

# Reliability Analysis Update

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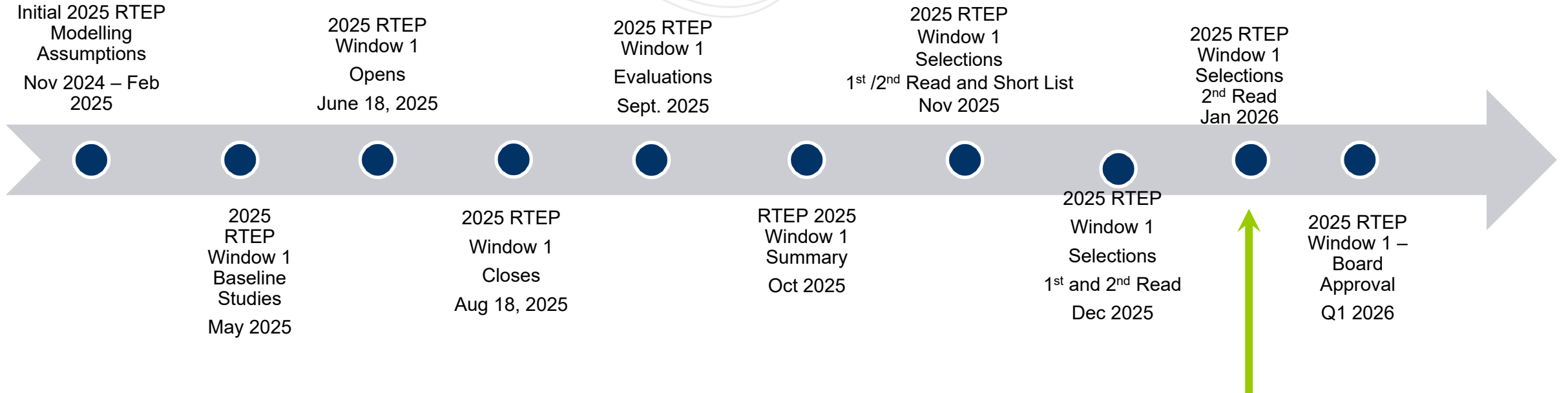
Jan. 6, 2026

- 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- Scenario 2: 2030 Base case + TC1 queue + (Remove) Q1 deactivations + (Remove) withdrawn queues + without NJ/DE OSW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ISA generation, Fast Lane Queue, TC1 queue, TC2 queue (with RRI), 7500MW NJ OSW, (Remove) Q1 deactivations, (Remove) withdrawn queues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.

# Problem Statement

## 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.

# Problem Statement

## 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

In the 2030 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:

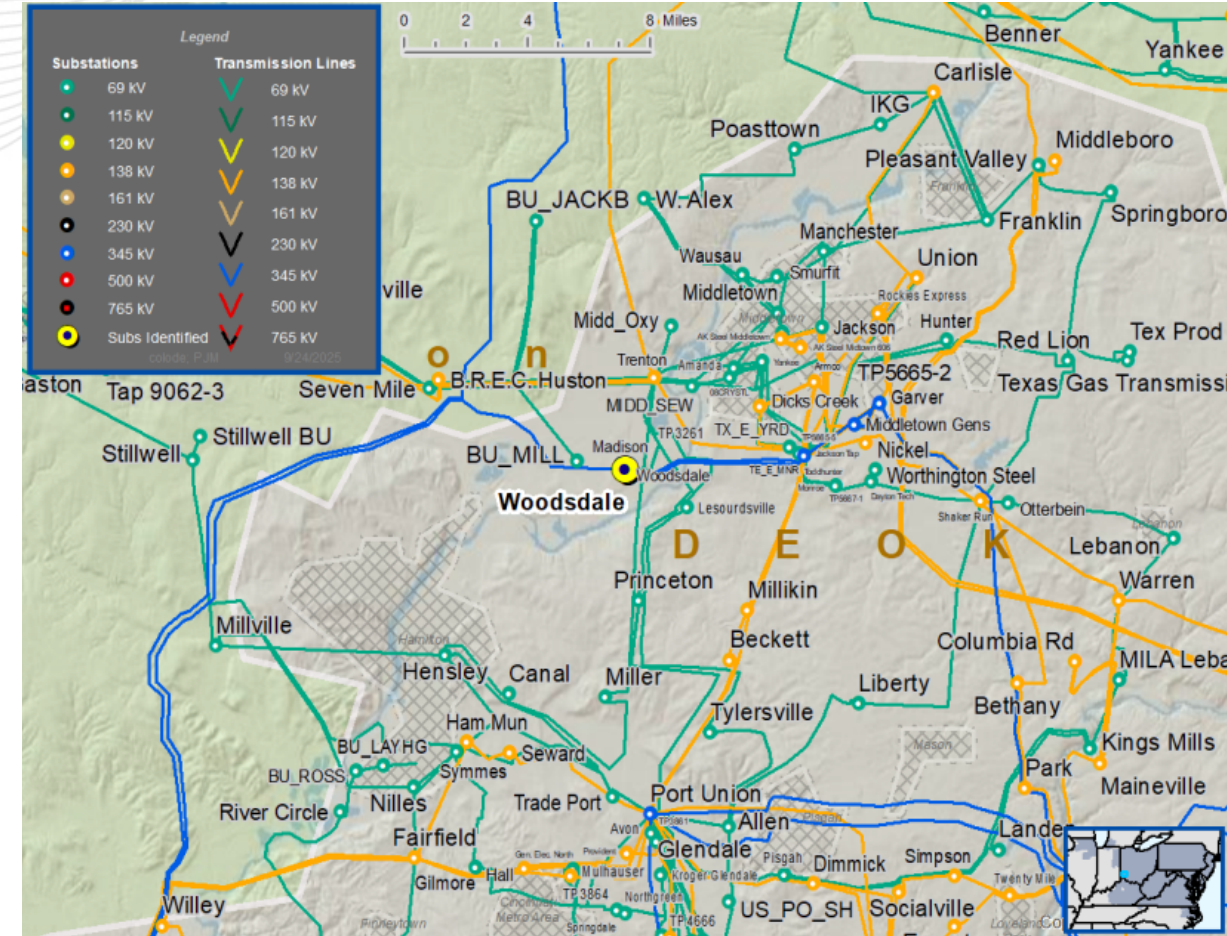
The 345 kV ring bus at Woodsdale Substation will be reconfigured into a 345 kV breaker-and-half yard to improve substation reliability. Additionally, all 2000A equipment at Woodsdale Substation will be upgraded to 3000A to increase substation capacity (b3940.1)

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

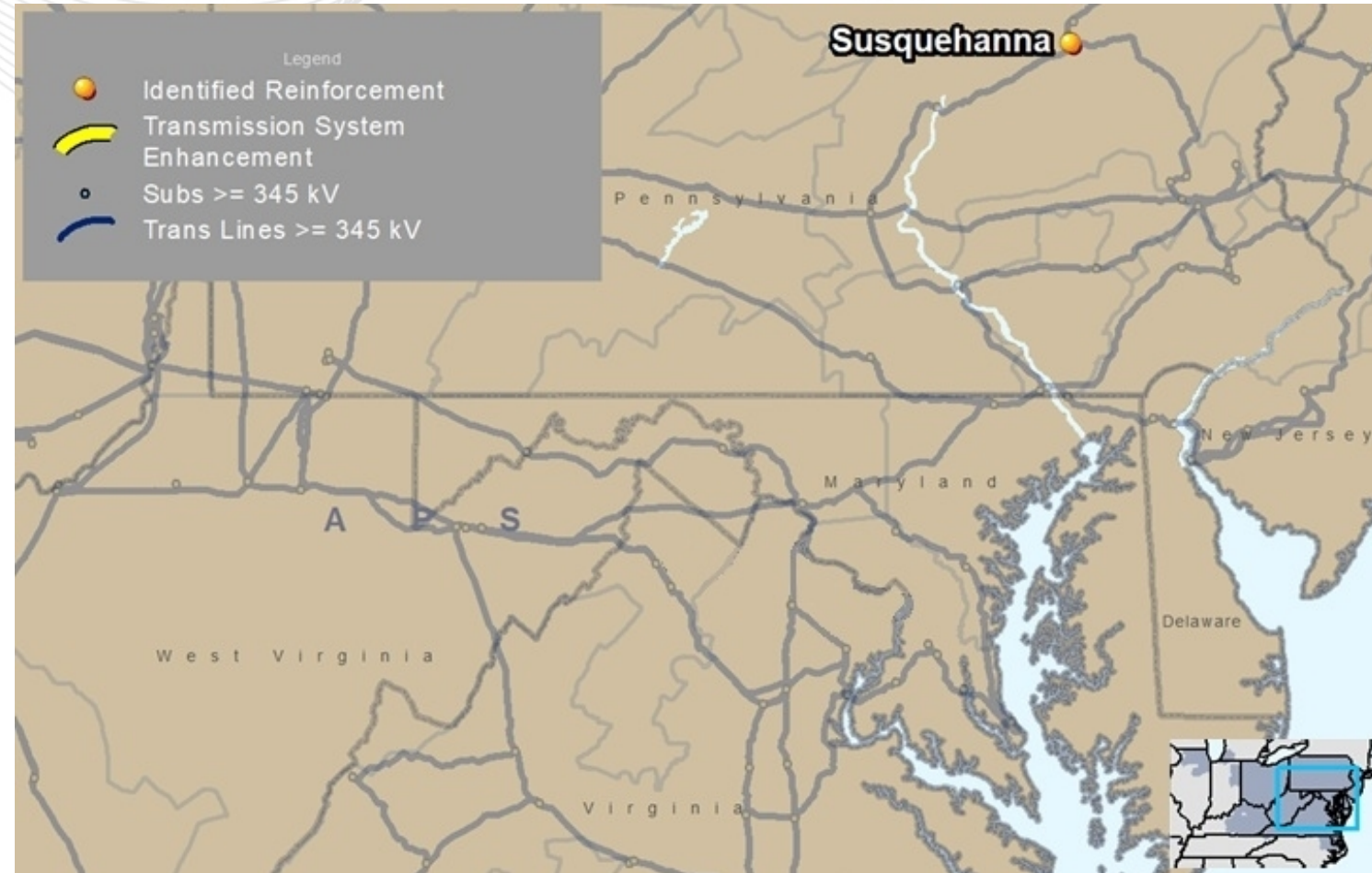
**Proposal Window Exclusion:** None

## 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                       |

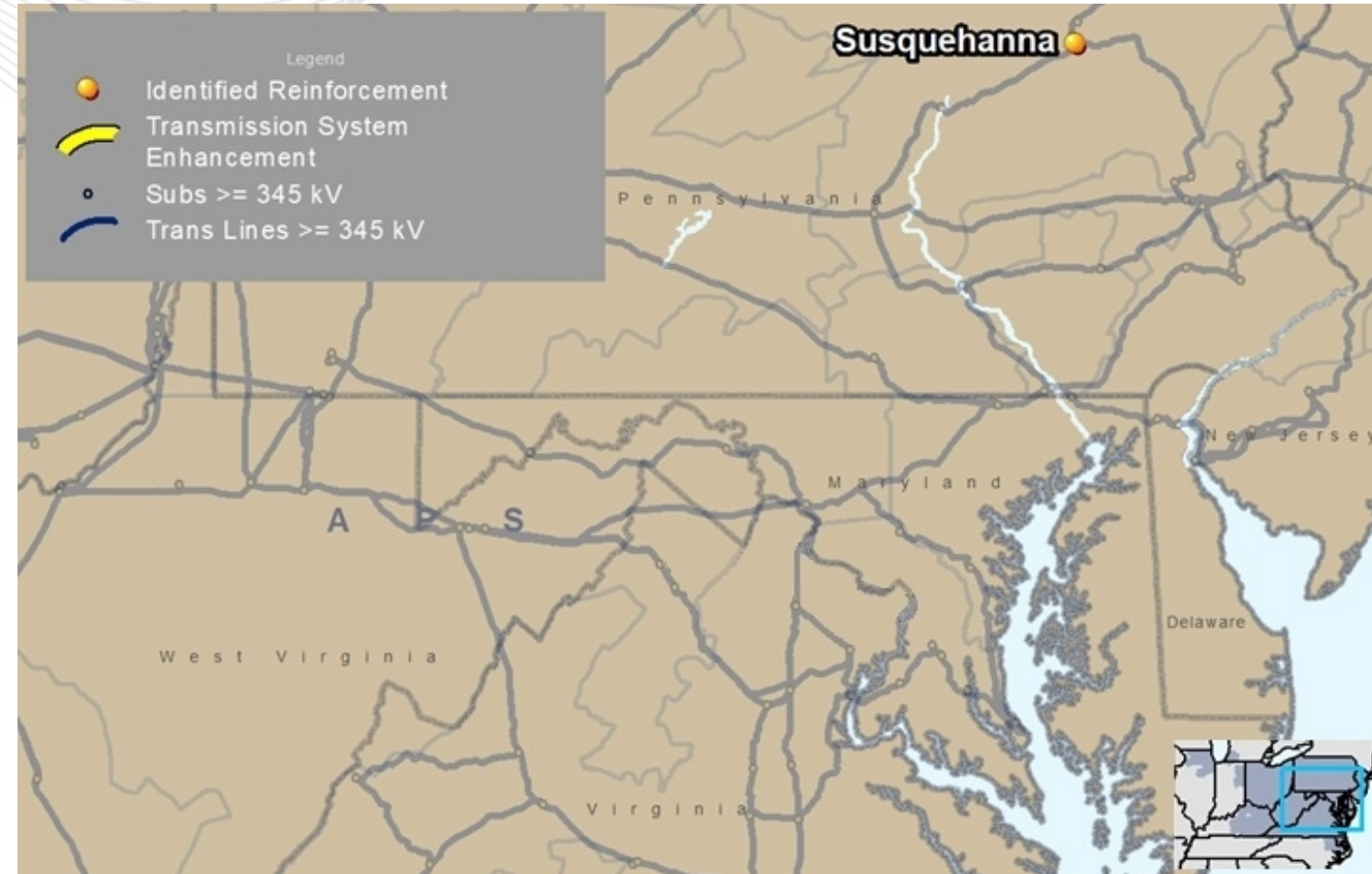
## Preliminary Facility Rating:

| 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

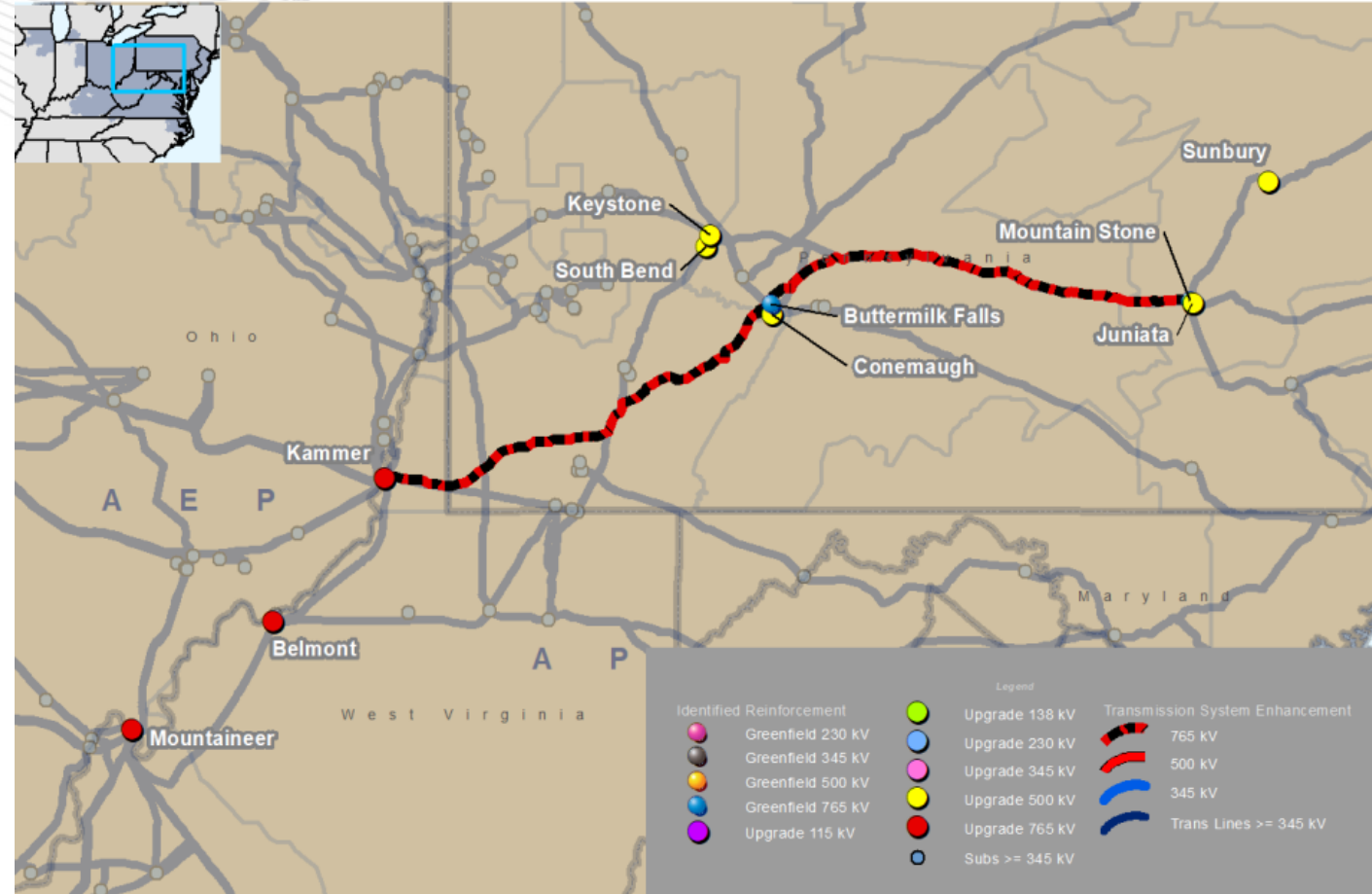
**Criteria:** Baseline Load Growth Deliverability & Reliability

**Assumption Reference:** 2025 RTEP Assumption

**Model Used for Analysis:** 2025 Series RTEP 2032 base cases

**Proposal ID:** 2025-W1-237

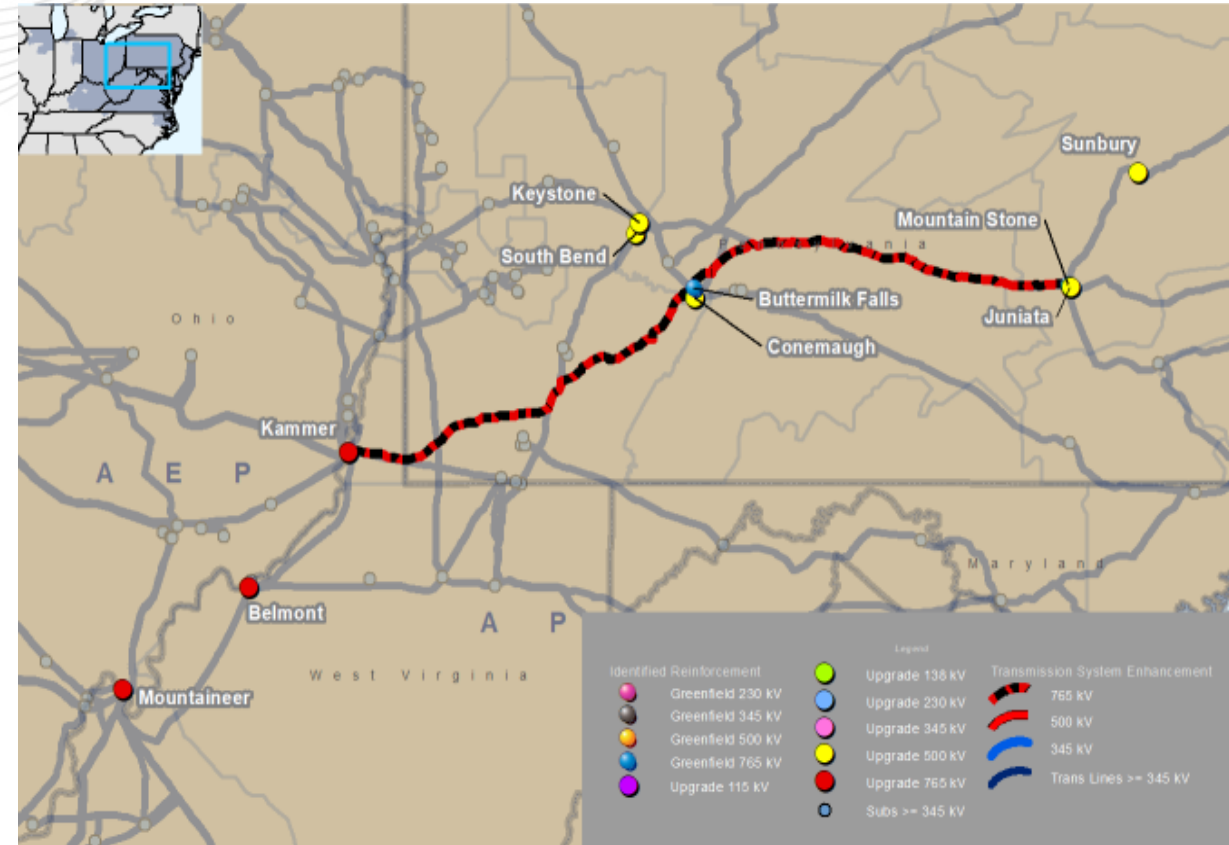
**Problem Statement:** In the 2032 RTEP analysis, multiple 500 kV transmission lines sourcing the Mid-Atlantic region are overloaded, and voltage collapse is observed for several regional facilities.



## 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)     |



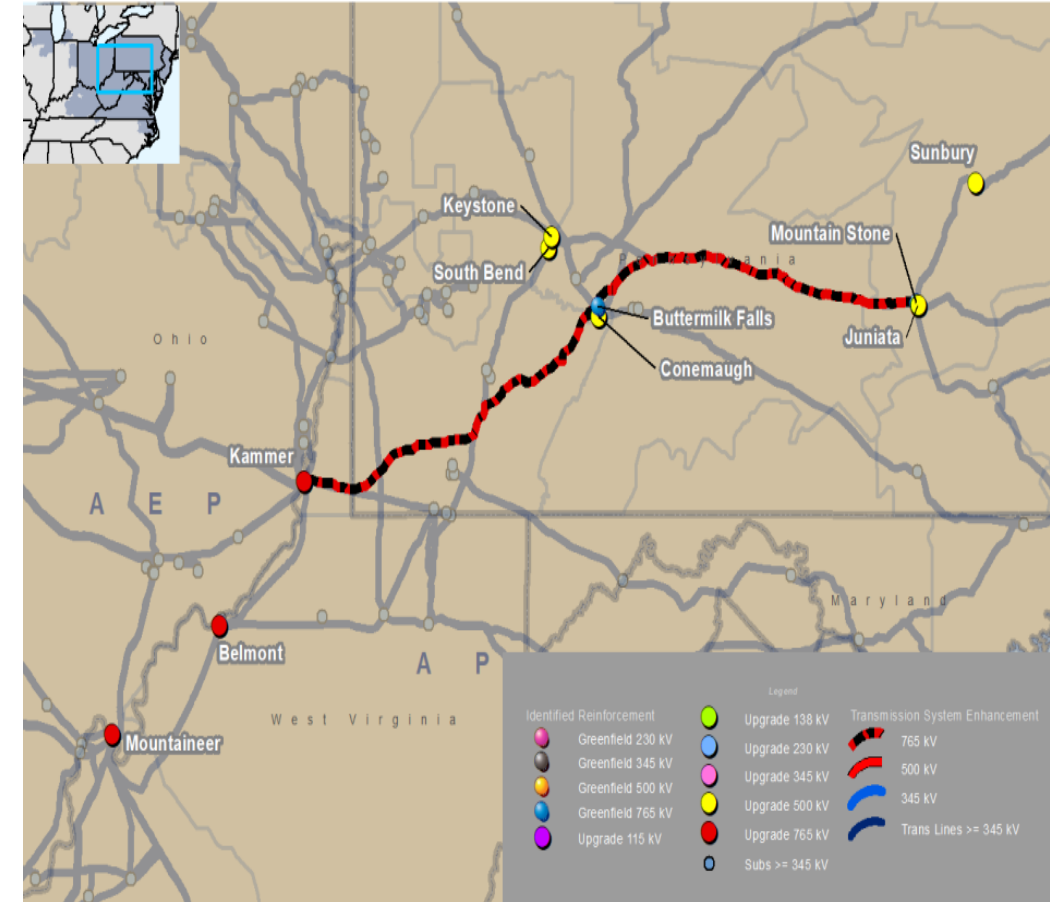
## Process Stage: Recommended Solution

| 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<br>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<br>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

**Criteria:** Baseline Load Growth Deliverability & Reliability

**Assumption Reference:** 2025 RTEP Assumption

**Model Used for Analysis:** 2025 Series RTEP 2032 base cases

**Proposal ID:** 2025-W1-919

**Problem Statement:** Multiple 500kV and 230 kV facilities overloaded in the PEPCO and PEPCO/Dominion tie, in the 2032 RTEP base case and the overload on these facilities worsens with the NJOSW delay as well as the additional 3.5 GW load from PPL (not included in the 2025 load forecast)



## Process Stage: Recommended Solution

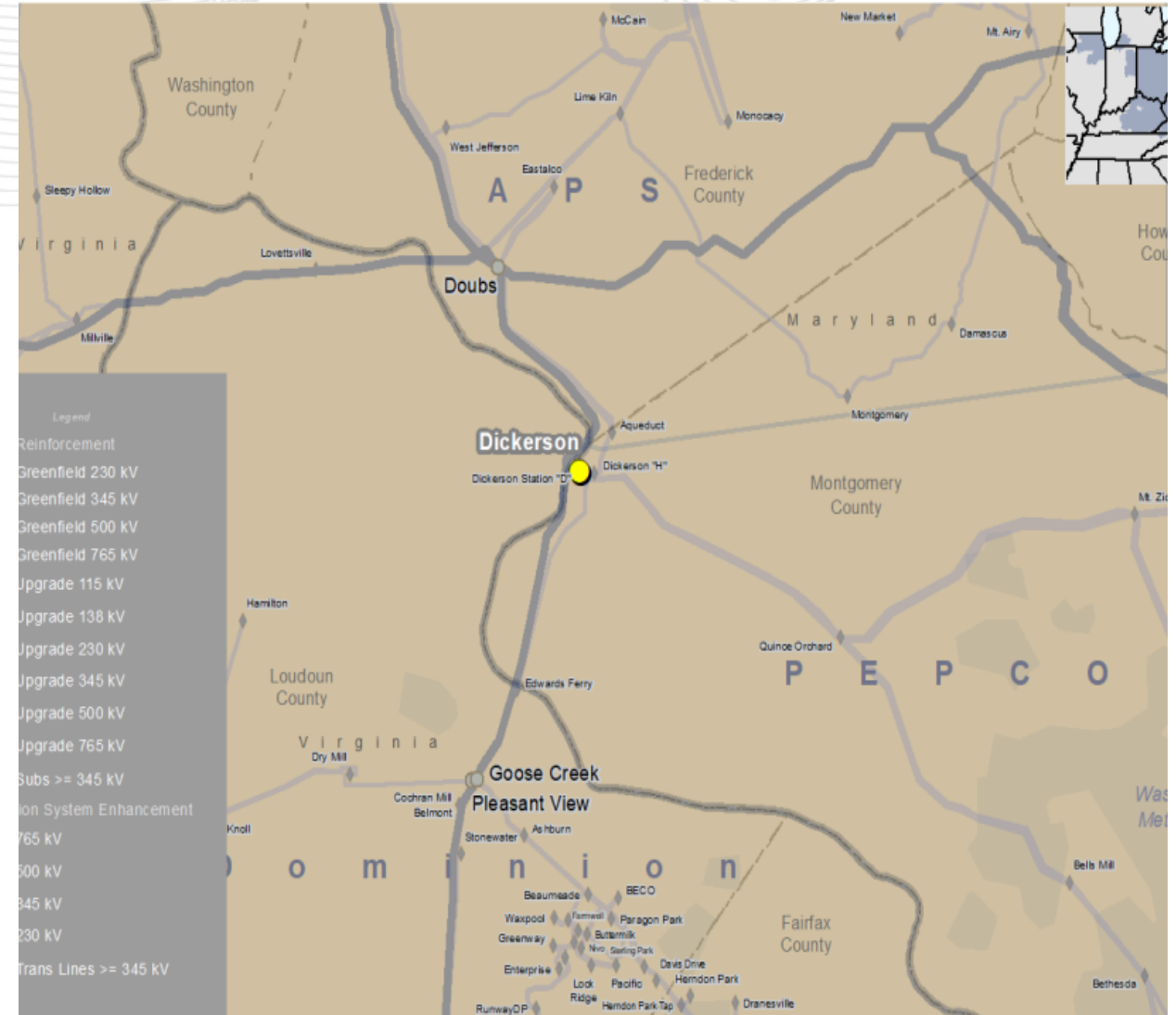
Proposal ID: 2025-W1-919

## 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

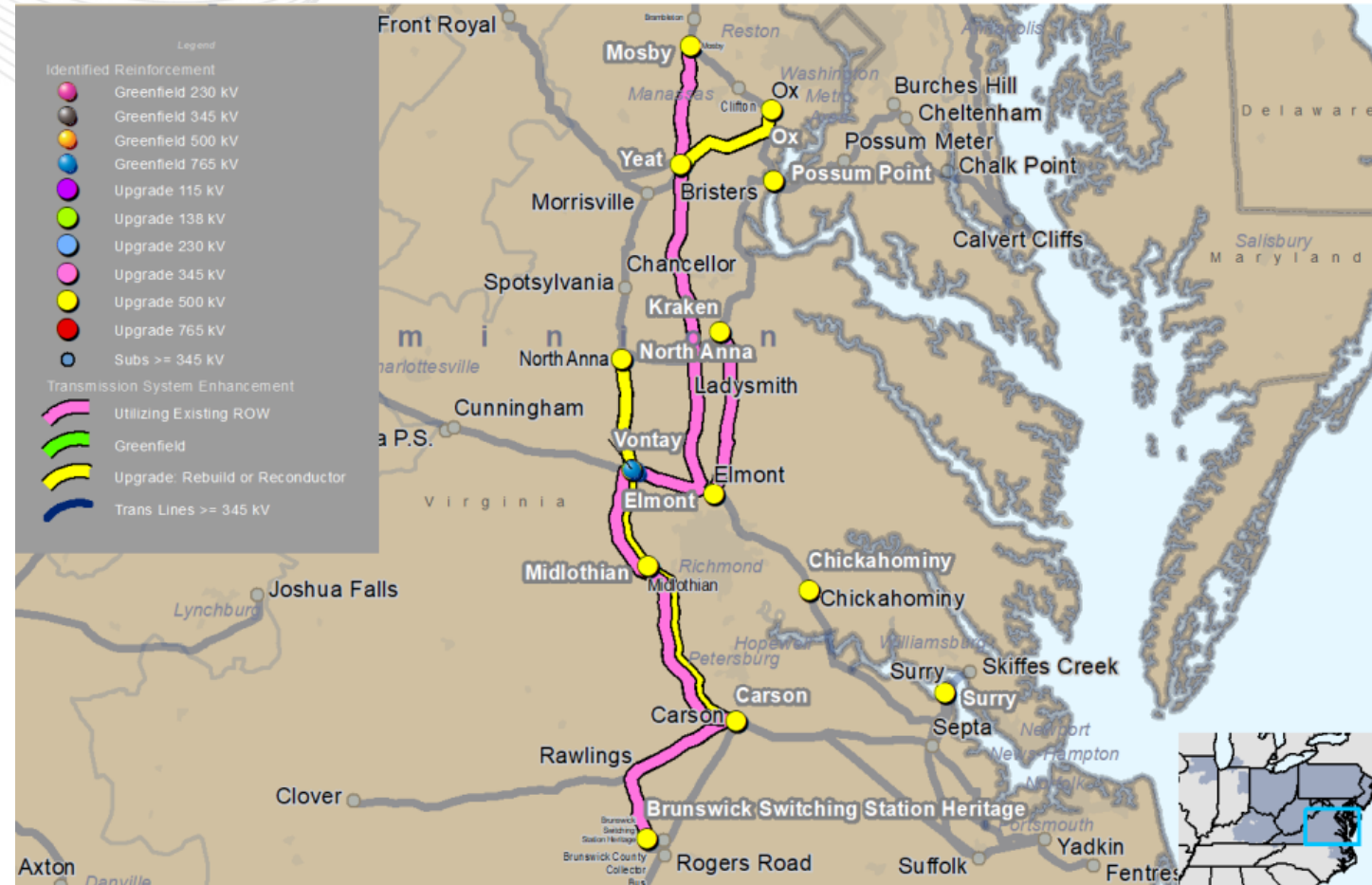
**Assumption Reference:** 2025 RTEP assumptions

**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           |
|               |   | <b>\$4832.45</b> |

# Dominion Transmission Zone: Baseline 2025-W1-9: Line 576 Vontay to Midlothian Rebuild

## 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 |

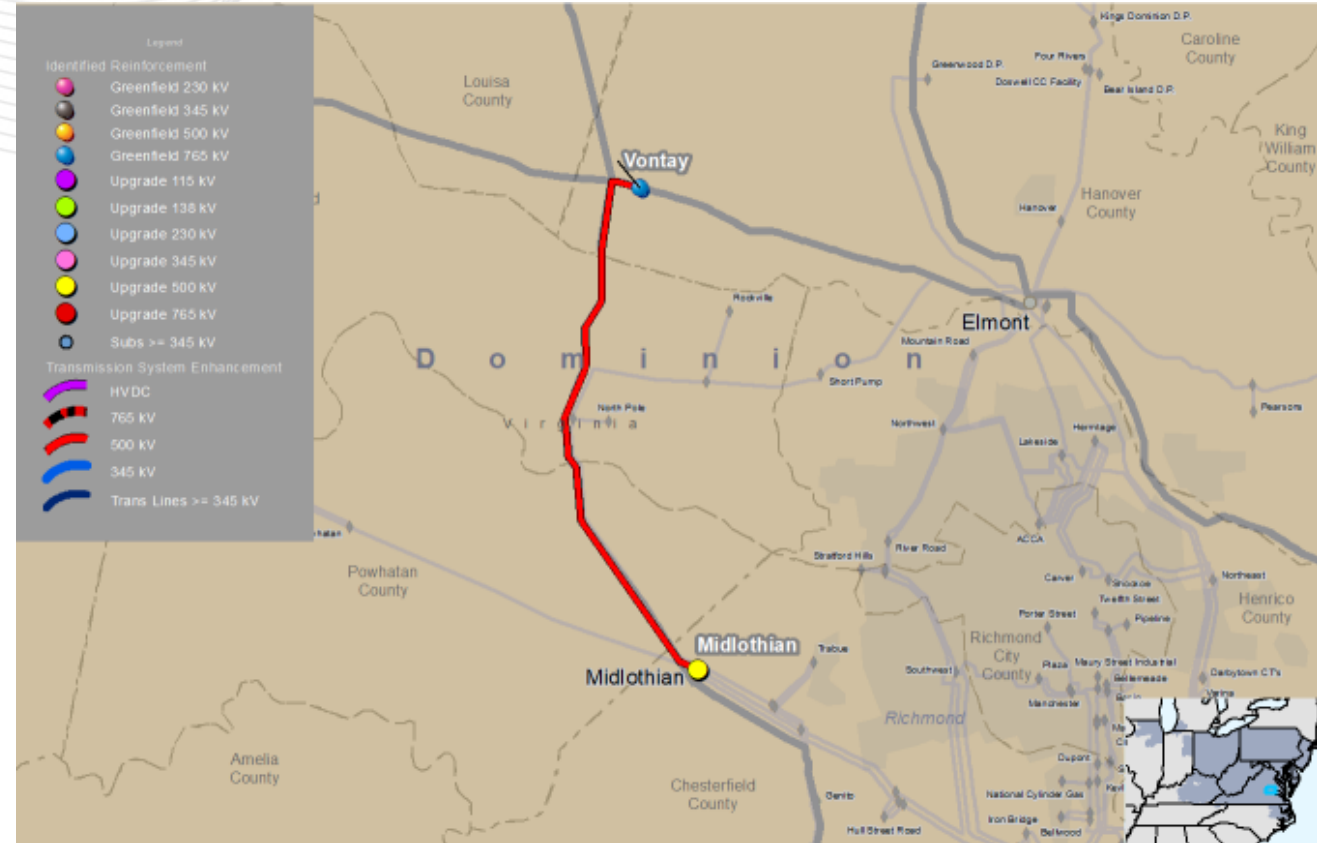
## Preliminary Facility Rating:

| # | 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**



# Dominion Transmission Zone: Baseline 2025-W1-117: Line 539 Yeat to Ox Rebuild

## 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 |

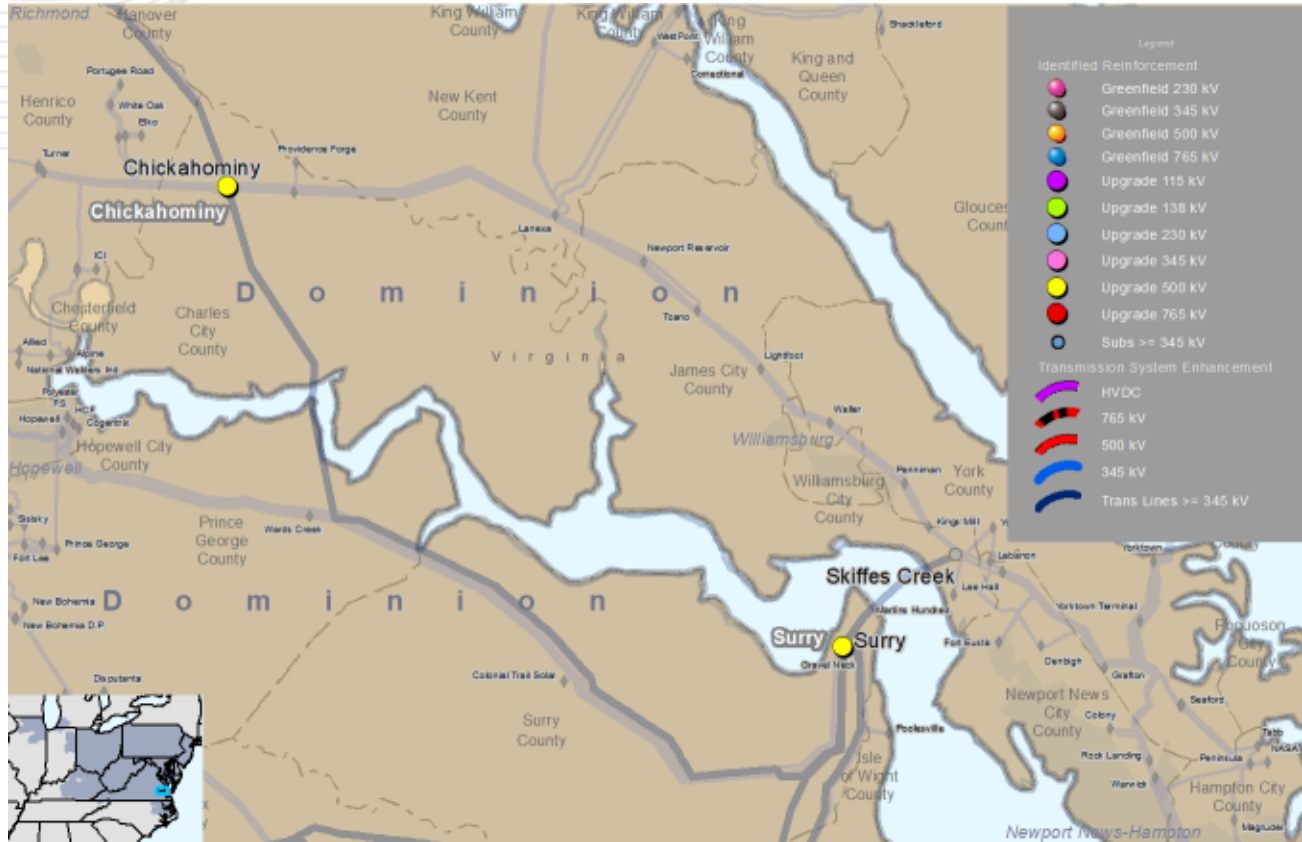
### Preliminary Facility Rating:

| # | 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**



# Dominion Transmission Zone: Baseline

## 2025-W1-238: Line 563 Carson to Midlothian Rebuild

### 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 |

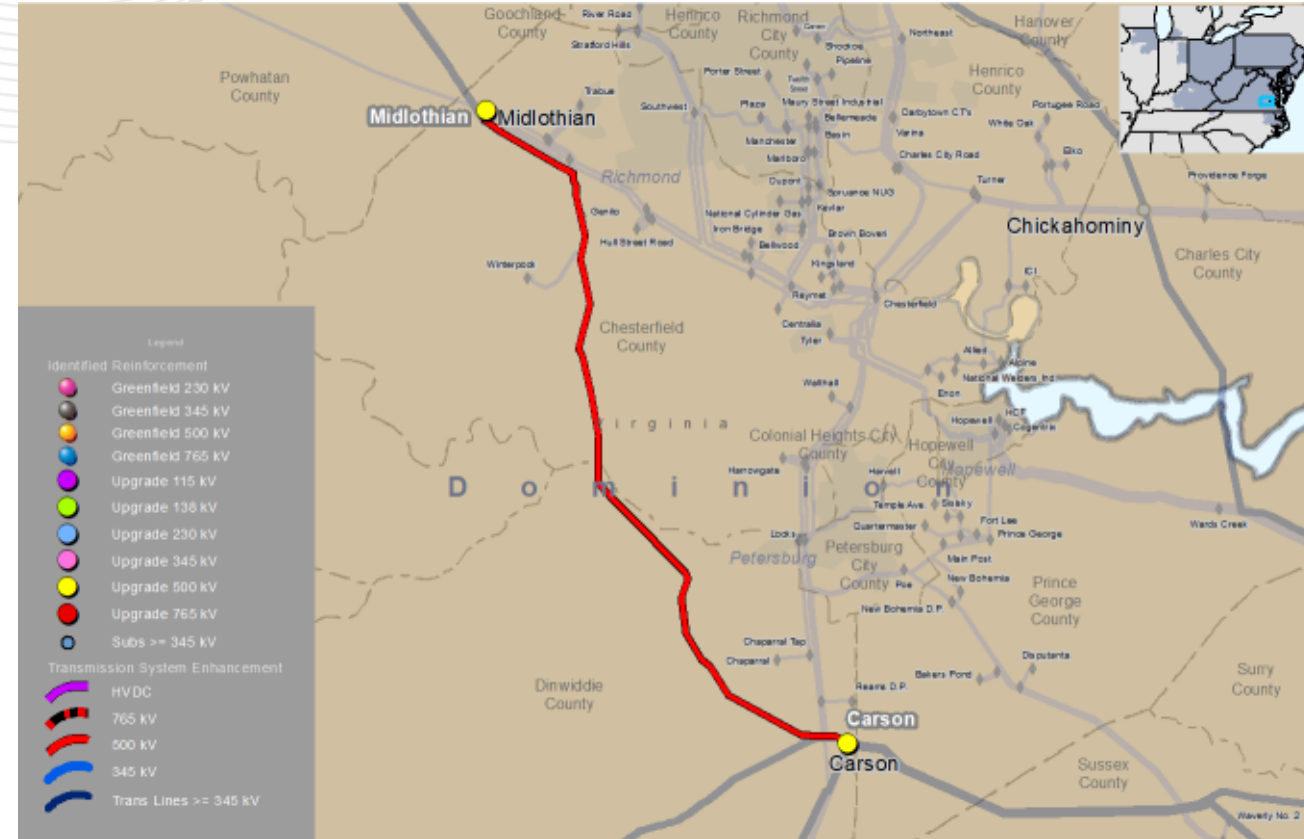
### Preliminary Facility Rating:

| # | 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**



# Dominion Transmission Zone: Baseline

## 2025-W1-247: New 765/500kV Vontay Substation

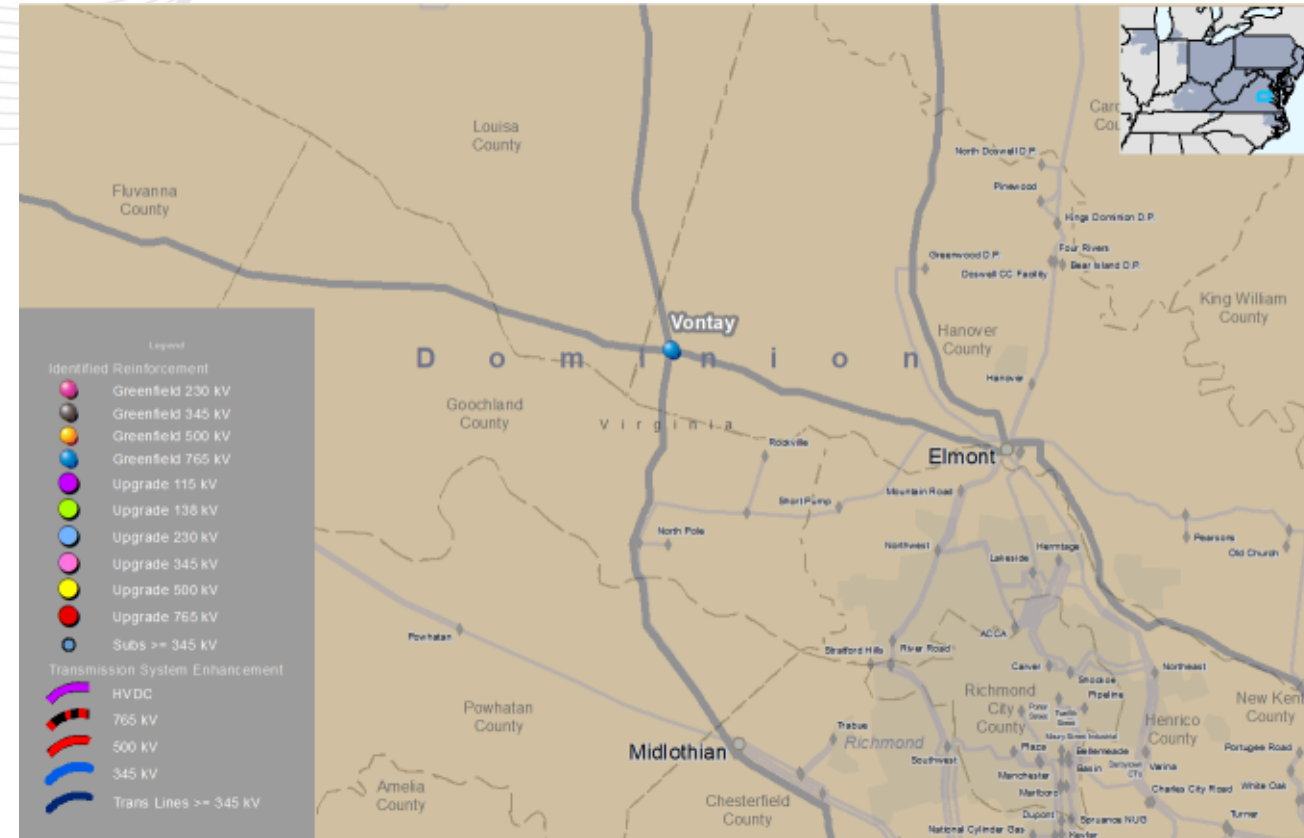
### Recommended Solution (2025-W1-247):

- 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**



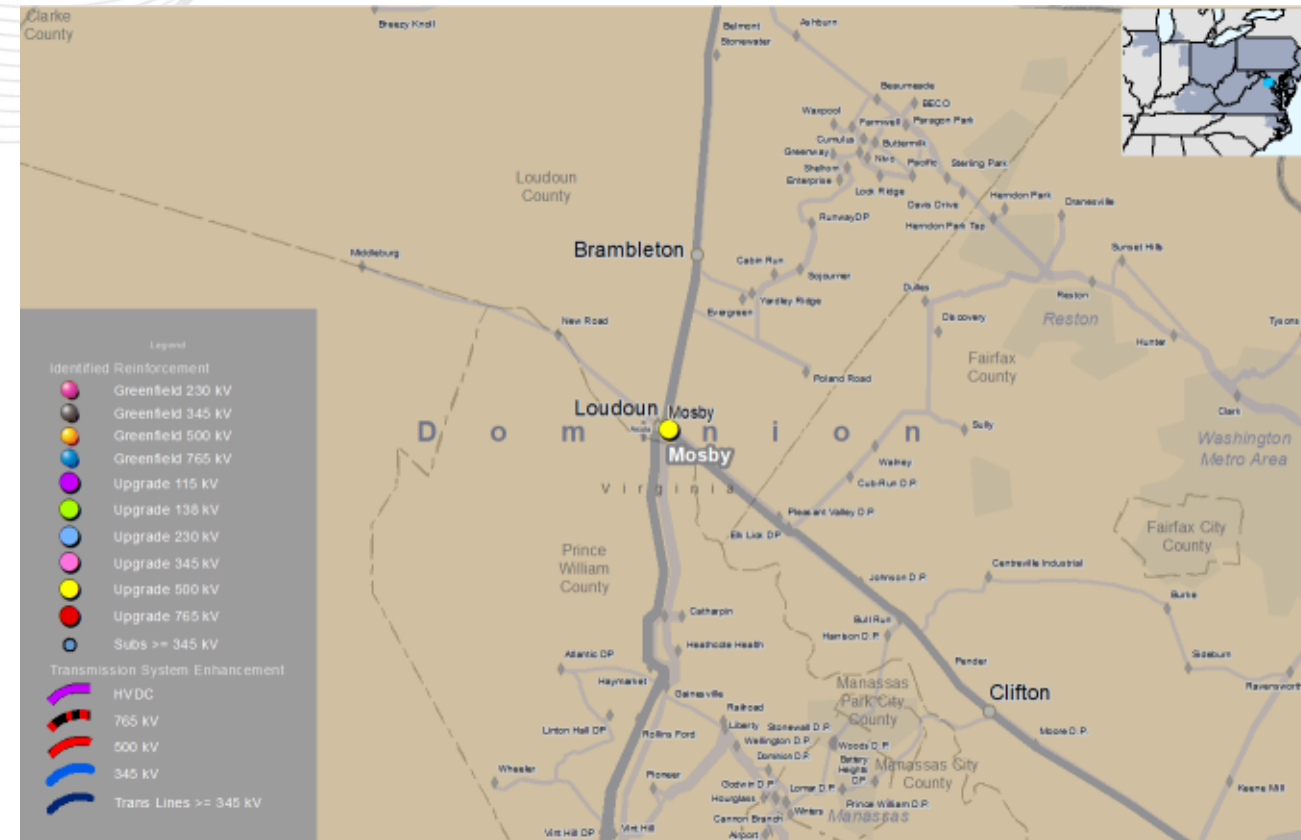


# Dominion Transmission Zone: Baseline

## 2025-W1-253: Line 5008 Cut-in to Mosby Substation

### 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**

# Dominion Transmission Zone: Baseline

## 2025-W1-306: New 500 kV Line - Elmont to Kraken

### 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 | 4357/4357/5011/5155/5155/5928 |

**Total Estimated Cost: \$162.50M**

**Required In-Service Date: 6/1/2032**

**Projected In-Service Date: 6/1/2032**



# Dominion Transmission Zone: Baseline 2025-W1-339: Line 576 North Anna to Vontay

## 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**

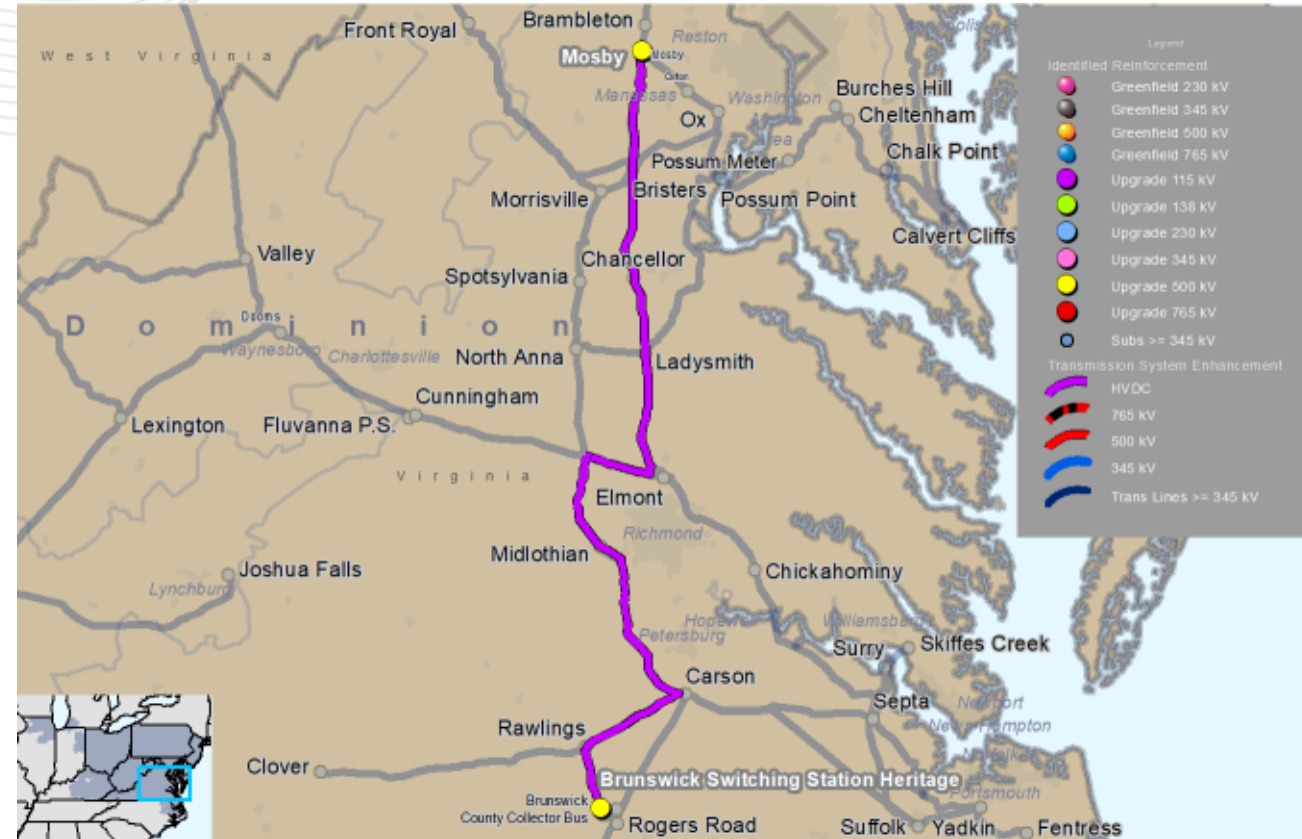


# Dominion Transmission Zone: Baseline

## 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**



# Dominion Transmission Zone: Baseline

## 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 |

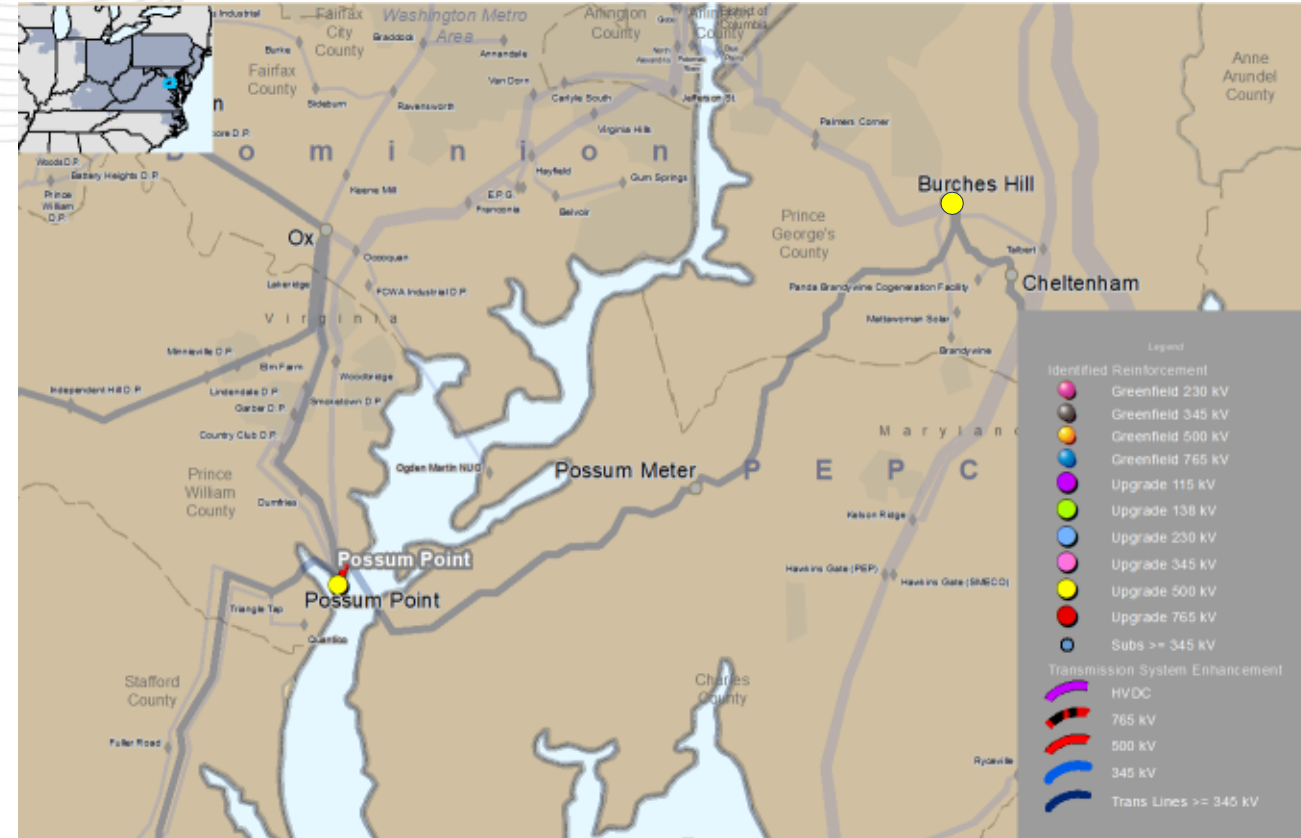
### Preliminary Facility Rating:

| # | 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.

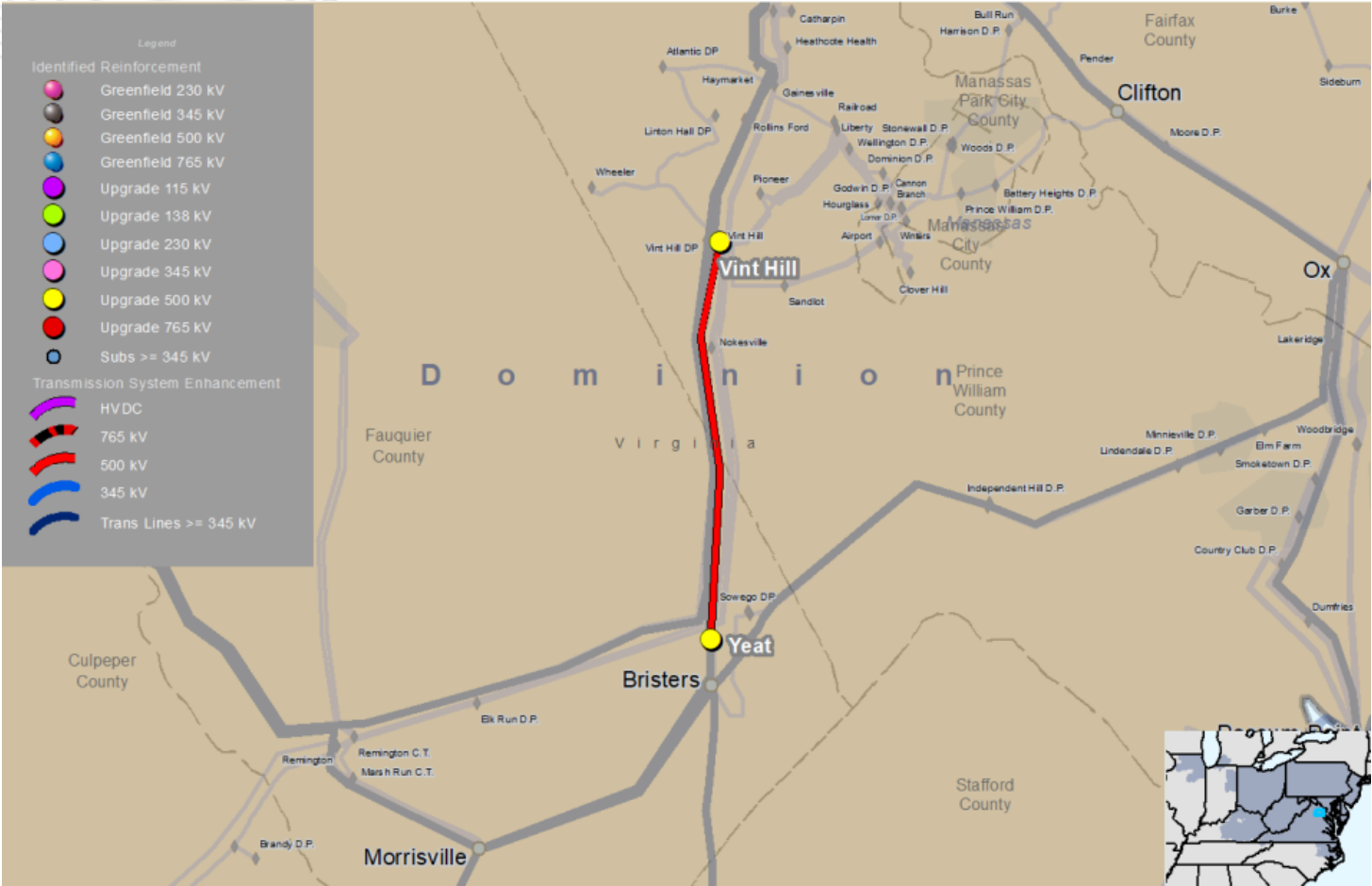
### Existing Facility Rating:

| # | 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)**

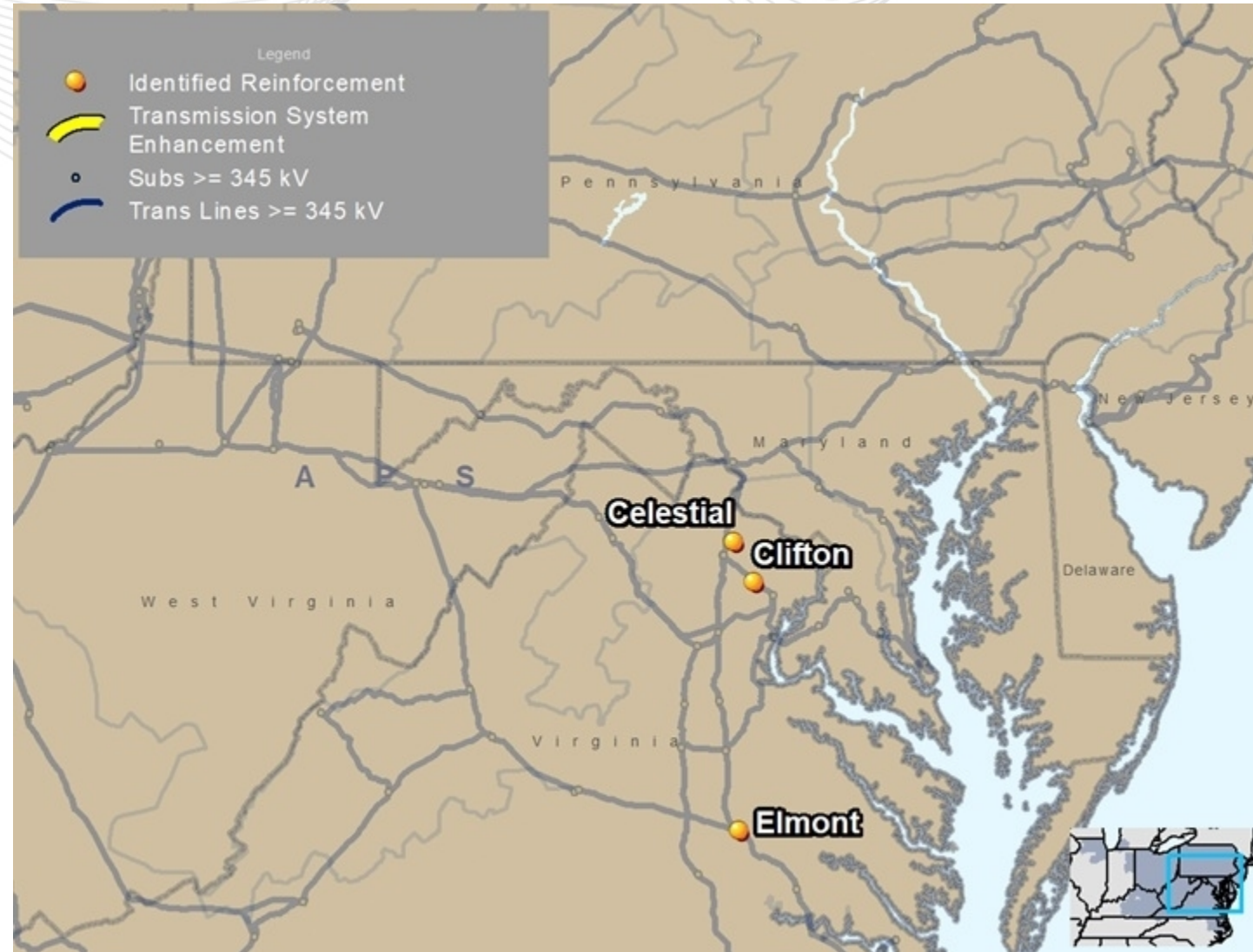
### Existing and Preliminary Facility Rating:

| 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 (2<sup>nd</sup> 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

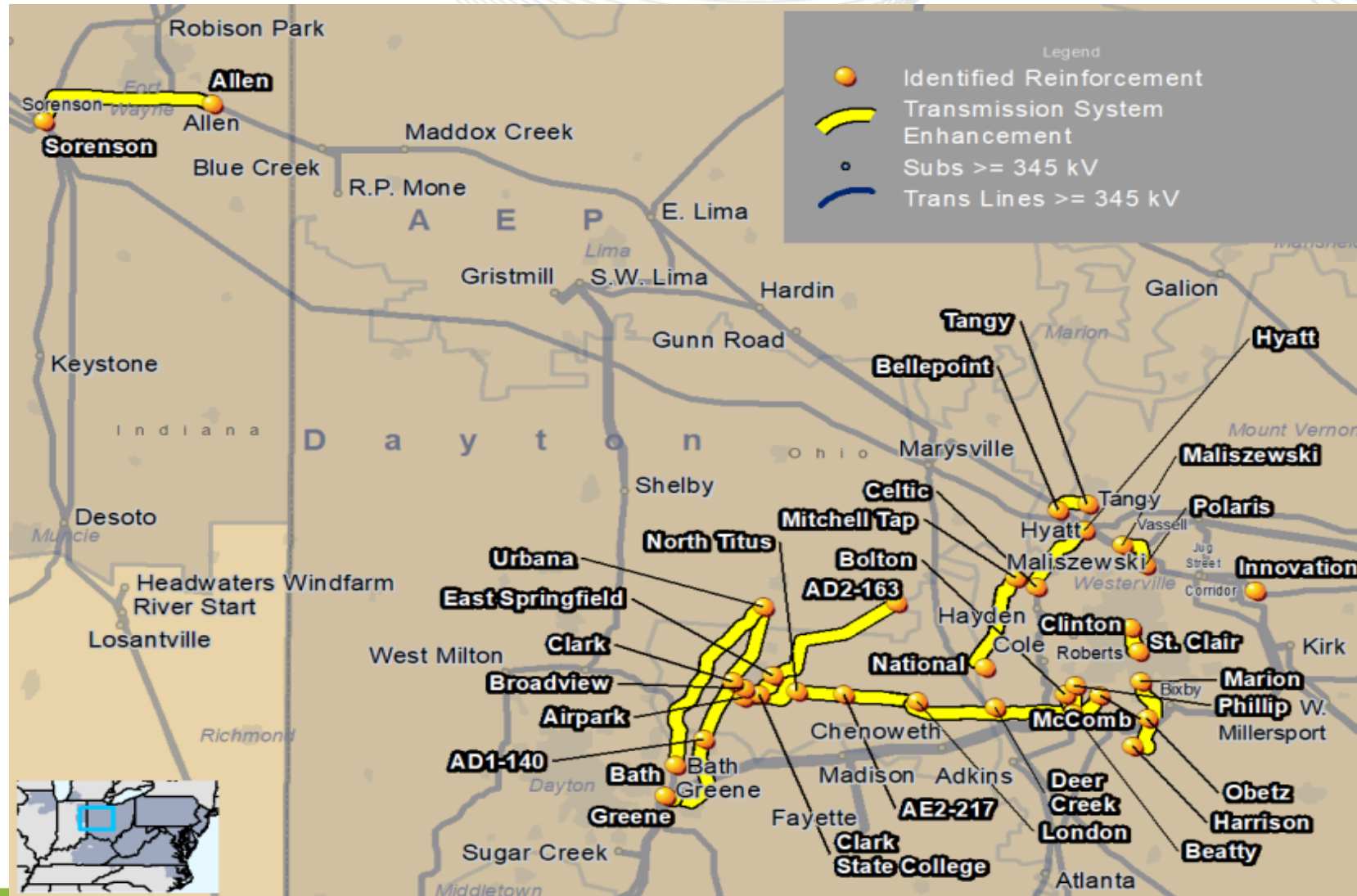




# AEP/ATSI/DAYTON/DEOK Transmission Zone: Baseline West Cluster Recommended Selection (2<sup>nd</sup> Read)

| 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     | Datyon      | 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 (2<sup>nd</sup> Read)





# Recommended Solution: Modified Proposal 570

## Existing/Preliminary Ratings

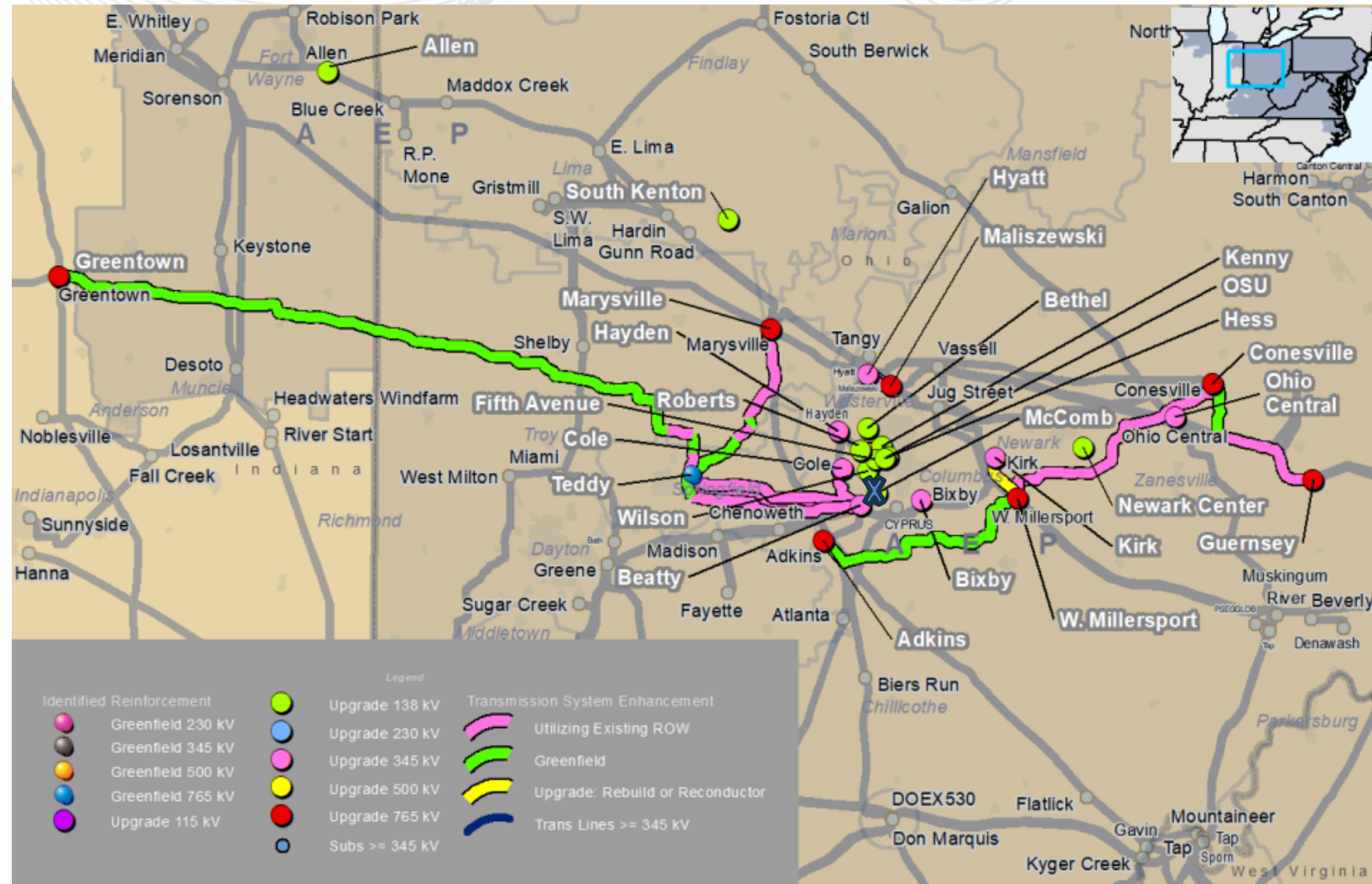
**Recommended Solution: Modified Proposal 570**

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**



| Baseline ID | Project Description   | Estimated Cost (Millions) | Projected ISD |
|-------------|---|---------------------------|---------------|
| b4068.1     | <b>Greentown 765 kV substation scope (AEP)</b><br>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     | <b>Greentown - Teddy 765 kV Line:</b><br>Construct a 60 mile long 765kV AC overhead transmission line between the existing Greentown 765 kV substation and the proposed Teddy 765 kV Substation. <b>(AEP Portion)</b><br><br>The total line length is 137 miles of for the Greentown to Teddy 765 kV line.  | \$ 356,218,094            | 10/31/2031    |
| b4068.3     | <b>Greentown - Teddy 765 kV Line:</b><br>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. <b>(DAYTON Portion)</b><br><br>The total line length is 137 miles of for the Greentown to Teddy 765 kV line.  | \$ 179,979,584            | 10/31/2031    |
| b4068.4     | <b>Greentown - Teddy 765 kV Line:</b><br>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. <b>(ATSI Portion)</b><br><br>The total line length is 137 miles of for the Greentown to Teddy 765 kV line.  | \$ 97,588,930             | 10/31/2031    |
| b4068.5     | <b>Teddy 765/345 kV Substation Scope</b><br>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     | <b>Teddy 765/345 kV Substation</b><br>Install two 345KV capacitor banks at Teddy Substation   | \$5,561,874         | 10/31/2030    |
| b4068.7     | <b>Teddy - Marysville 765 kV:</b><br>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. <b>(FE Portion)</b>   | \$45,501,757        | 10/31/2030    |
| b4068.8     | <b>Teddy - Marysville 765 kV:</b><br>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. <b>(AEP Portion)</b>  | \$130,956,276       | 10/31/2030    |
| b4068.9     | <b>Marysville 765 kV Substation Scope</b><br>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    | <b>Marysville 765 kV Substation</b><br>Add one 765KV STATCOM & Add two 345KV capacitor banks  | \$169,815,905       | 10/31/2030    |
| b4068.11    | <b>Teddy - Beatty single circuit 345 kV:</b><br>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. <b>(FE portion)</b><br><br>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    | <b>Teddy - Beatty single circuit 345 kV:</b><br>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. <b>(AEP portion)</b><br><br>The total length of Teddy - Beatty 345 kV circuit is 32 miles. | \$37,402,130        | 10/31/2030    |
| b4068.13    | <b>Teddy - Cole single circuit 345 kV:</b><br>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. <b>(FE portion)</b><br><br>The total length of Teddy - Cole 345 kV circuit is 41.7 miles.    | \$50,190,680        | 10/31/2030    |
| b4068.14    | <b>Teddy - Cole single circuit 345 kV:</b><br>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. <b>(AEP portion)</b><br><br>The total length of Teddy - Cole 345 kV circuit is 41.7 miles.      | \$37,402,130        | 10/31/2030    |
| b4068.15    | <b>Teddy - Cole single circuit 345 kV:</b><br>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.<br><br>The total length of Teddy - Cole 345 kV circuit is 41.7 miles.                   | \$21,630,661        | 10/31/2030    |
| b4068.16    | <b>Cole 345 kV Substation Scope</b><br>Create a new 345KV line position to interconnect the new 345KV Teddy line.  | \$1,000,000         | 10/31/2030    |
| b4068.17    | <b>Beatty 345 kV Substation Scope</b><br>Create a new 345KV line position to interconnect the new 345KV Teddy line. Install two 345KV circuit breakers.  | \$3,857,100         | 10/31/2030    |



# Recommended Solution: Modified Proposal 570 (CONT')

| Baseline ID | Project Description  | Estimated Cost (\$) | Projected ISD |
|-------------|--|---------------------|---------------|
| b4068.18    | <b>Guernsey 765 kV Substation Scope</b><br>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    | <b>Guernsey - Conesville 765 kV:</b><br>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    | <b>West Millersport Substation Scope</b><br>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    | <b>Ohio Center - Conesville 345 kV:</b><br>Wreck Ohio Center - Conesville 345 kV circuit to facilitate the Conesville - West Millersport 765 kV line.<br><br>Note: The cost for Conesville - West Millersport 765 kV is a different component                              | \$1,464,055         | 6/30/2028     |
| b4068.23    | <b>Ohio Center - Bixby 345 kV:</b><br>Wreck part of Ohio Center - Bixby 345 kV circuit around West Millersport 345 kV to facilitate the Conesville - West Millersport 765 kV line.<br><br>Note: The cost for Conesville - West Millersport 765 kV is a different component | \$3,858,538         | 6/30/2028     |
| b4068.21    | <b>Ohio Central 345 kV scope</b><br>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    | <b>Bixby 345 kV Substation Scope</b><br>New relaying at Bixby 345 kV substation.  | \$75,000            | 10/31/2031    |
| b4068.26    | <b>West Millersport - Adkins 765 kV:</b><br>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    | <b>West Millersport - Kirk 345 kV:</b><br>Rebuild 6.37 mile section of the double circuit West Millersport-Kirk 345kV circuit   | \$24,300,000        | 10/31/2031    |
| b4068.28    | <b>Hyatt - Maliszewski Double Circuit 345 kV:</b><br>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    | <b>Hayden - Cole 345 kV:</b><br>Rebuild 7.89 mile of Beatty - Hayden 345 kV line.   | \$37,872,000        | 10/31/2031    |
| b4068.30    | <b>Newark 138 kV Center Station Scope</b><br>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    | <b>Ohio Central 138 kV scope</b><br>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    | <b>Allen 138 kV Substation Scope</b><br>Replace bus conductor at Allen station.   | \$50,000            | 10/31/2031    |
| b4068.32    | <b>Roberts - Kenny 138kV Rebuild:</b><br>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    | <b>Wilson - Fifth Avenue 138kV line:</b><br>Perform sag remediation on the Wilson - Fifth Avenue 138 kV line.   | \$18,255,715        | 10/31/2031    |
| b4068.34    | <b>Bethel 138 kV Substation Scope:</b><br>Replace one 138KV circuit breaker.  | \$500,000           | 10/31/2031    |
| b4068.35    | <b>OSU 138 kV Station Scope:</b><br>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    | <b>Hess 138 kV Substation Scope:</b><br>Replace one 138KV circuit breaker to alleviate CT thermal limit.   | \$700,000           | 10/31/2031    |
| b4068.37    | <b>South Kenton 138 kV Substation scope:</b><br>Replace line side disconnect switches and bus tie switch on East Lima line at South Kenton substation.   | \$110,000           | 10/31/2031    |
| b4068.38    | <b>Meadow Lake 345 kV Substation Scope:</b><br>Replace four 345 kV circuit breakers.   | \$4,000,000         | 10/31/2031    |
| b4068.39    | <b>Conesville 765 kV Substation Scope:</b><br>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    | <b>Conesville - West Millersport 765 kV:</b><br>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    | <b>Adkins 765 kV Substation Scope</b><br>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    | <b>Ohio Central Station Scope:</b><br>Install two new 138 kV circuit breakers.  | \$3,000,000         | 10/31/2031    |
| b4068.43    | <b>Kammer Dumont Structures:</b><br>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    | <b>Ohio Central - Fostoria Central Structure:</b><br>Remove structure 10 and replace with lower structure to lower the line.  | \$1,000,000         | 10/31/2031    |
| b4068.45    | <b>Gavin - Marysville Structures:</b><br>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    | <b>East Springfield - London Structures:</b><br>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    | <b>Beatty - Hayden Structures:</b><br>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    |



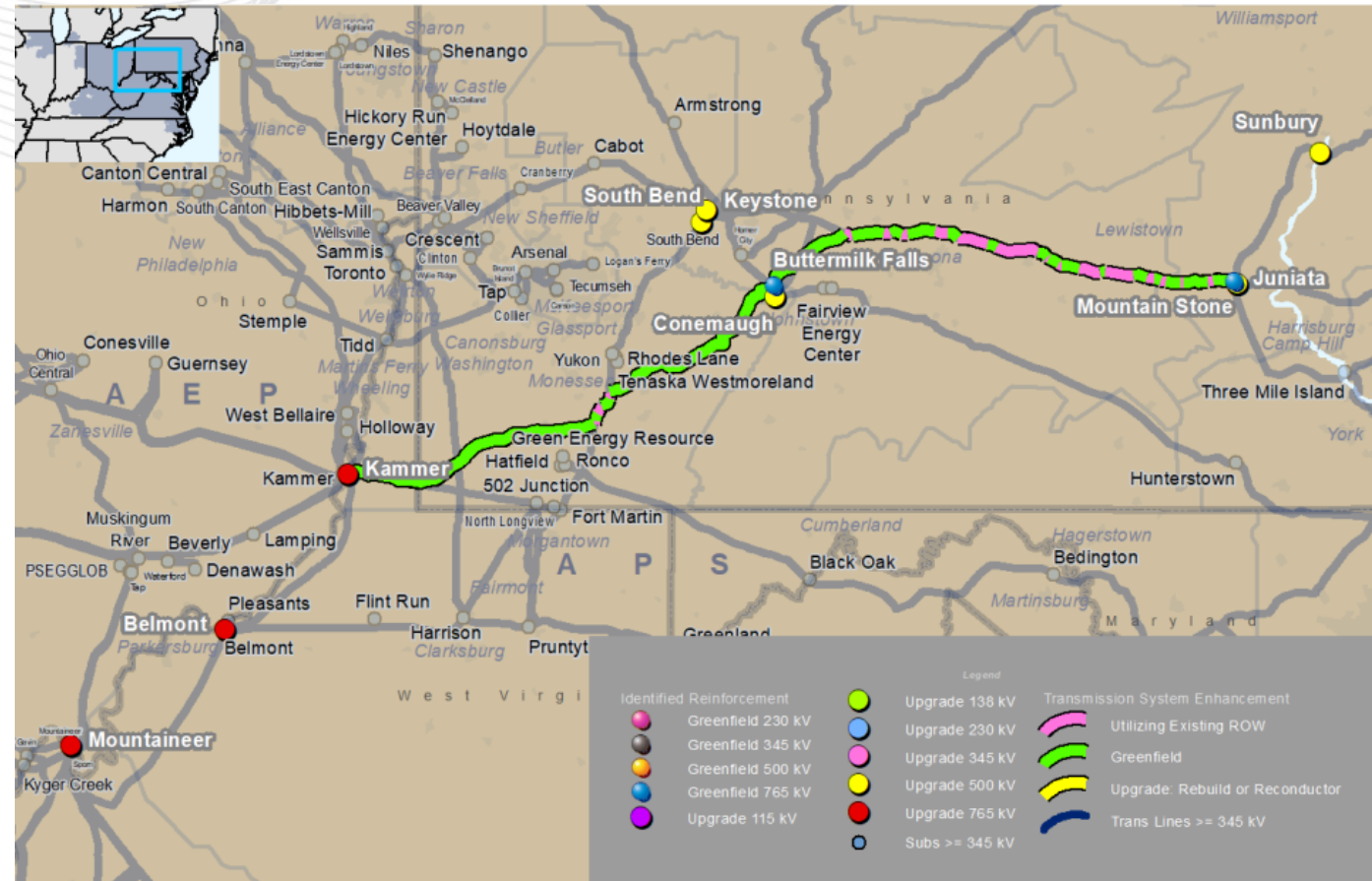
# Recommended Solution: Modified Proposal 570

## 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                |
| <b>Total Cost Estimate</b>   |  | <b>\$1,738.59</b>   | <b>\$1,797.32</b>      |

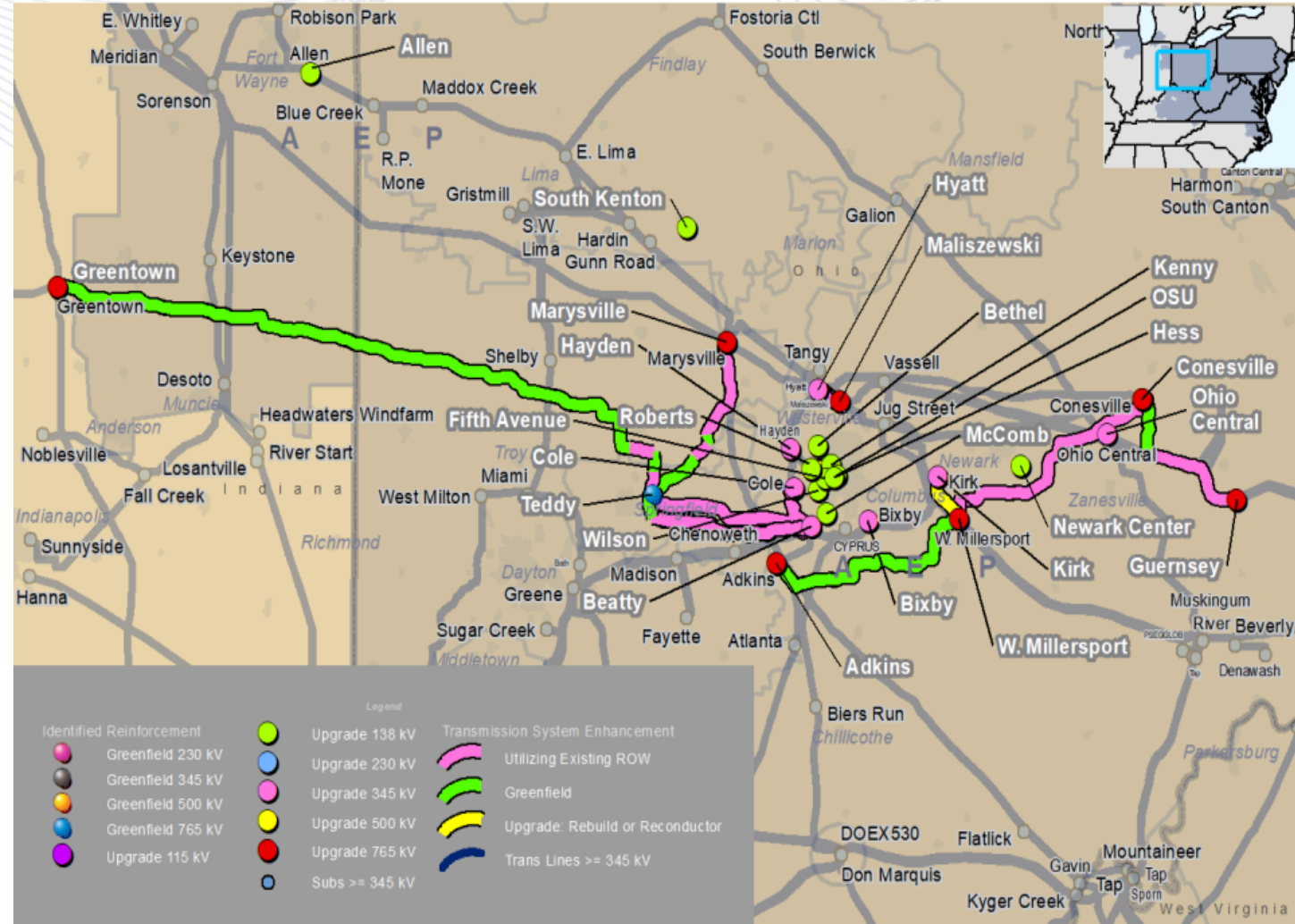






West Regional Cluster Solution - Transource/FE Proposal 2025-W1-570 (Modified)

| 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                 |
| <b>Total Cost Estimate</b>                | <b>\$2,768.00</b>   | <b>\$3,410.66</b>      |



| Category                               | Proposal Cost Estimate (\$M) | Independent Cost Estimate (\$M) |
|--|------------------------------|---------------------------------|
| <b>In-Zone Related Total</b>           | <b>\$2,303.60</b>            | <b>N/A</b>                      |
|  |                              |                                 |
| 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                      |
| <b>Regional Transfer Related Total</b> | <b>\$9,339.05</b>            | <b>\$10,234.45</b>              |
|  |                              |                                 |
| <b>2025 RTEP Total</b>                 | <b>\$11,642.64</b>           |                                 |

# Cancellations





# PECO Transmission Zone: NJ SAA Project Baseline

## 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)

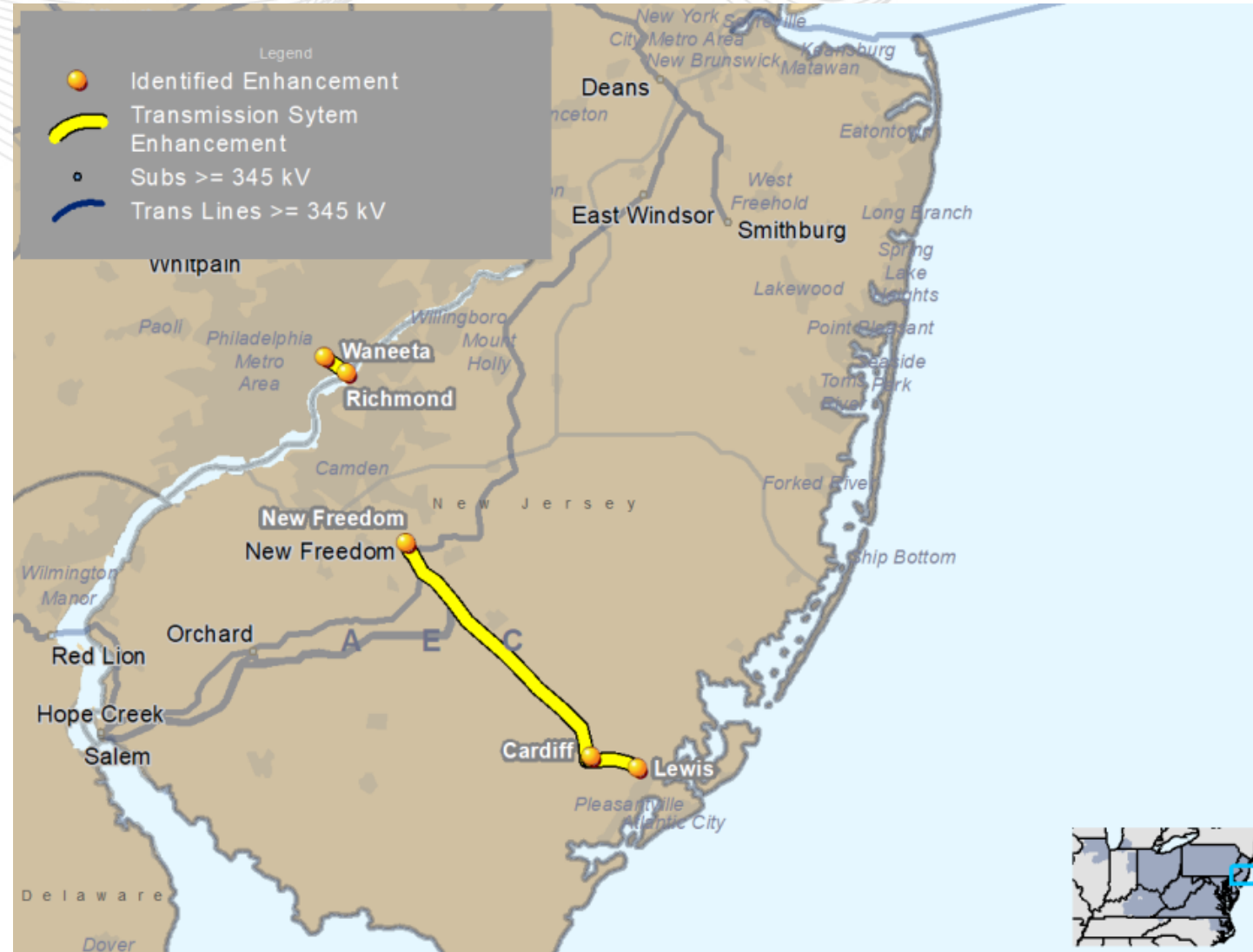
- Rebuild the underground portion of Richmond-Waneeta 230 kV (0.95 miles) (b3737.23)

