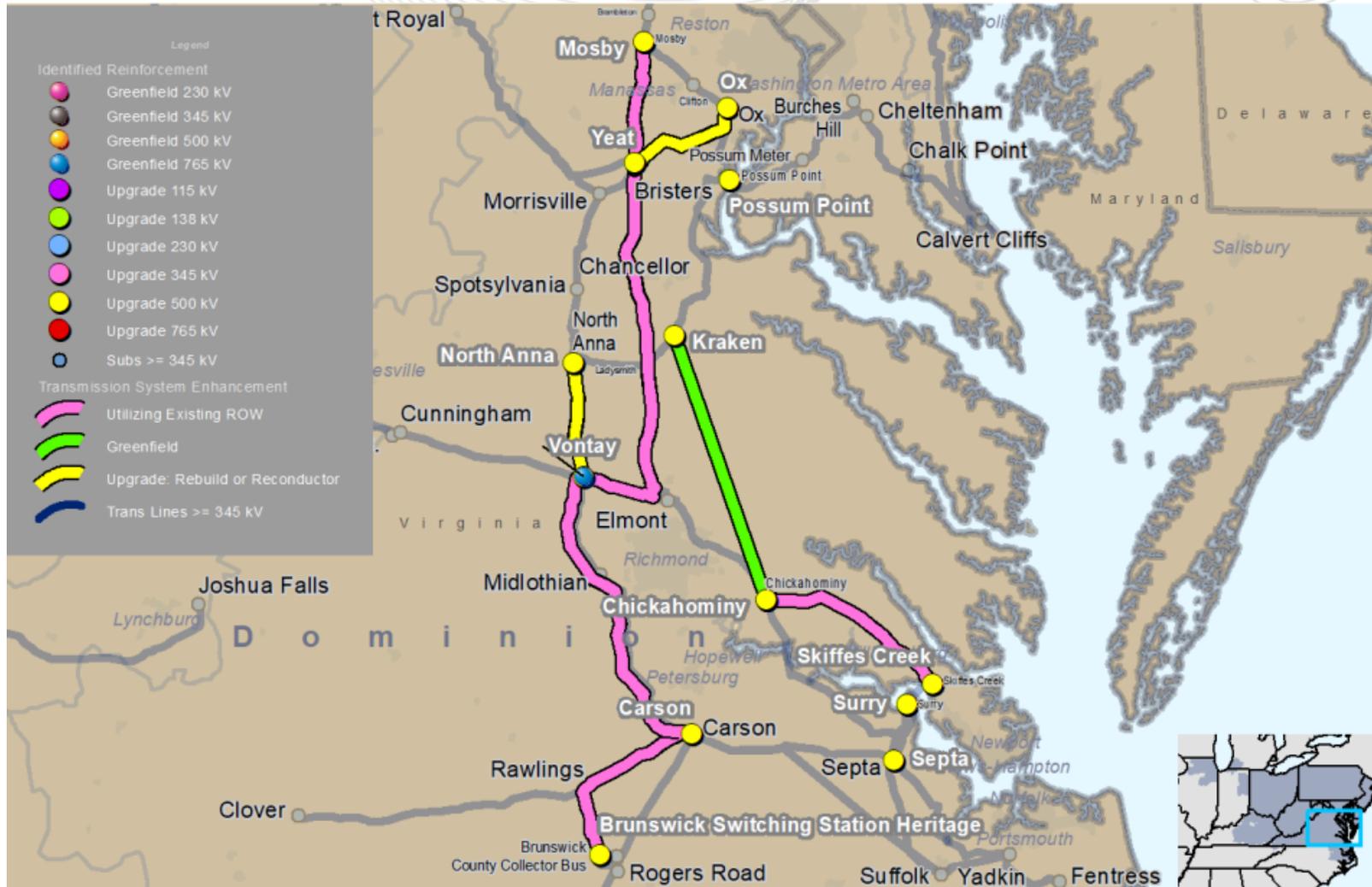
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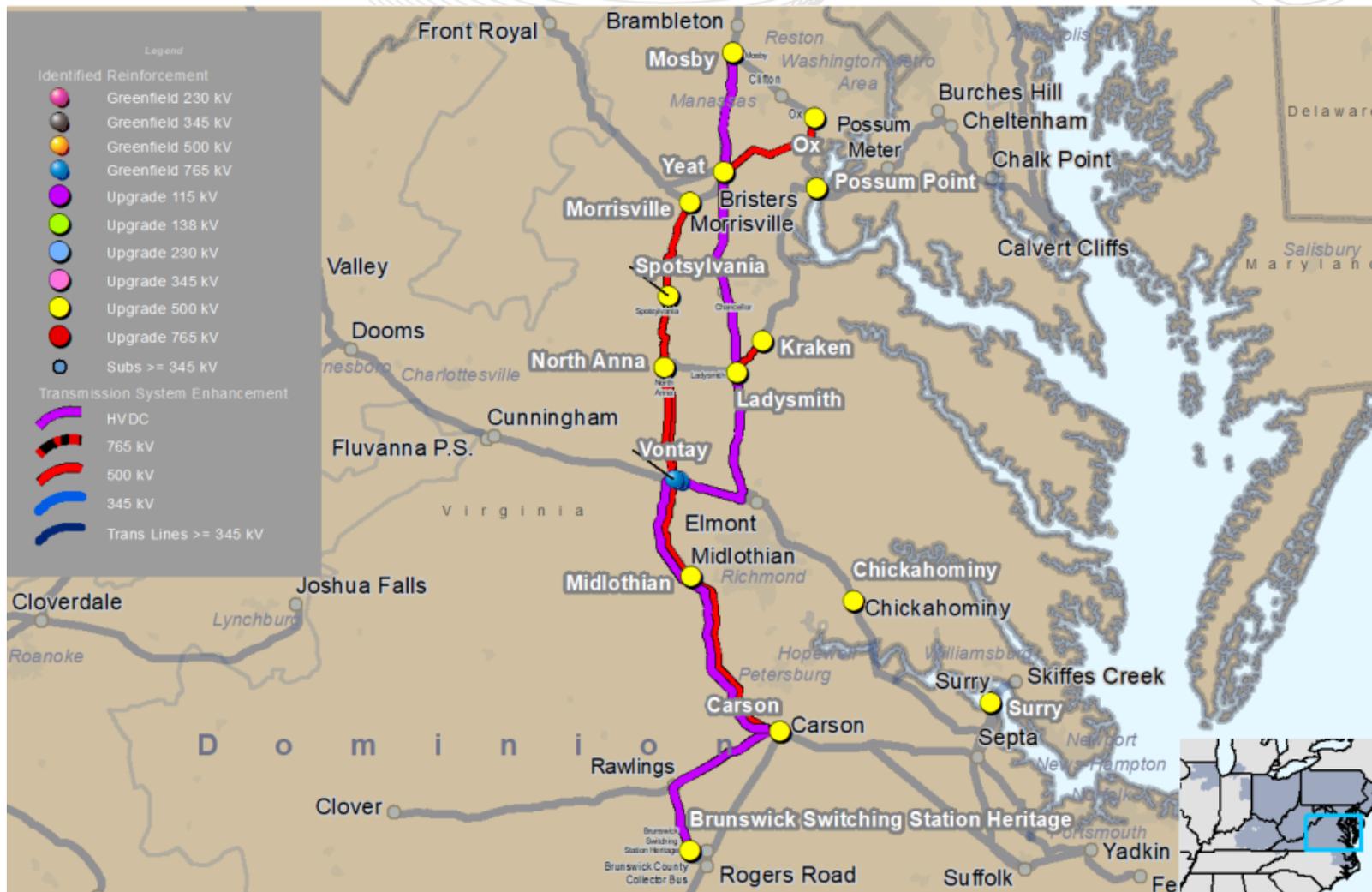
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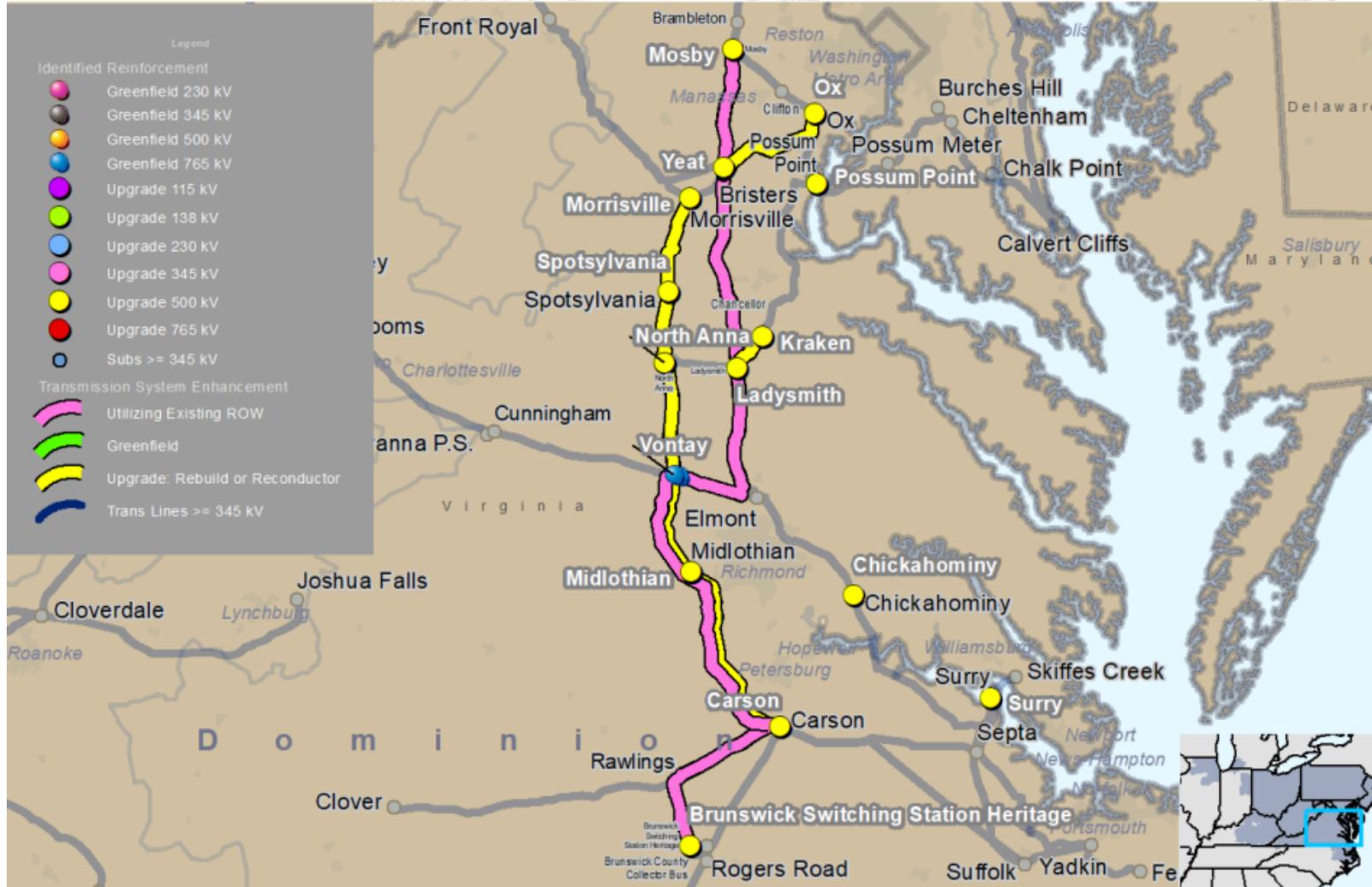
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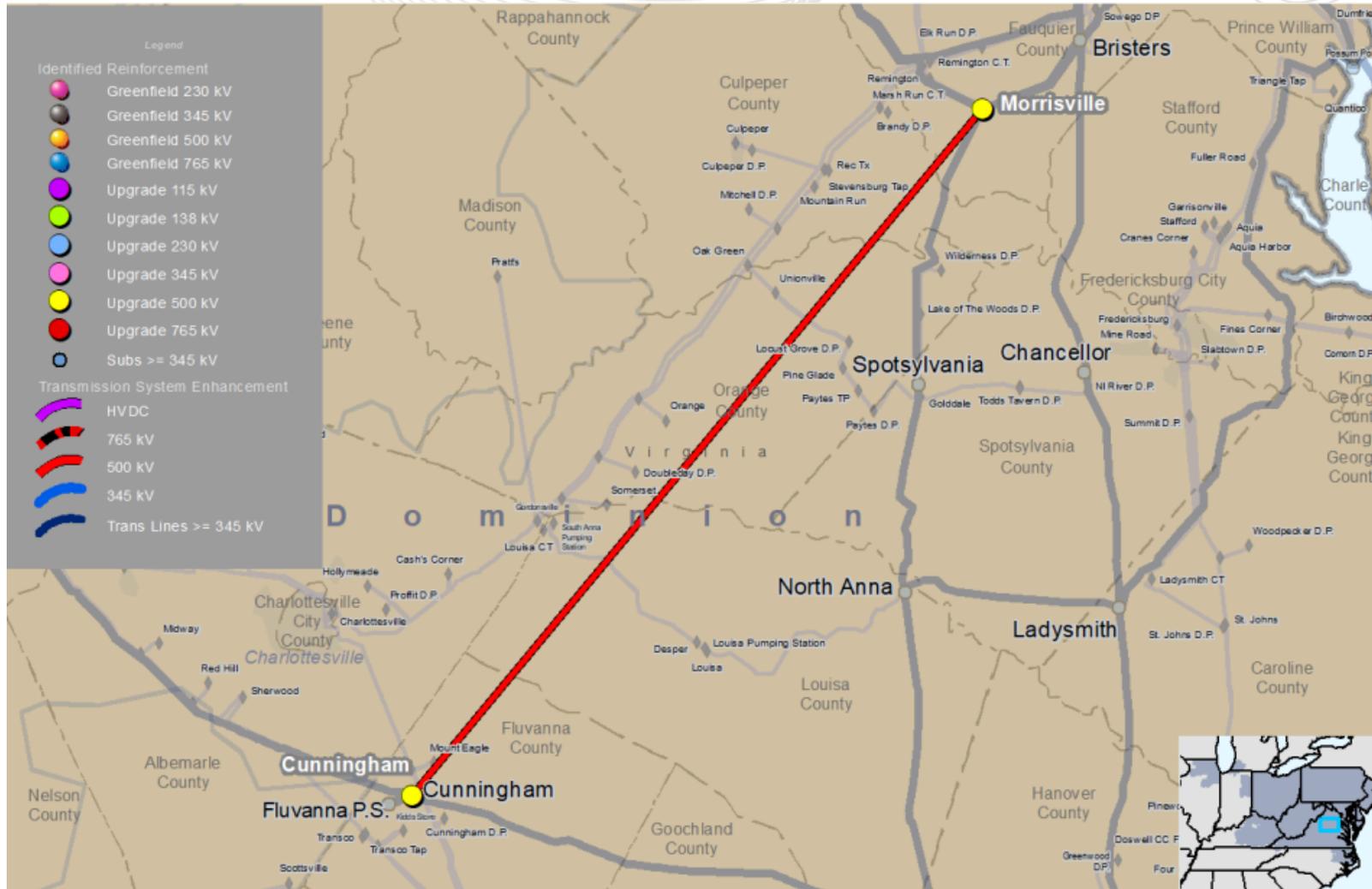
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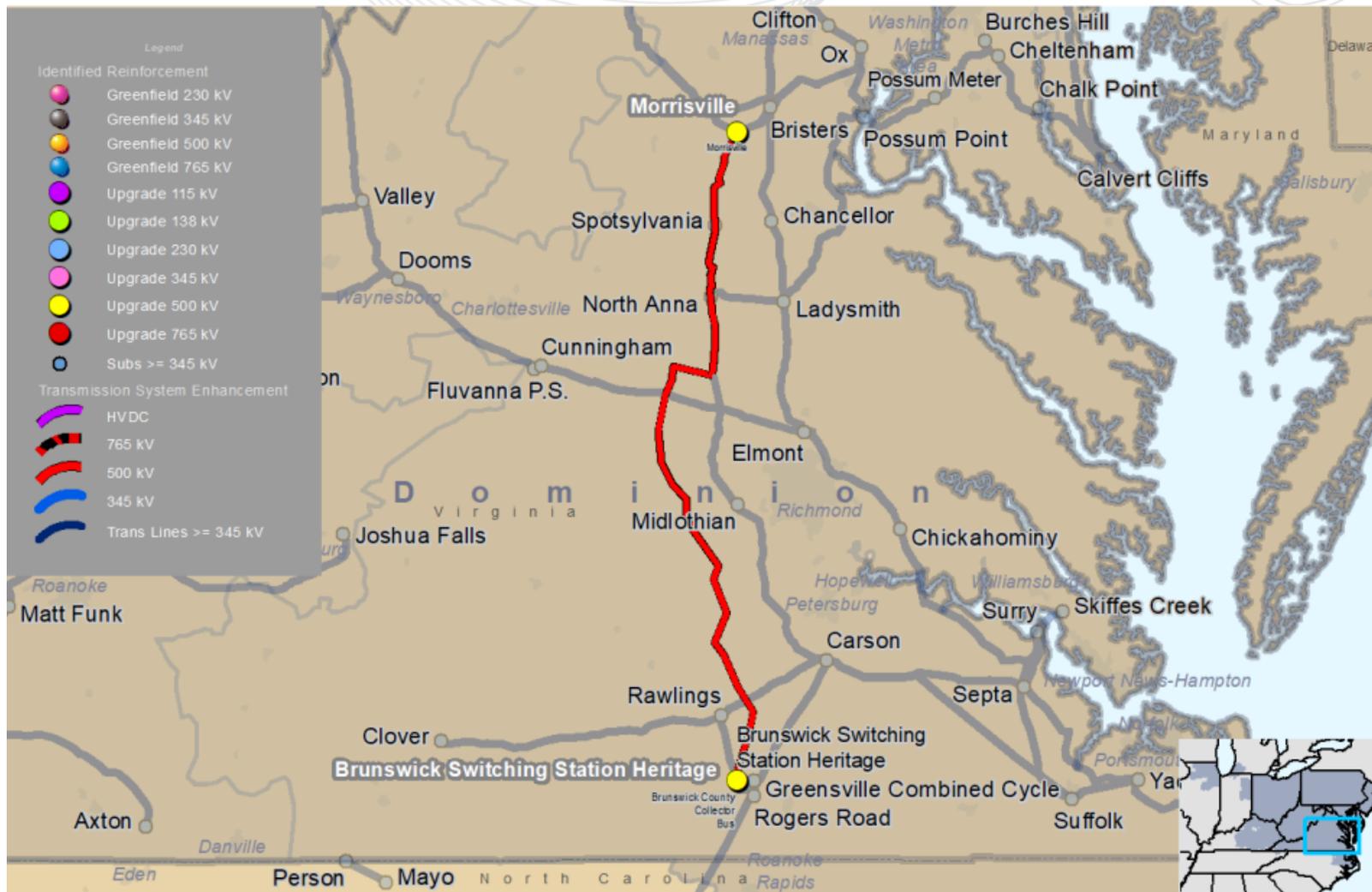
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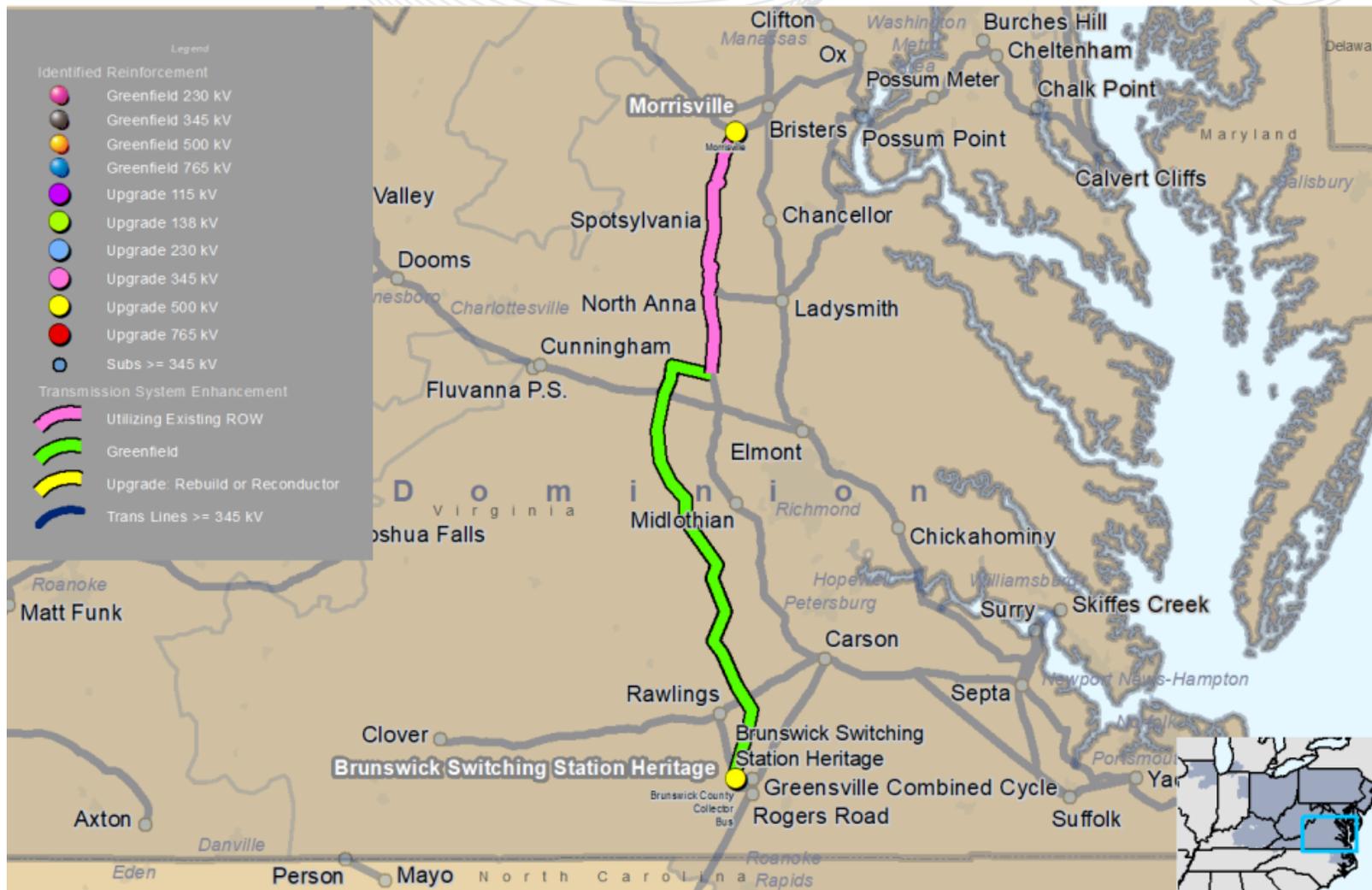
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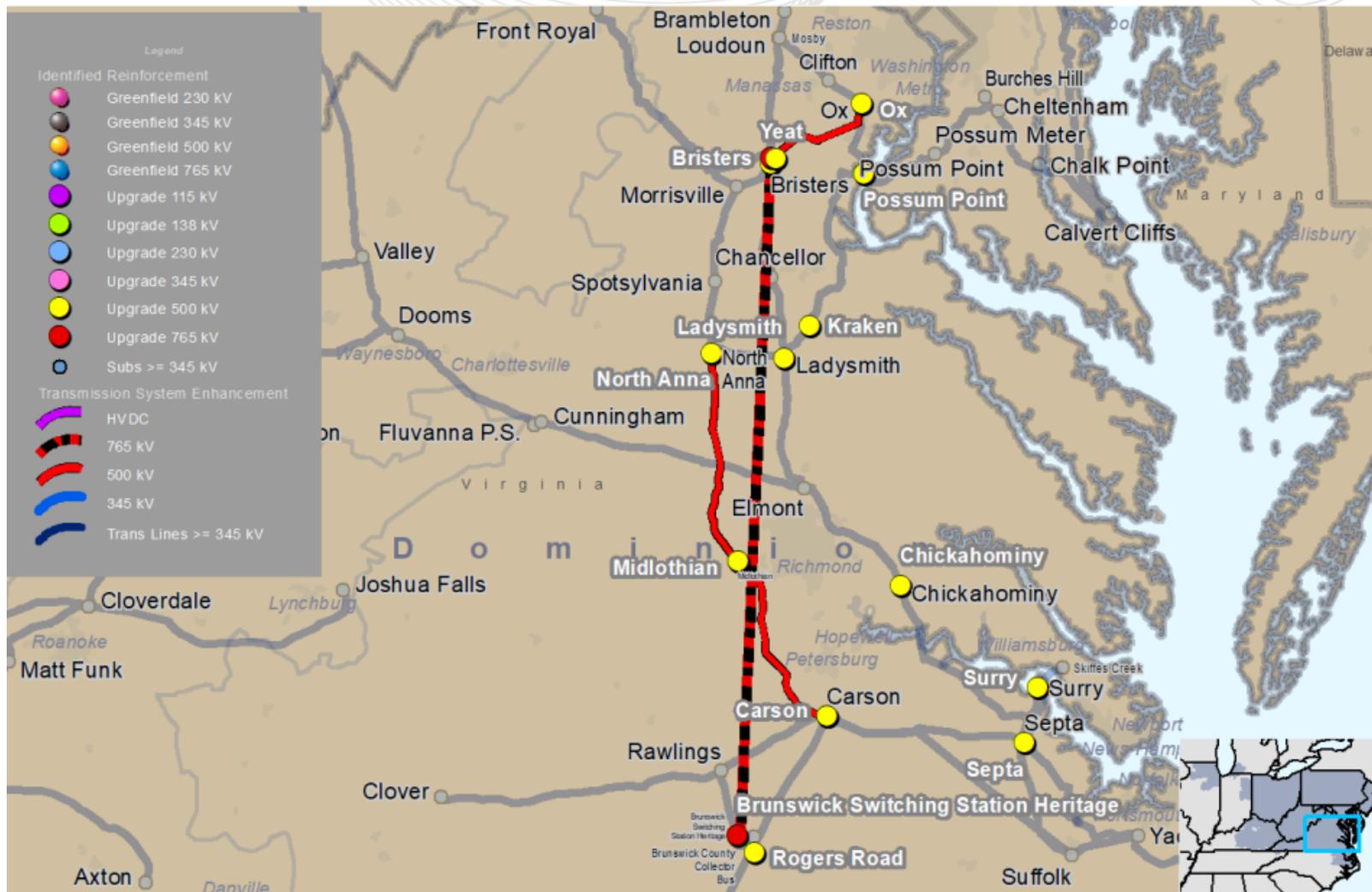
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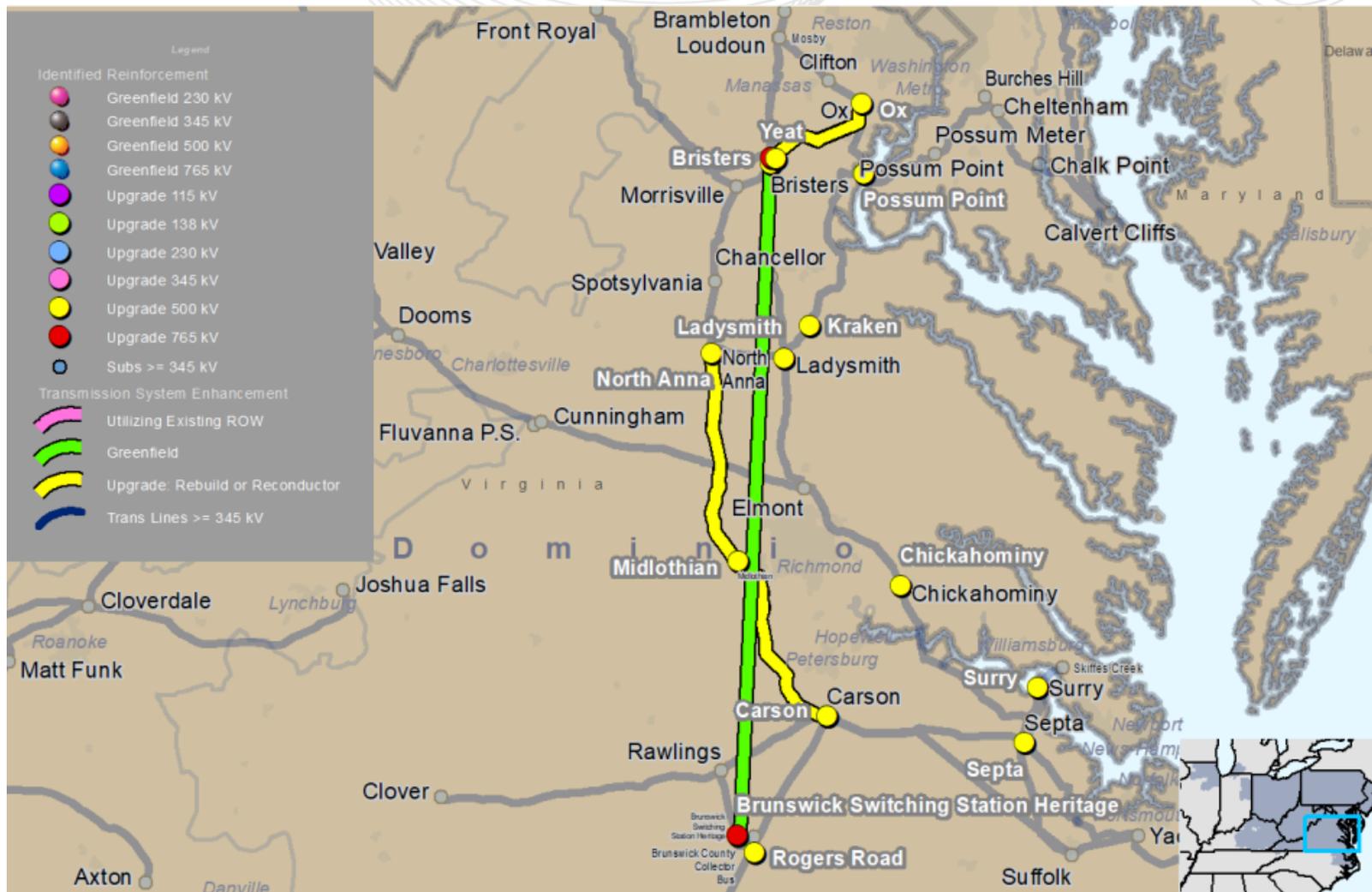