**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 overdutied.

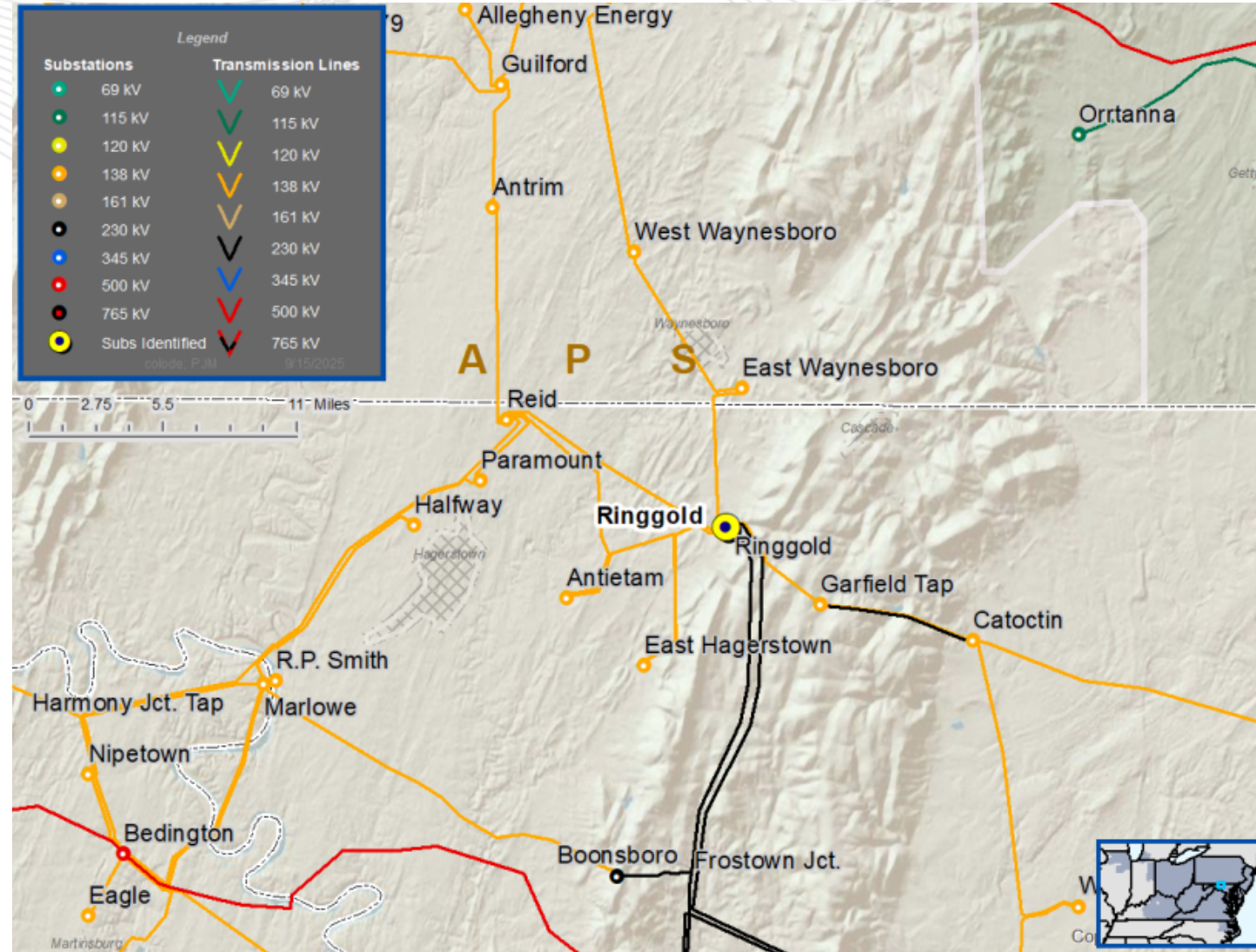
**Recommended Solution:**

Replace the overdutied 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)

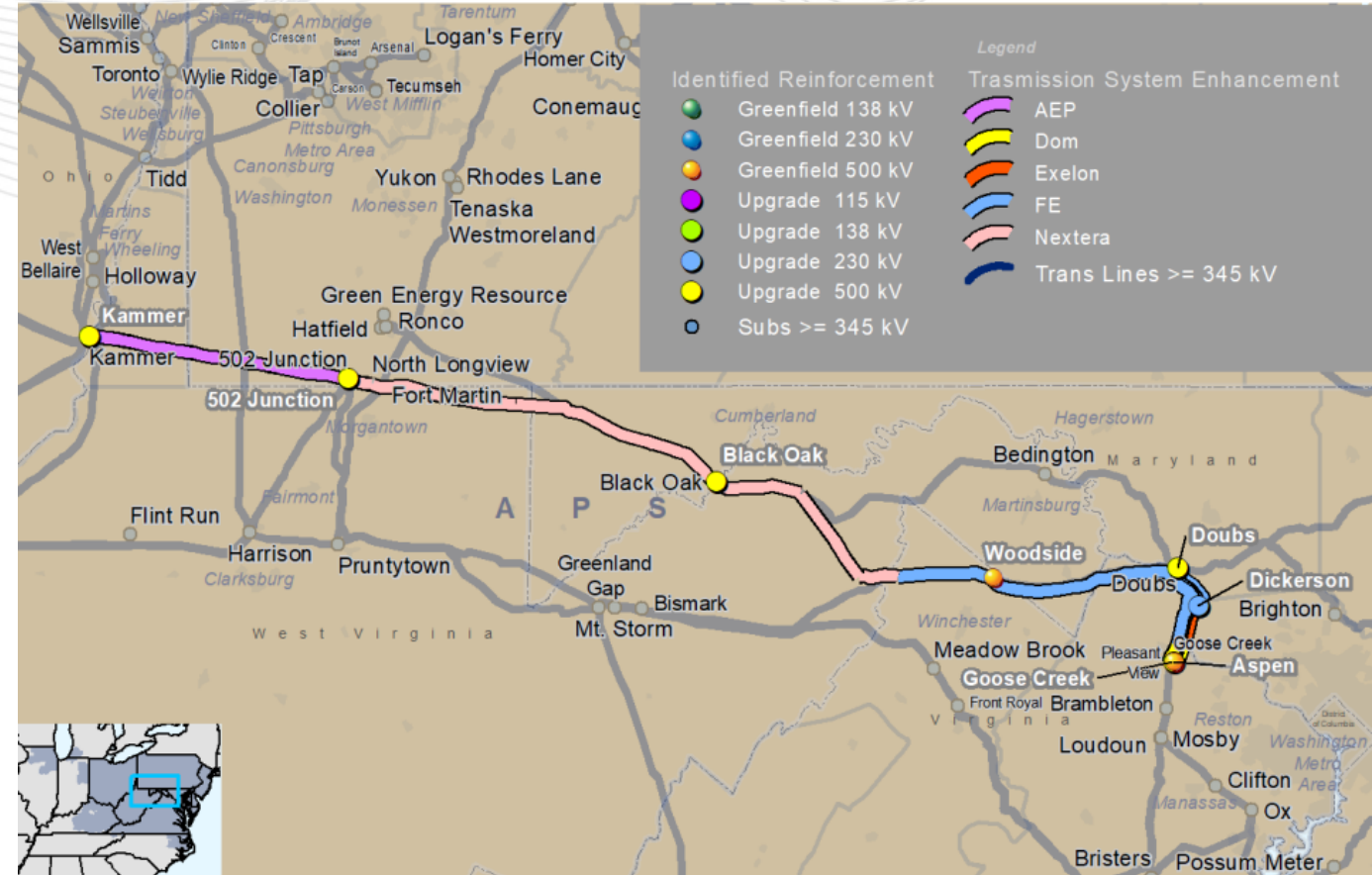
- **b3800.102:** New 500 kV line from existing 502 Junction substation to the demarcation point between FE/NEET around Gore substation (bypass Black Oak) (NEET Portion) - \$315.65M
- **b3800.106 – b3800.110:** Woodside substation adjacent to existing Stonewall 138 kV substation - \$80.04M
- **b3800.113, 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)

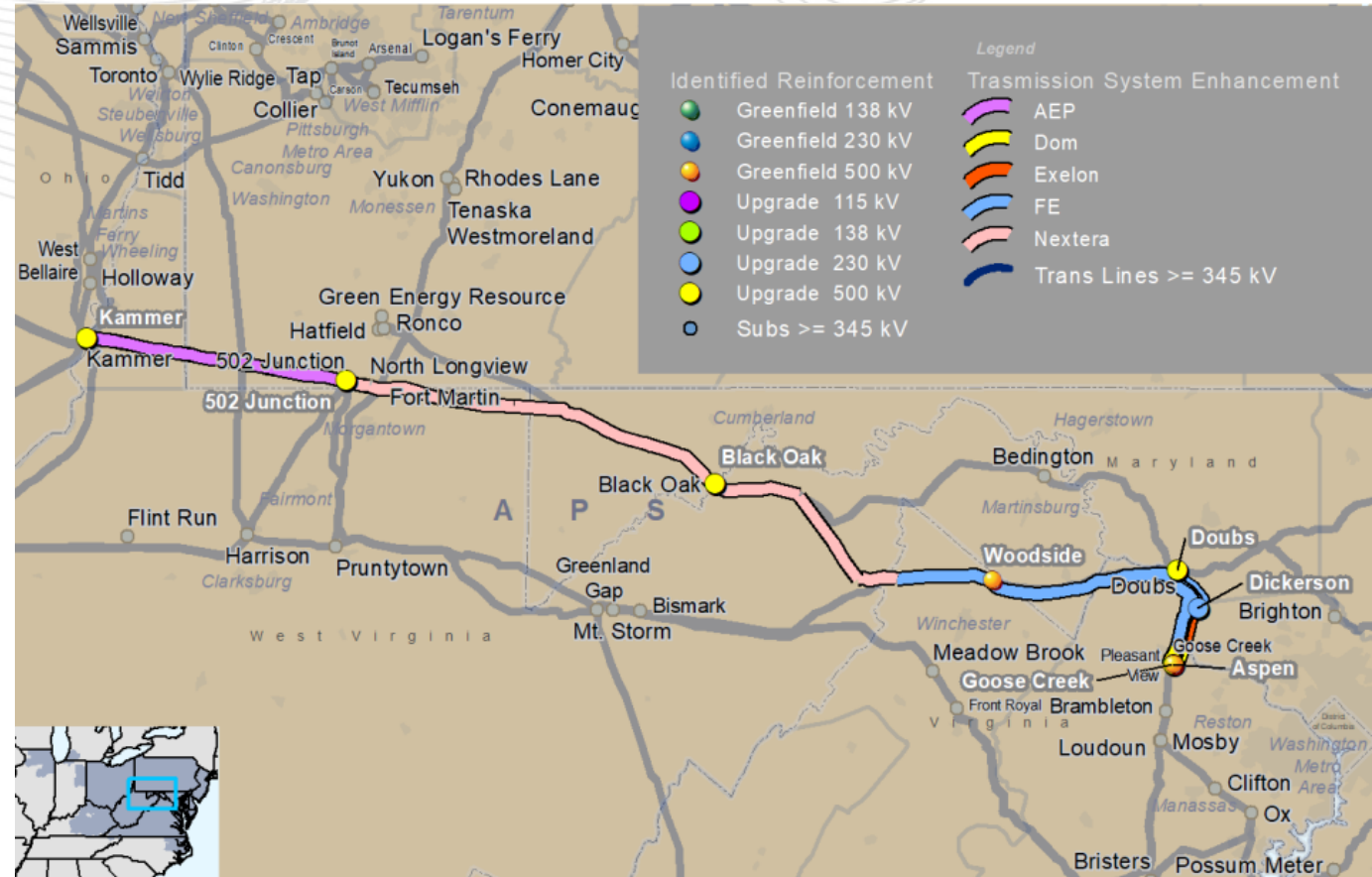
- **b3800.102:** New 500 kV line from existing 502 Junction substation to the demarcation point between FE/NEET around Gore substation (bypass Black Oak) (NEET Portion) - ~~\$315.65M~~ **\$632.60M**
- **b3800.106 – b3800.110:** Woodside substation adjacent to existing Stonewall 138 kV substation - ~~\$80.04M~~ **\$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



- Objective:
  - Identify long lead needs ( $\geq 230$  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   | EDGEMR 5     | 231000 | CLAY_230     | 1   | 230/230 | 235/235 | 2032      |
| Summer     | Single       | 231001   | EDGEMR 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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Joshua Stephenson, [Joshua.Stephenson@pjm.com](mailto:Joshua.Stephenson@pjm.com)

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**Reliability Analysis Update**

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**Member Hotline**

(610) 666 – 8980

(866) 400 – 8980

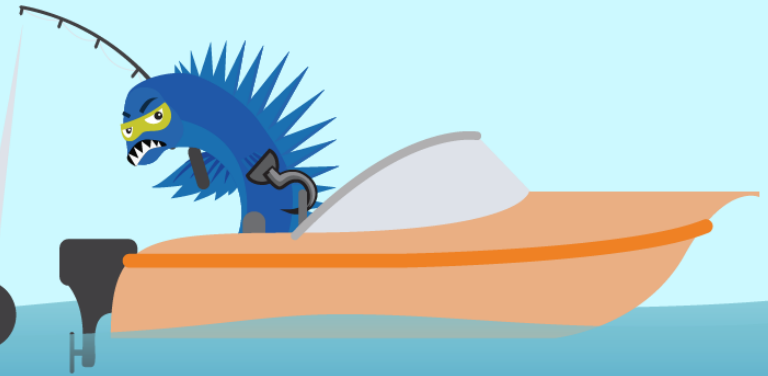
[custsvc@pjm.com](mailto:custsvc@pjm.com)

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

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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

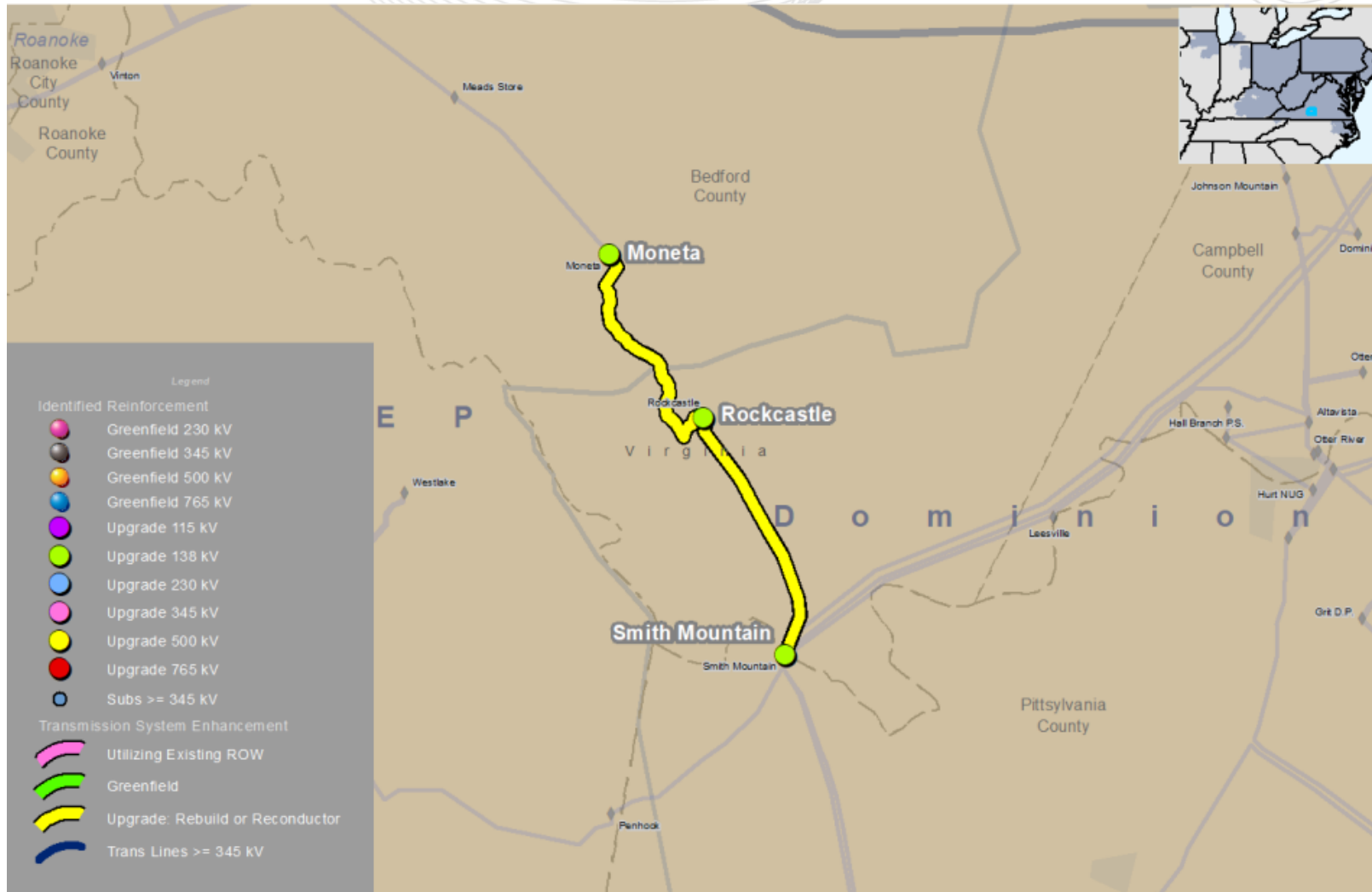
*Note: These maps are only intended to illustrate the general electrical connectivity of the projects and should not be relied upon for exact geographical substation locations, line routes, or scope of work.*

# AEPSCT (AEP)

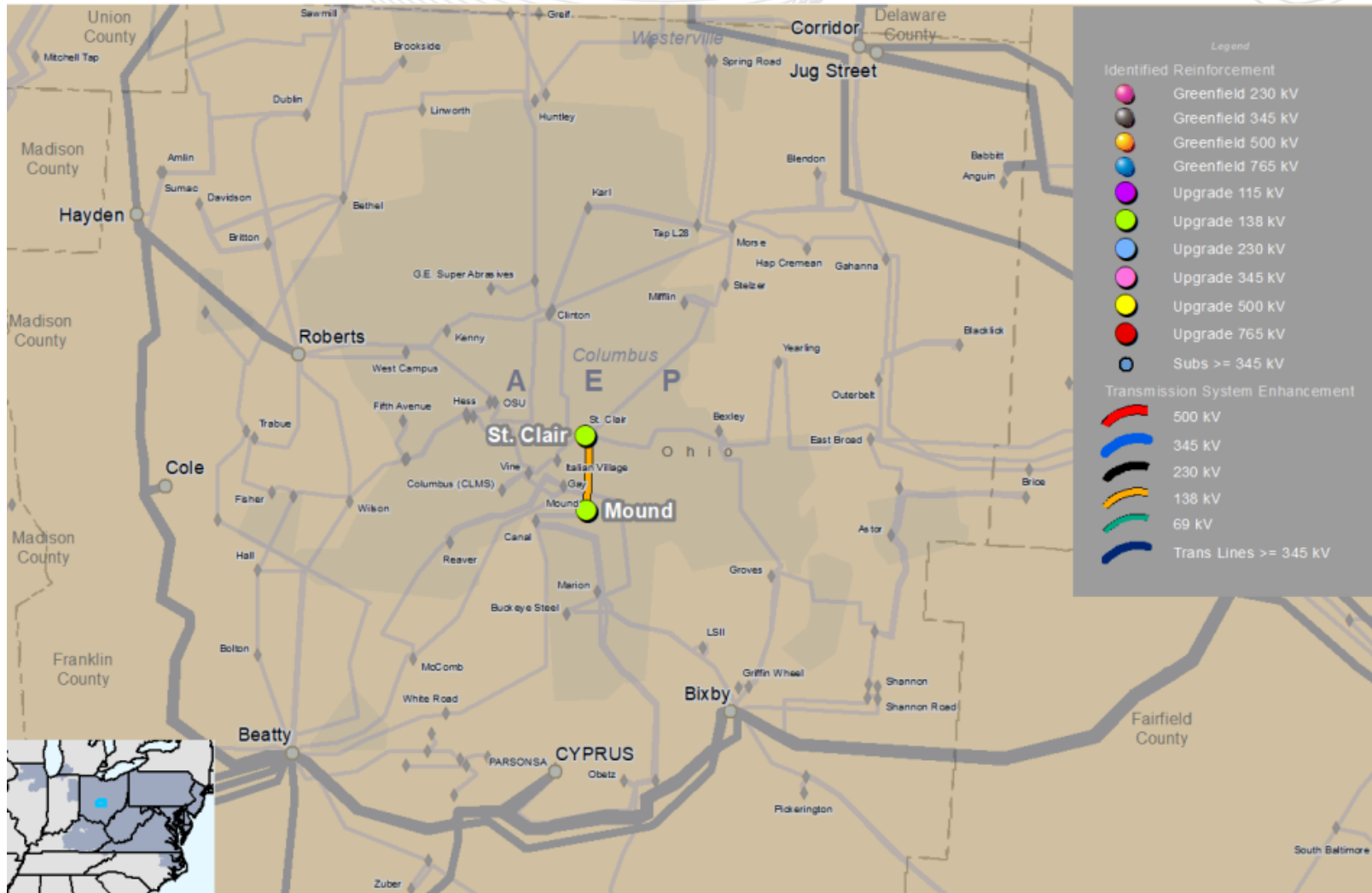


This map is only intended to illustrate the general electrical connectivity of the projects and should not be relied upon for exact geographical substation locations or line routes.

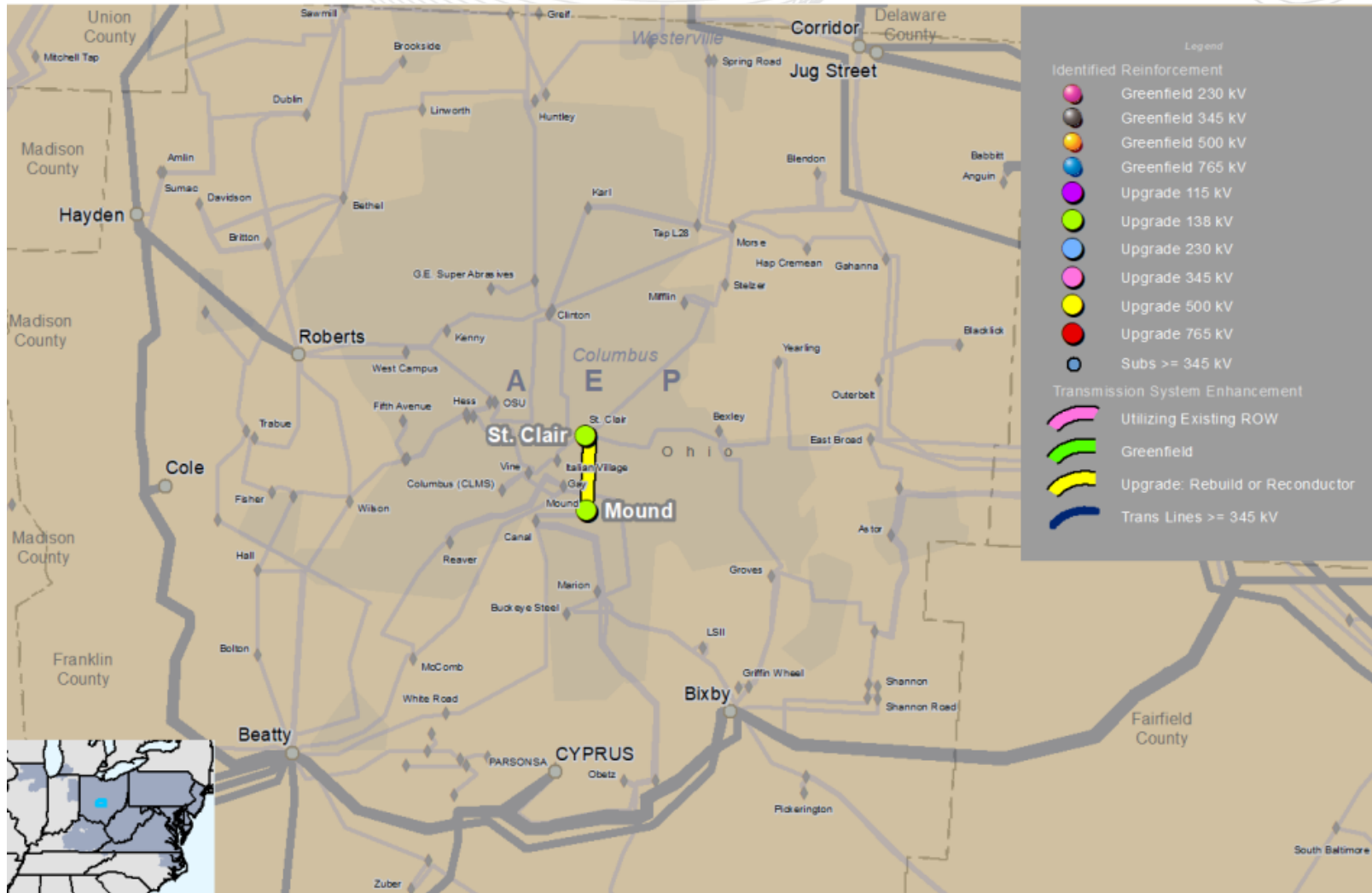




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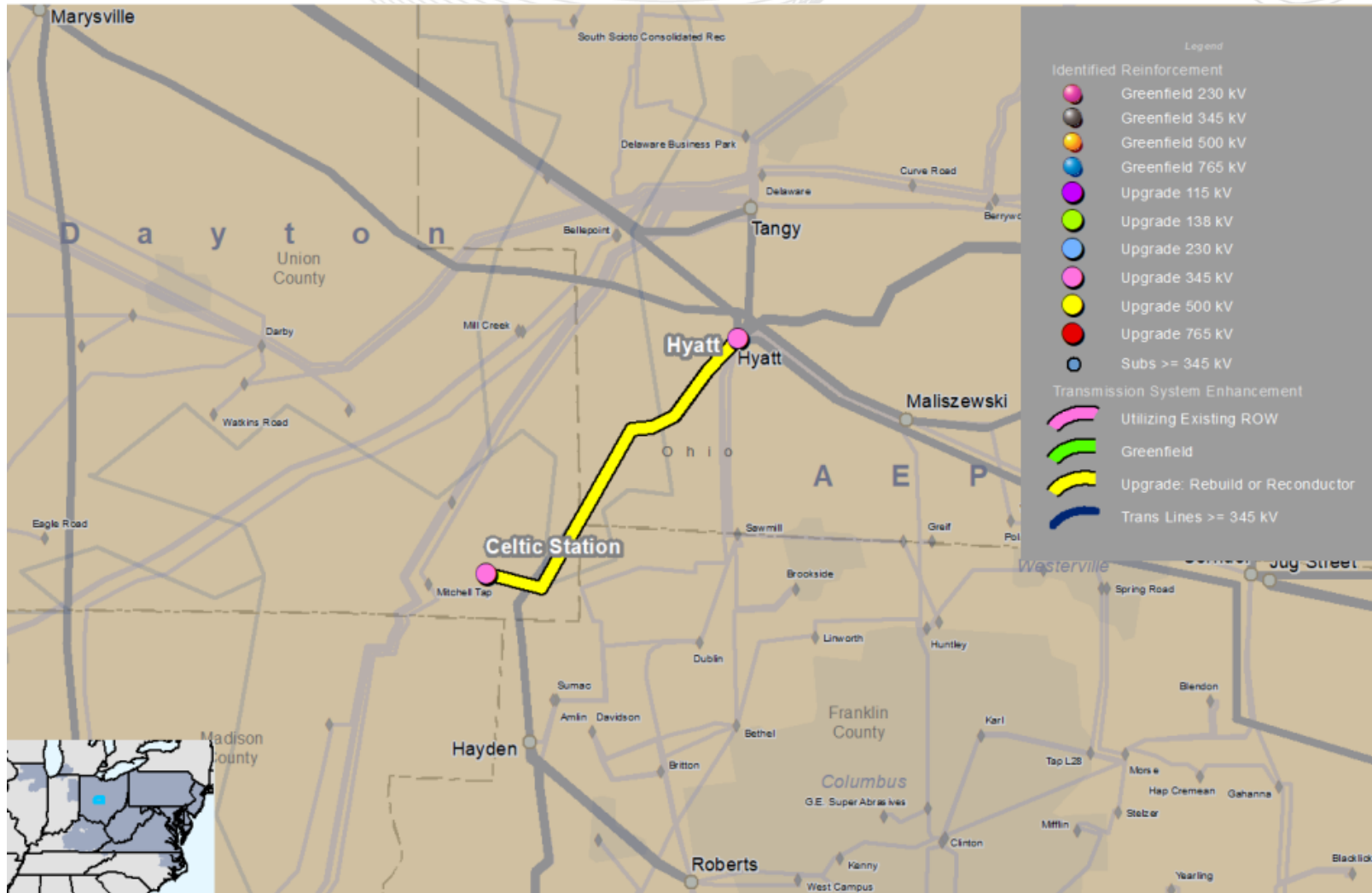


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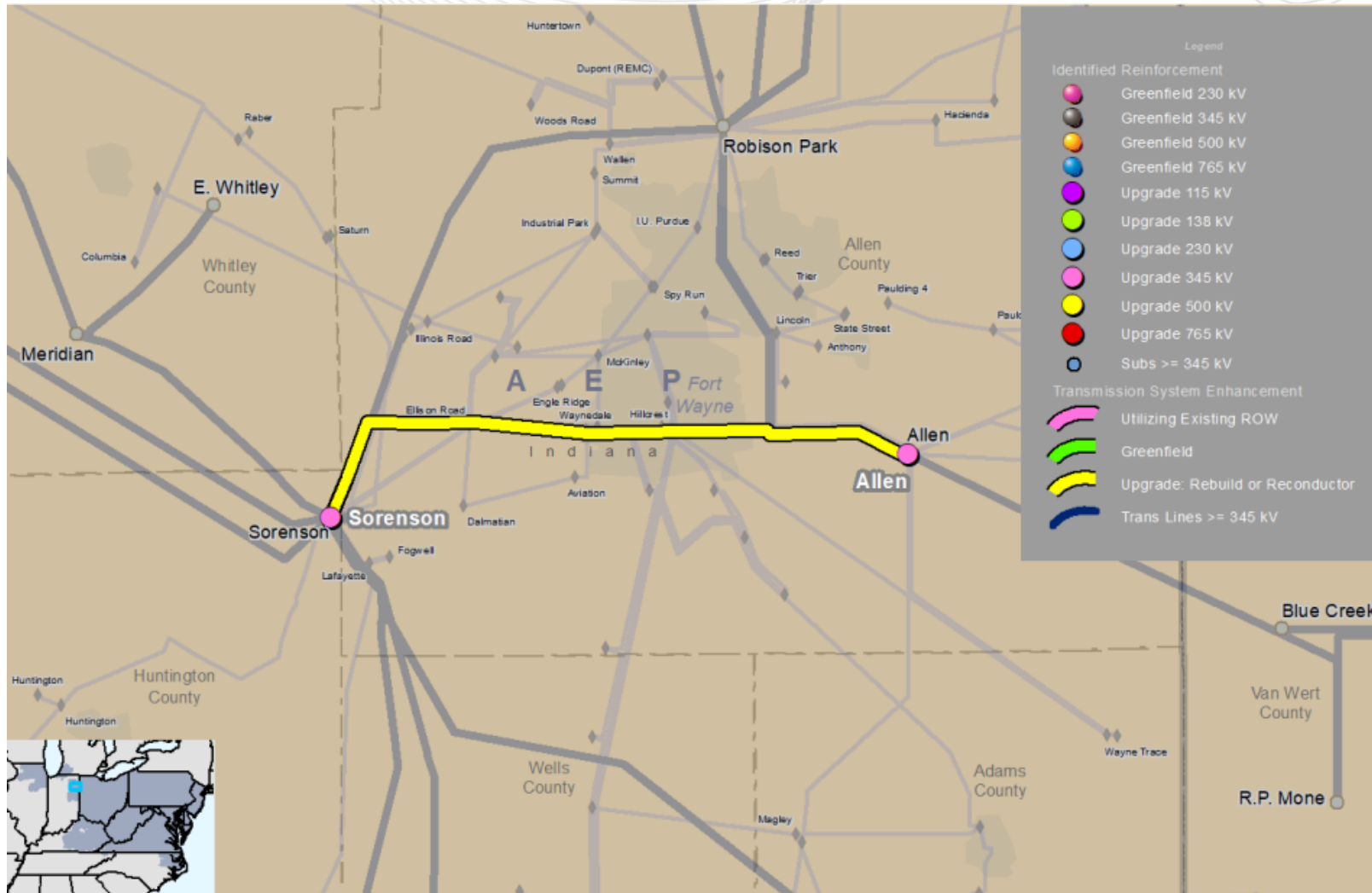




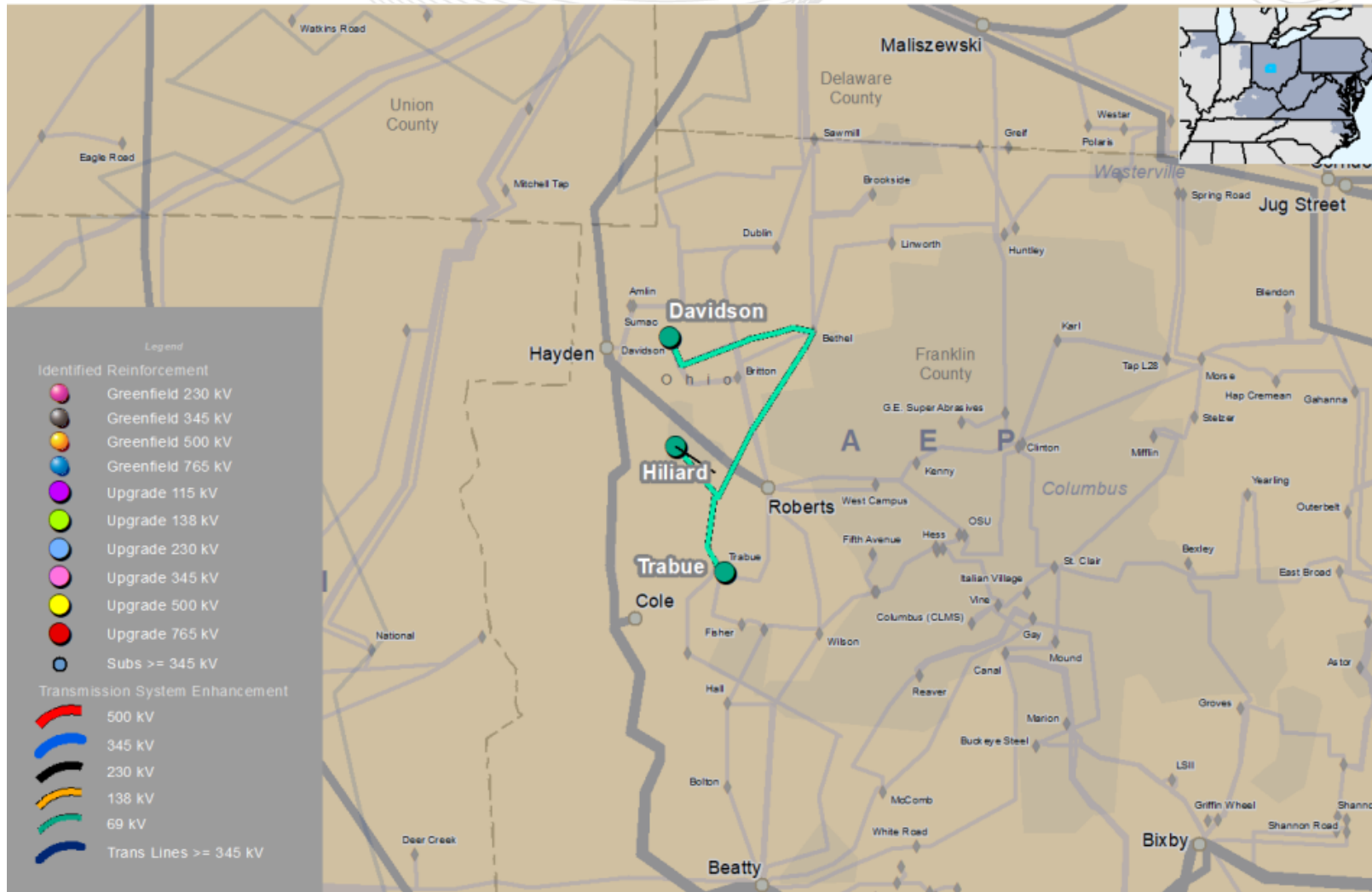
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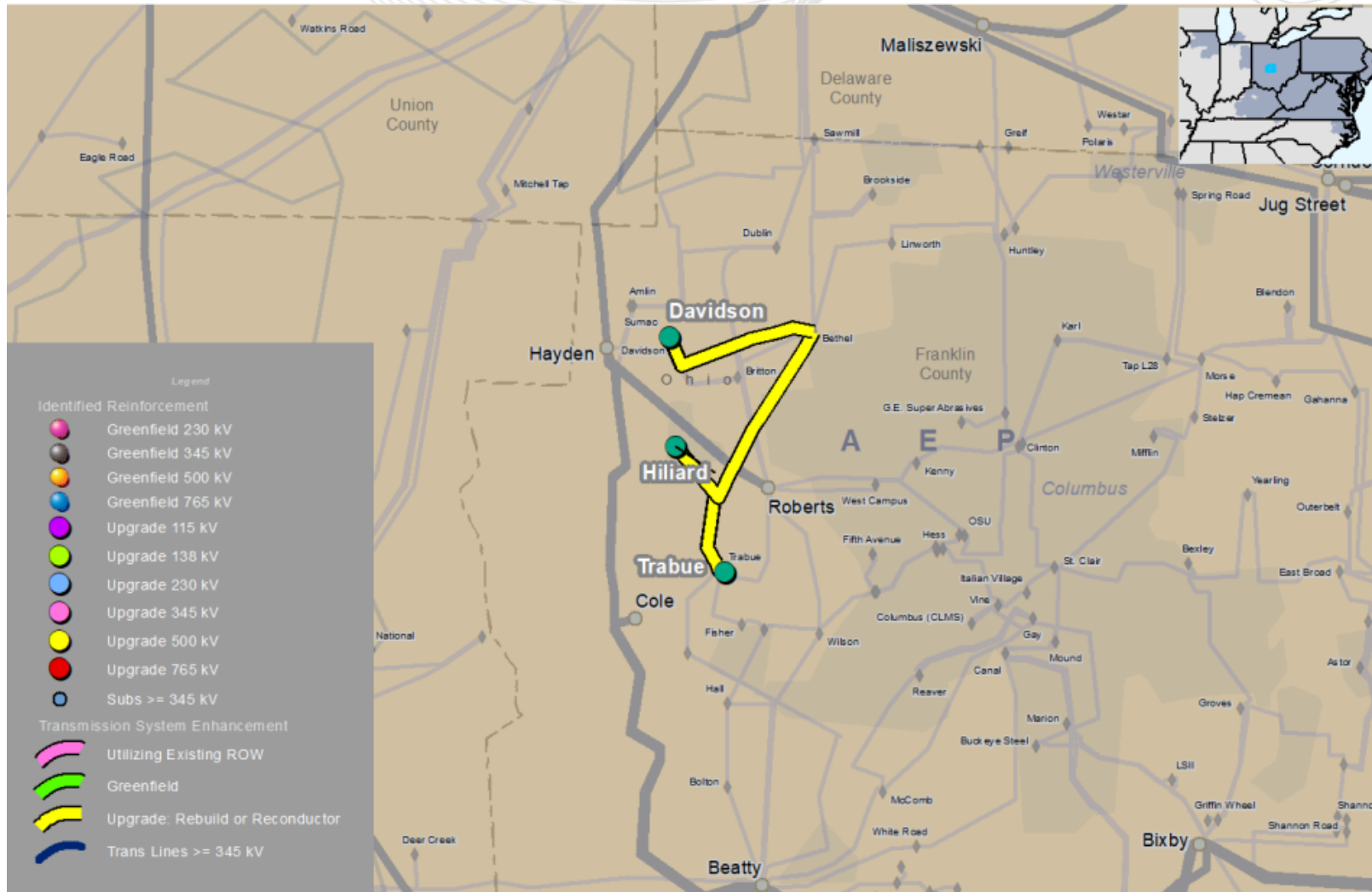


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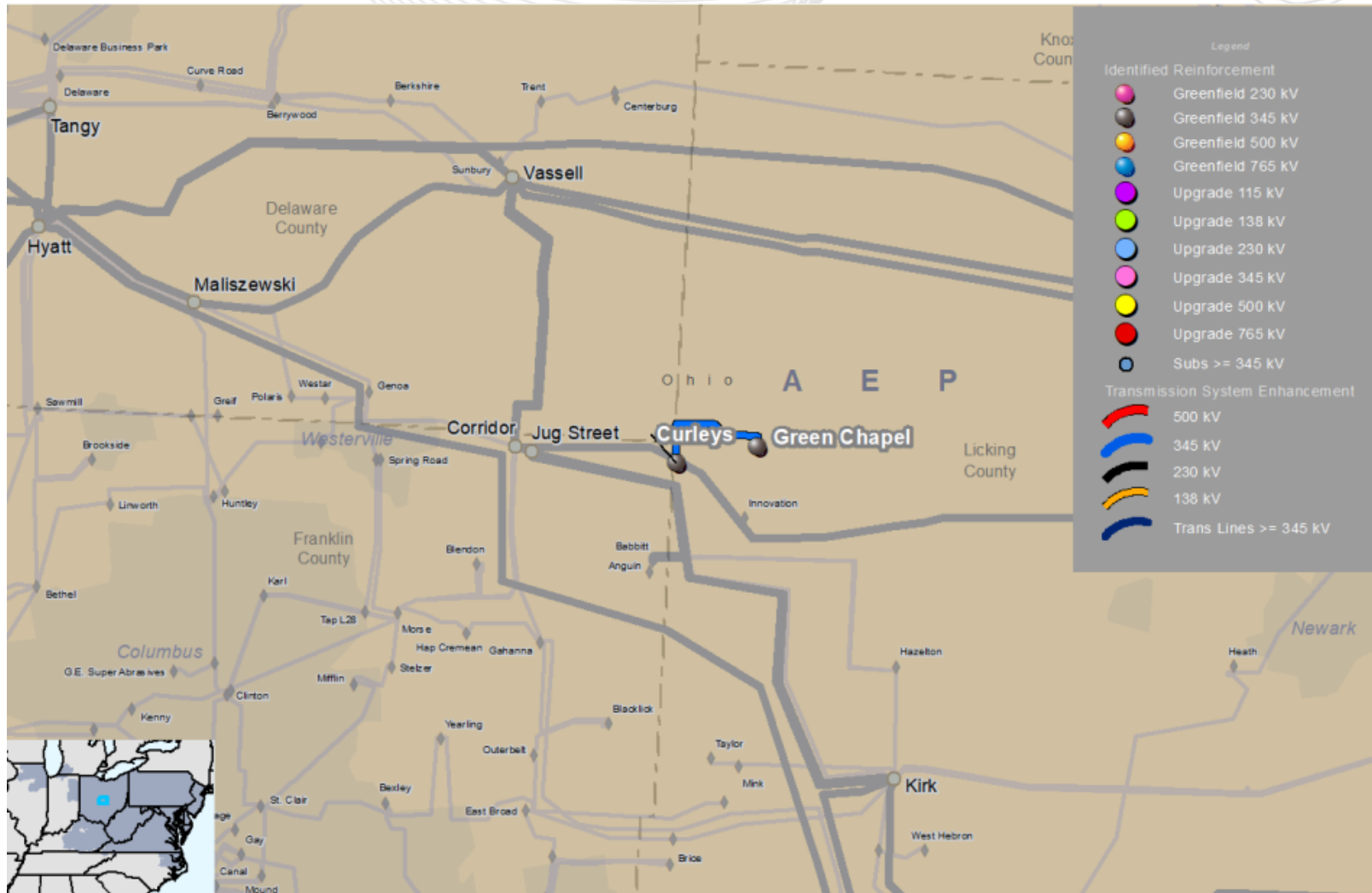


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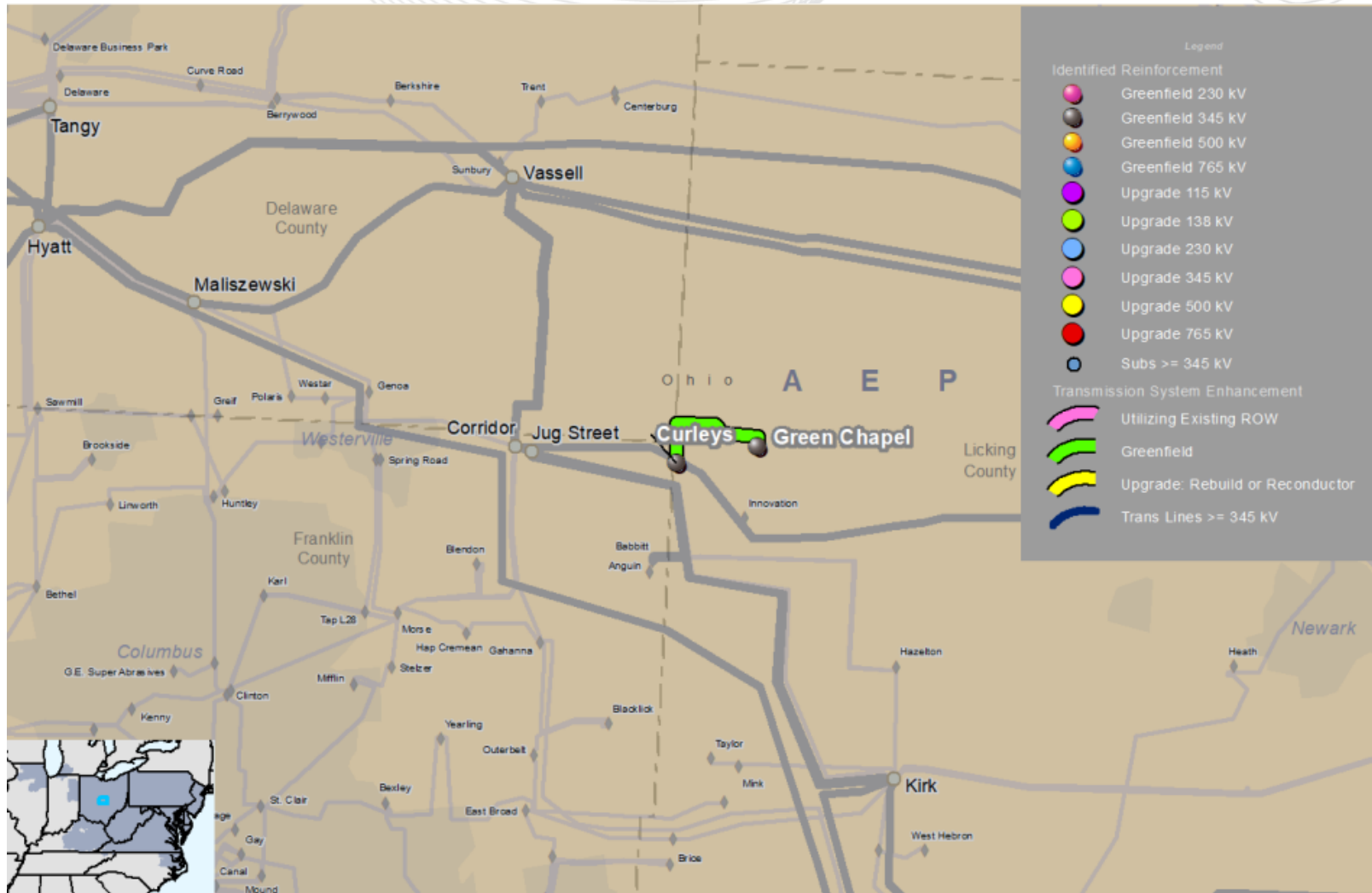




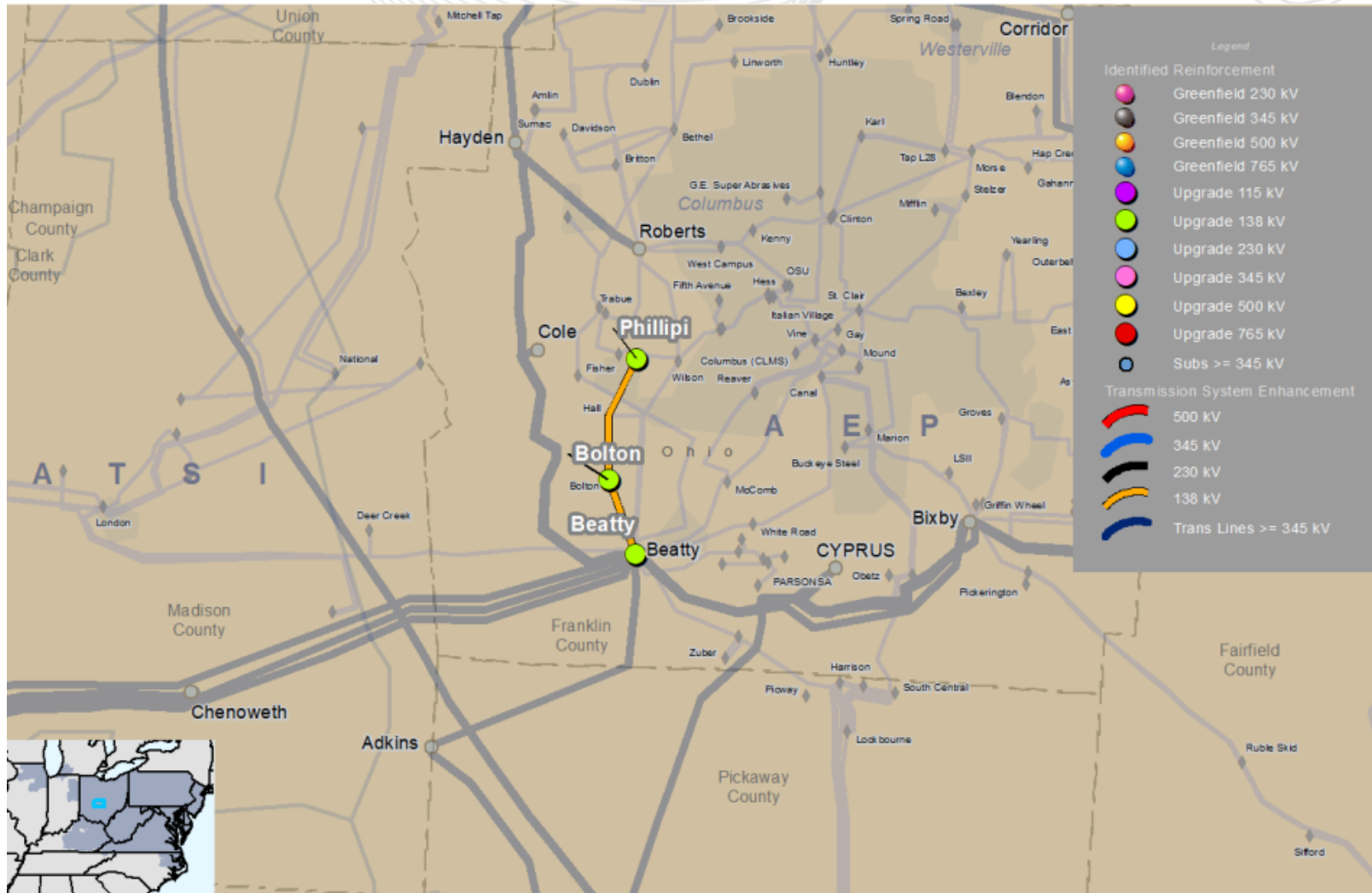
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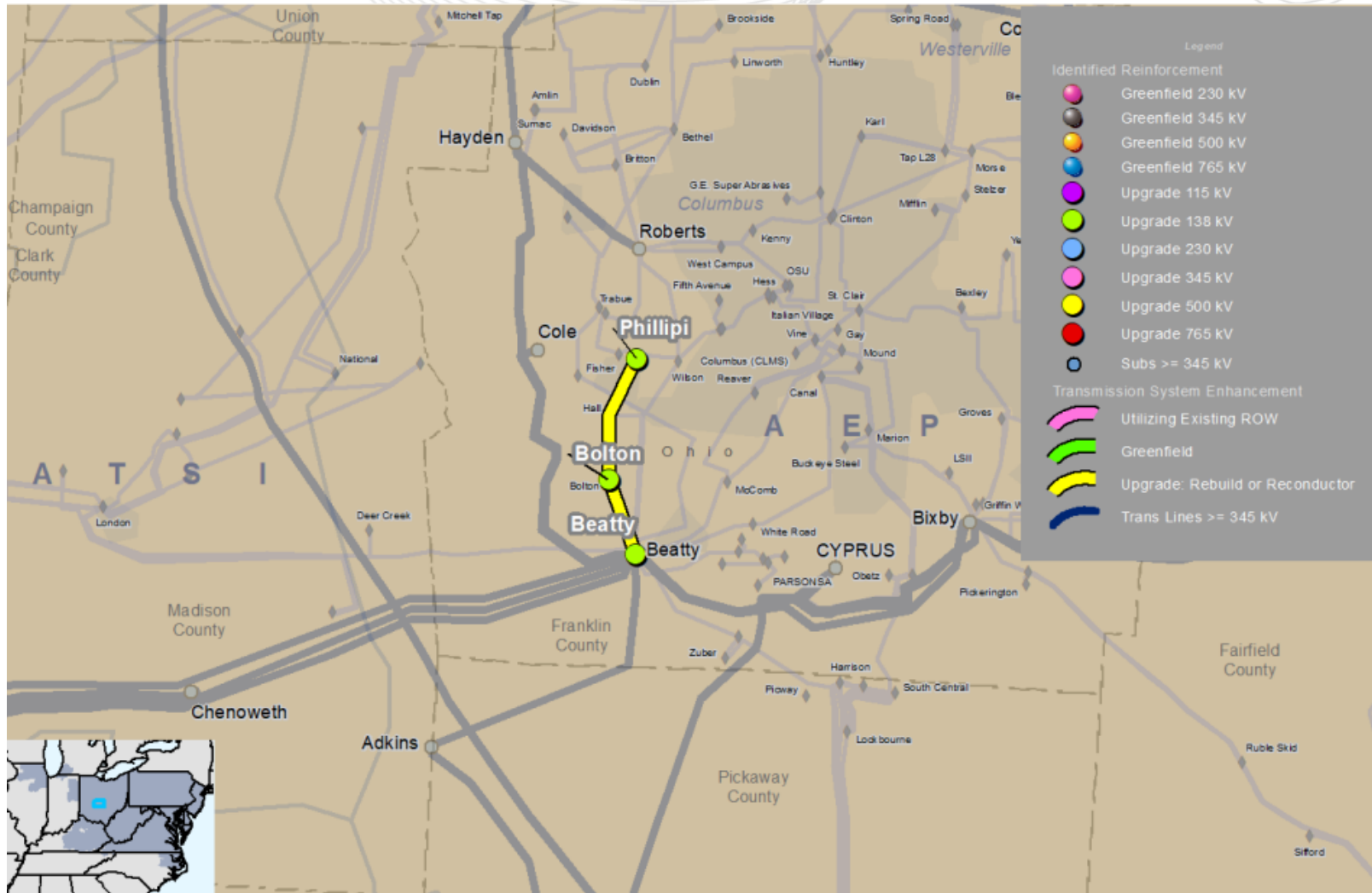


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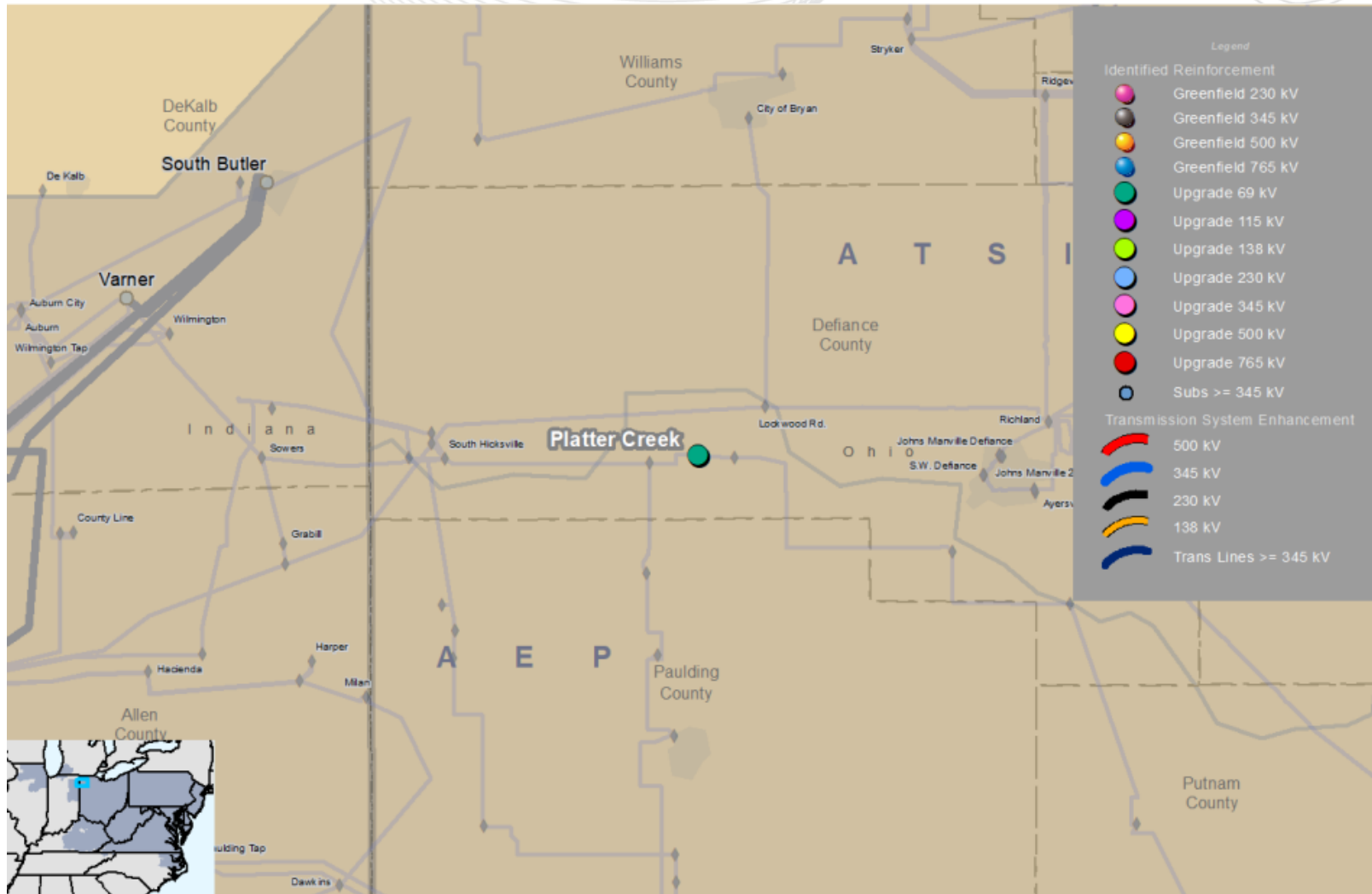


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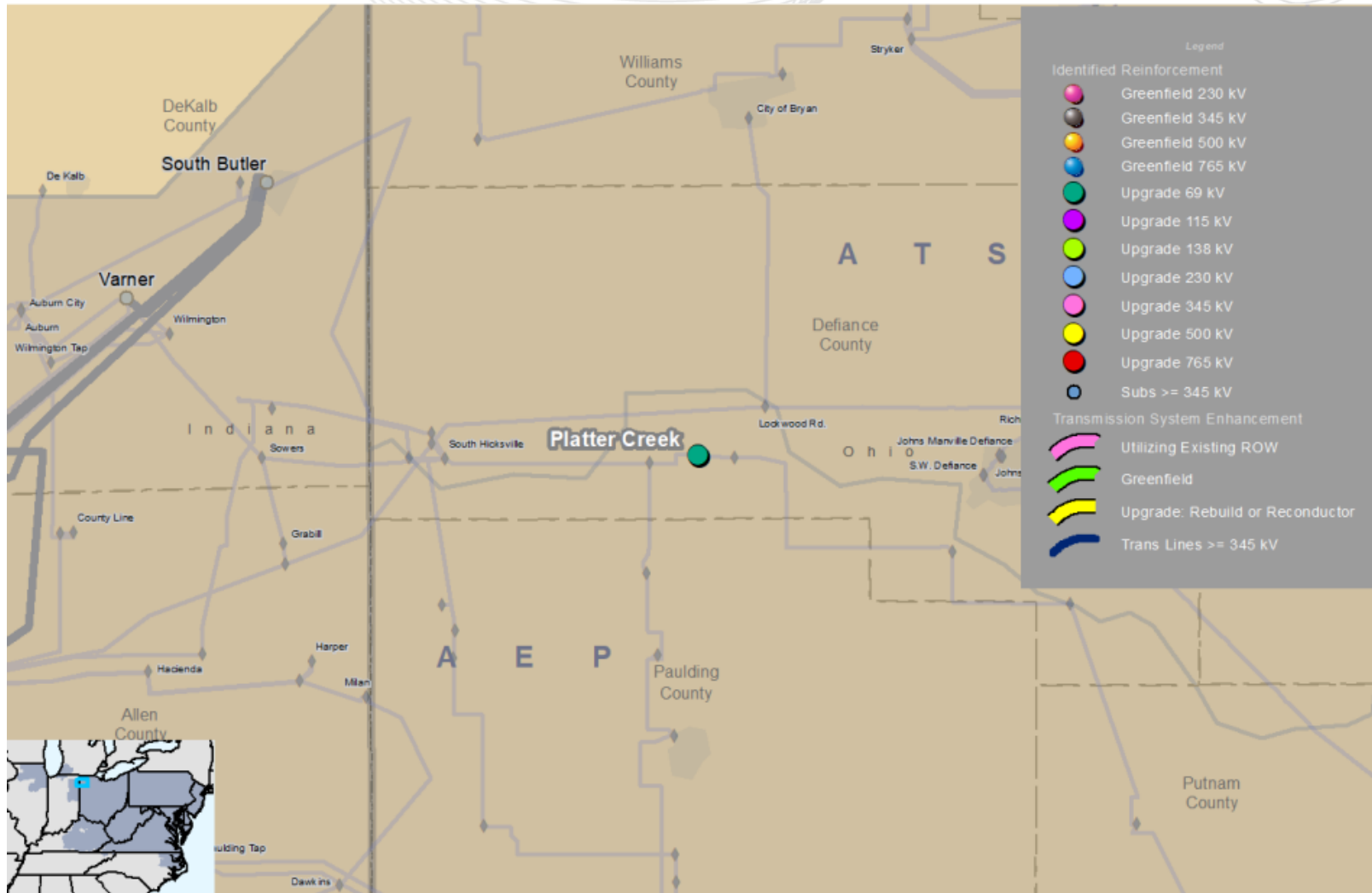




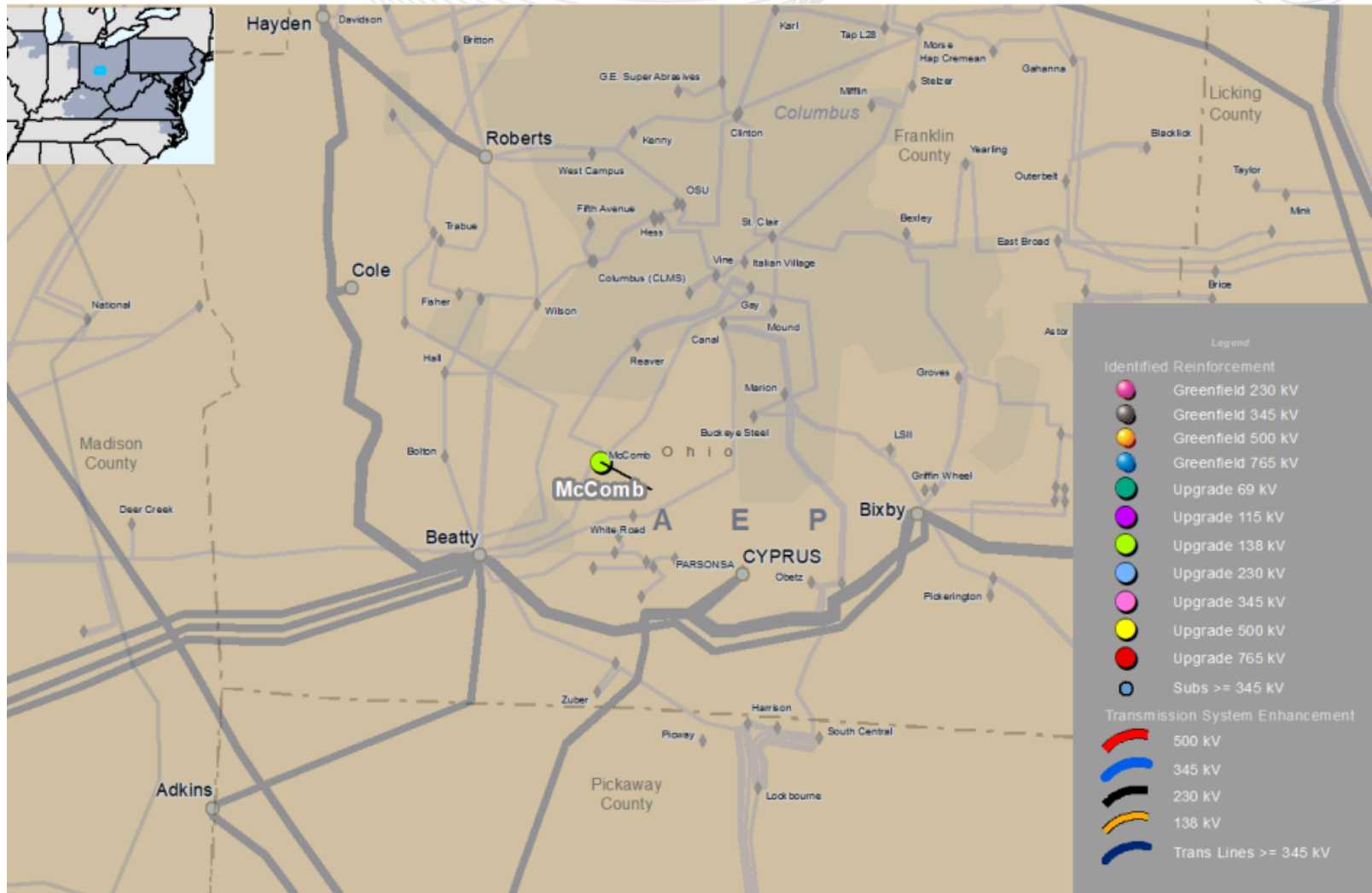
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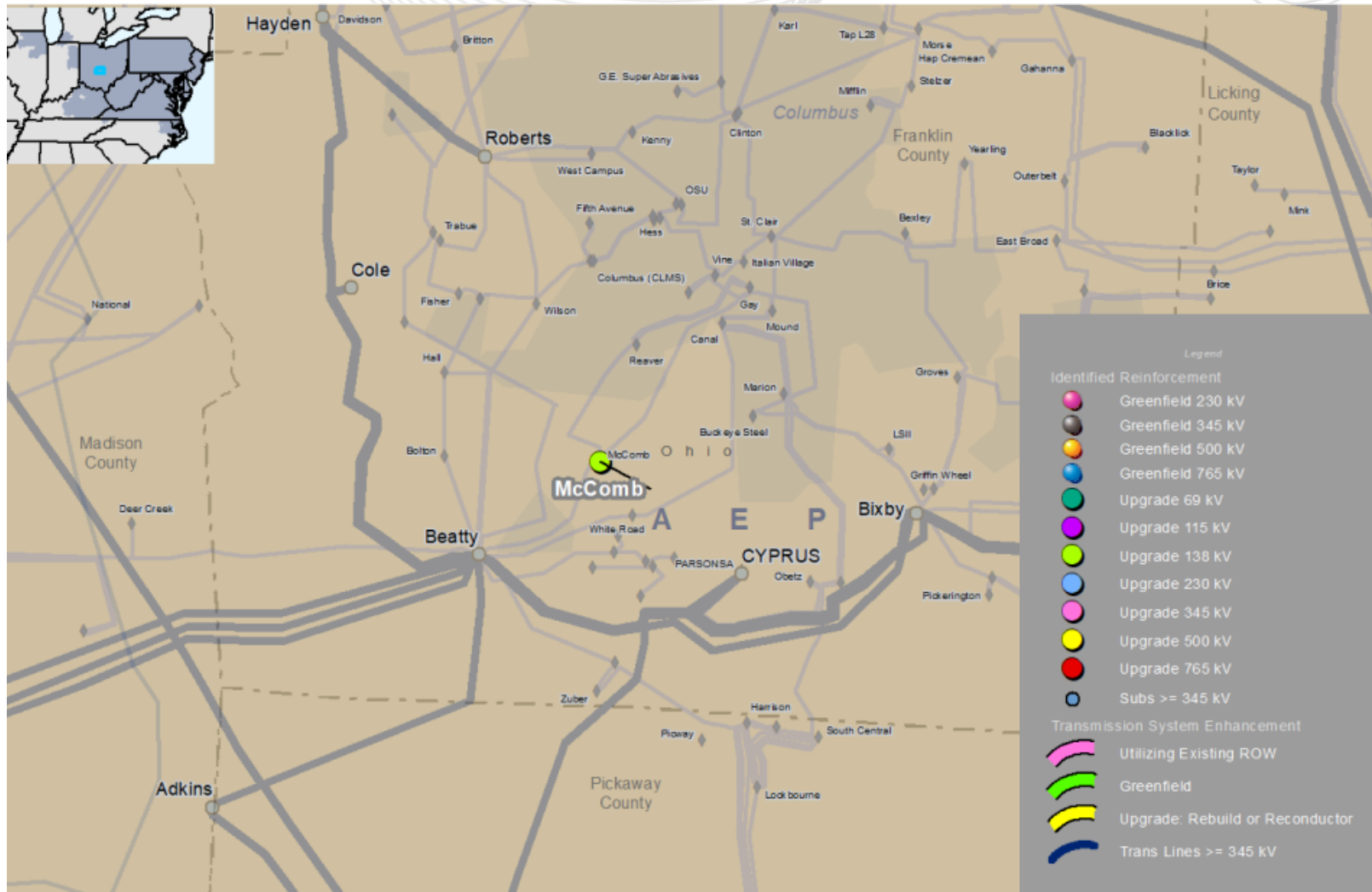


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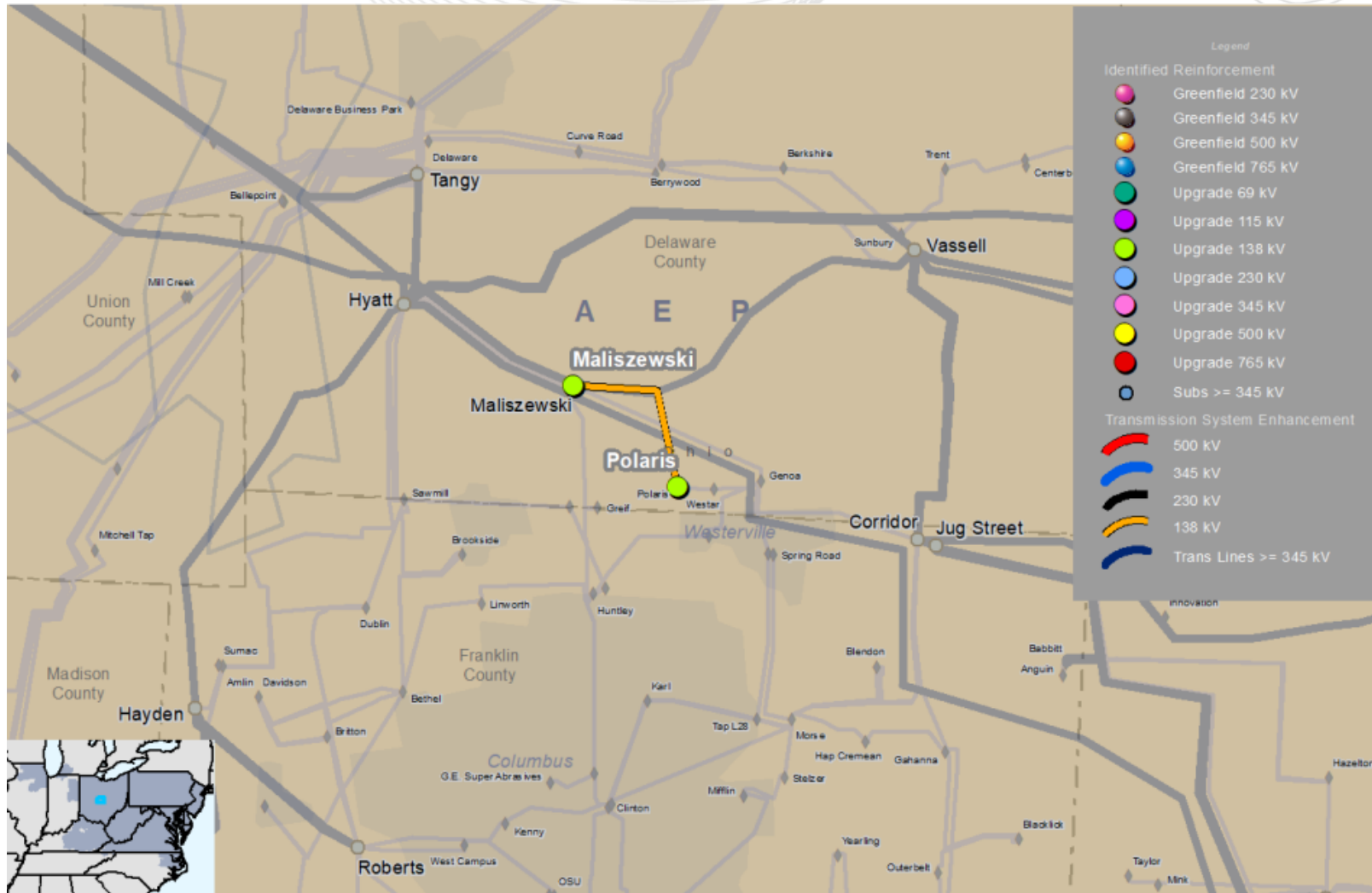


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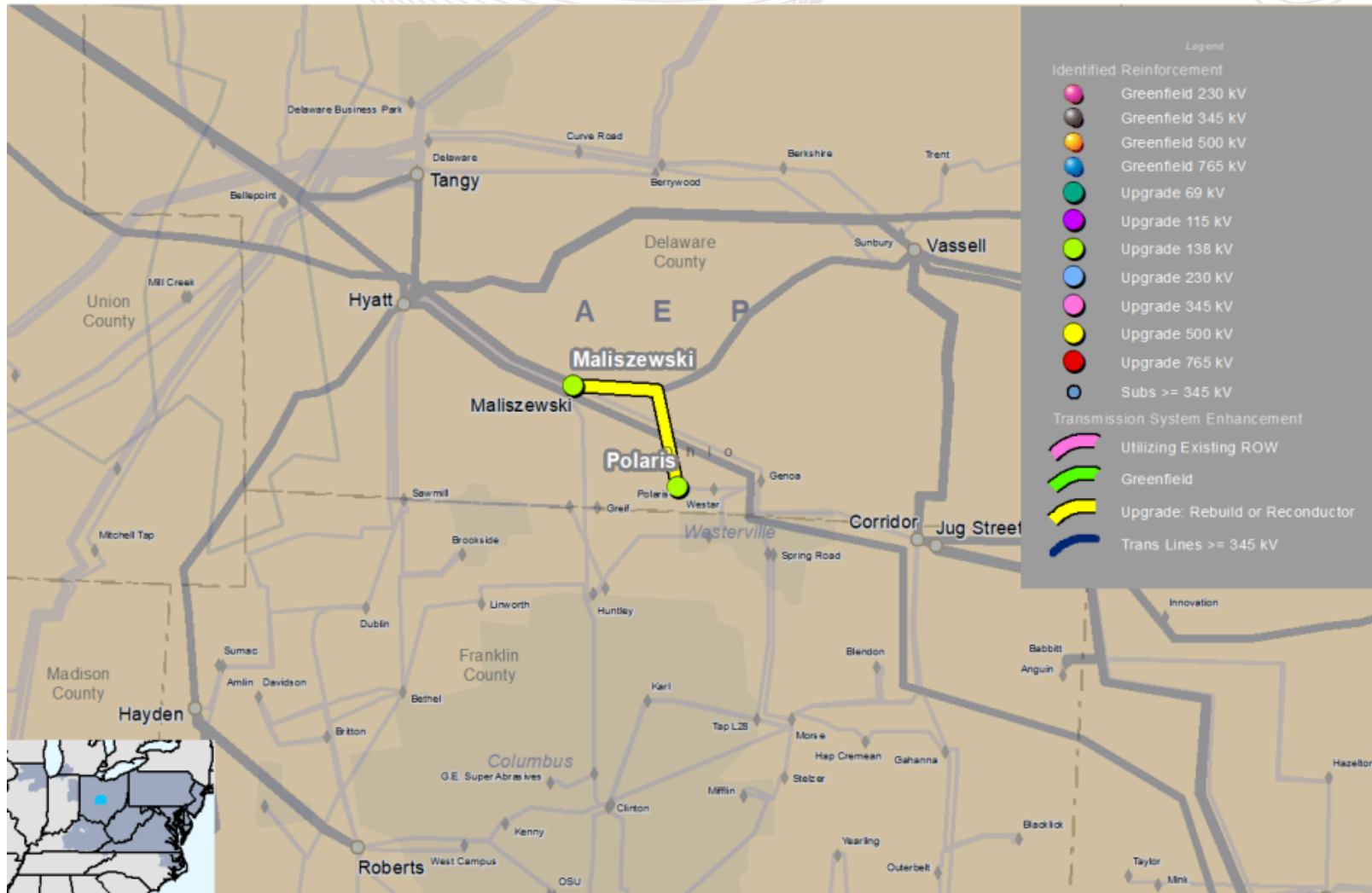




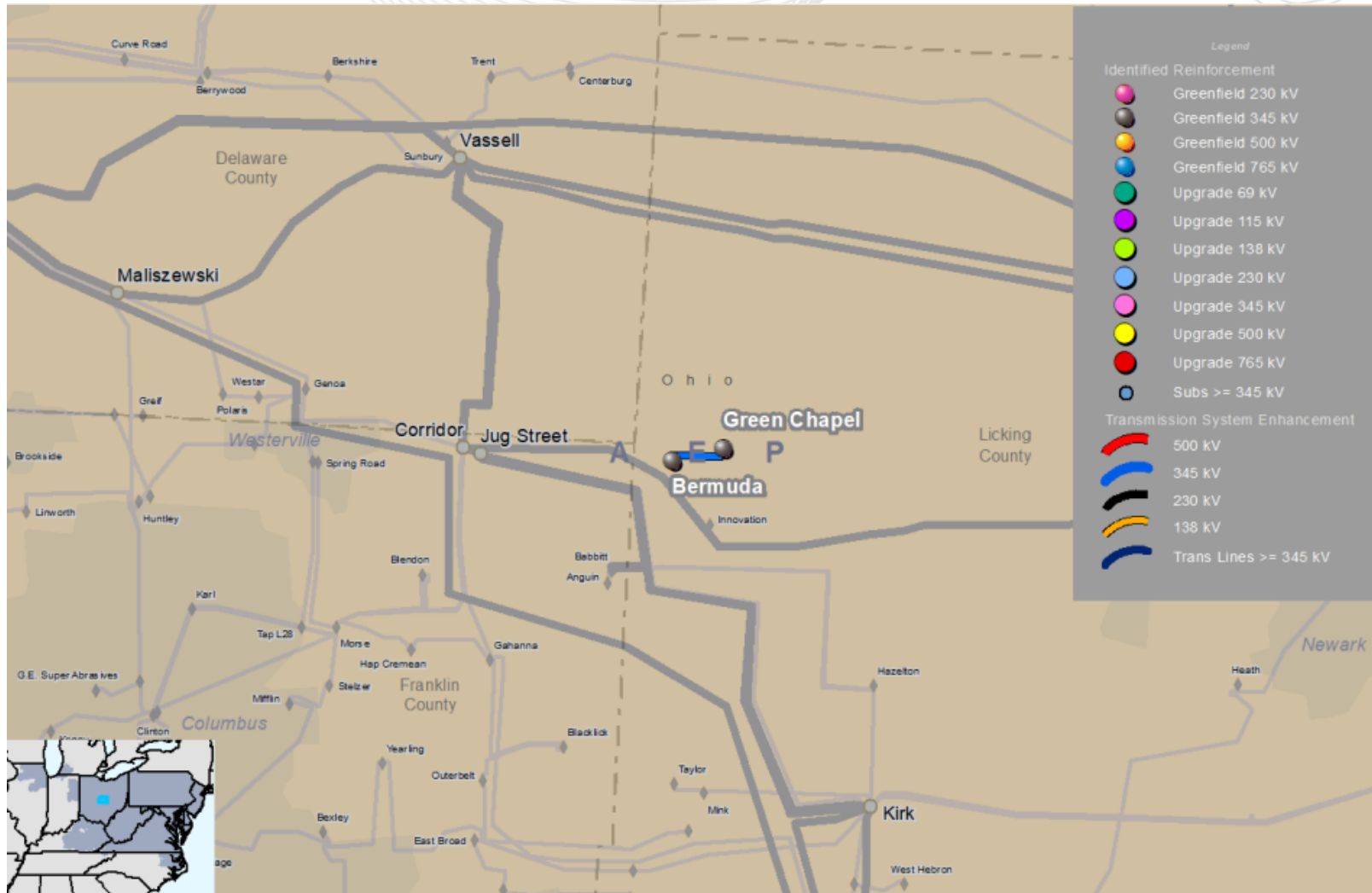
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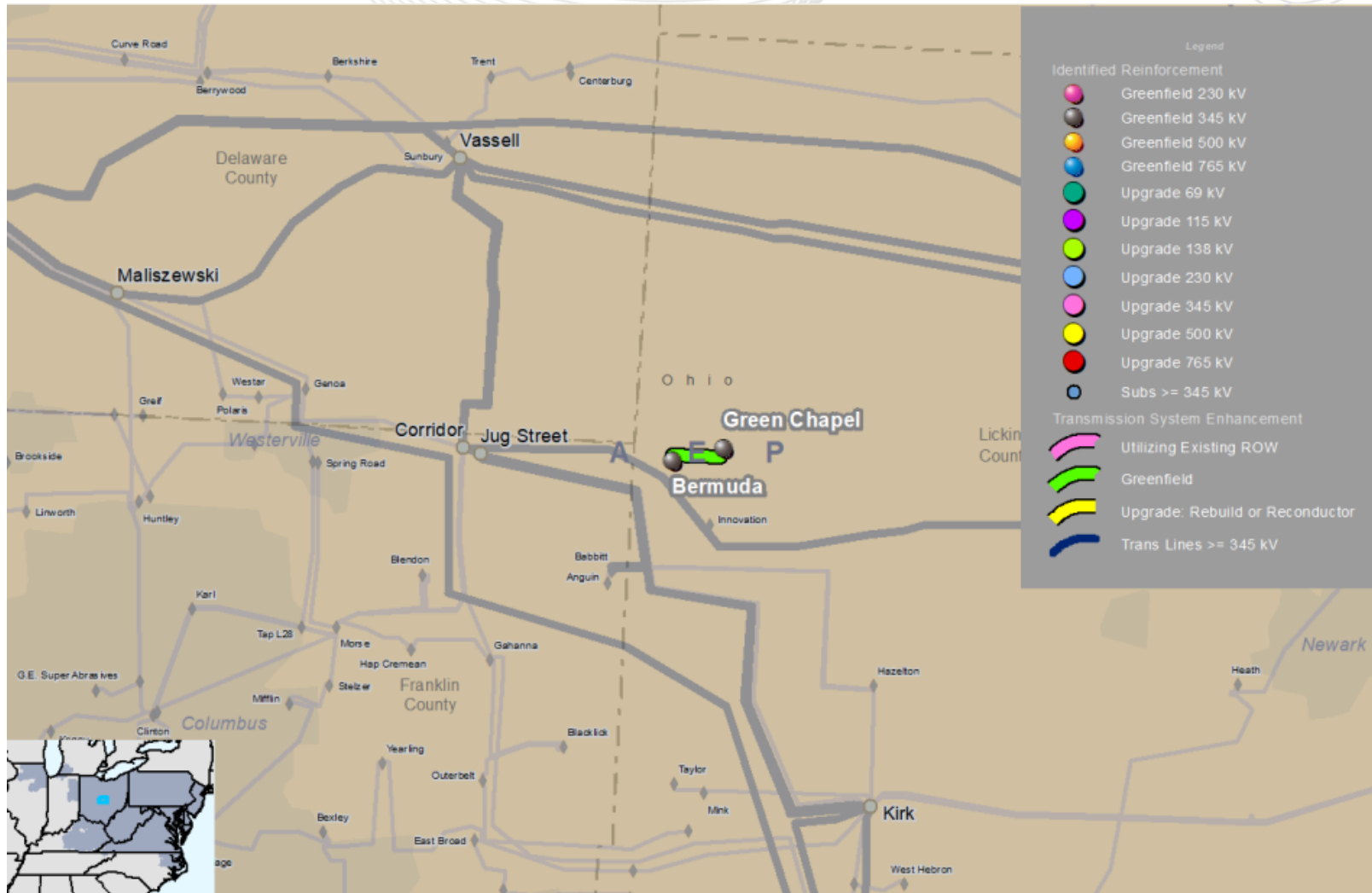
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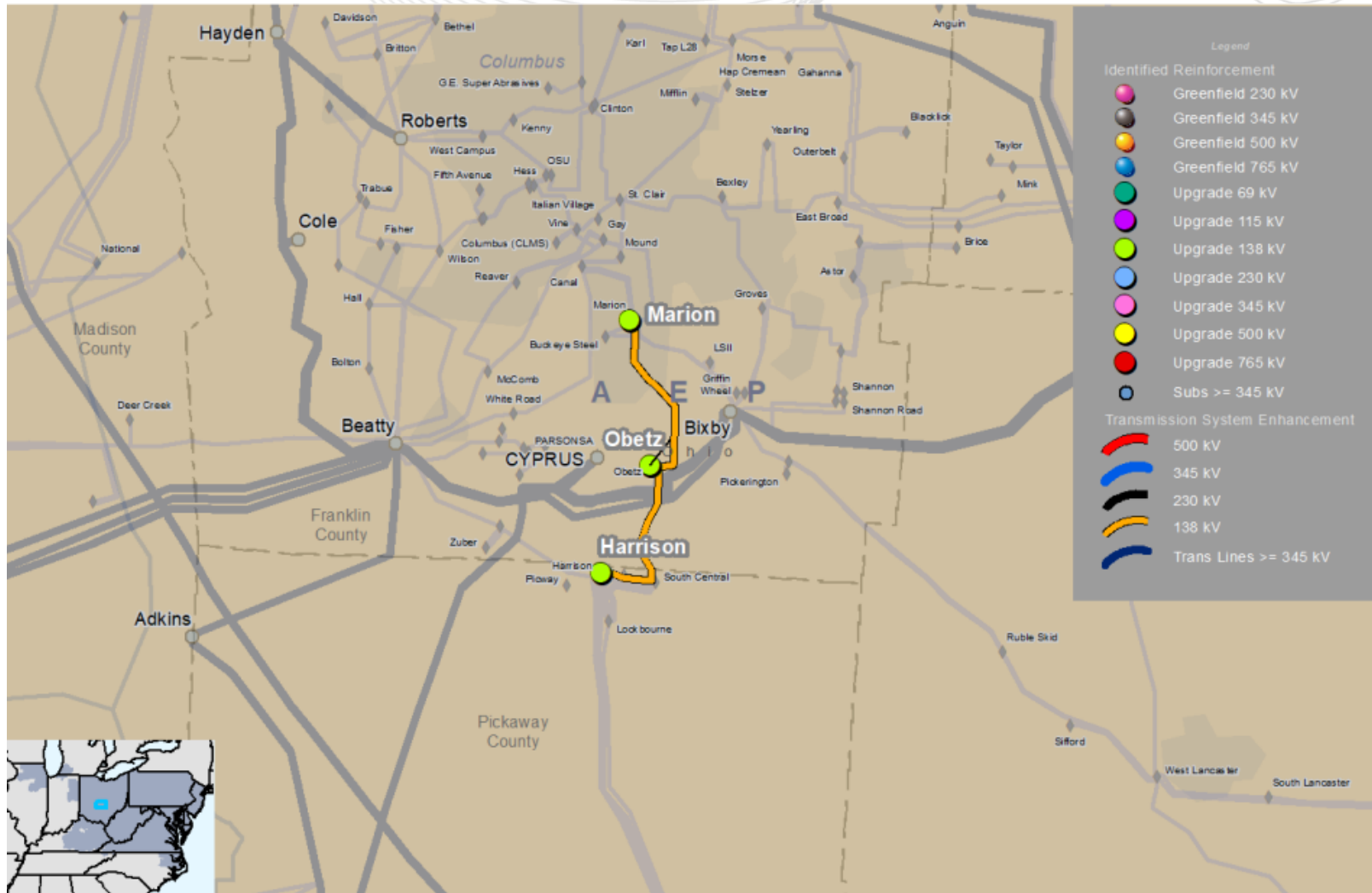


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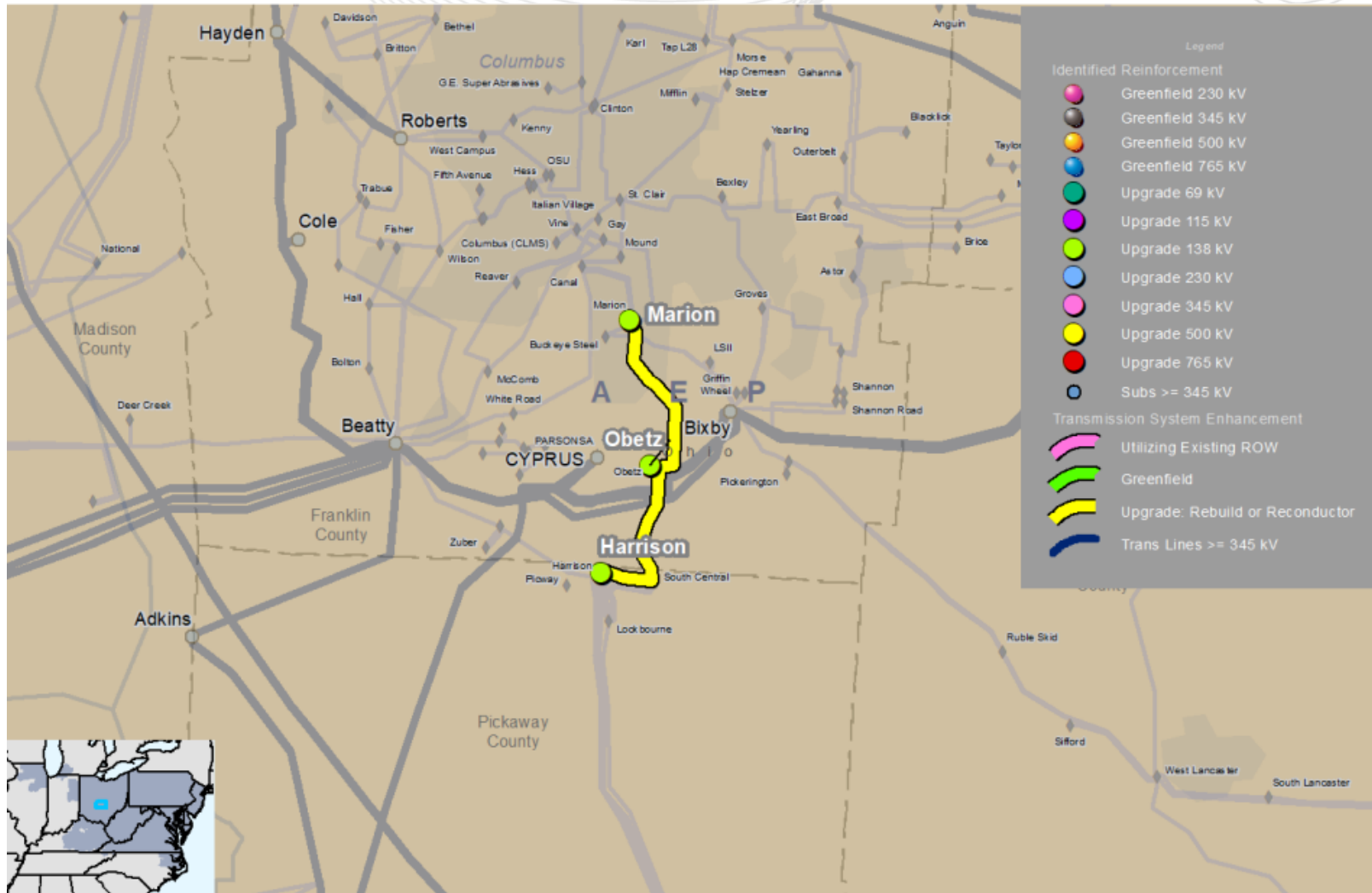


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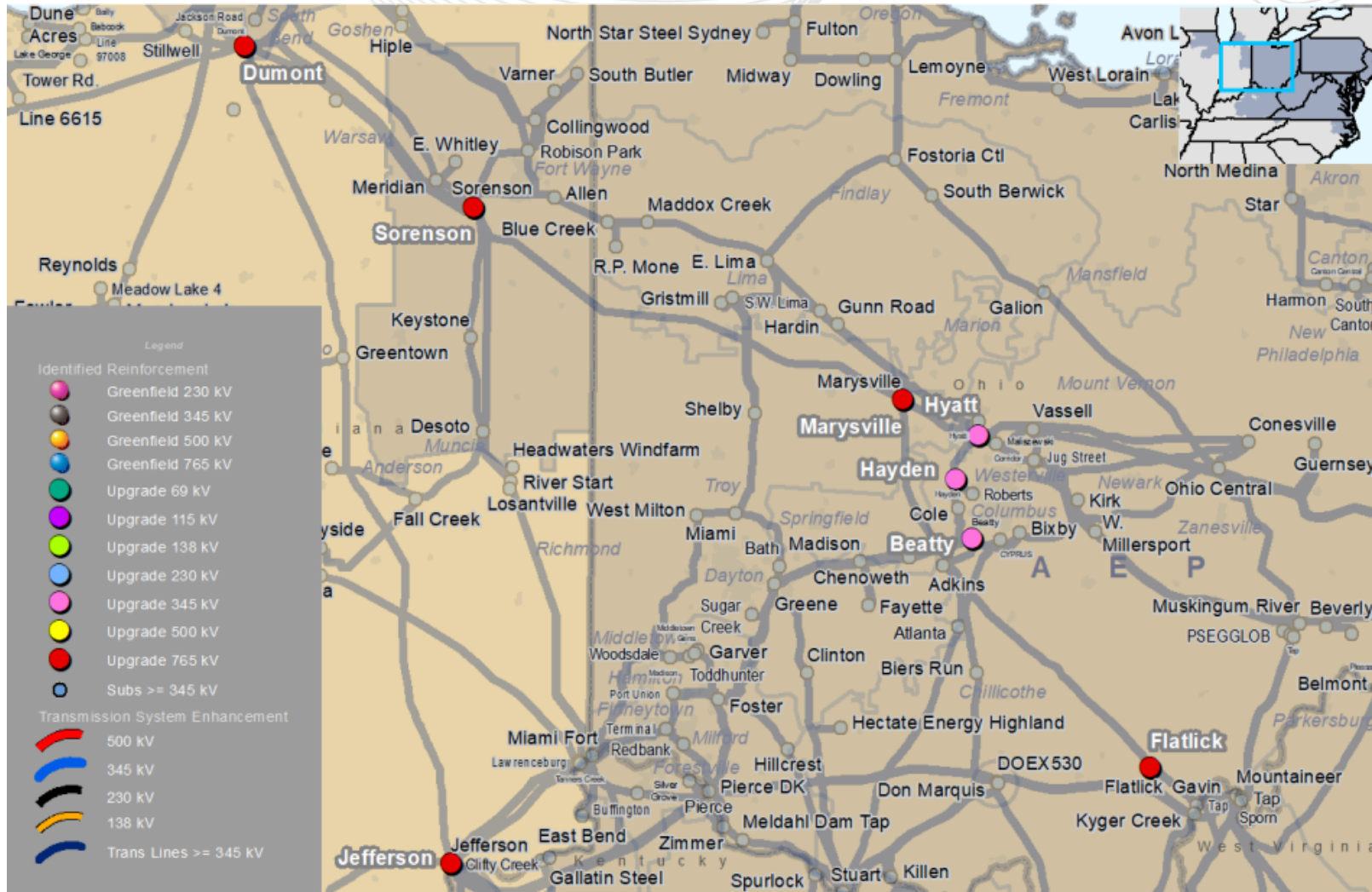




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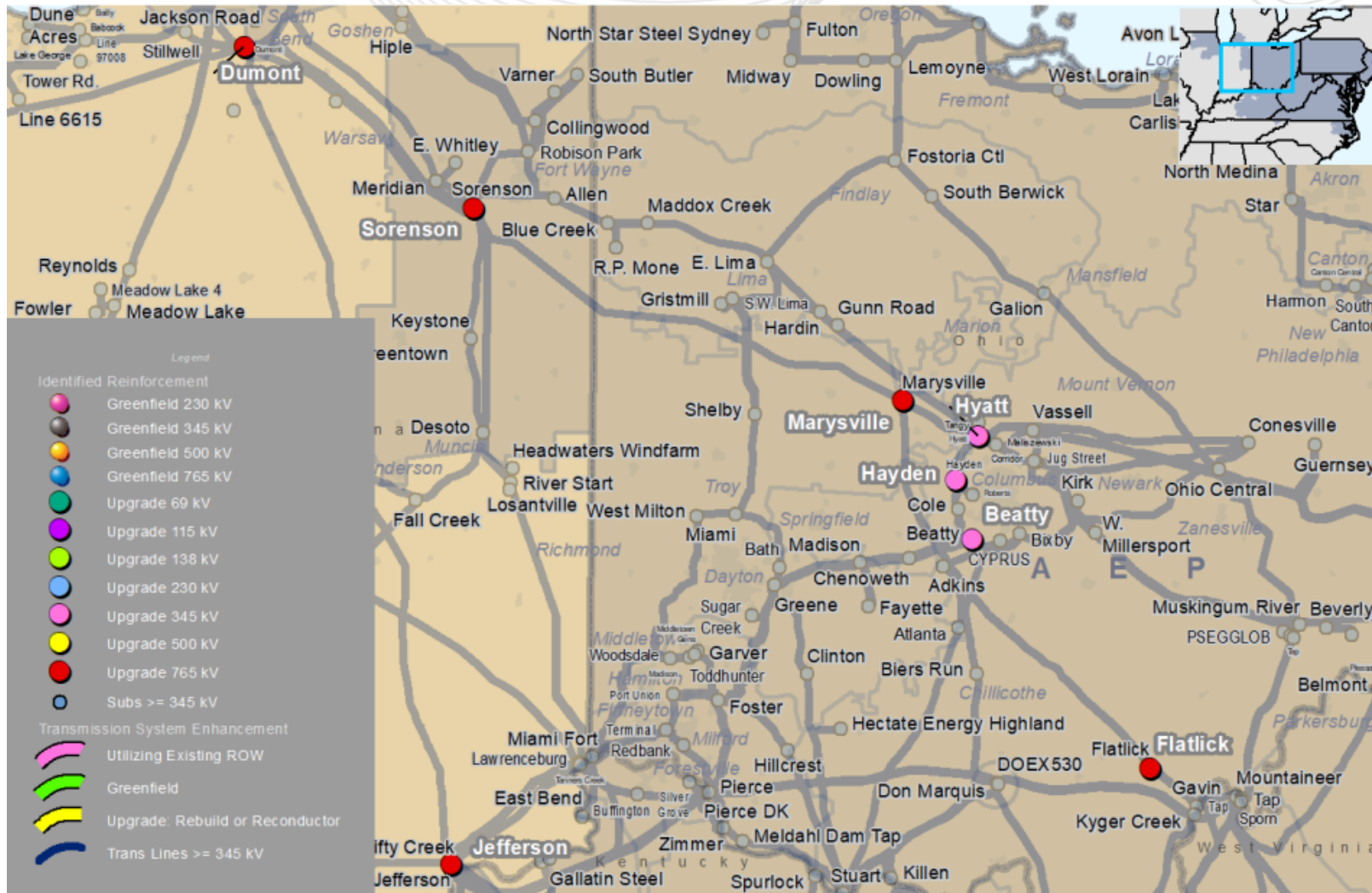


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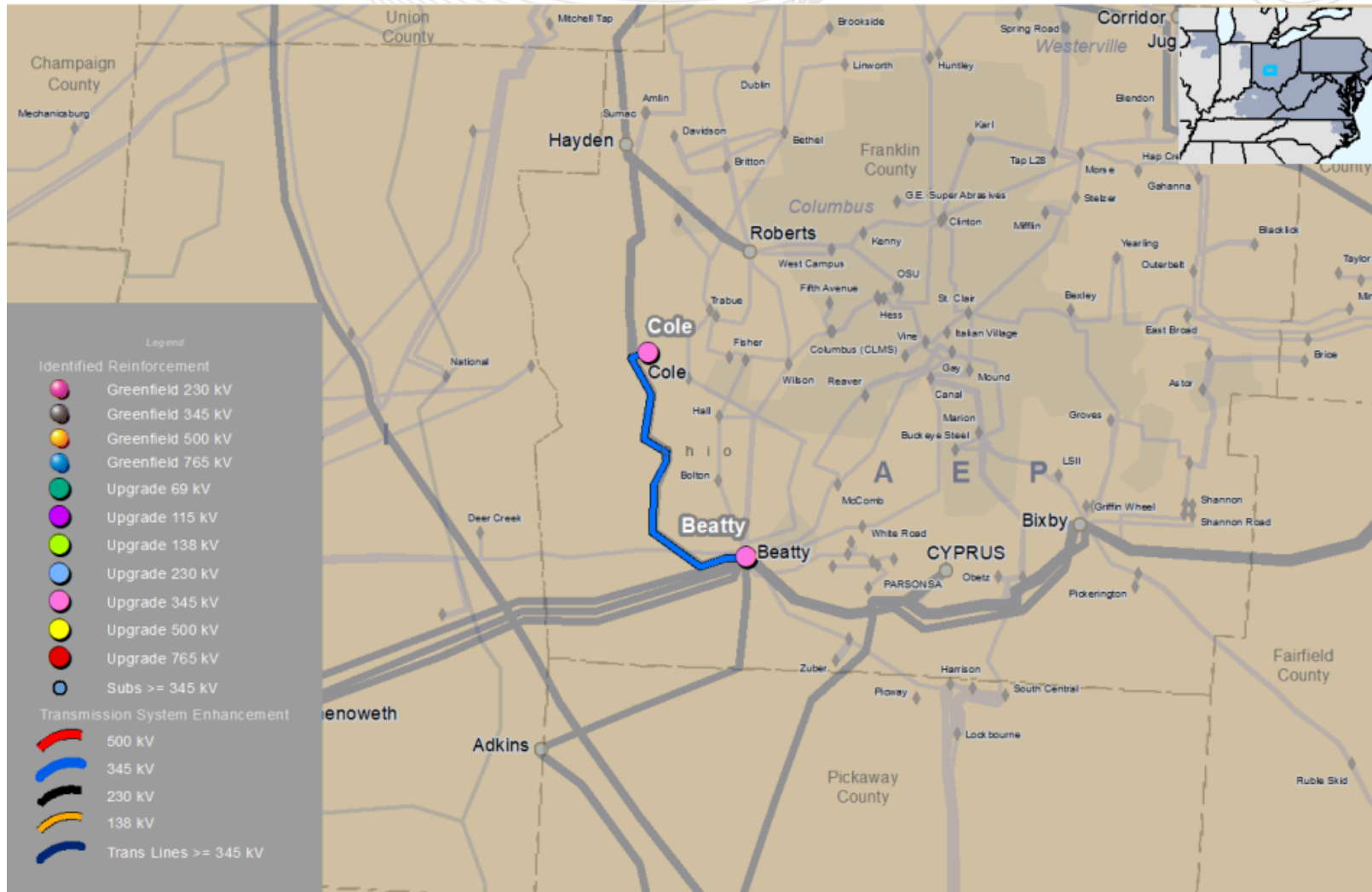


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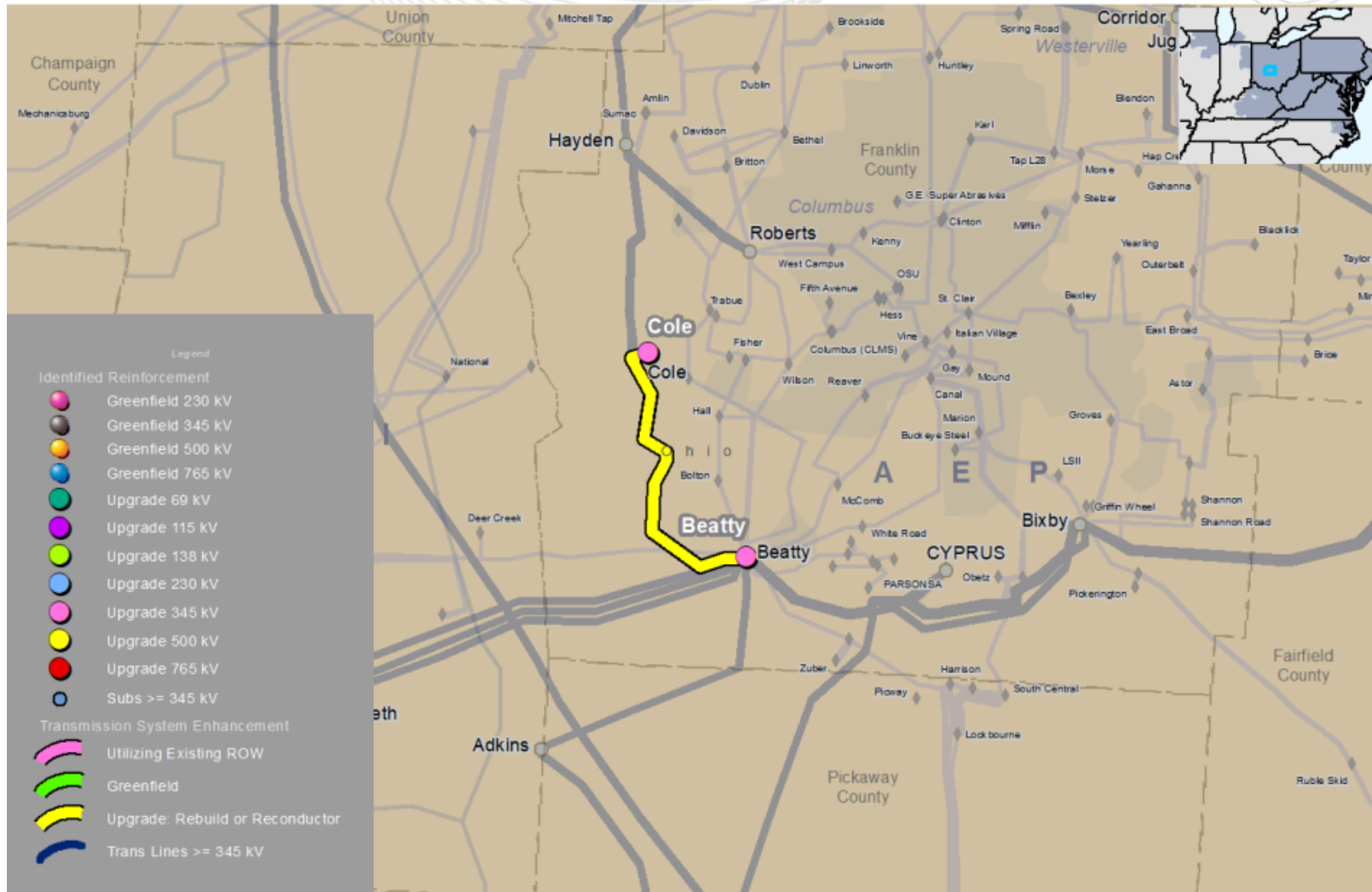


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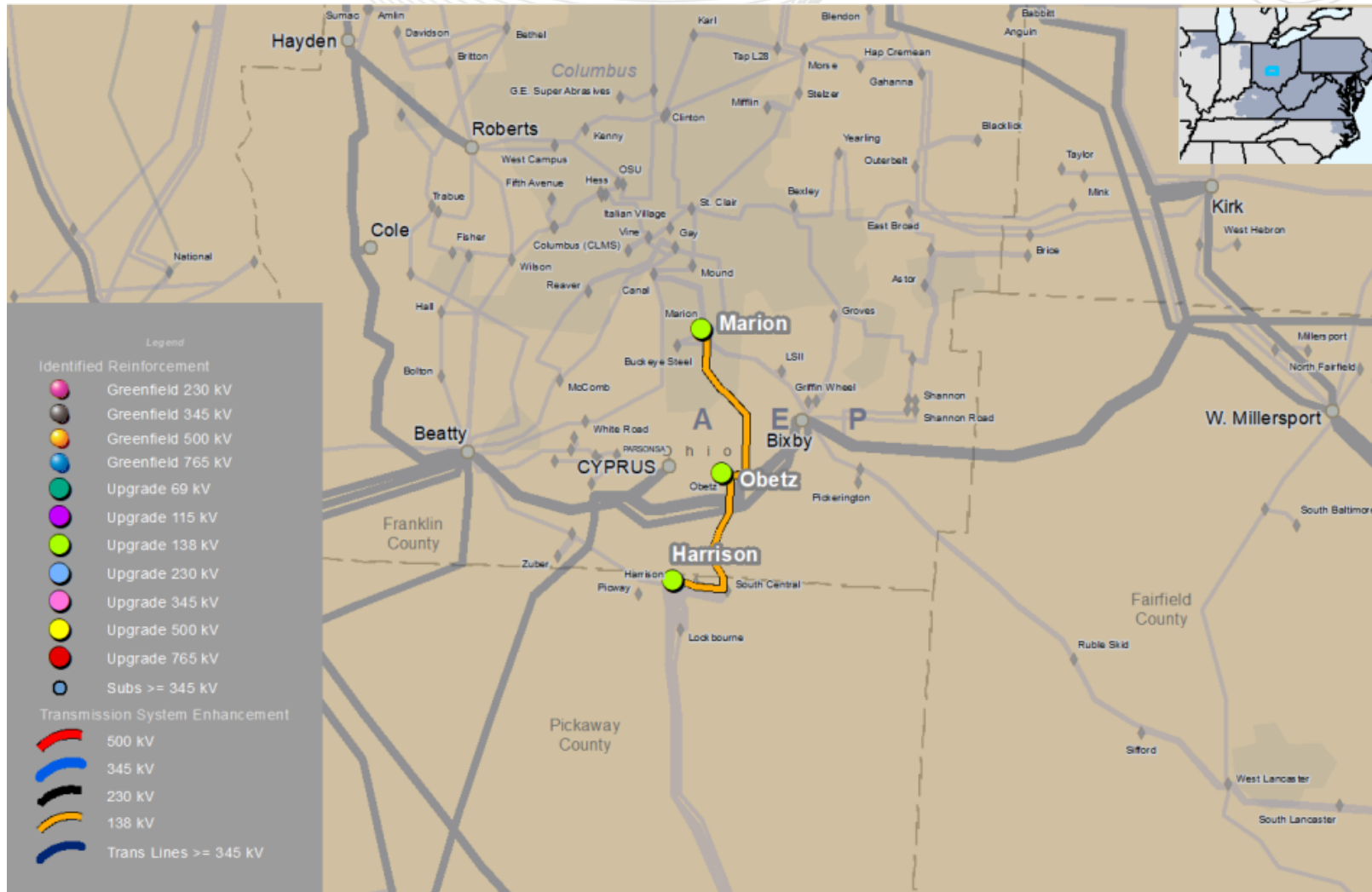


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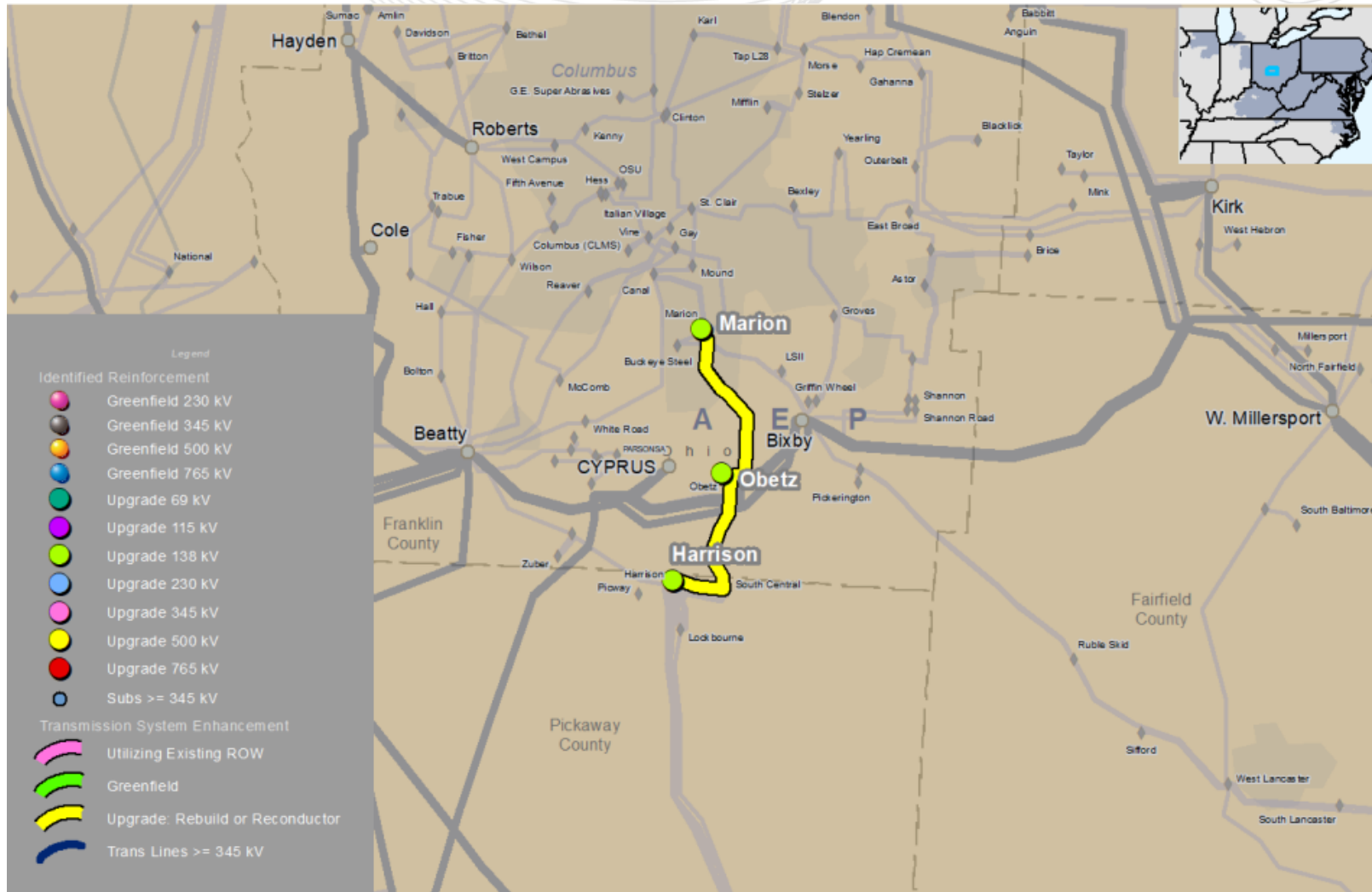




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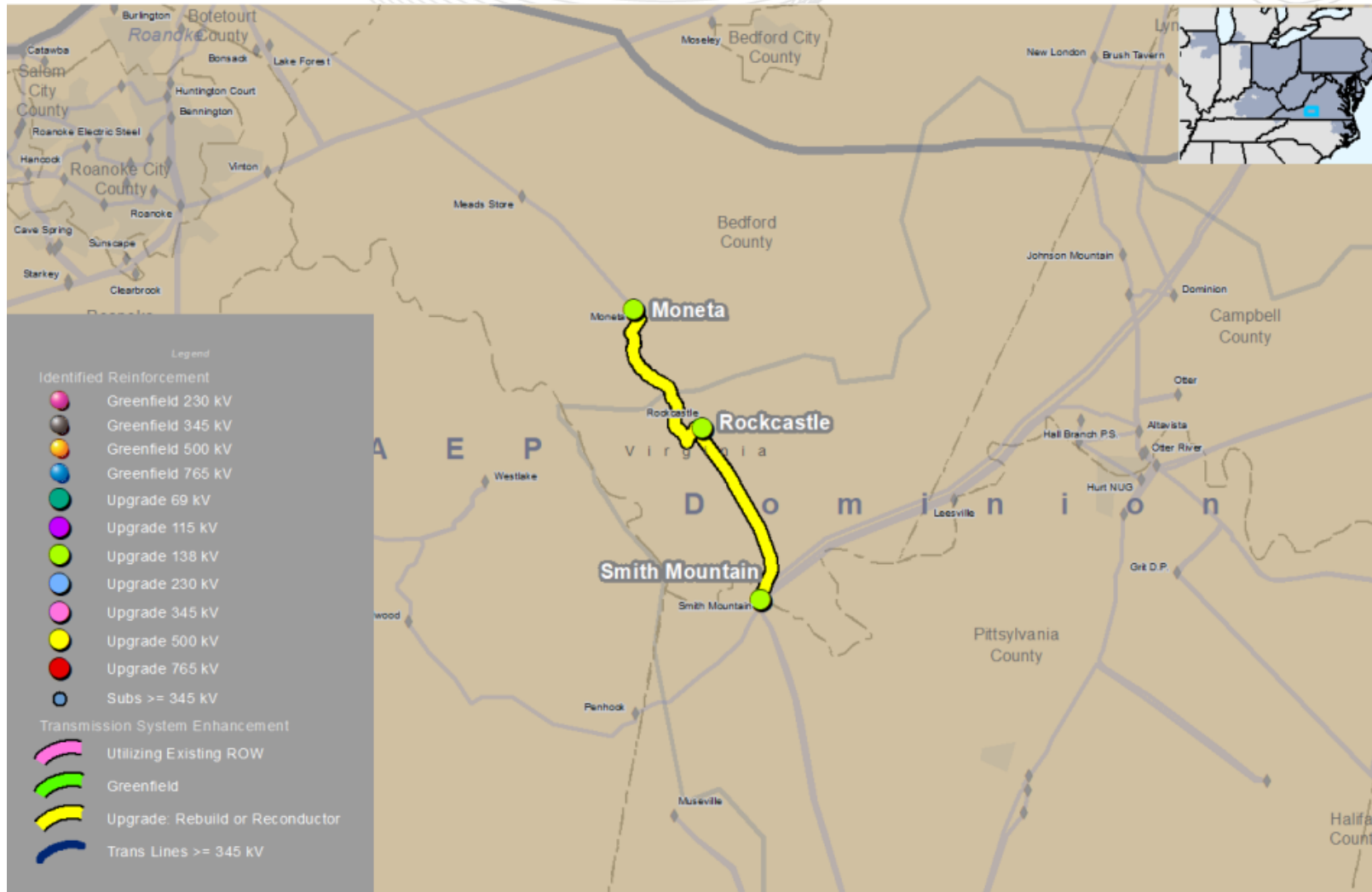


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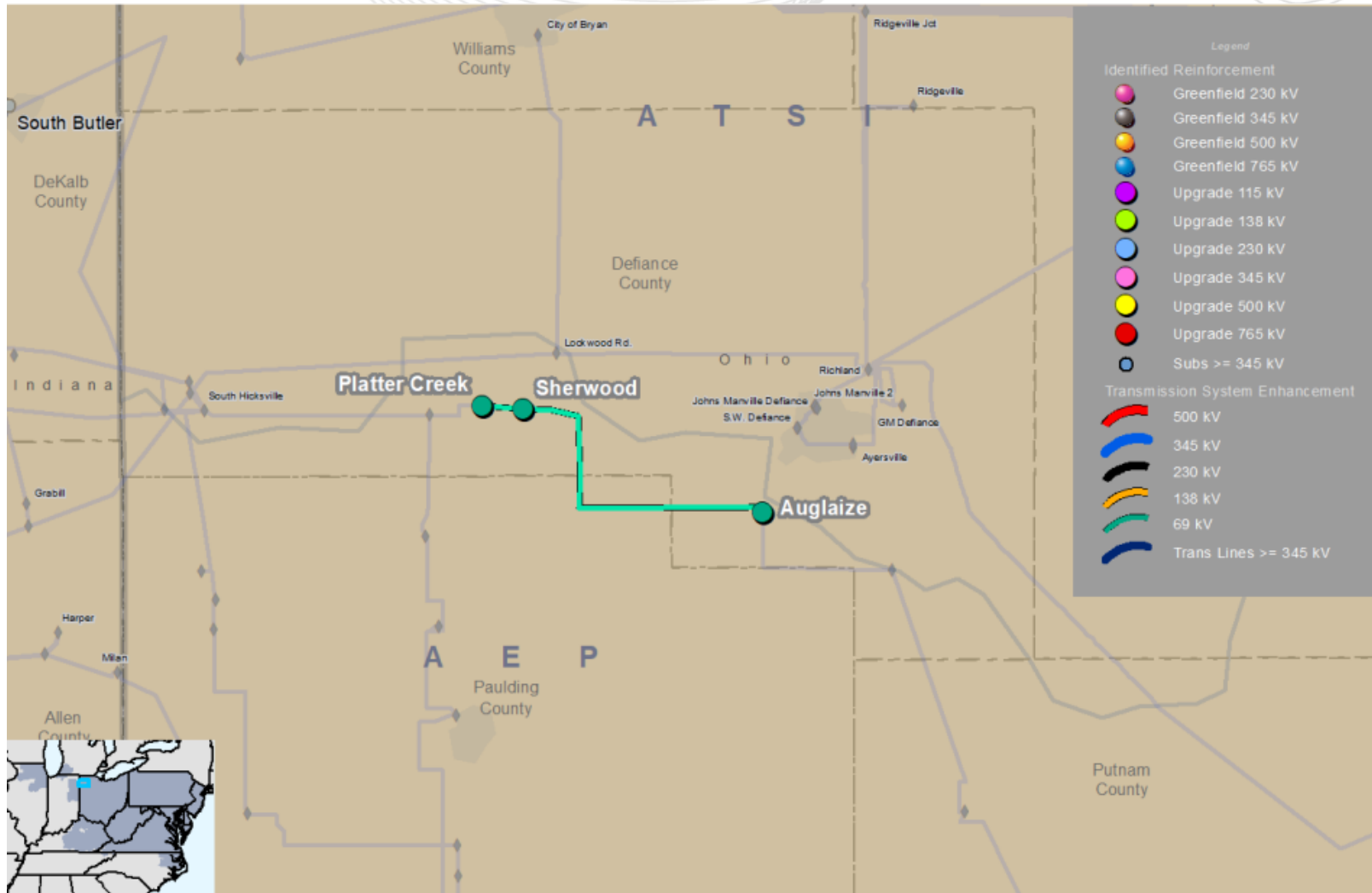


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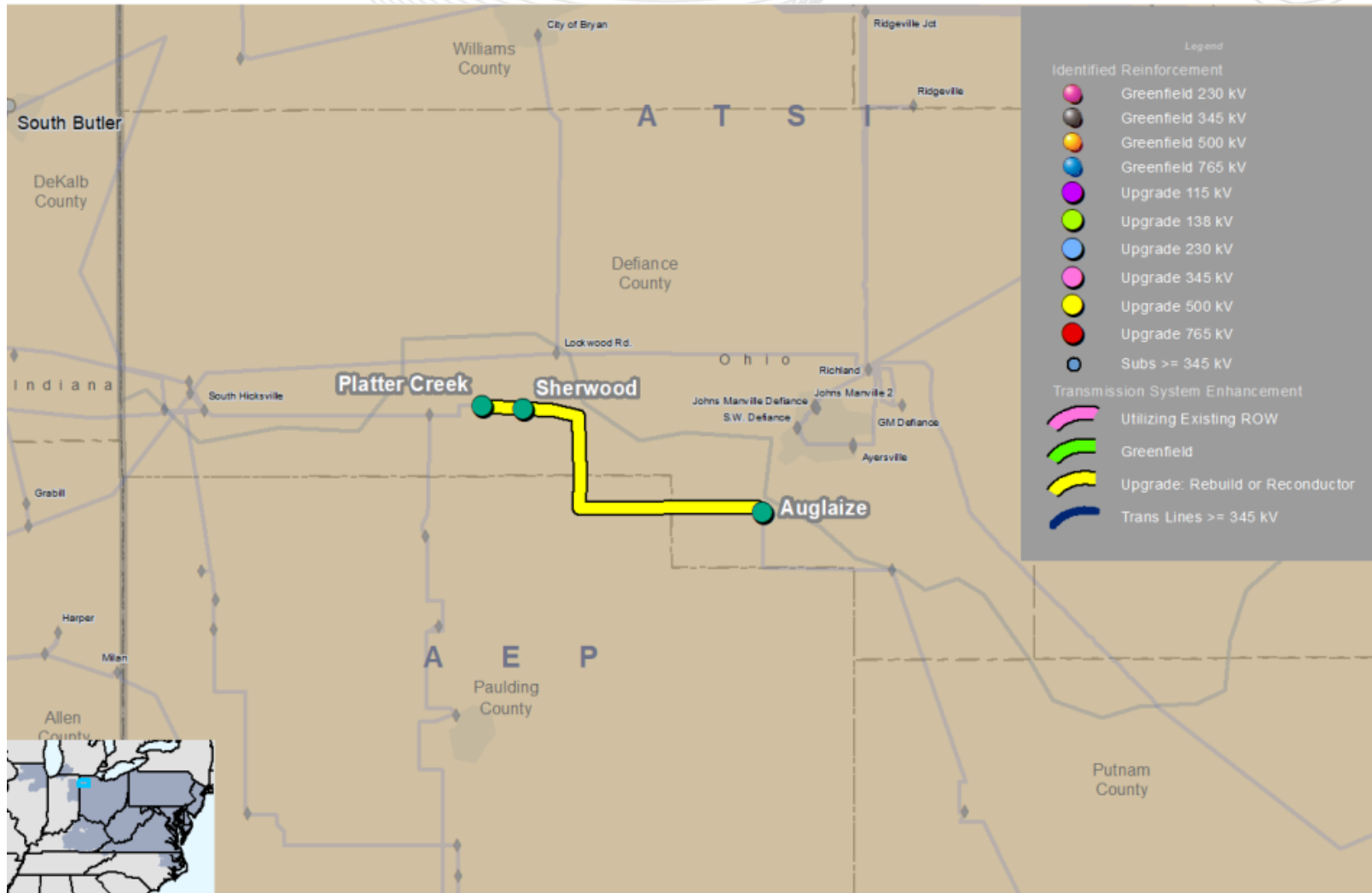




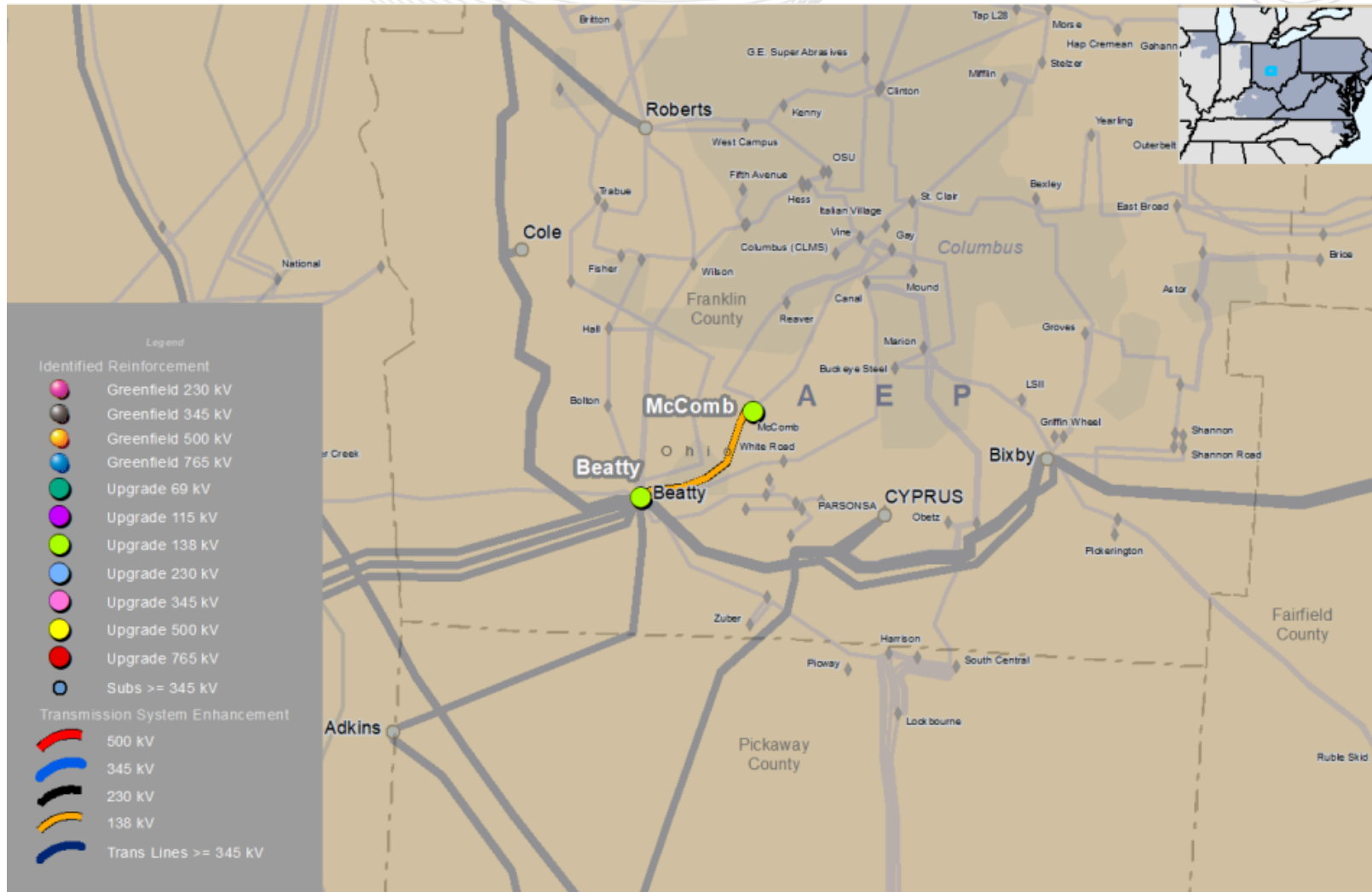
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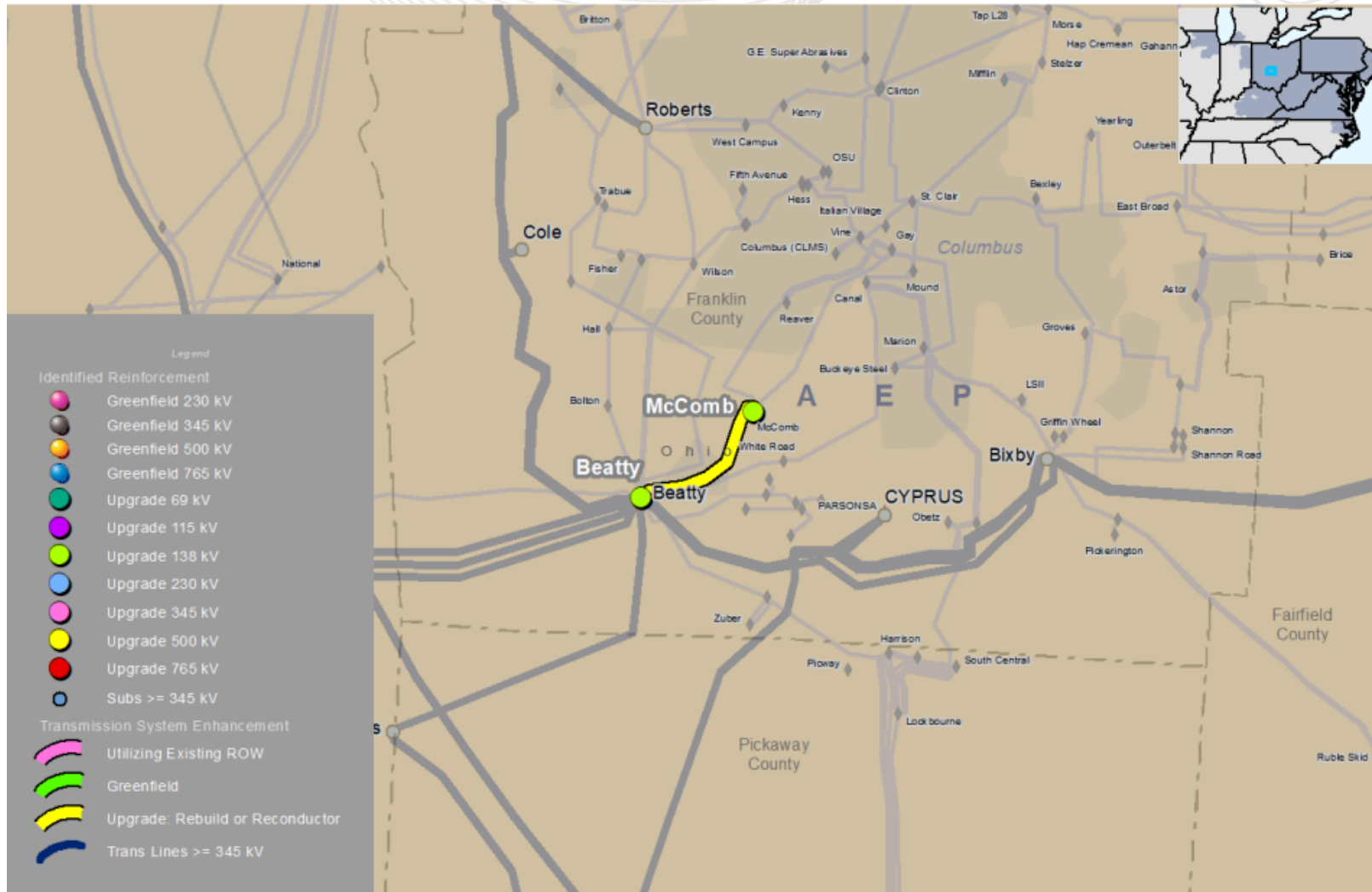


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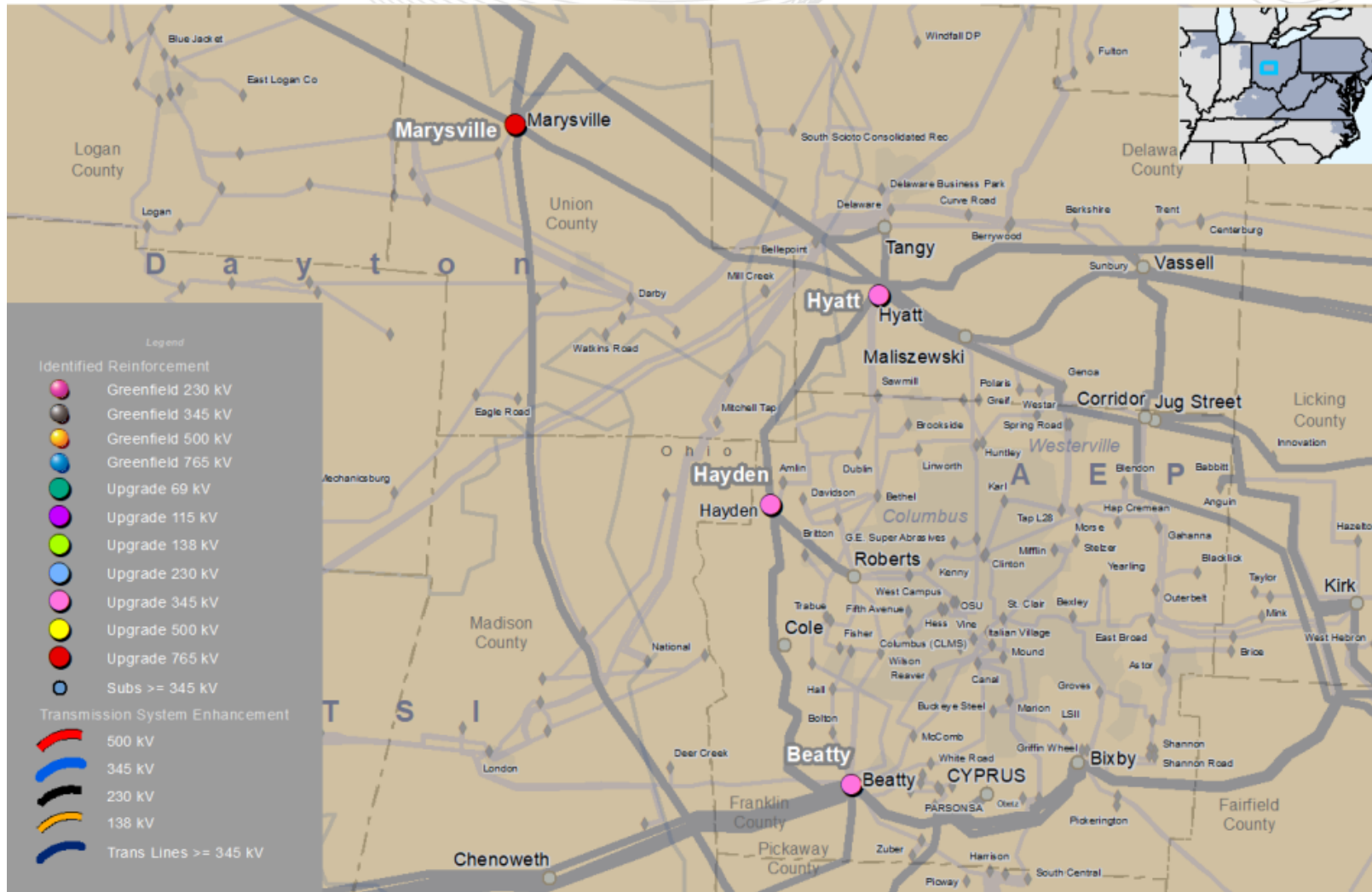


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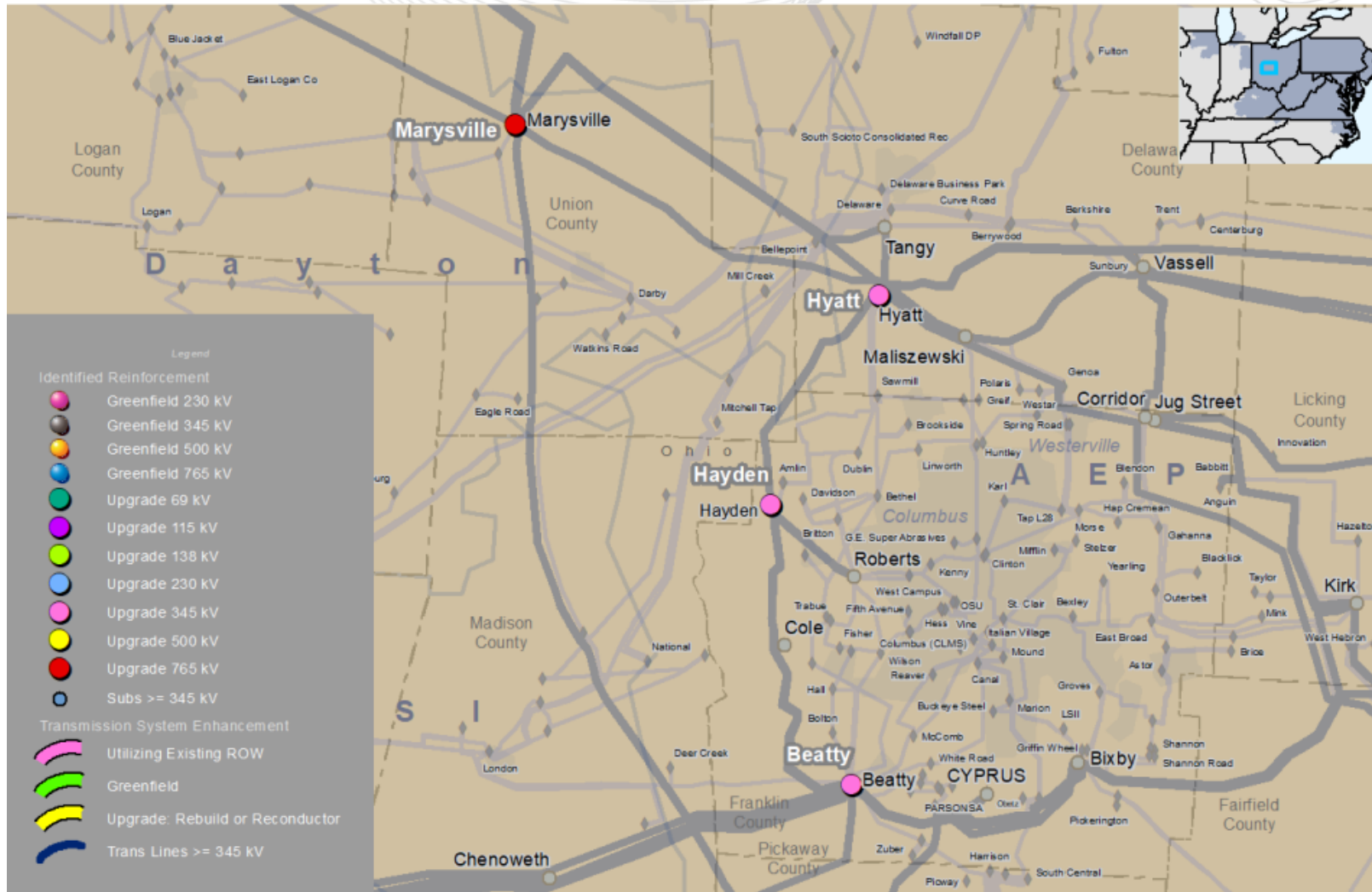




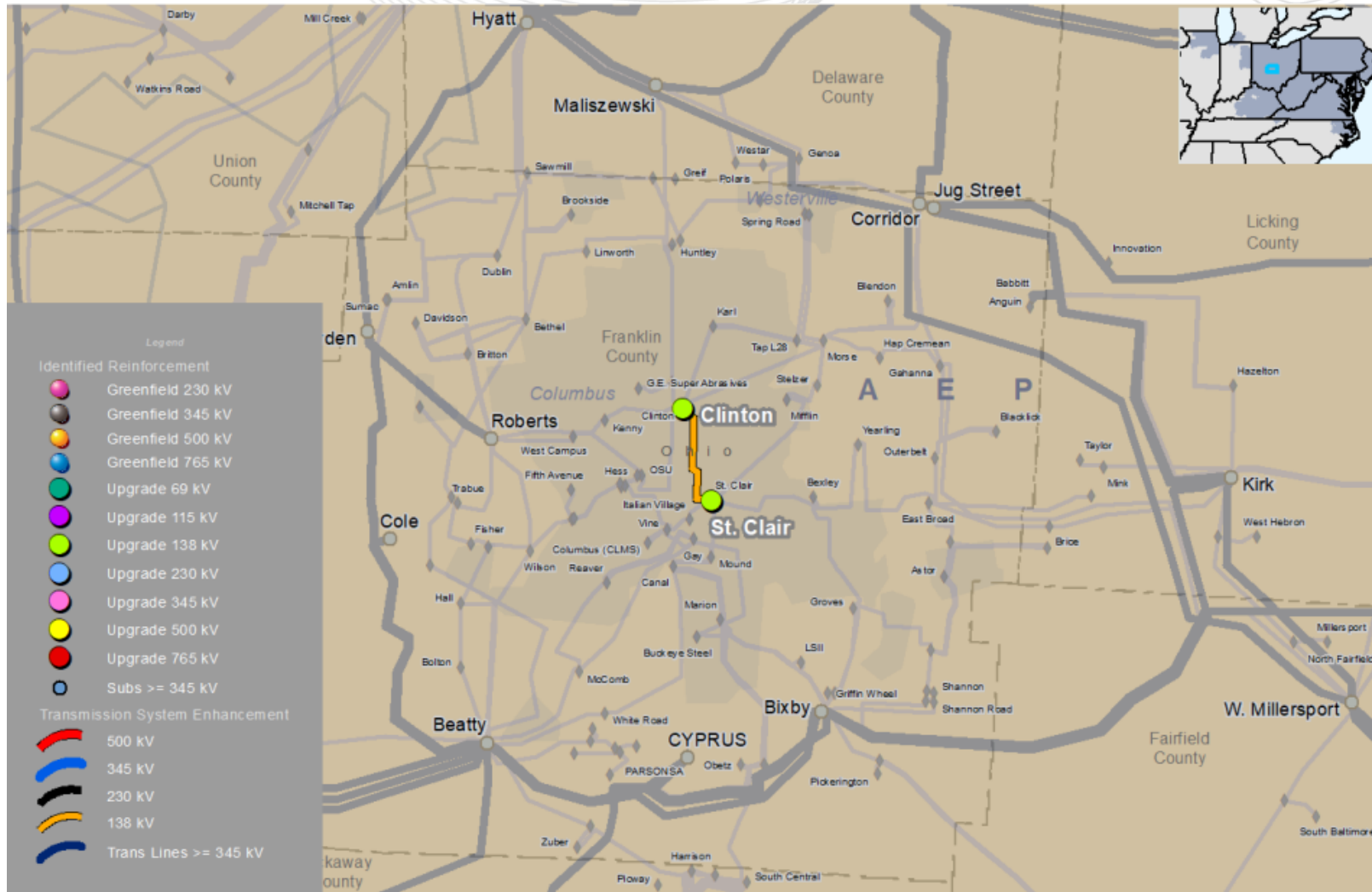
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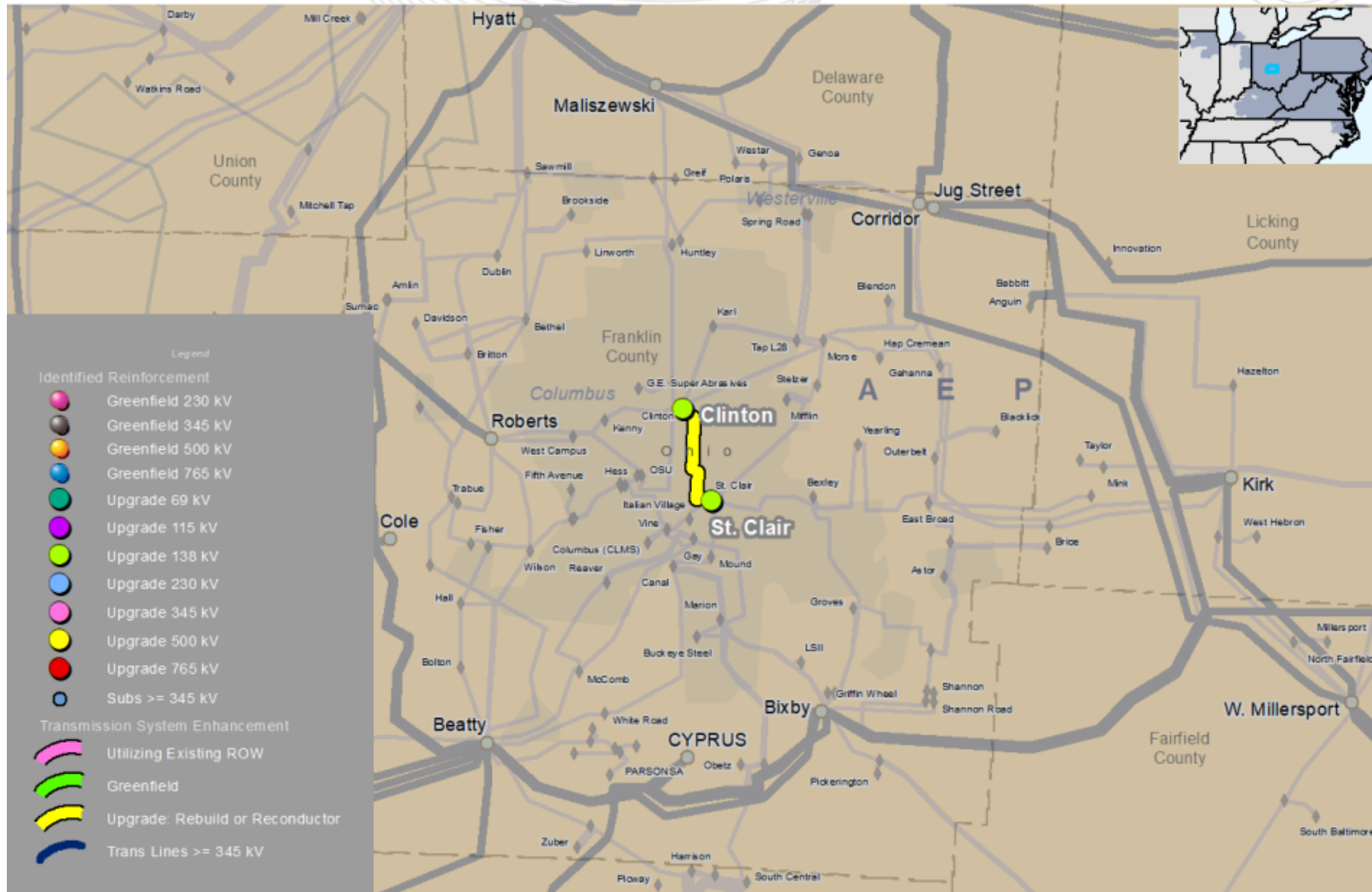


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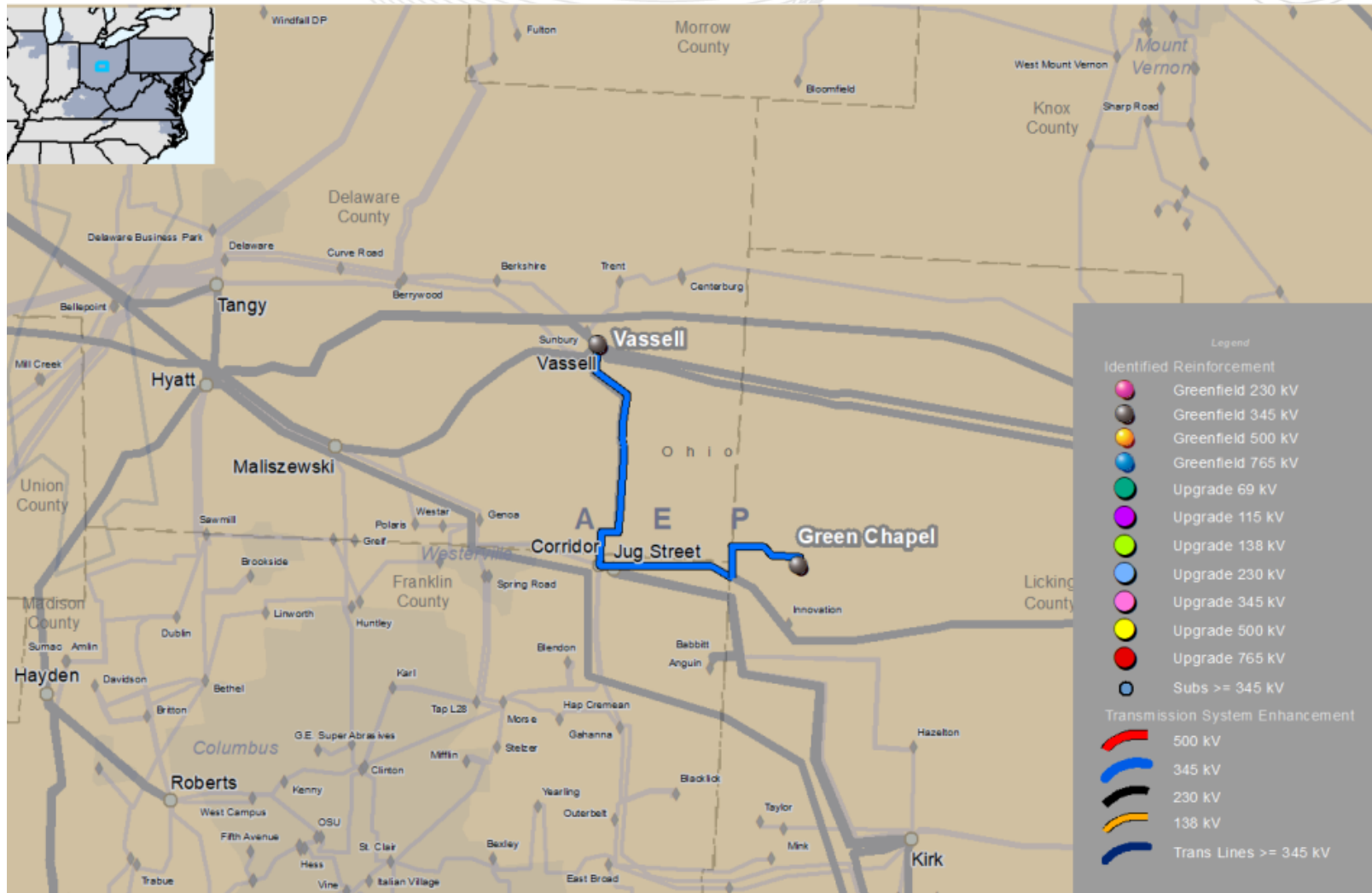
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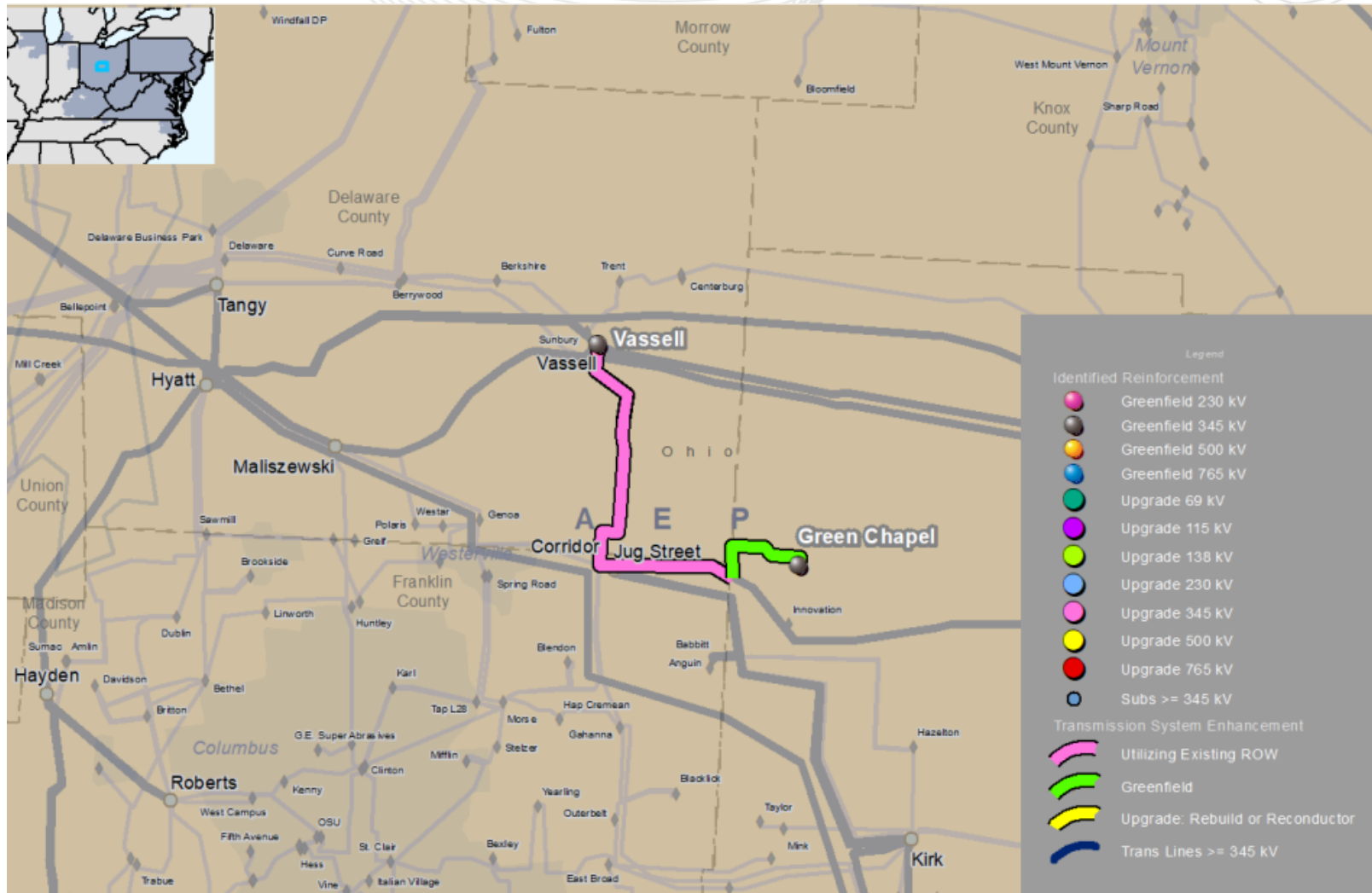


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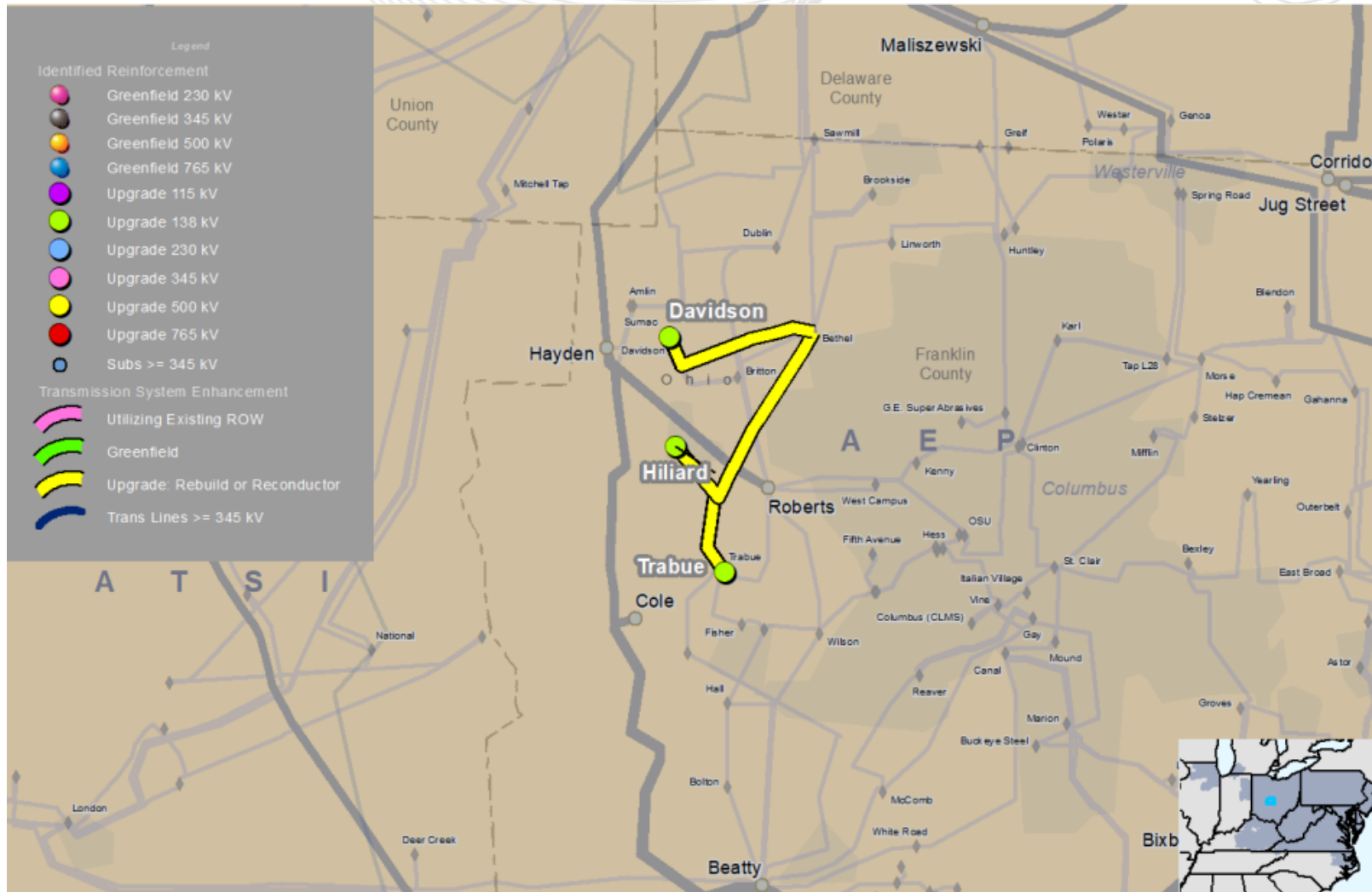
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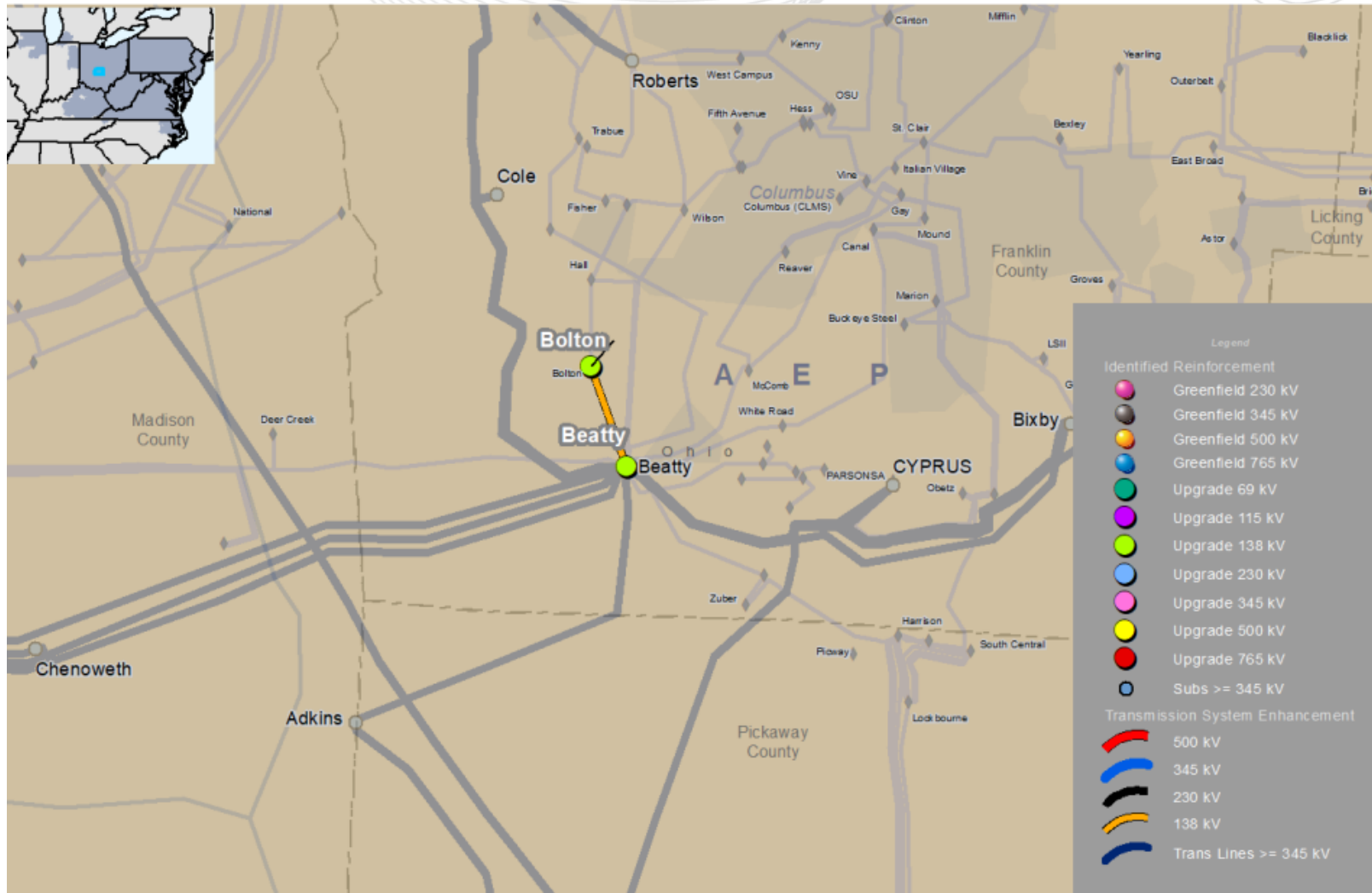
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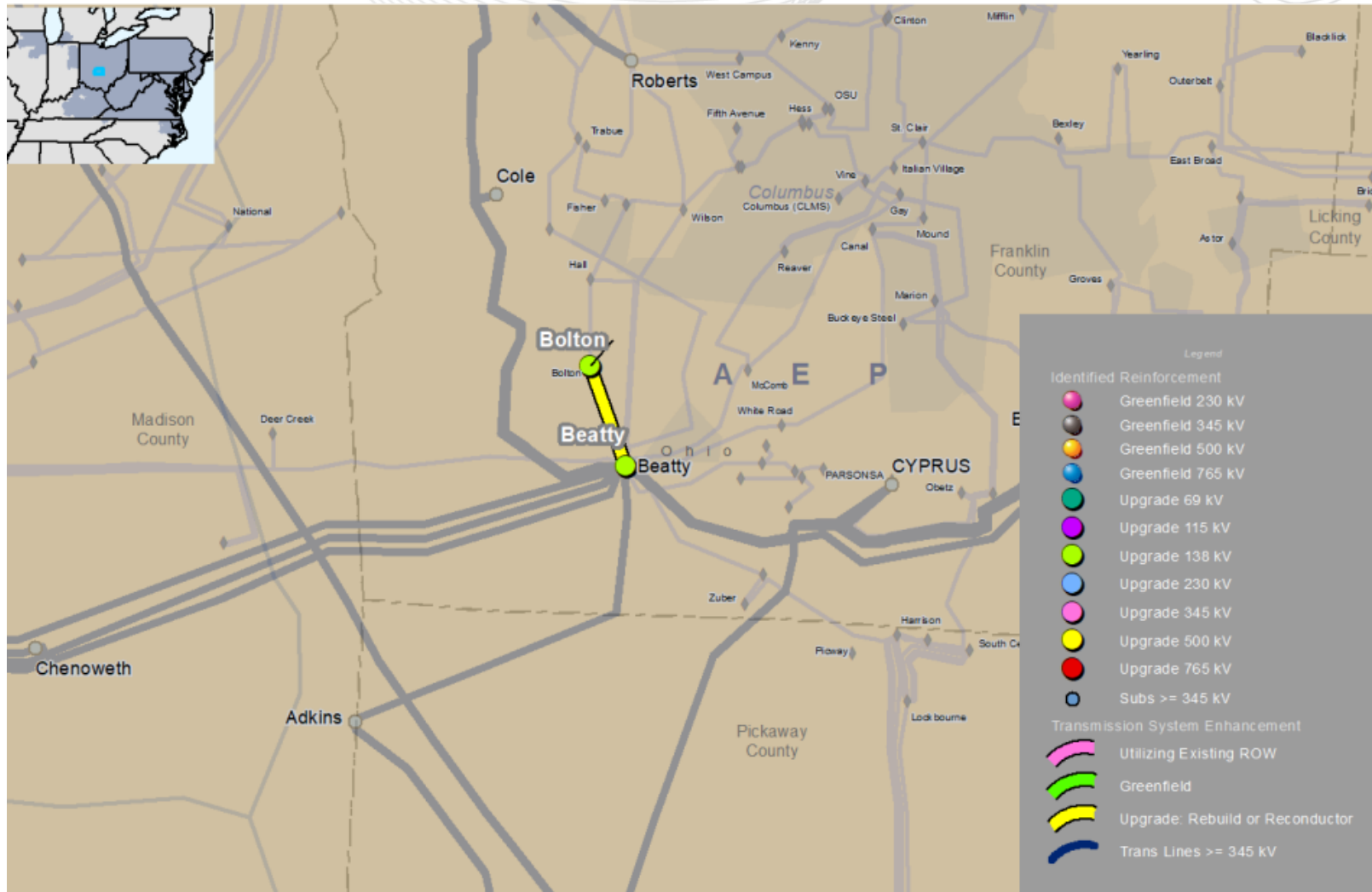


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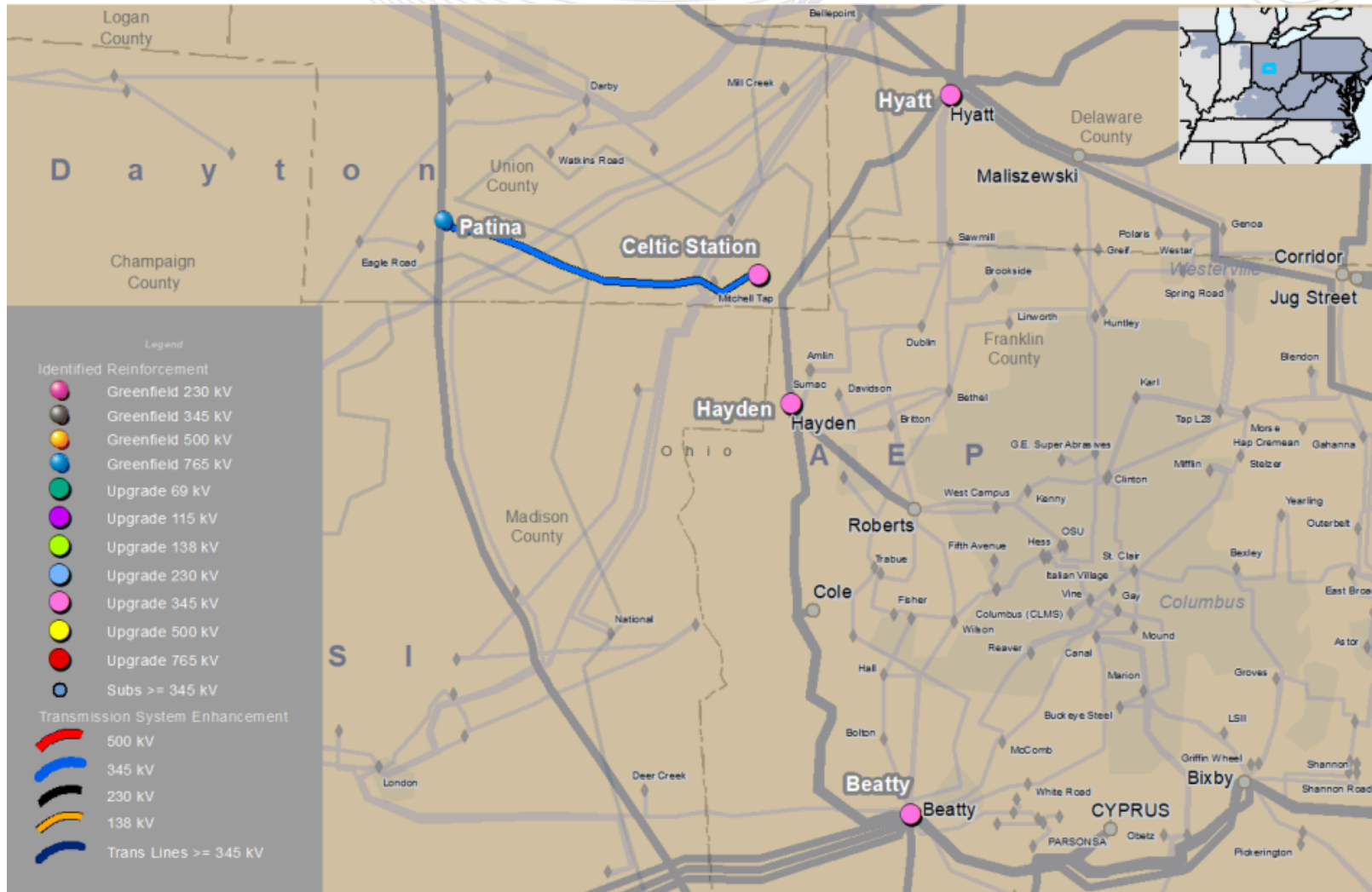


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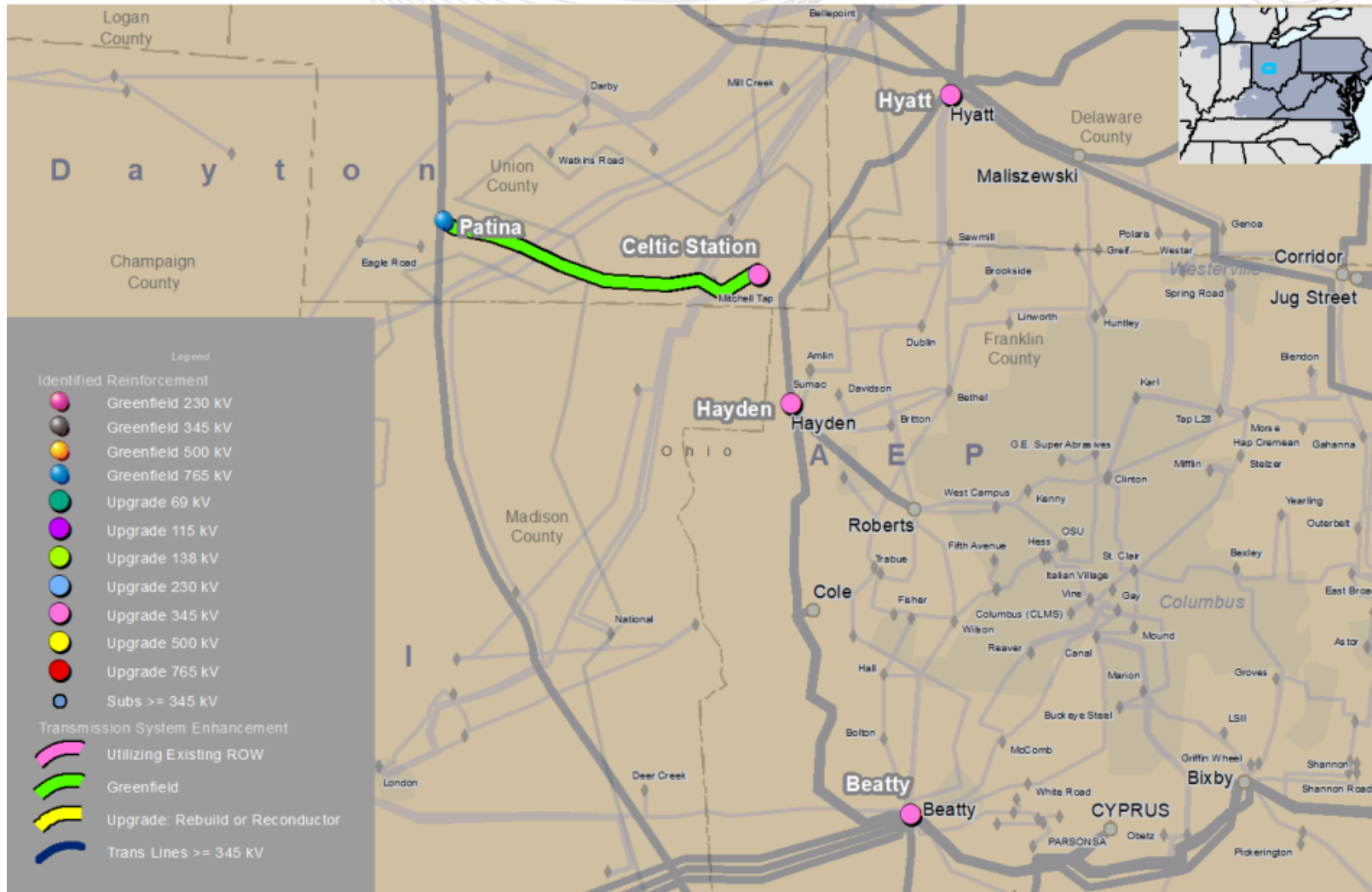