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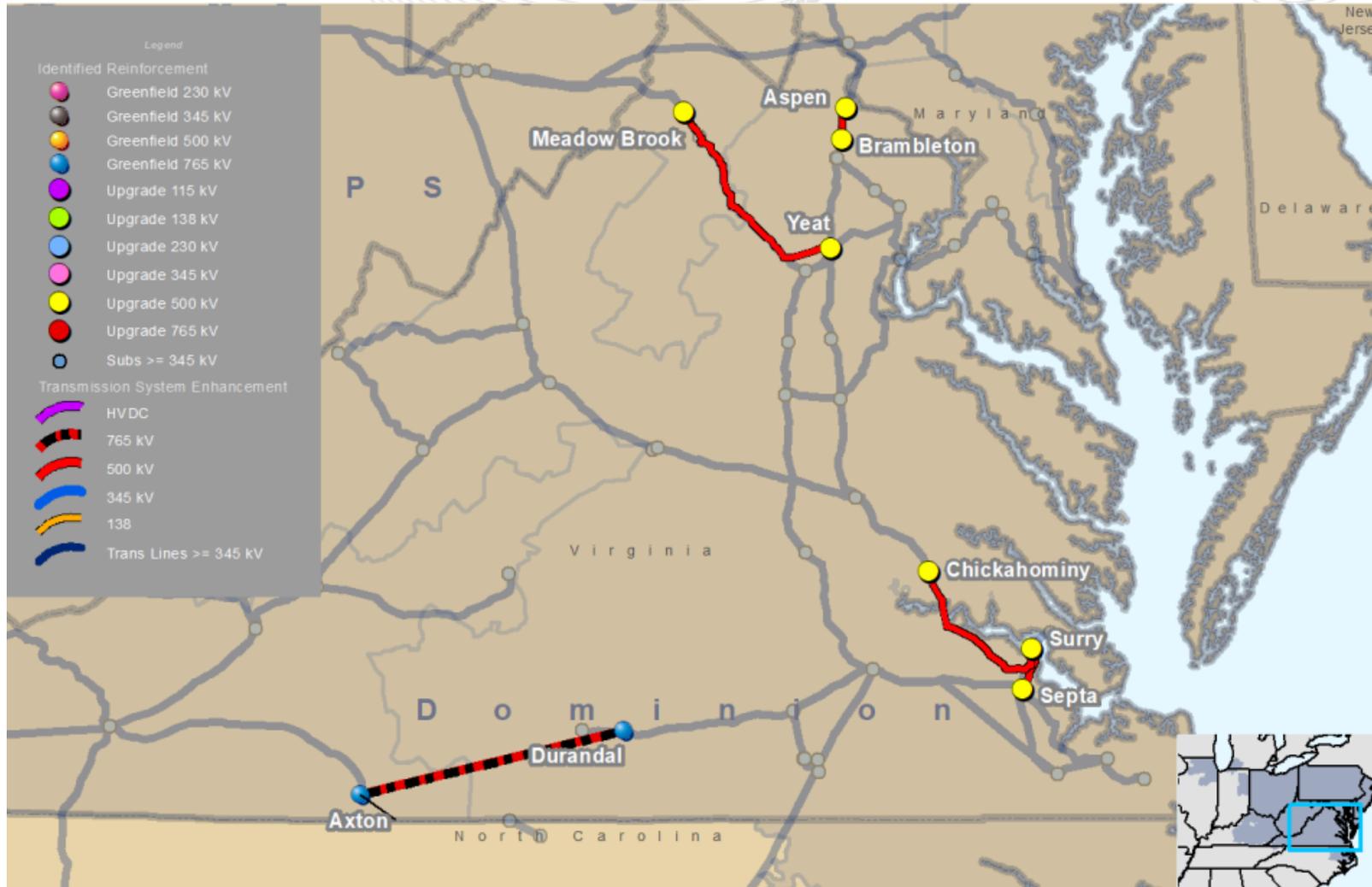
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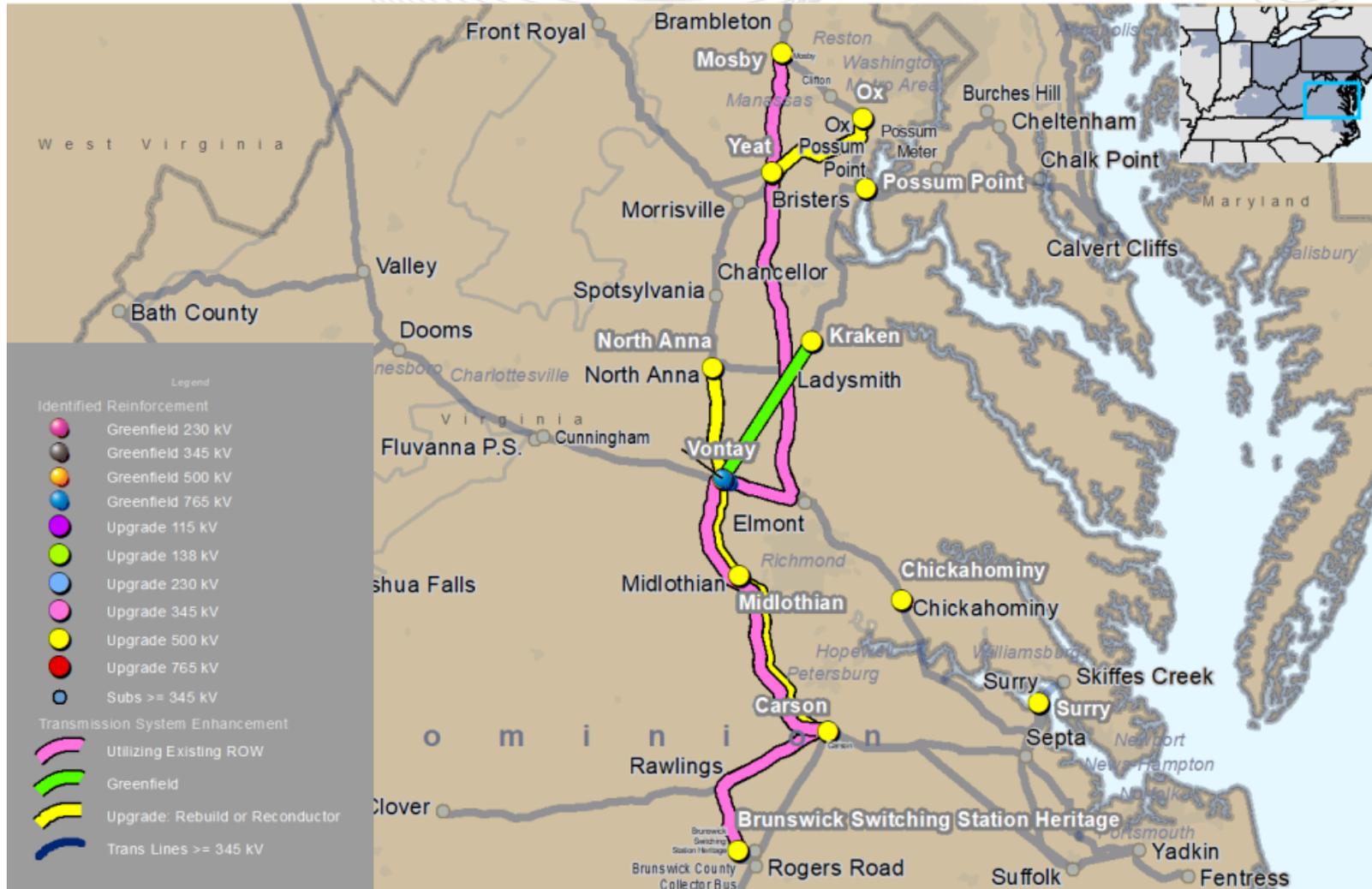
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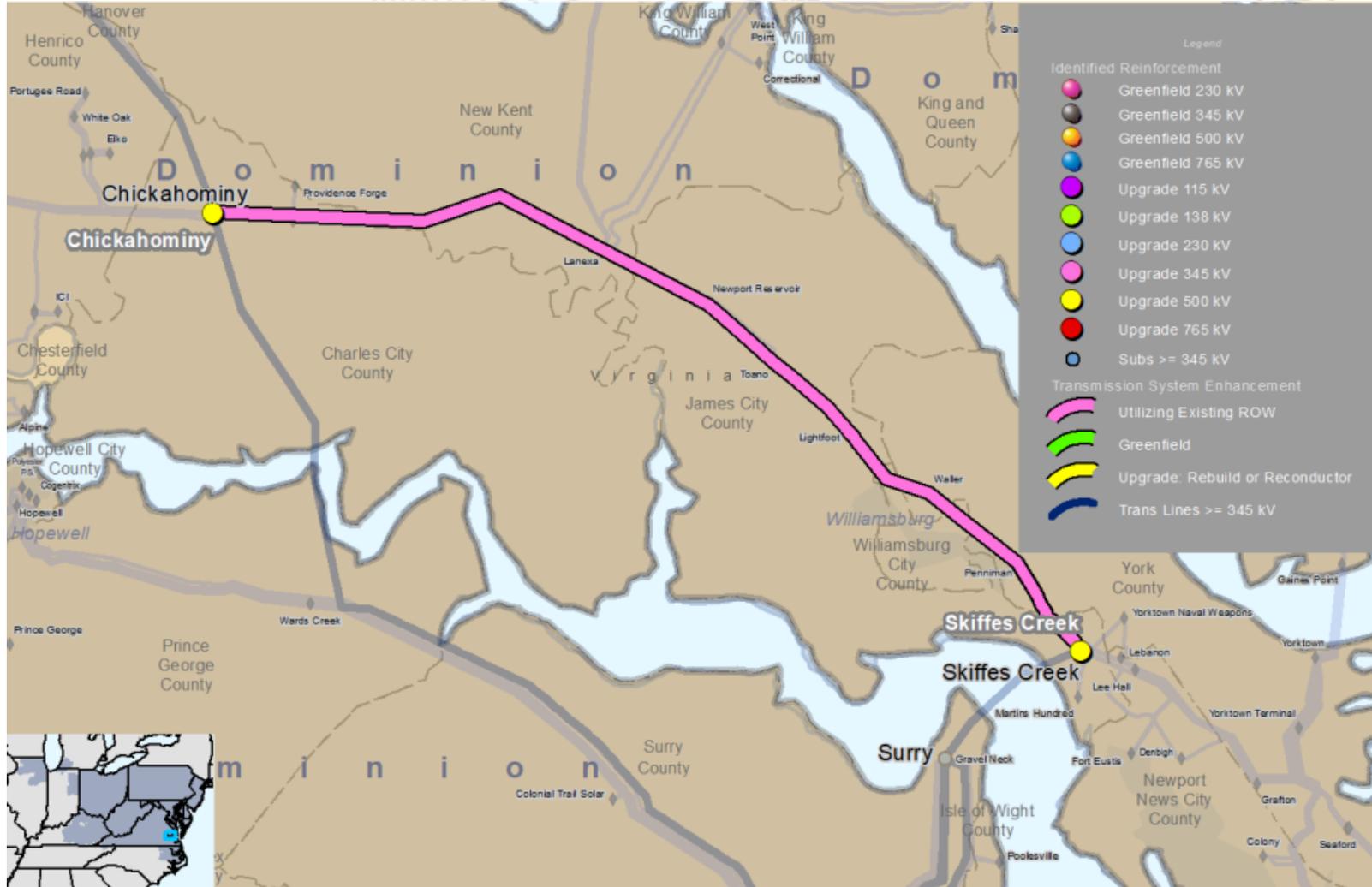
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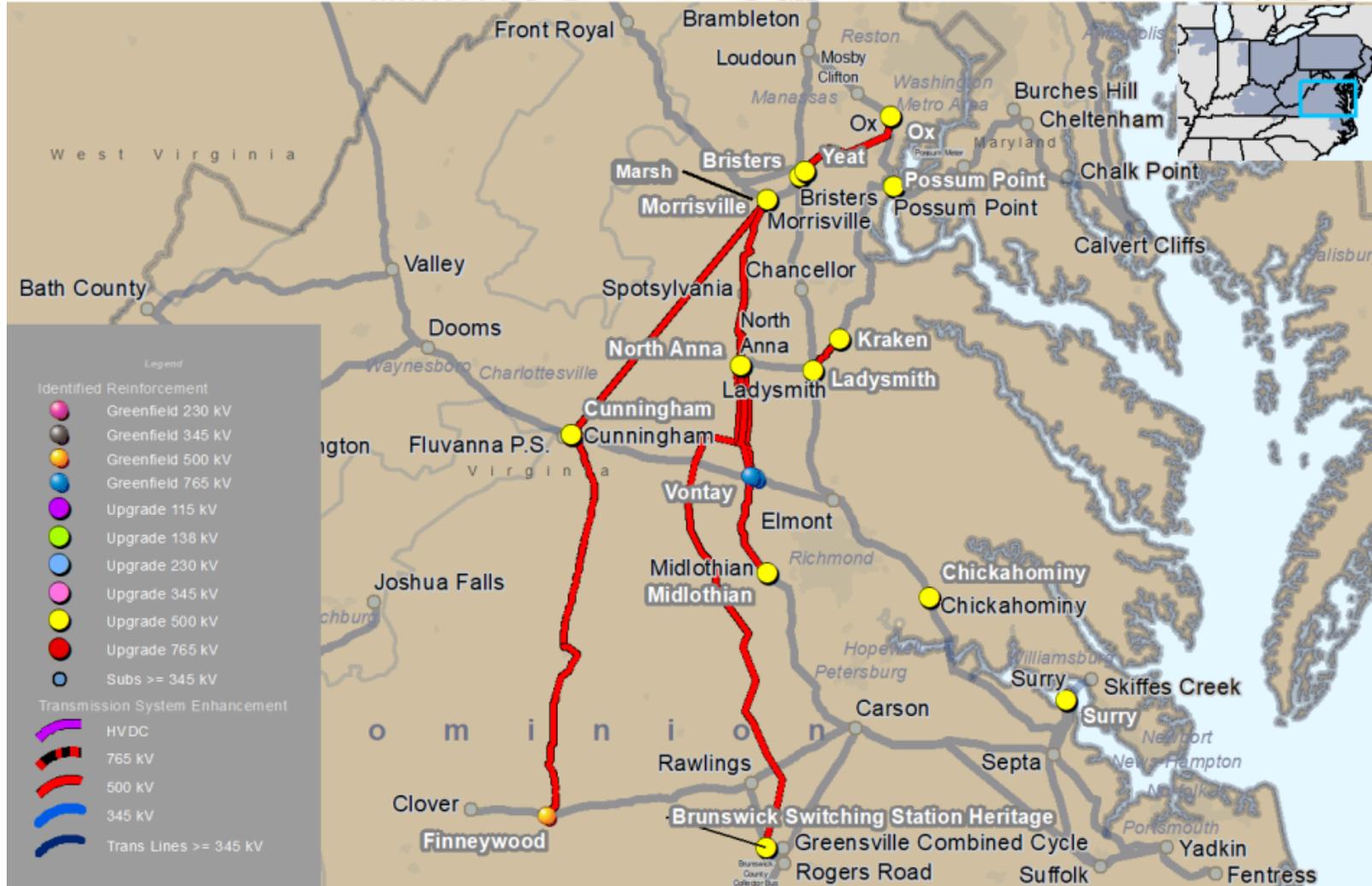
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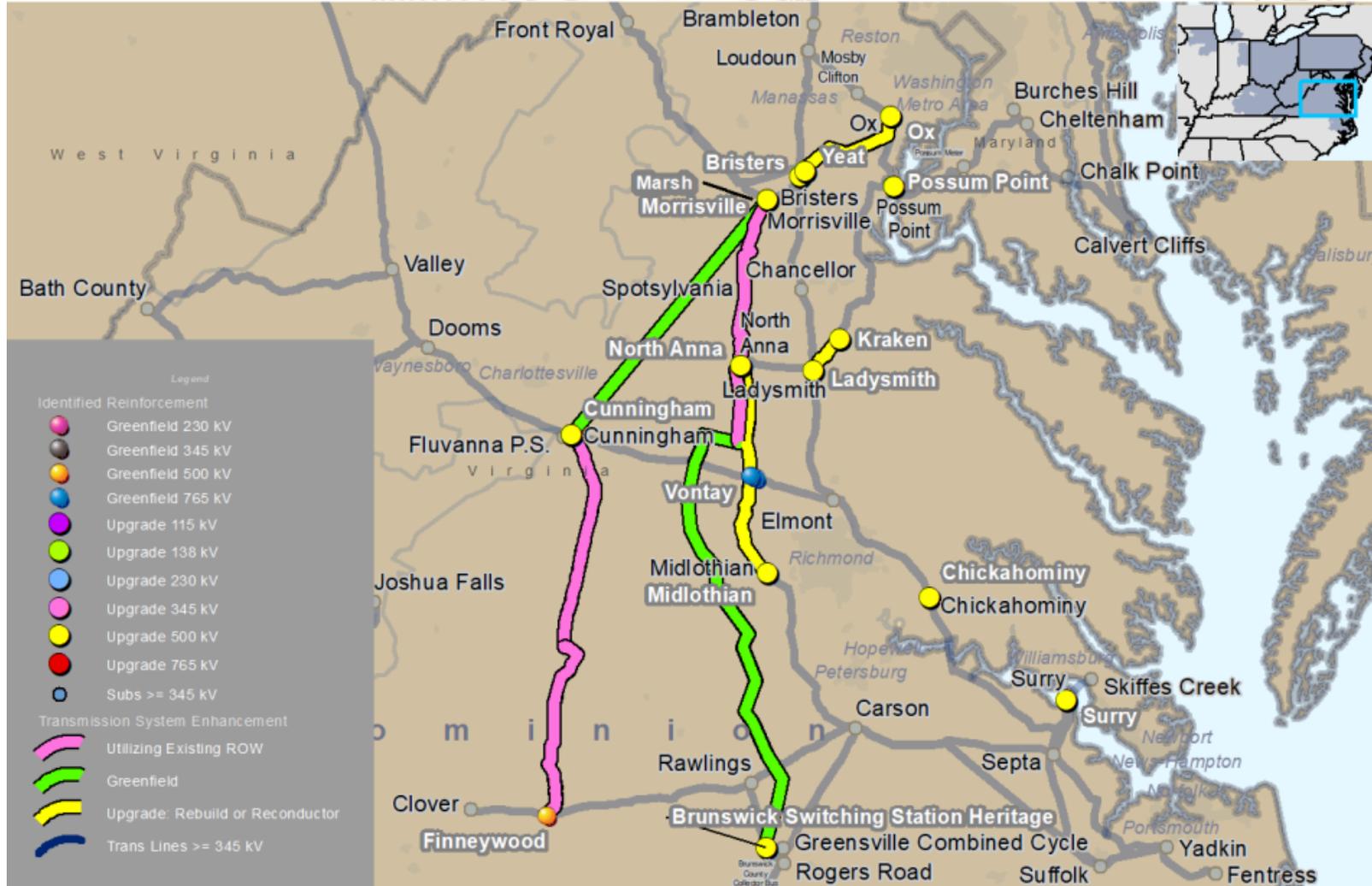
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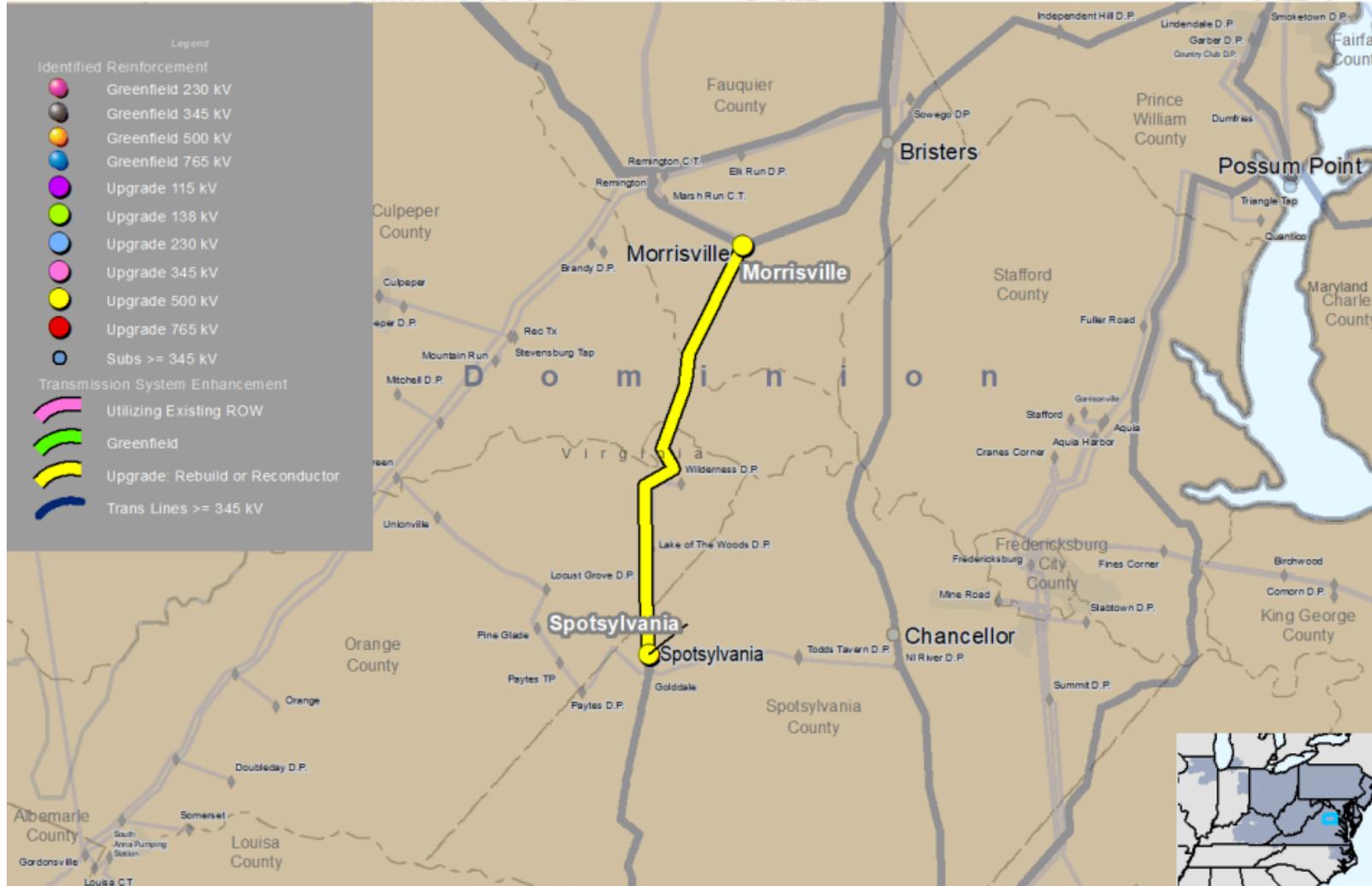
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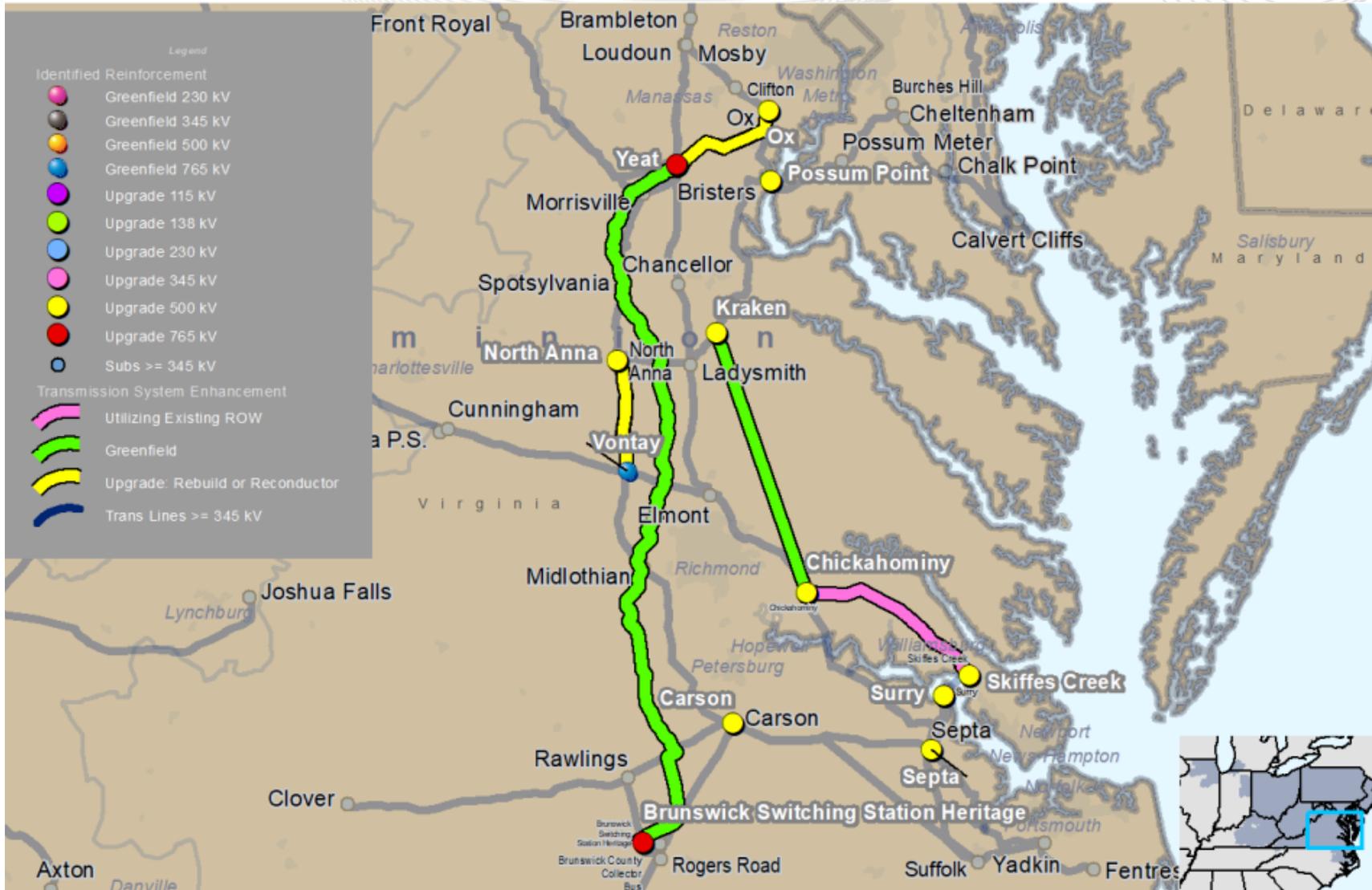
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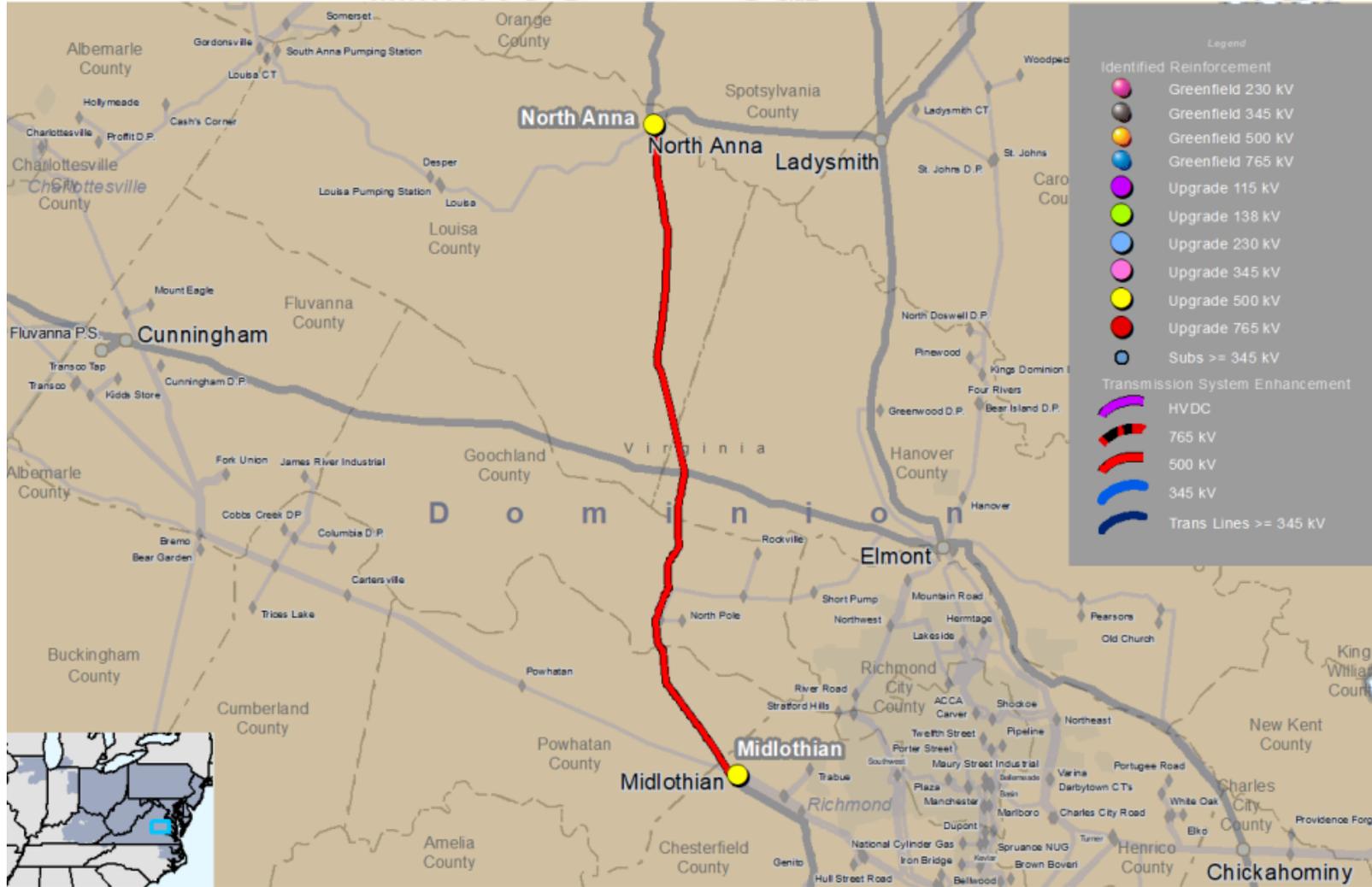