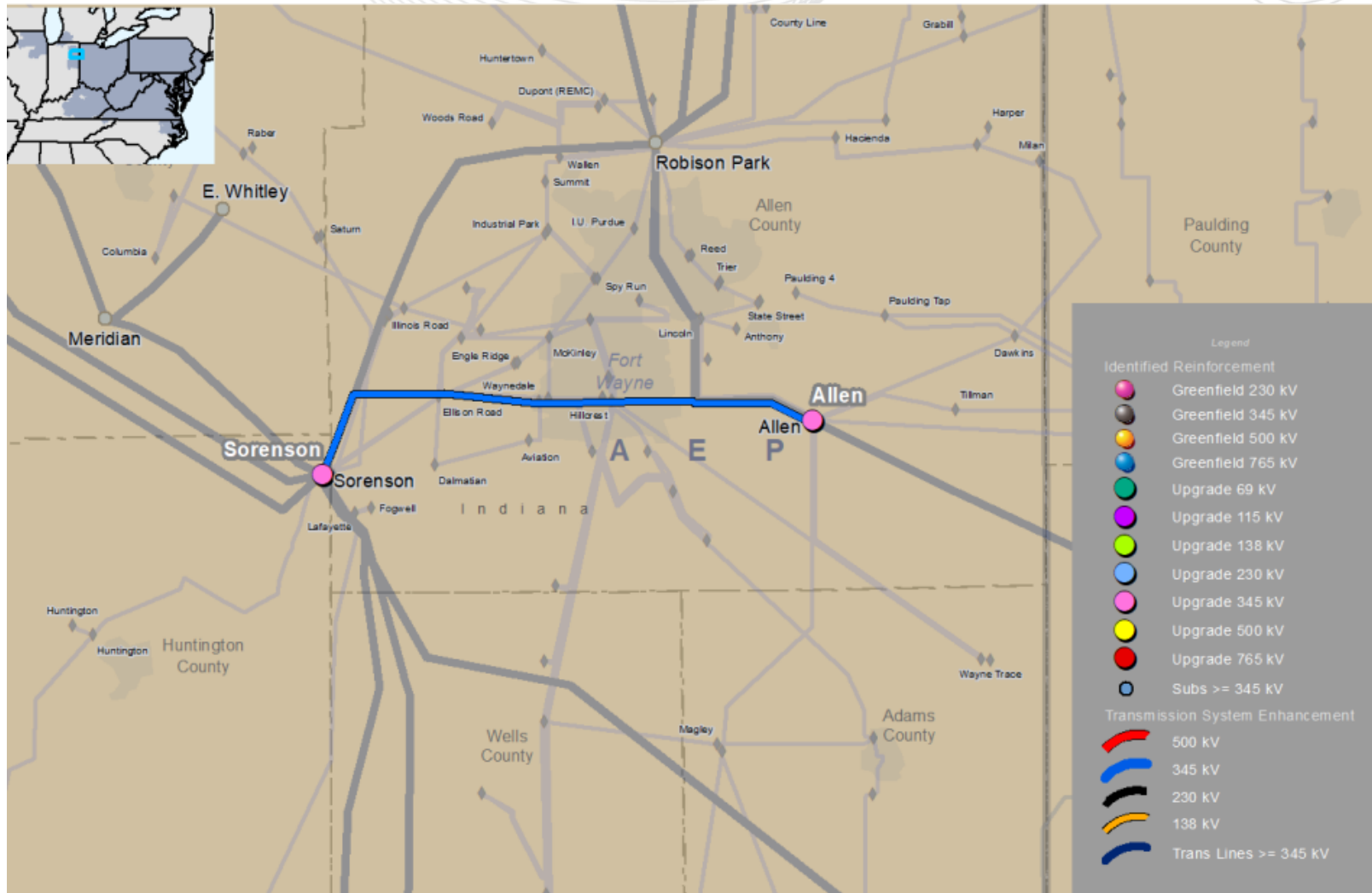
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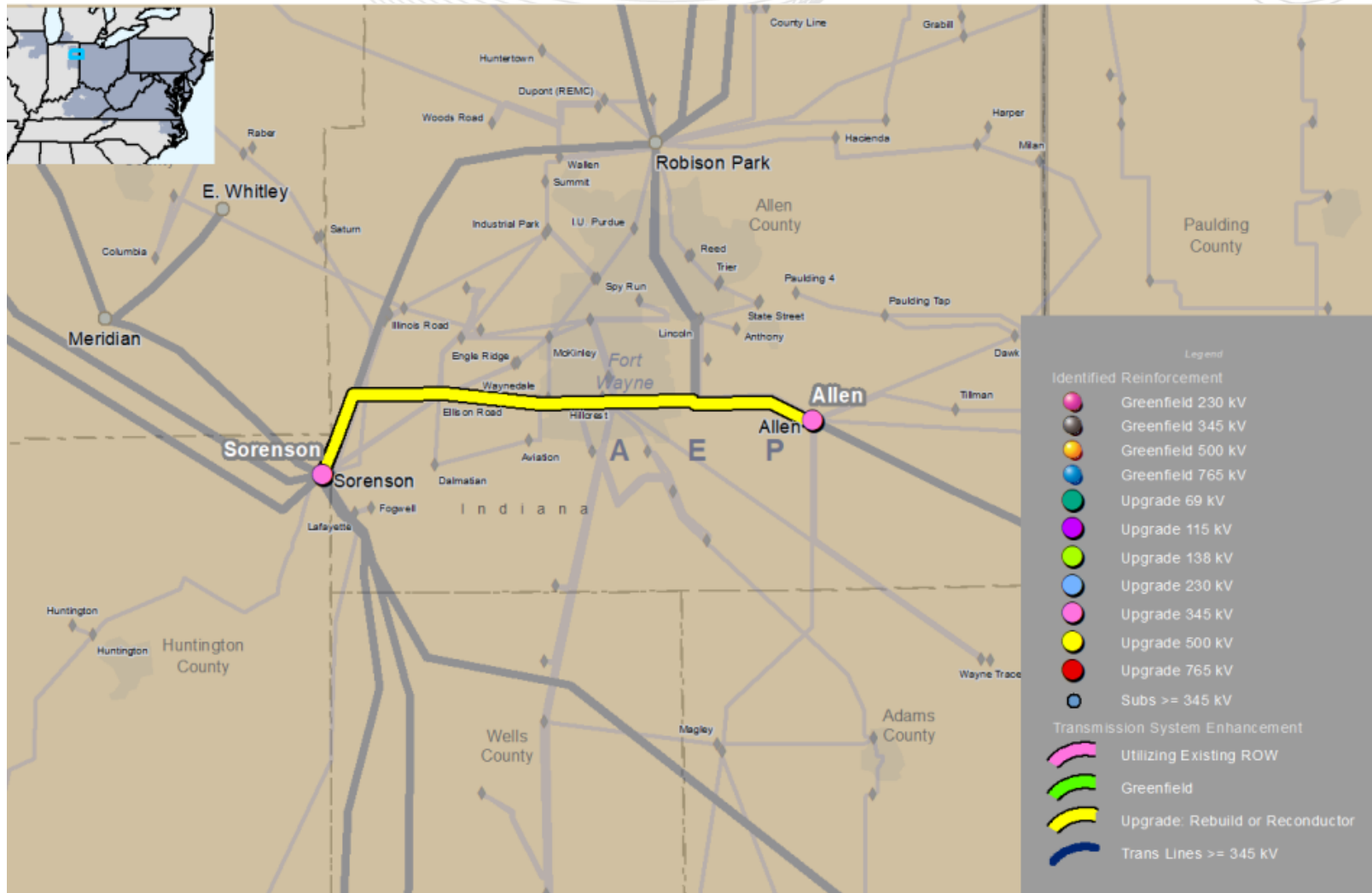
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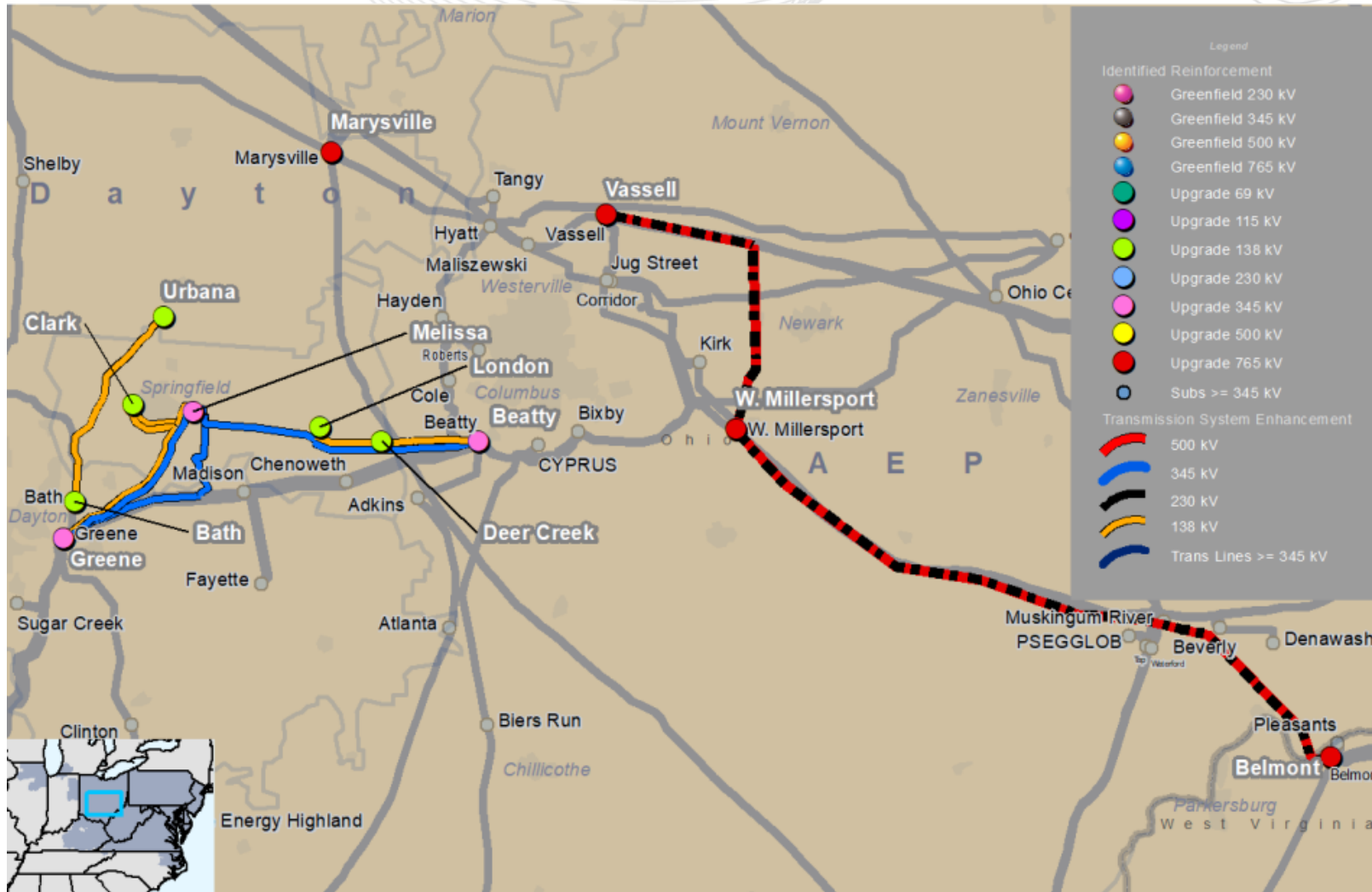
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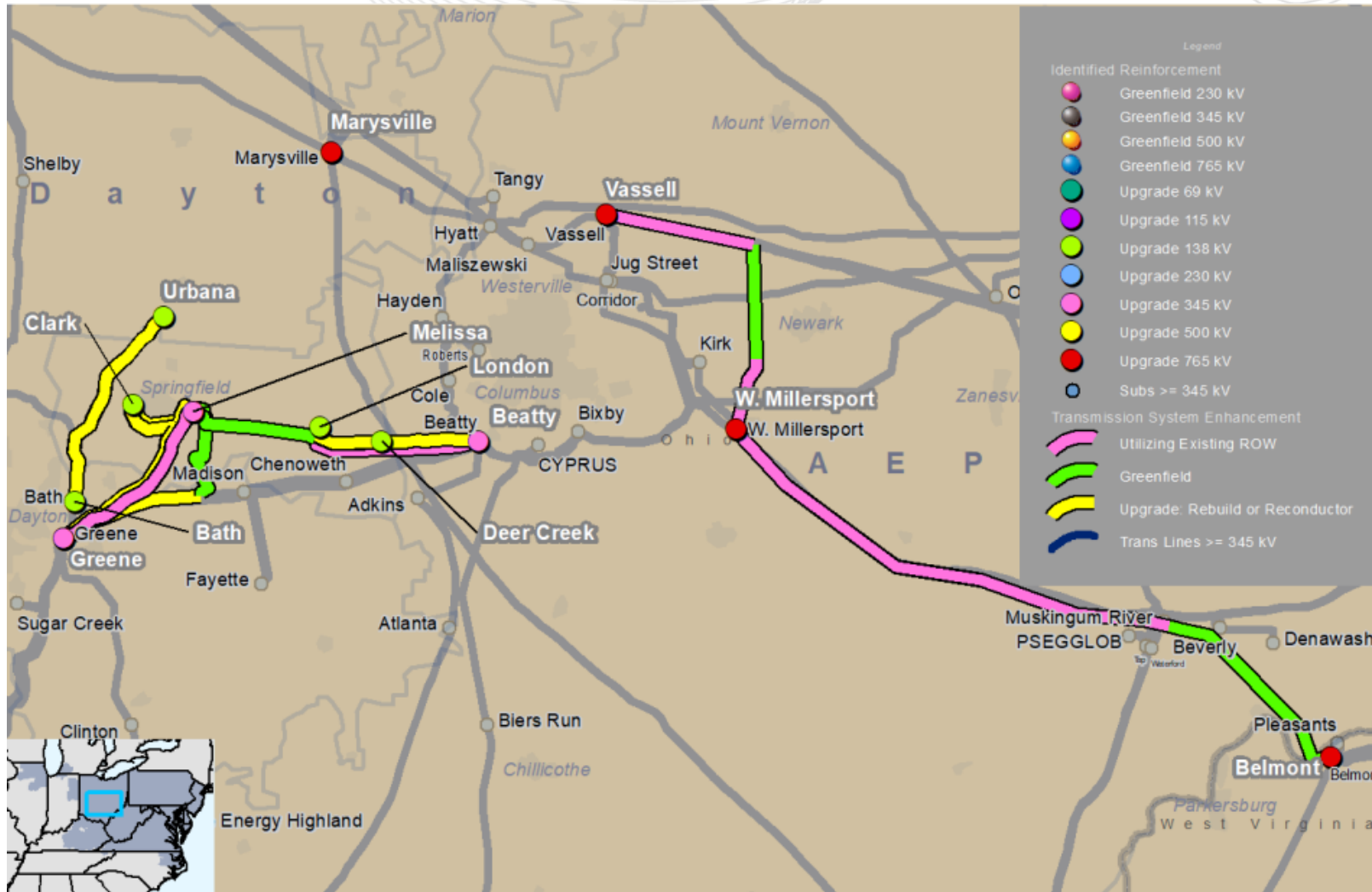
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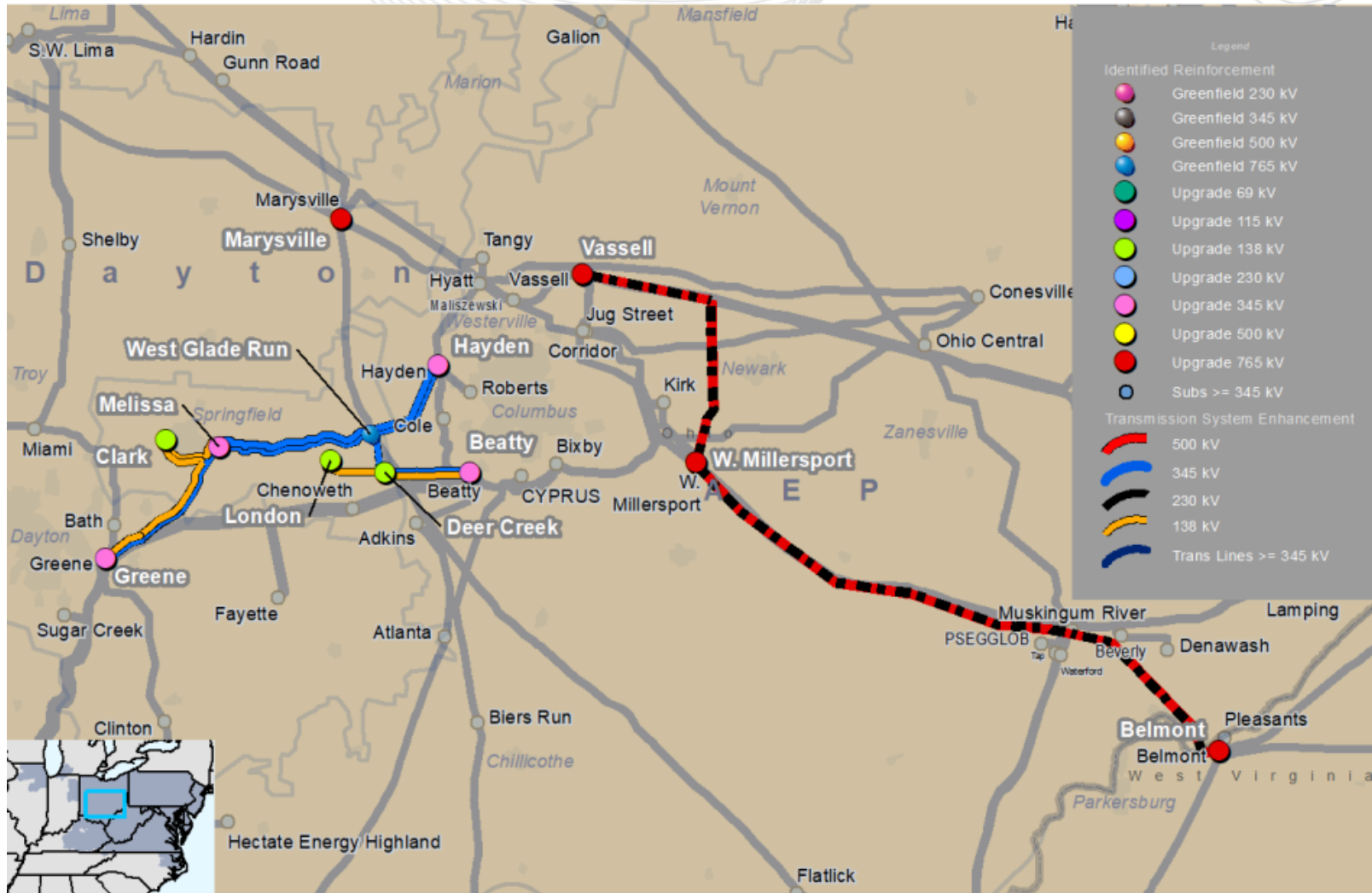
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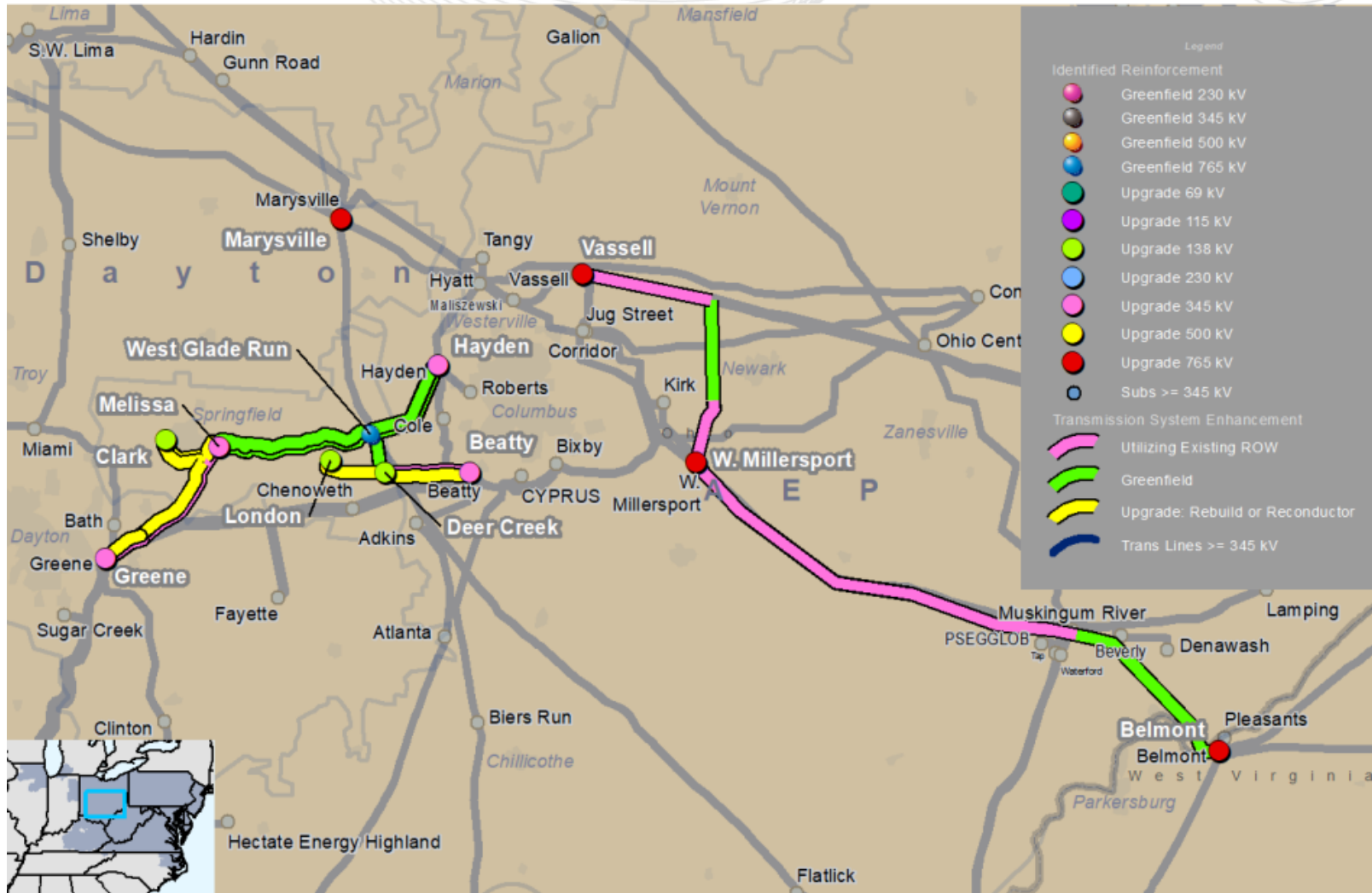
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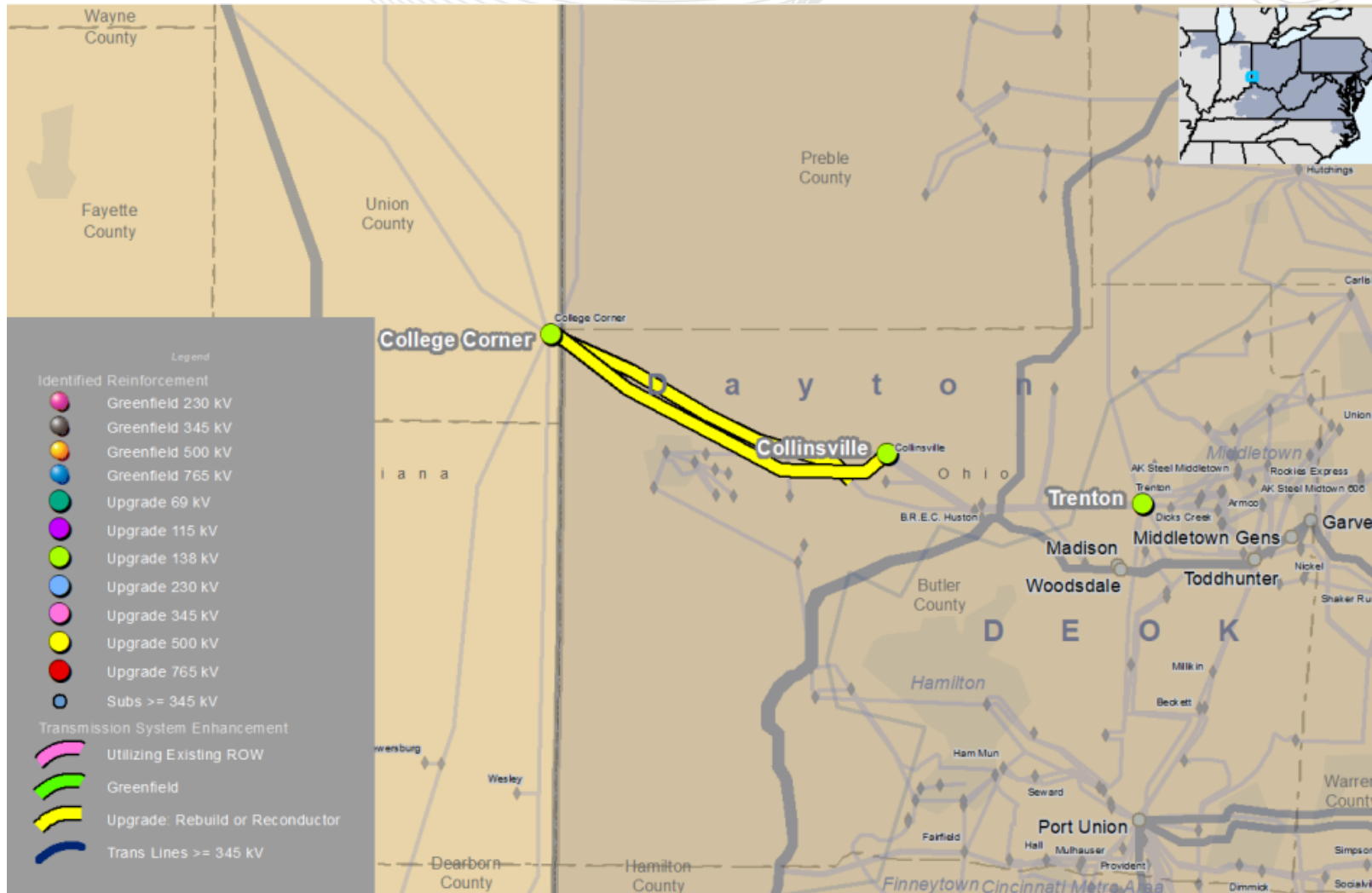
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# CINSI (DEOK)

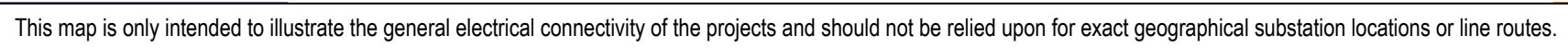


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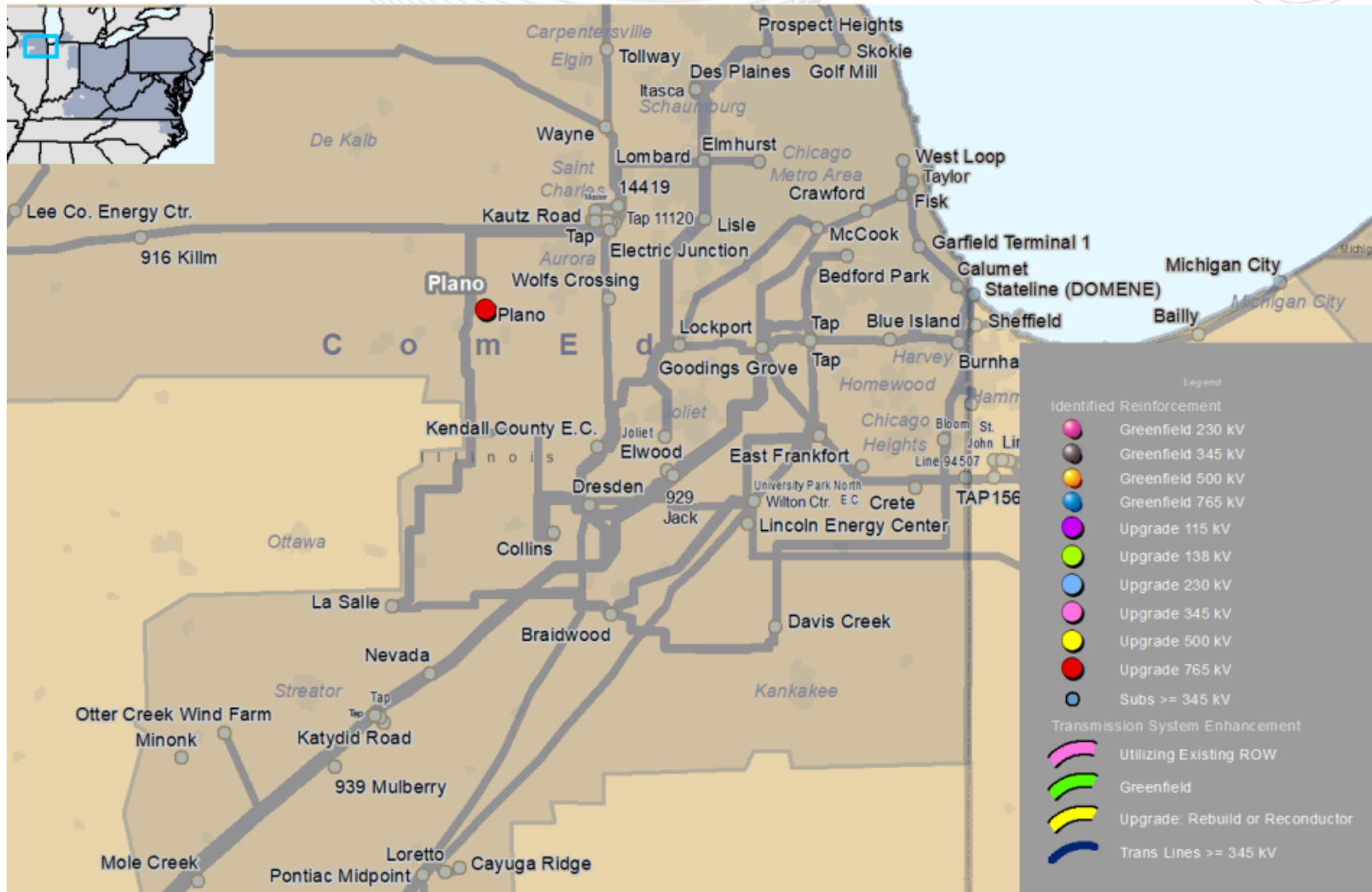


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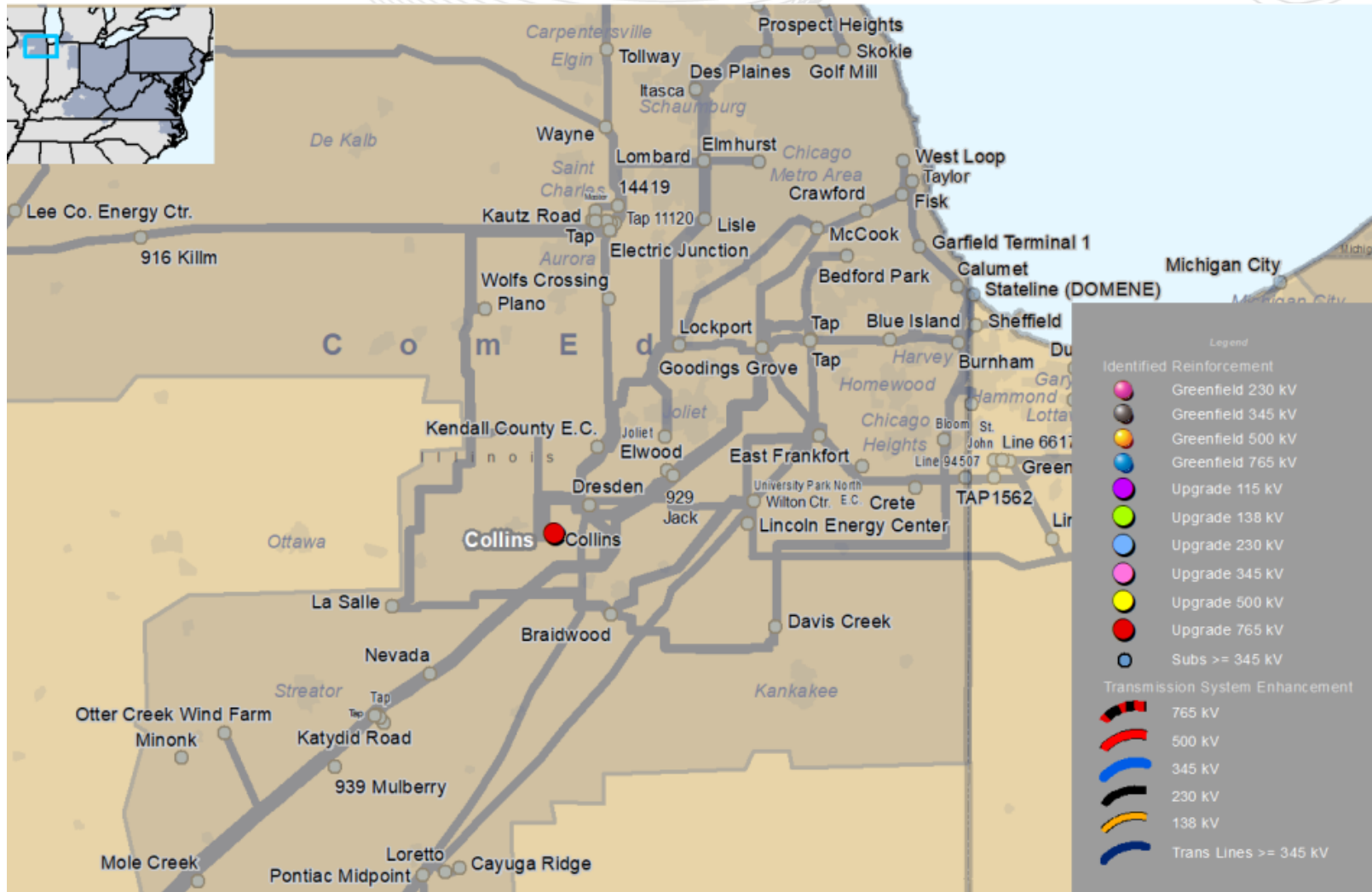
# COMED (Exelon)



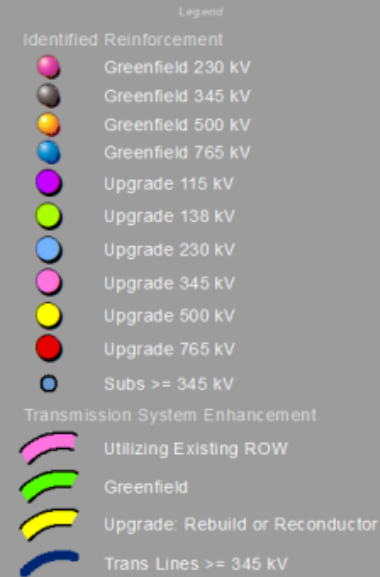




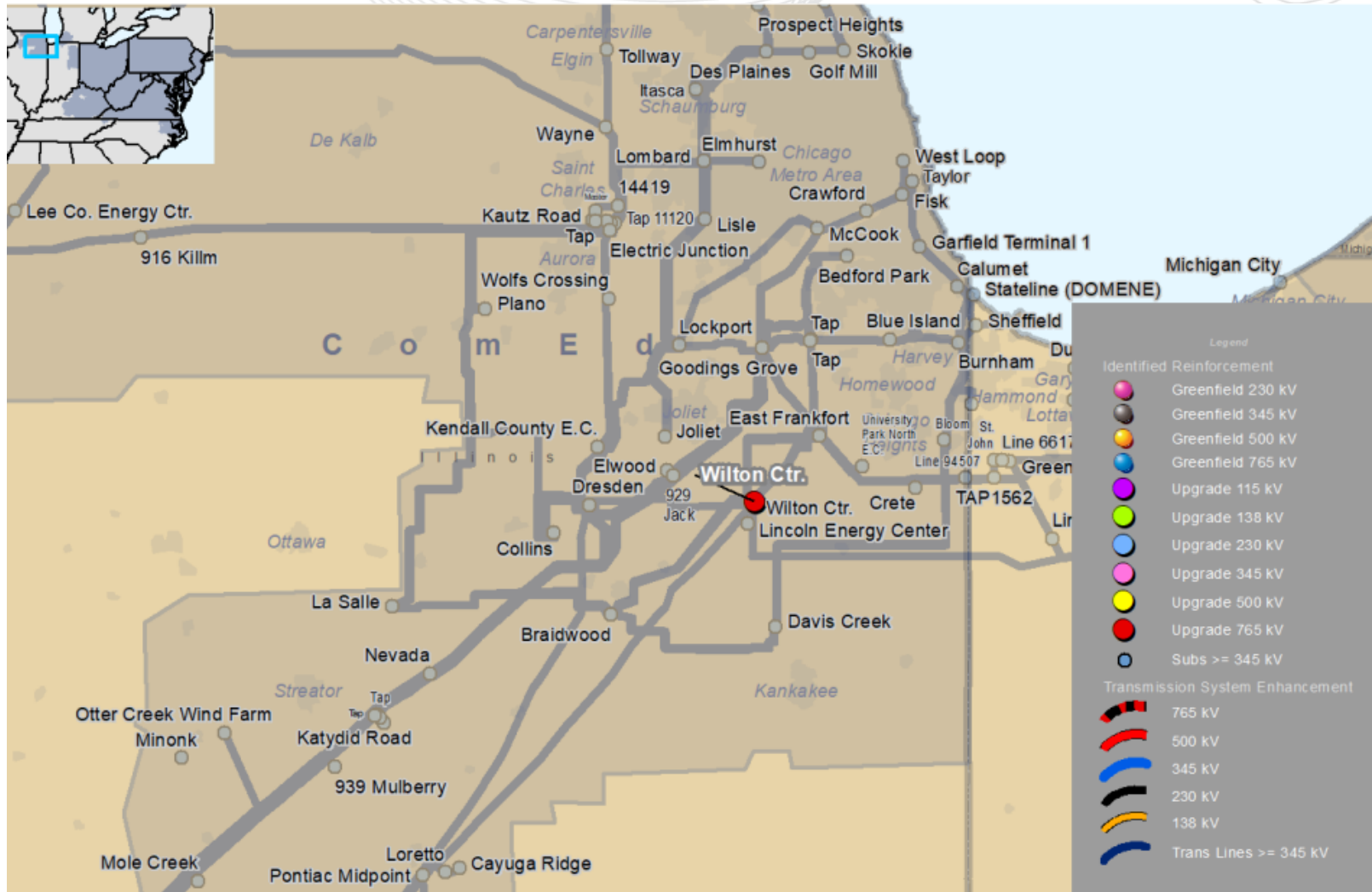
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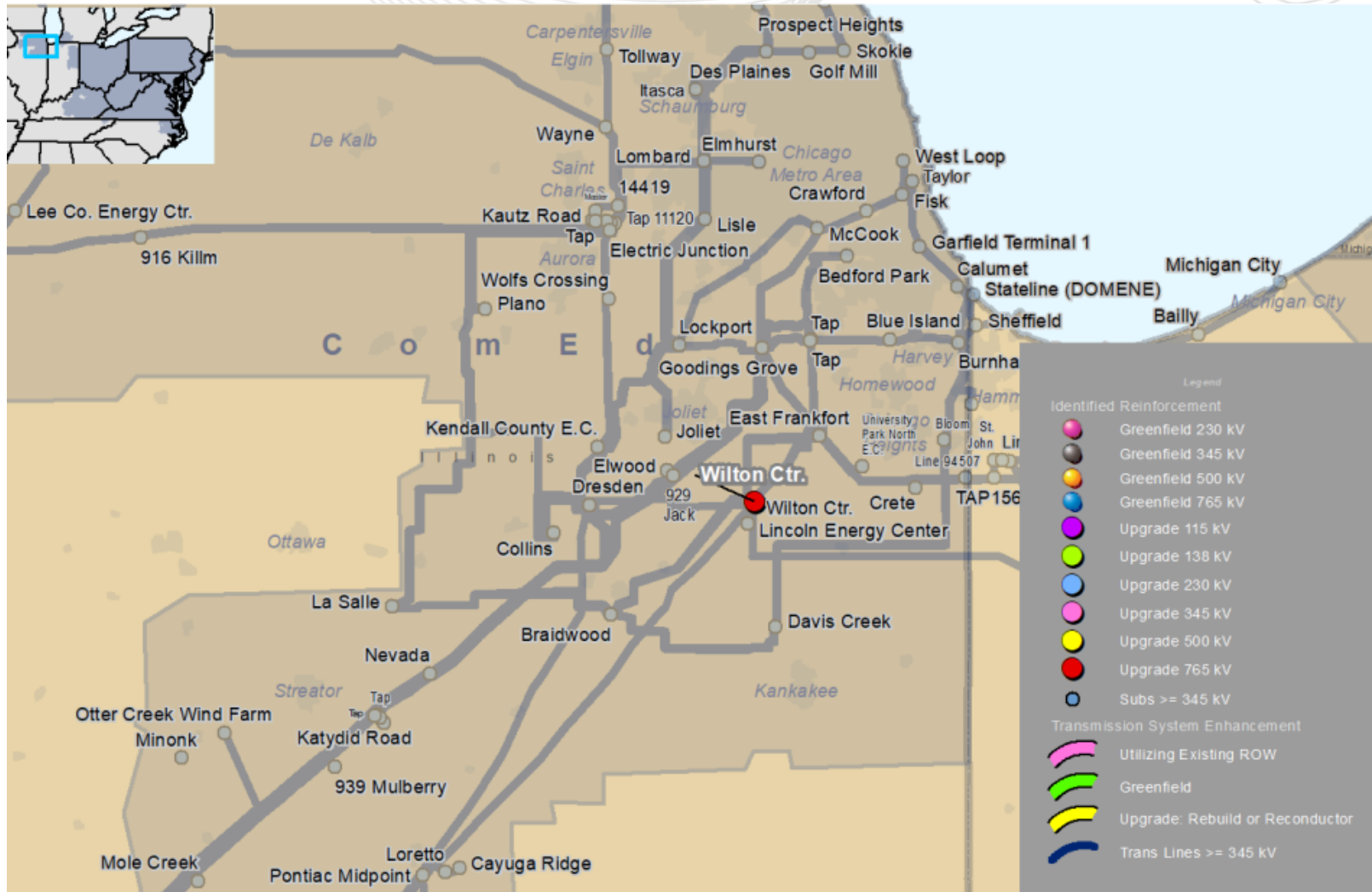


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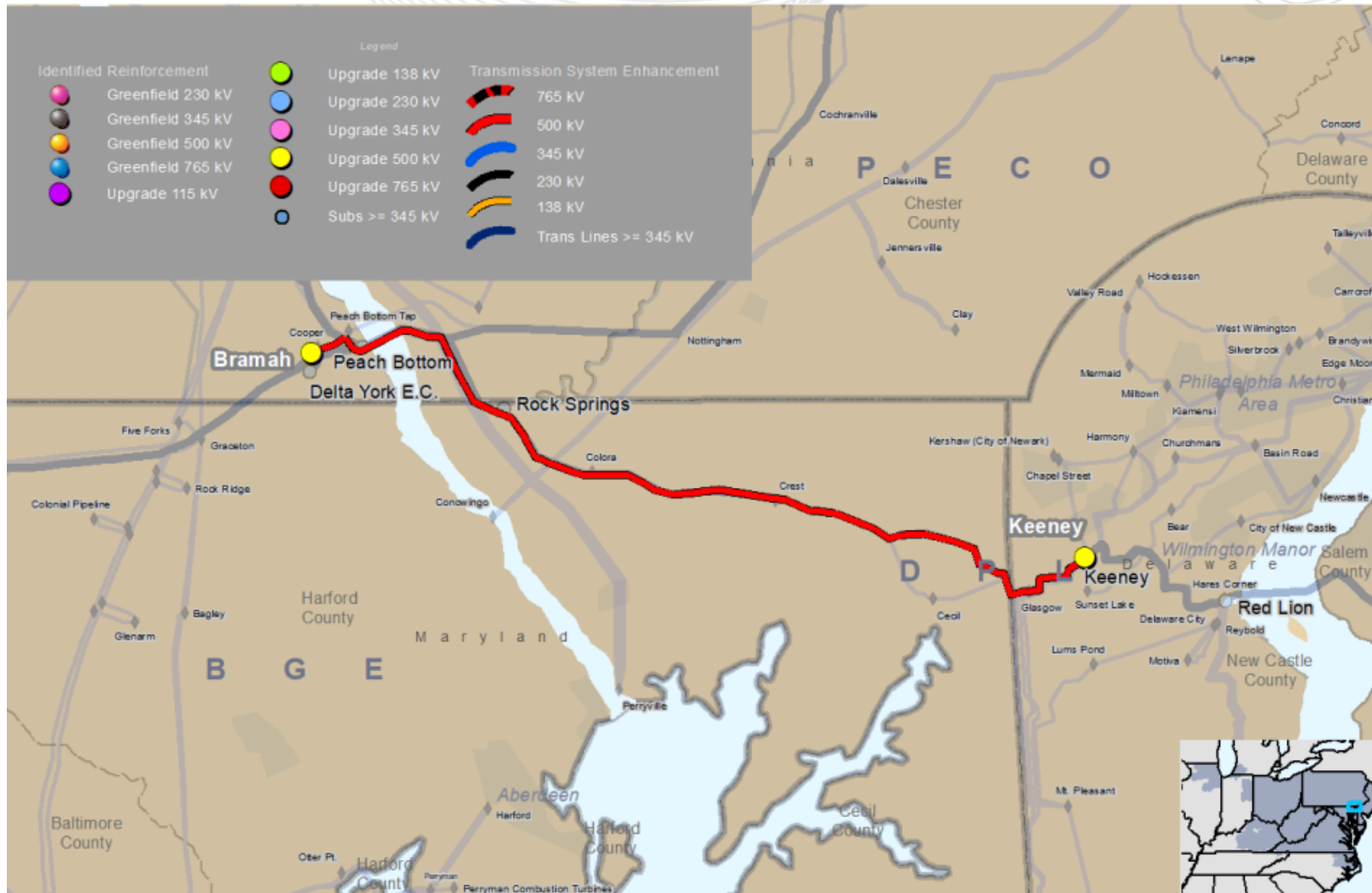




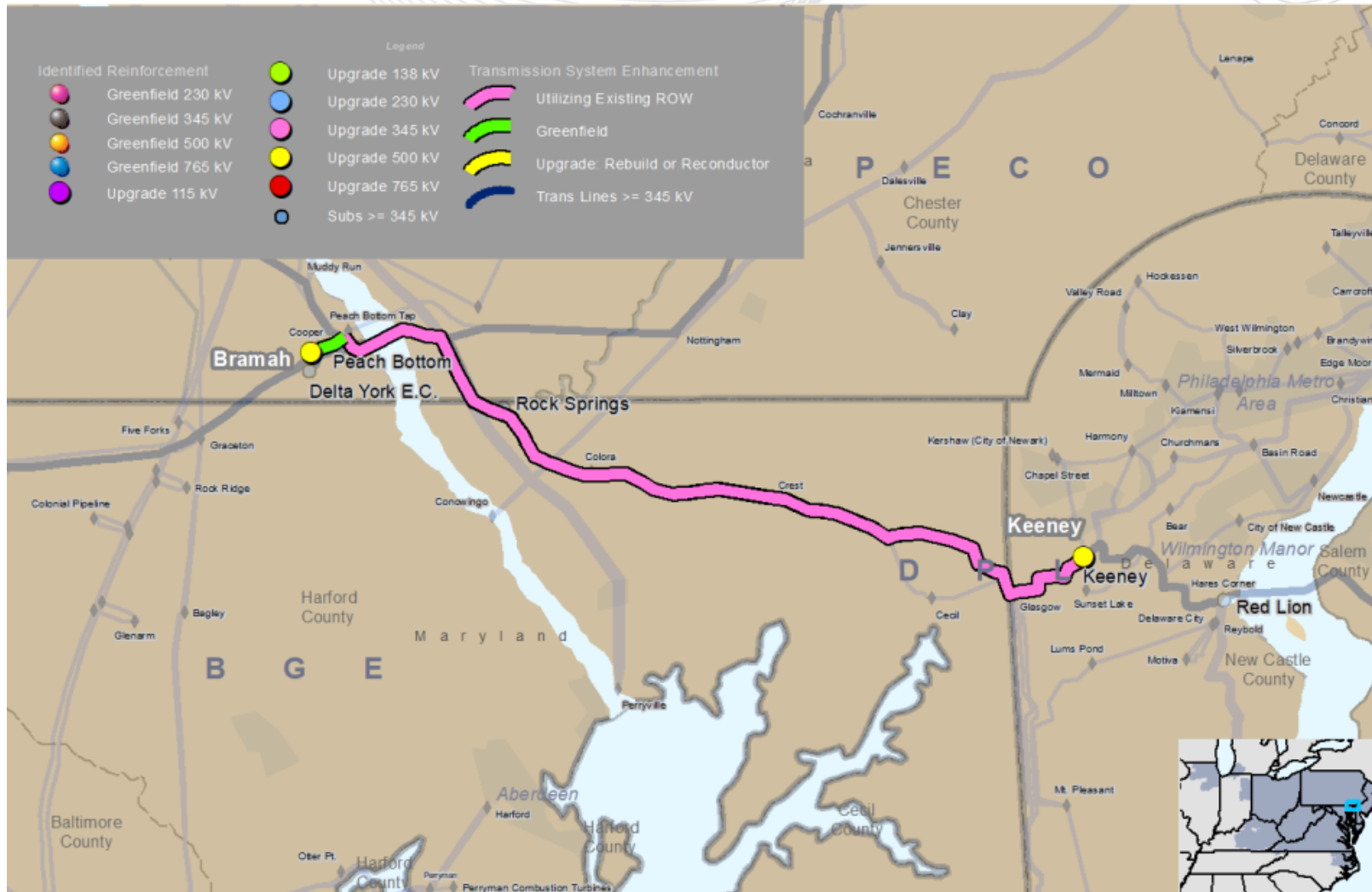
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# DPL (Exelon)



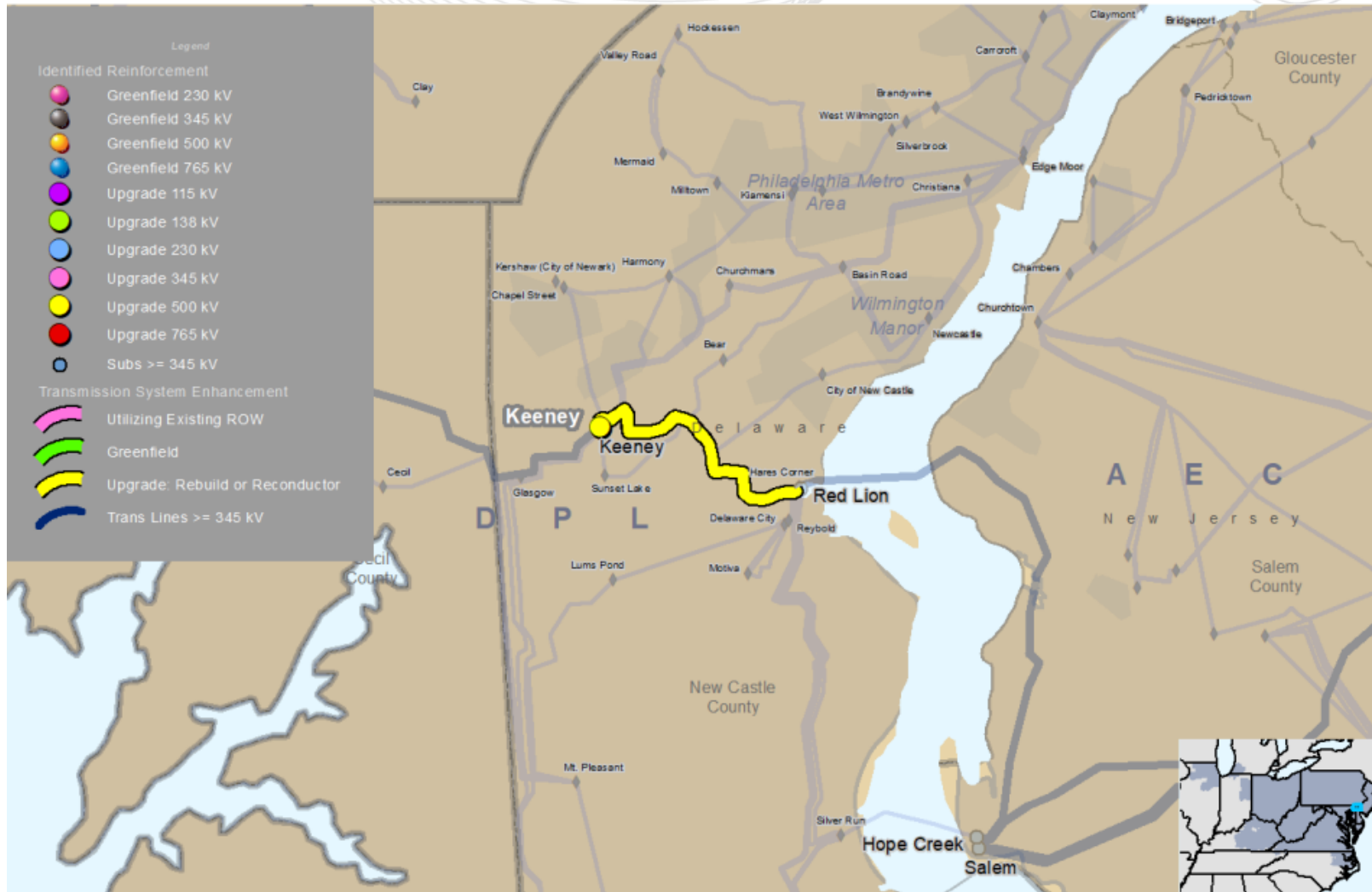
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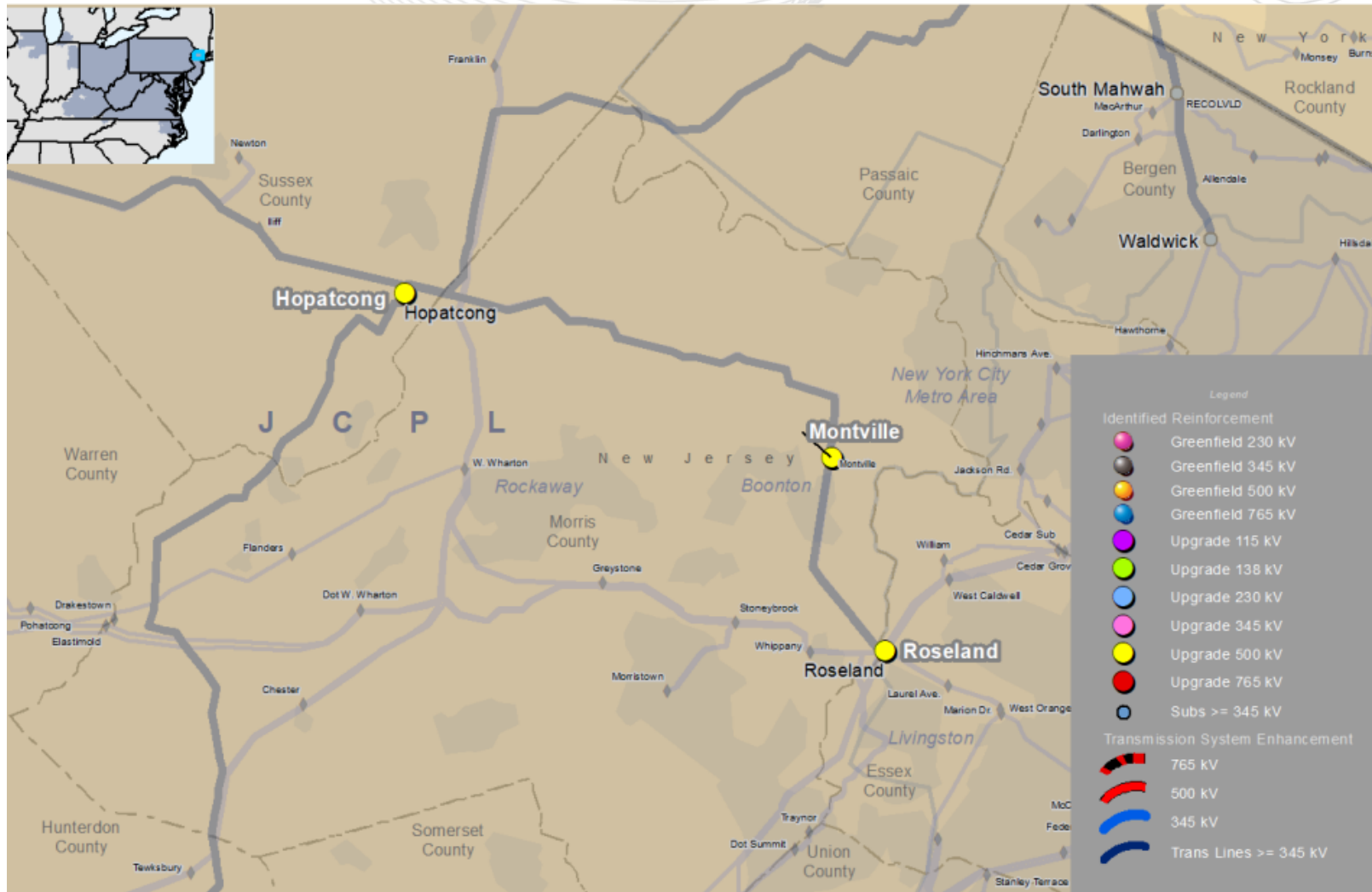
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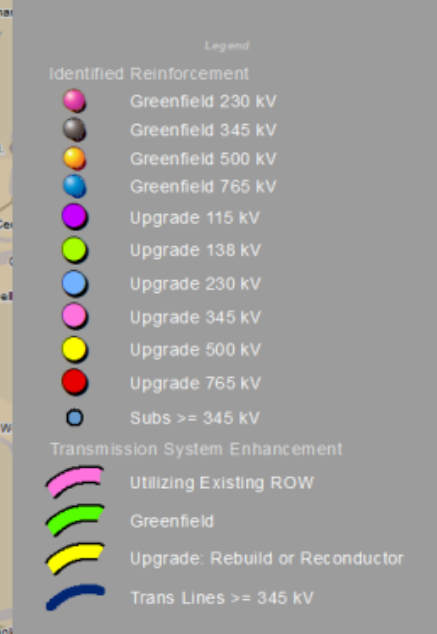
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# JCPL (FirstEnergy)

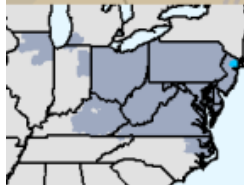
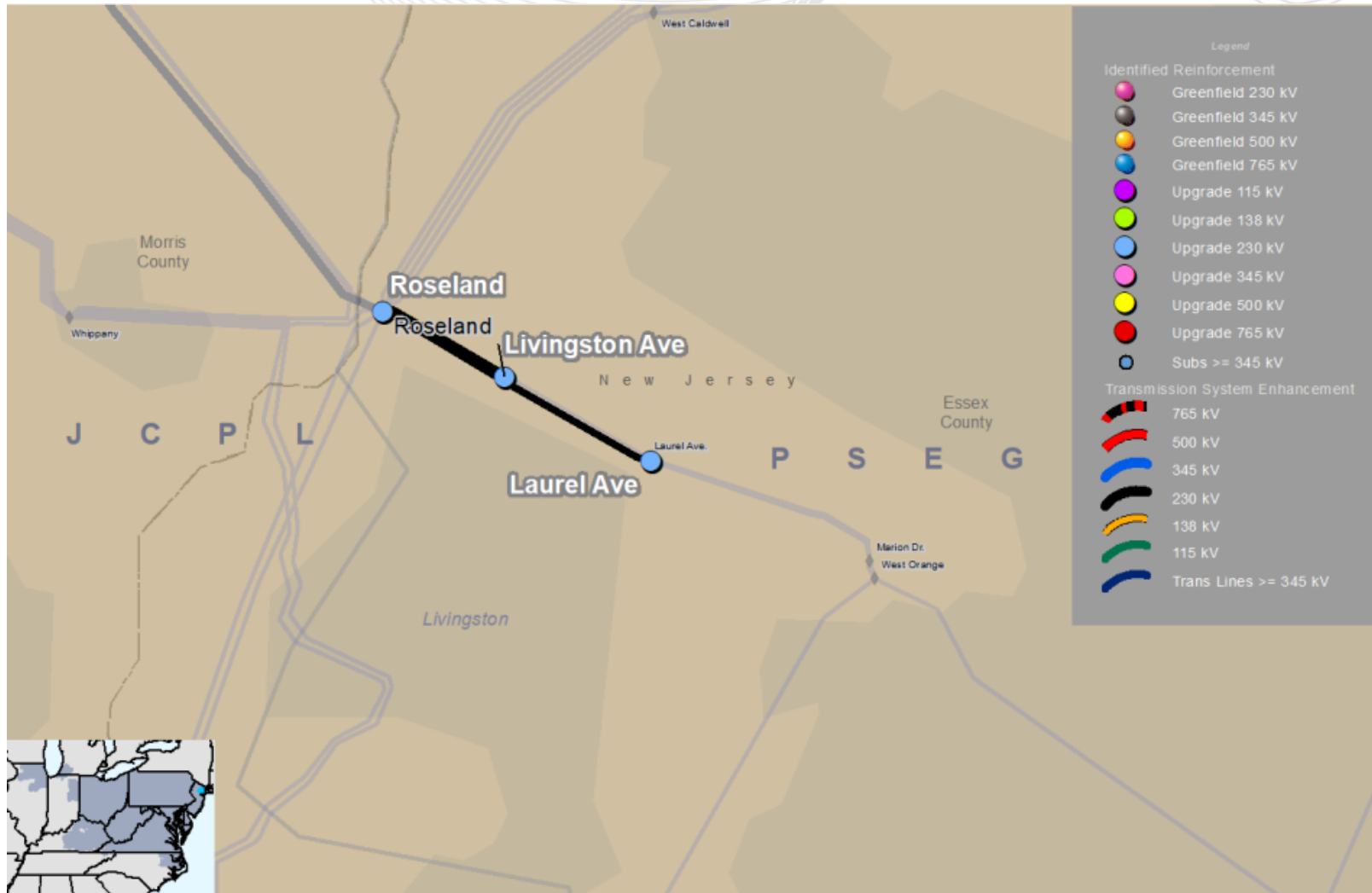


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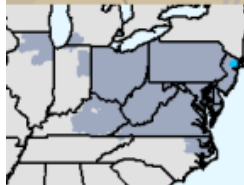
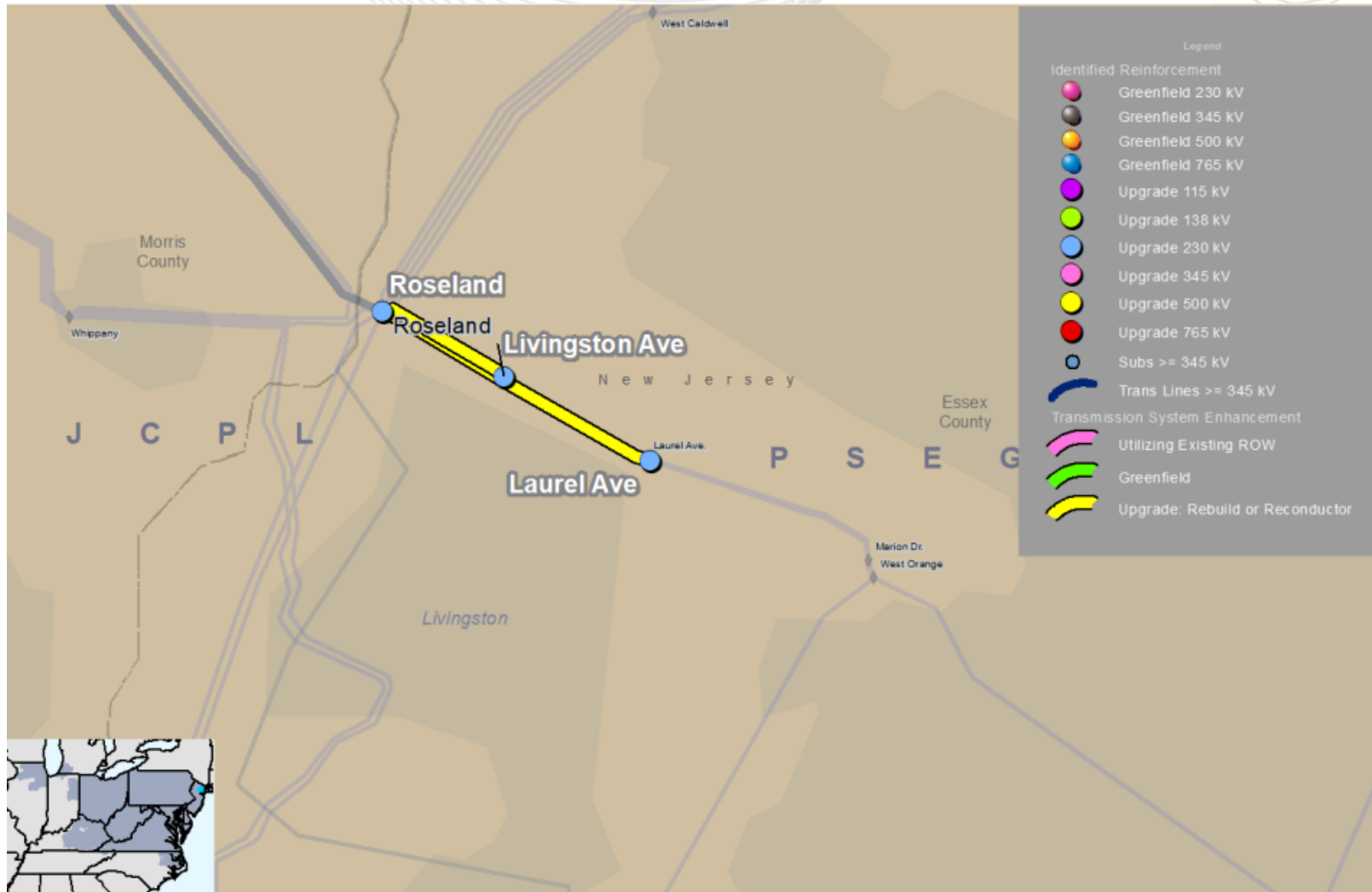
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# PSEG



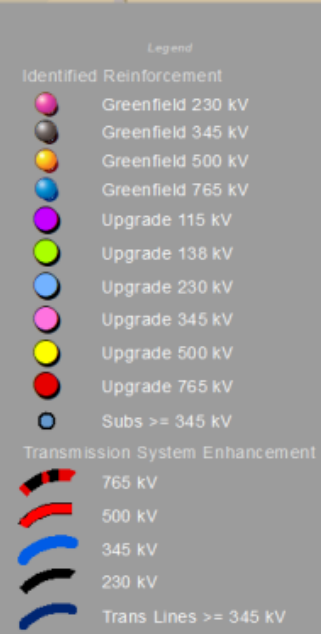
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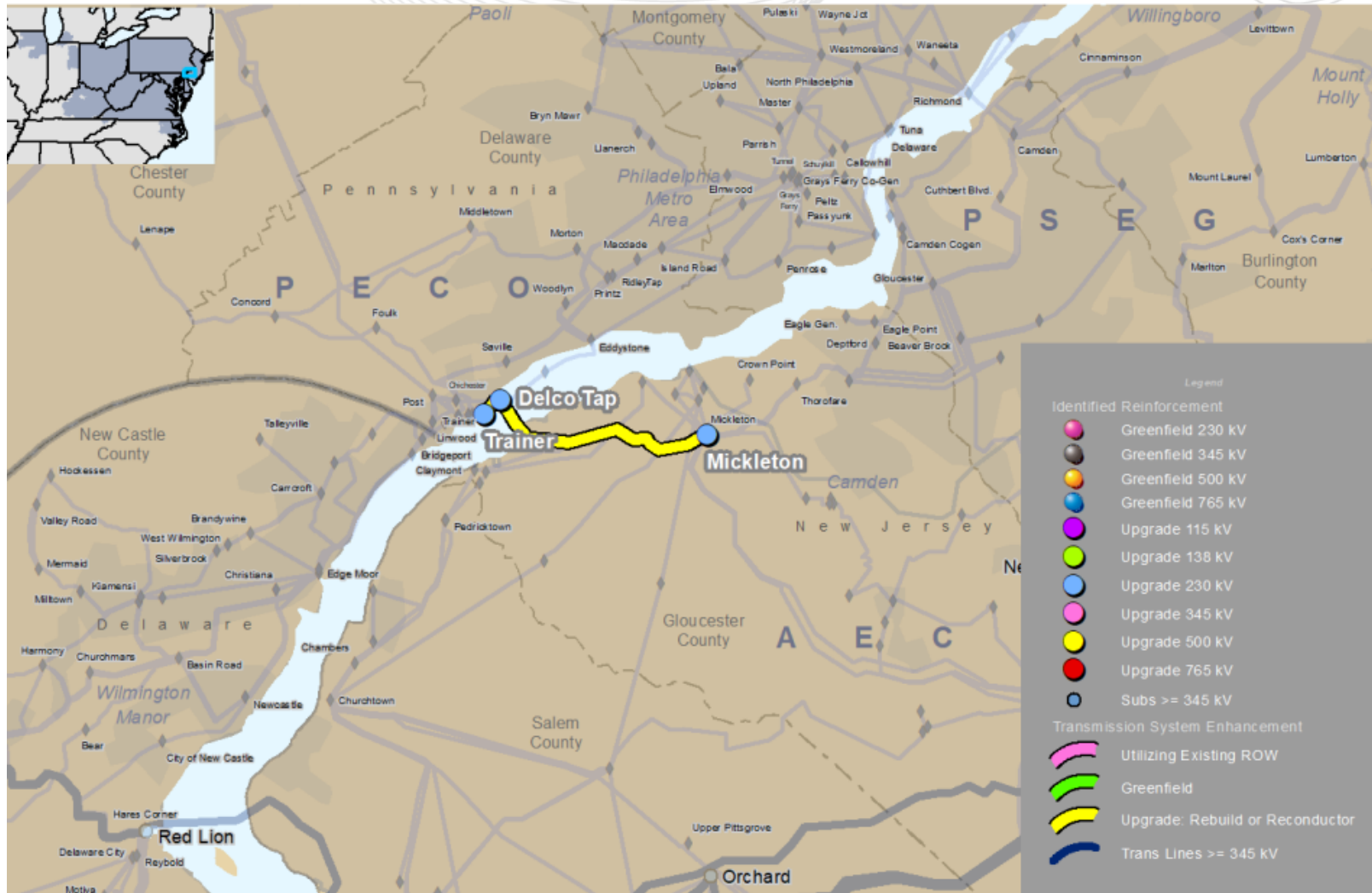


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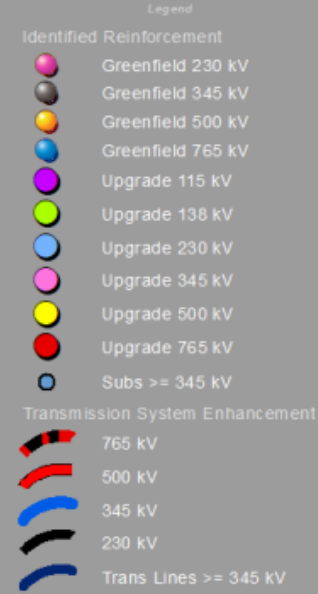
# PECO (Exelon)



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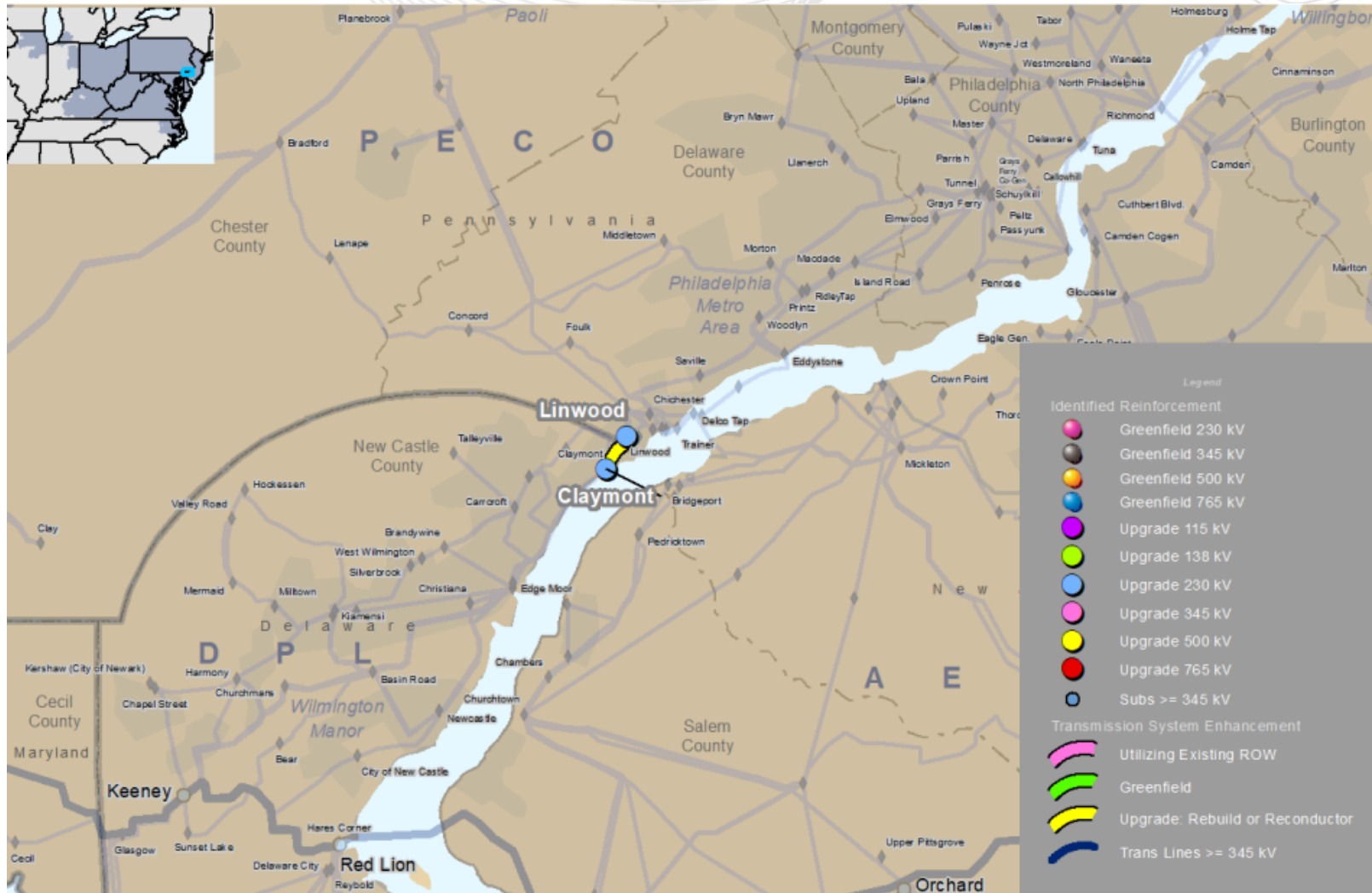


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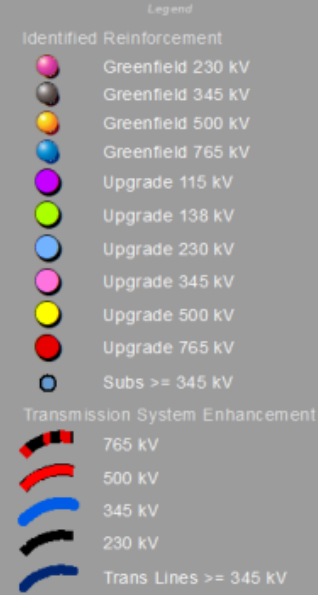


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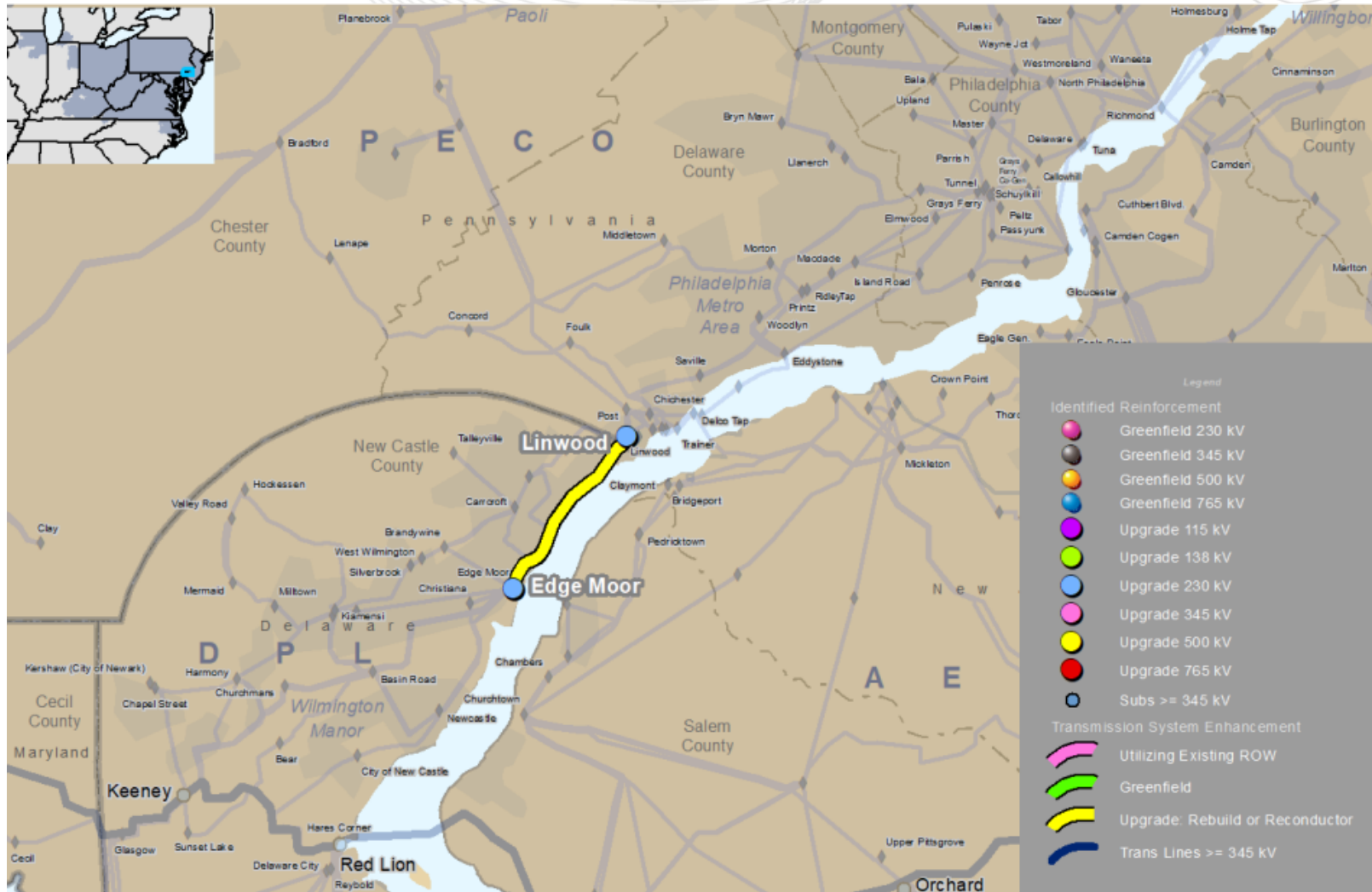




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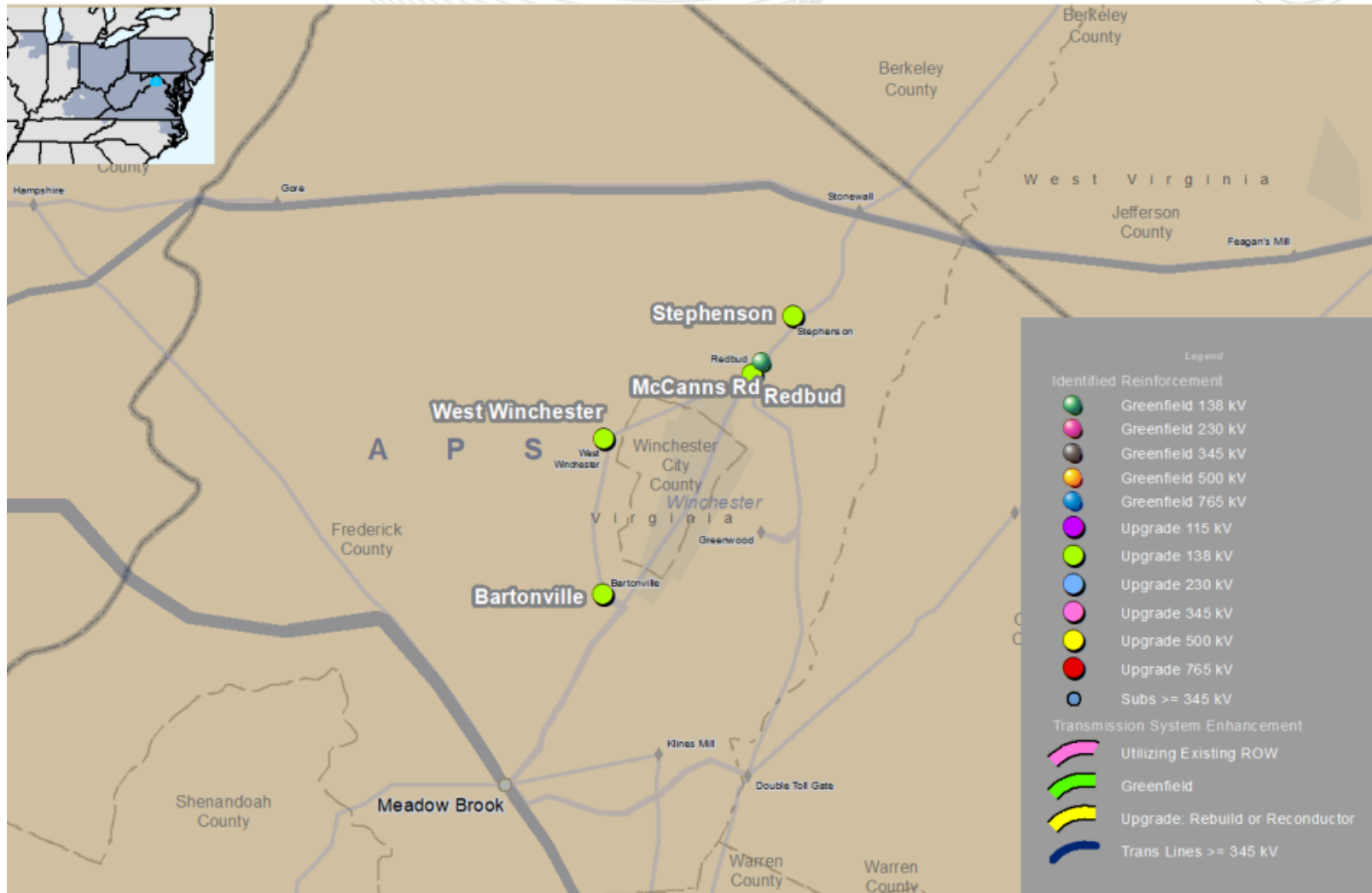
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# POTOED (FirstEnergy)

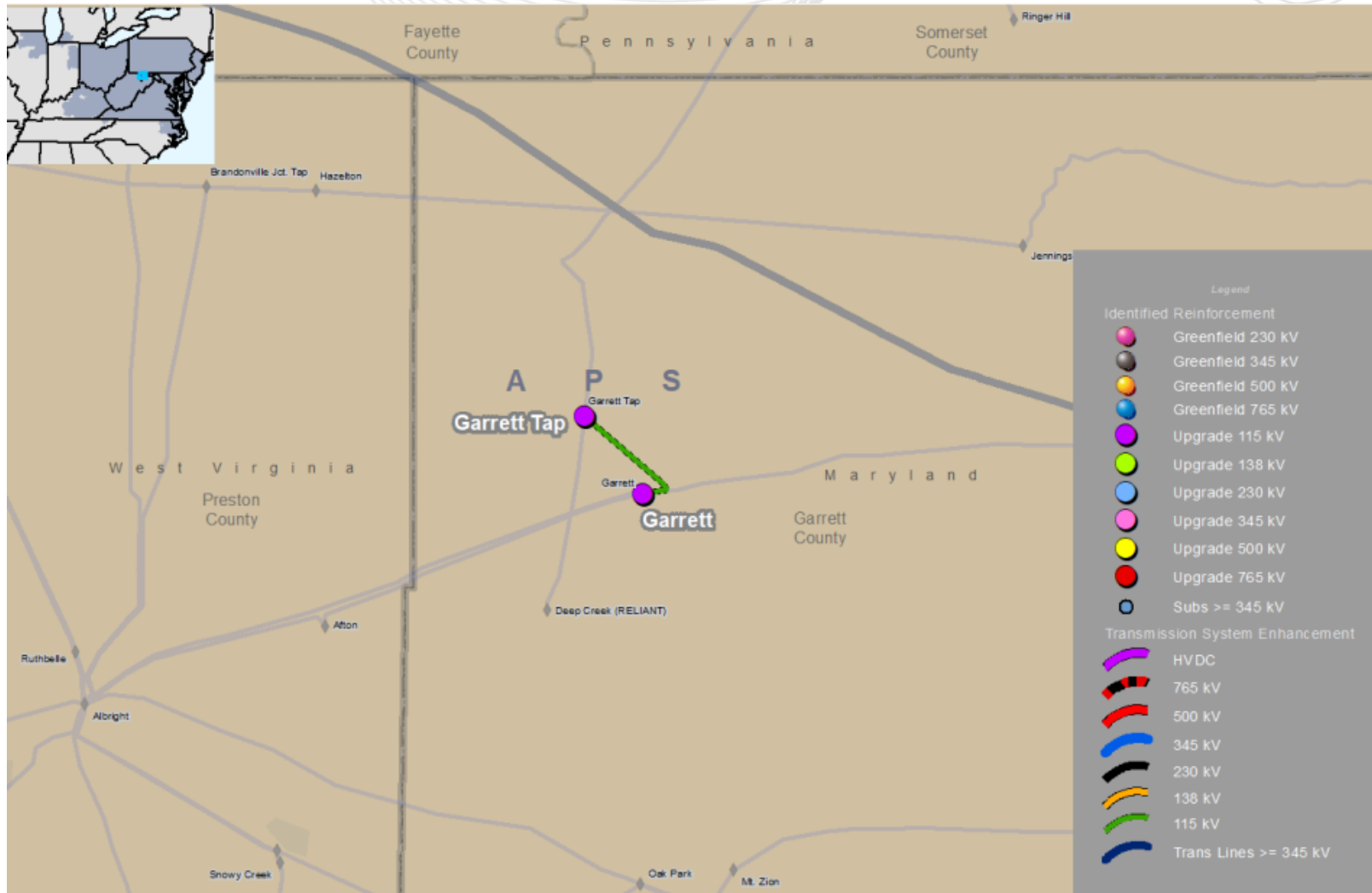


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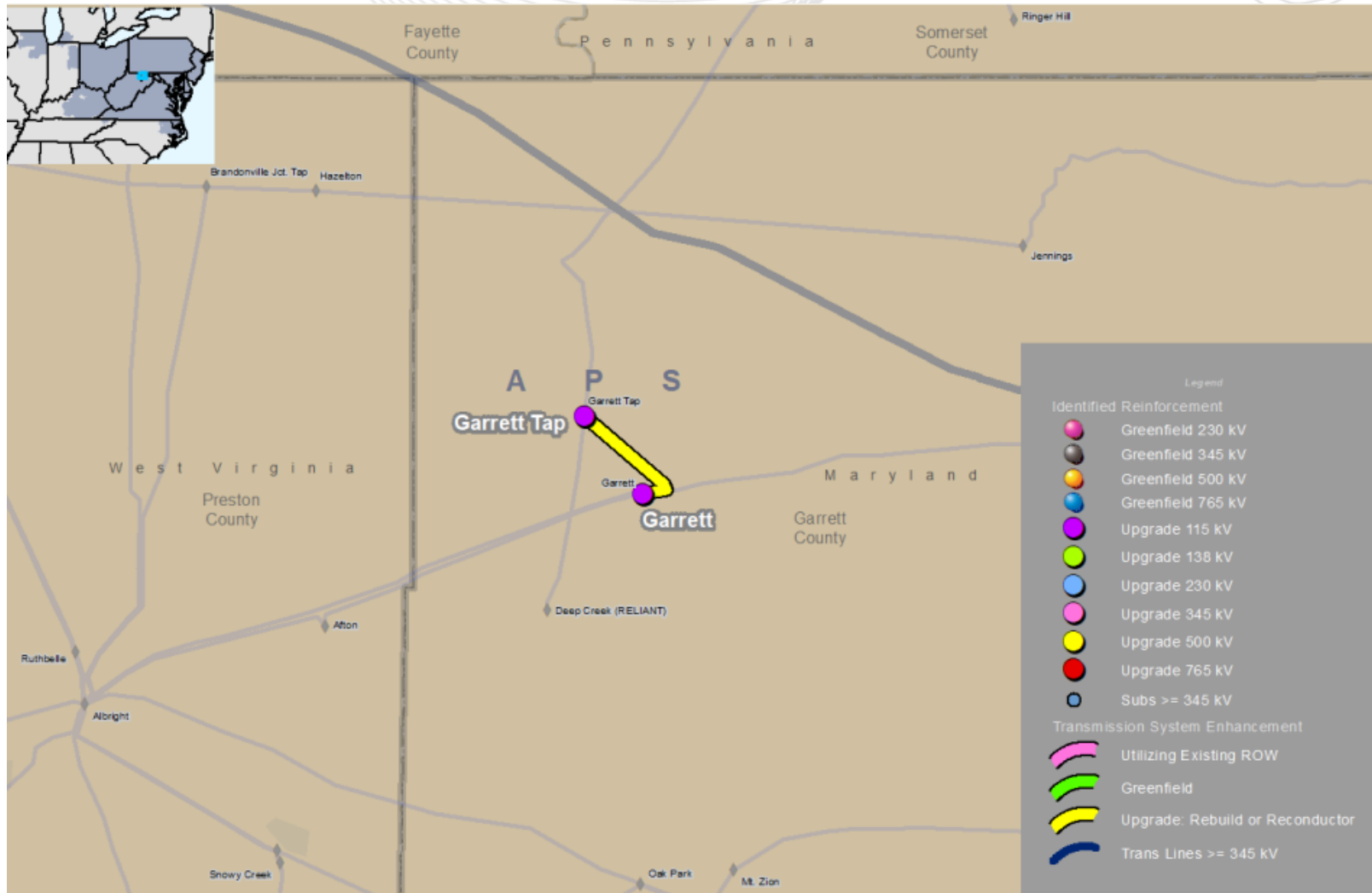




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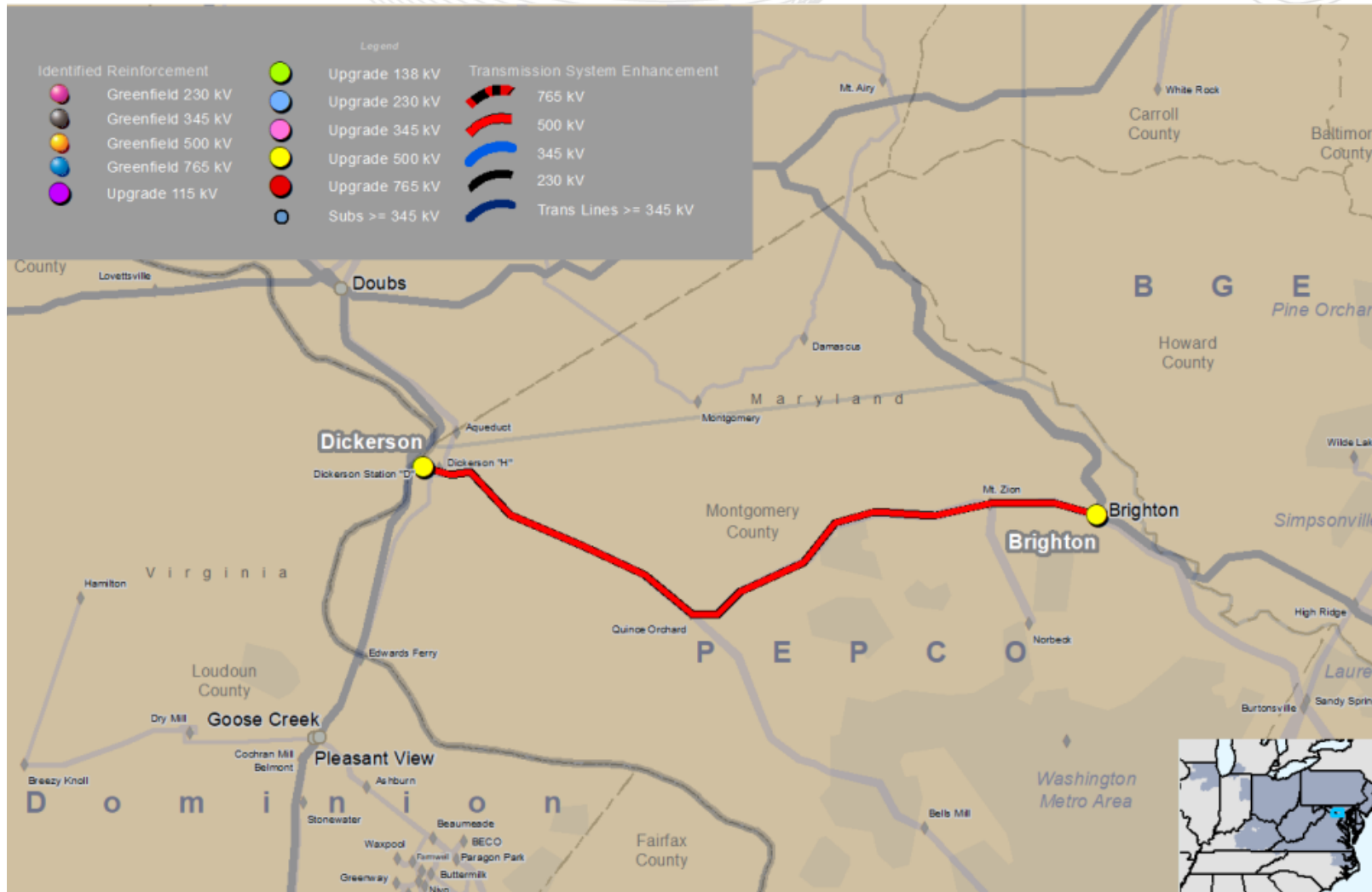


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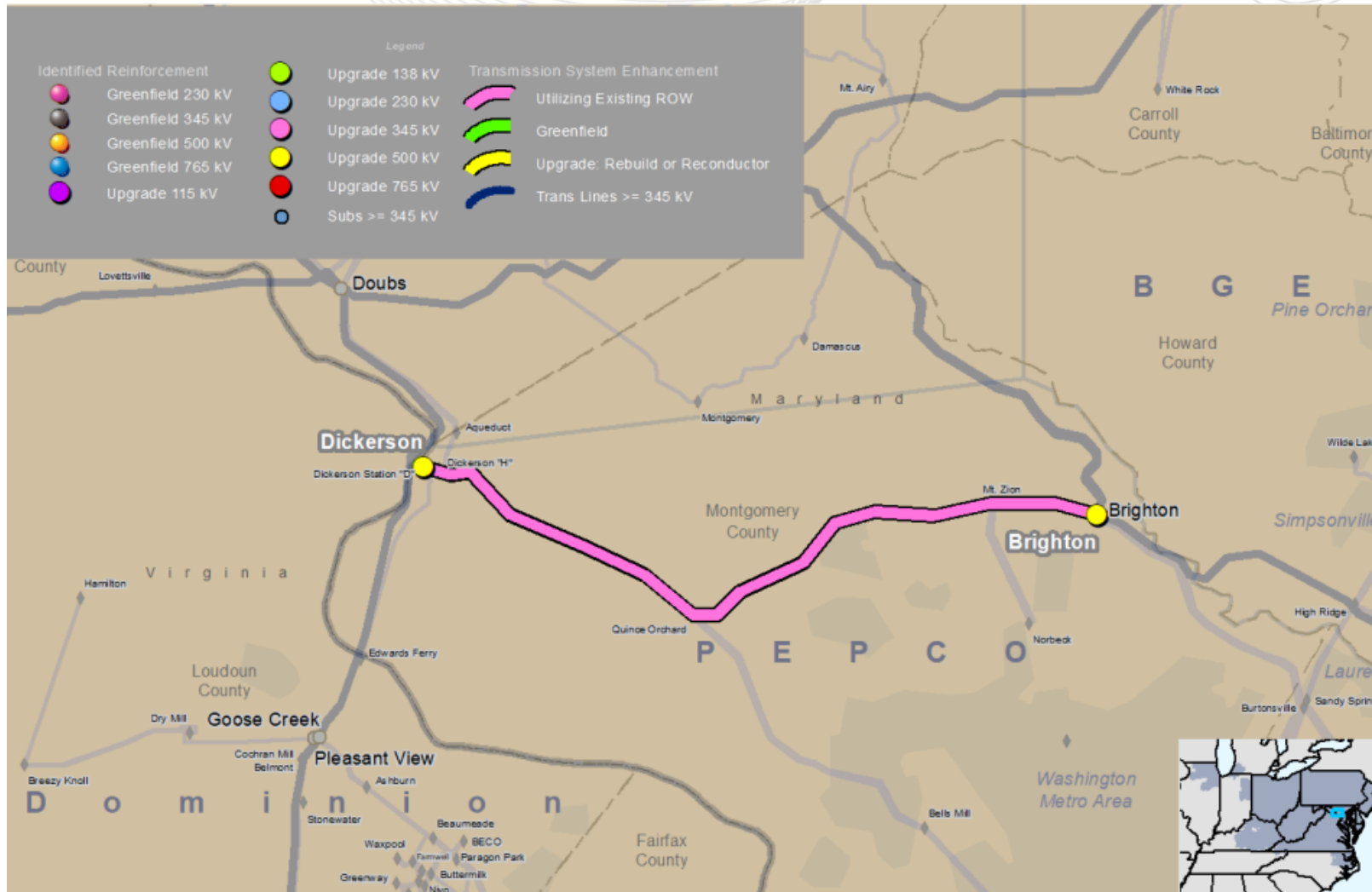
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# PEPCO (Exelon)

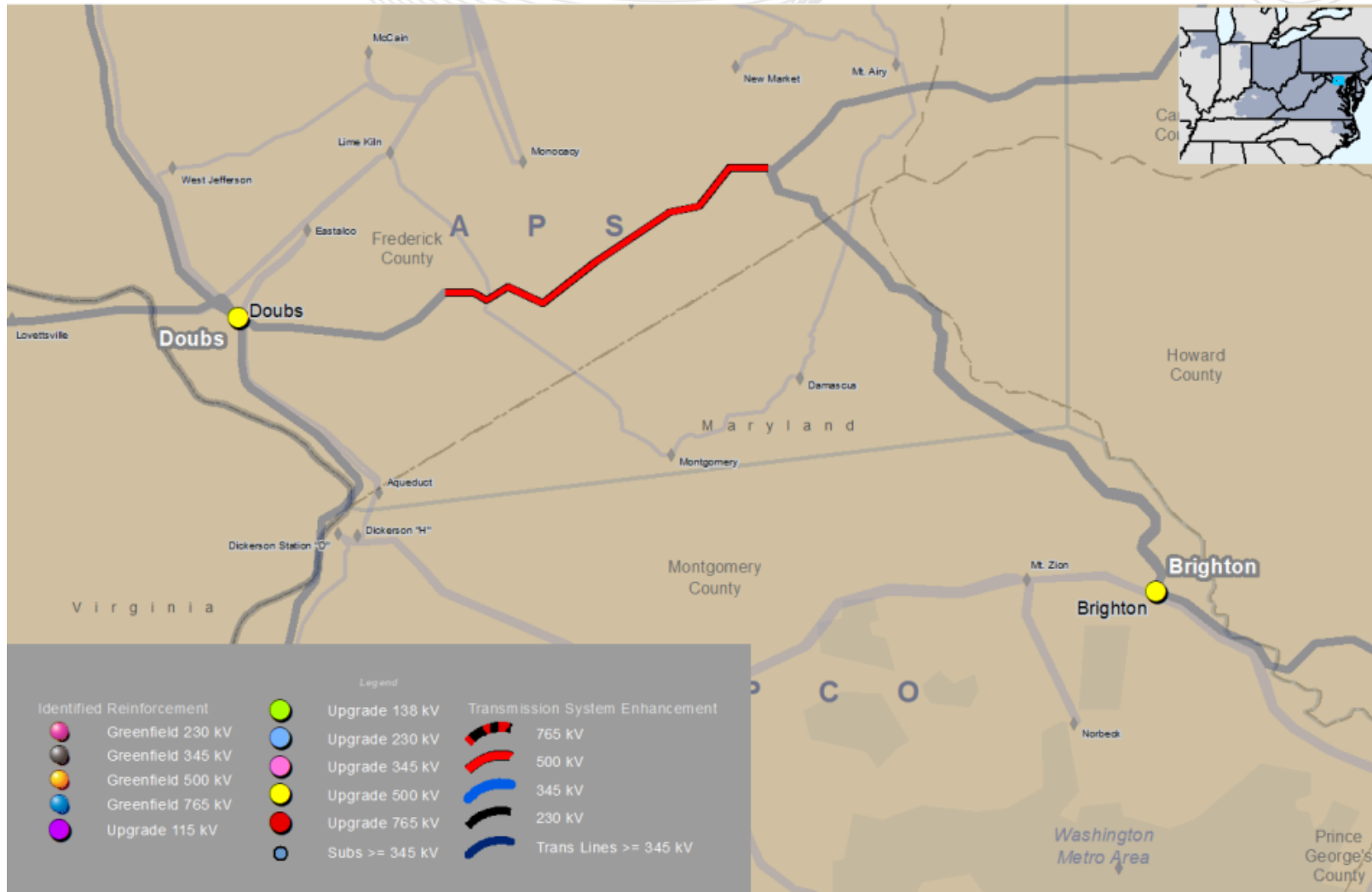


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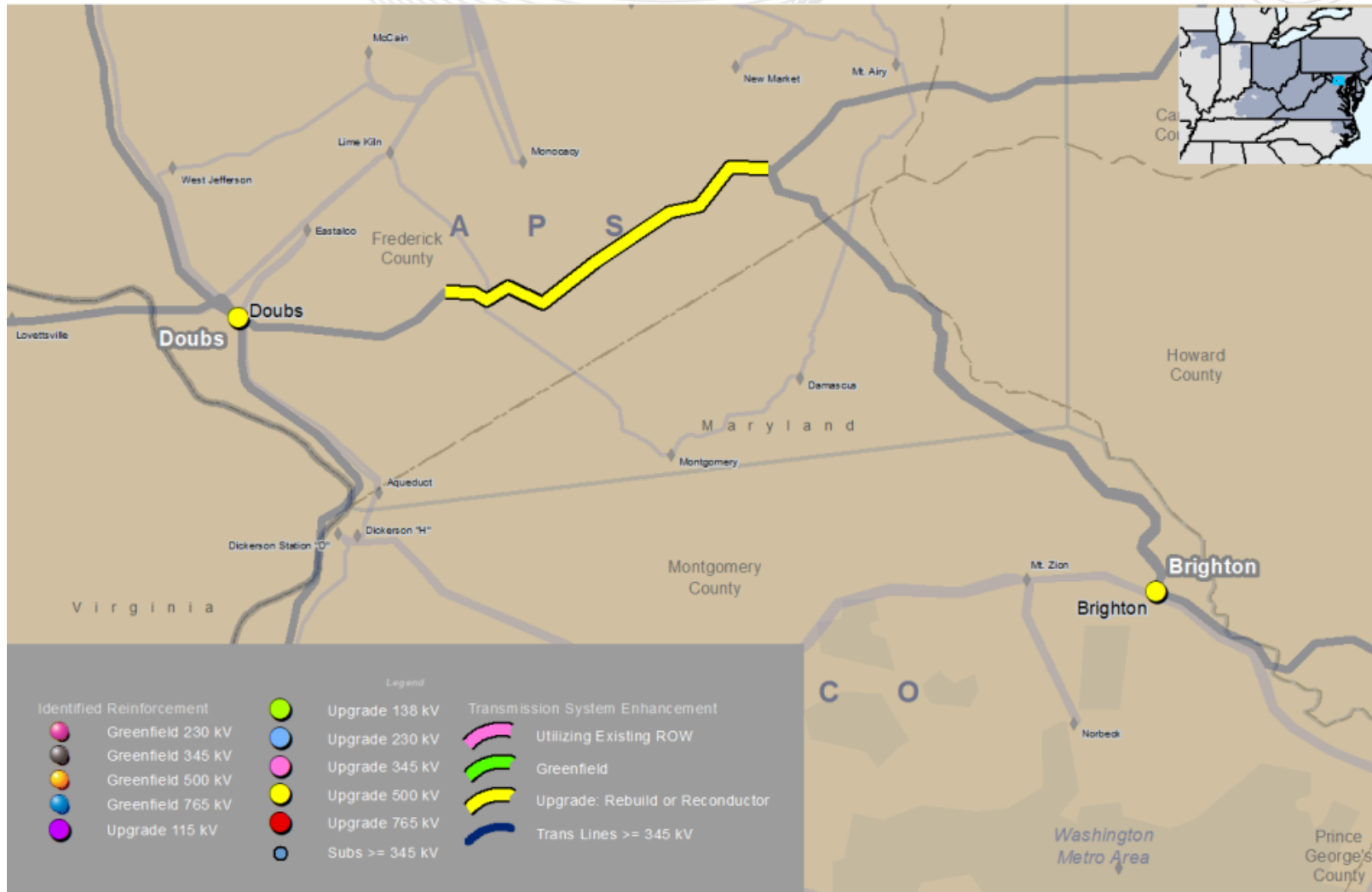




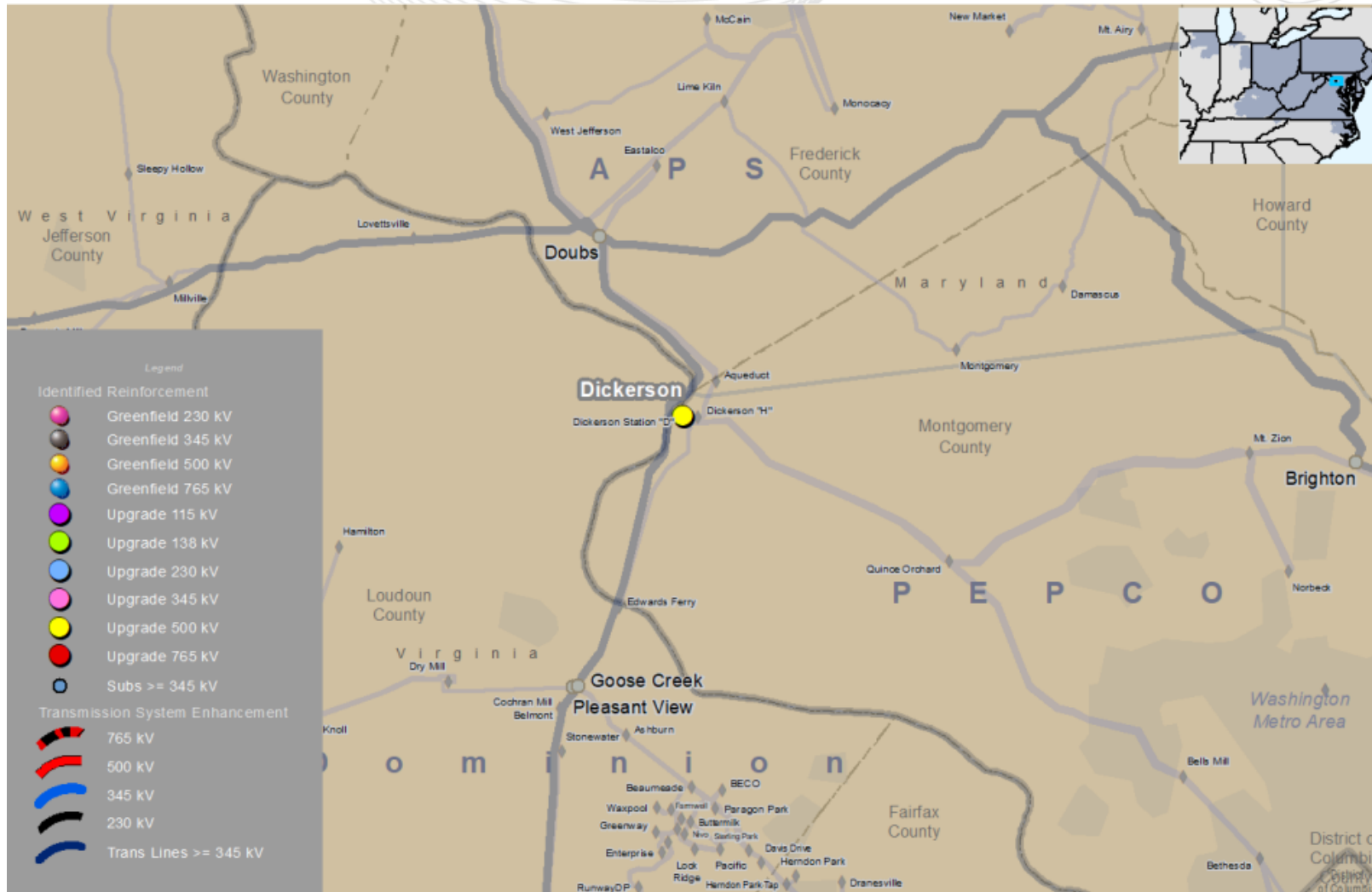
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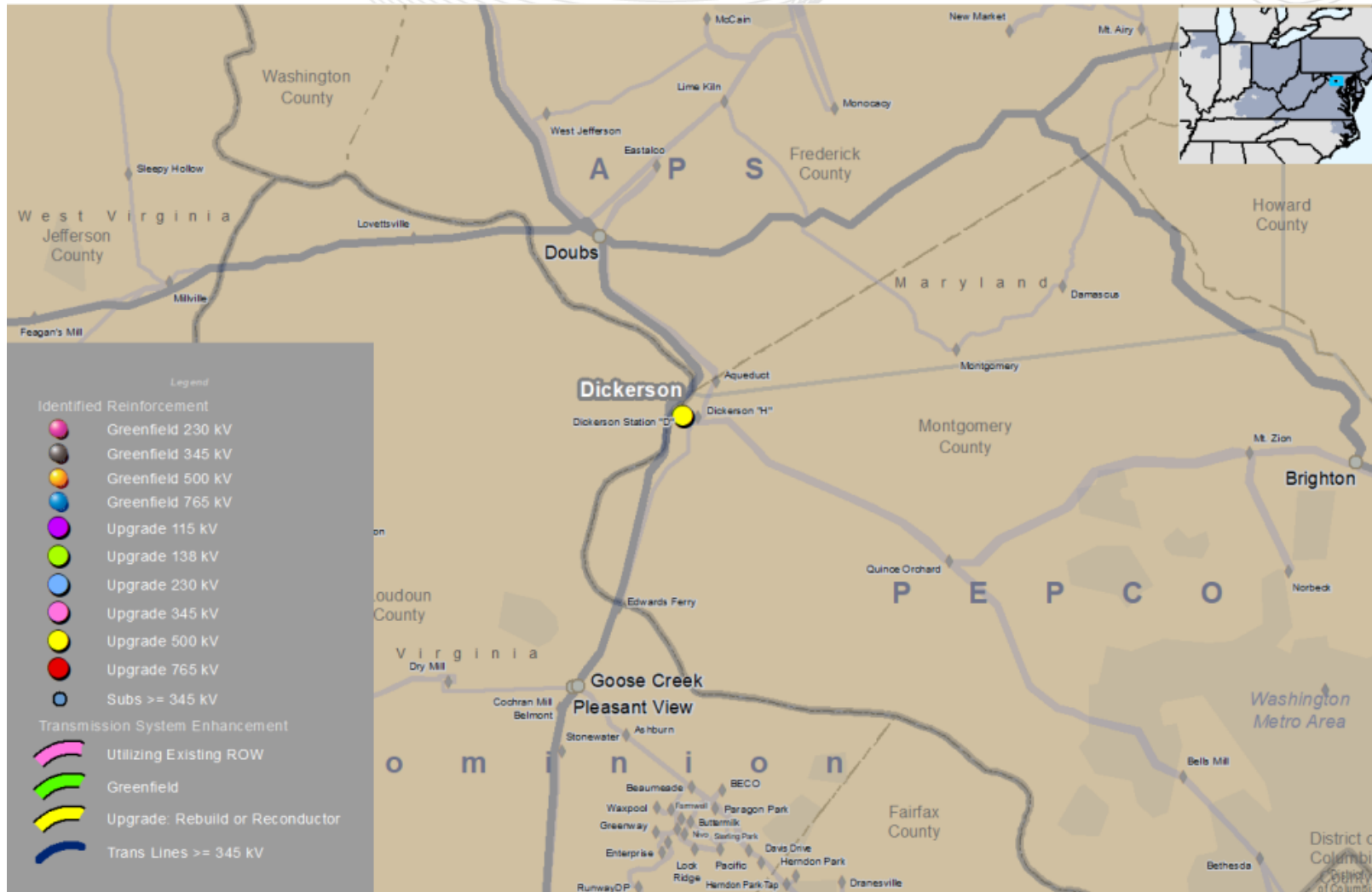
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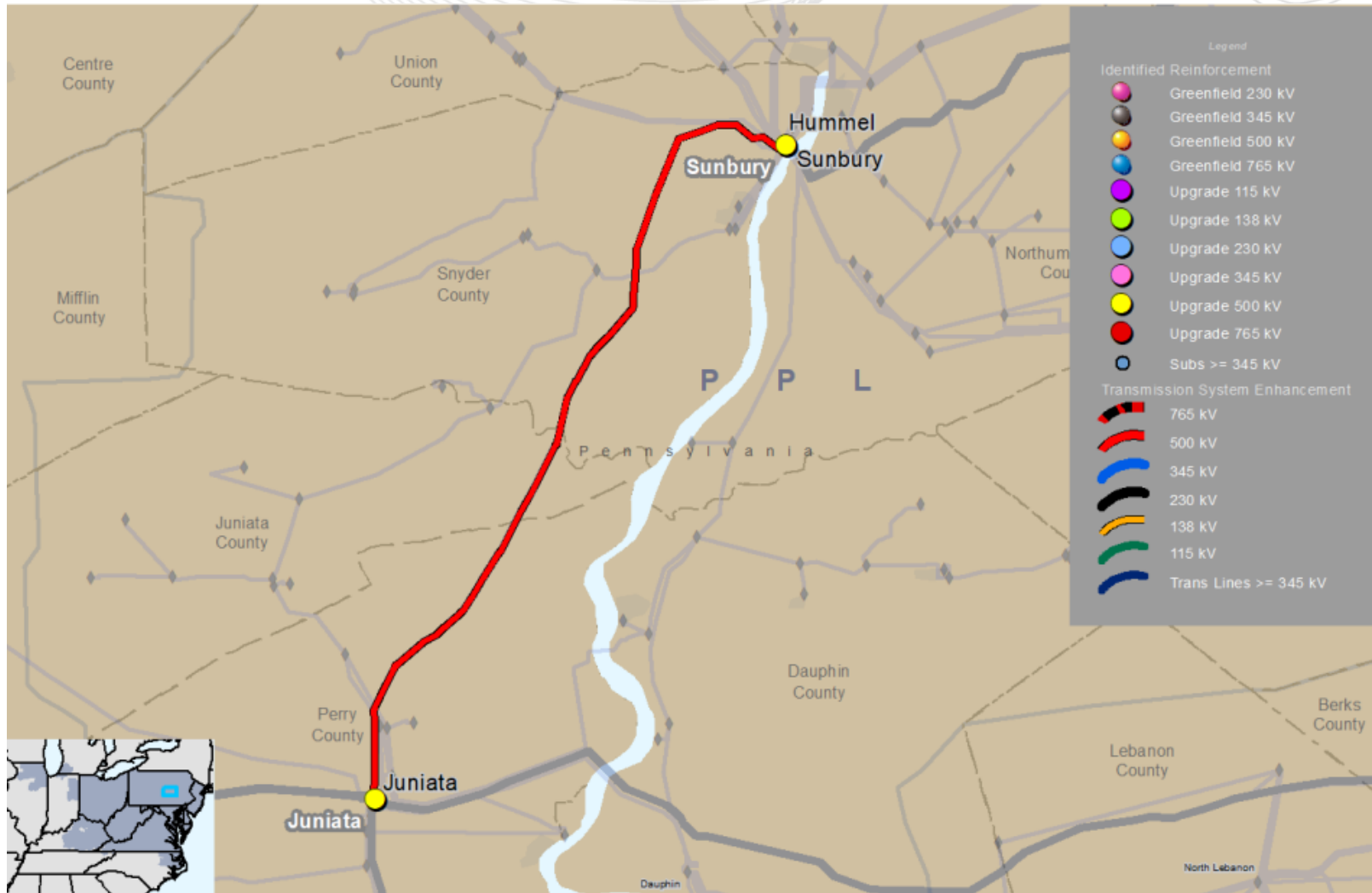
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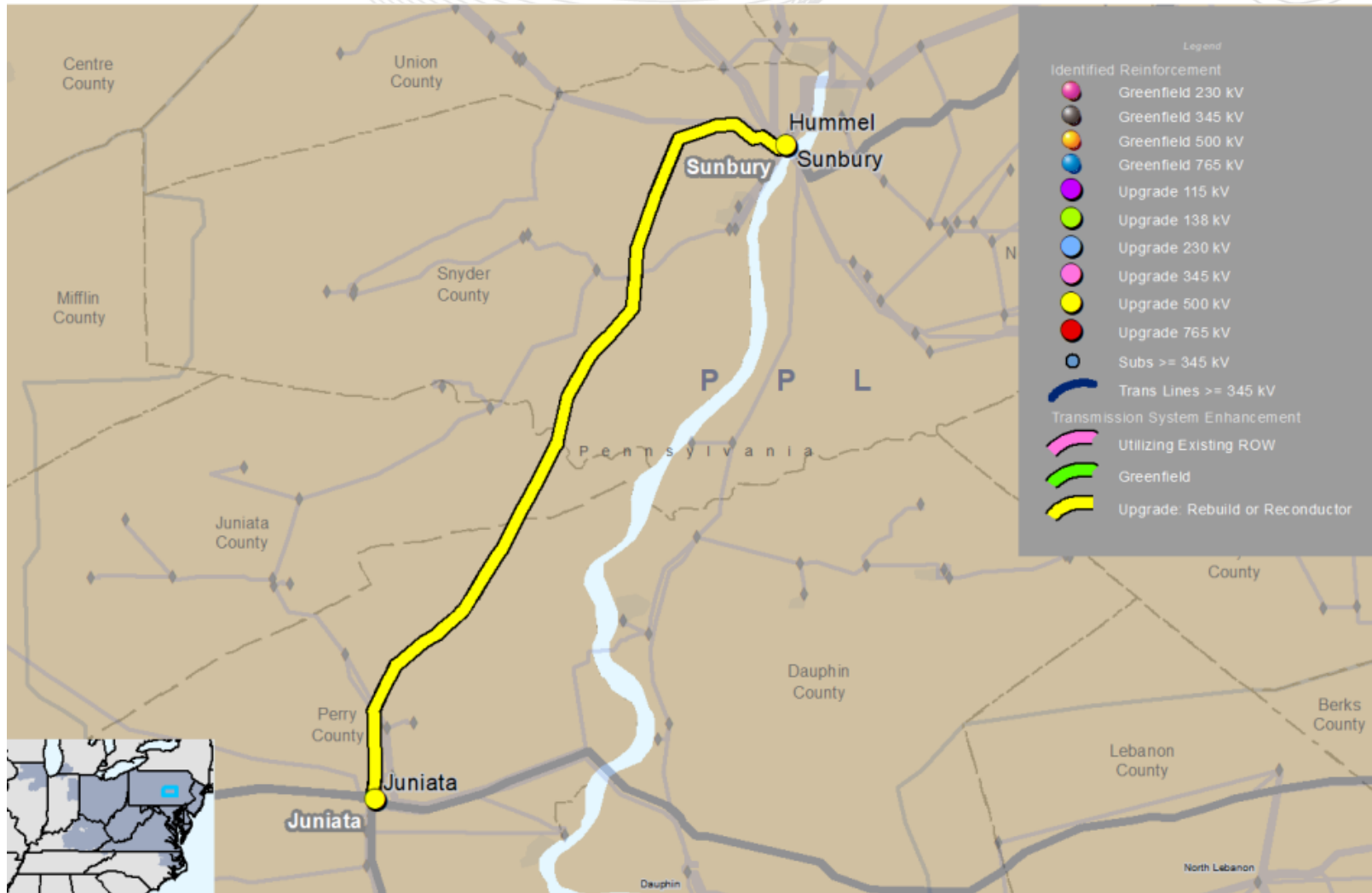
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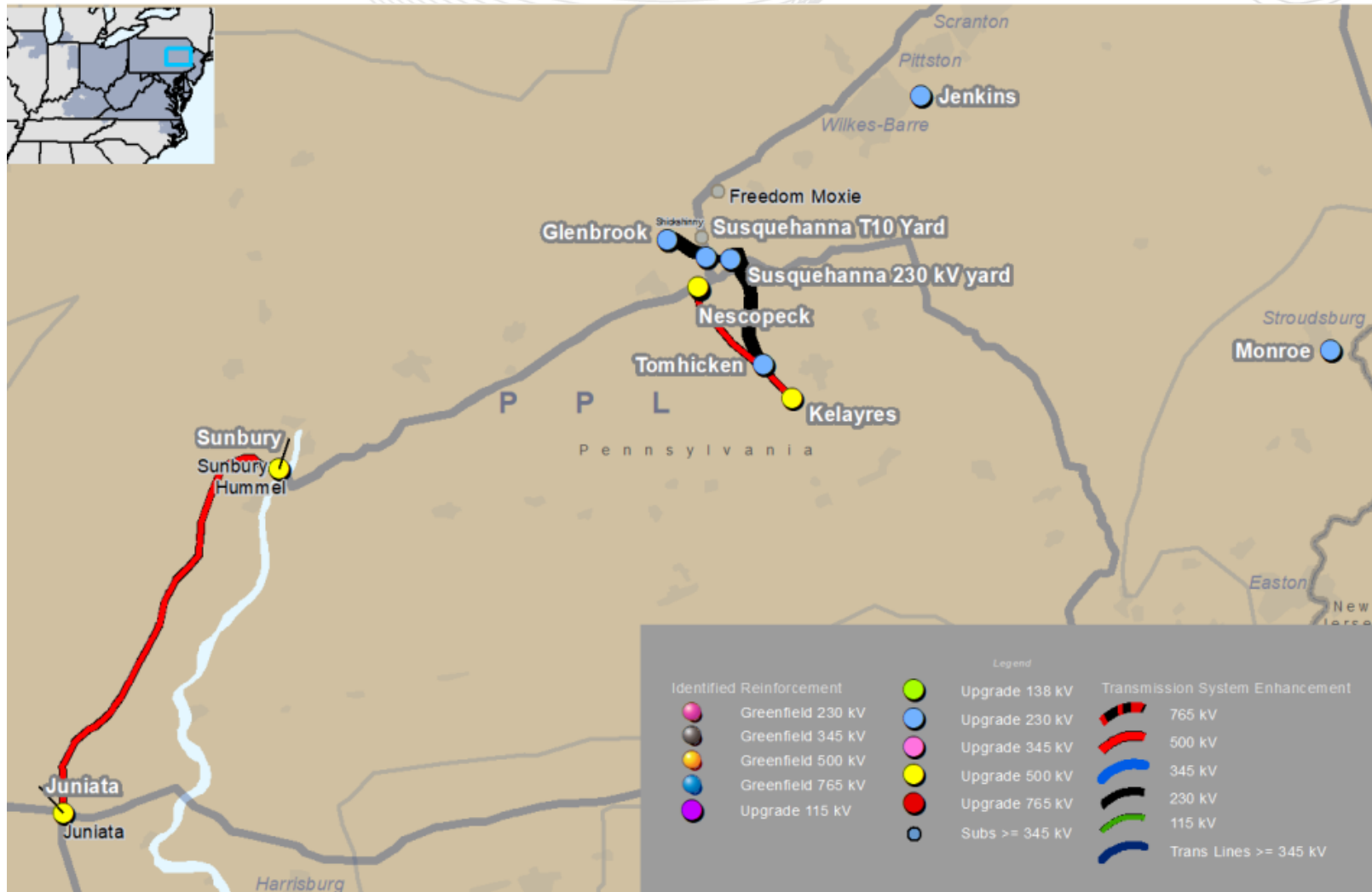
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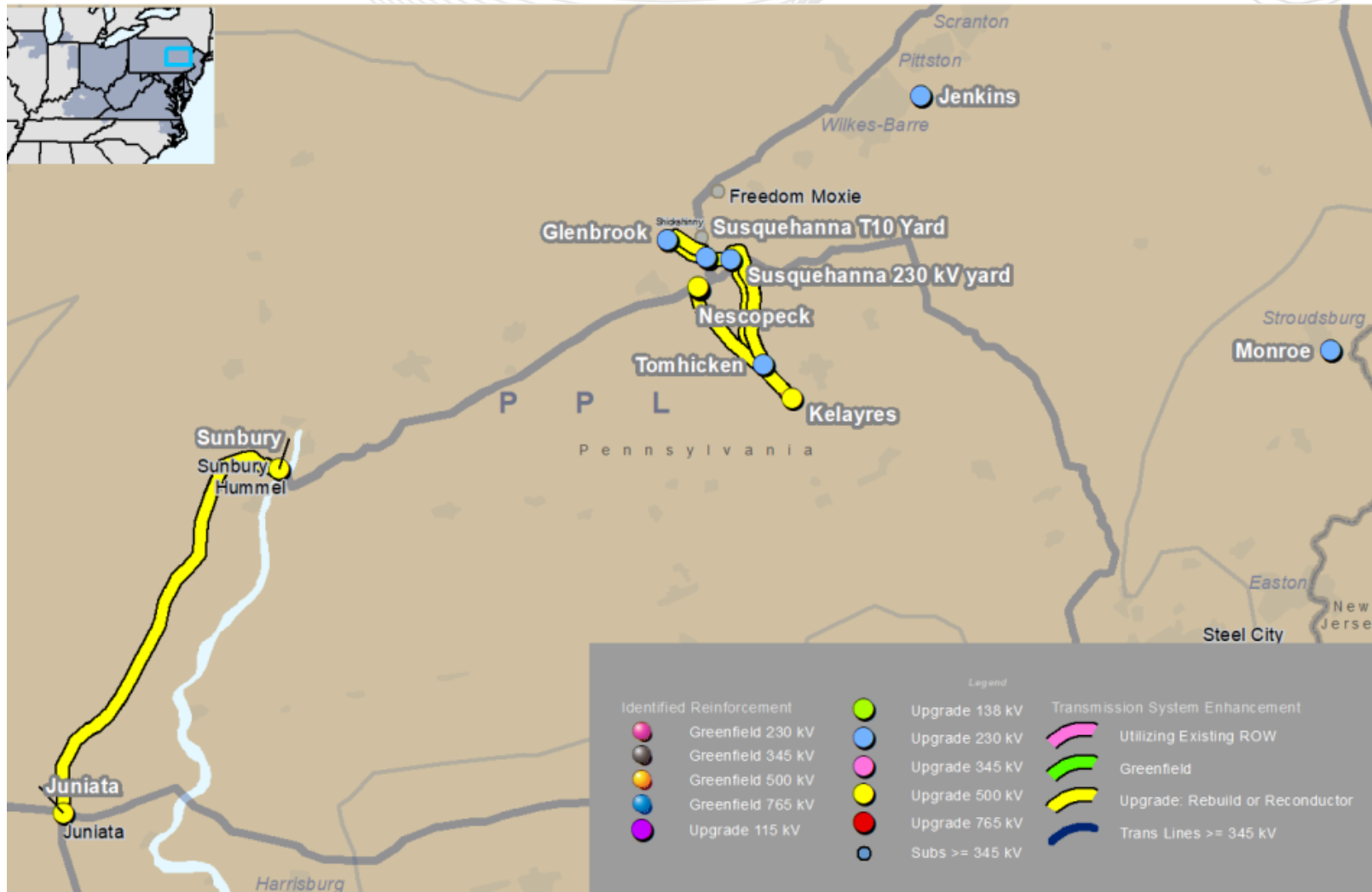
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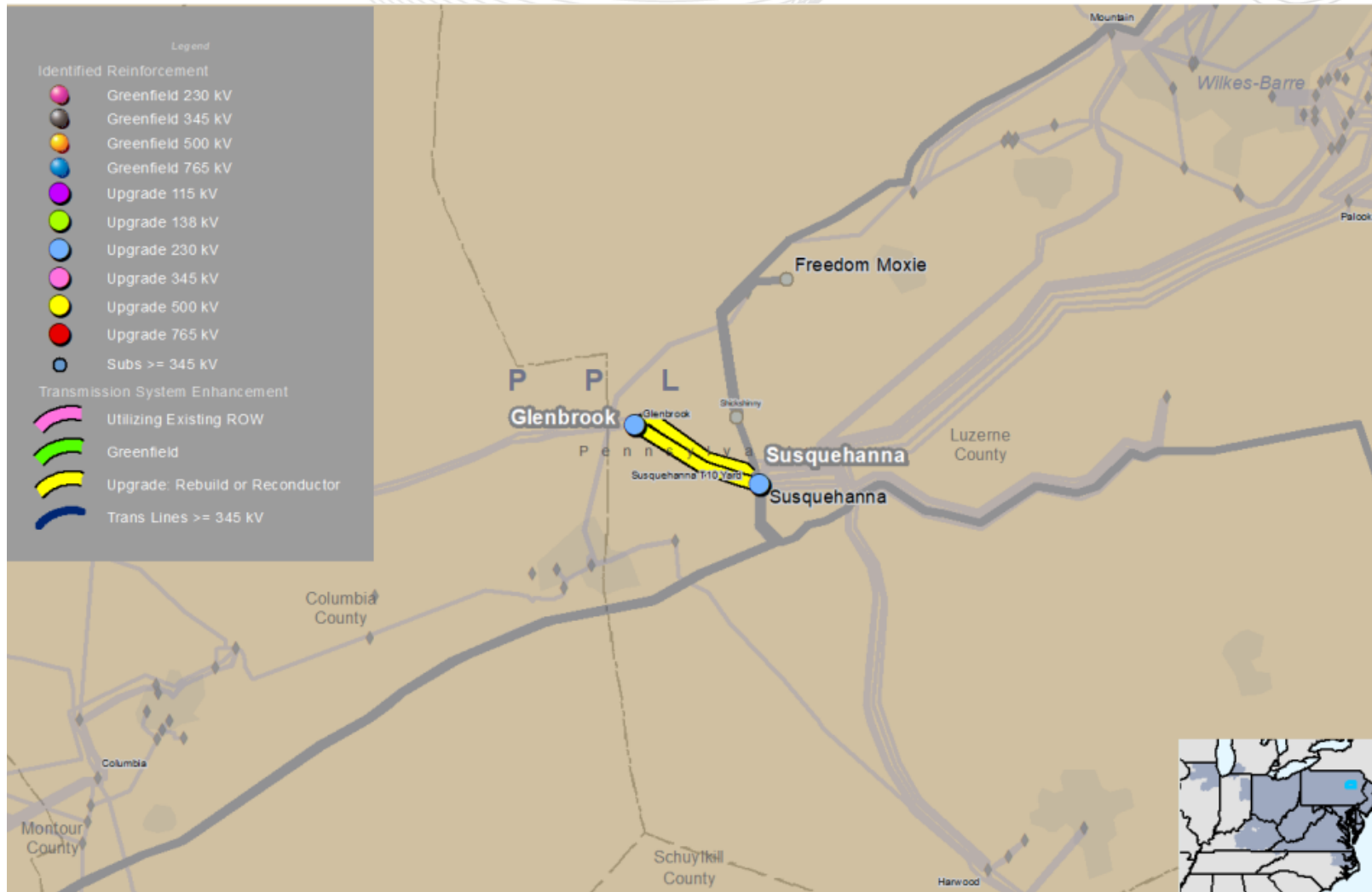


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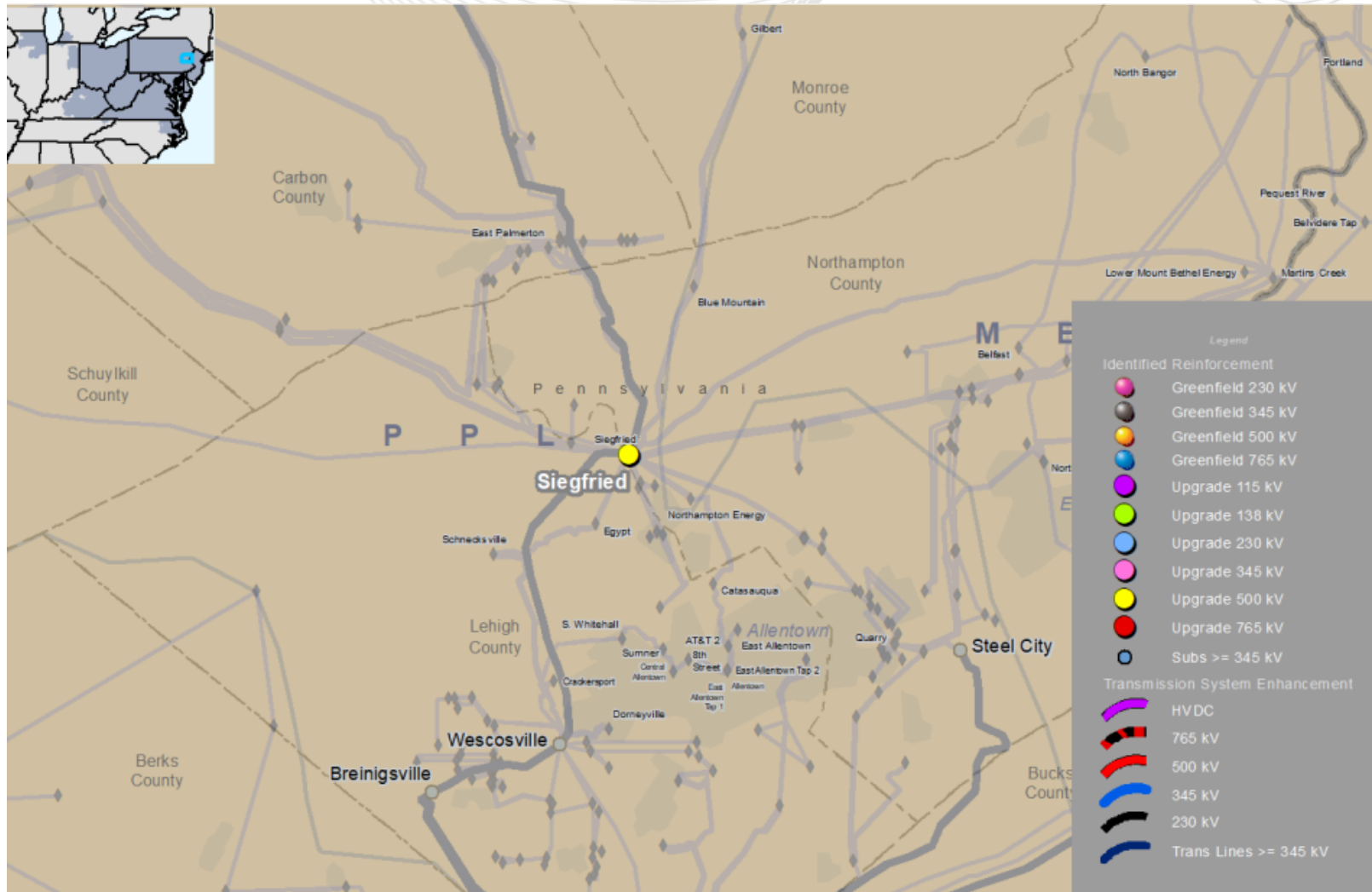




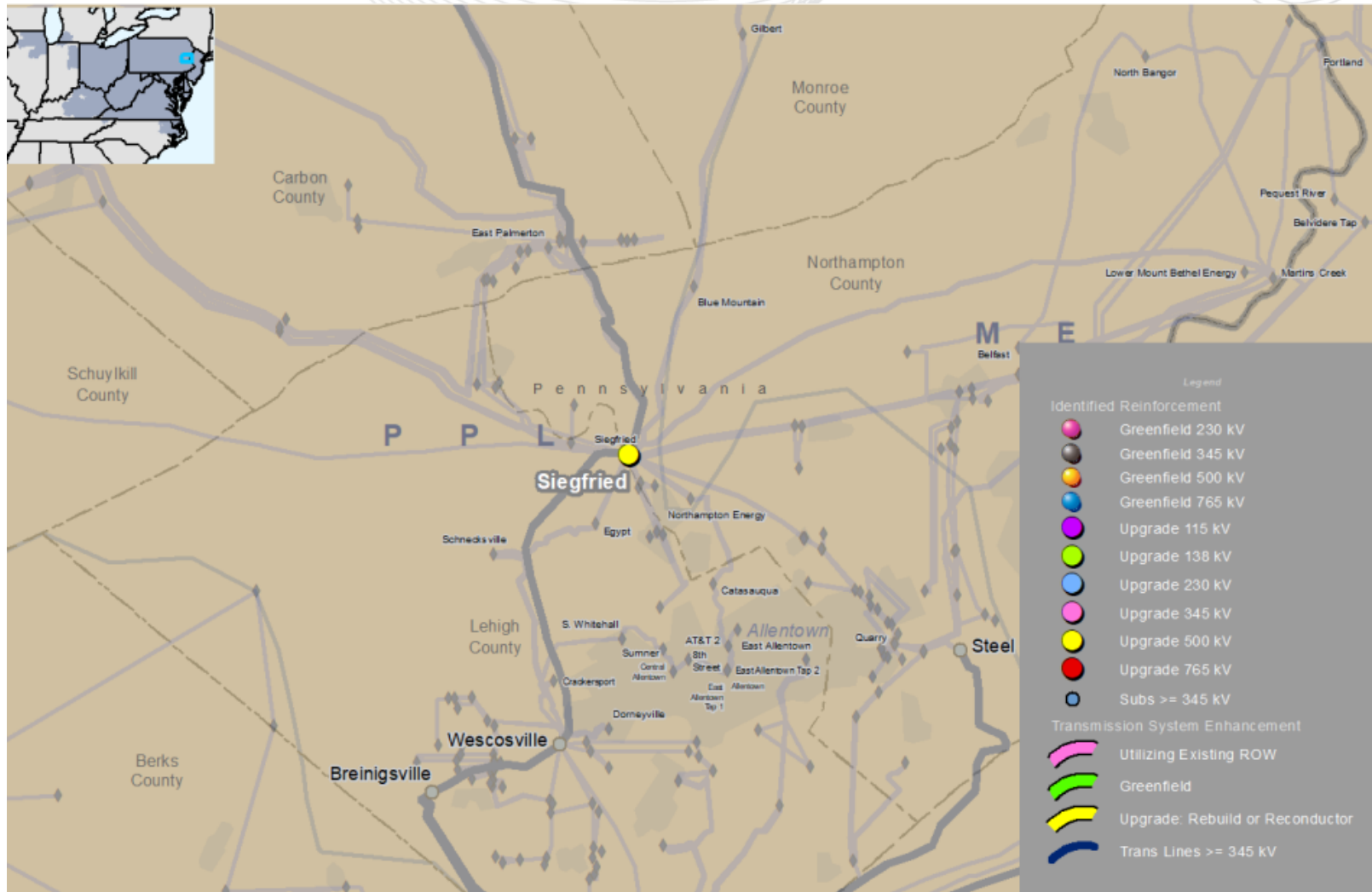
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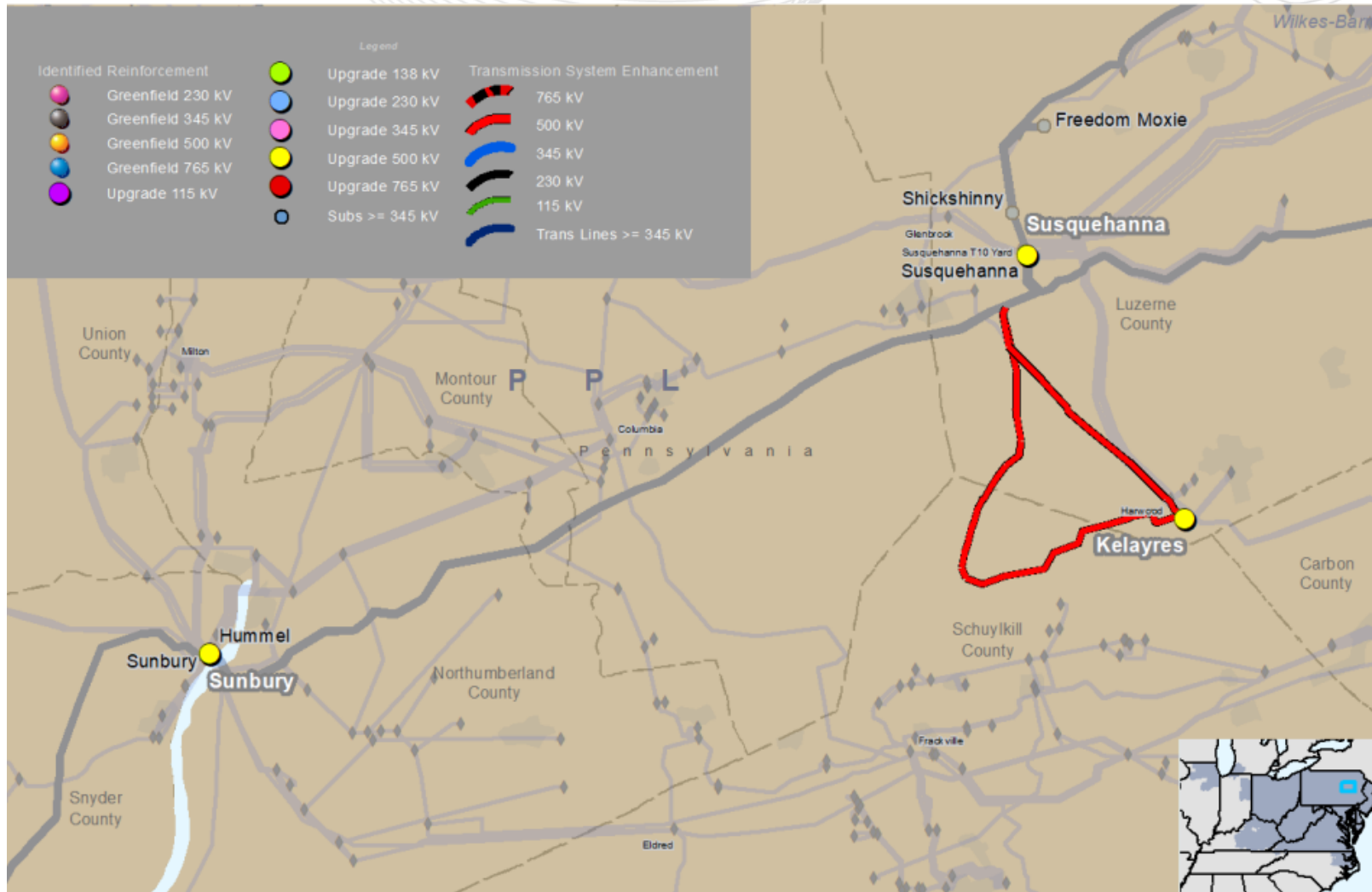
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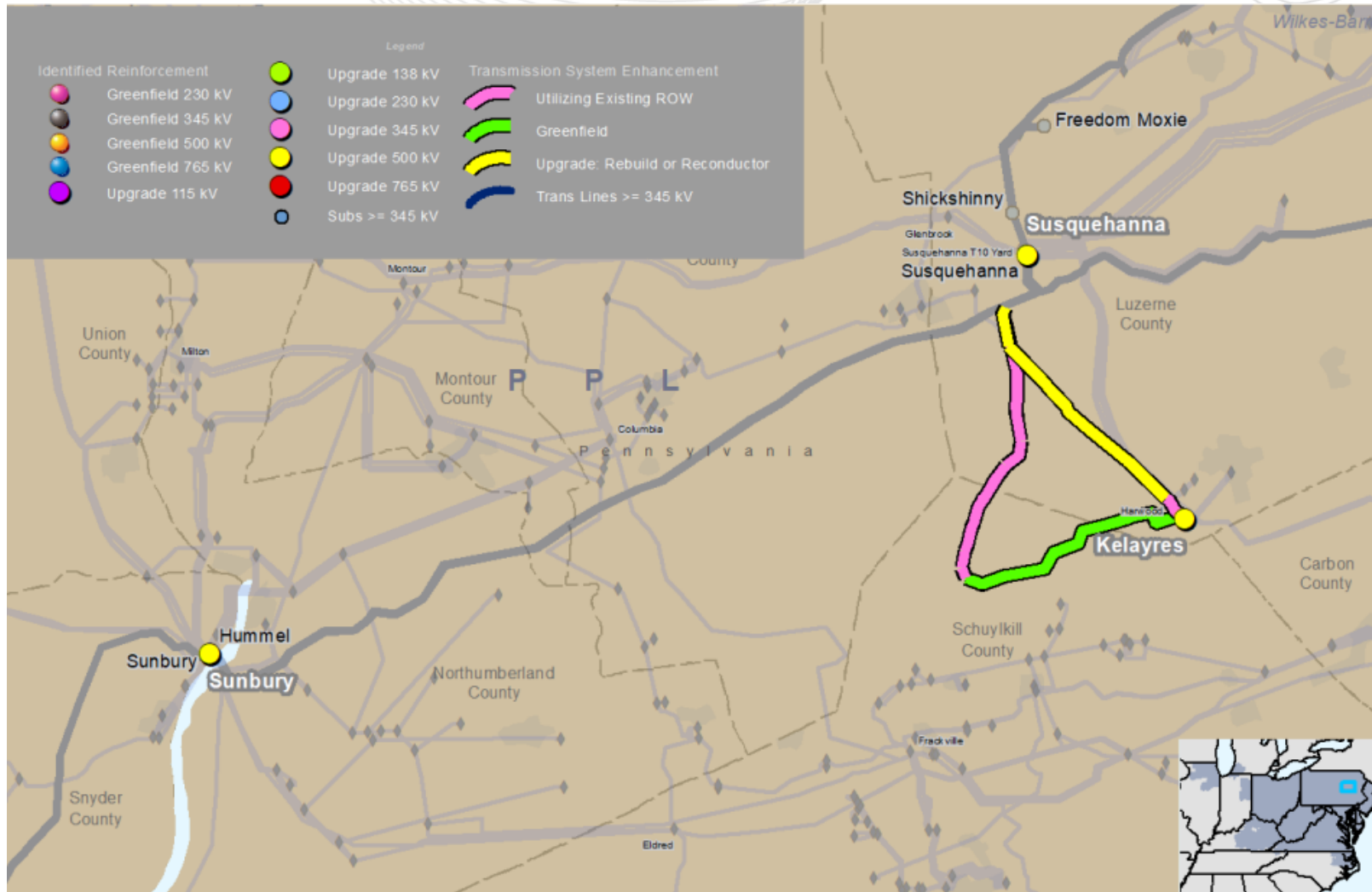


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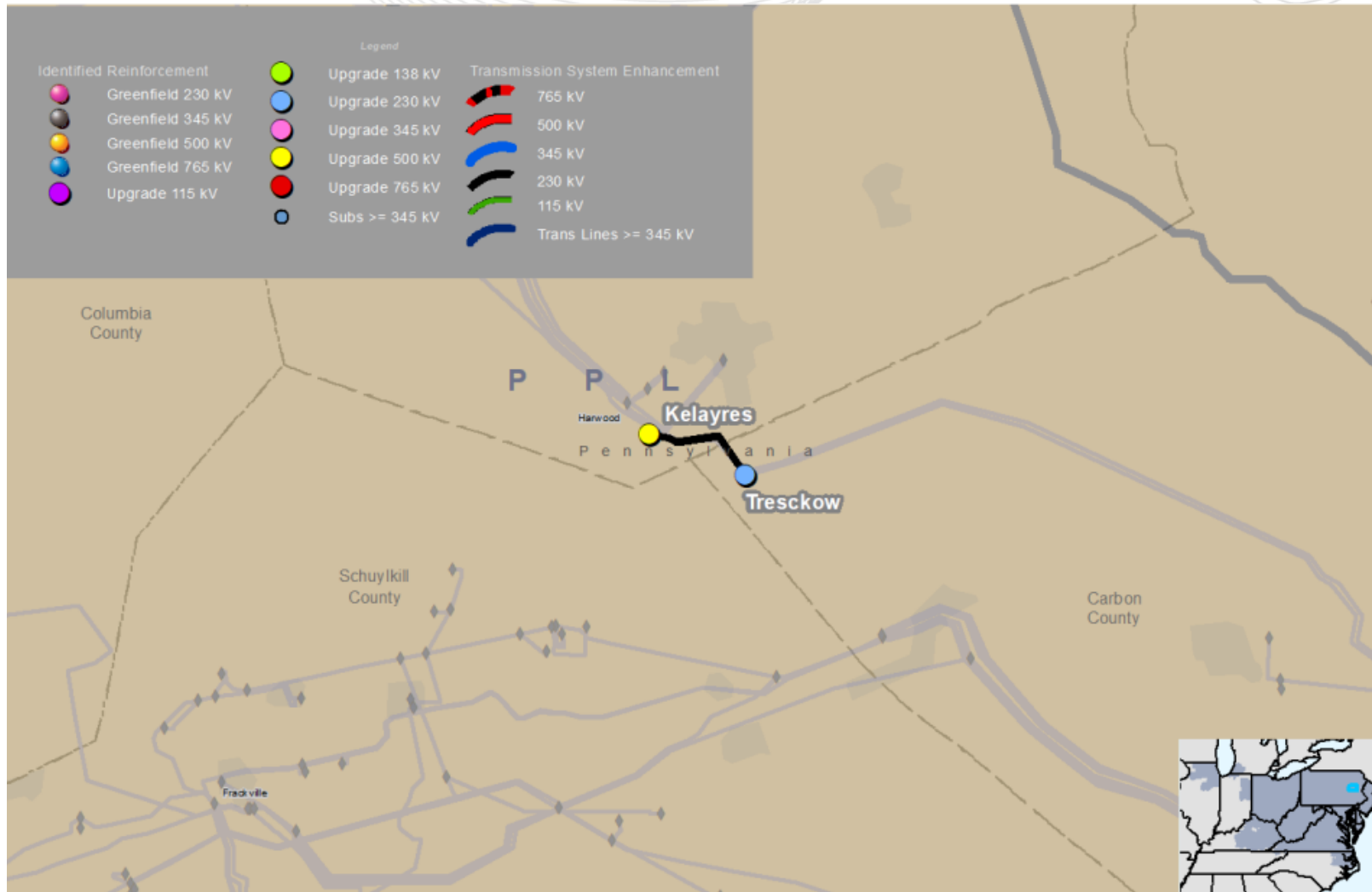


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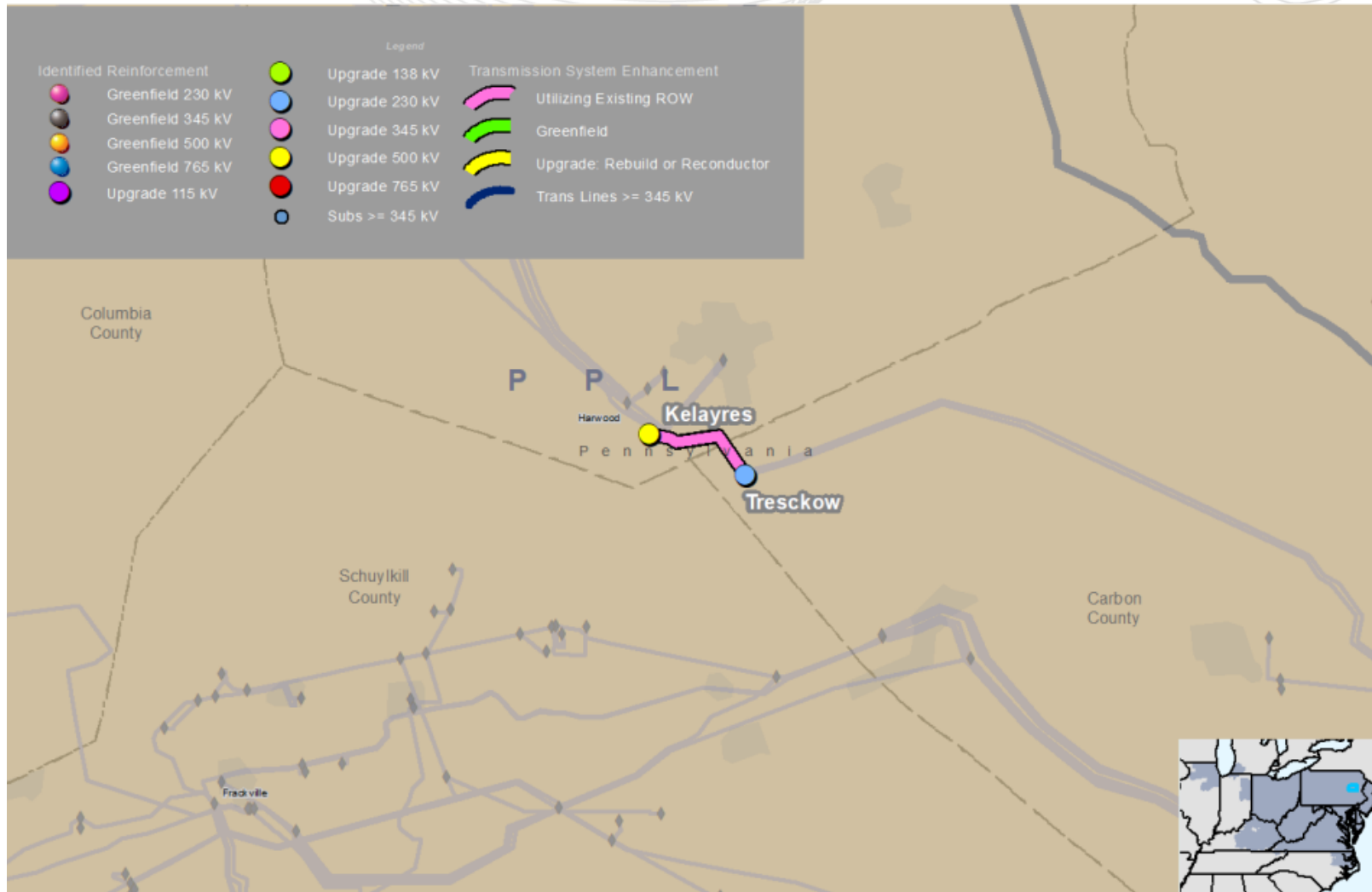




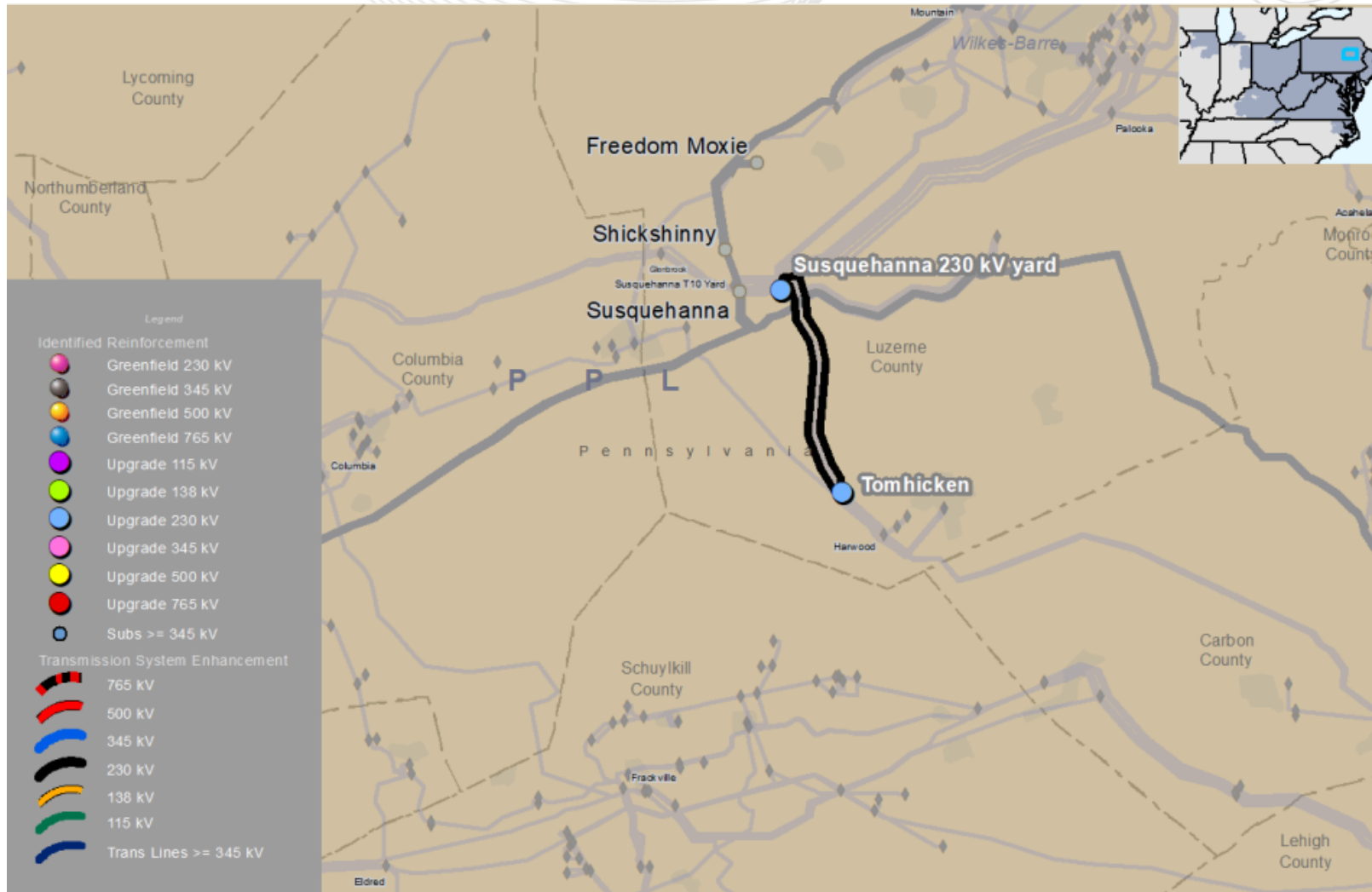
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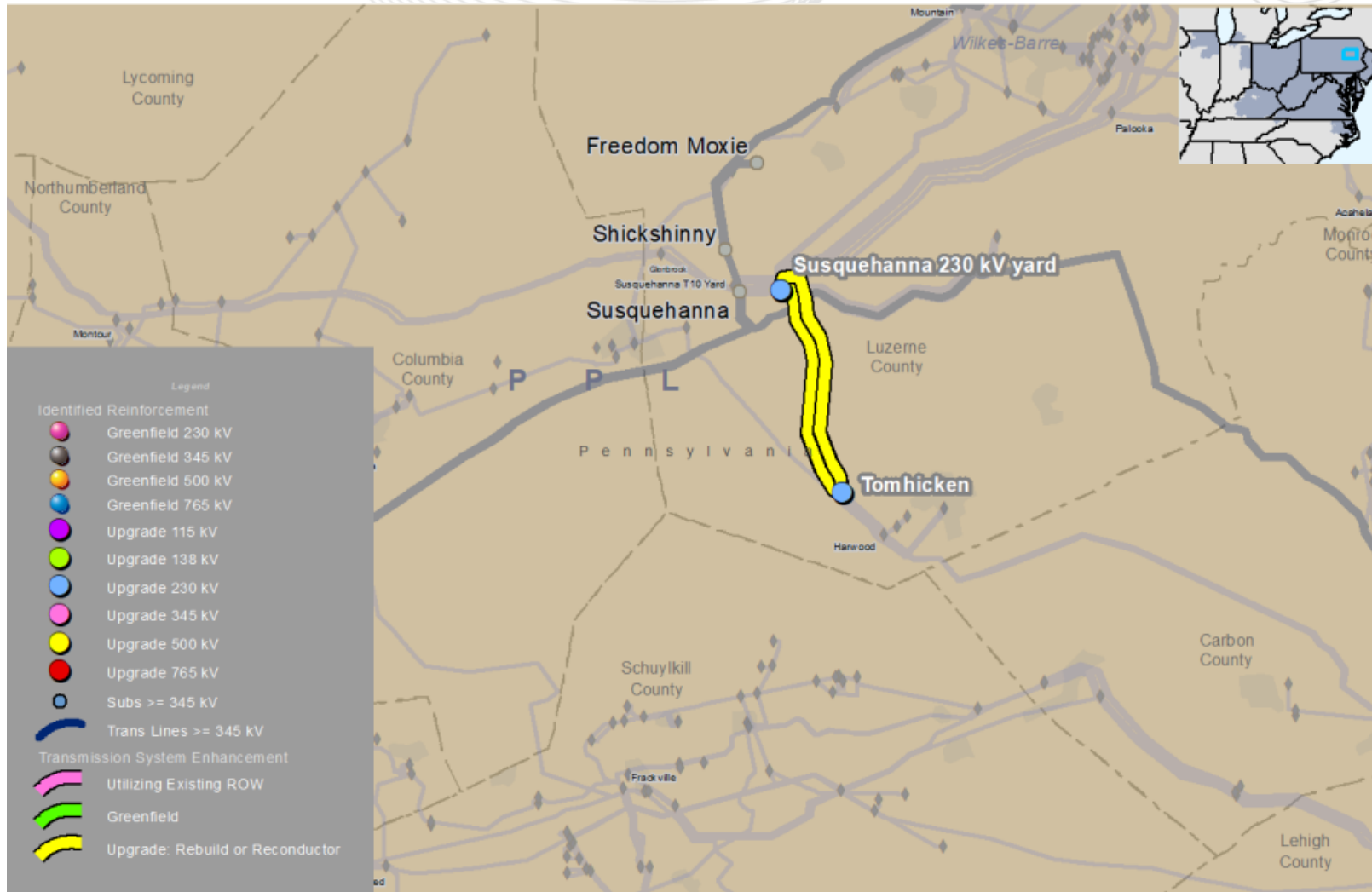
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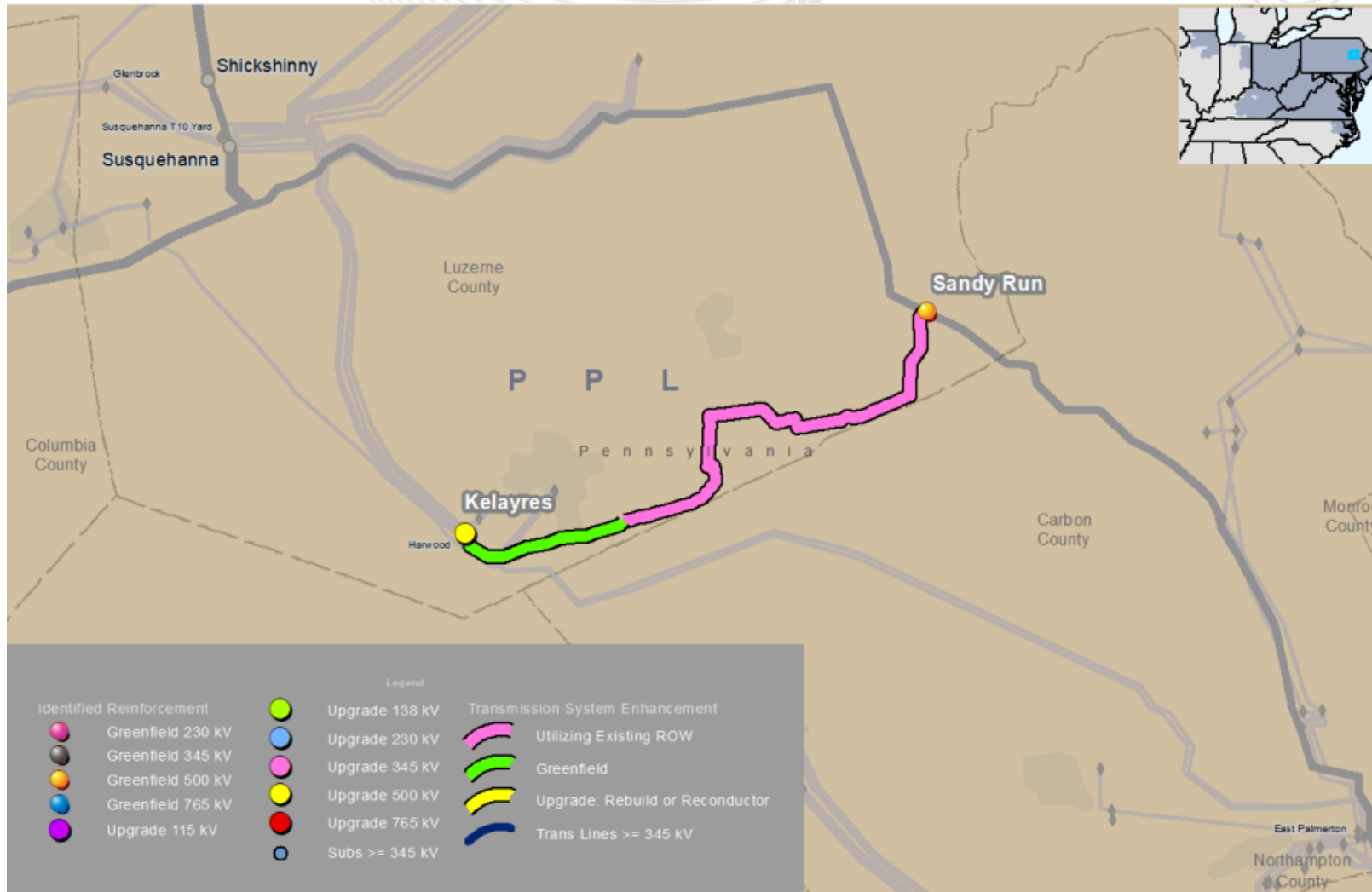


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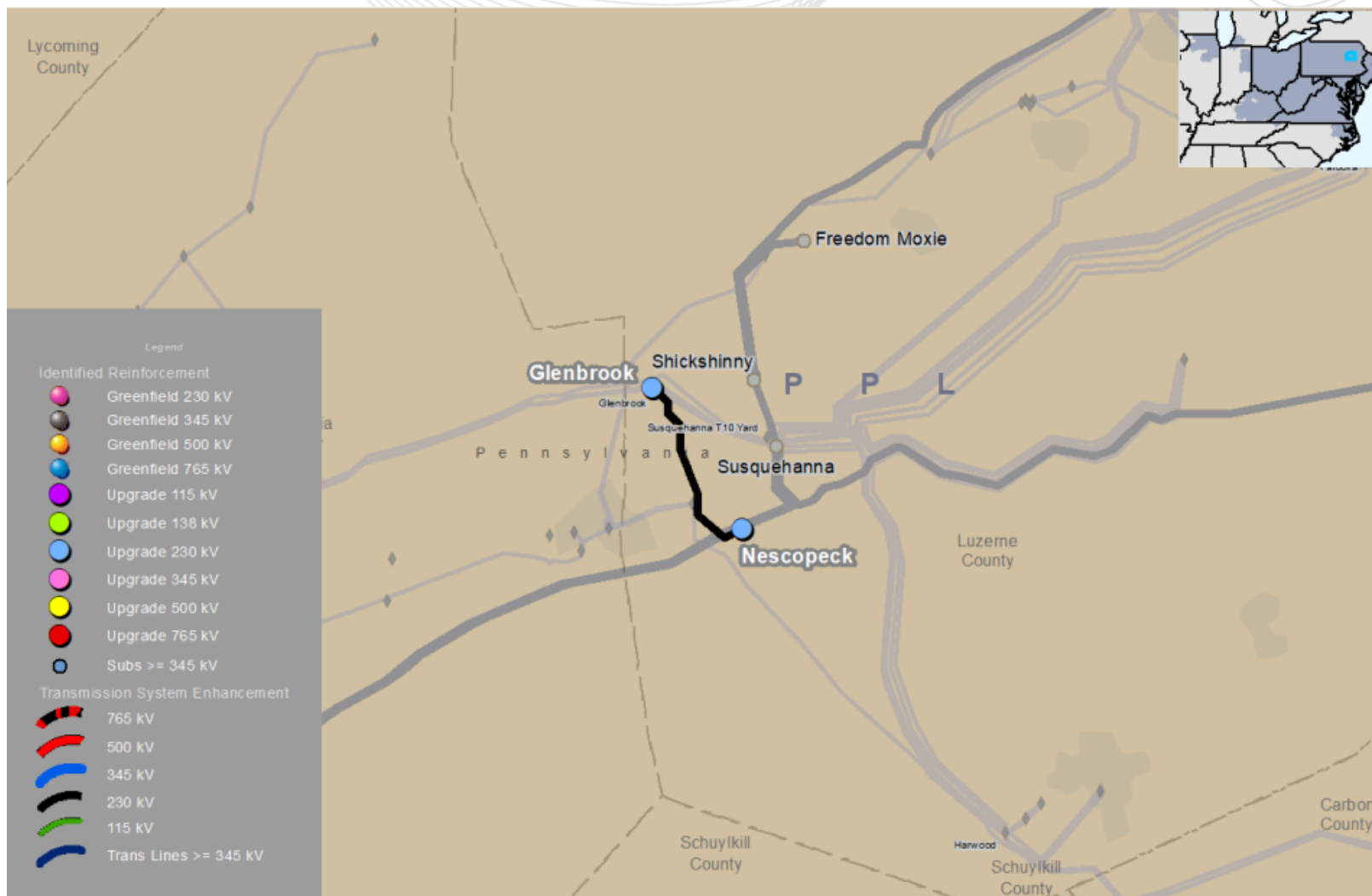




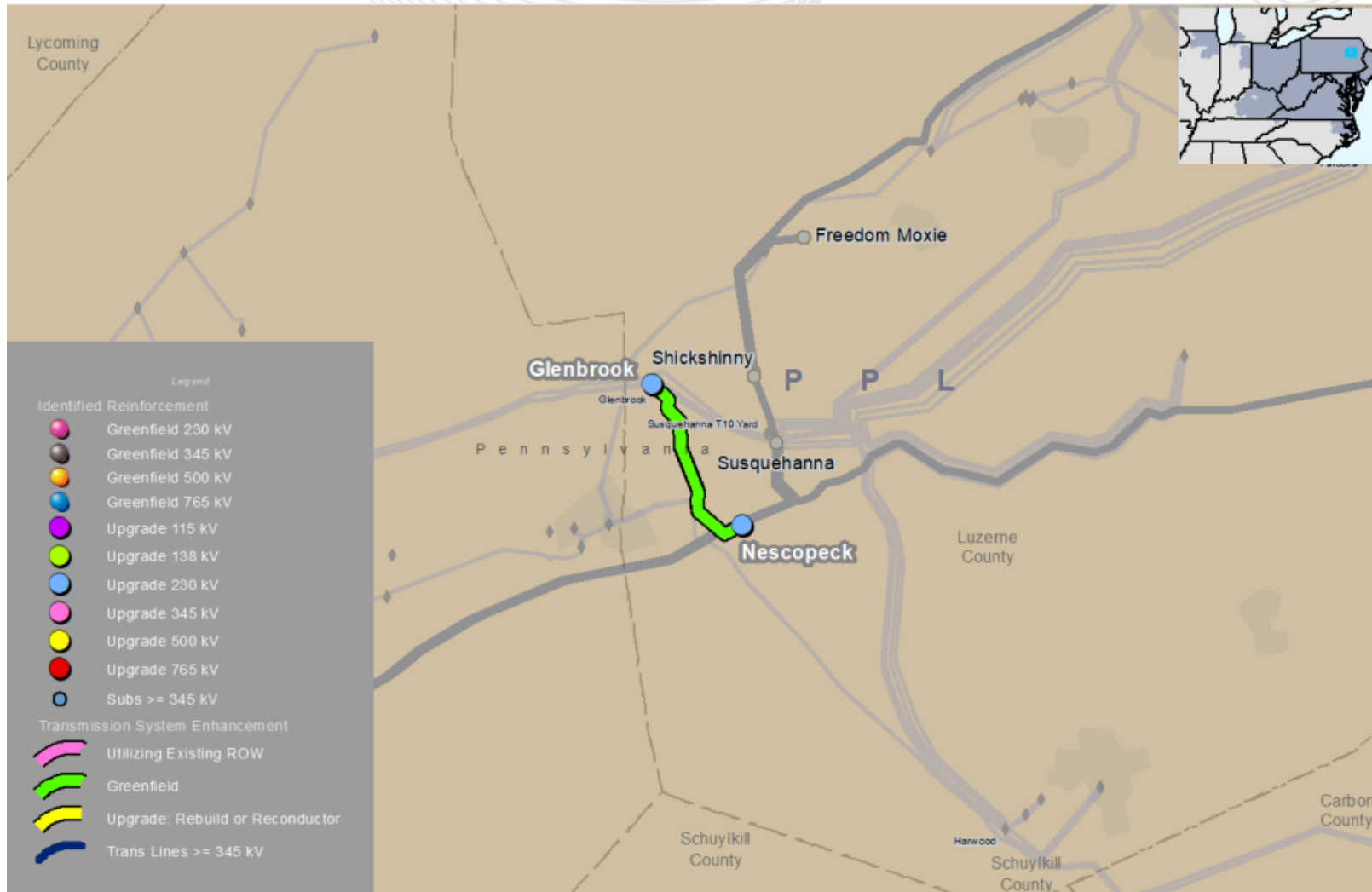
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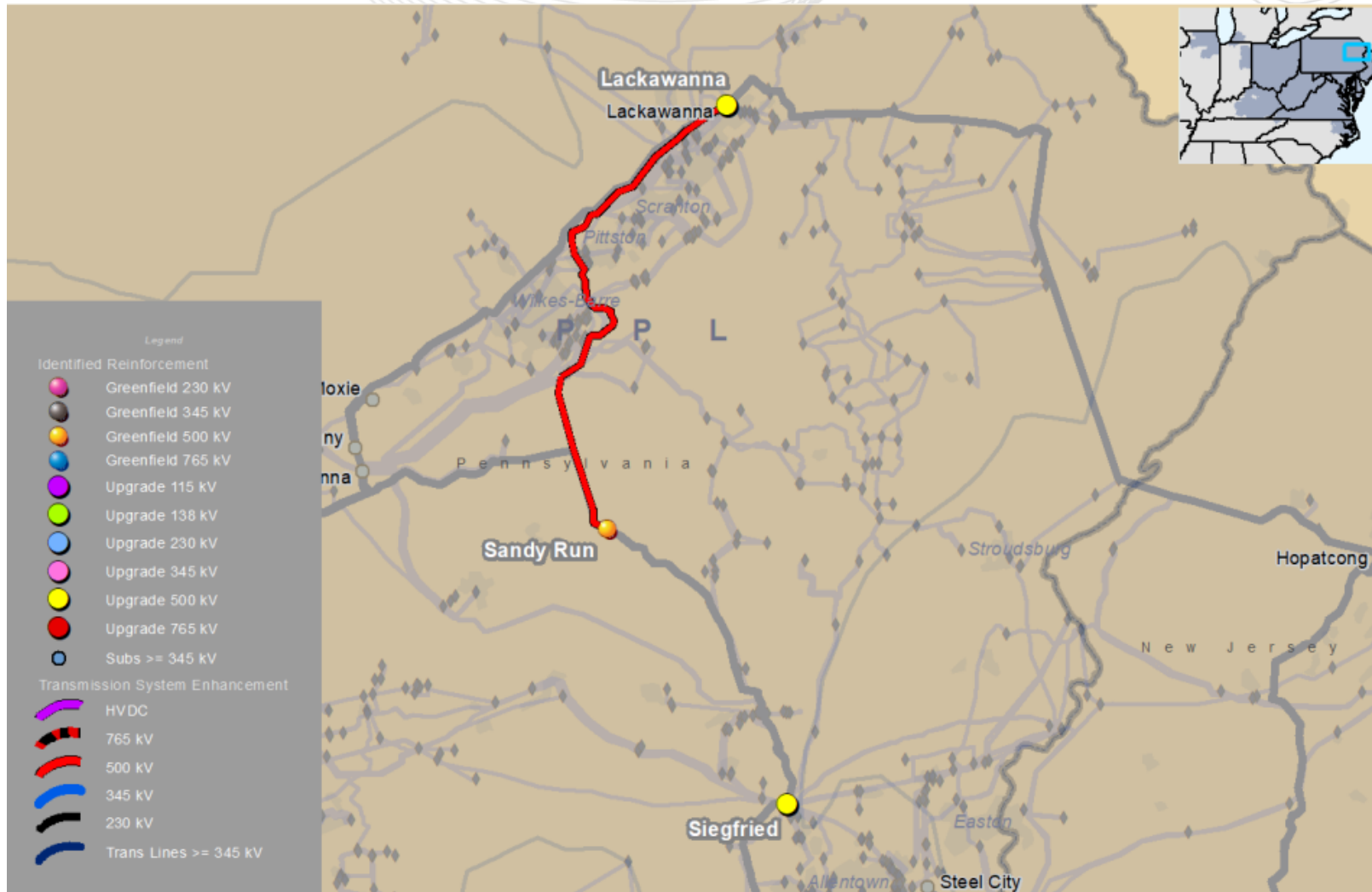
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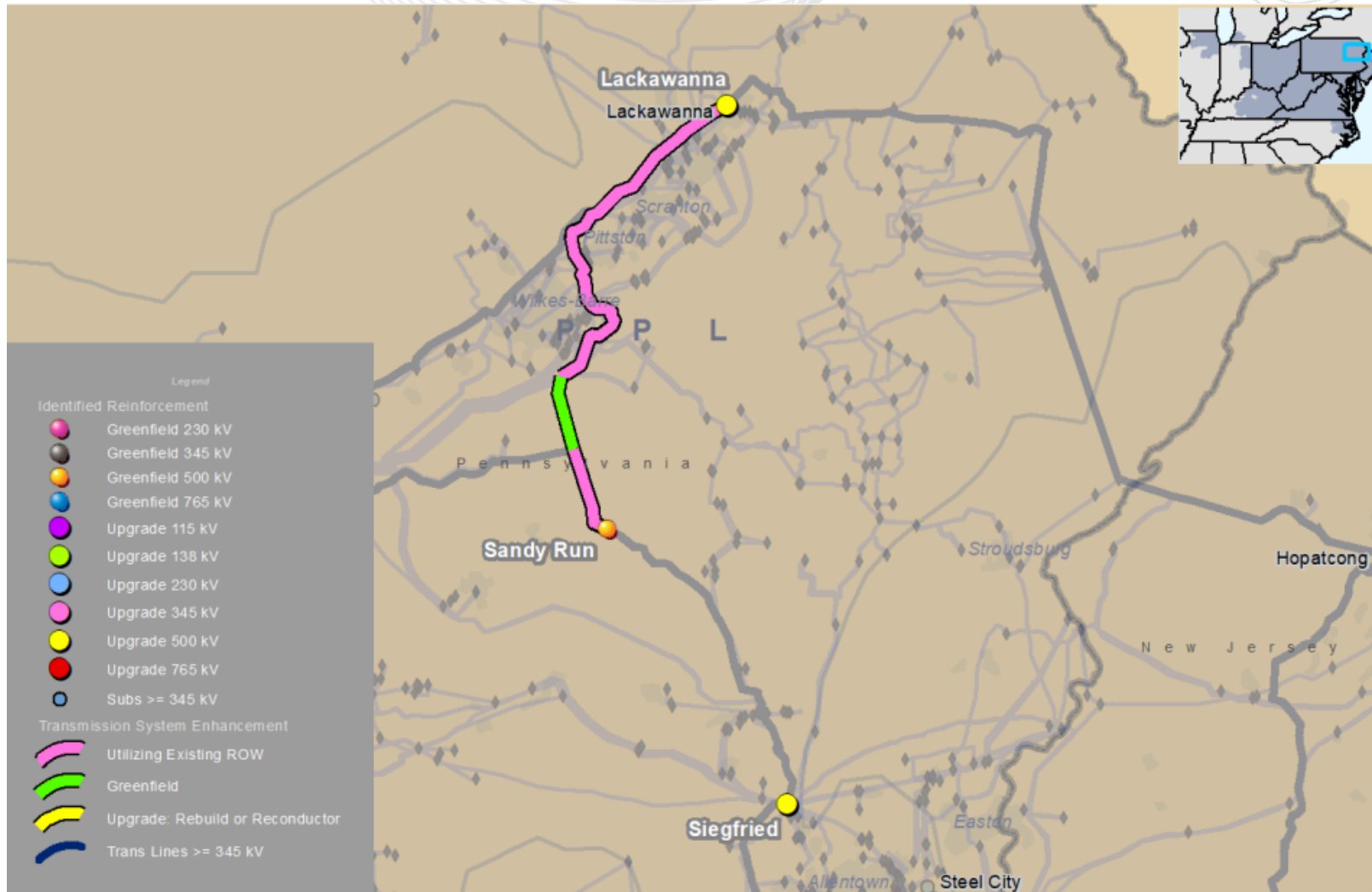


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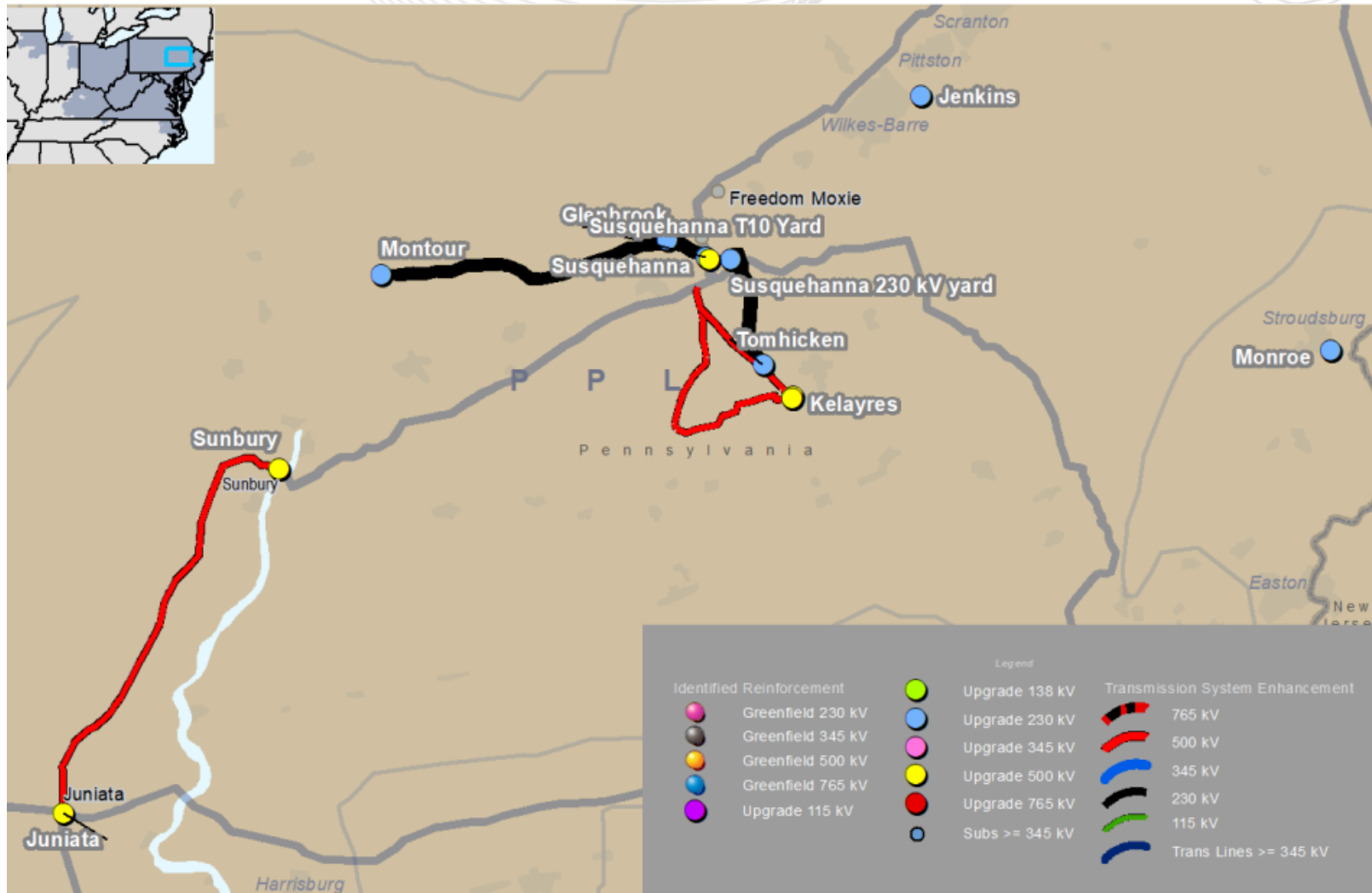


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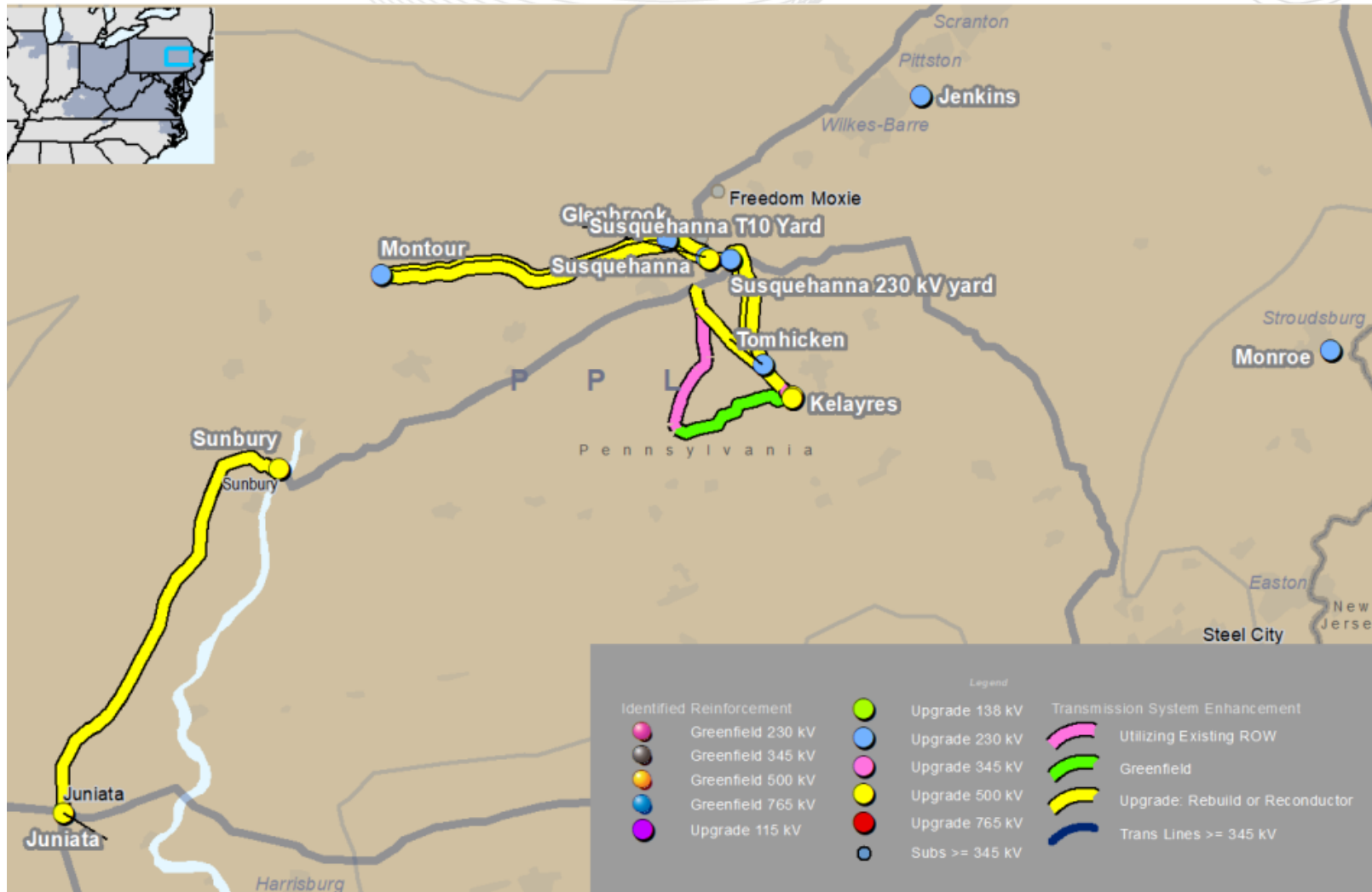