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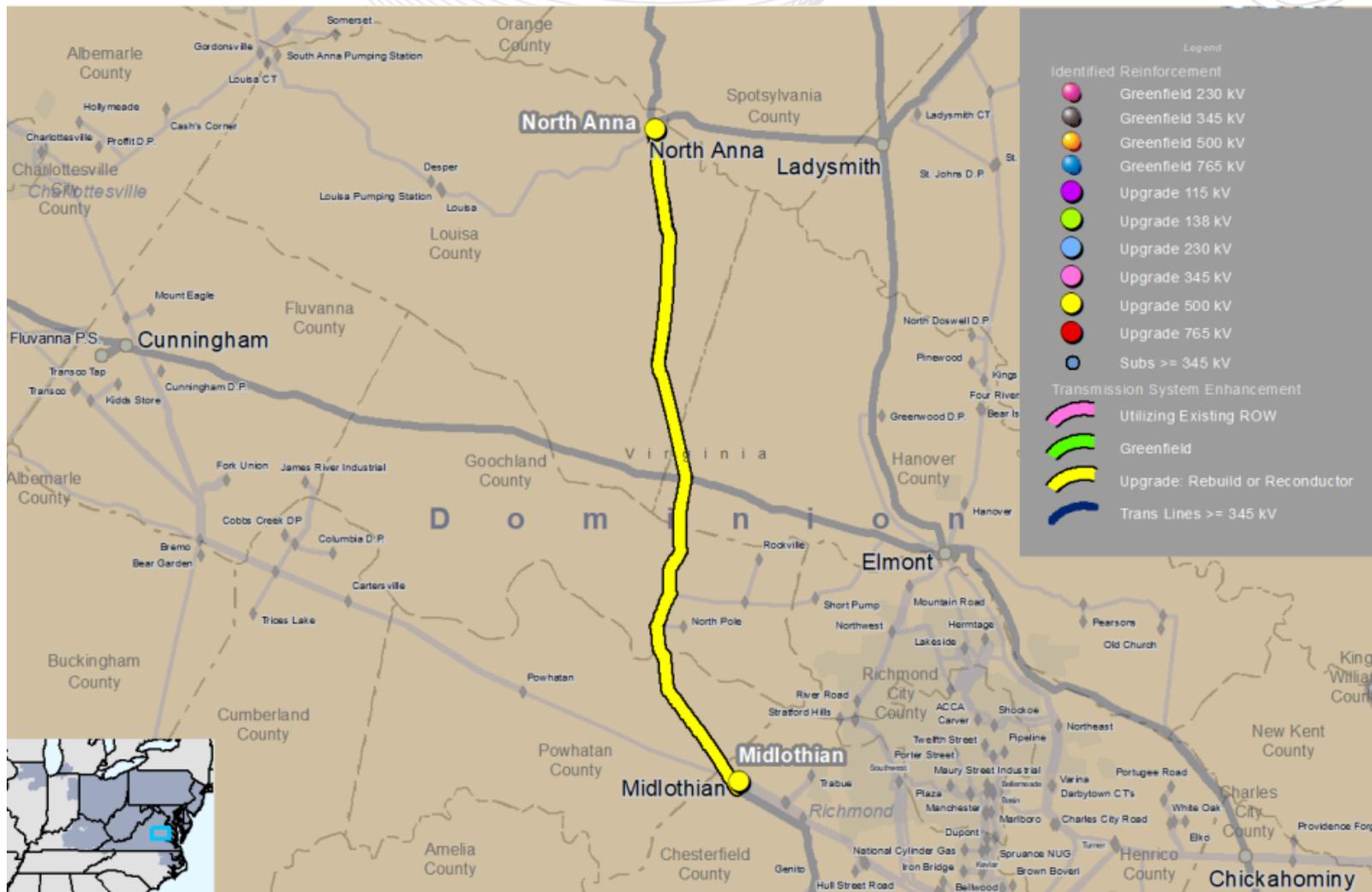