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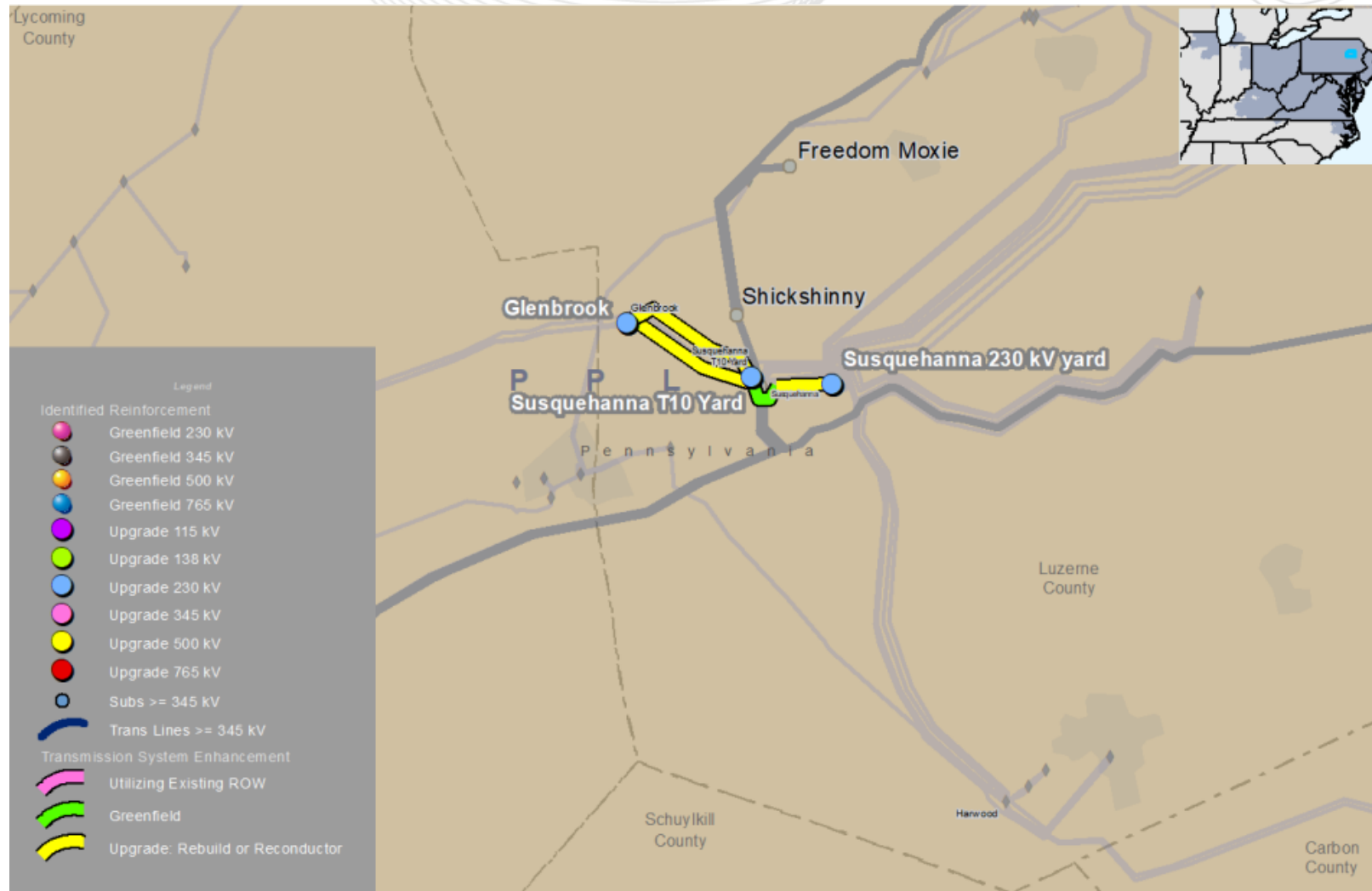
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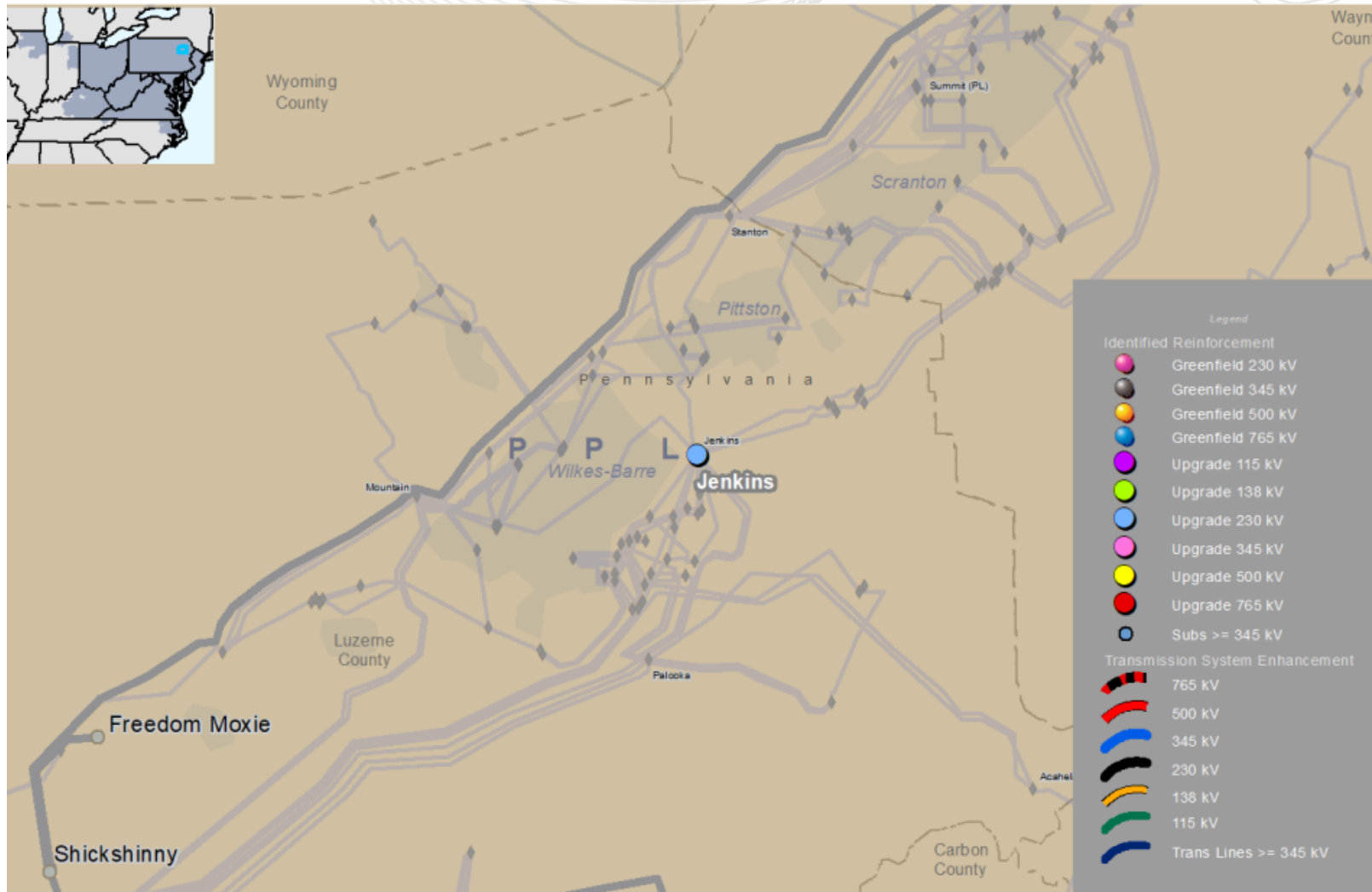


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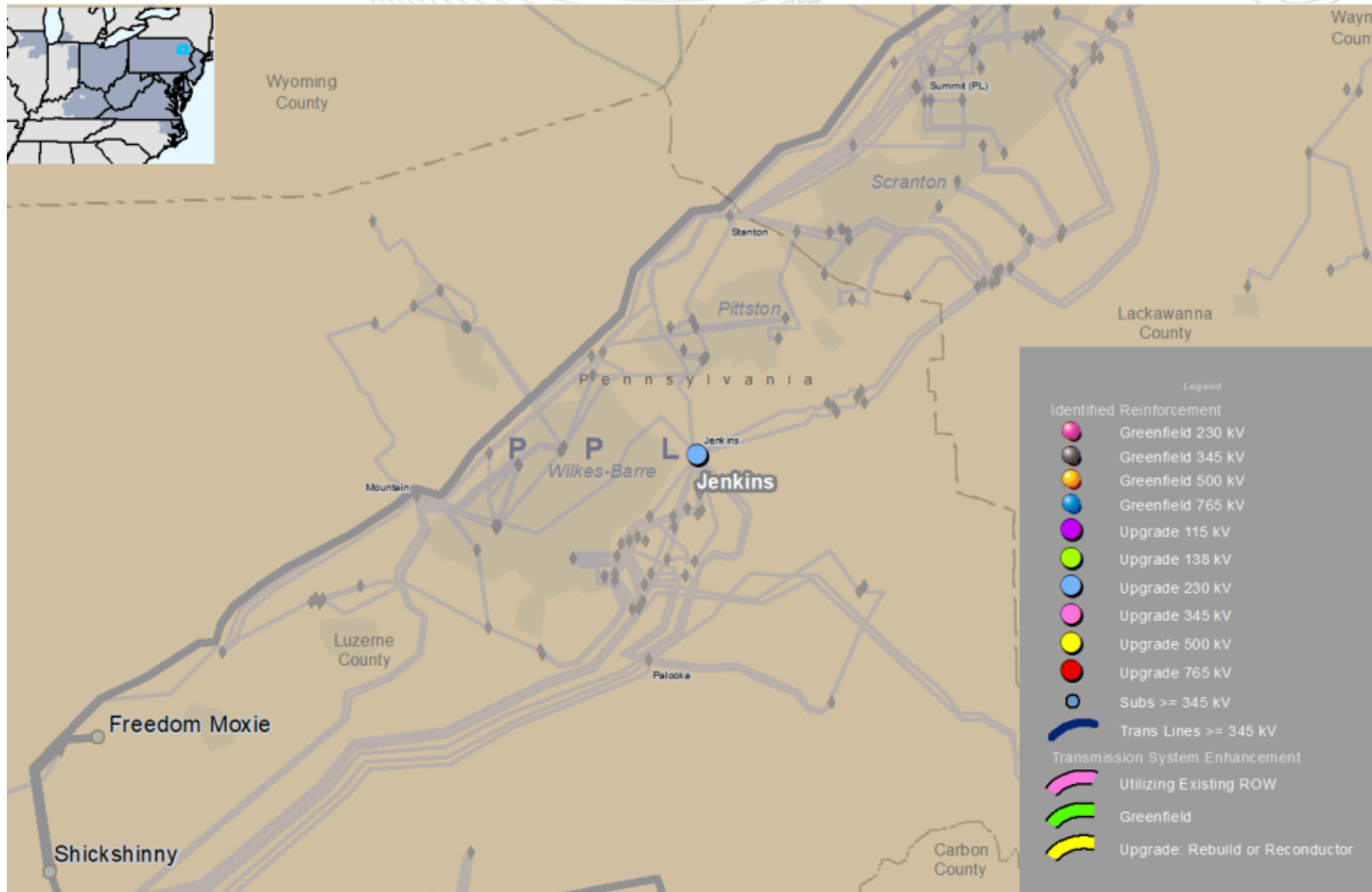


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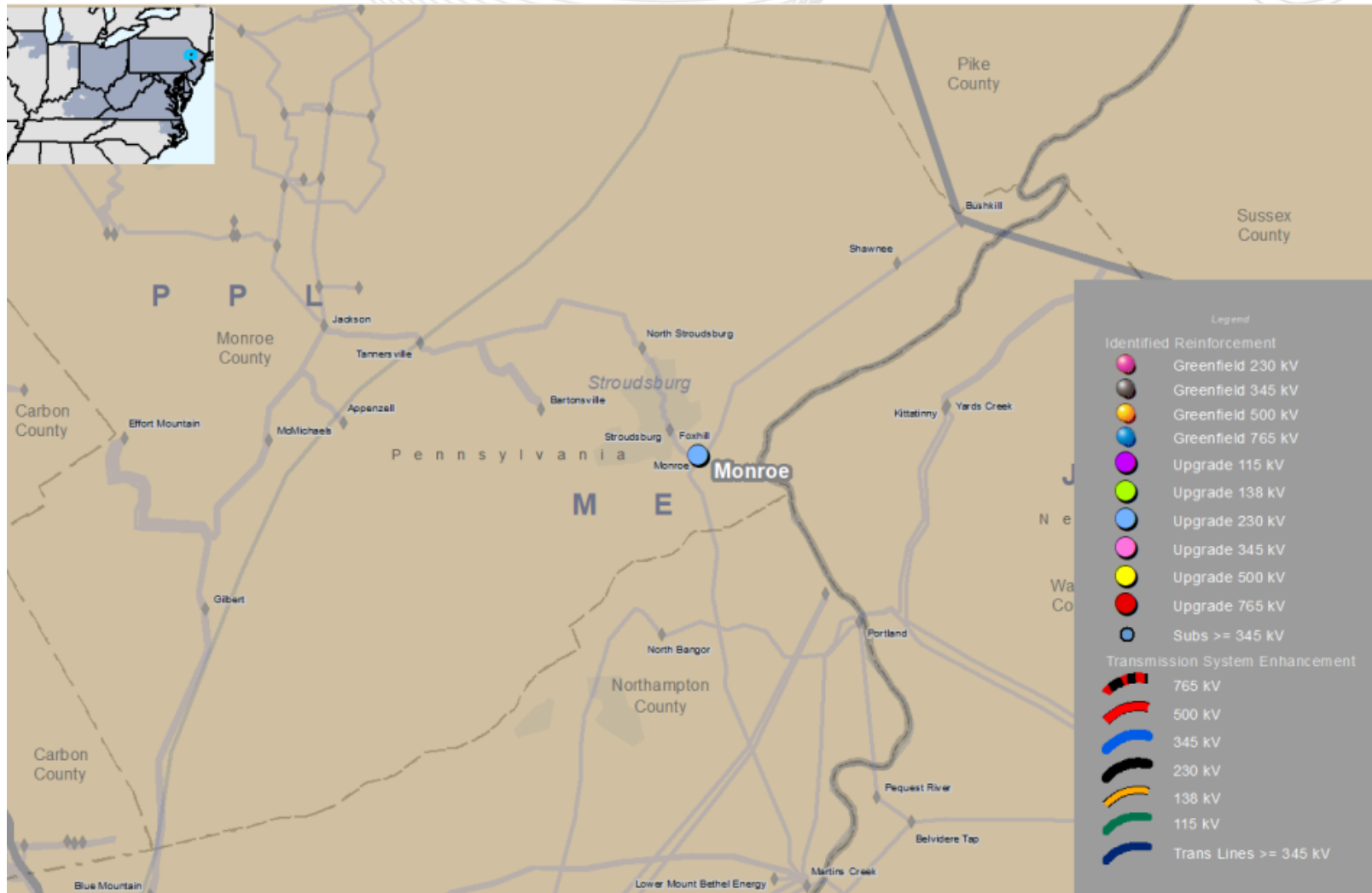




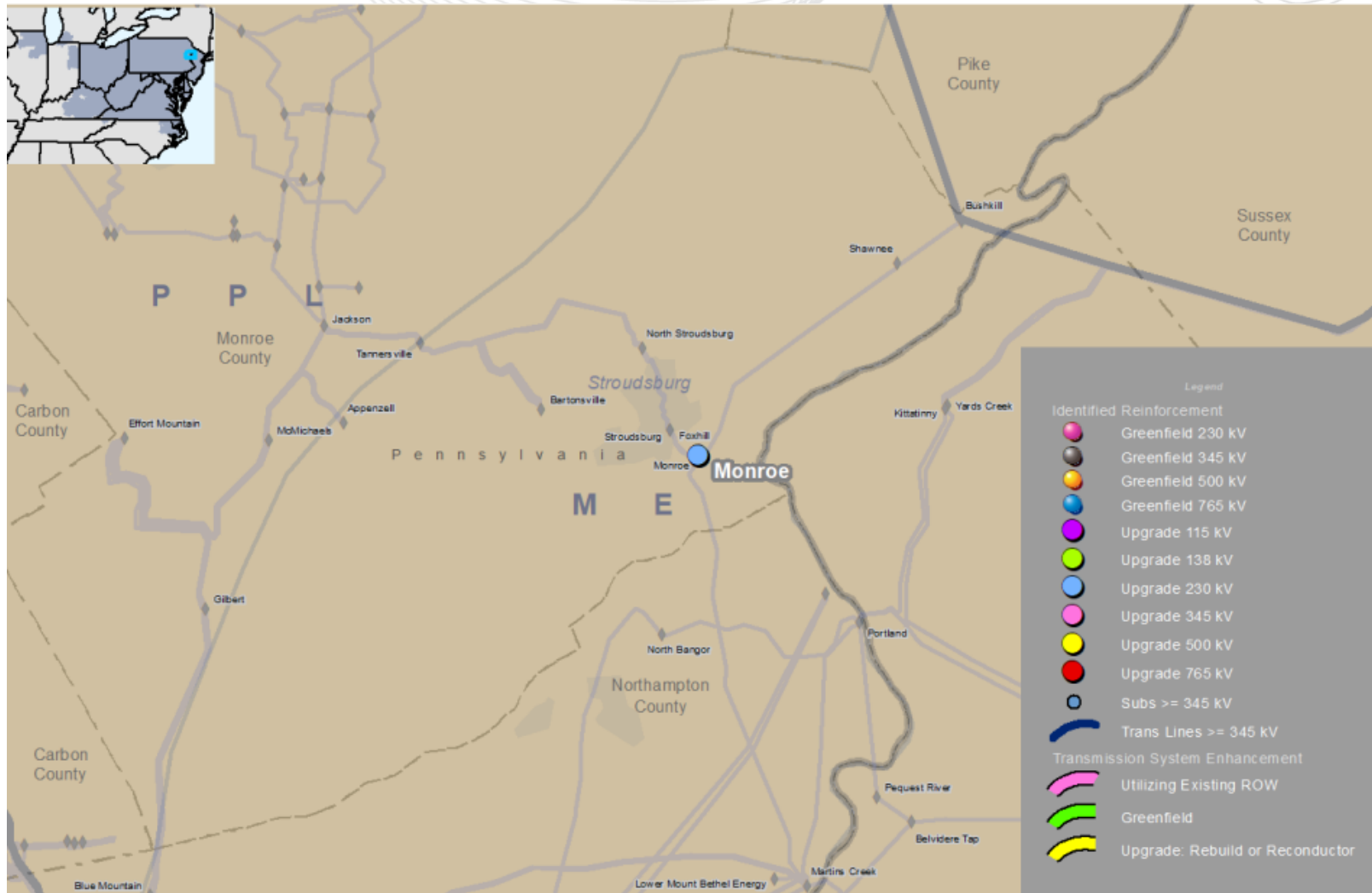
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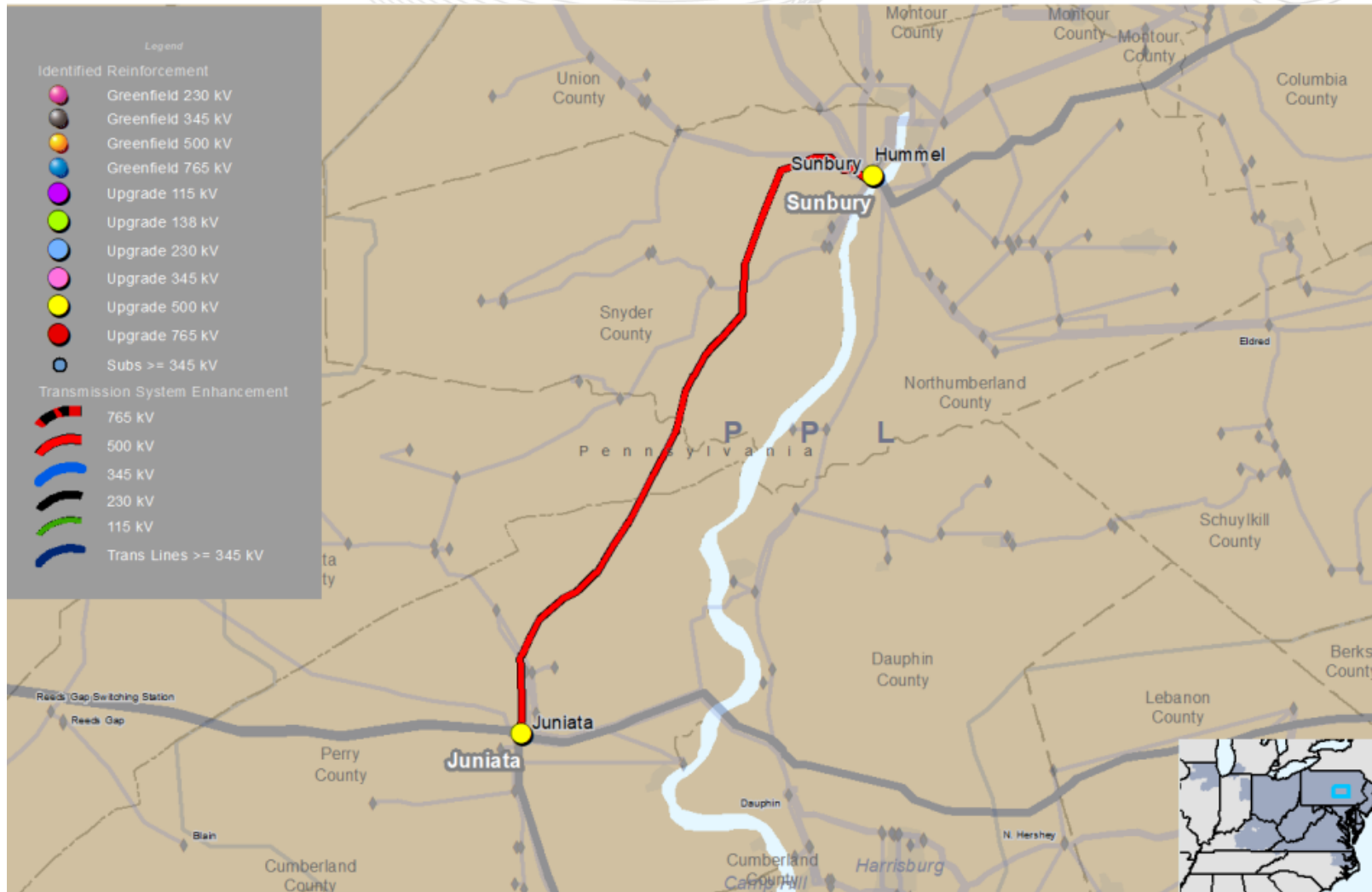
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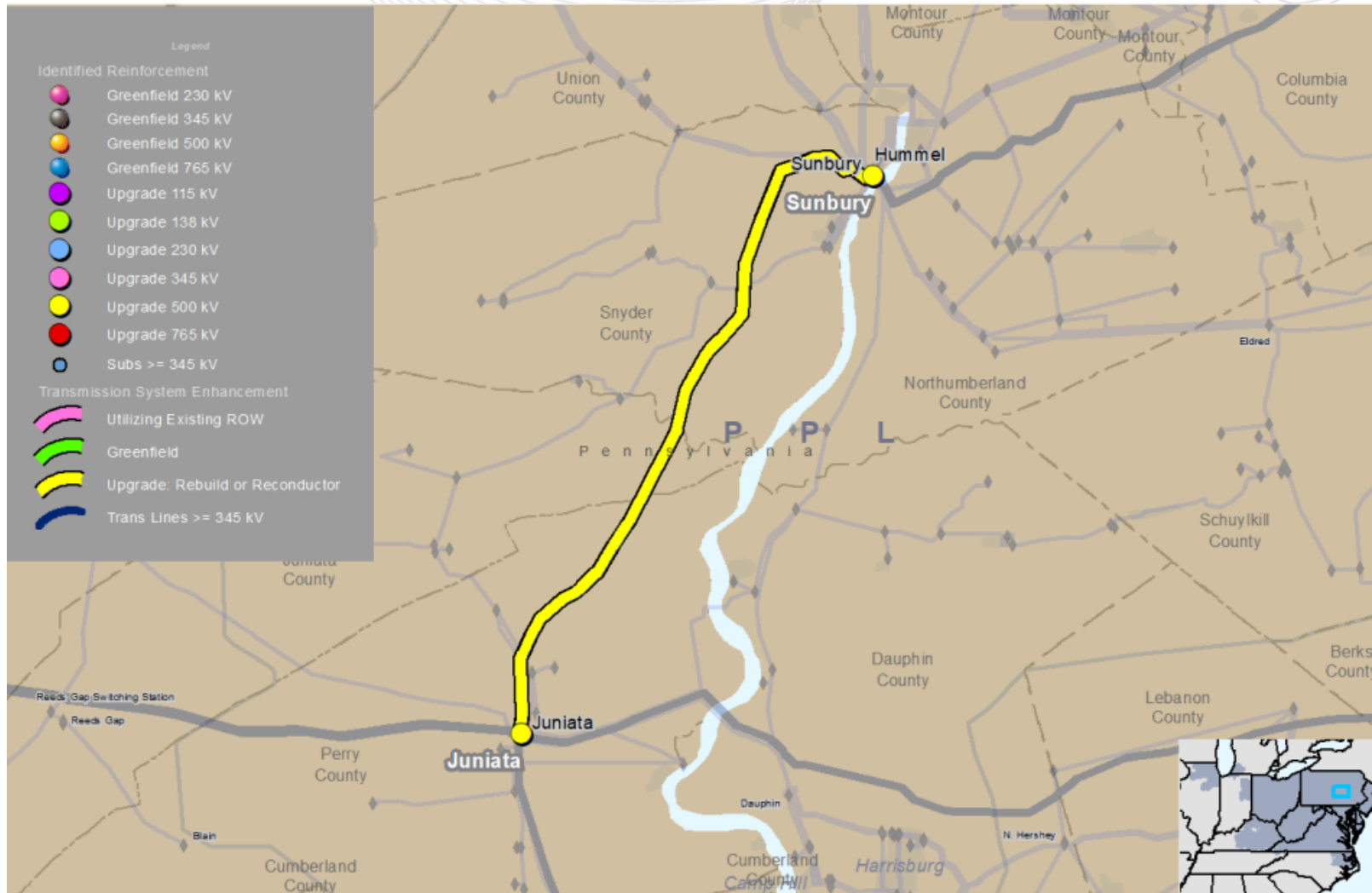


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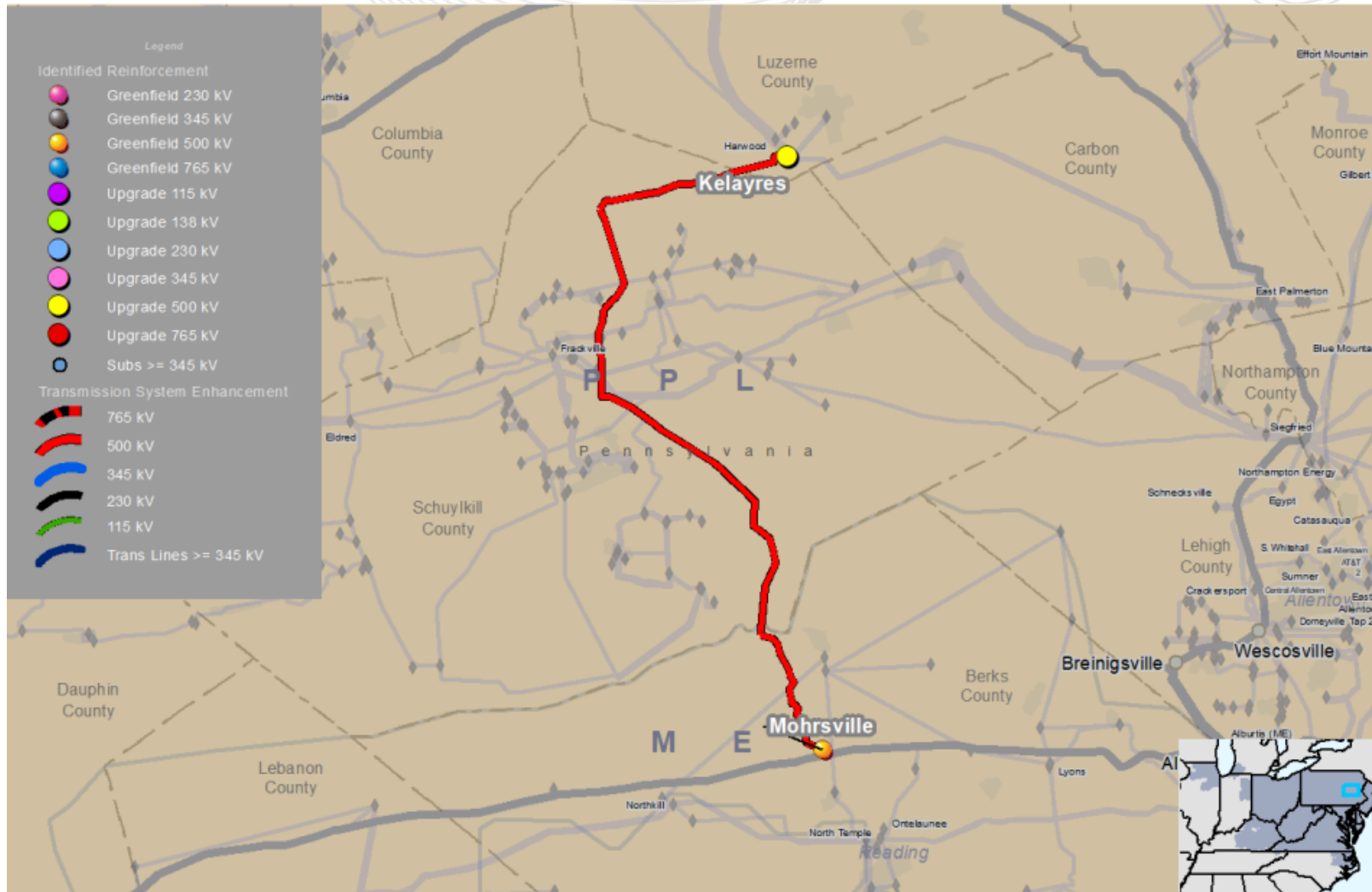


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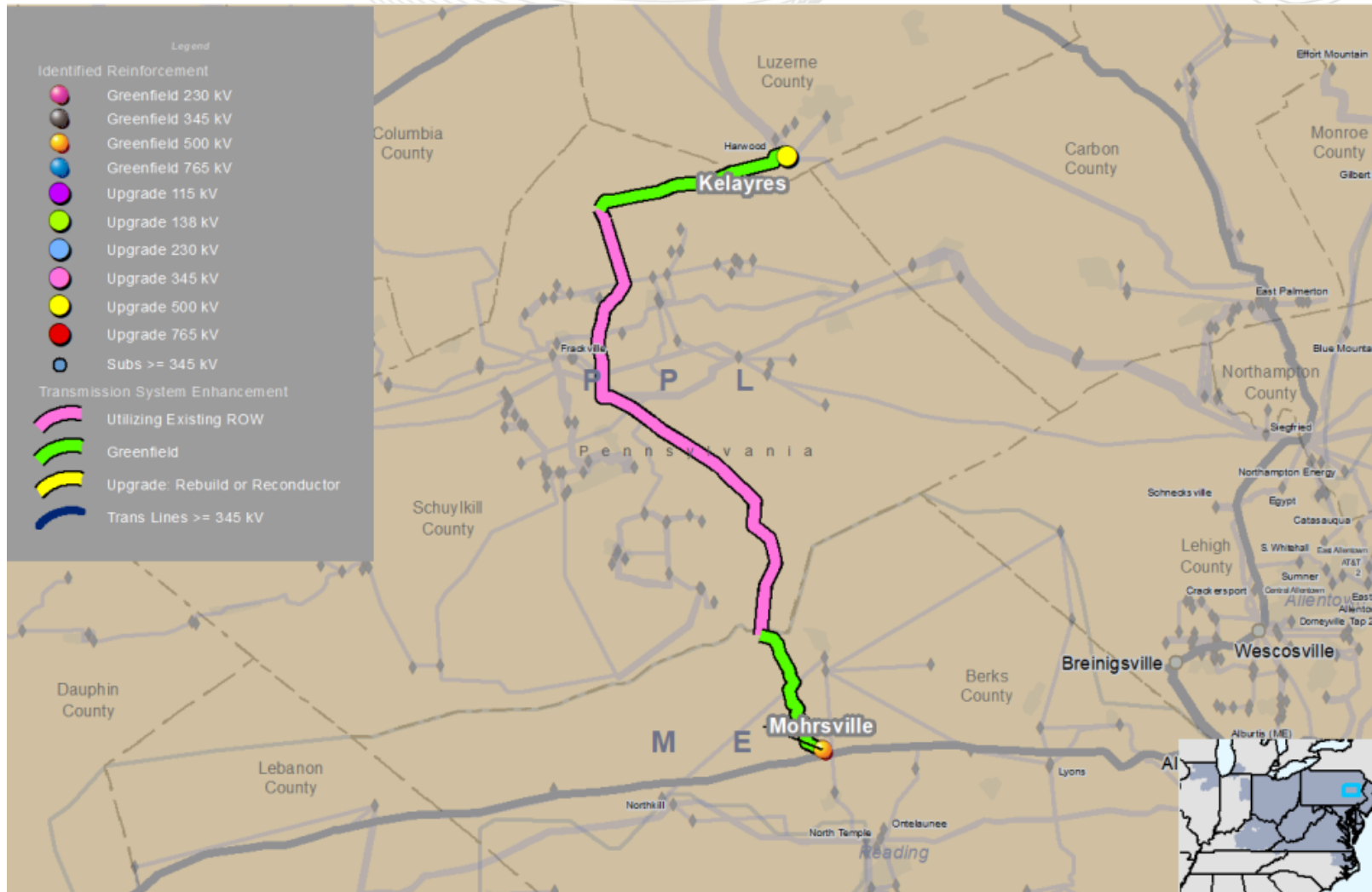




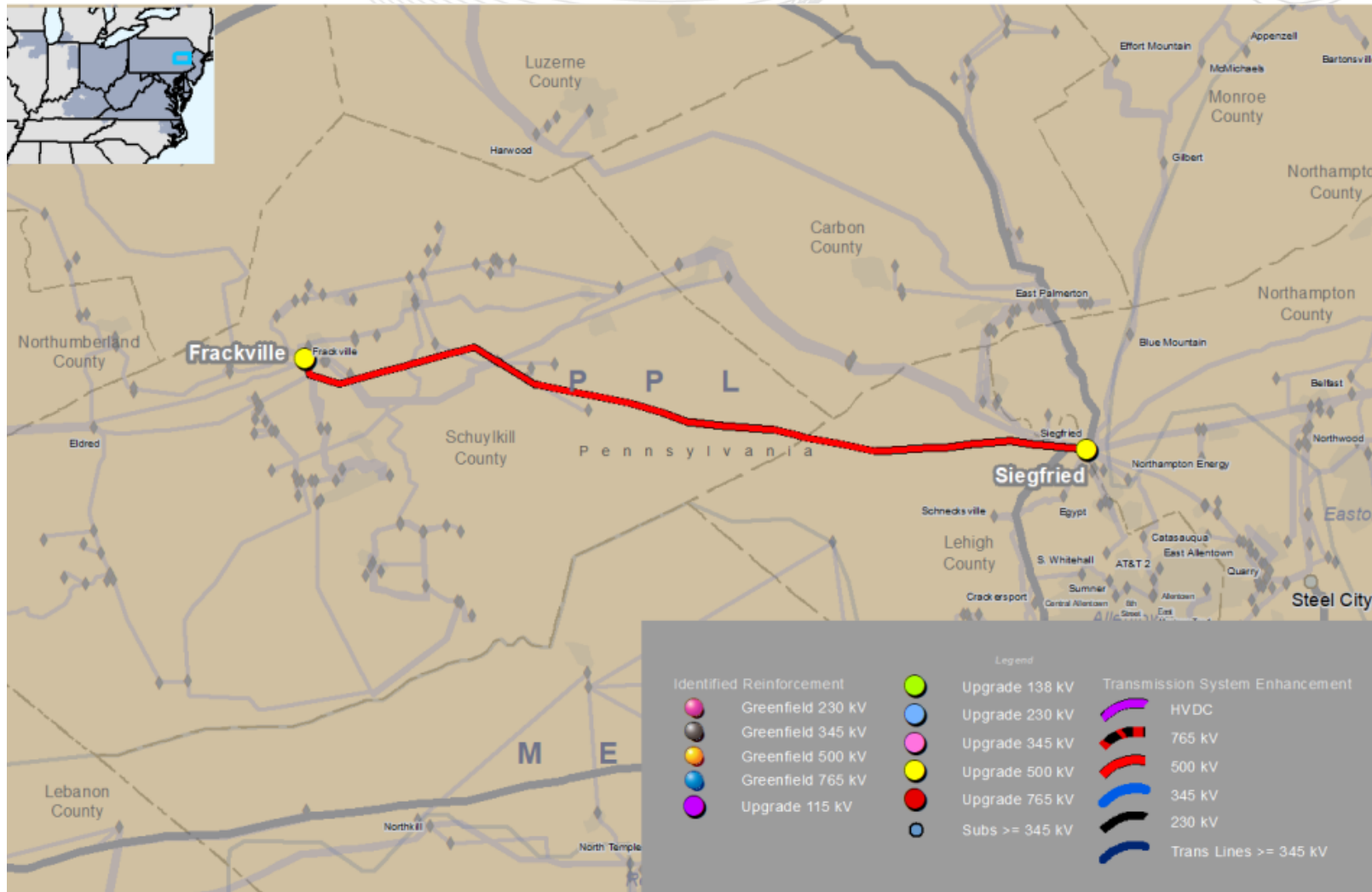
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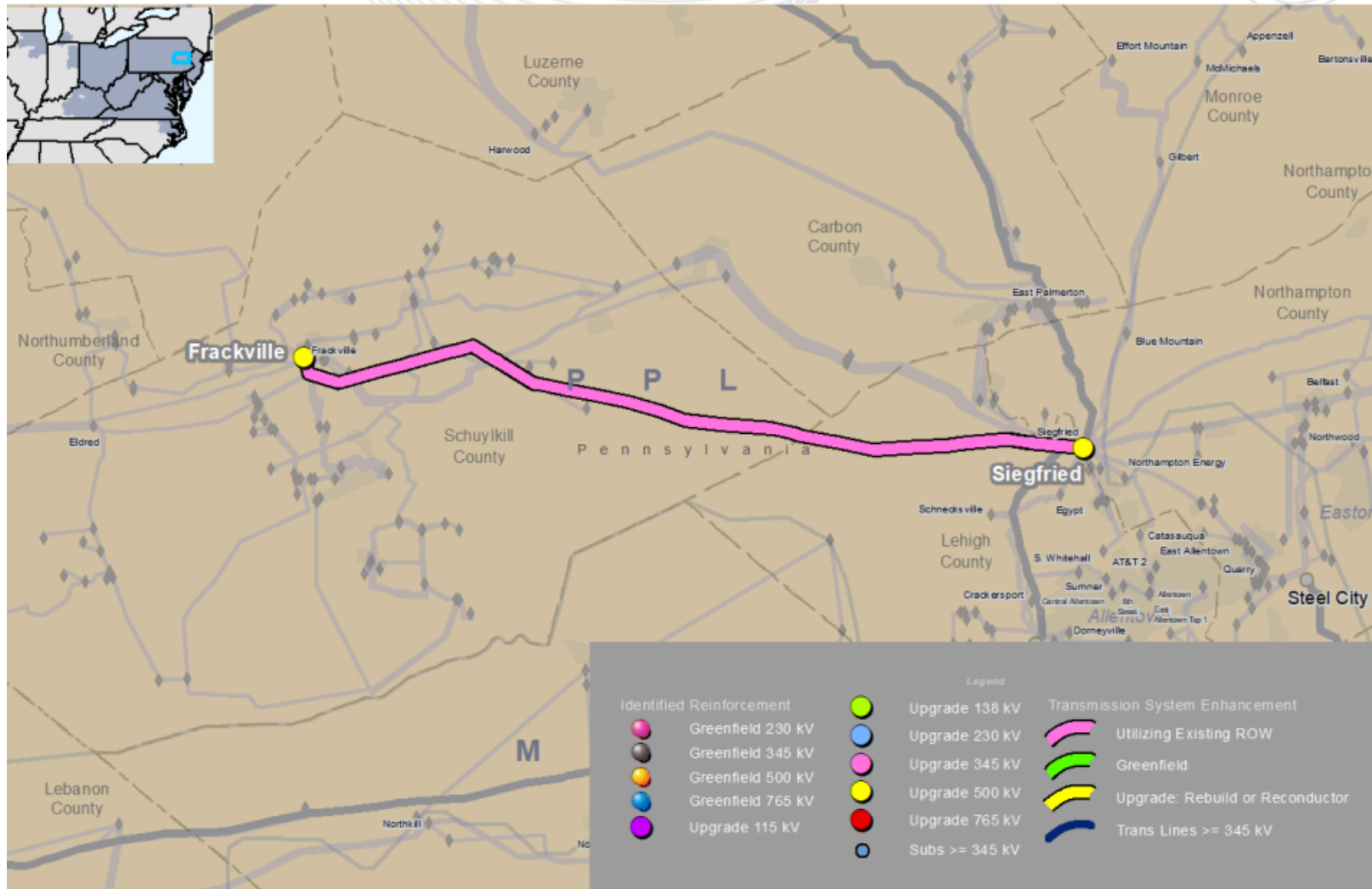
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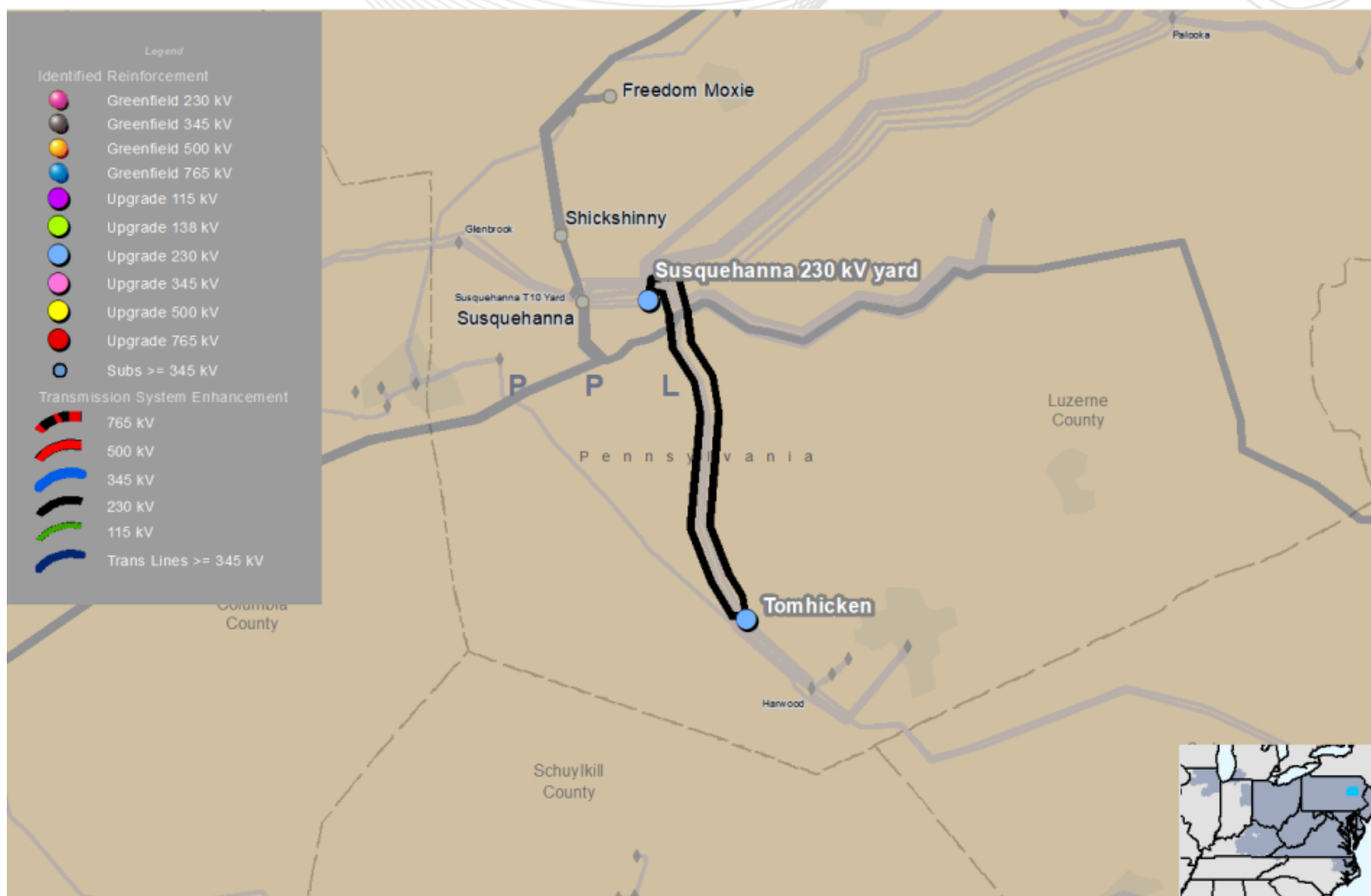


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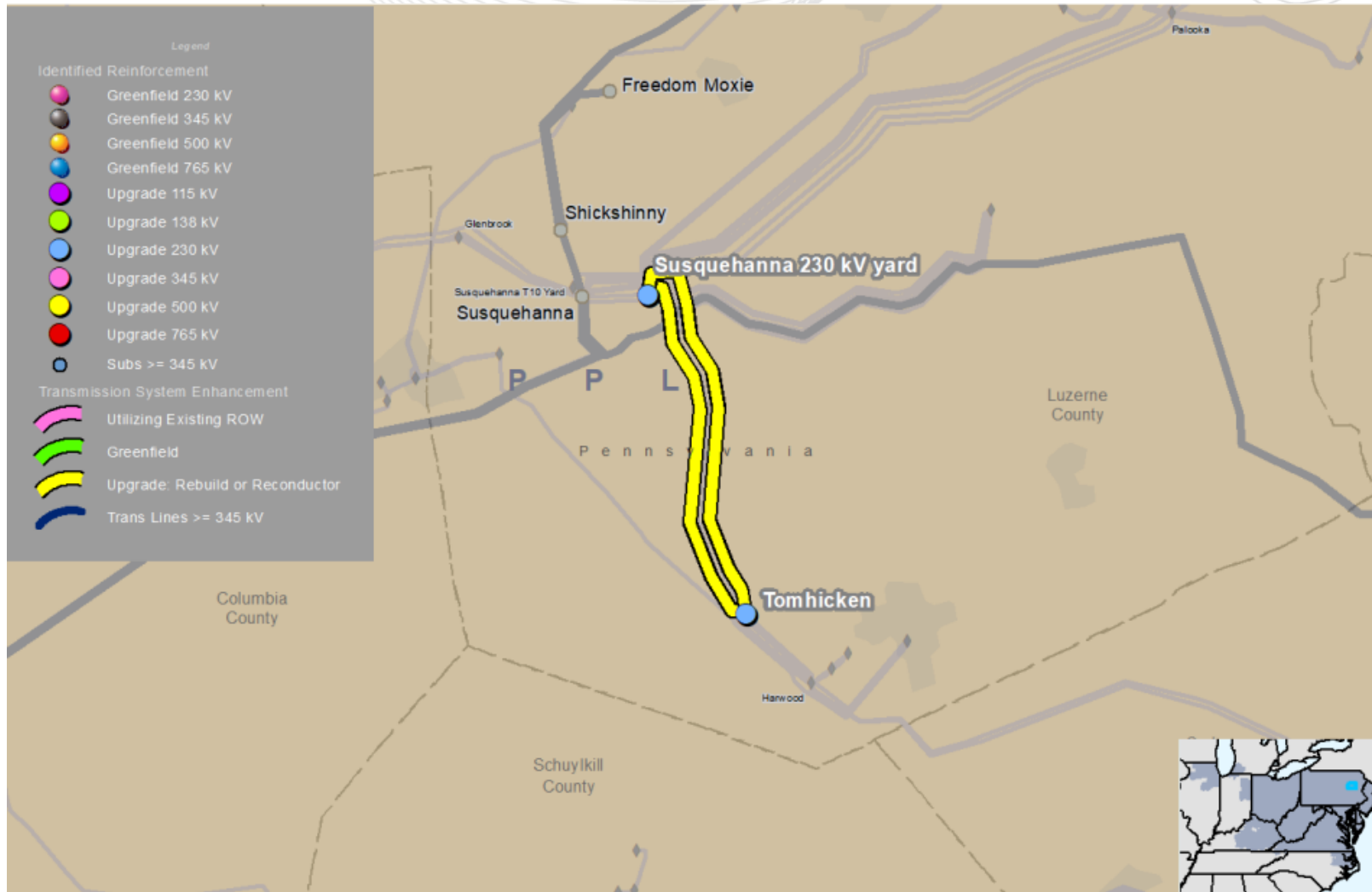


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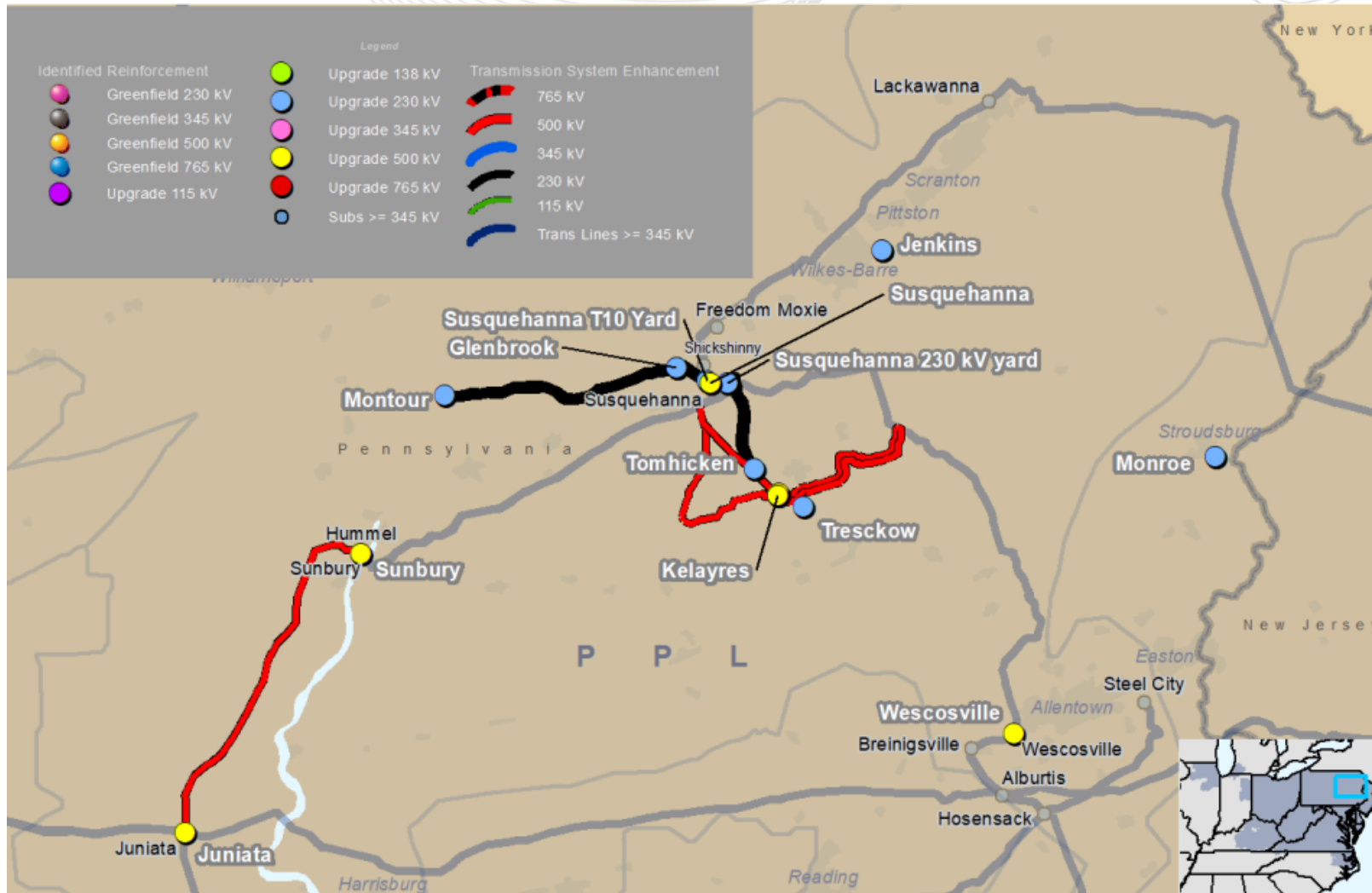




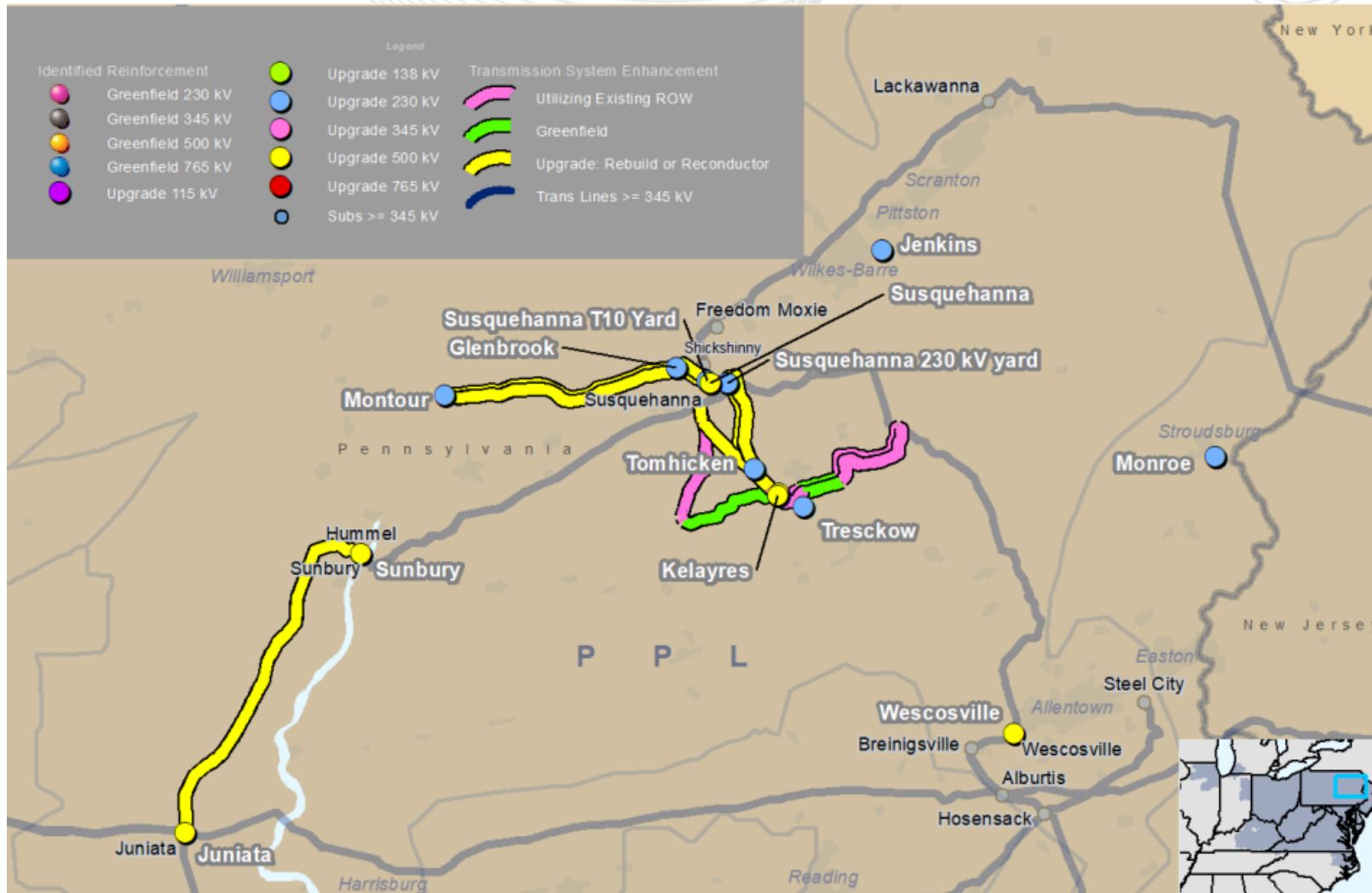
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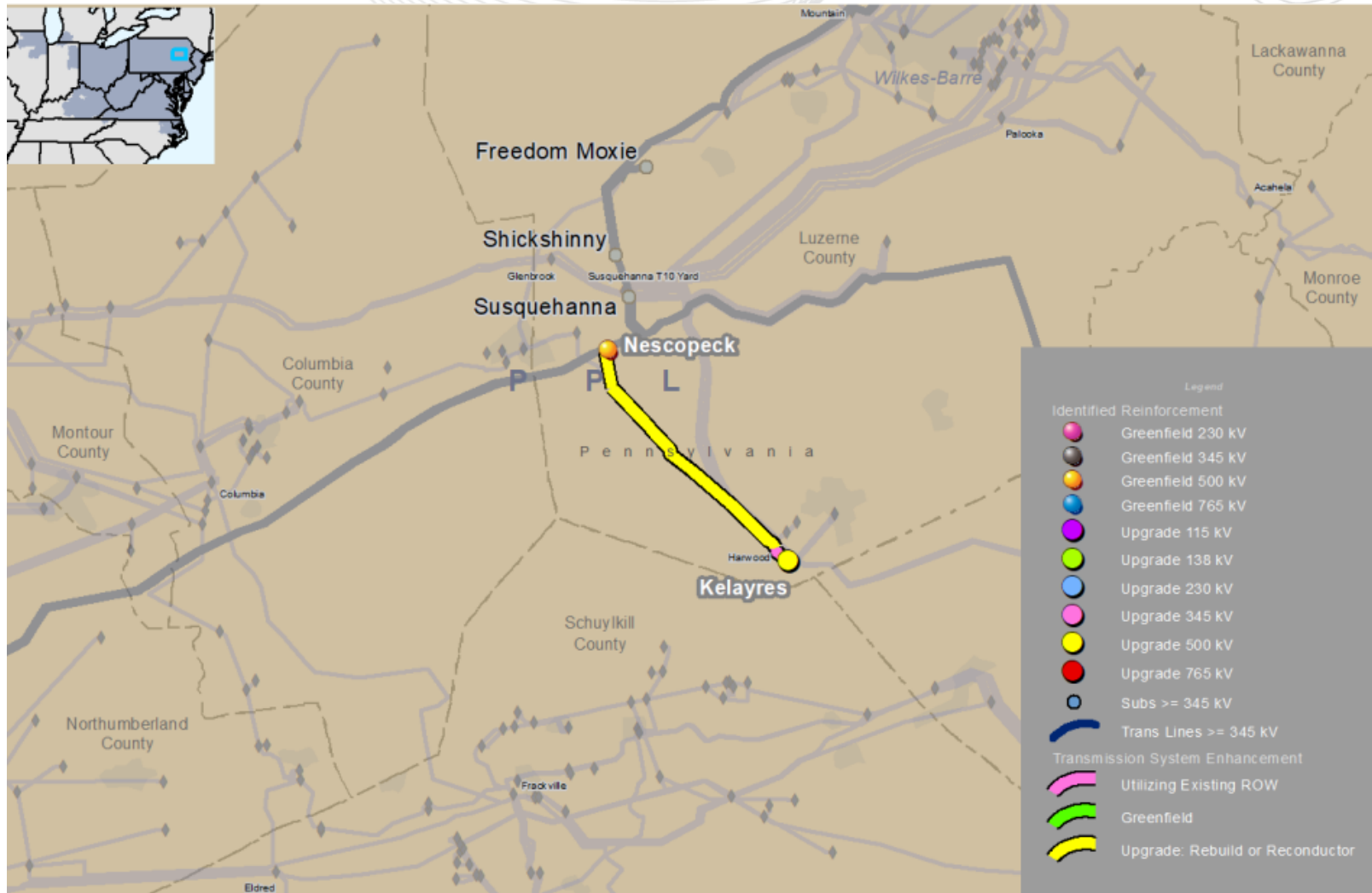


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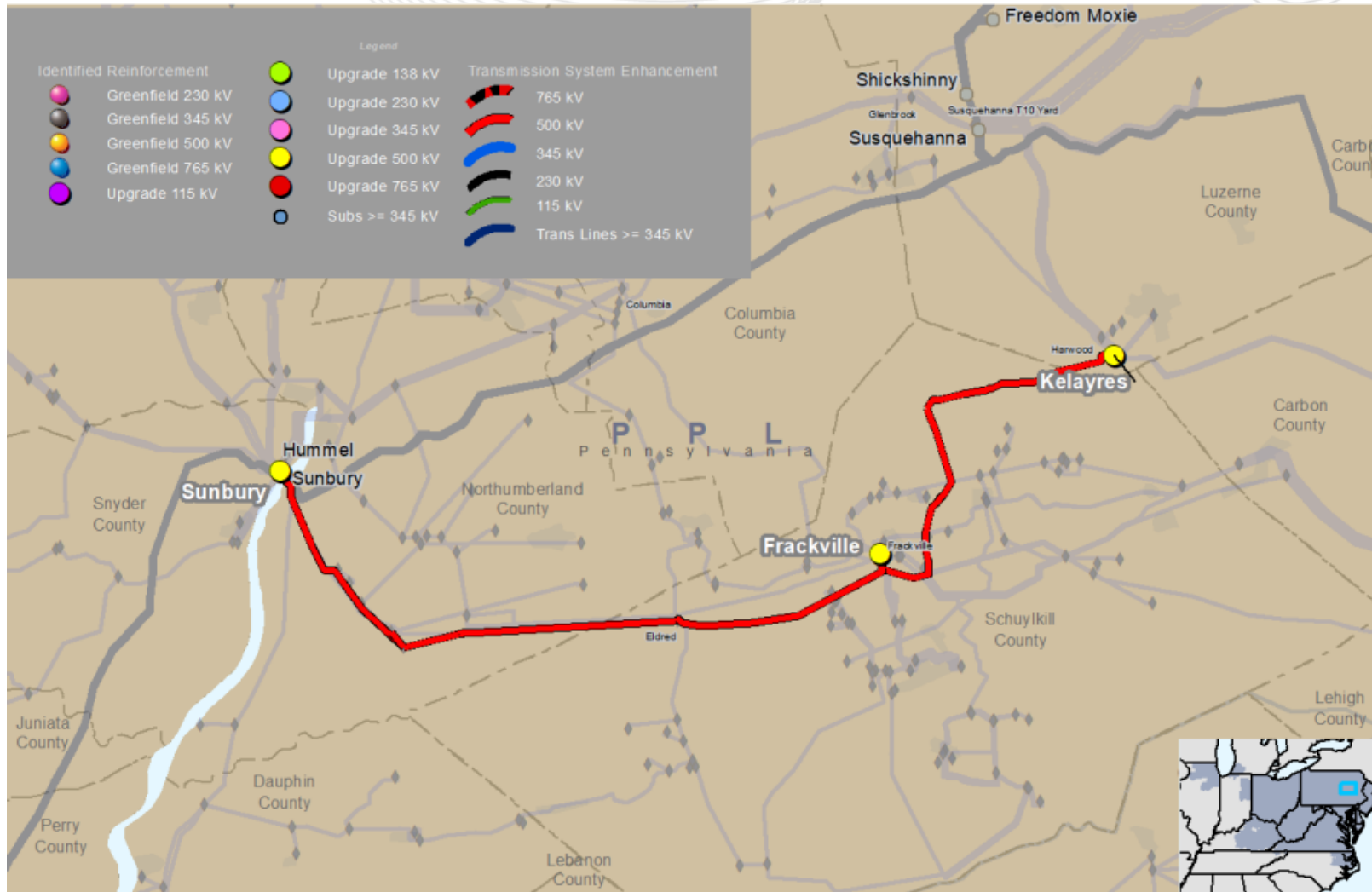


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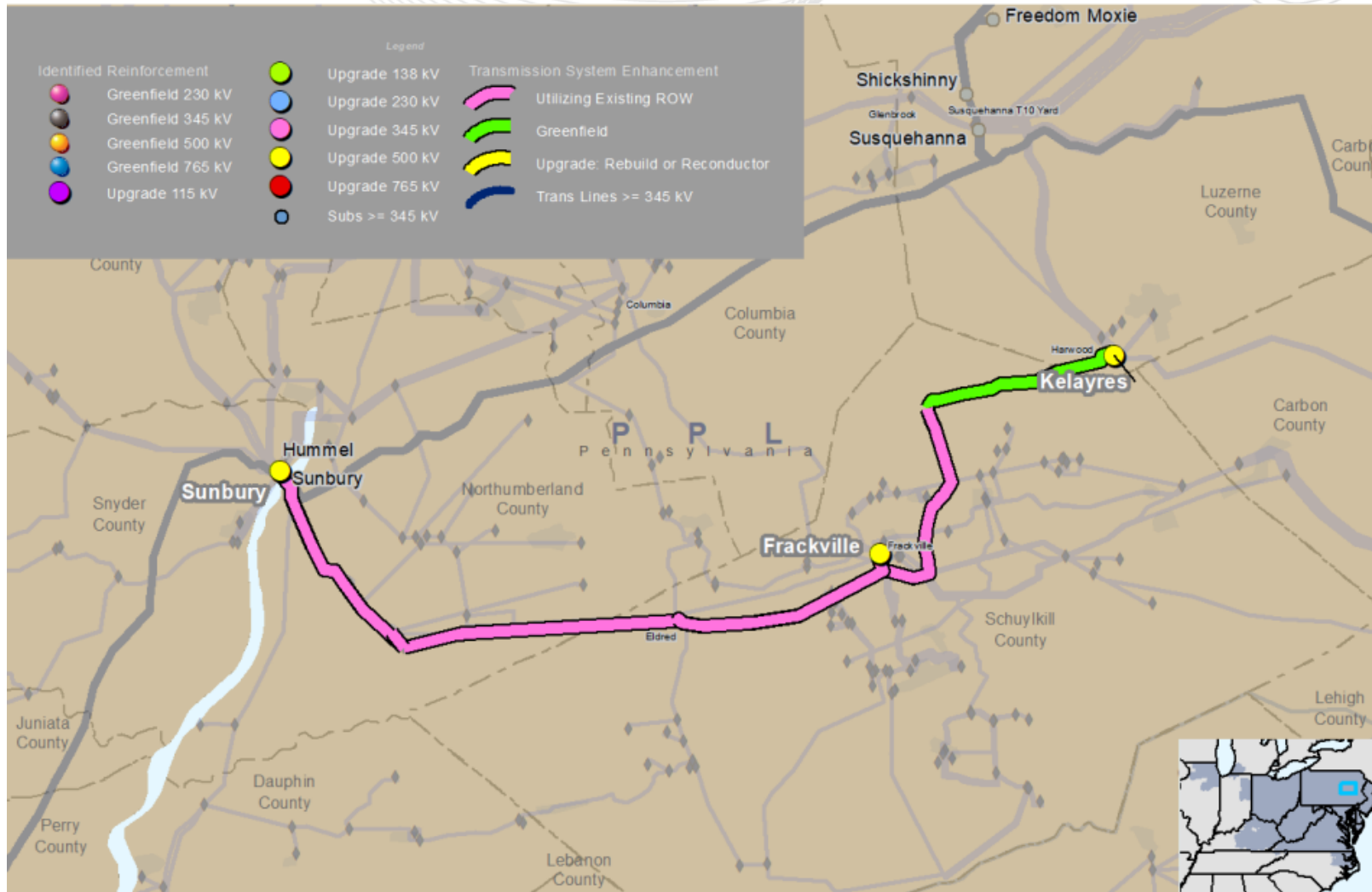




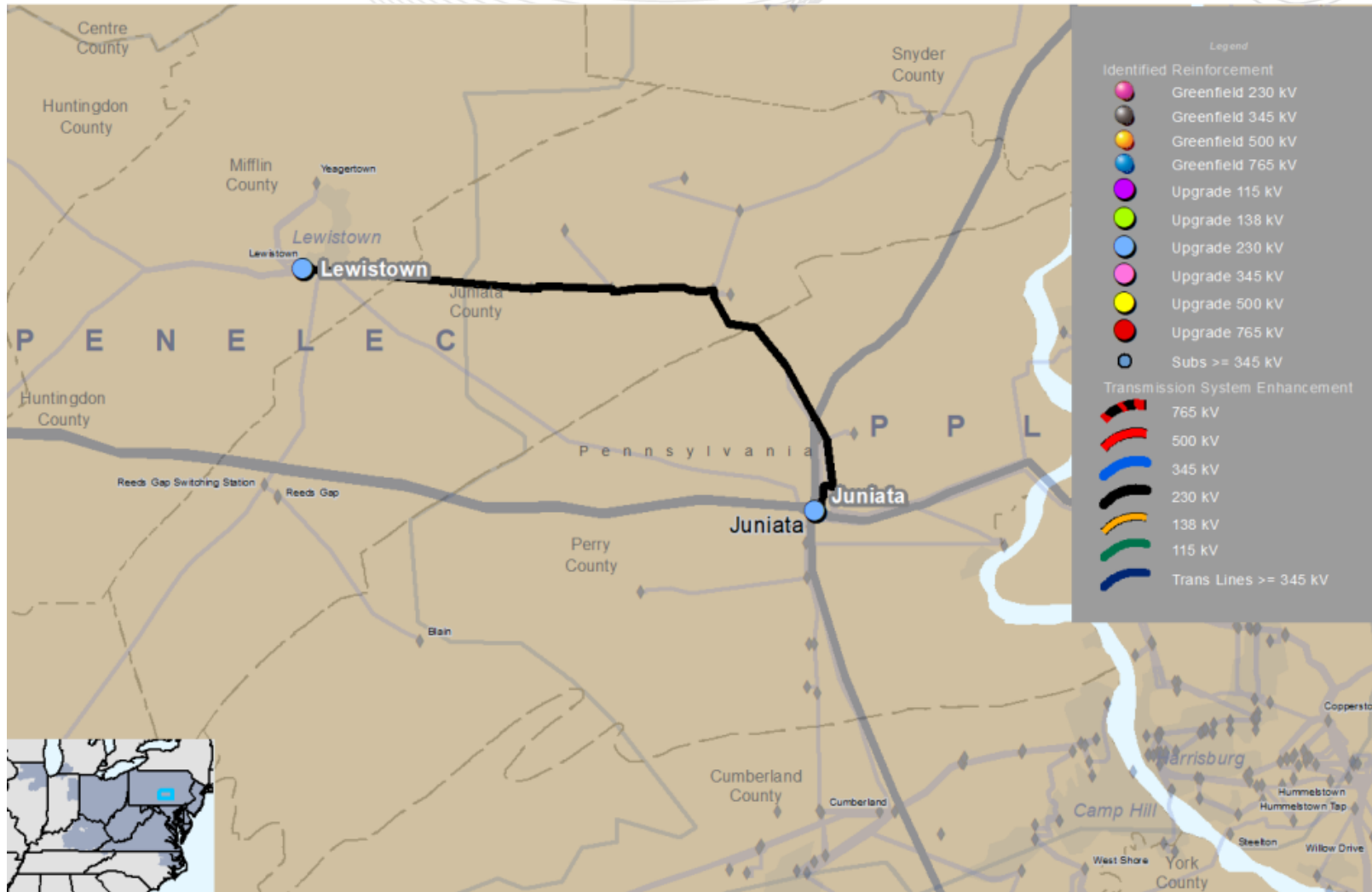
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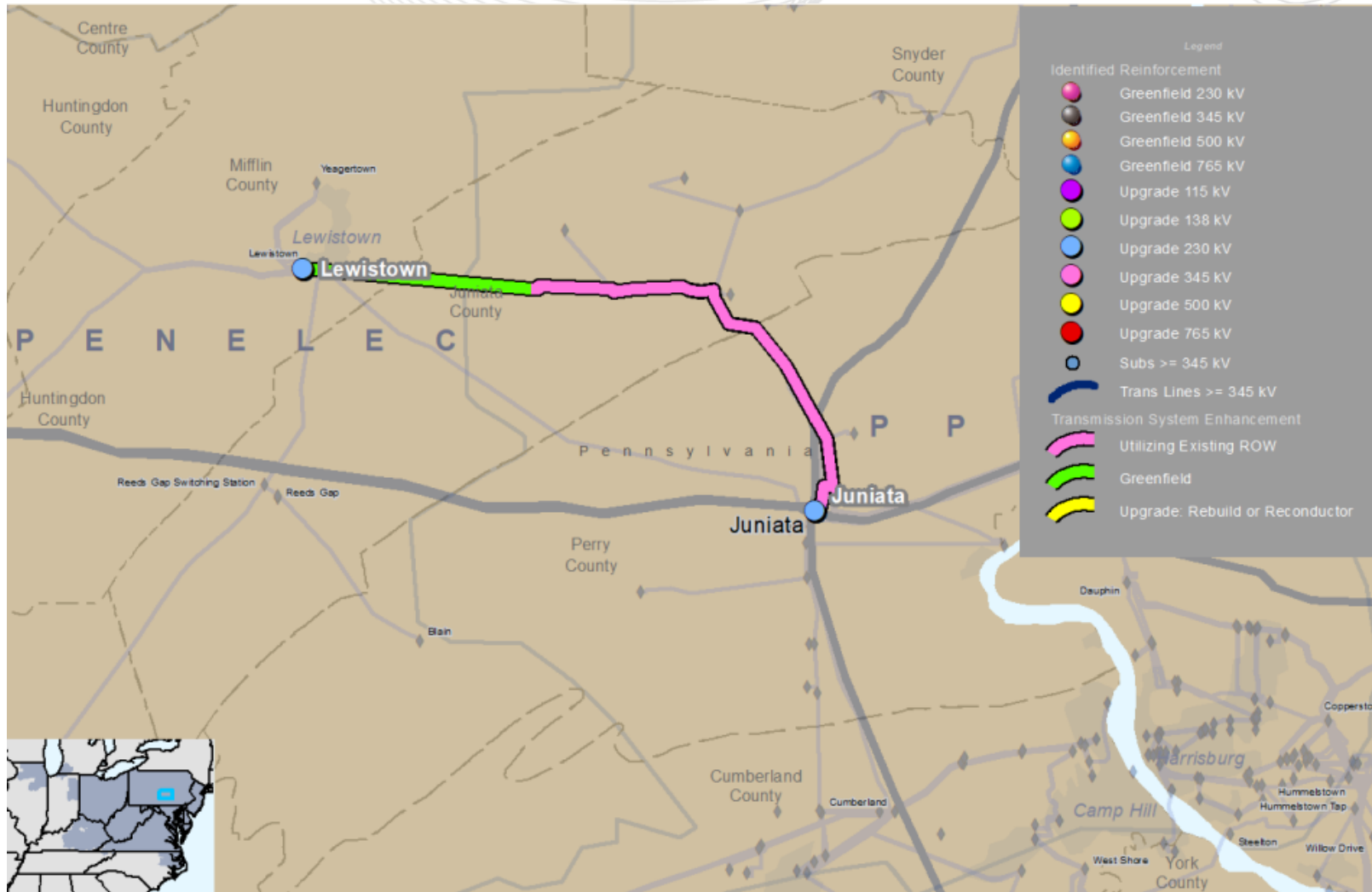
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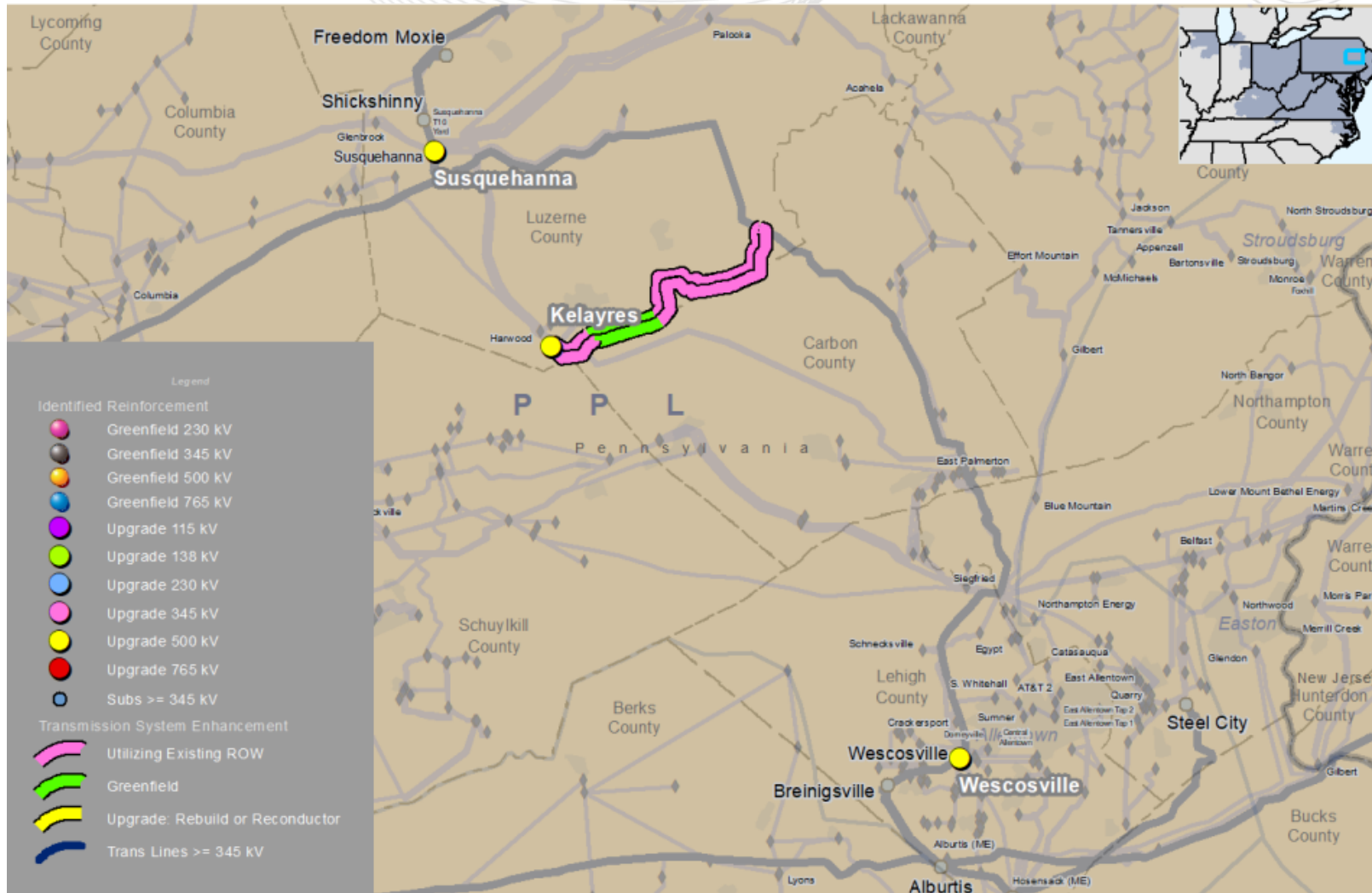


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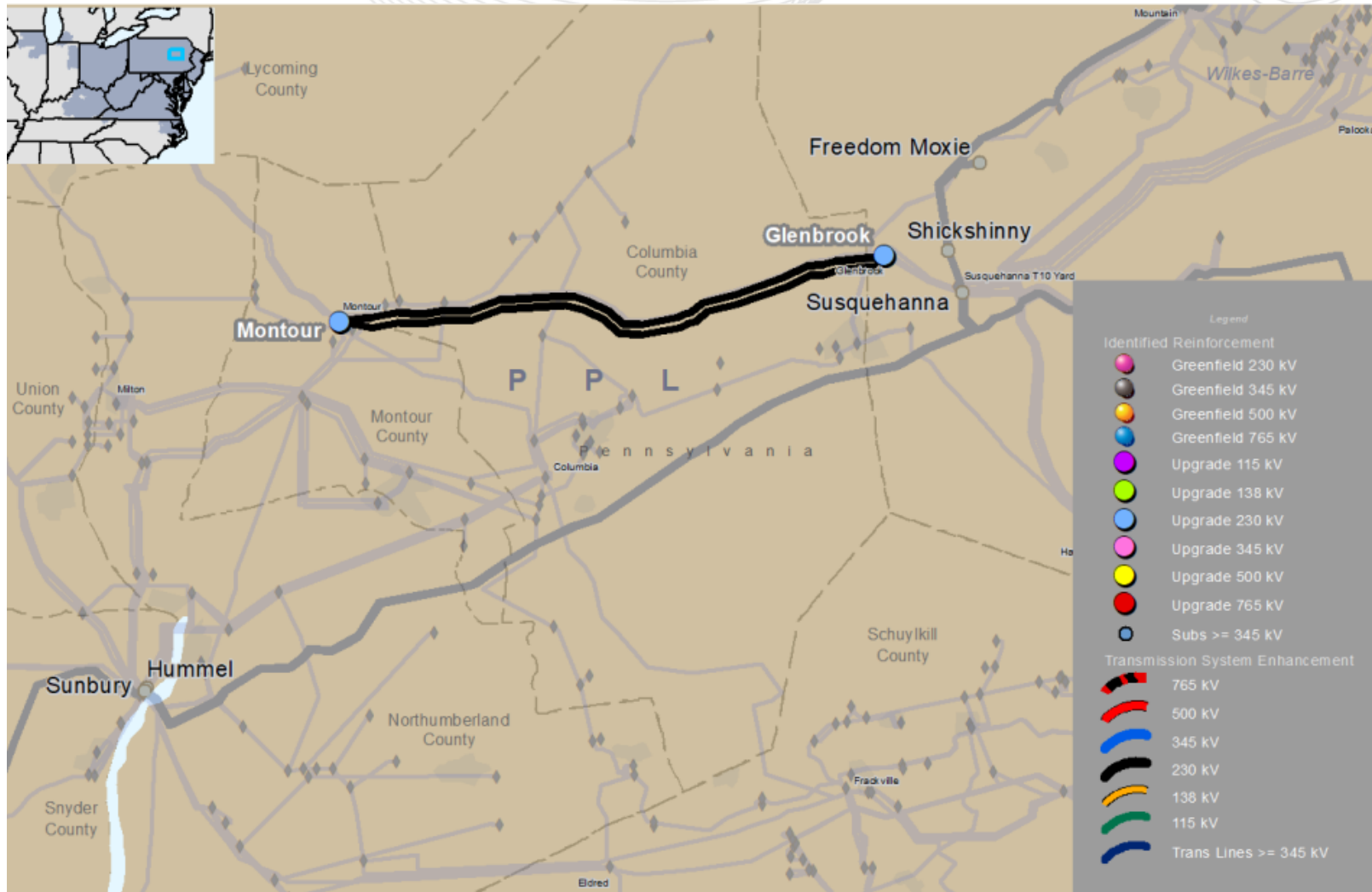




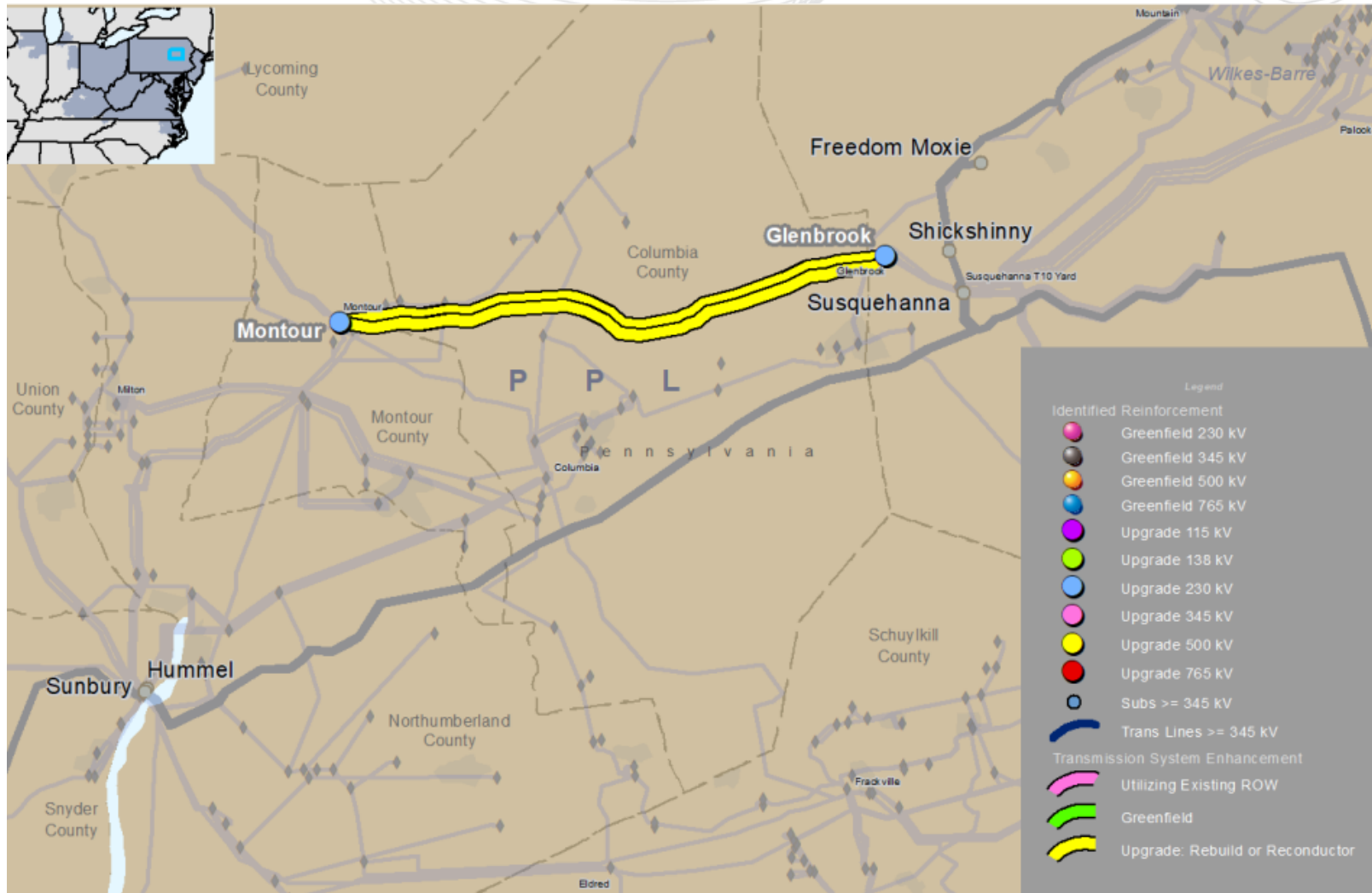
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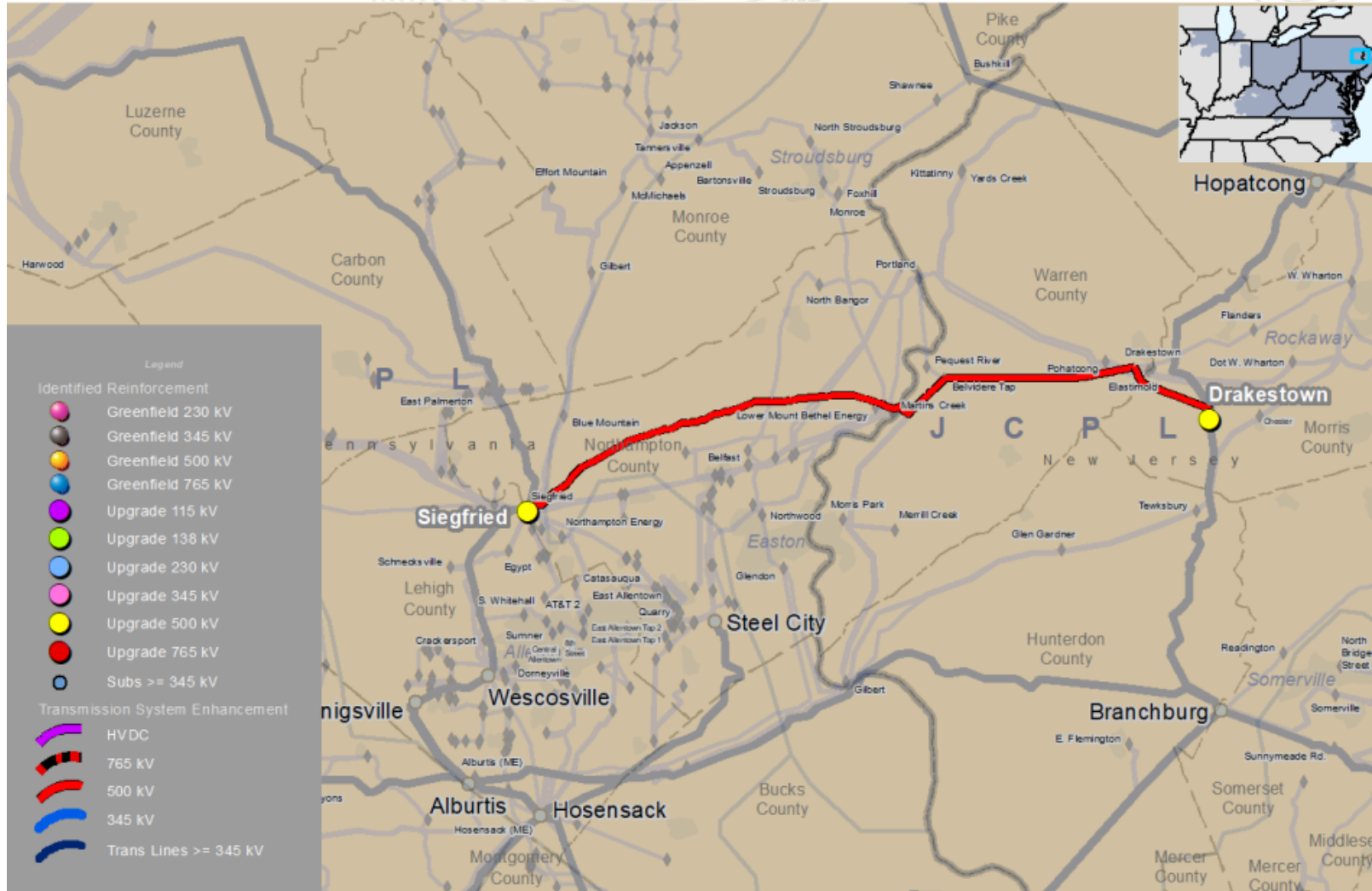


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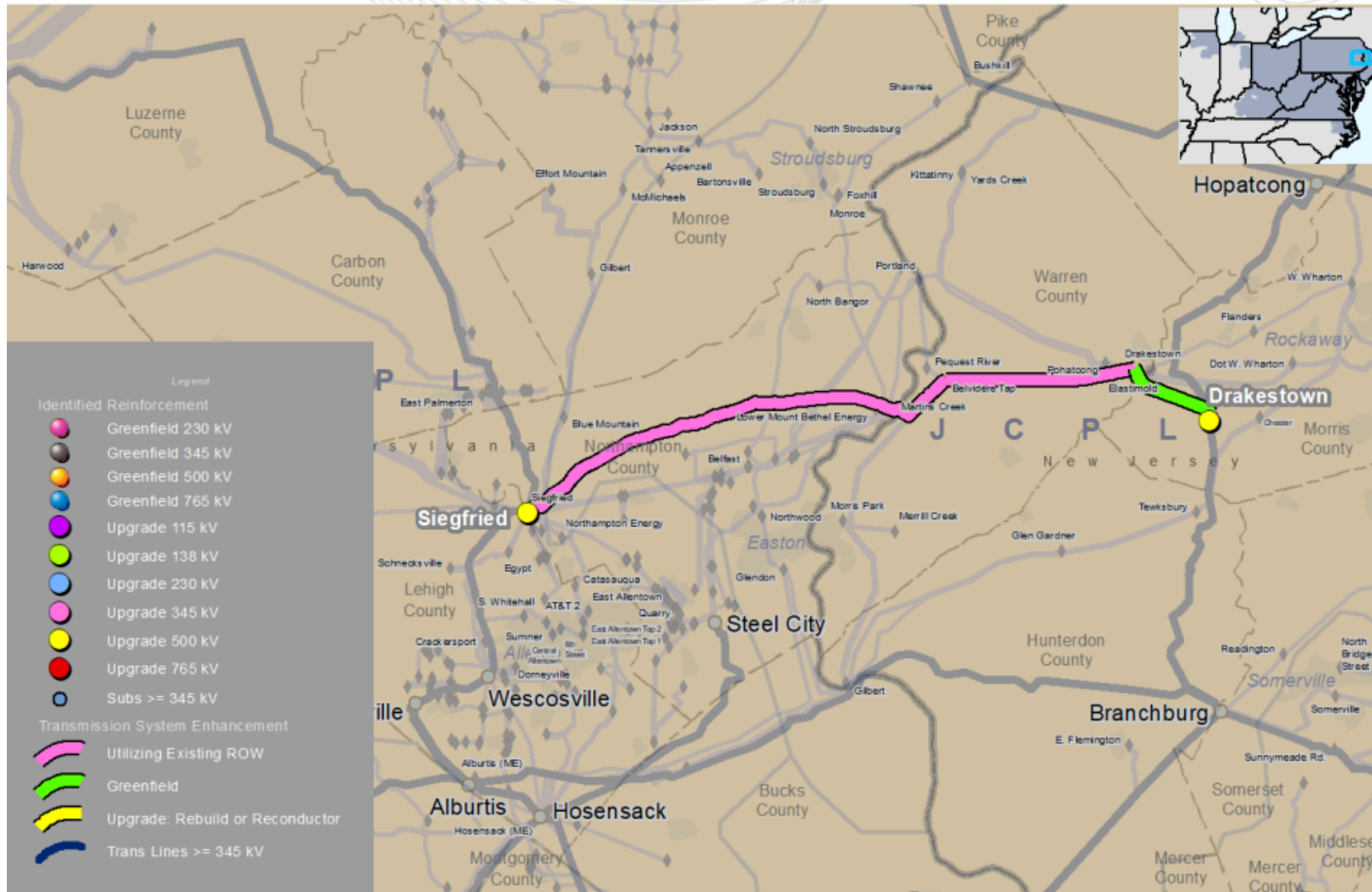
# PPLTO & TRNSLK

## (Connected Proposals by PPL and Translink)

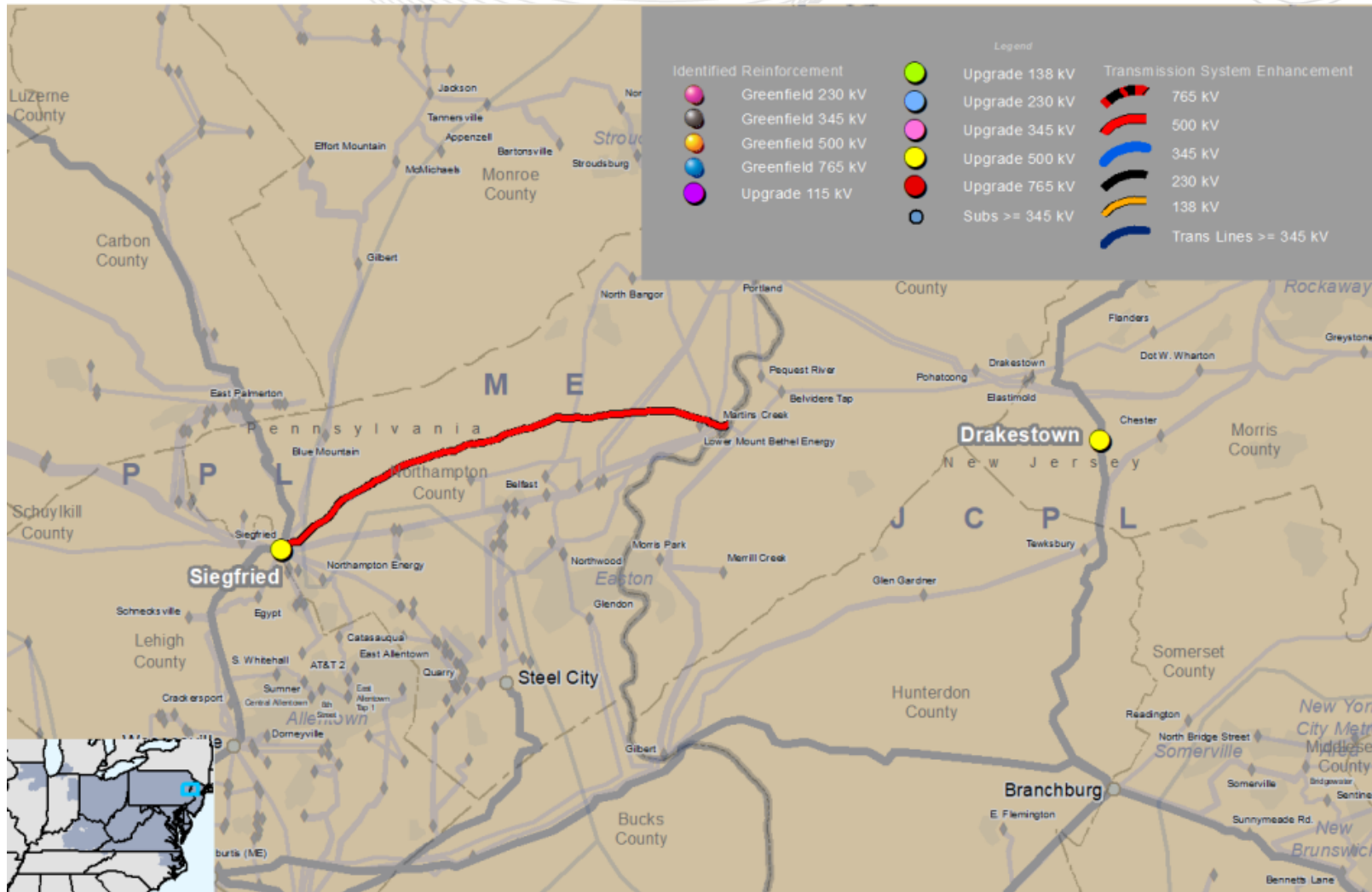




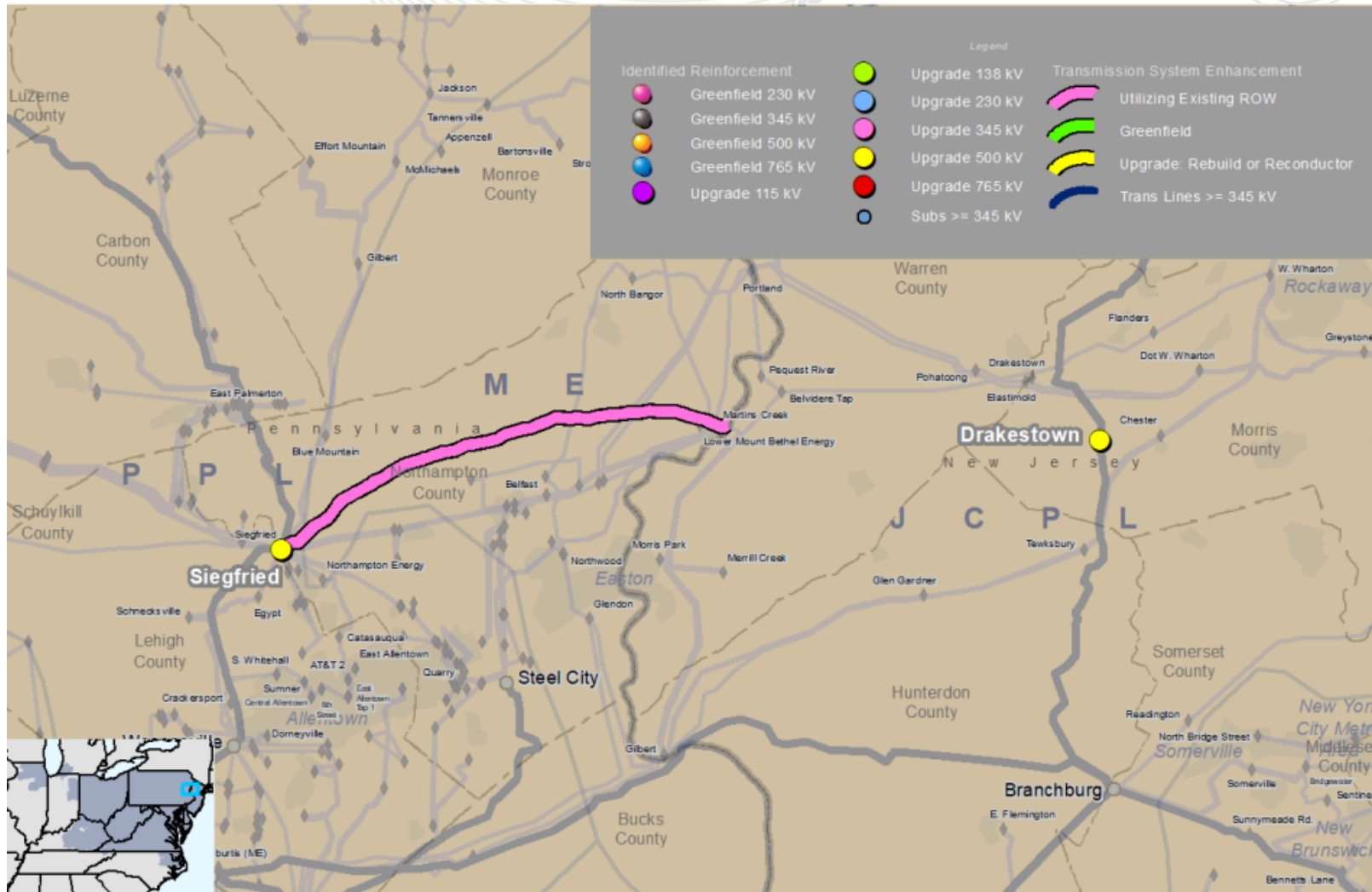
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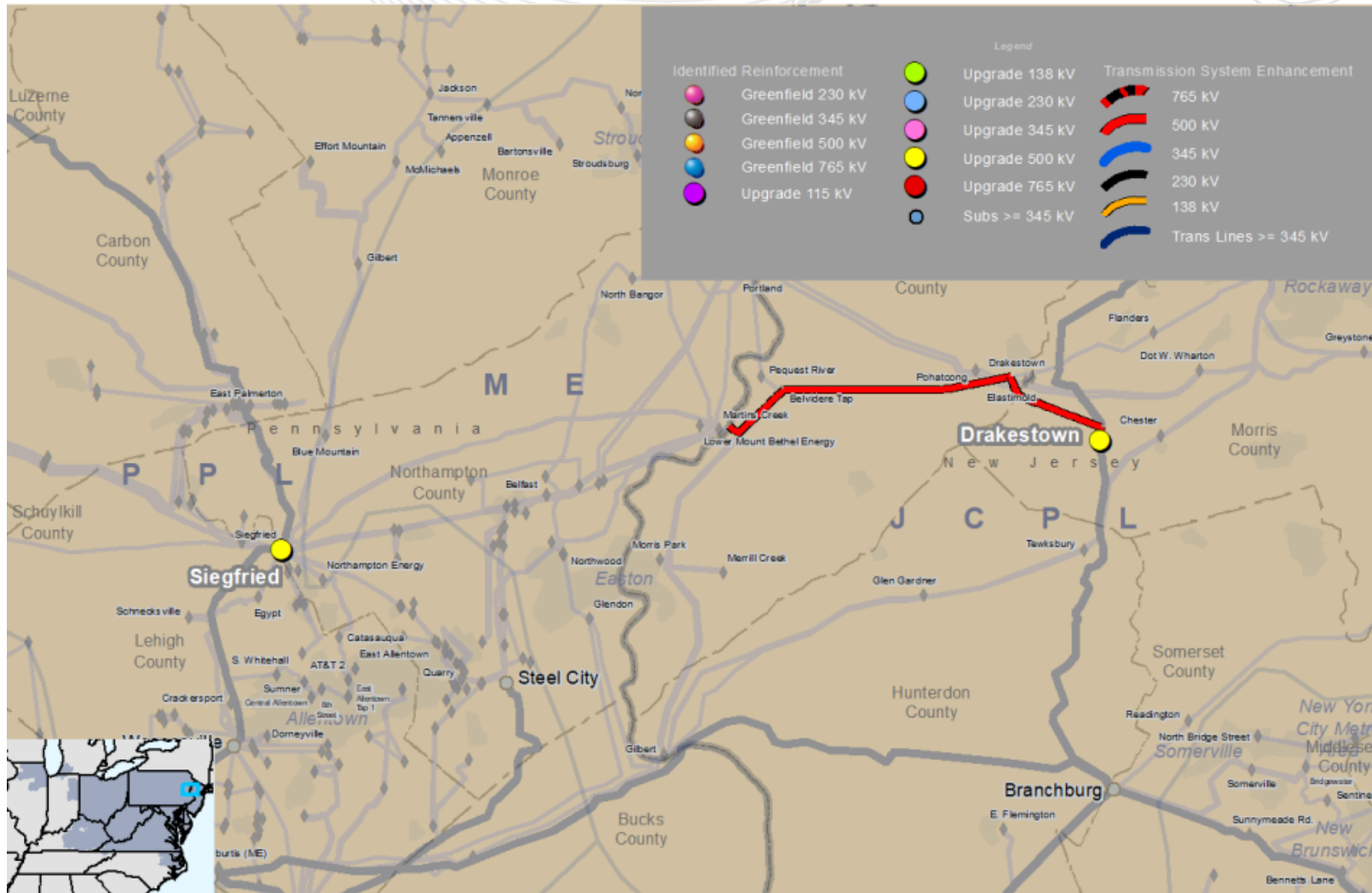


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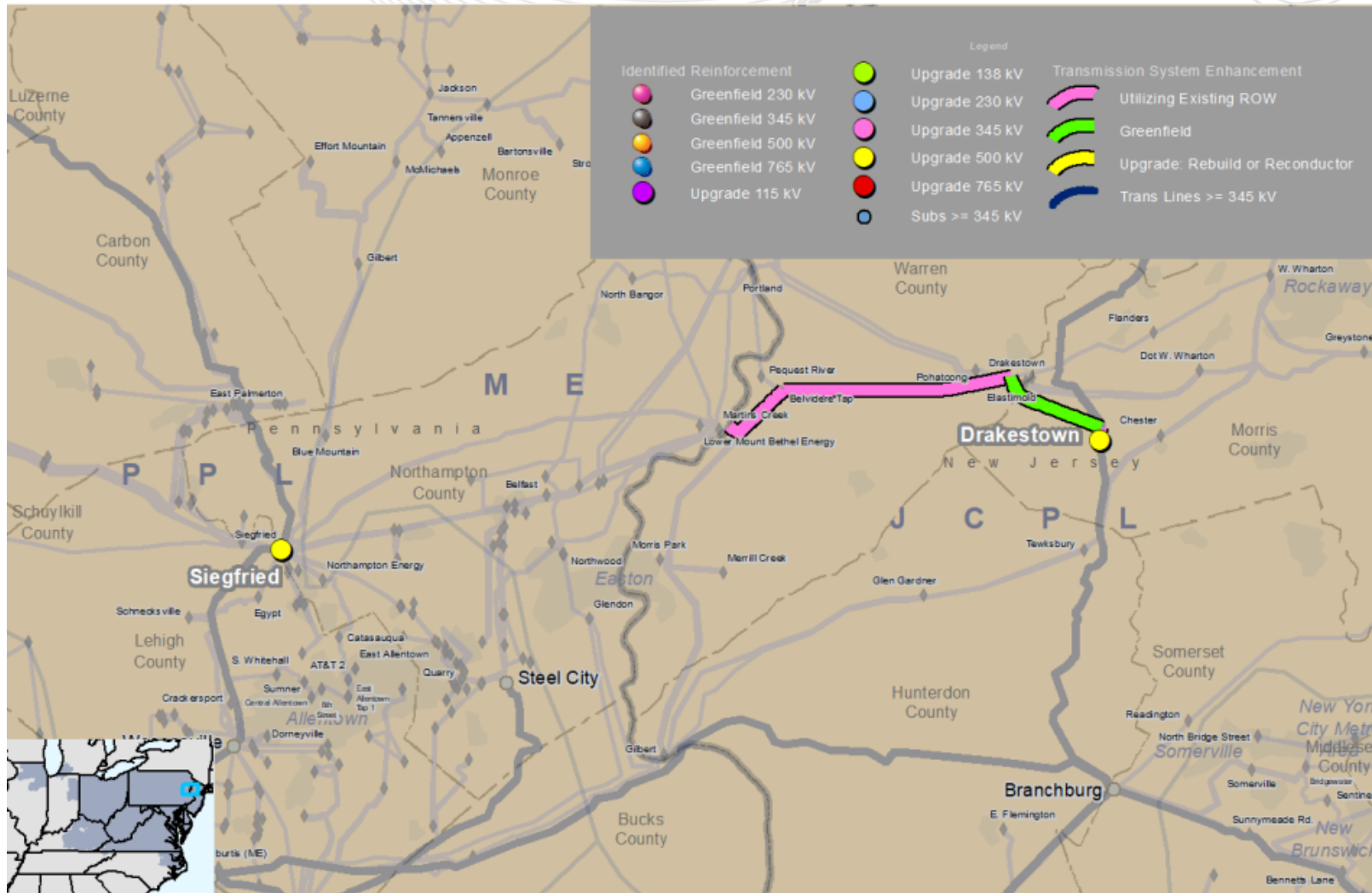
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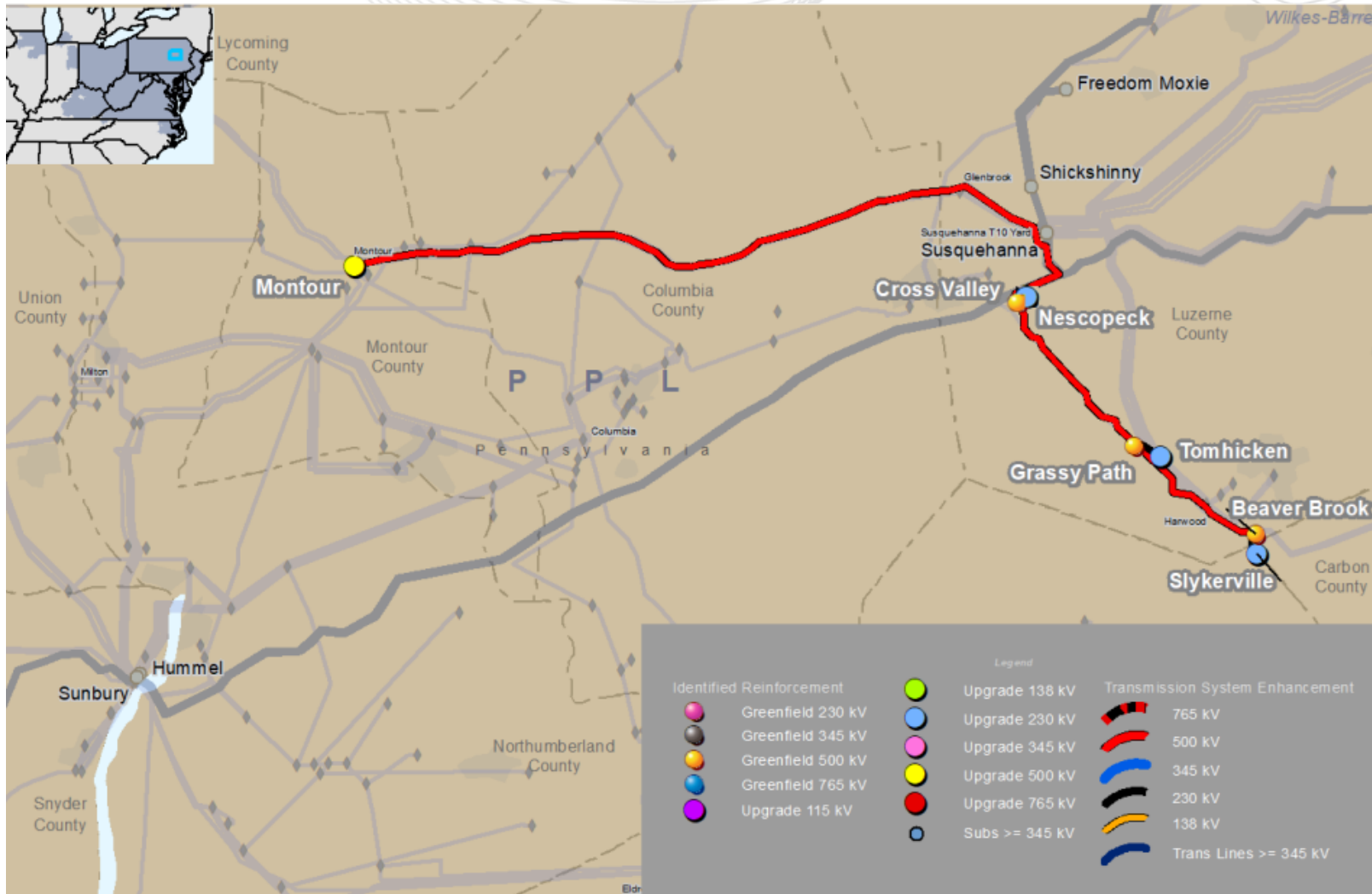
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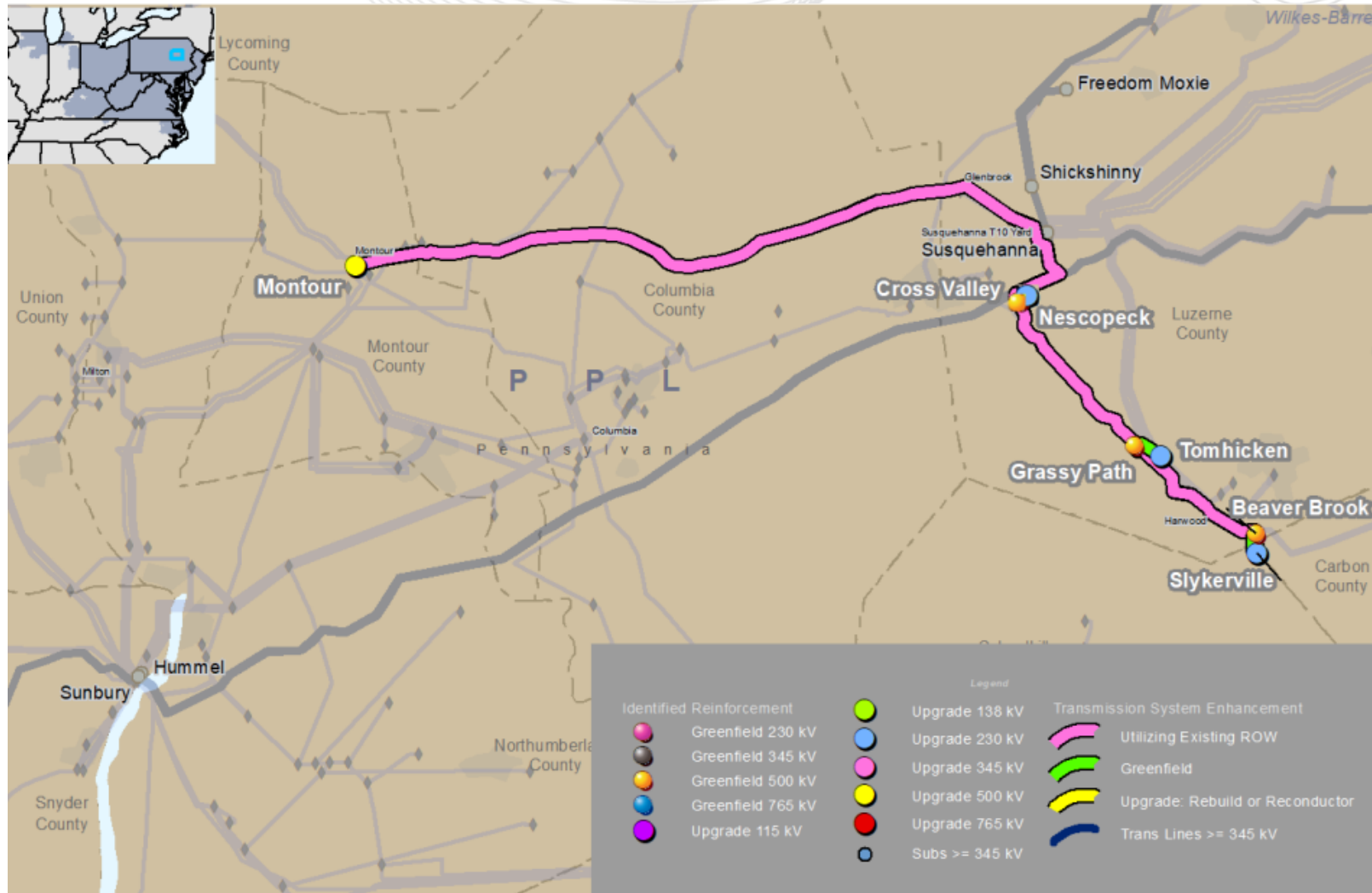


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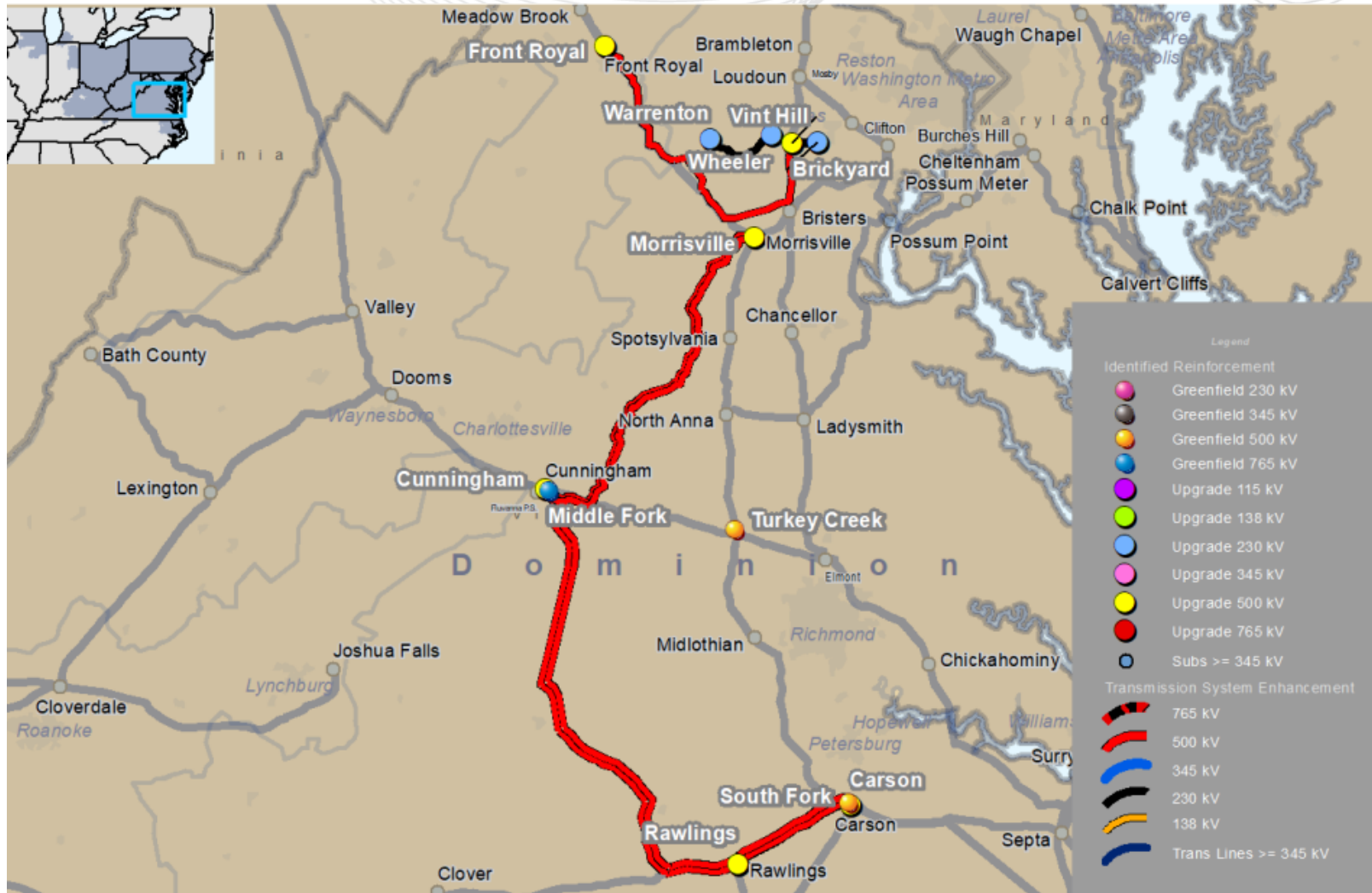
# CNTLTM (LS Power)



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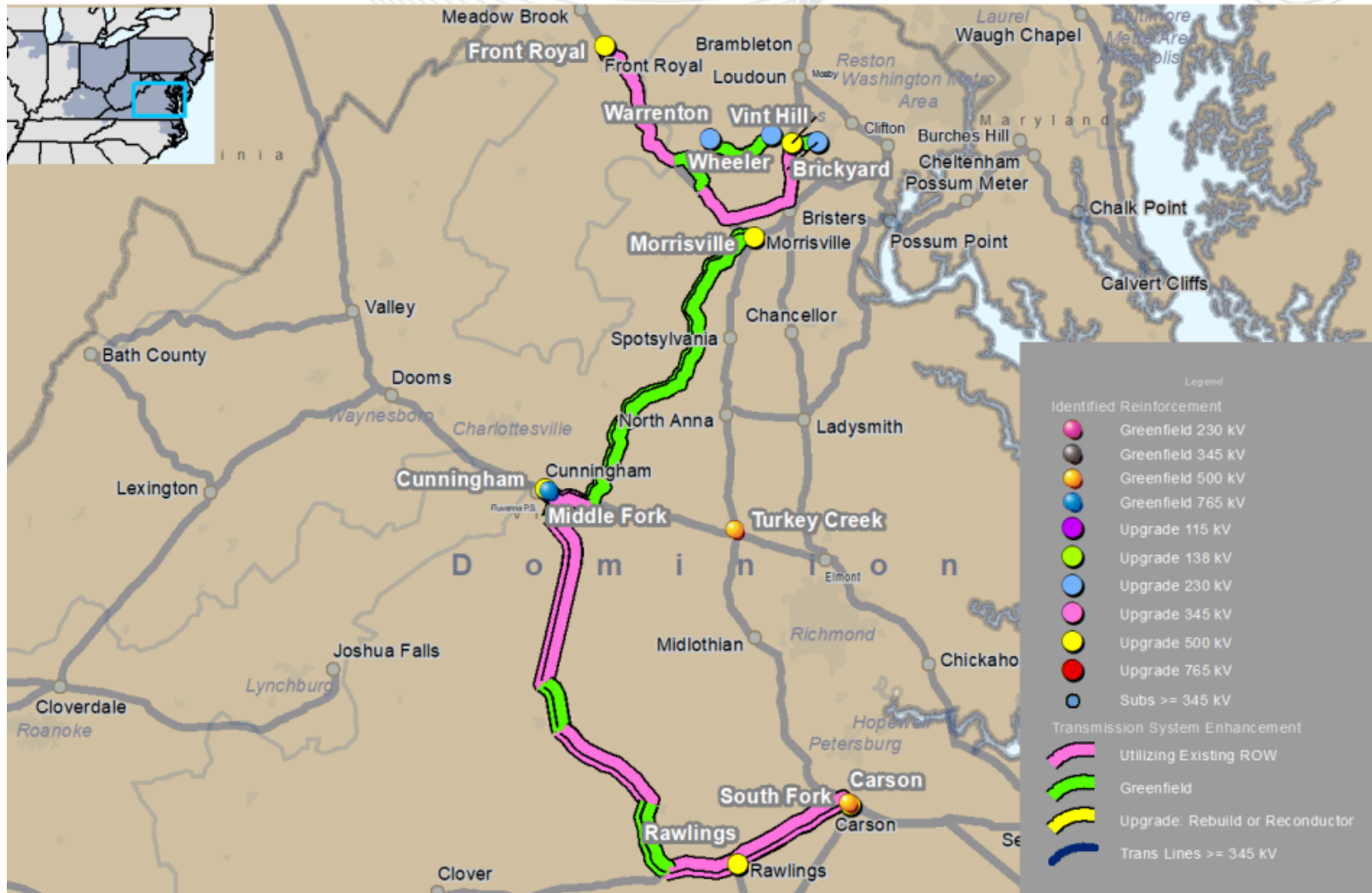


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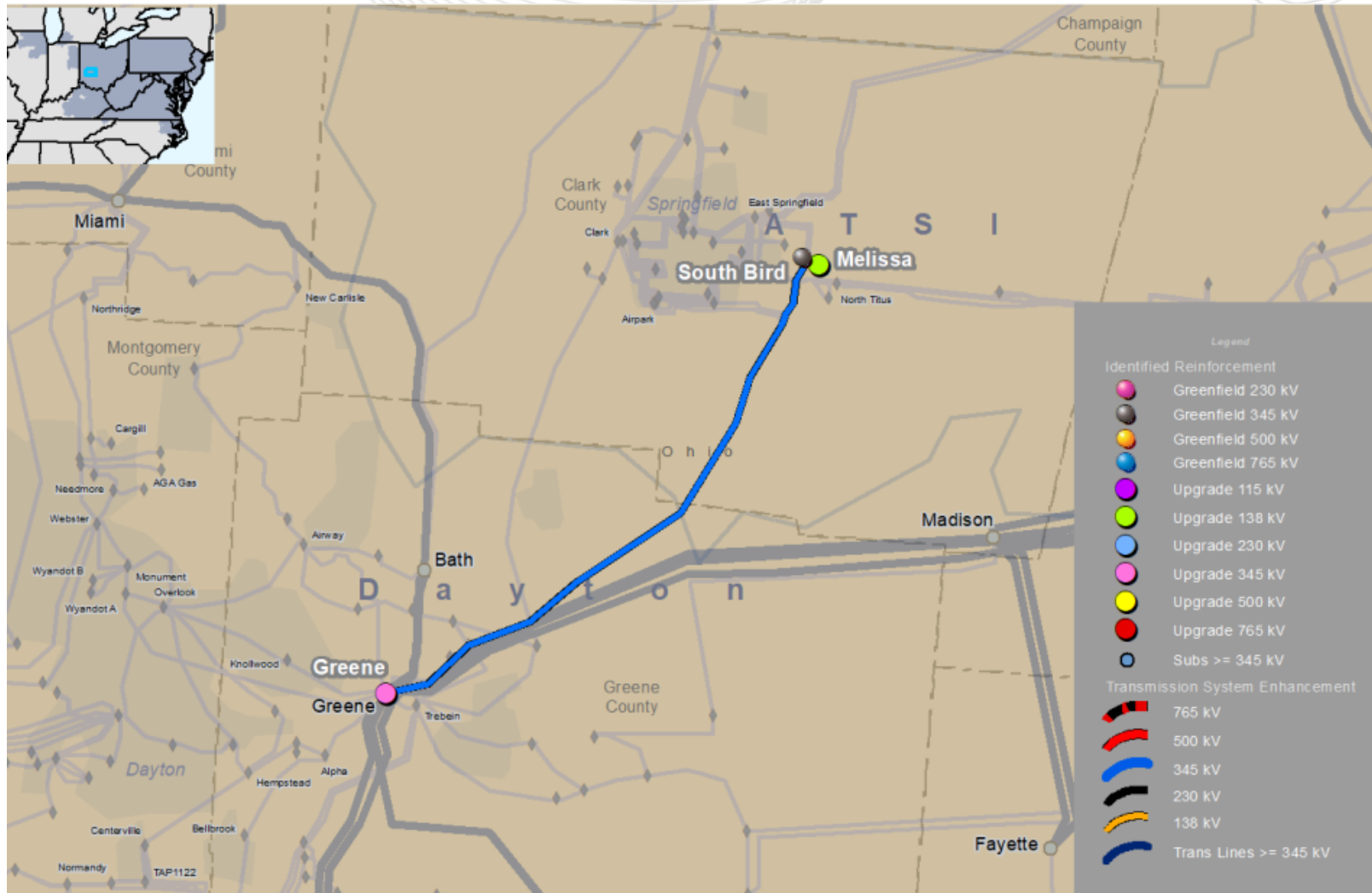


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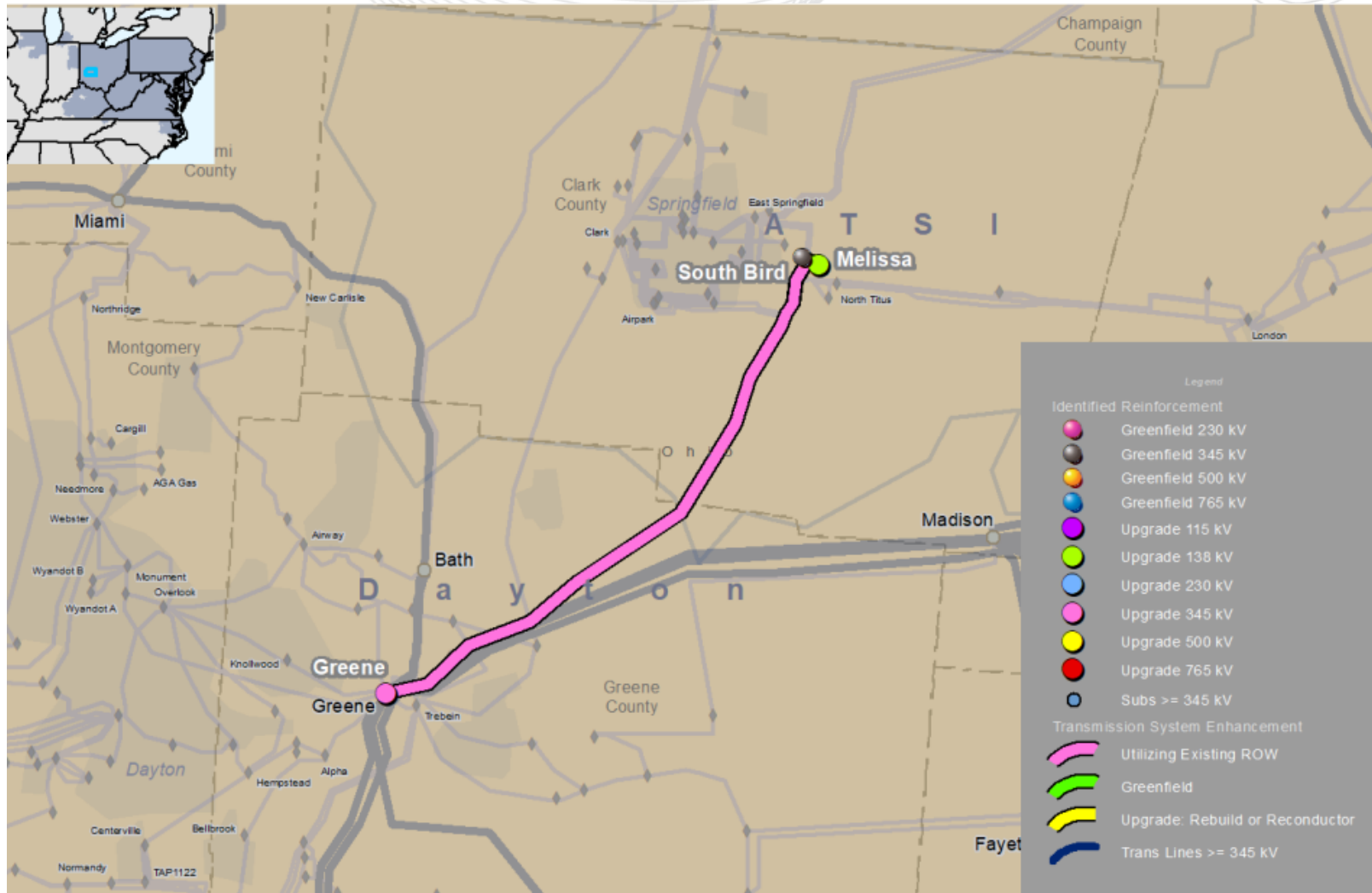




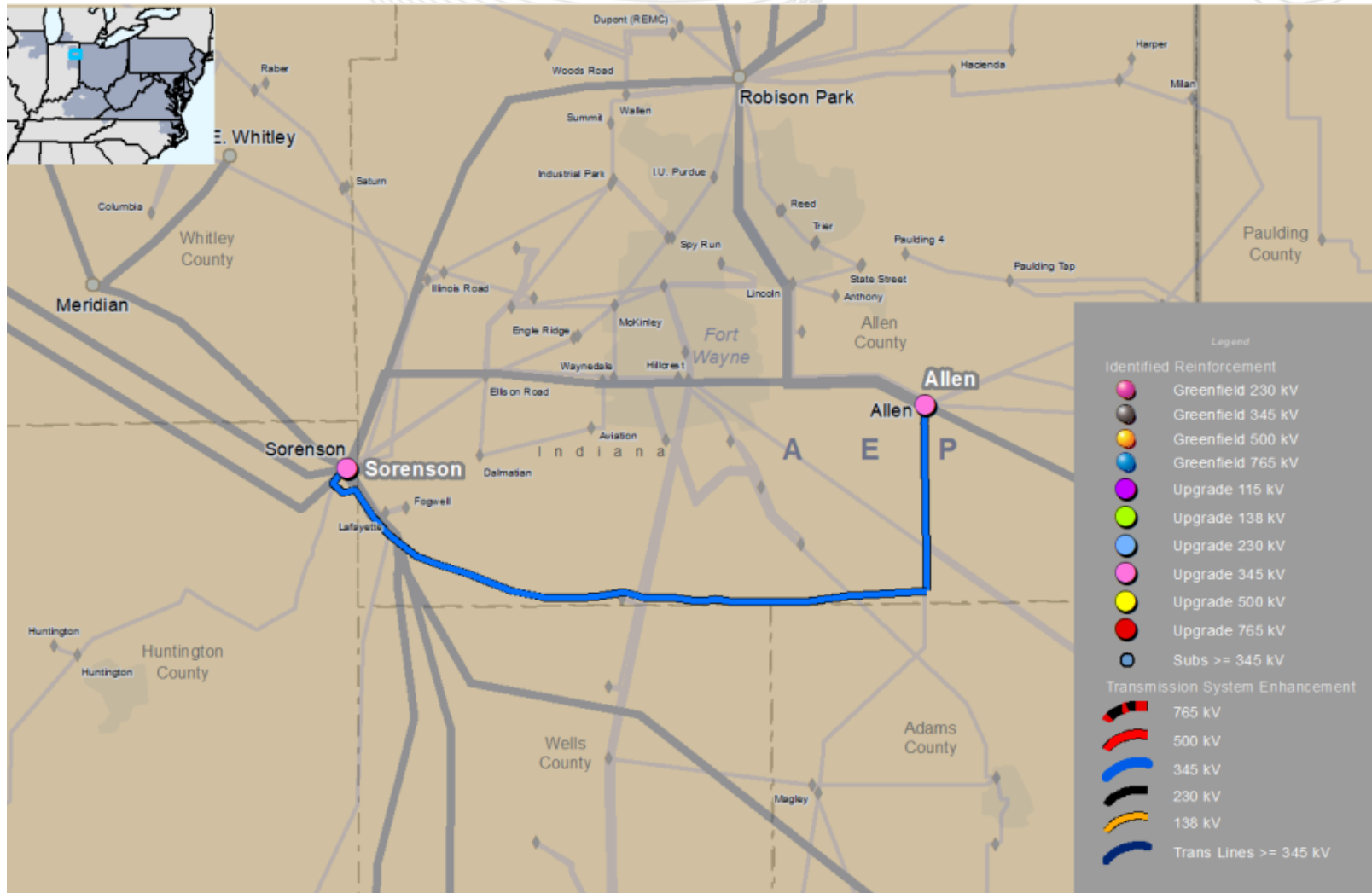
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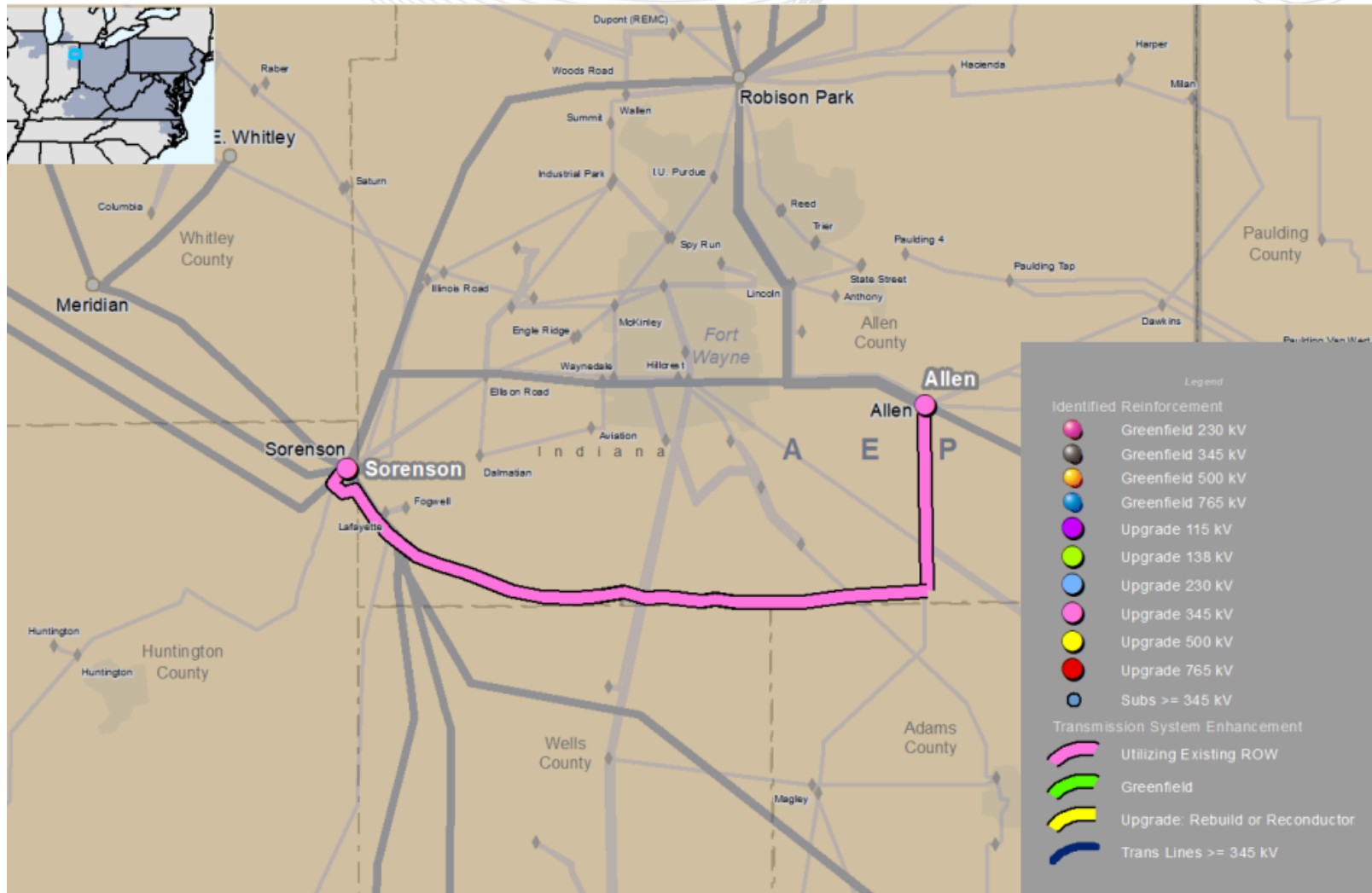
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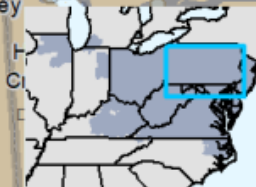
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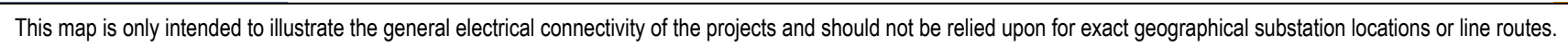
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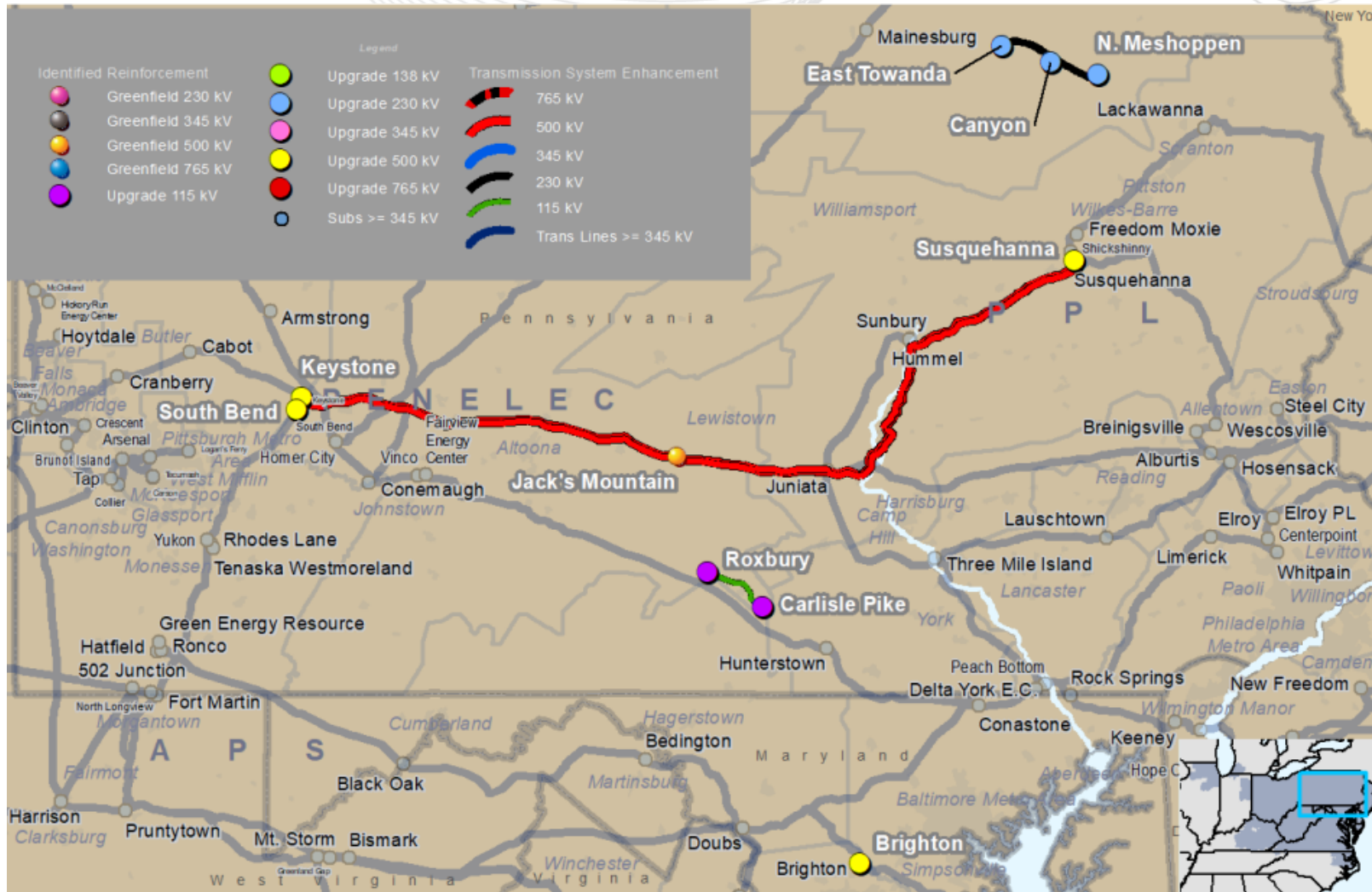


# MATLIT (FirstEnergy)



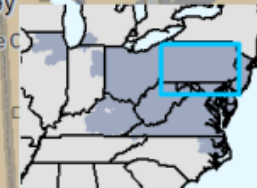
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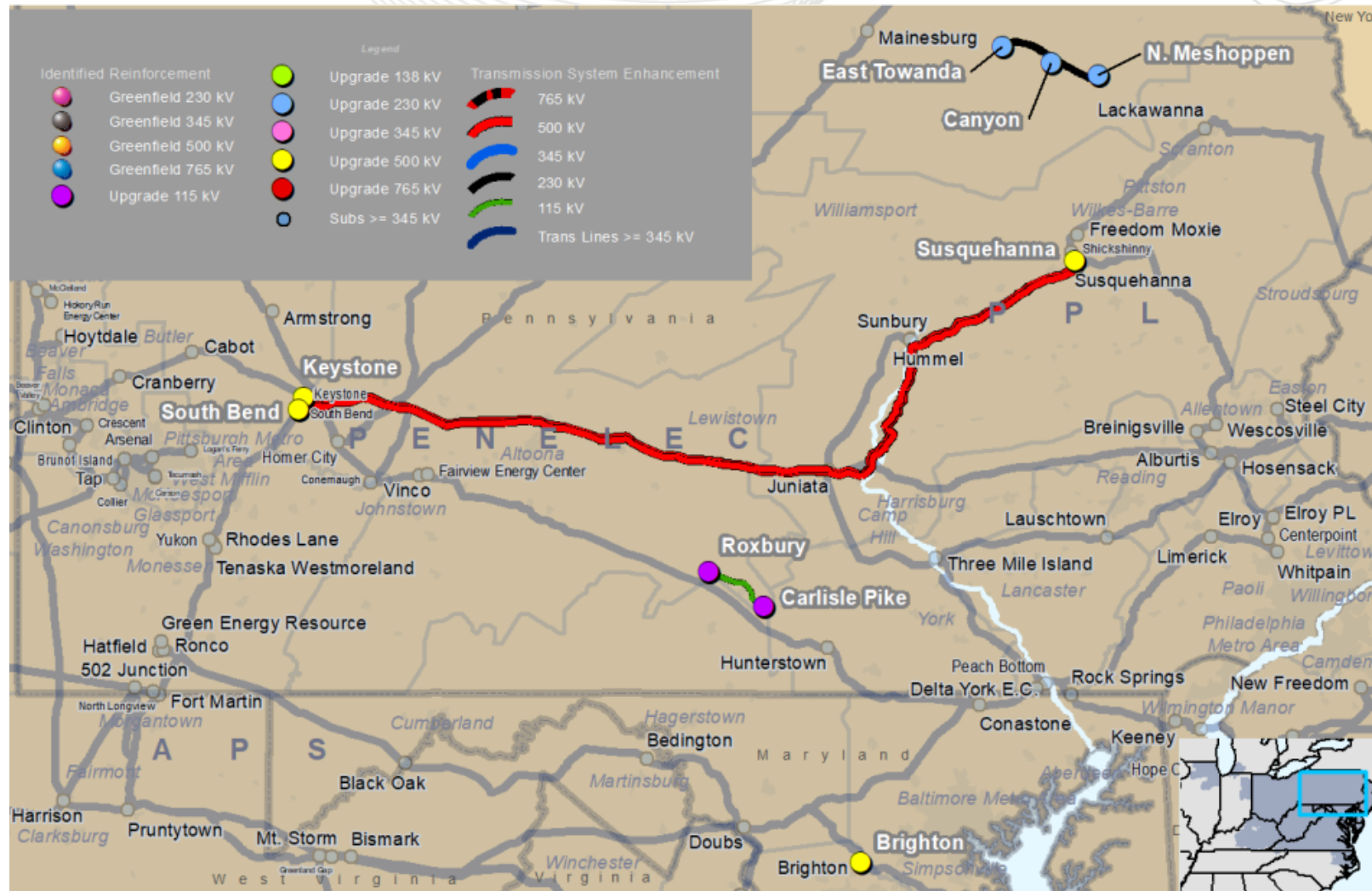
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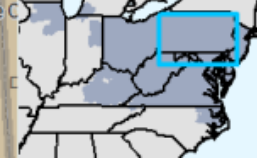


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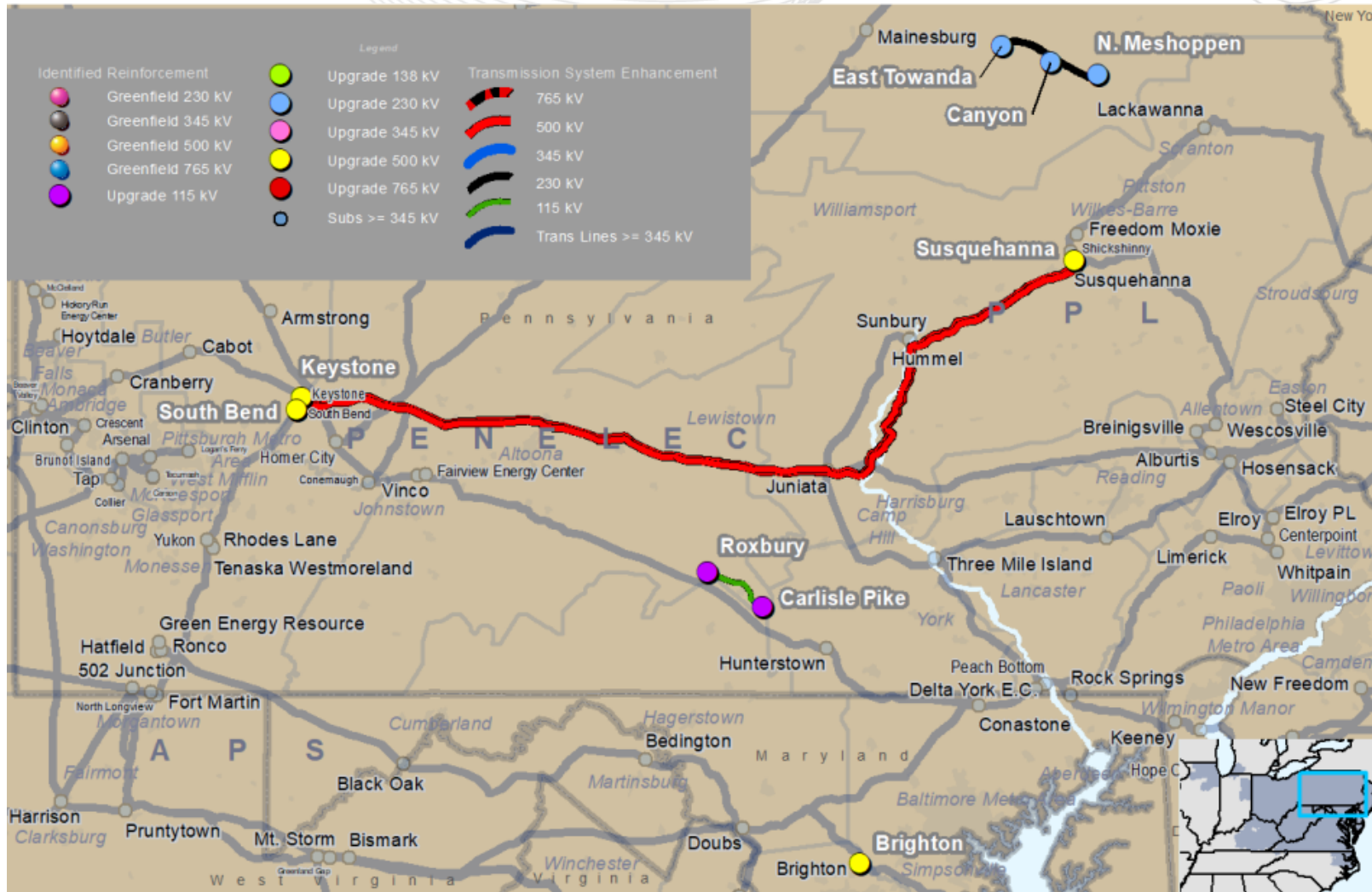




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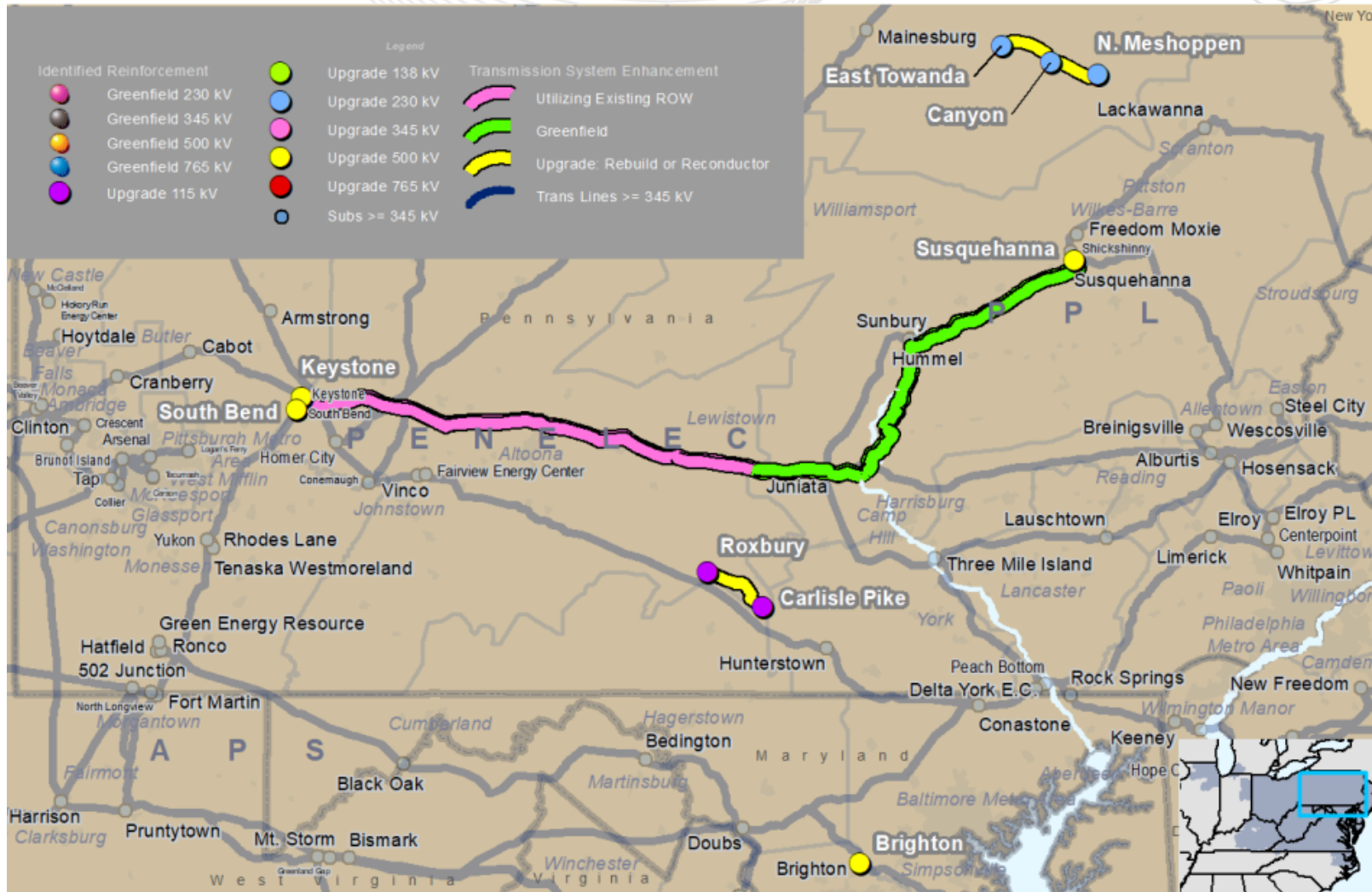


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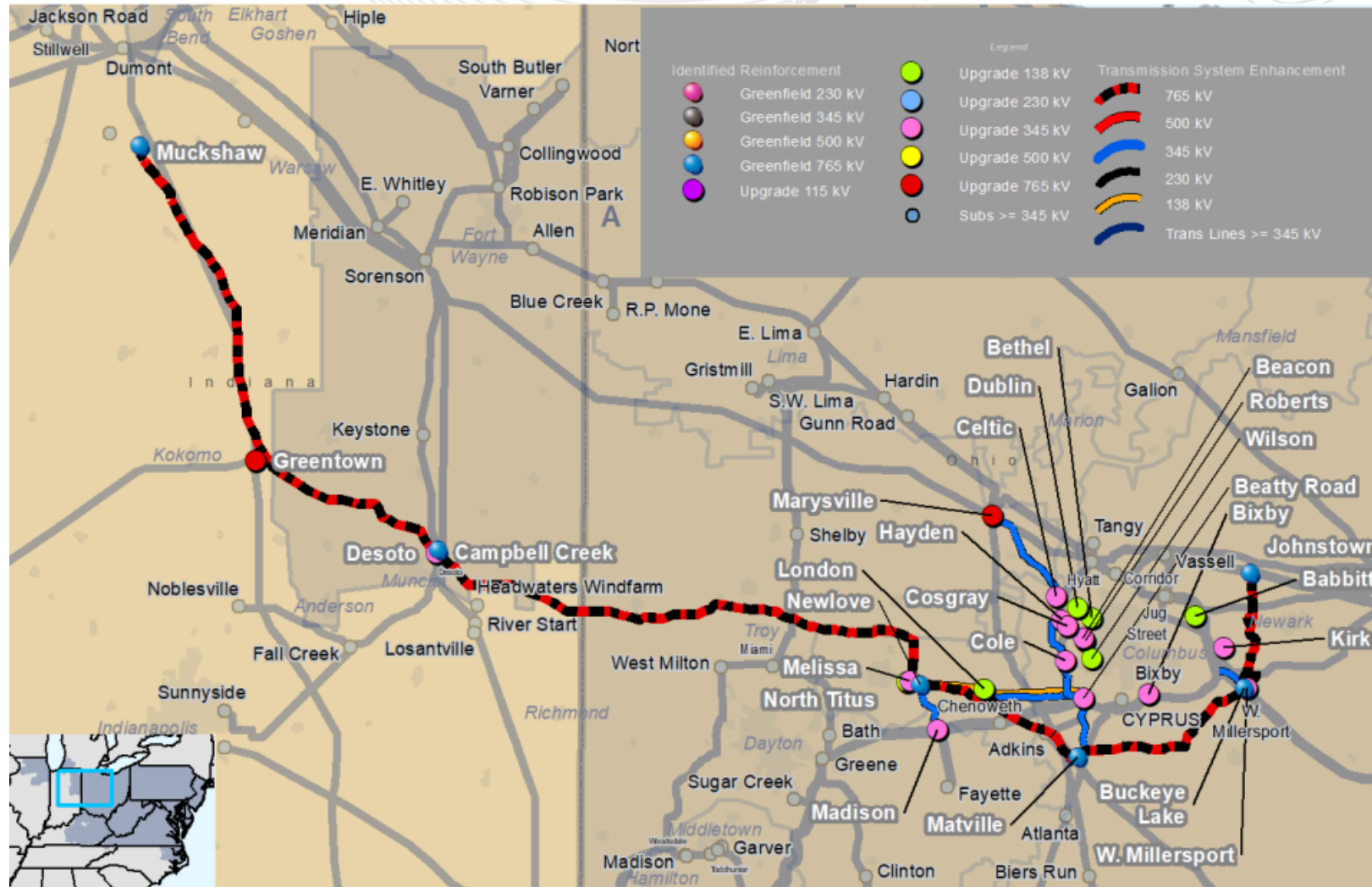




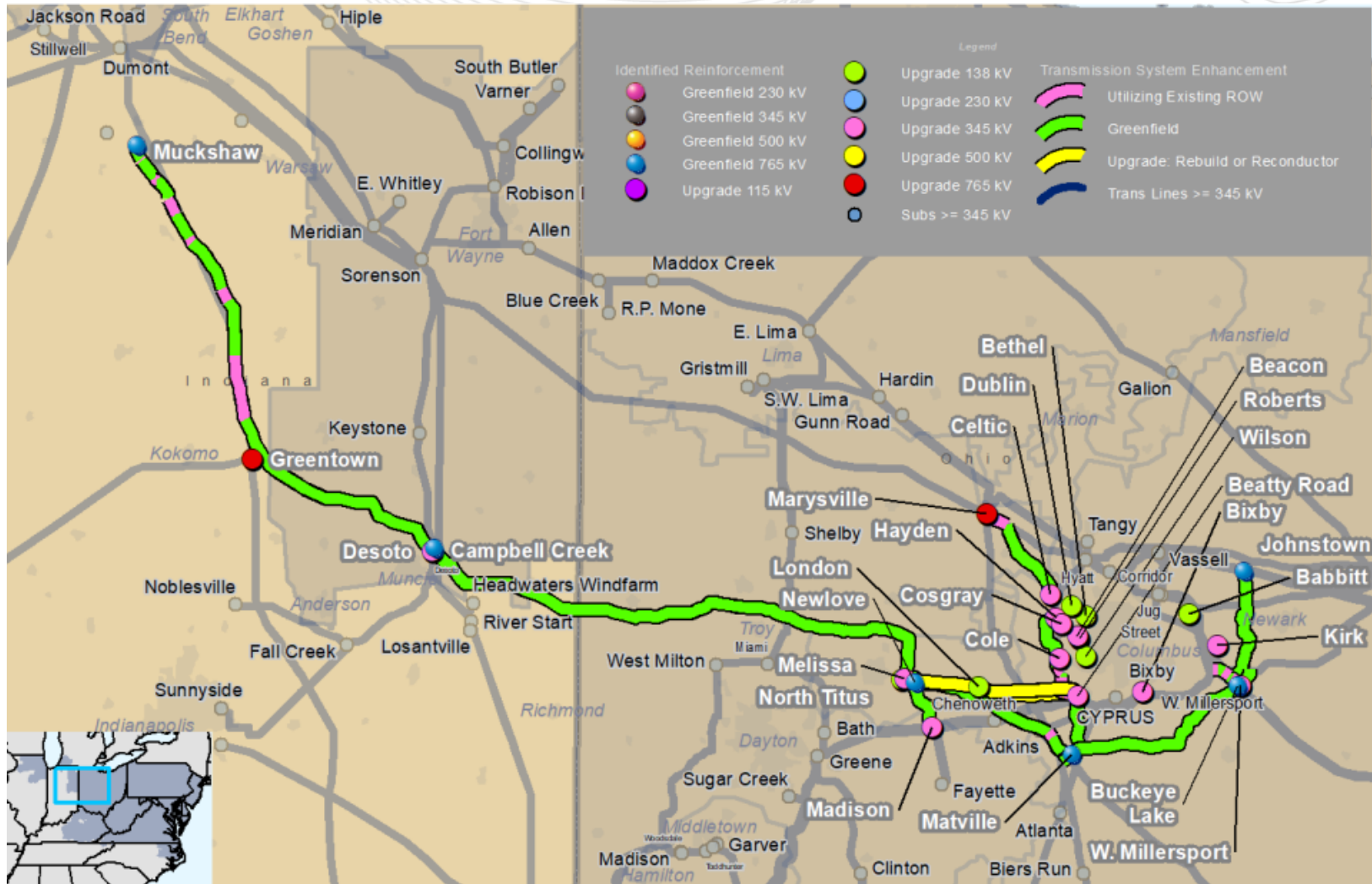
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# NXTMID (NextEra)

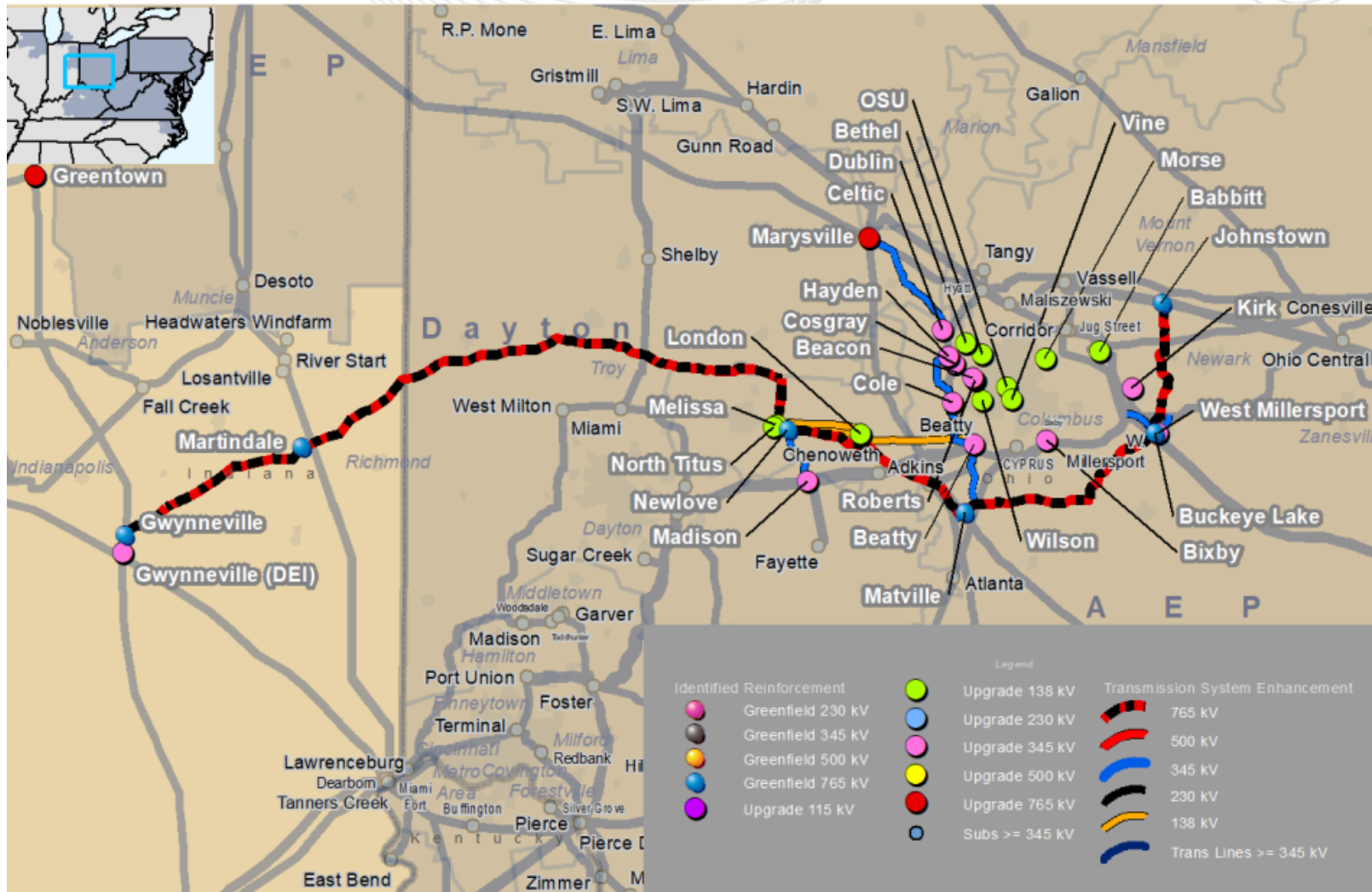




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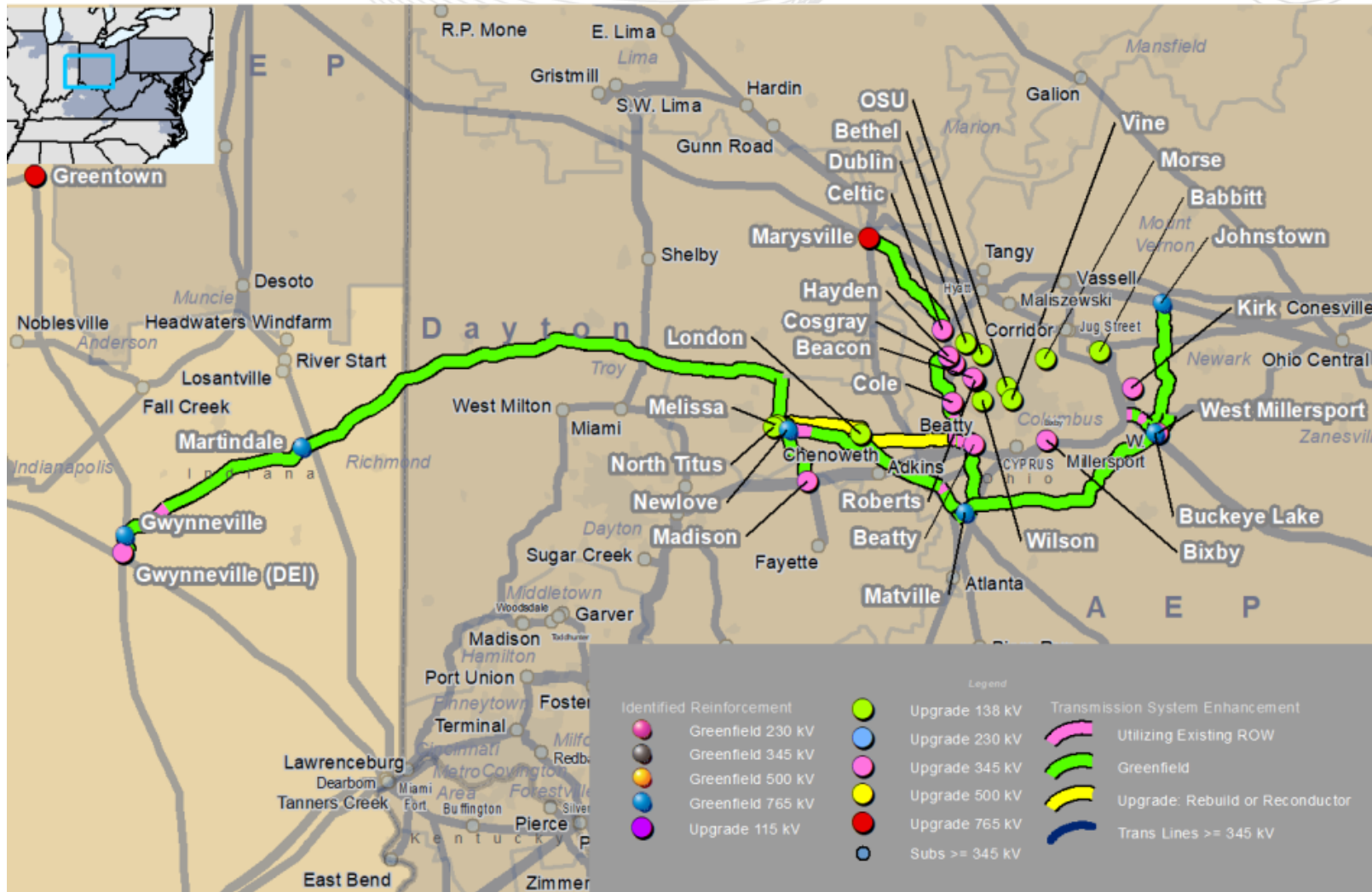


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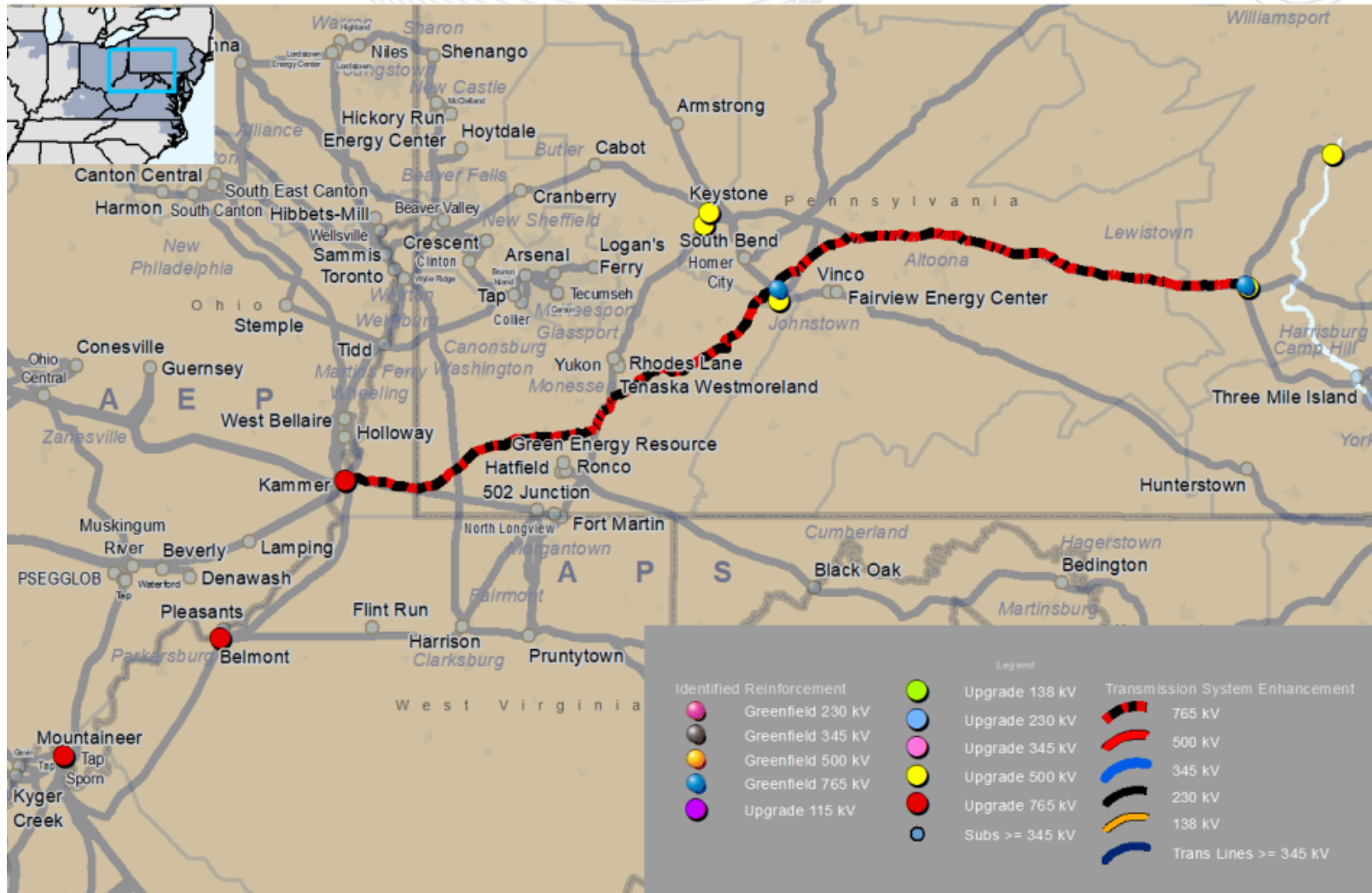


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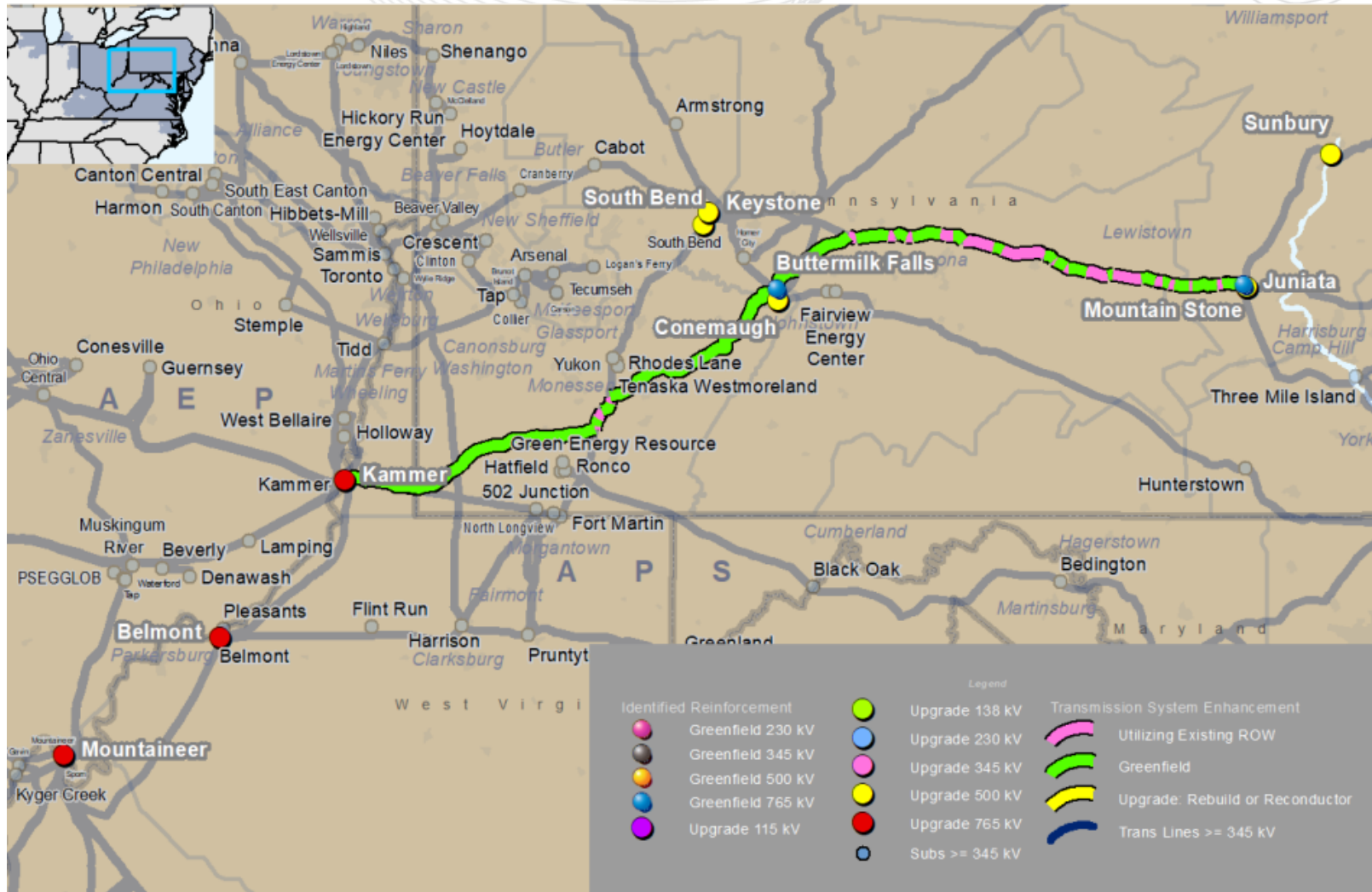


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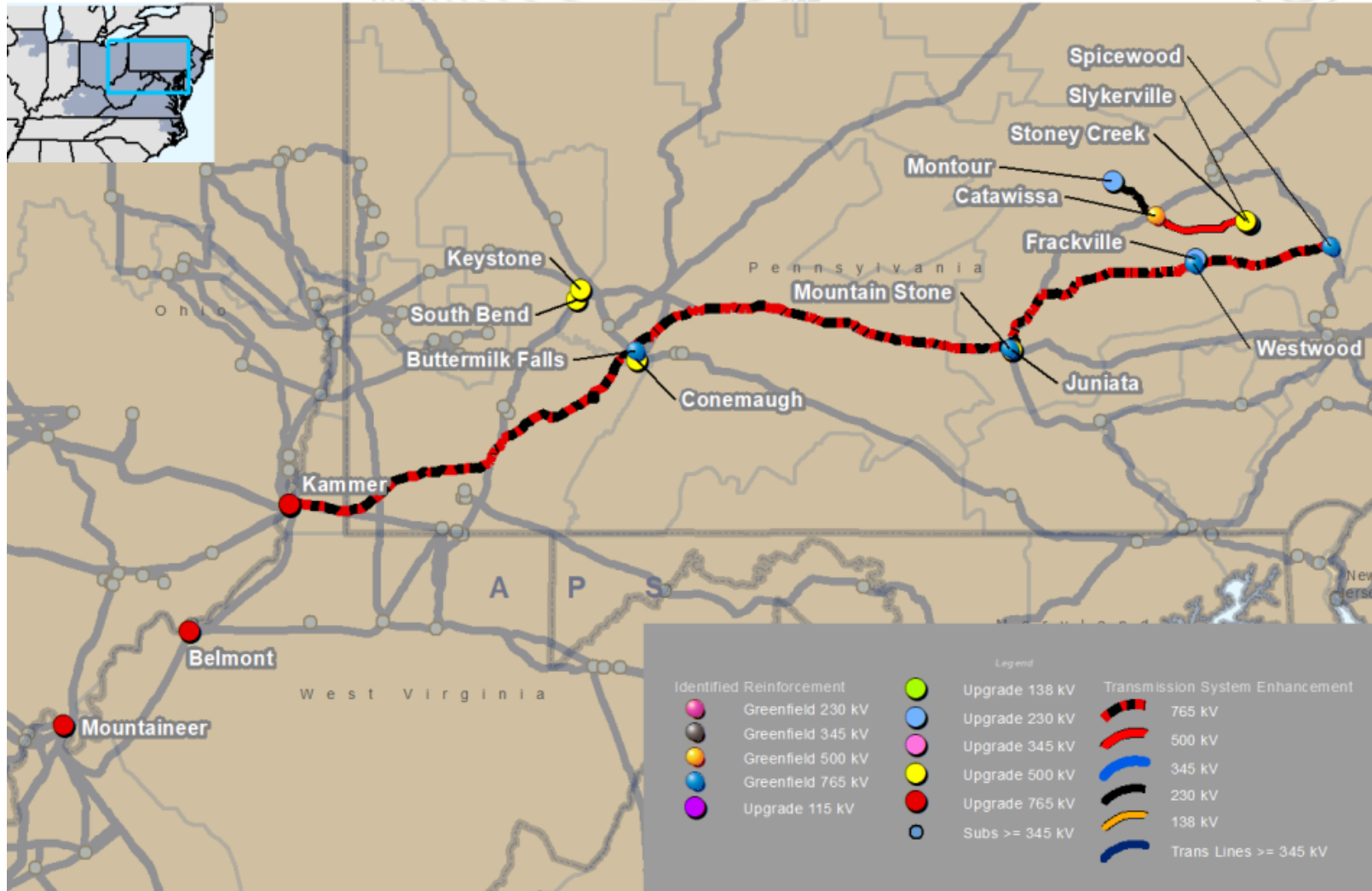