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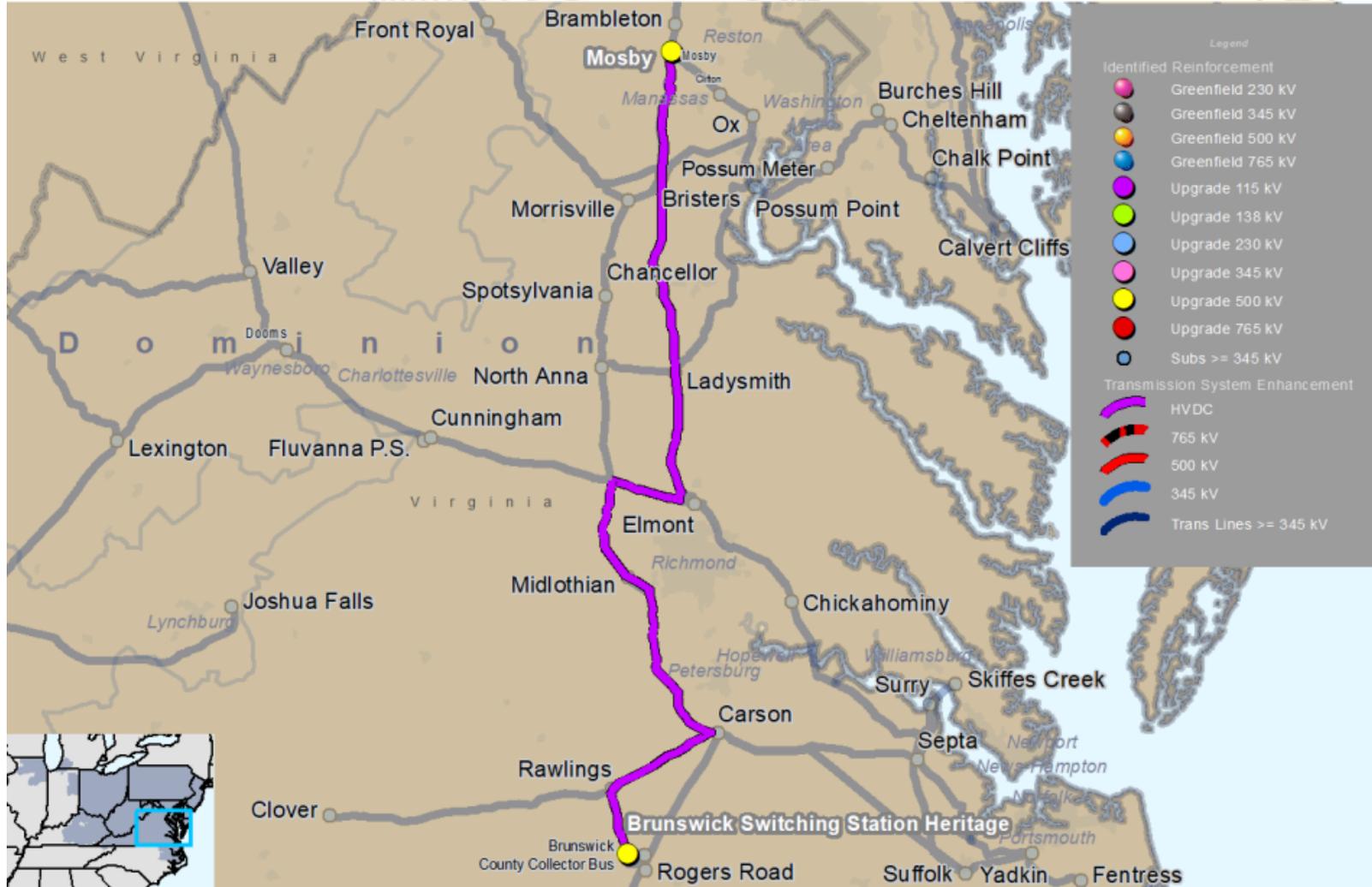




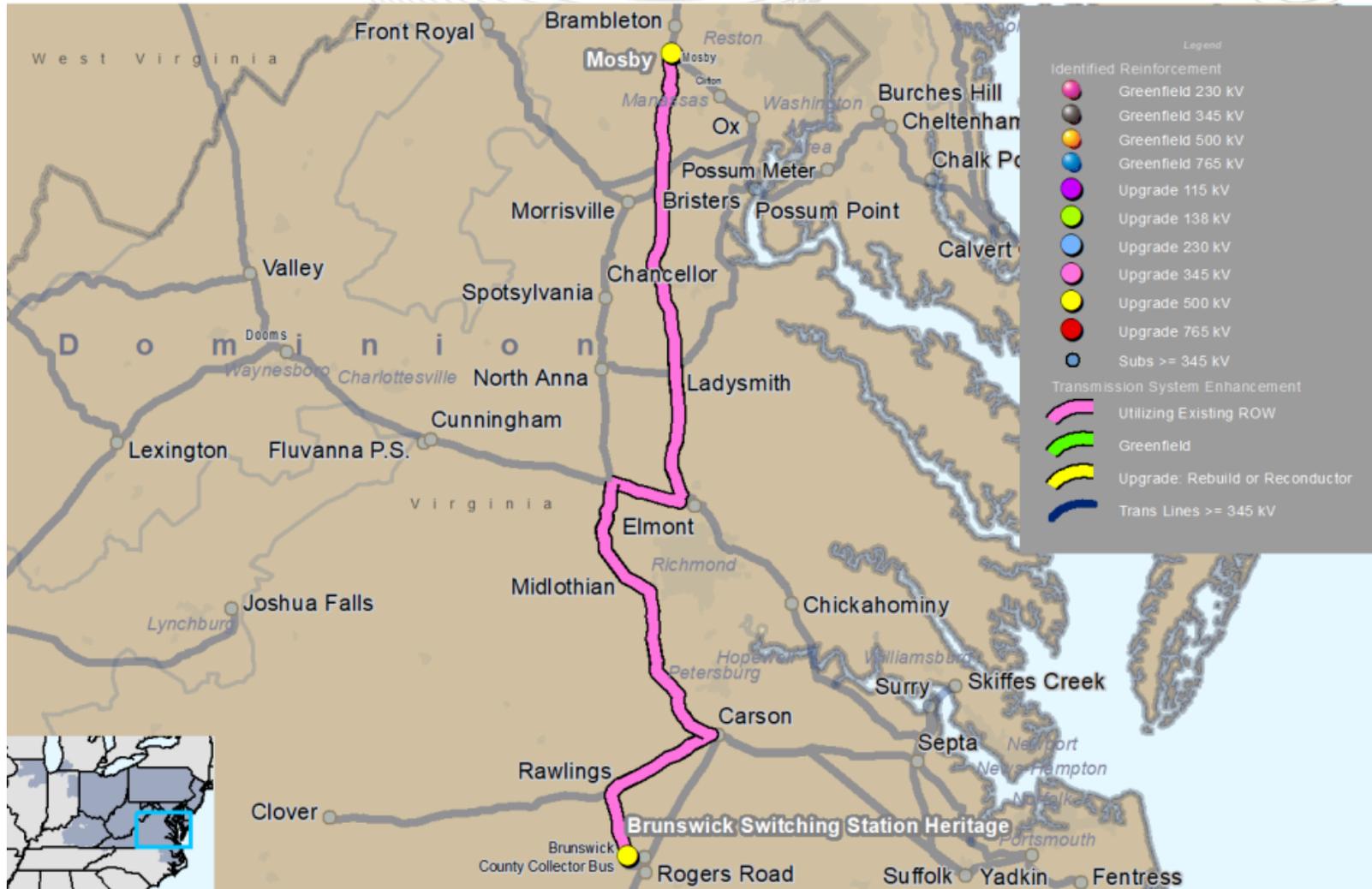
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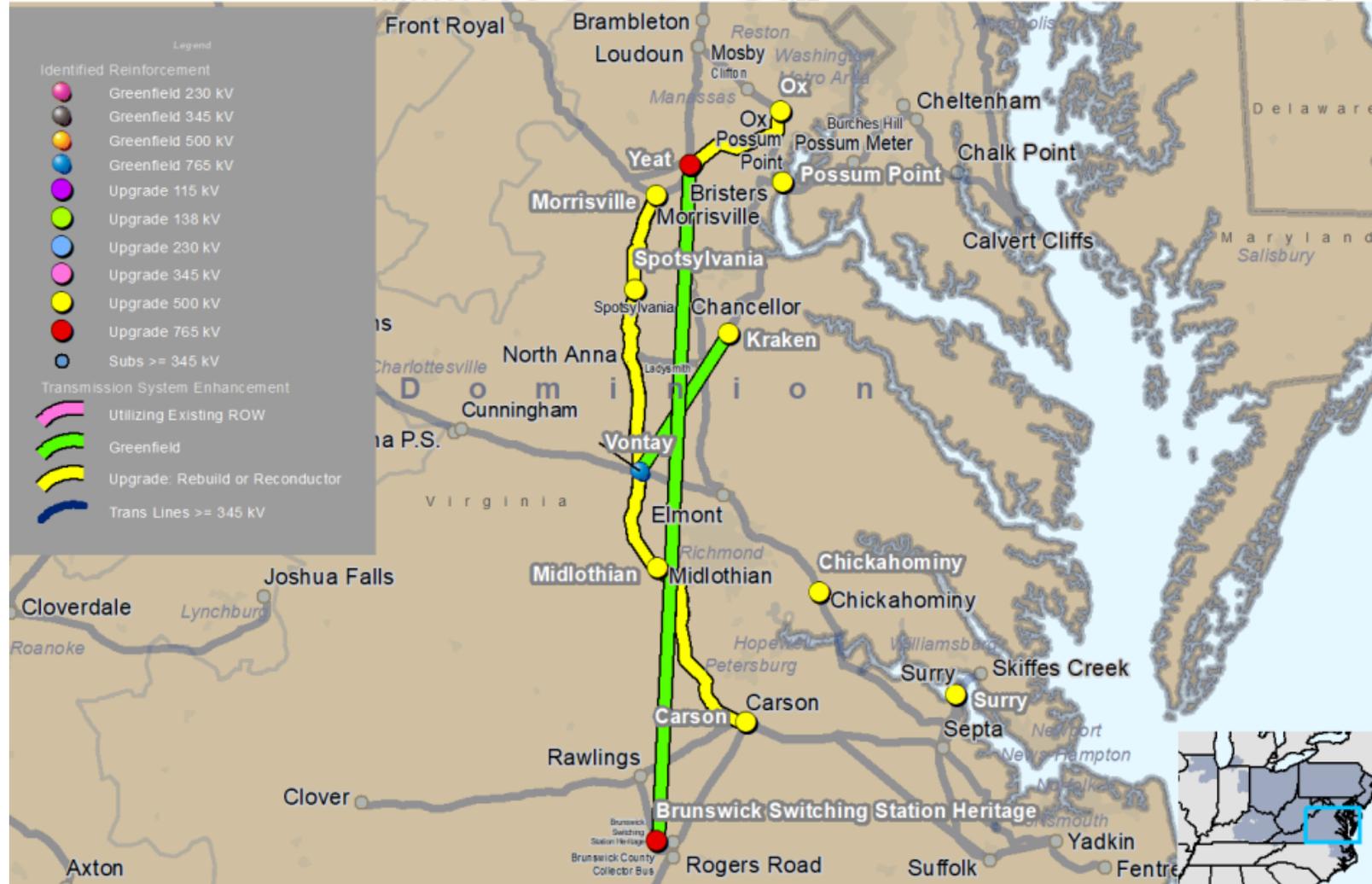
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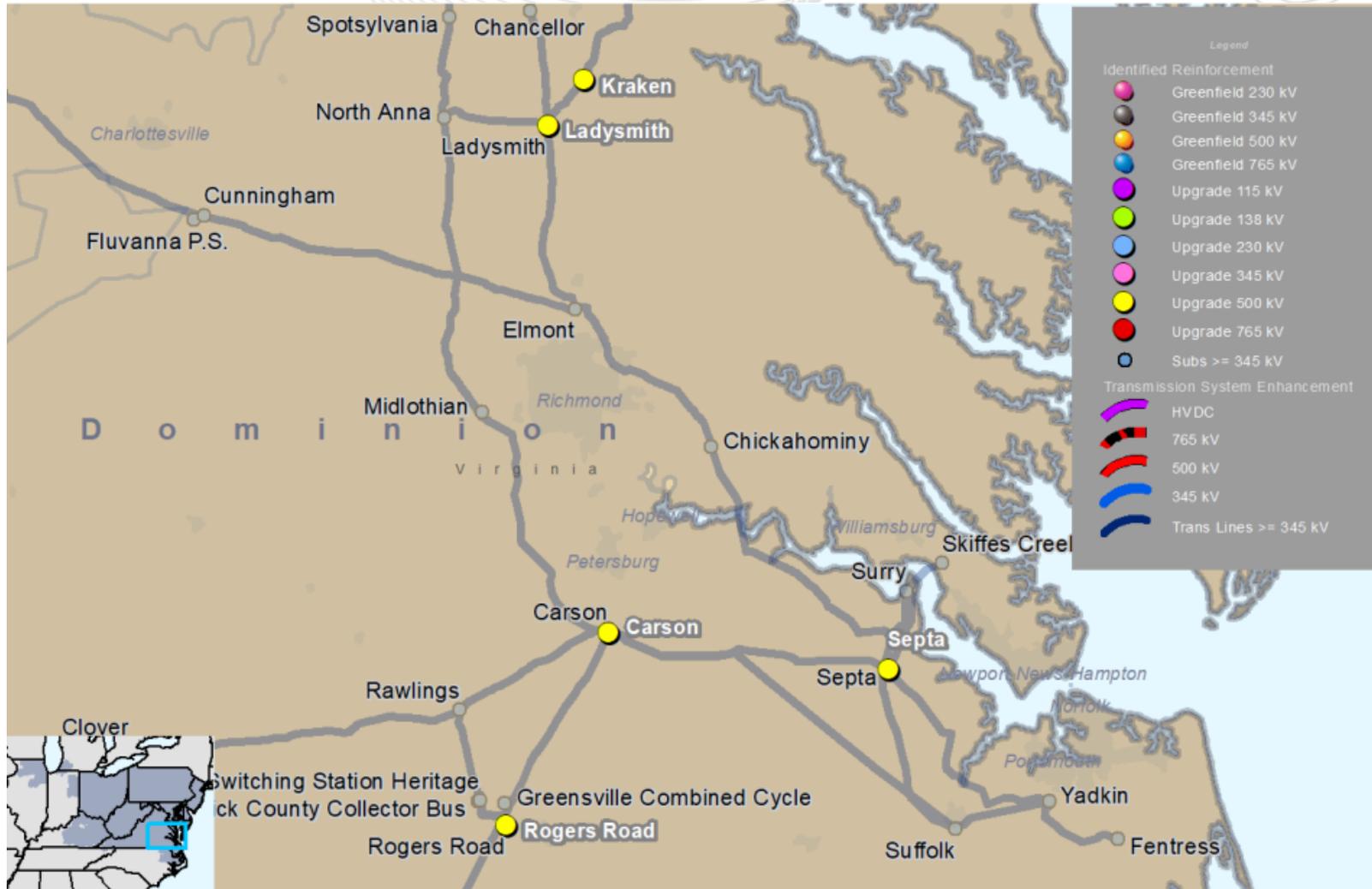
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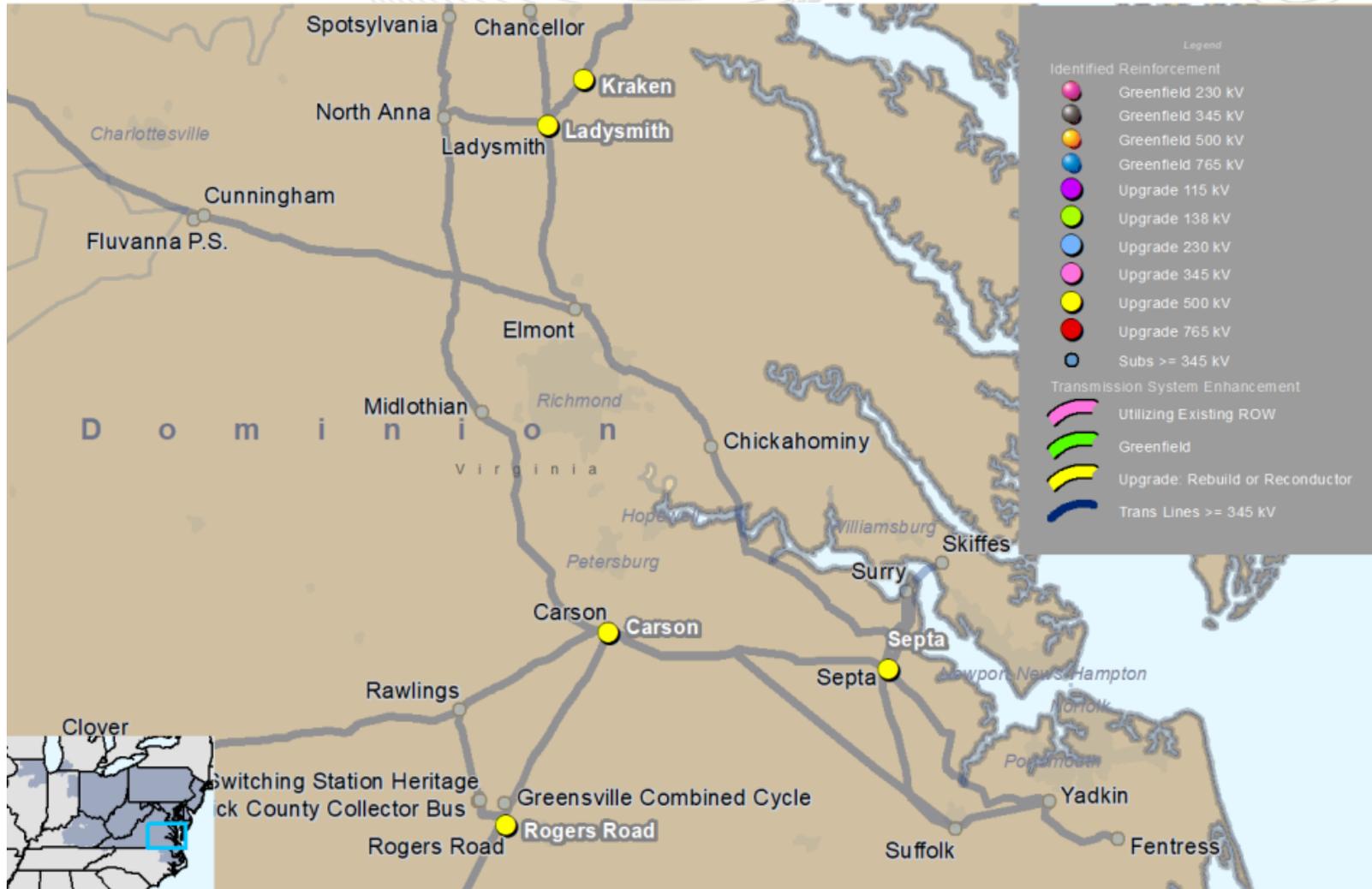
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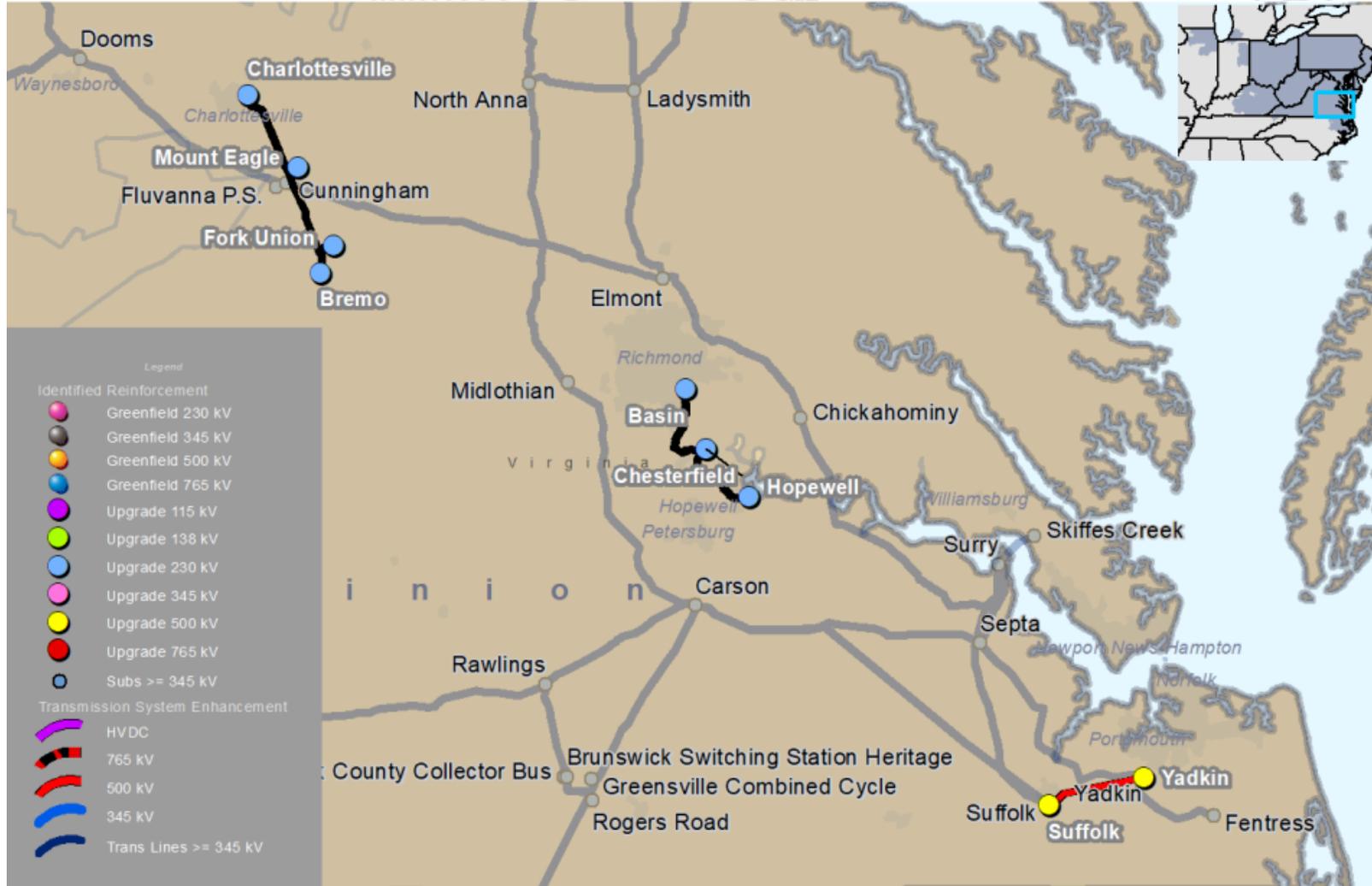
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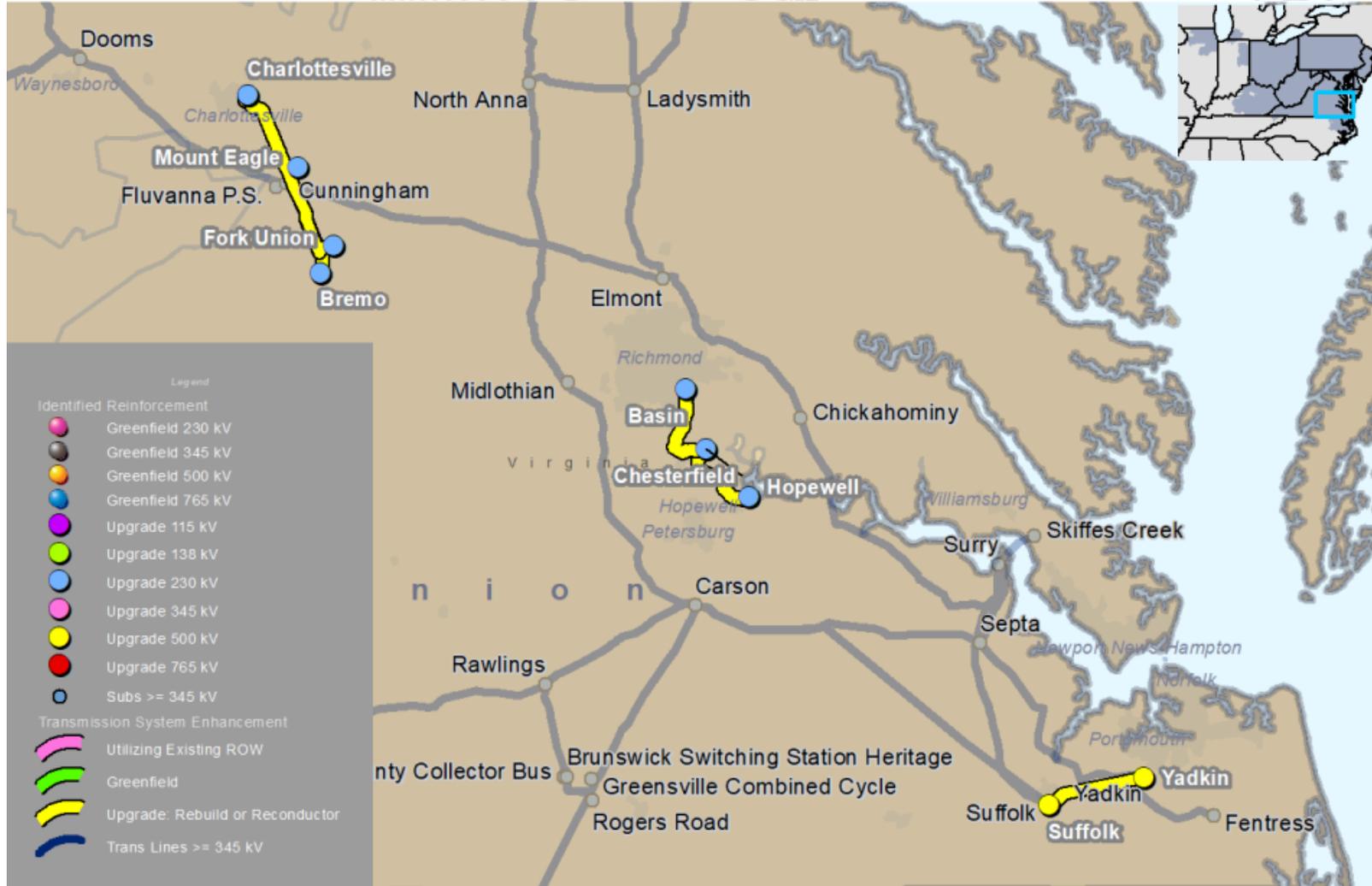
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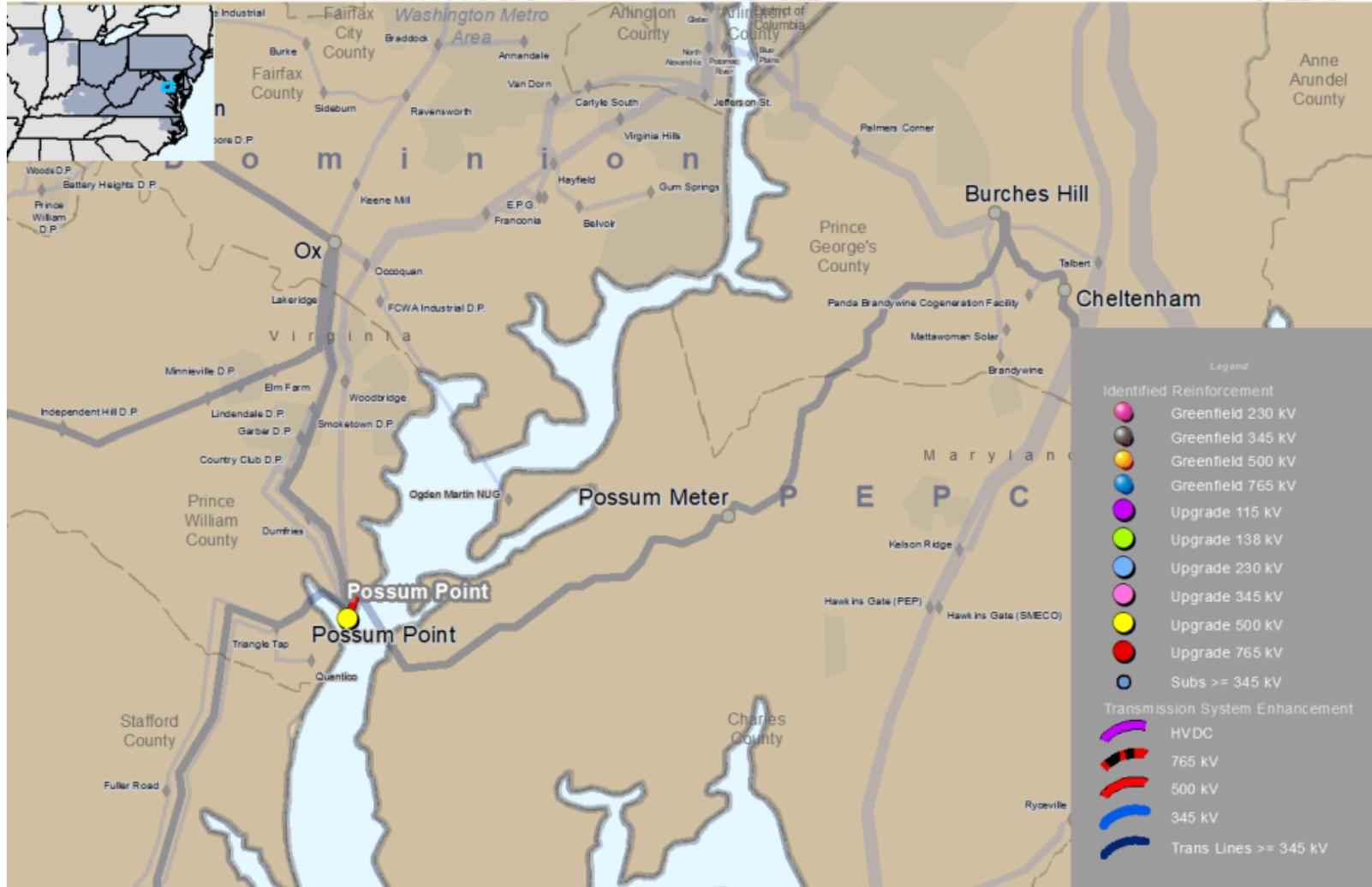
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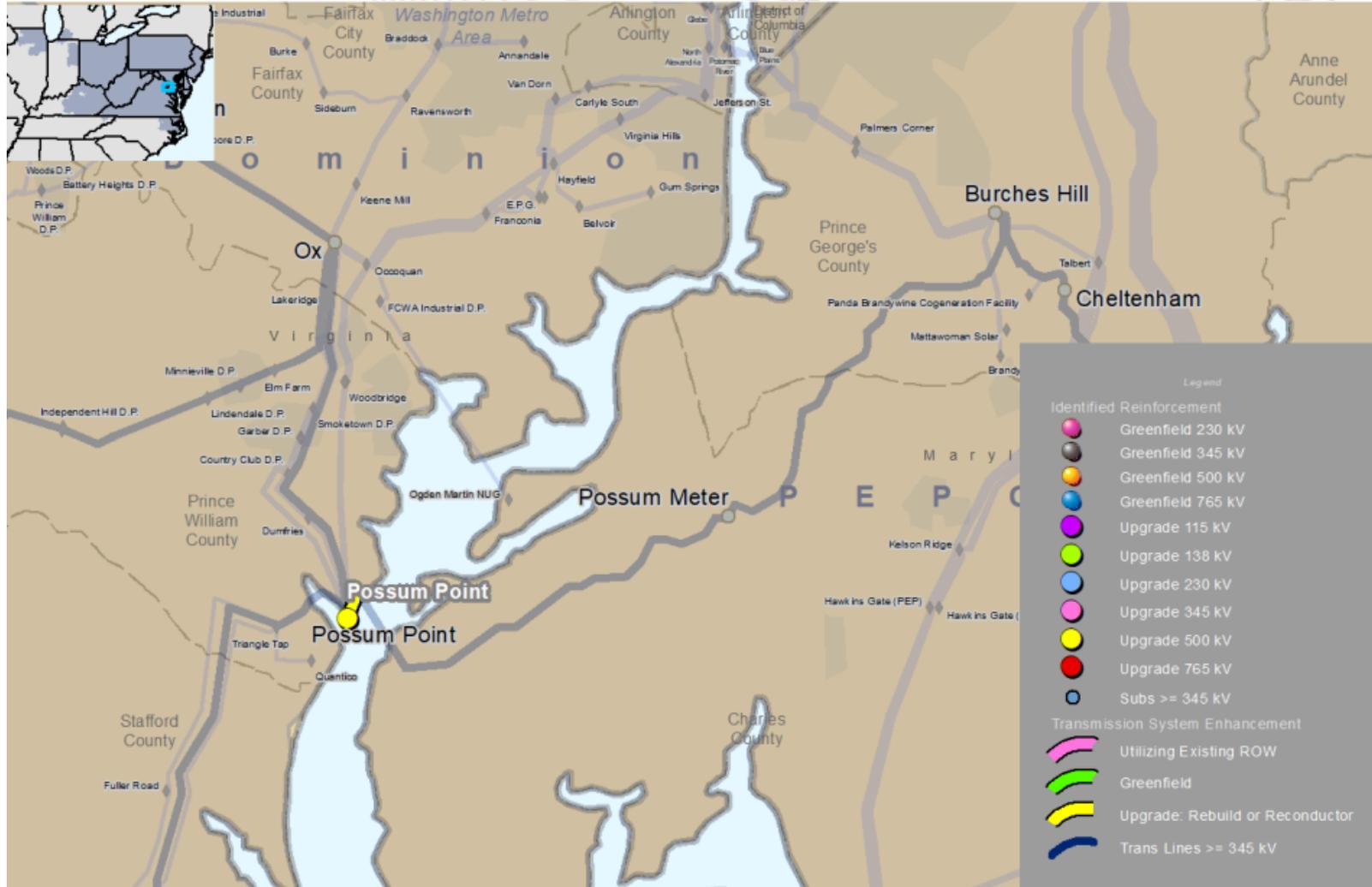
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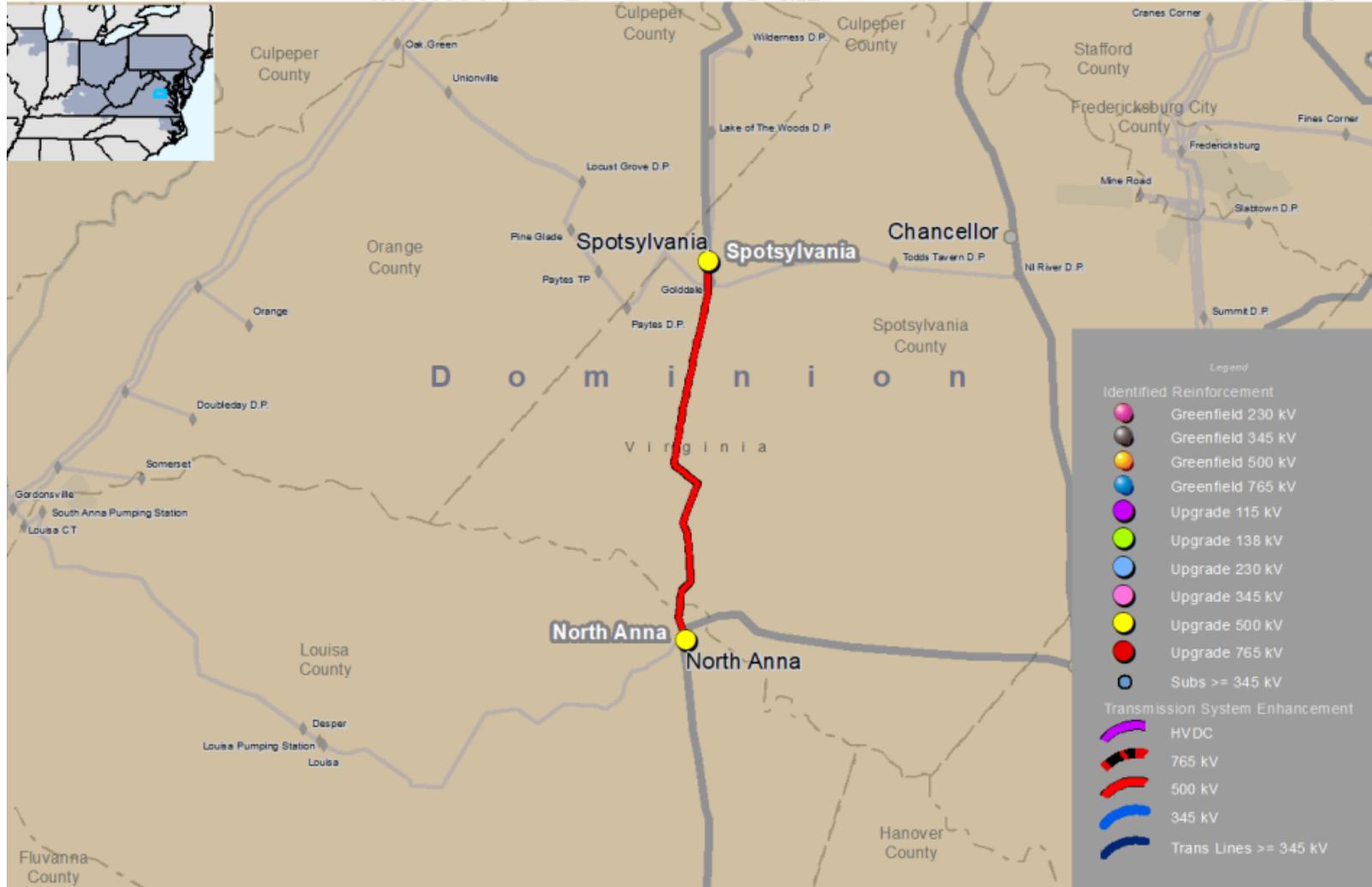
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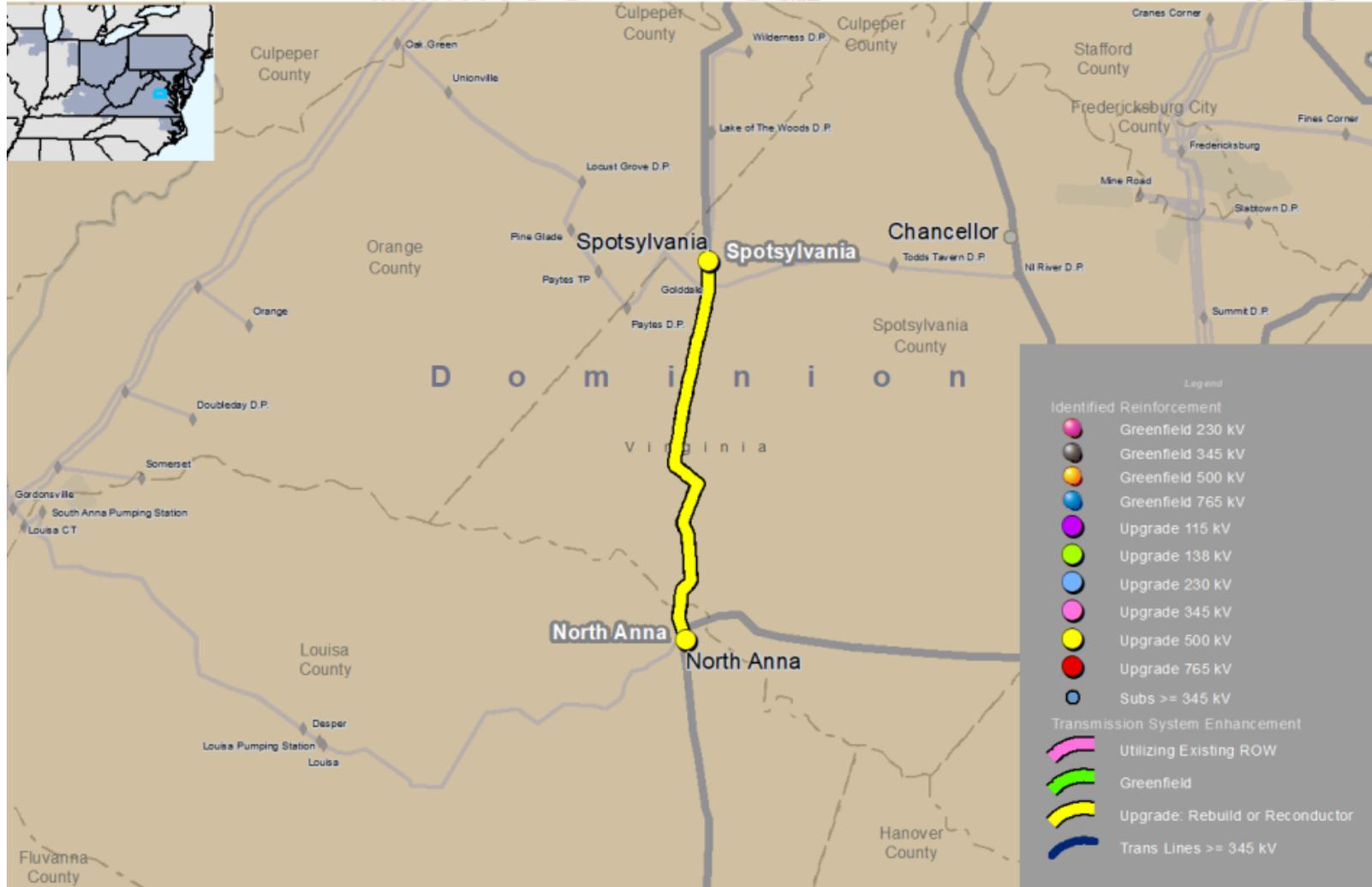
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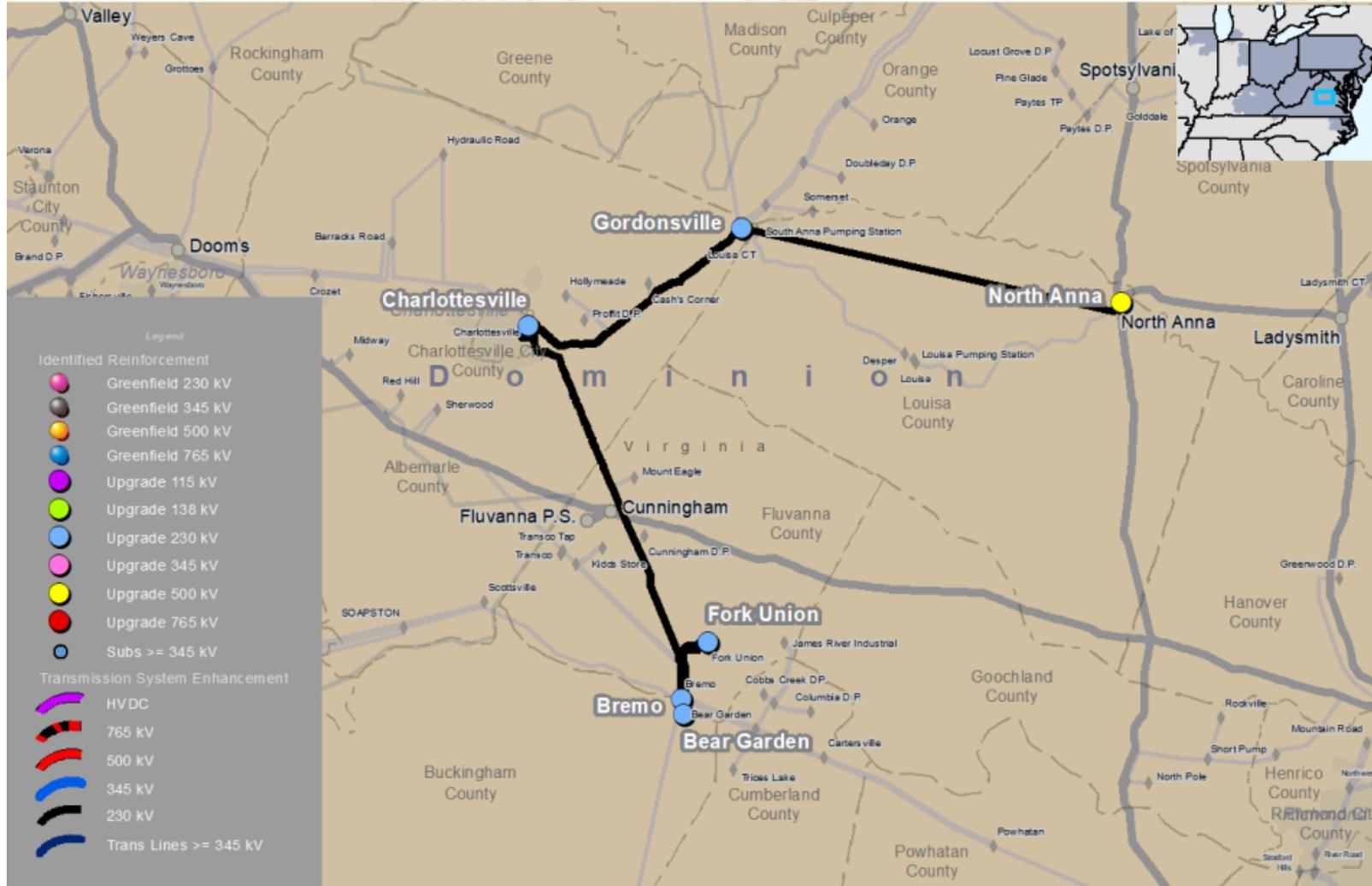
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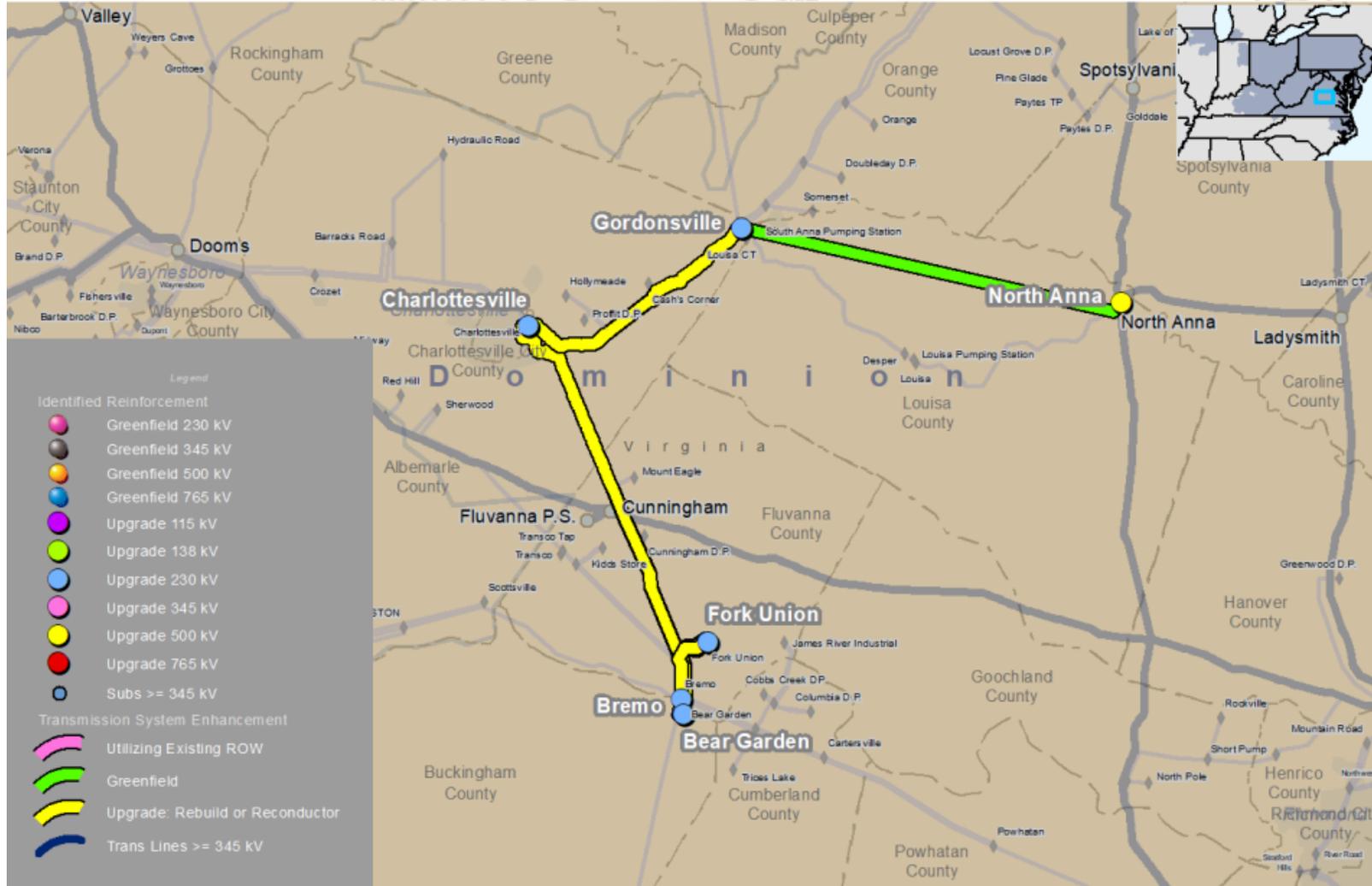
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Appendix

Scenario 5 and Scenario 6

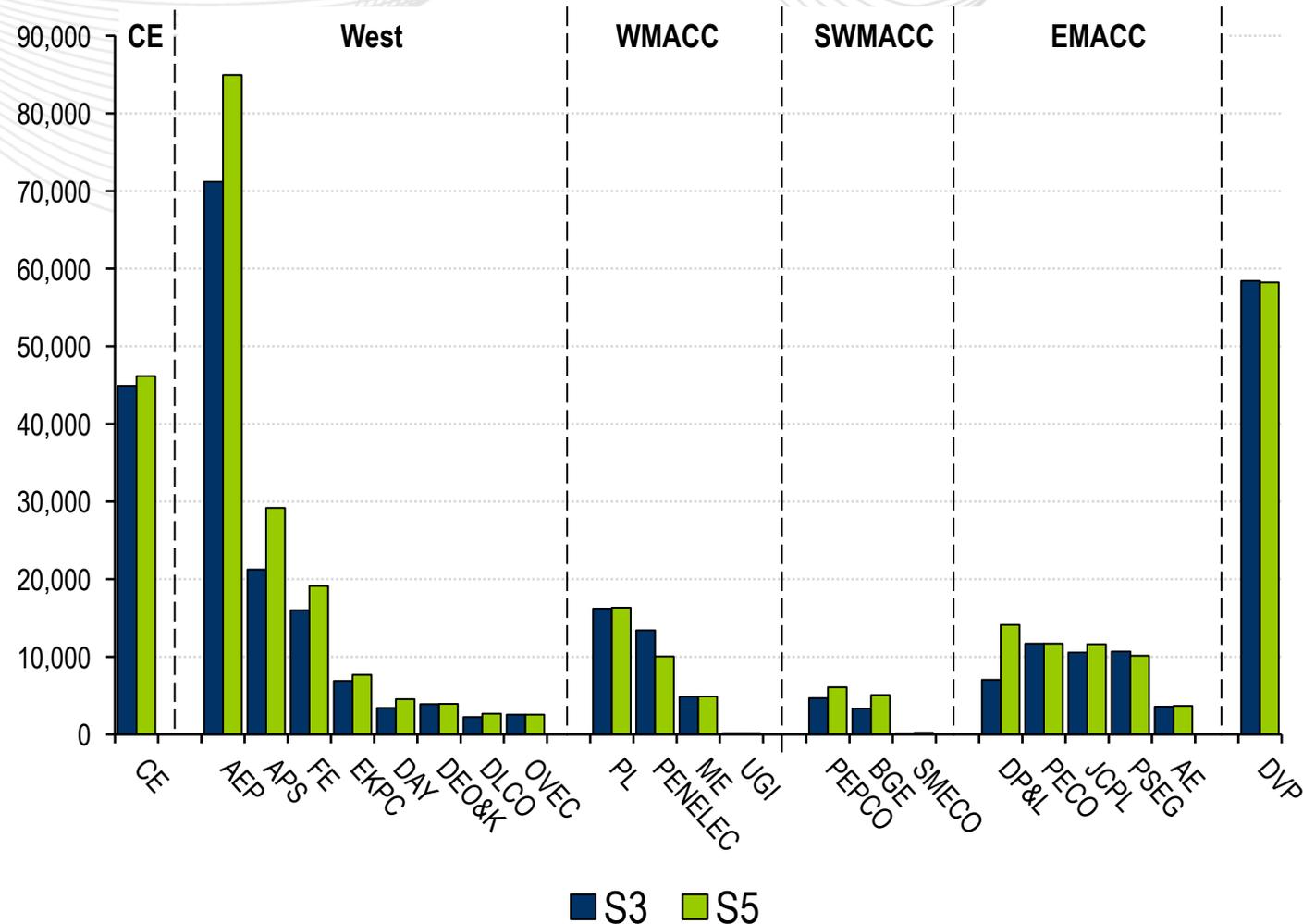


Nameplate Capacity: S3 vs. S5

By TO/Region

Nameplate Capacity (MW)

Area	S3	S5
CE	44,913	46,166
AEP	71,187	84,952
APS	21,240	29,187
FE	16,016	19,126
EKPC	6,903	7,674
DAY	3,416	4,541
DEO&K	3,900	3,930
DLCO	2,243	2,675
OVEC	2,555	2,555
West	127,461	154,641
PL	16,216	16,336
PENELEC	13,420	10,049
ME	4,868	4,888
UGI	170	170
WMACC	34,673	31,443
PEPCO	4,674	6,082
BGE	3,344	5,074
SMECO	148	215
SWMACC	8,166	11,372
DP&L	7,040	14,118
PECO	11,692	11,692
JCPL	10,551	11,620
PSEG	10,680	10,144
AE	3,583	3,677
EMACC	43,547	51,251
DVP	58,431	58,236
Grand Total	317,190	353,108



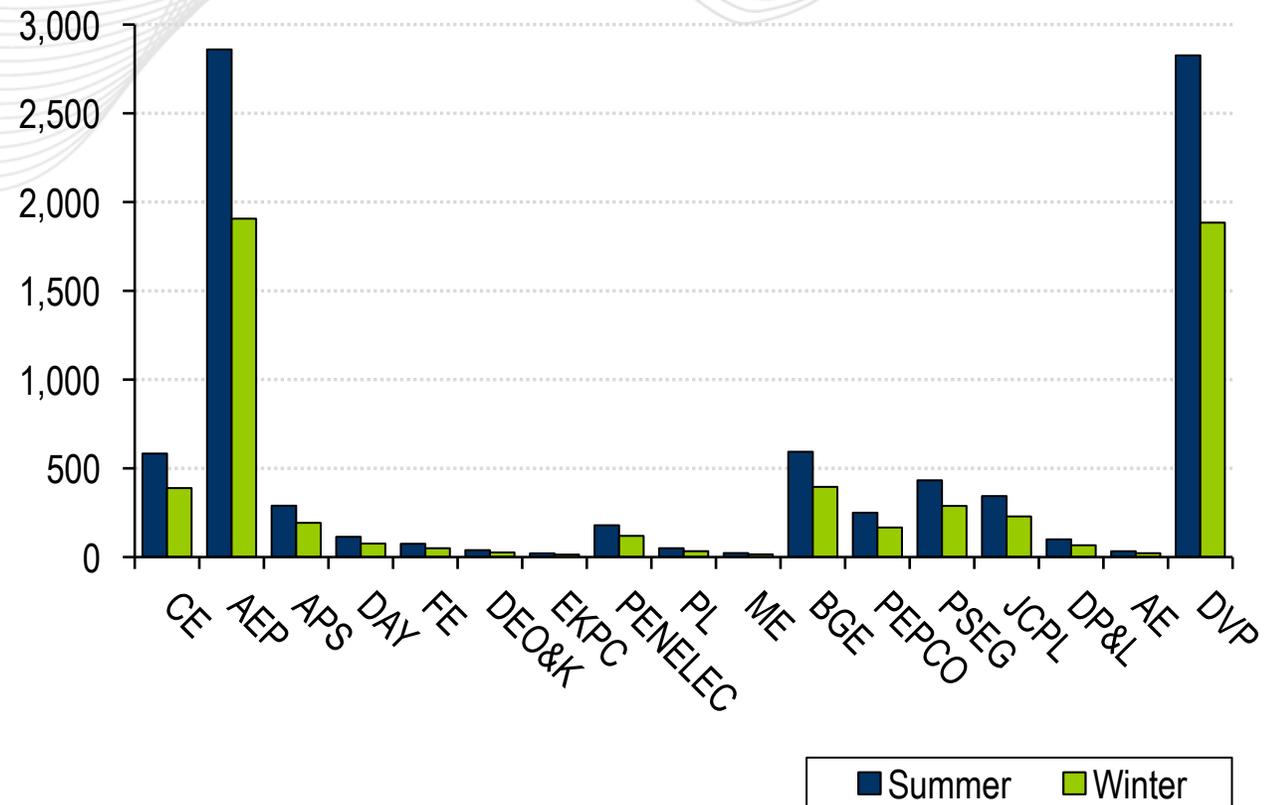


2032 Scenario 6: Battery Dispatched

Battery Dispatch (MW)

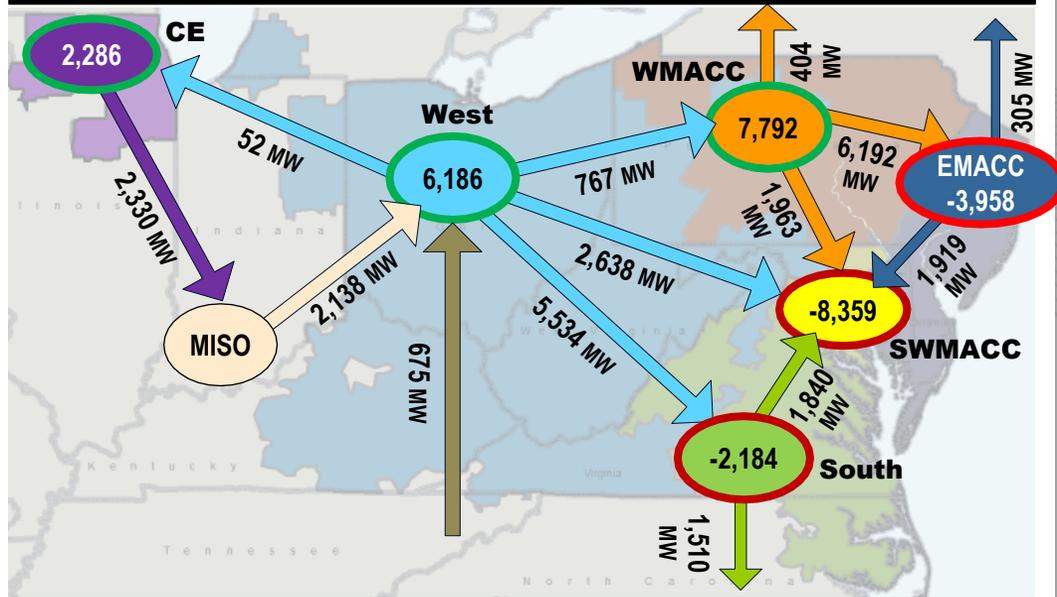
Area Name	Summer	Winter
CE	583	389
AEP	2,860	1,907
APS	289	193
DAY	114	76
FE	75	50
DEO&K	39	26
EKPC	21	14
PENELEC	179	120
PL	50	33
ME	23	15
BGE	593	396
PEPCO	250	167
PSEG	433	288
JCPL	344	229
DP&L	100	67
AE	33	22
DVP	2,826	1,884
Grand Total	8,813	5,875

Battery Generation (GW)

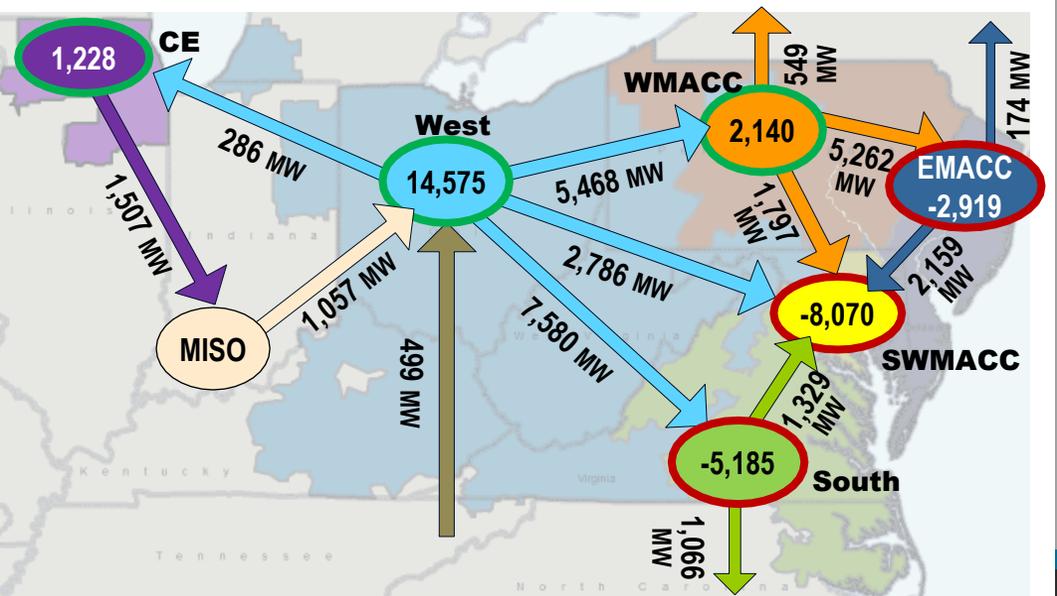


Summer: Gen/Load Profile in S3/S5

2032 Scenario 3



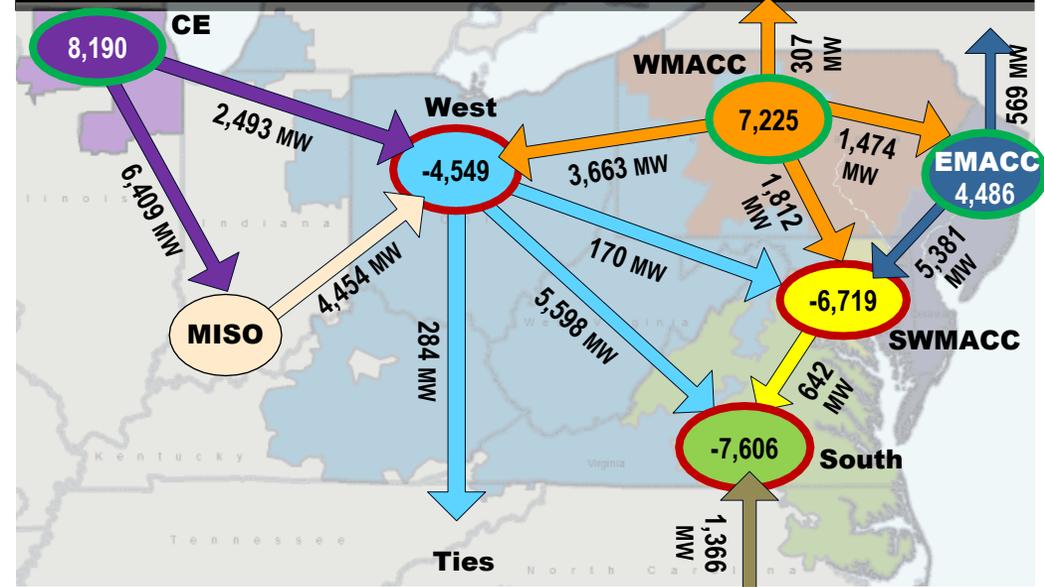
2032 Scenario 5



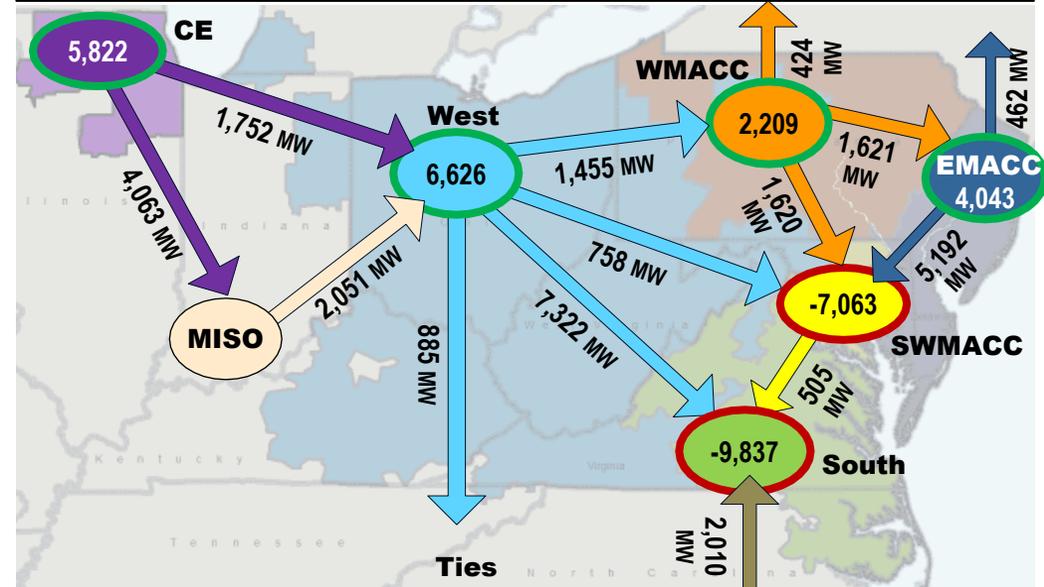
Area	Pgen (MW)		Load+Losses (MW)		Net (MW)	
	S3	S5	S3	S5	S3	S5
APS	15,170	19,485	10,571	10,824	4,599	8,660
FE	11,857	14,276	15,546	15,629	-3,689	-1,353
AEP	45,156	47,721	39,928	39,994	5,228	7,727
OVEC	2,214	1,843	39	38	2,175	1,805
DAY	1,869	2,073	3,719	3,725	-1,850	-1,651
DEO&K	3,348	2,816	5,674	5,678	-2,326	-2,862
DLCO	2,080	2,434	2,752	2,757	-672	-323
CE	25,338	24,290	23,052	23,062	2,286	1,228
PENELEC	9,255	5,323	3,118	3,164	6,137	2,158
ME	3,653	3,656	3,437	3,441	215	215
JCPL	4,949	4,934	6,159	6,140	-1,211	-1,205
PL	14,235	12,596	12,713	12,747	1,522	-152
PECO	10,899	10,789	9,227	9,243	1,672	1,546
PSEG	8,400	8,111	11,487	11,502	-3,087	-3,391
BGE	2,016	2,383	6,778	6,784	-4,761	-4,401
PEPCO	2,576	2,483	5,456	5,463	-2,880	-2,980
AE	1,516	1,458	2,644	2,650	-1,128	-1,193
DP&L	4,243	5,775	4,037	4,040	206	1,735
UGI	119	119	201	201	-82	-82
RECO	0	0	411	411	-411	-411
SMECO	29	58	746	746	-717	-689
EKPC	4,796	4,652	2,074	2,082	2,723	2,570
DVP	35,751	32,776	37,934	37,961	-2,184	-5,185
Total	209,468	210,052	207,704	208,284	1,764	1,768

WIN: Gen/Load Profile in S3/S5

2032 Scenario 3



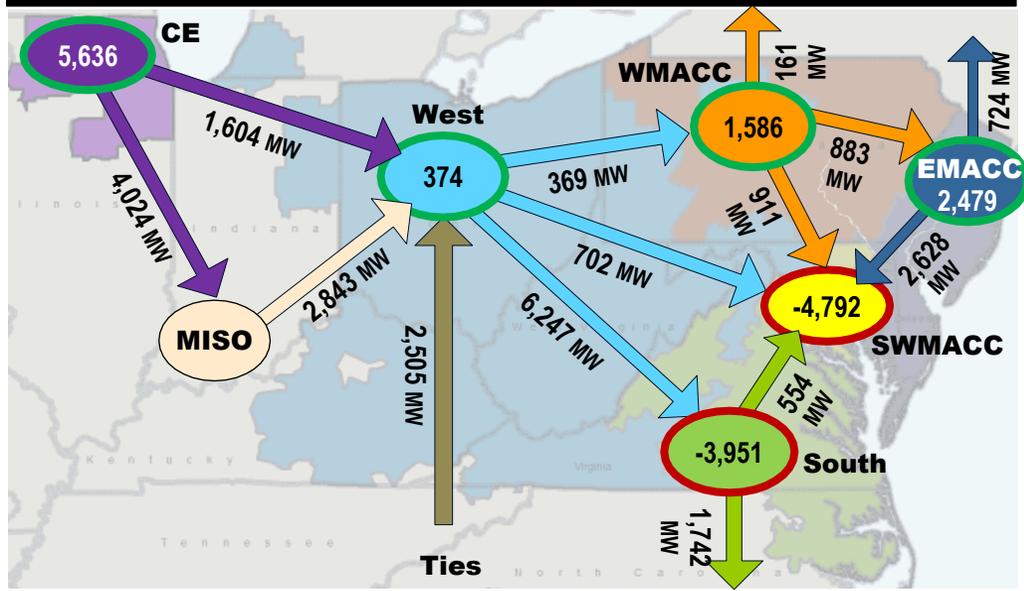
2032 Scenario 5



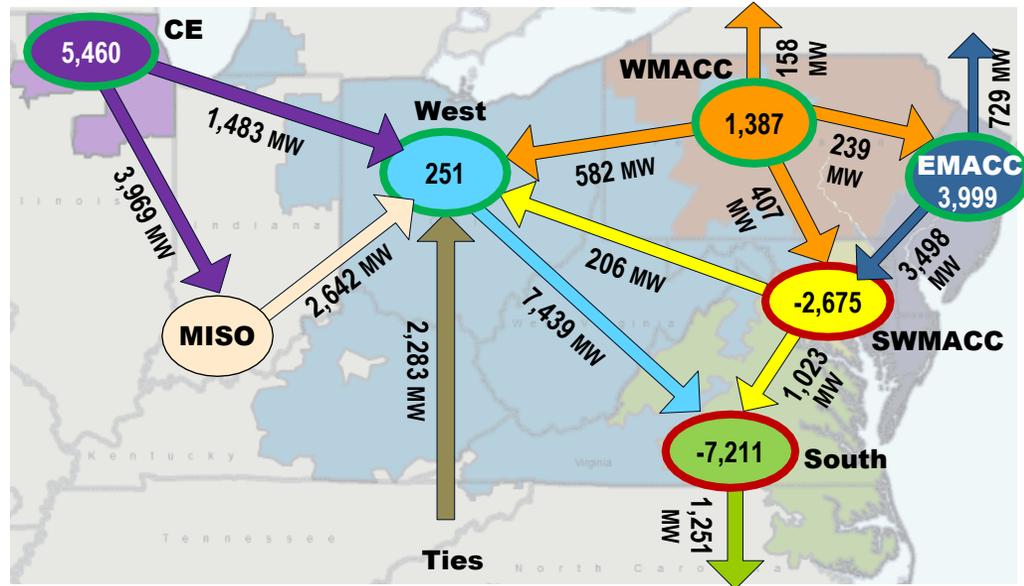
Area	Pgen (MW)		Load+Losses (MW)		Net (MW)	
	S3	S5	S3	S5	S3	S5
APS	14,271	19,343	11,265	11,470	3,006	7,873
FE	11,603	12,763	13,850	13,934	-2,247	-1,171
AEP	35,761	42,460	40,247	40,401	-4,486	2,060
OVEC	2,100	2,100	50	51	2,050	2,048
DAY	1,103	1,610	3,317	3,341	-2,214	-1,731
DEO&K	3,404	2,185	4,936	4,942	-1,532	-2,757
DLCO	2,255	2,486	2,089	2,094	165	392
CE	27,835	24,803	18,925	18,980	8,910	5,822
PENELEC	8,388	4,363	2,988	2,986	5,401	1,377
ME	3,644	3,602	3,209	3,202	436	400
JCPL	6,472	6,495	5,549	5,551	923	944
PL	14,446	13,510	12,985	12,993	1,462	517
PECO	10,812	10,862	7,402	7,407	3,410	3,454
PSEG	9,665	8,615	10,412	10,421	-747	-1,805
BGE	2,010	2,570	6,374	6,363	-4,364	-3,793
PEPCO	3,279	2,358	4,959	4,957	-1,680	-2,599
AE	2,152	2,053	2,069	2,071	84	-17
DP&L	5,009	5,653	3,905	3,898	1,104	1,754
UGI	161	119	205	205	-43	-85
RECO	0	0	287	287	-287	-287
SMECO	3	7	677	677	-674	-671
EKPC	3,558	2,768	2,848	2,856	710	-88
DVP	30,833	28,660	38,439	38,497	-7,606	-9,837
Total	198,765	199,384	196,989	197,584	1,776	1,801

LL: Gen/Load Profile in S3/S5

2032 Scenario 3



2032 Scenario 5



Area	Pgen (MW)		Load+Losses (MW)		Net (MW)	
	S3	S5	S3	S5	S3	S5
APS	8,074	5,913	6,673	6,662	1,400	-749
FE	9,091	8,893	9,607	9,631	-516	-737
AEP	28,133	30,619	28,251	28,229	-118	2,390
OVEC	271	130	30	24	240	106
DAY	1,035	1,146	1,808	1,820	-773	-674
DEO&K	882	1,790	2,896	2,909	-2,013	-1,119
DLCO	1,975	1,776	1,556	1,558	419	218
CE	19,119	18,923	13,483	13,463	5,636	5,460
PENELEC	3,288	3,710	1,561	1,547	1,726	2,163
ME	3,573	2,768	1,723	1,720	1,850	1,048
JCPL	1,325	3,309	3,011	3,012	-1,686	297
PL	7,313	7,594	9,321	9,319	-2,007	-1,724
PECO	7,554	8,401	4,830	4,831	2,724	3,569
PSEG	6,764	5,447	6,263	6,221	501	-773
BGE	1,786	2,567	3,665	3,671	-1,879	-1,104
PEPCO	104	1,427	2,678	2,688	-2,574	-1,262
AE	1,258	756	1,439	1,427	-181	-670
DP&L	3,352	3,901	1,997	2,090	1,356	1,810
UGI	119	0	103	100	16	-100
RECO	0	0	234	234	-234	-234
SMECO	29	60	368	369	-339	-309
EKPC	2,884	1,939	1,150	1,123	1,734	816
DVP	22,849	19,344	26,800	26,555	-3,951	-7,211
Total	130,778	130,412	129,446	129,202	1,332	1,211

Xfmr = Transformer

Summer: S3/S5 Unique Overloaded Facilities

2032 Base Scenario (S3)

Area	230-345 kV		500-765 kV		Total
	Line	Xfmr	Line	Xfmr	
AP	1				1
ATSI	9				9
AEP	28		6	1	35
OVEC	3				3
DAY	2				2
DEO&K	4				4
DLCO	1				1
ComEd	9				9
PENELEC	2				2
METED	2				2
PPL	12			1	13
PECO	11				11
PSEG	5				5
PEPCO	2		1	1	3
AE	1				1
DP&L	2				2
EKPC	1				1
Dominion	82		12	8	102
Total	173	0	18	11	202

2032 Deactivation Scenario (S5)

Area	230-345 kV		500-765 kV		Total
	Line	Xfmr	Line	Xfmr	
AP	3		8	3	14
ATSI	13				13
AEP	52		18	3	73
OVEC	3				3
DAY	3				3
DEO&K	5				5
DLCO	2				2
ComEd	12			2	14
PENELEC	7		3	1	11
METED	3			1	4
JCPL	2				2
PPL	14		1	1	16
PECO	17		2		19
PSEG	11			1	12
BGE	3		1	2	6
PEPCO	7		2	2	11
AE	1				1
DP&L	22		2	1	24
EKPC	1				1
Dominion	96		18	8	122
Total	275	0	53	24	352

Changes in S5 Compared to S3

Area	230-345 kV		500-765 kV		Total
	Line	Xfmr	Line	Xfmr	
AP	2	0	8	3	13
ATSI	5	0	0	0	5
AEP	24	0	12	2	38
OVEC	1	0	0	0	1
DAY	1	0	0	0	1
DEO&K	2	0	0	0	2
DLCO	1	0	0	0	1
ComEd	4	0	0	2	6
PENELEC	5	0	3	1	9
METED	1	0	0	1	2
JCPL	2	0	0	0	2
PPL	2	0	1	0	3
PECO	6	0	2	0	8
PSEG	6	0	0	1	7
BGE	3	0	1	2	6
PEPCO	5	0	2	1	8
AE	0	0	0	0	0
DP&L	20	0	2	1	22
EKPC	0	0	0	0	0
Dominion	14	0	6	0	20
Total	102	0	35	13	150

Xfmr = Transformer

WIN: S3/S5 Unique Overloaded Facilities

2032 Base Scenario (S3)

Area	230–345 kV		500–765 kV		Total
	Line	Xfmr	Line	Xfmr	
ATSI	1				1
AEP	12		2	1	15
DAY	1				1
DEO&K	1				1
ComEd	20			4	24
METED	2				2
JCPL	1		1		2
PPL	4				4
PECO	3		2		4
PSEG	4				4
BGE				1	1
PEPCO	1				1
AE	1				1
DP&L	1		1		2
Dominion	26			3	29
Total	75	0	5	9	89

2032 Deactivation Scenario (S5)

Area	230–345 kV		500–765 kV		Total
	Line	Xfmr	Line	Xfmr	
AP			2		2
ATSI	4				4
AEP	22		8	3	32
OVEC	2				2
DAY	1				1
DEO&K	2				2
ComEd	28		1	4	33
PENELEC			1		1
METED	2				2
JCPL	9	2	1		12
PPL	7				7
PECO	15		2		17
PSEG	8				8
BGE			2	1	3
PEPCO	6		4	2	11
AE	2				2
DP&L	20		3	1	24
Dominion	43		8	7	57
Total	168	2	28	18	216

Changes in S5 Compared to S3

Area	230–345 kV		500–765 kV		Total
	Line	Xfmr	Line	Xfmr	
AP	0	0	2	0	2
ATSI	3	0	0	0	3
AEP	10	0	6	2	18
OVEC	2	0	0	0	2
DAY	0	0	0	0	0
DEO&K	1	0	0	0	1
ComEd	9	0	1	0	9
PENELEC	0	0	1	0	1
METED	0	0	0	0	0
JCPL	8	2	0	0	10
PPL	3	0	0	0	3
PECO	13	0	0	0	13
PSEG	4	0	0	0	4
BGE	0	0	2	0	2
PEPCO	5	0	4	2	11
AE	1	0	0	0	1
DP&L	19	0	2	1	22
Dominion	17	0	8	4	29
Total	94	2	23	9	128



LL: S3/S5 Unique Overloaded Facilities

Xfmr = Transformer

2032 Base Scenario (S3)

Area	230-345 kV		500-765 kV		Total
	Line	Xfmr	Line	Xfmr	
ATSI	1				1
AEP	12		1		13
OVEC	2				2
ComEd	13				13
METED	2				2
JCPL	1				1
PPL	3			1	4
PSEG	1				1
Dominion	64		5	7	76
Total	98	0	6	8	112

2032 Deactivation Scenario (S5)

Area	230-345 kV		500-765 kV		Total
	Line	Xfmr	Line	Xfmr	
ATSI	1				1
AEP	20		1	1	22
OVEC	2				2
DEO&K	1				1
ComEd	24			2	26
METED	2				2
JCPL	1				1
PPL	2			1	3
PECO			1		1
PSEG	1				1
DP&L	8				8
Dominion	55		5	7	67
Total	115	0	7	11	133

Changes in S5 Compared to S3

Area	230-345 kV		500-765 kV		Total
	Line	Xfmr	Line	Xfmr	
ATSI	0	0	0	0	0
AEP	8	0	0	1	9
OVEC	-1	0	0	0	-1
DEO&K	1	0	0	0	1
ComEd	12	0	0	2	14
METED	0	0	0	0	0
JCPL	0	0	0	0	0
PPL	-1	0	0	0	-1
PECO	0	0	1	0	1
PSEG	0	0	0	0	0
DP&L	8	0	0	0	8
Dominion	-9	0	0	0	-9
Total	17	0	1	3	21