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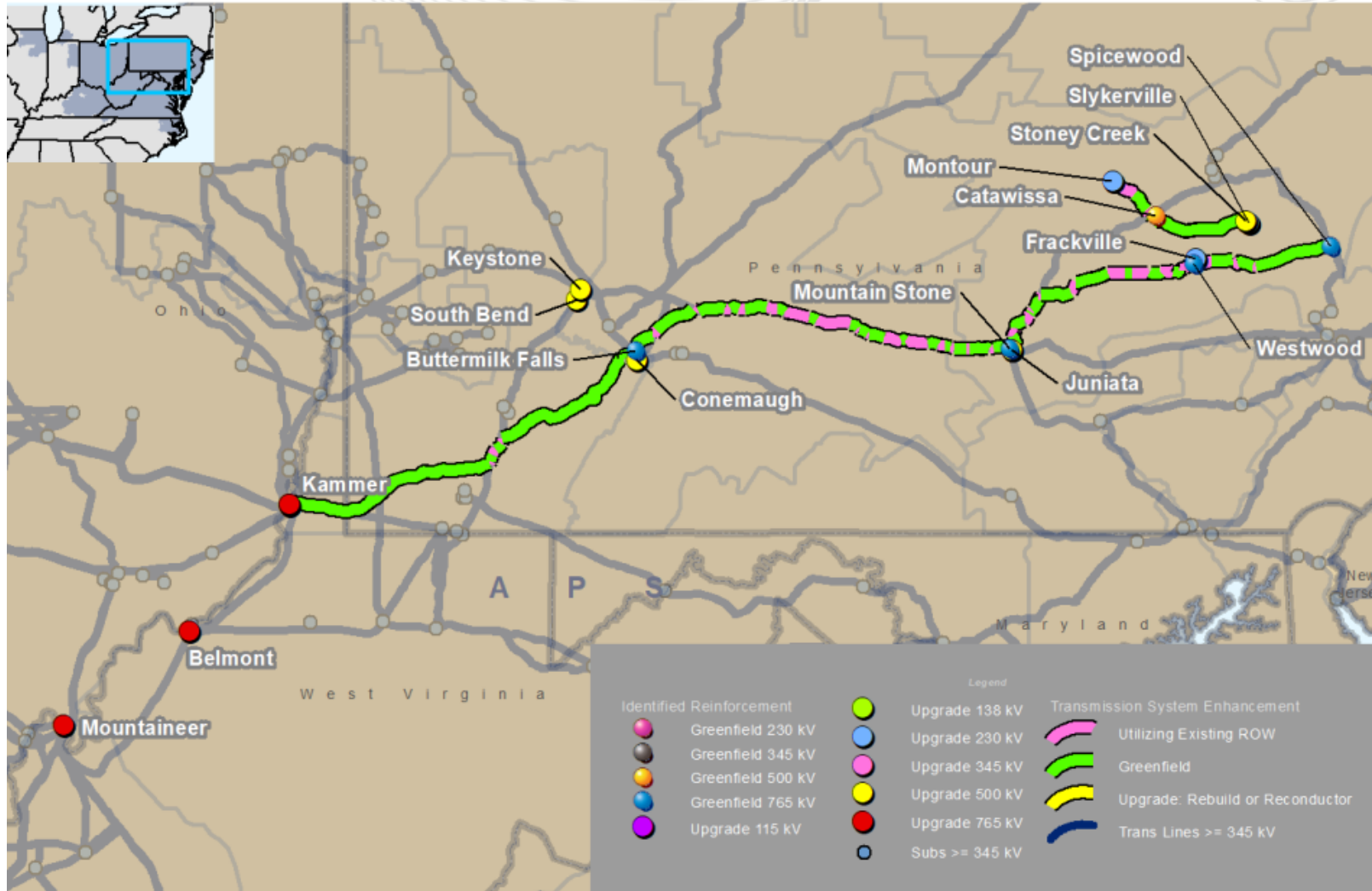




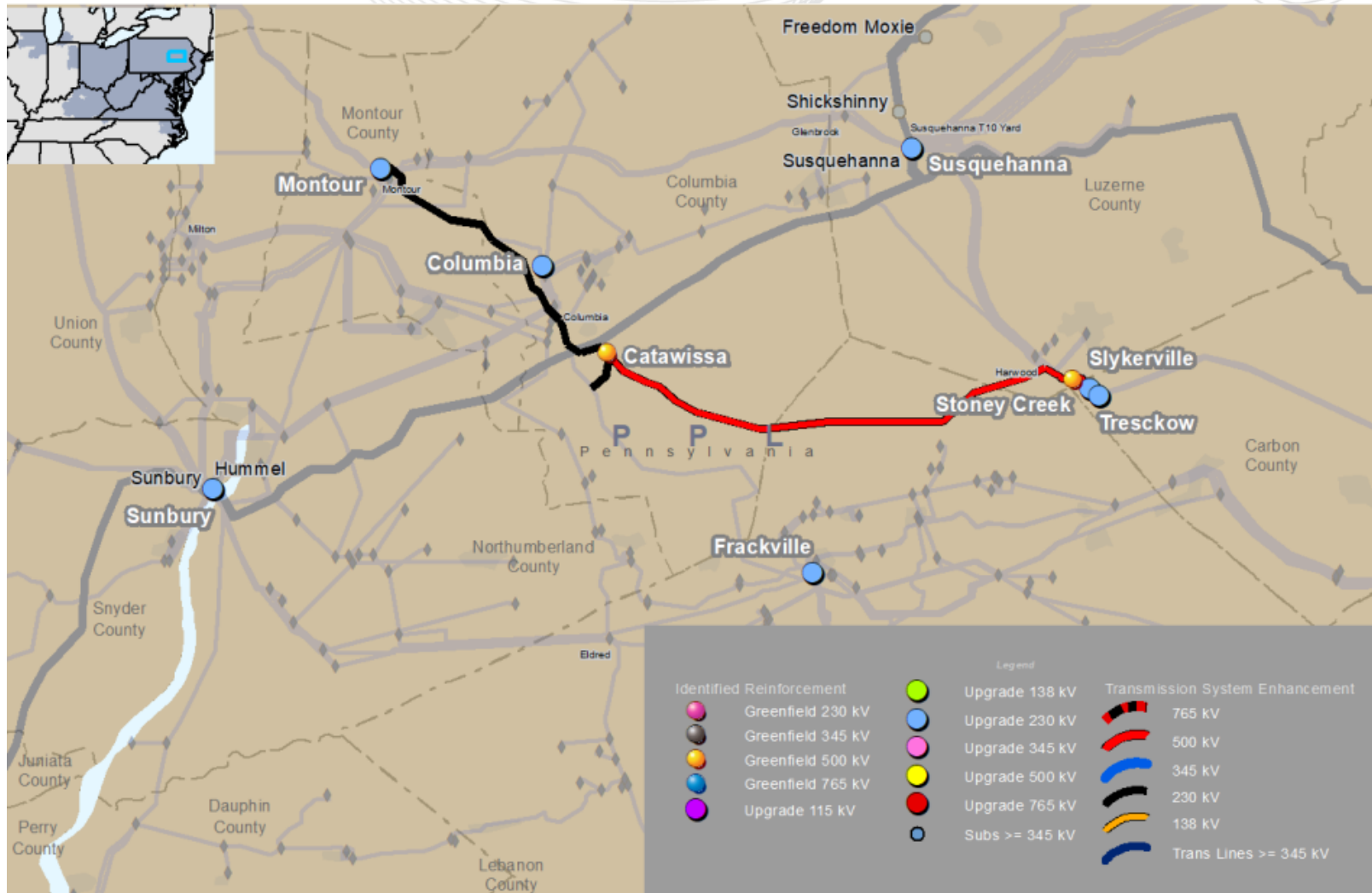
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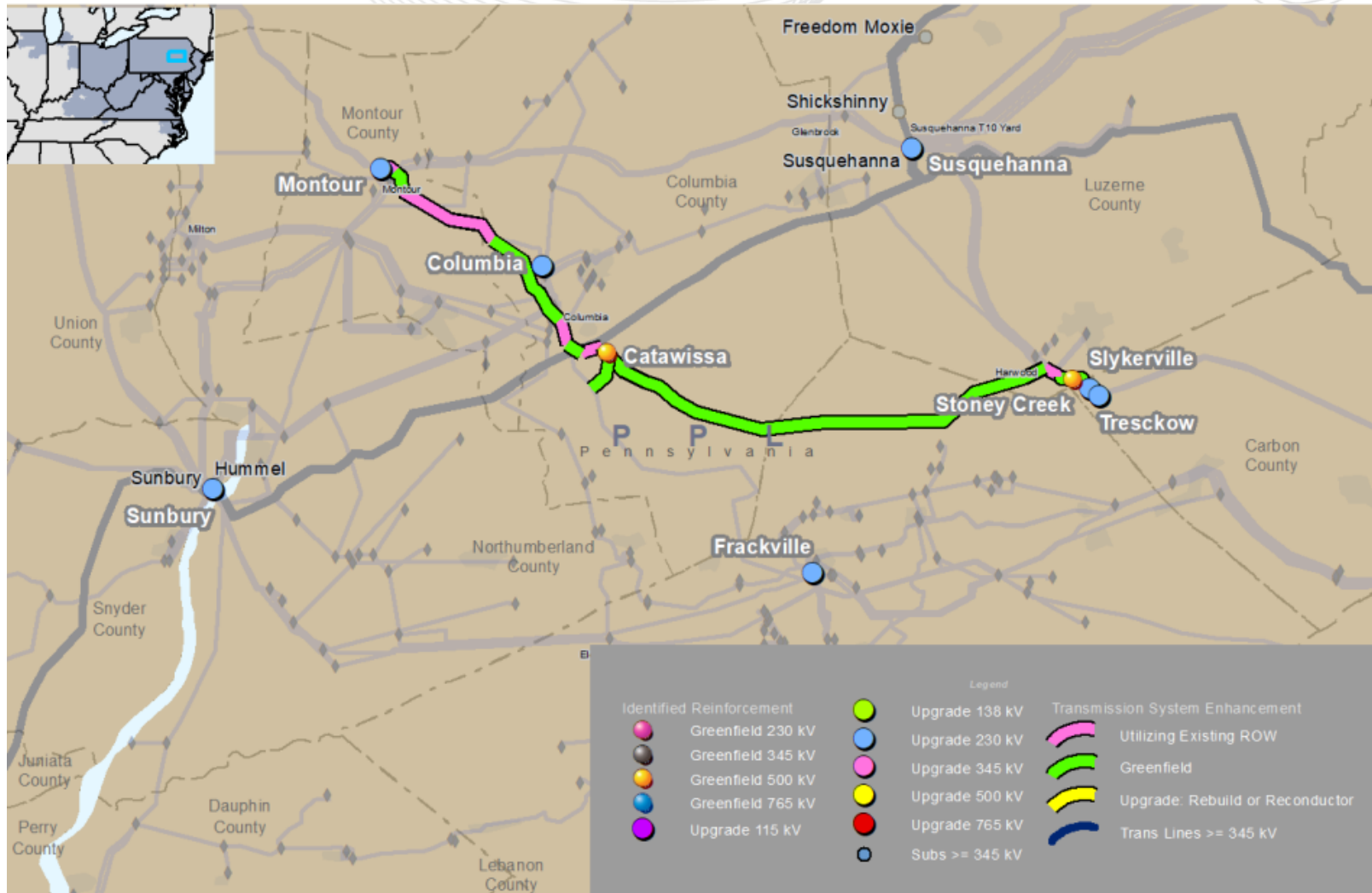


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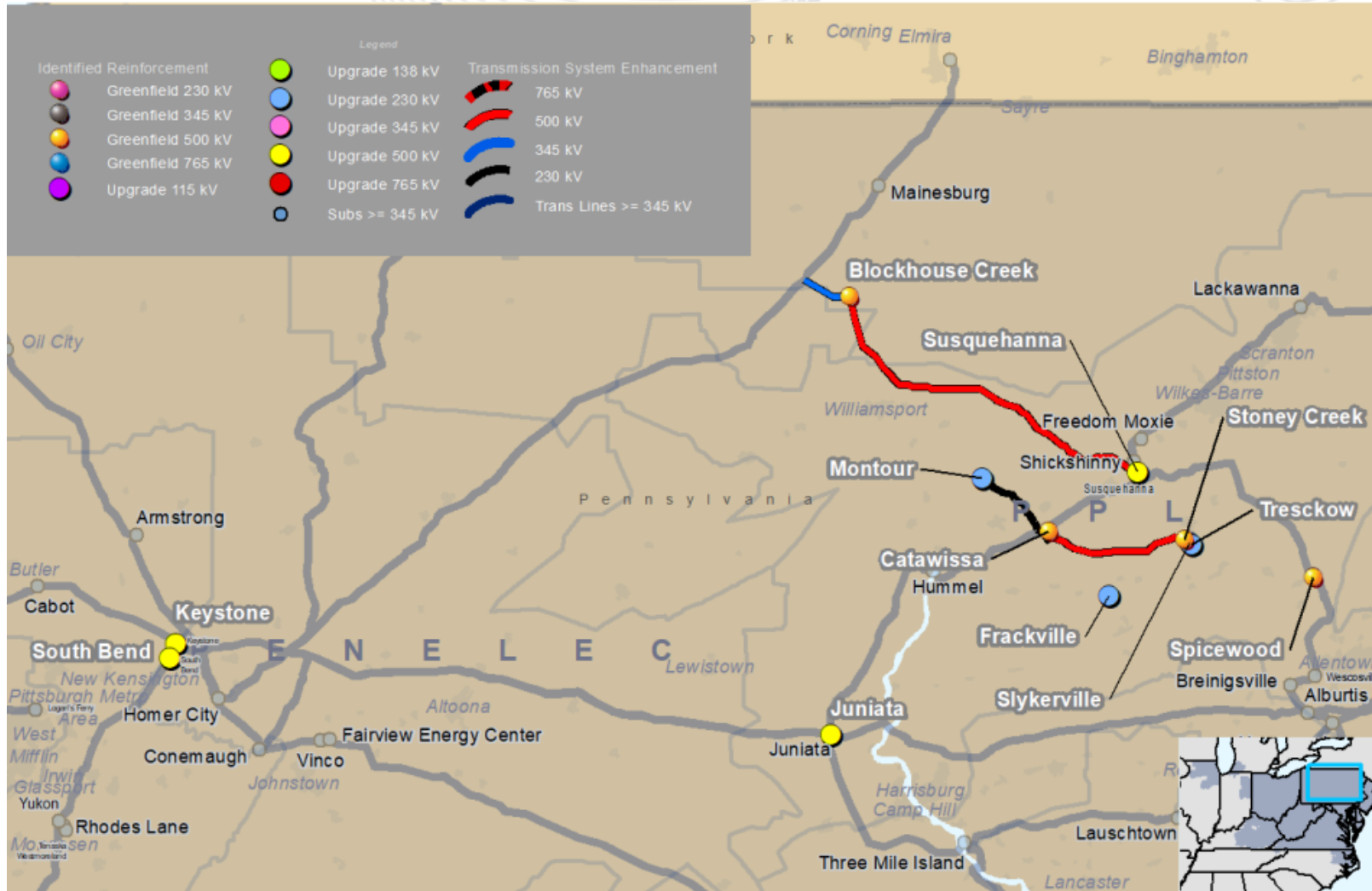
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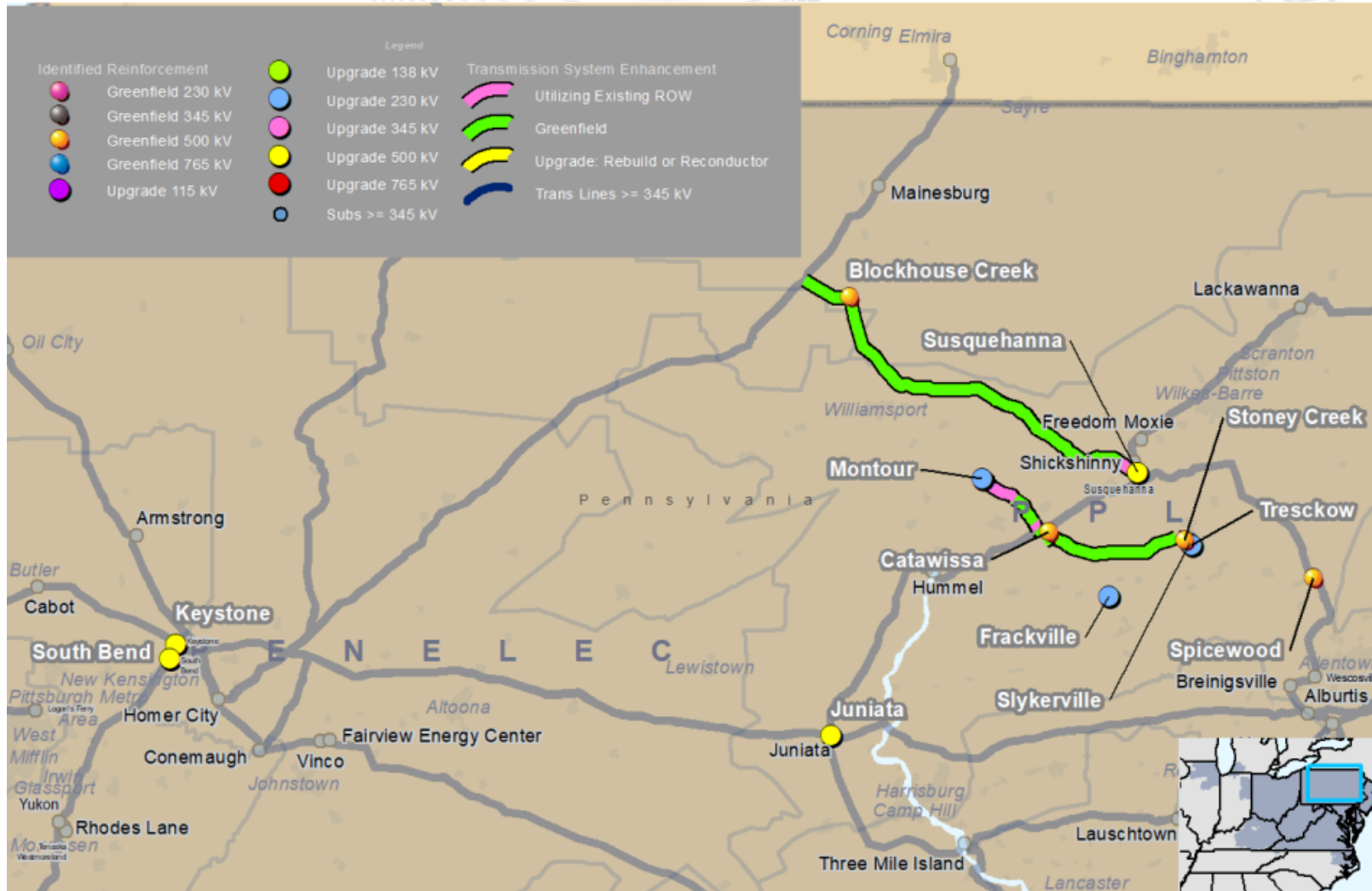


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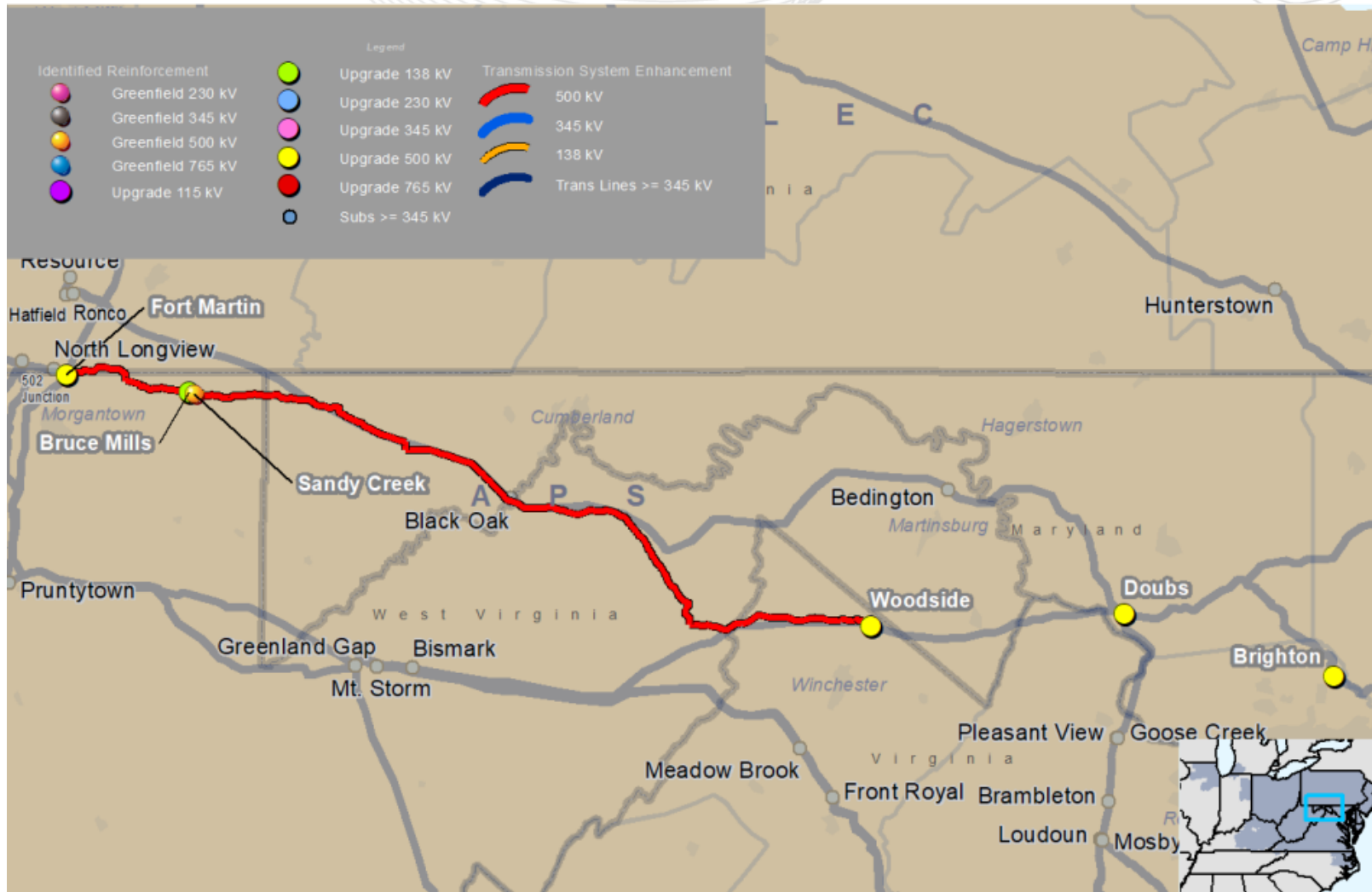




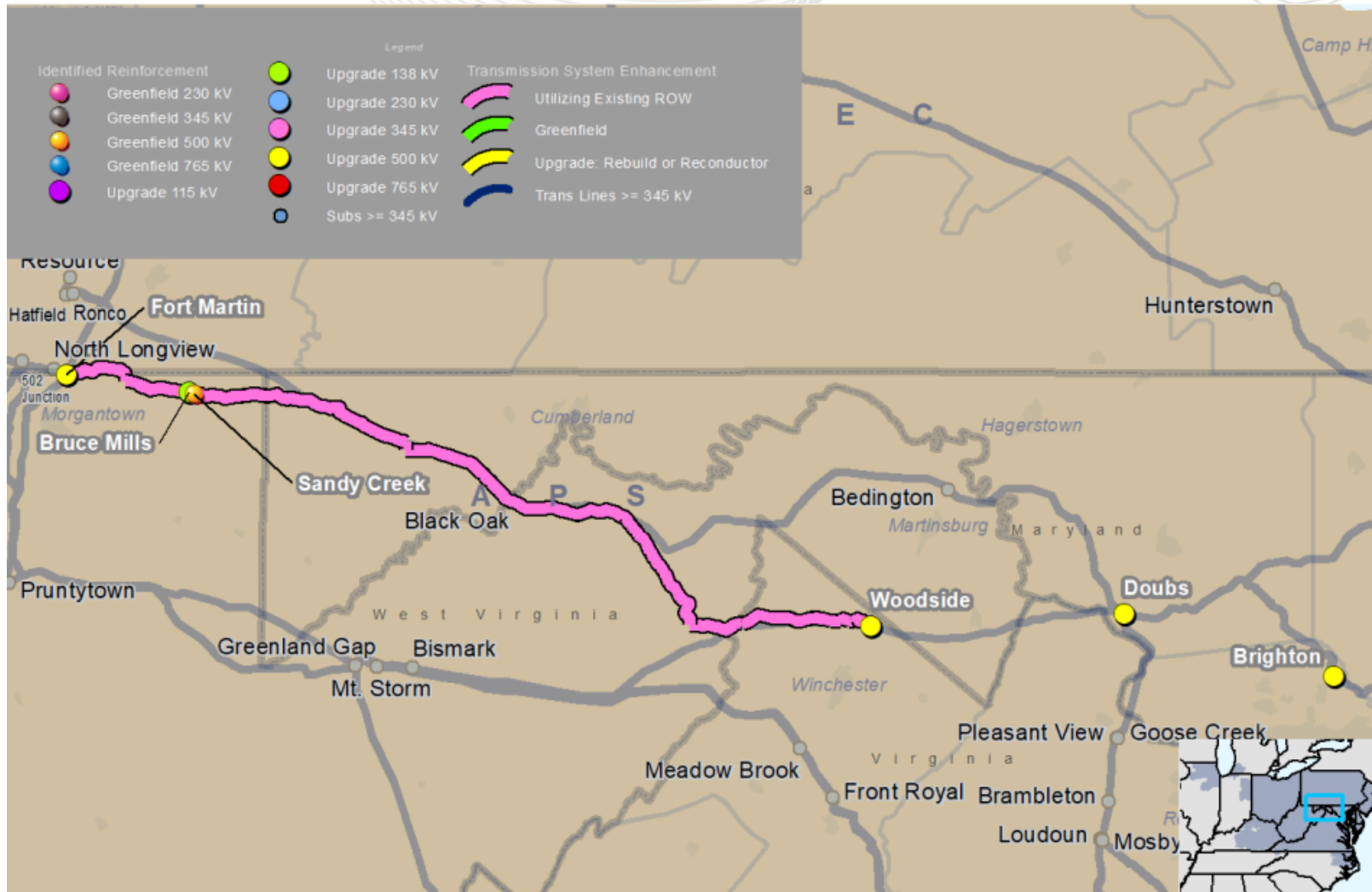
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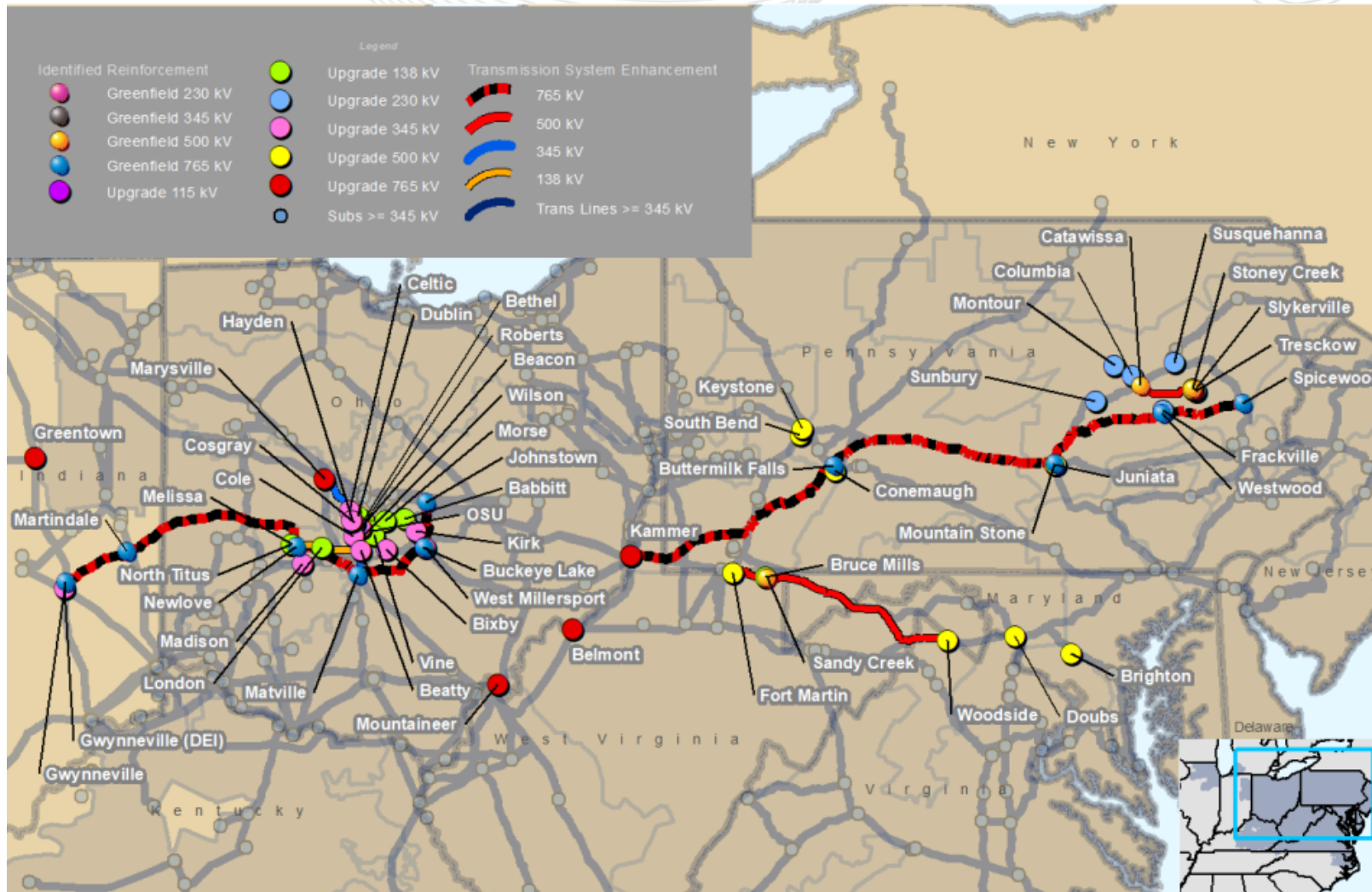


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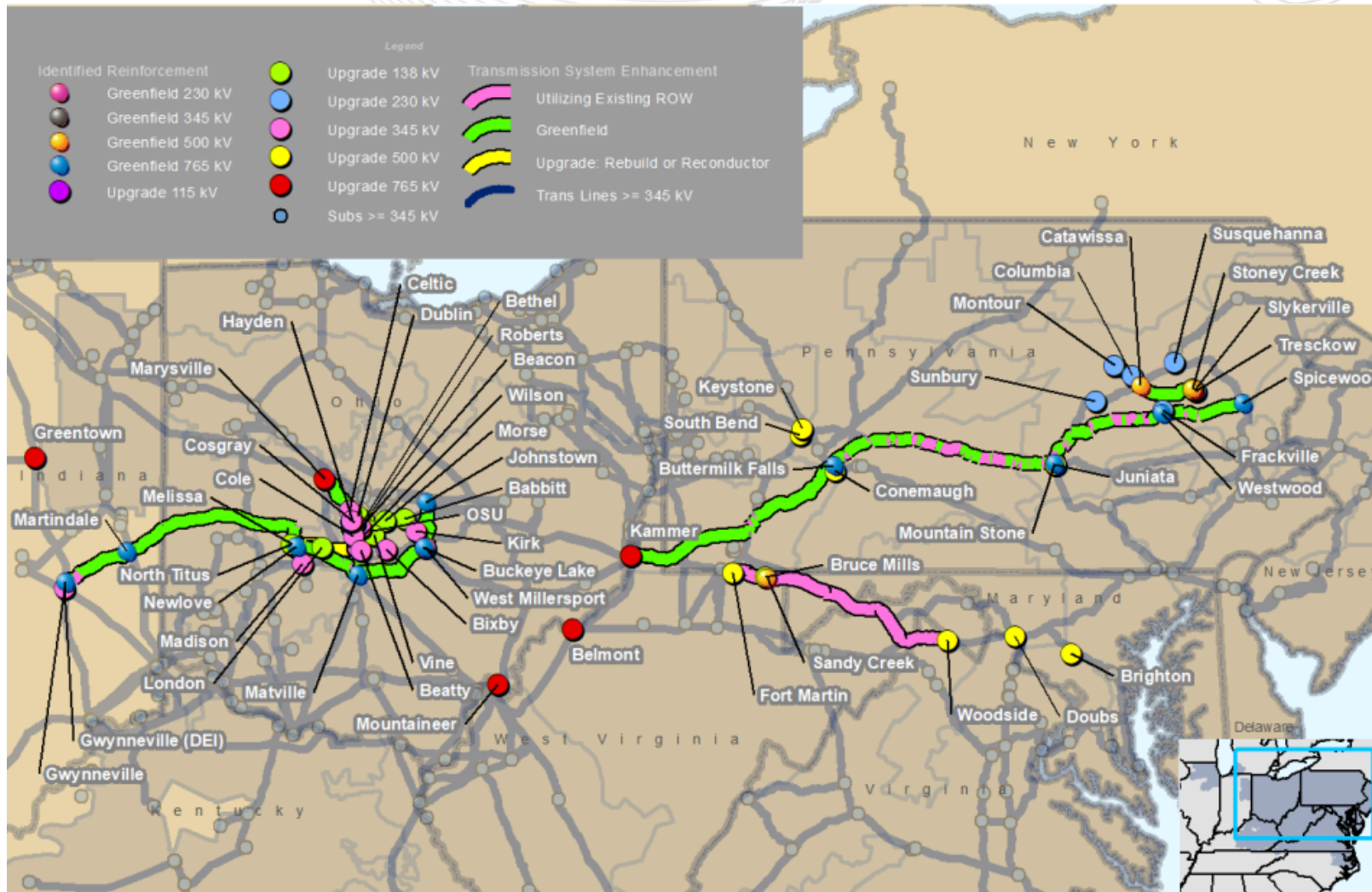
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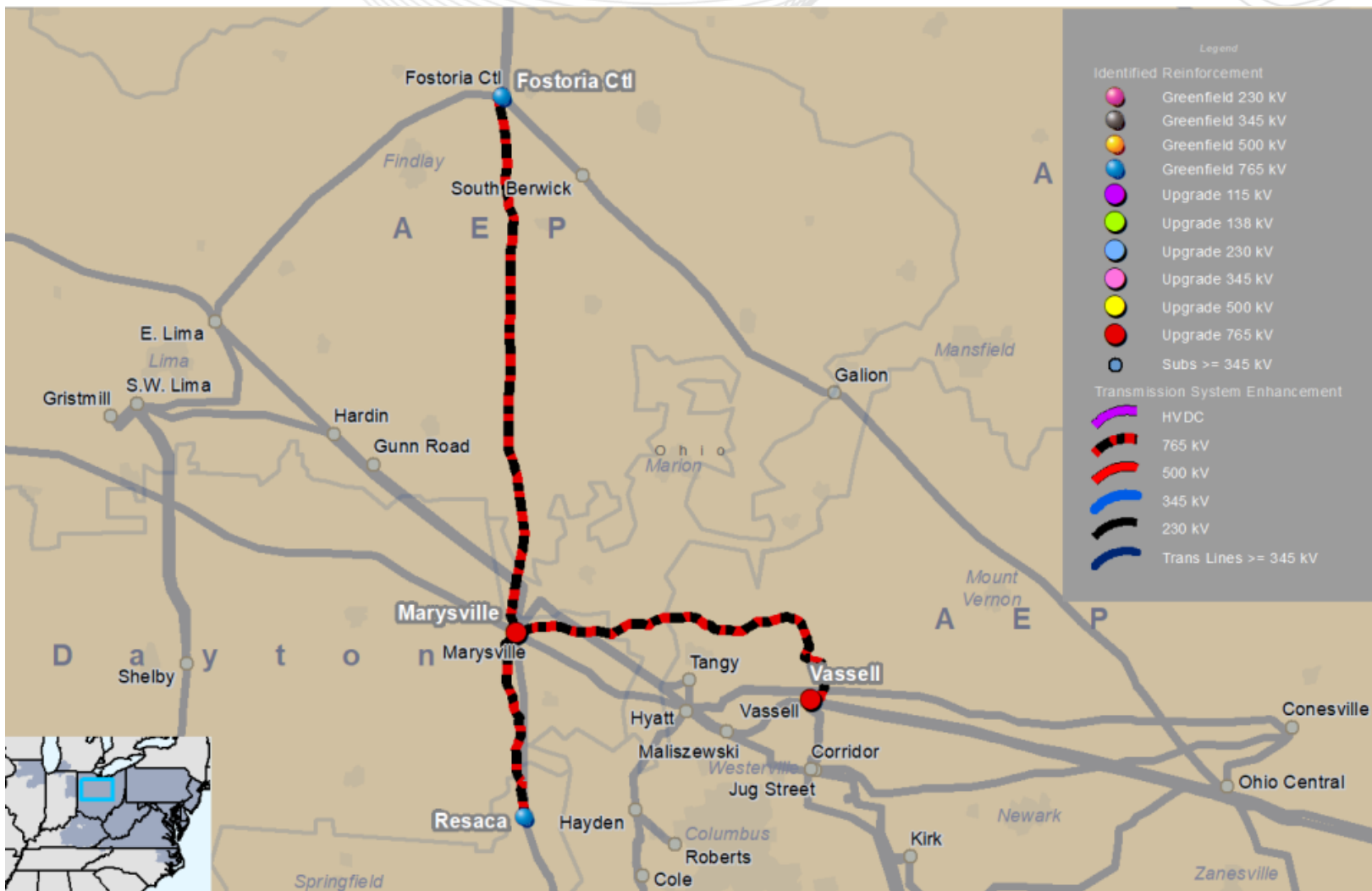
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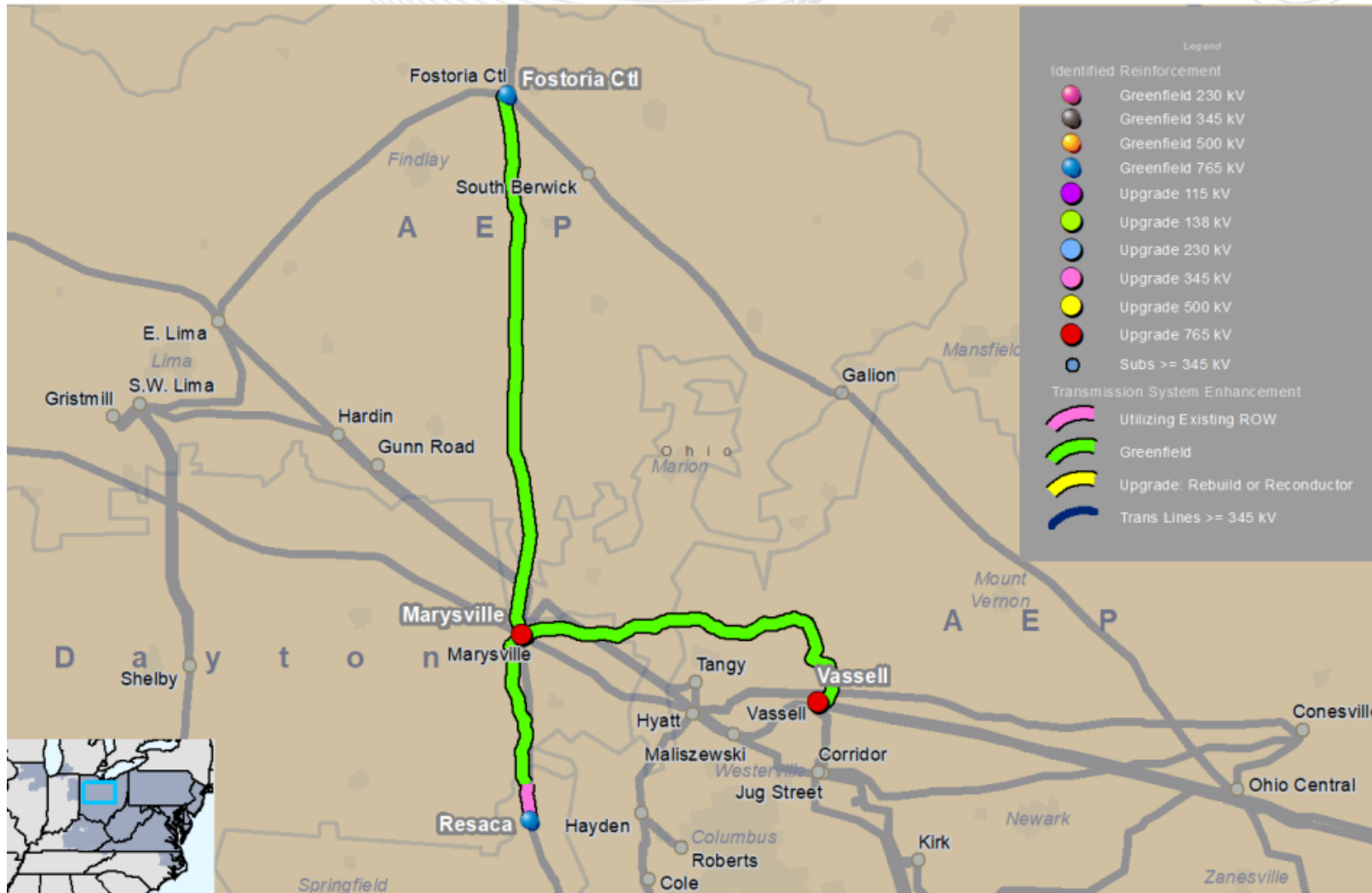


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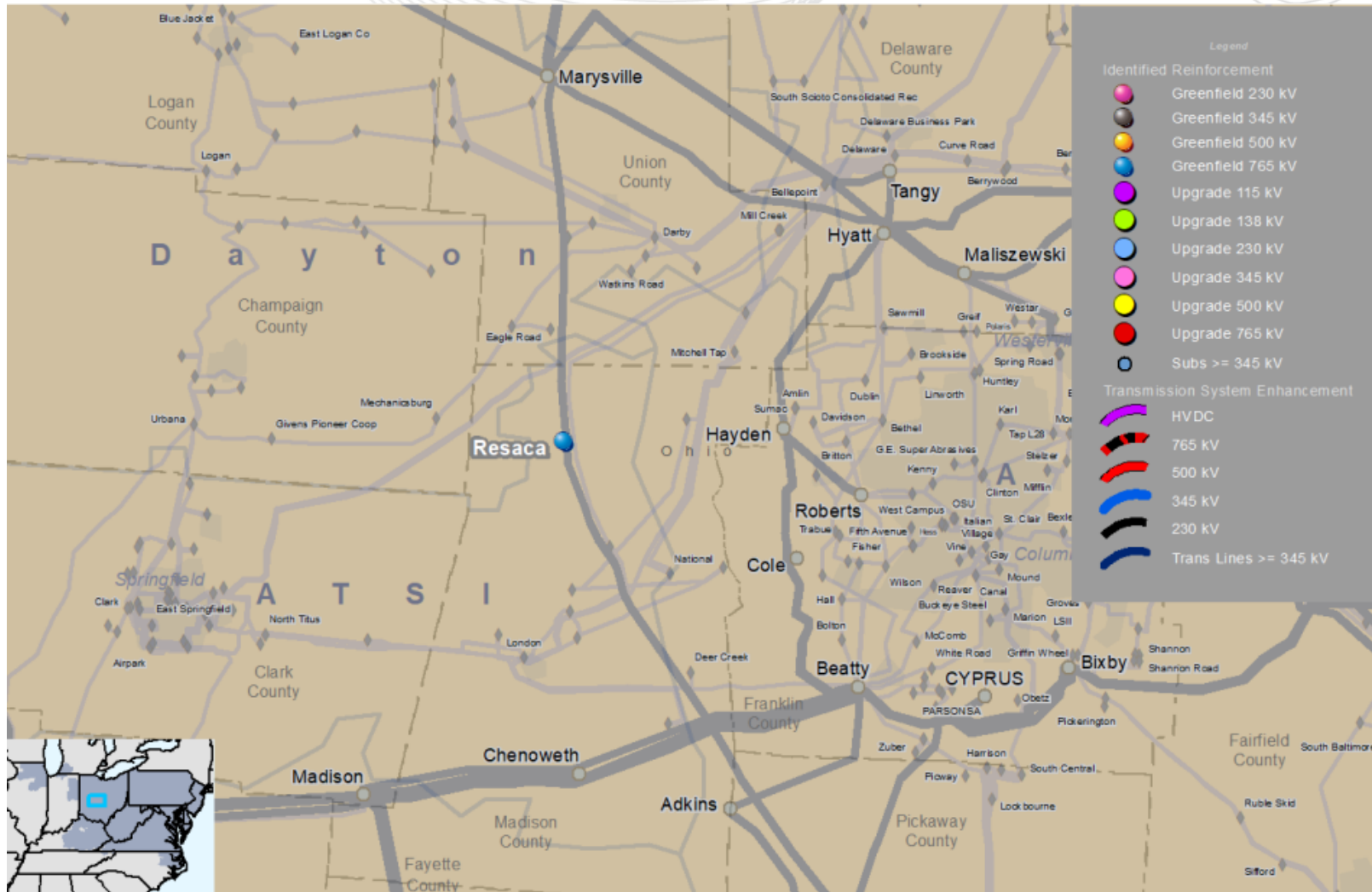
# PSEGRT (PSEG)



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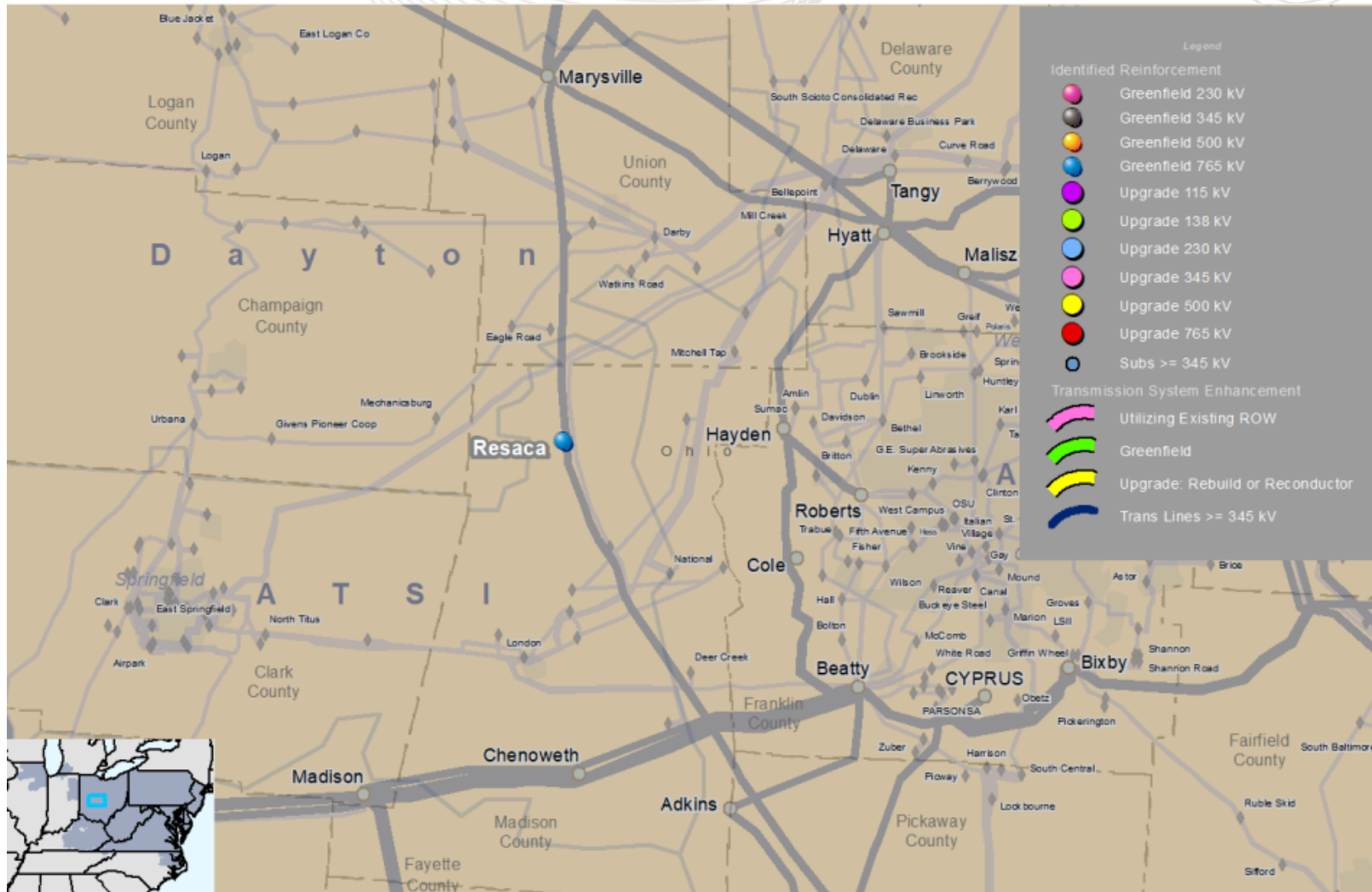


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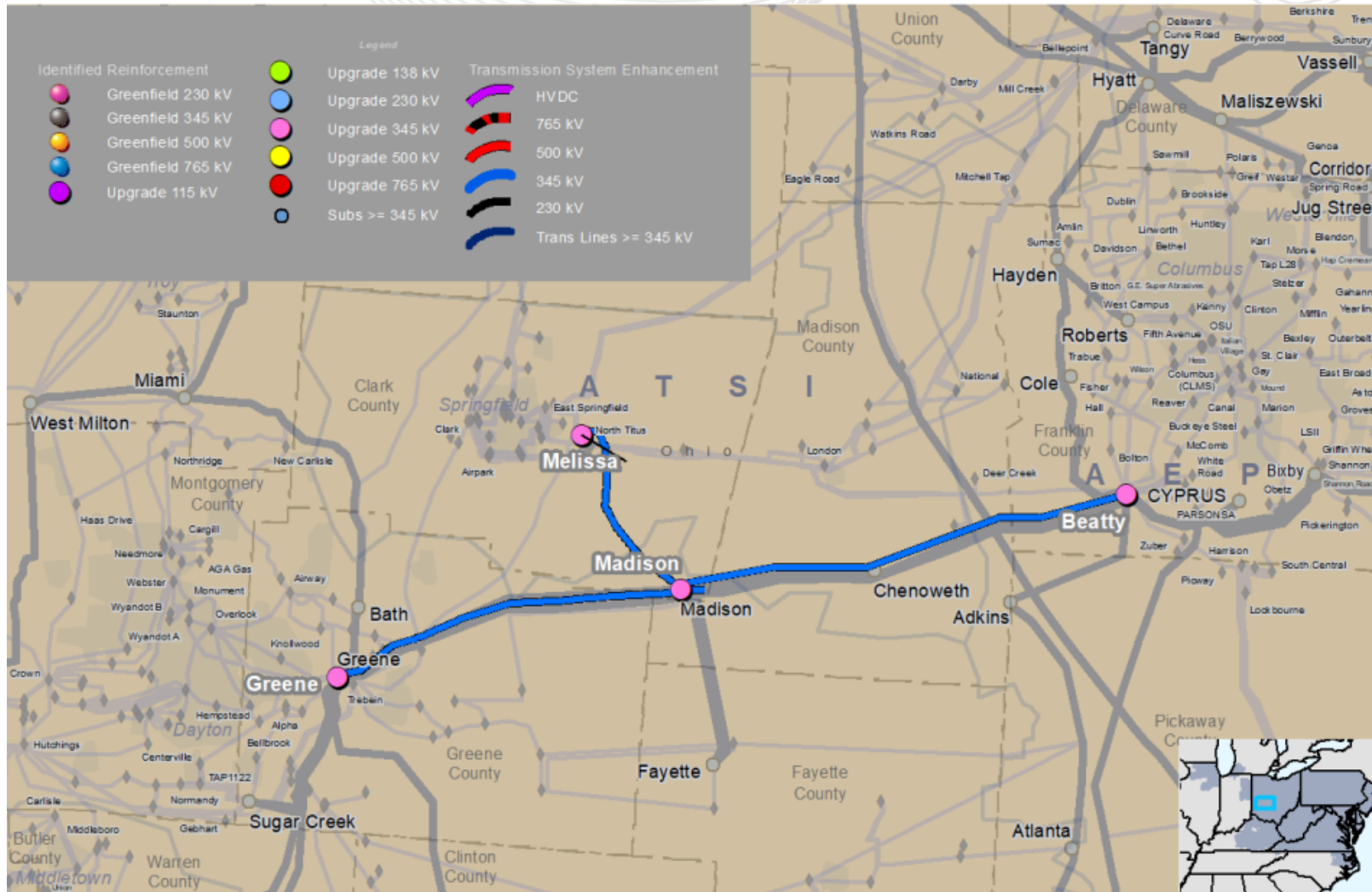


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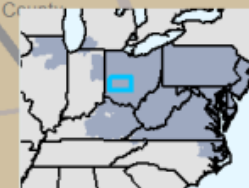




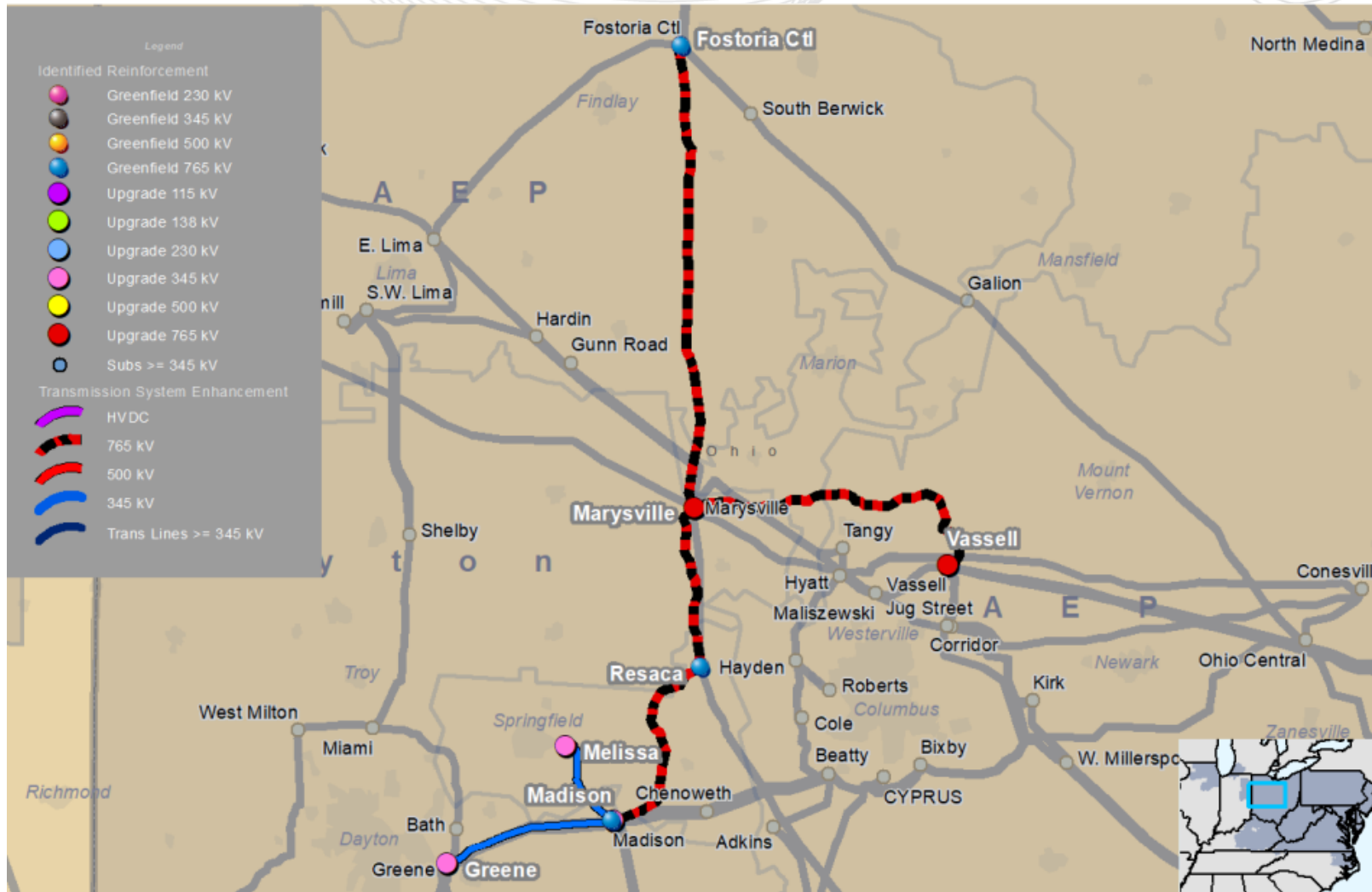
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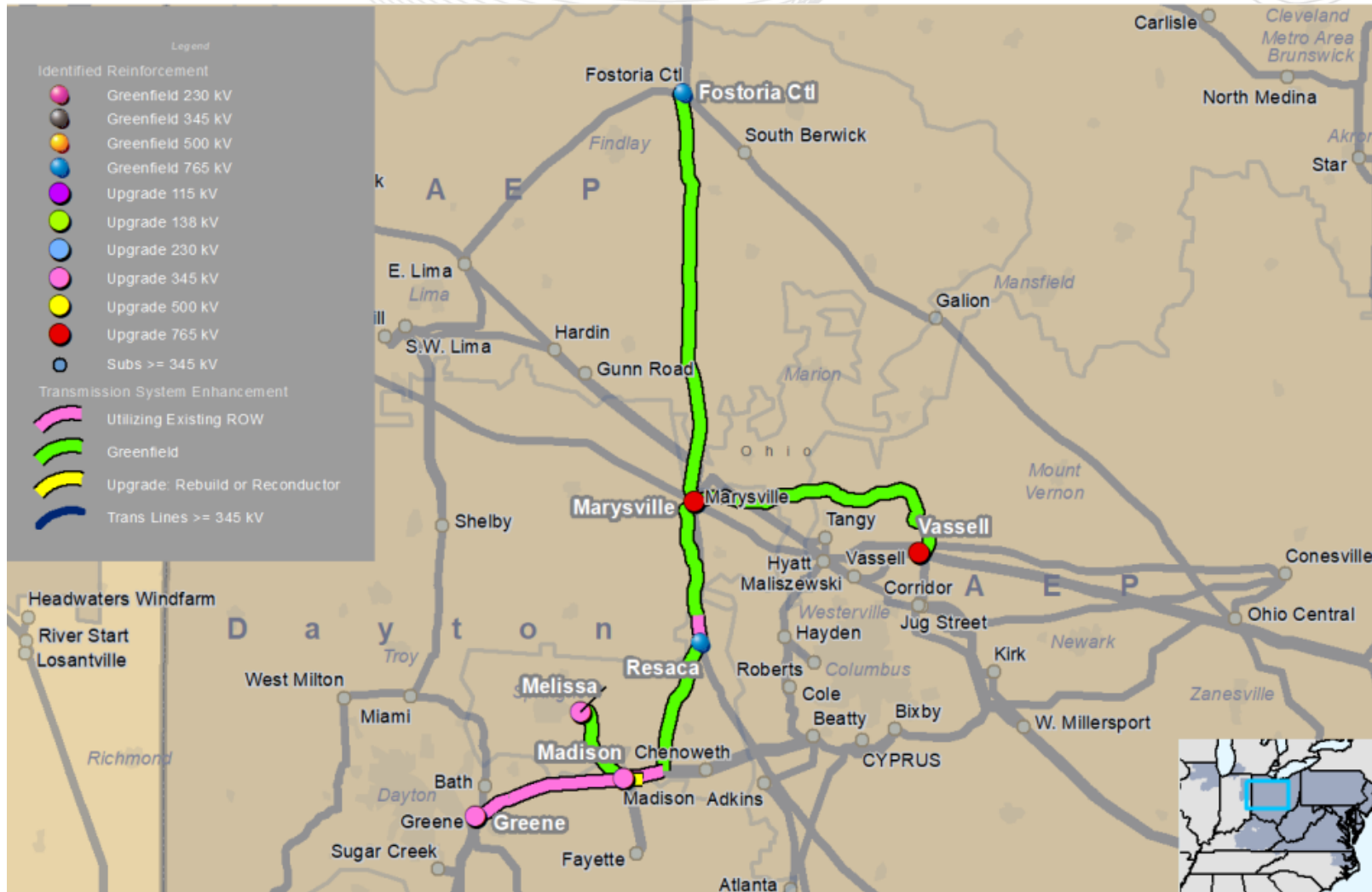


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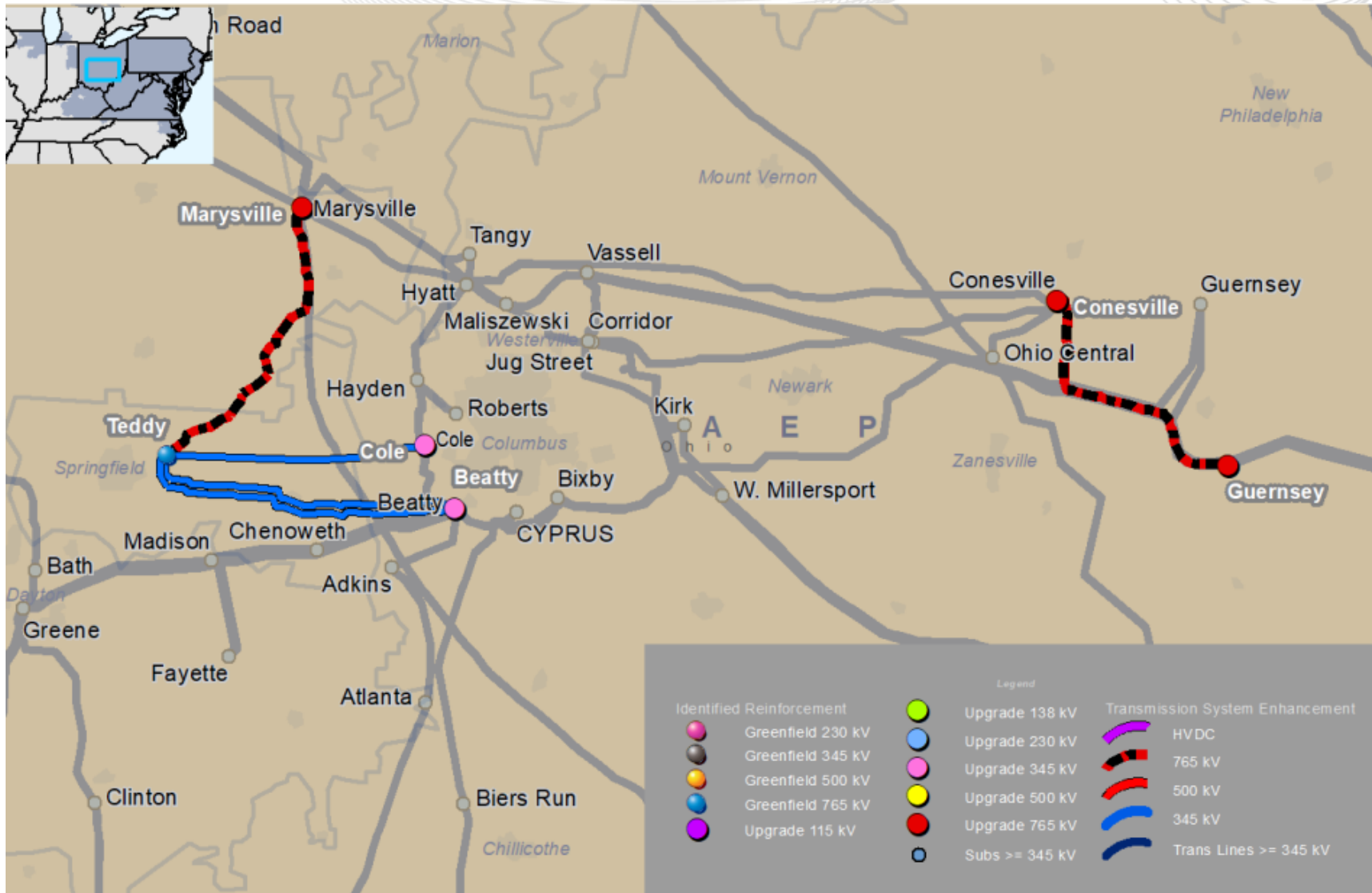


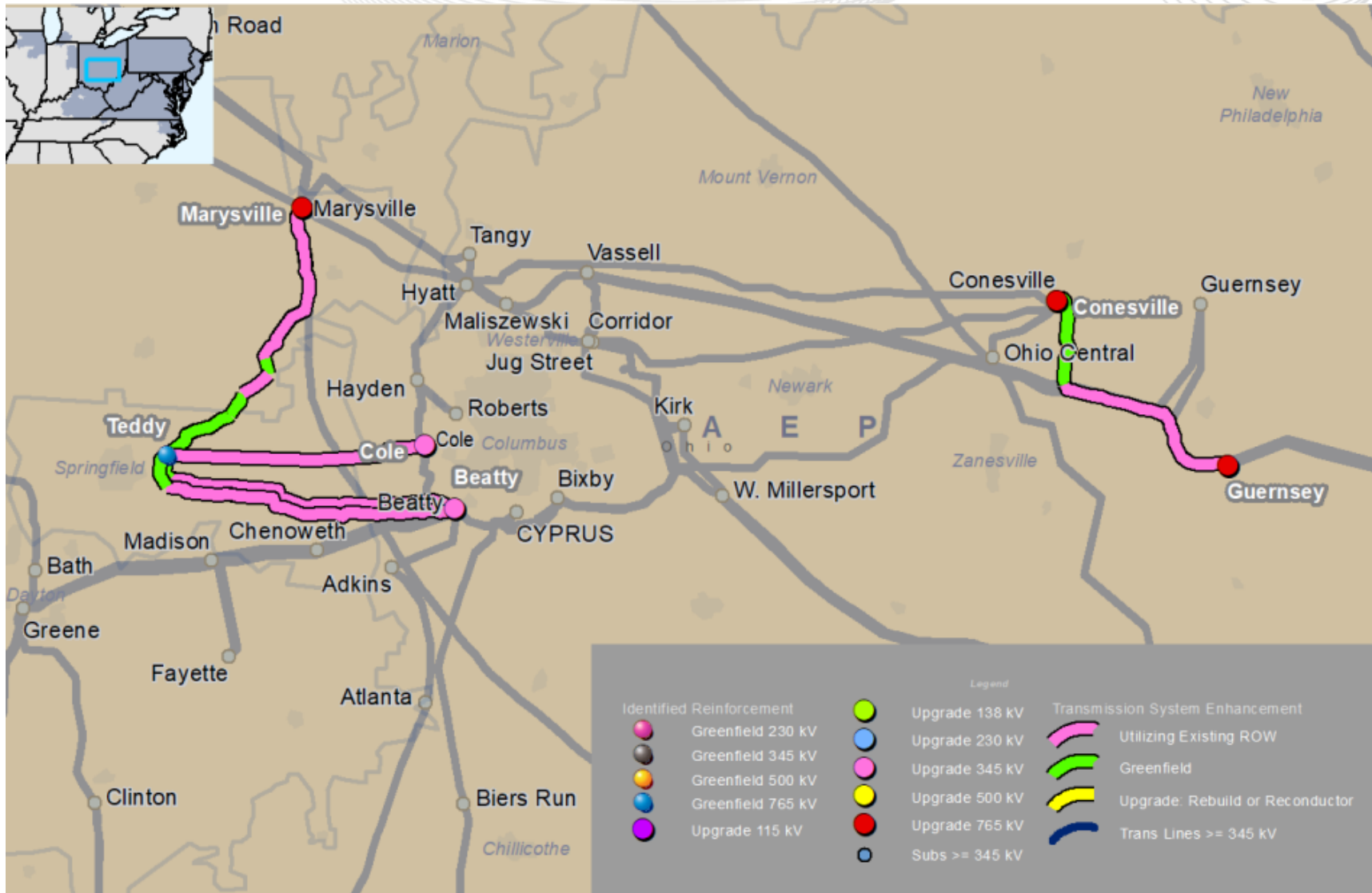
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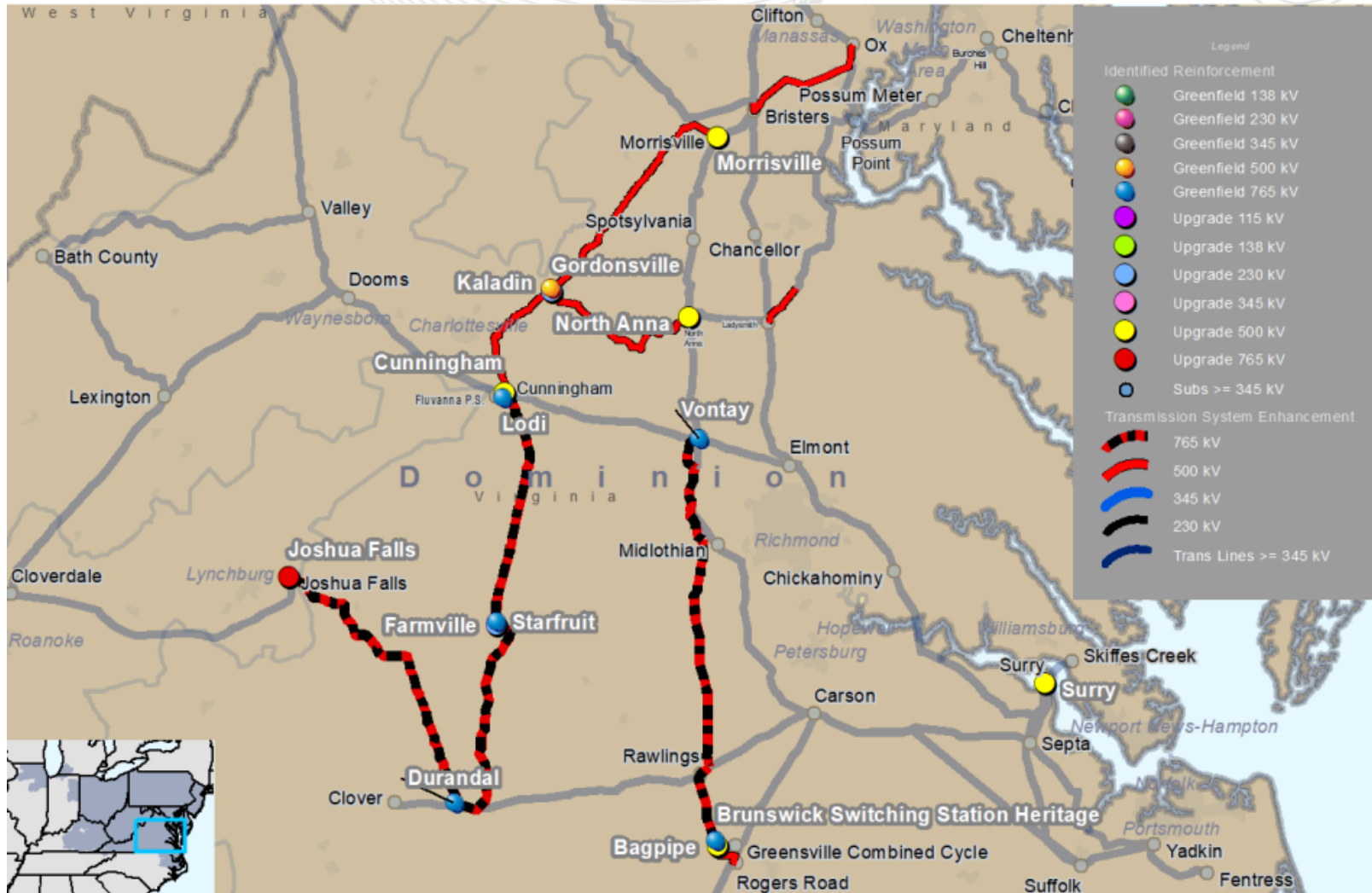
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# TRANSRC (Transource)

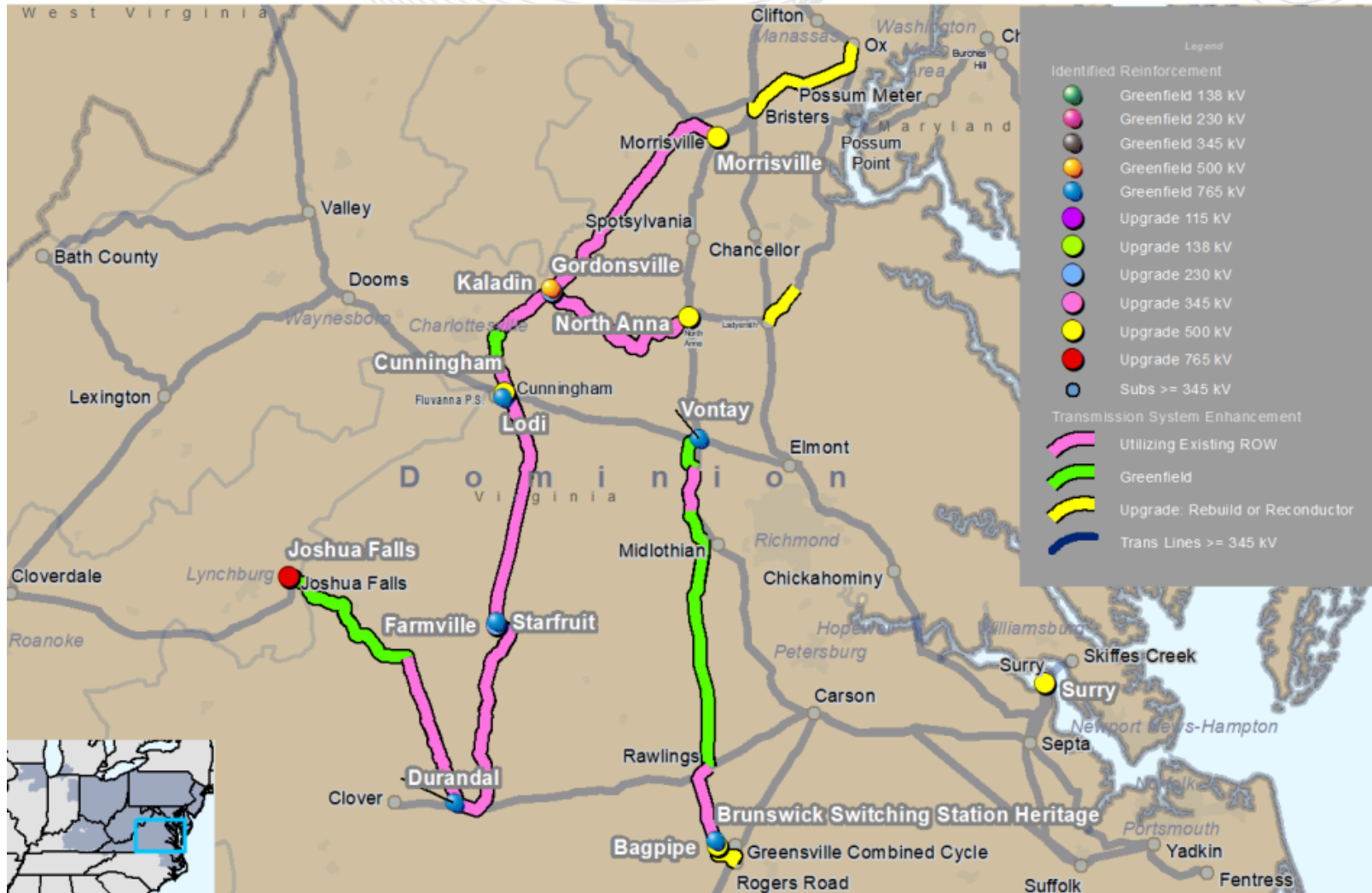




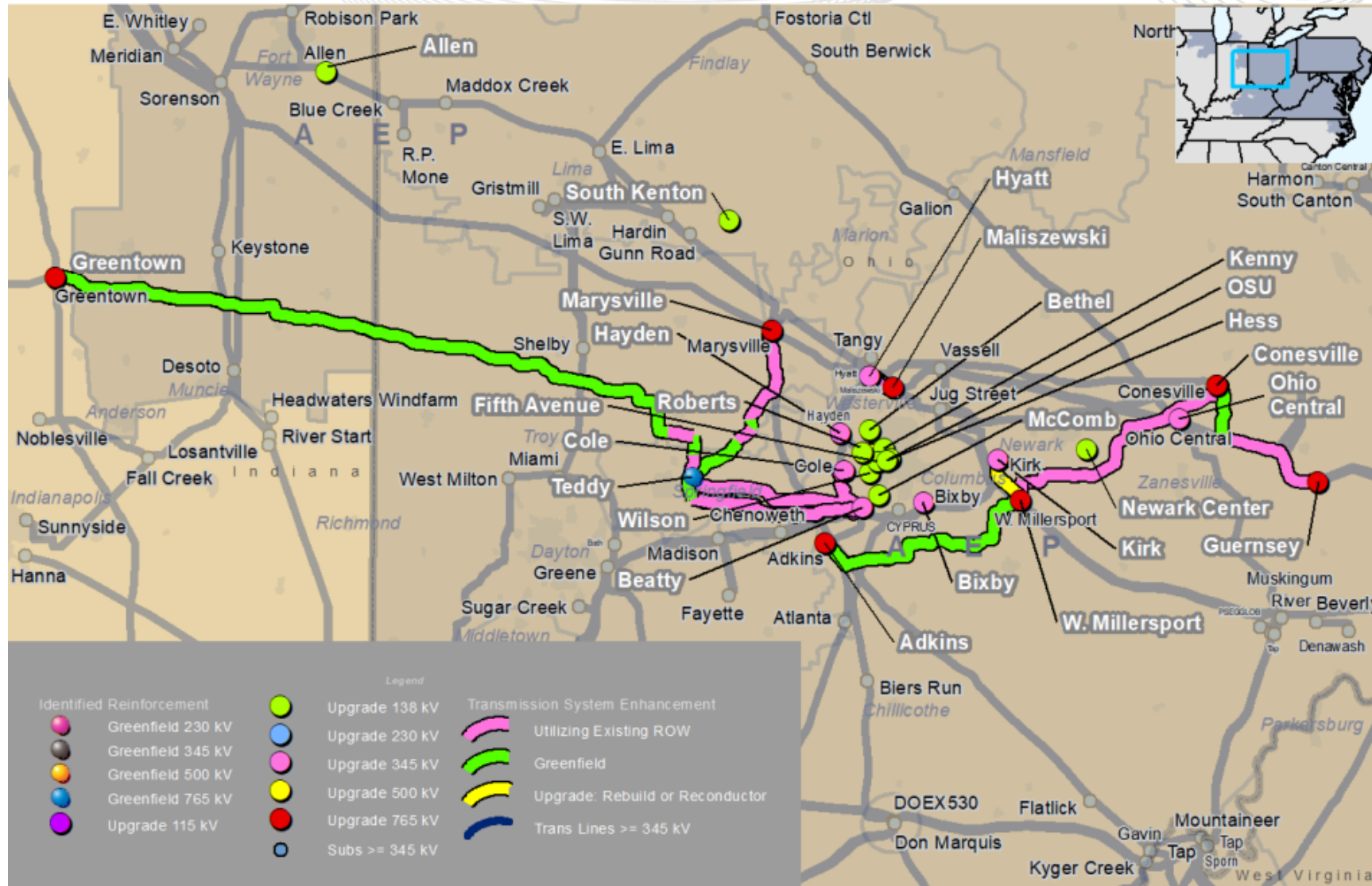




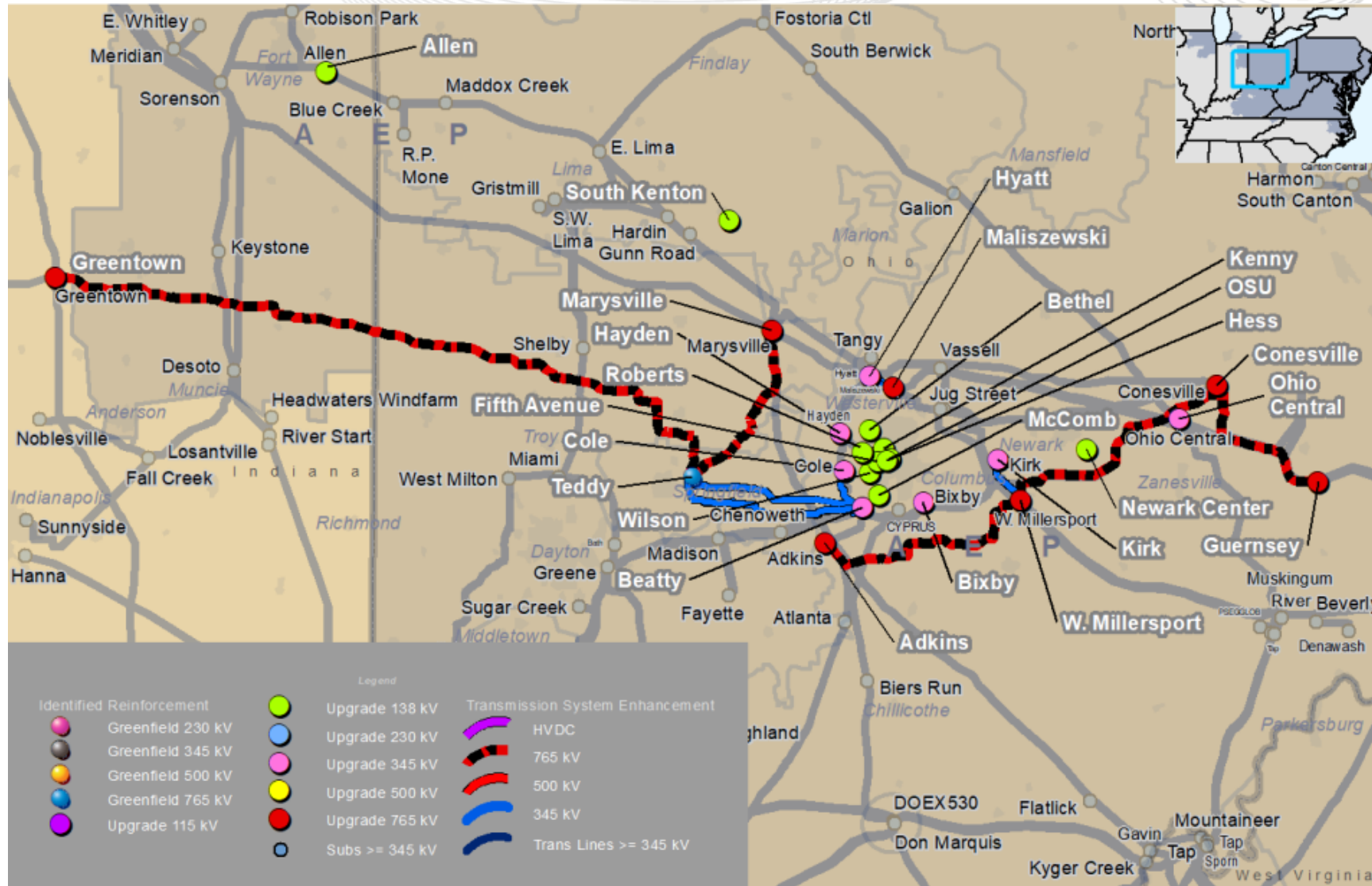
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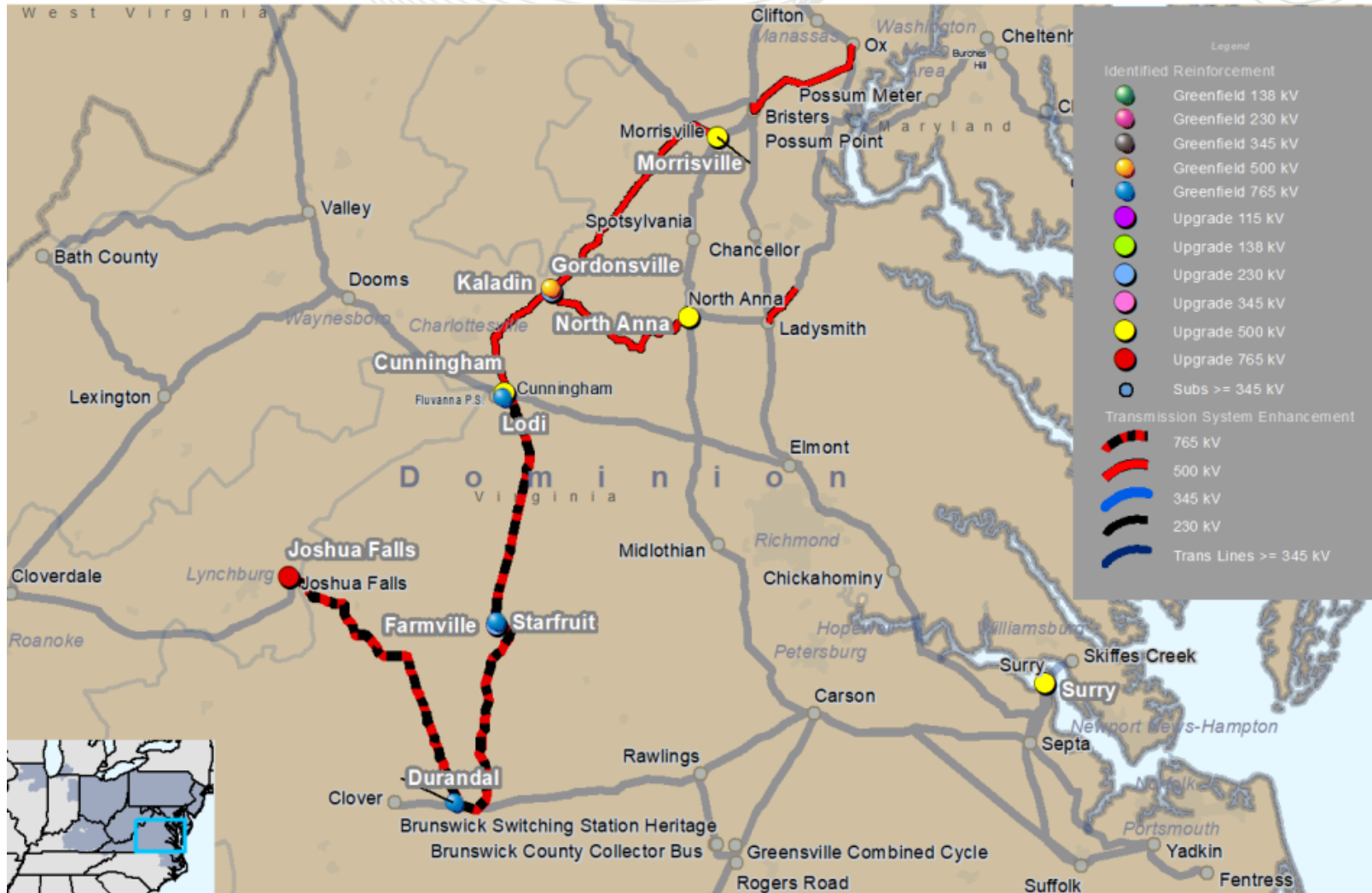


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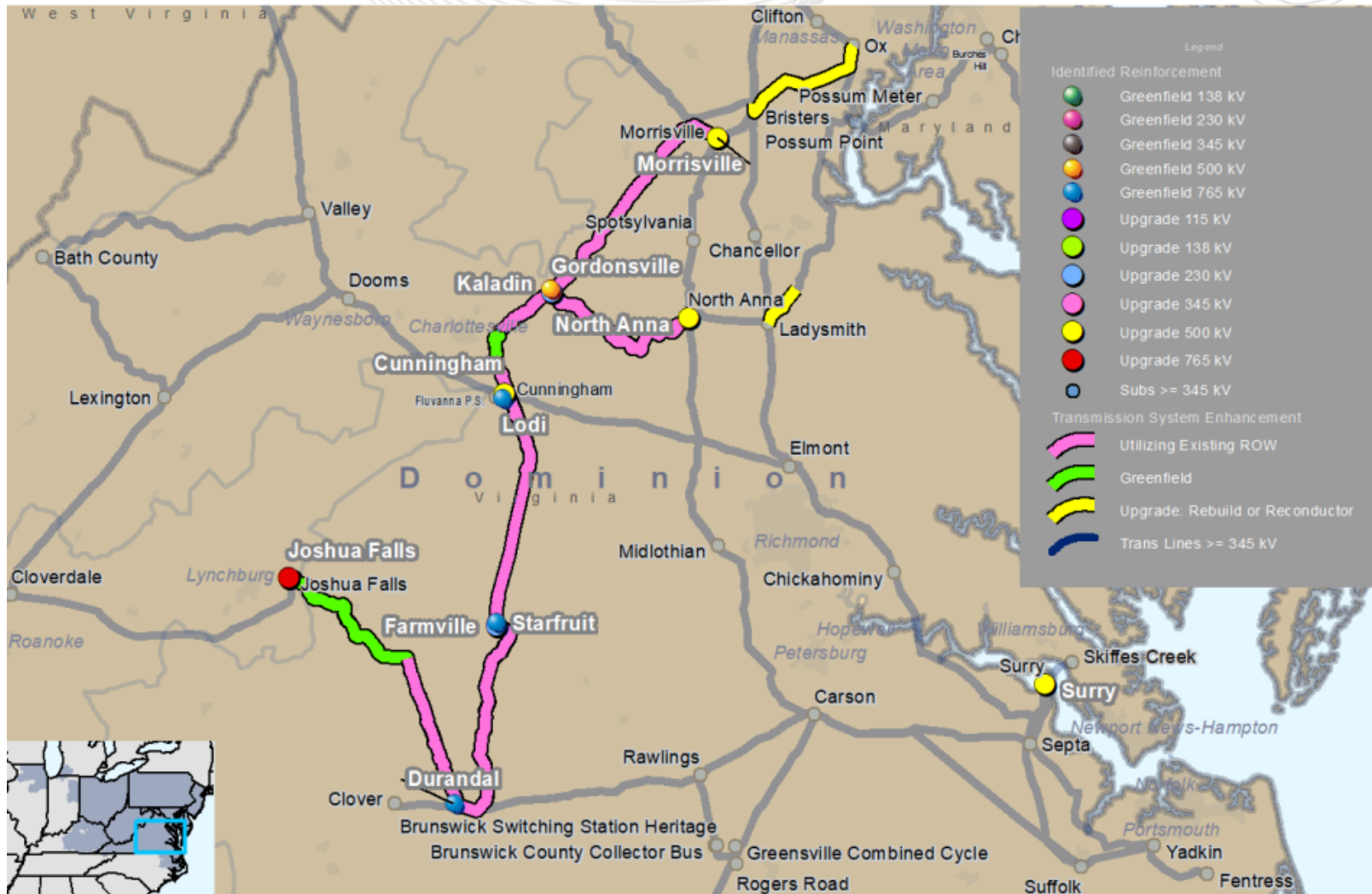






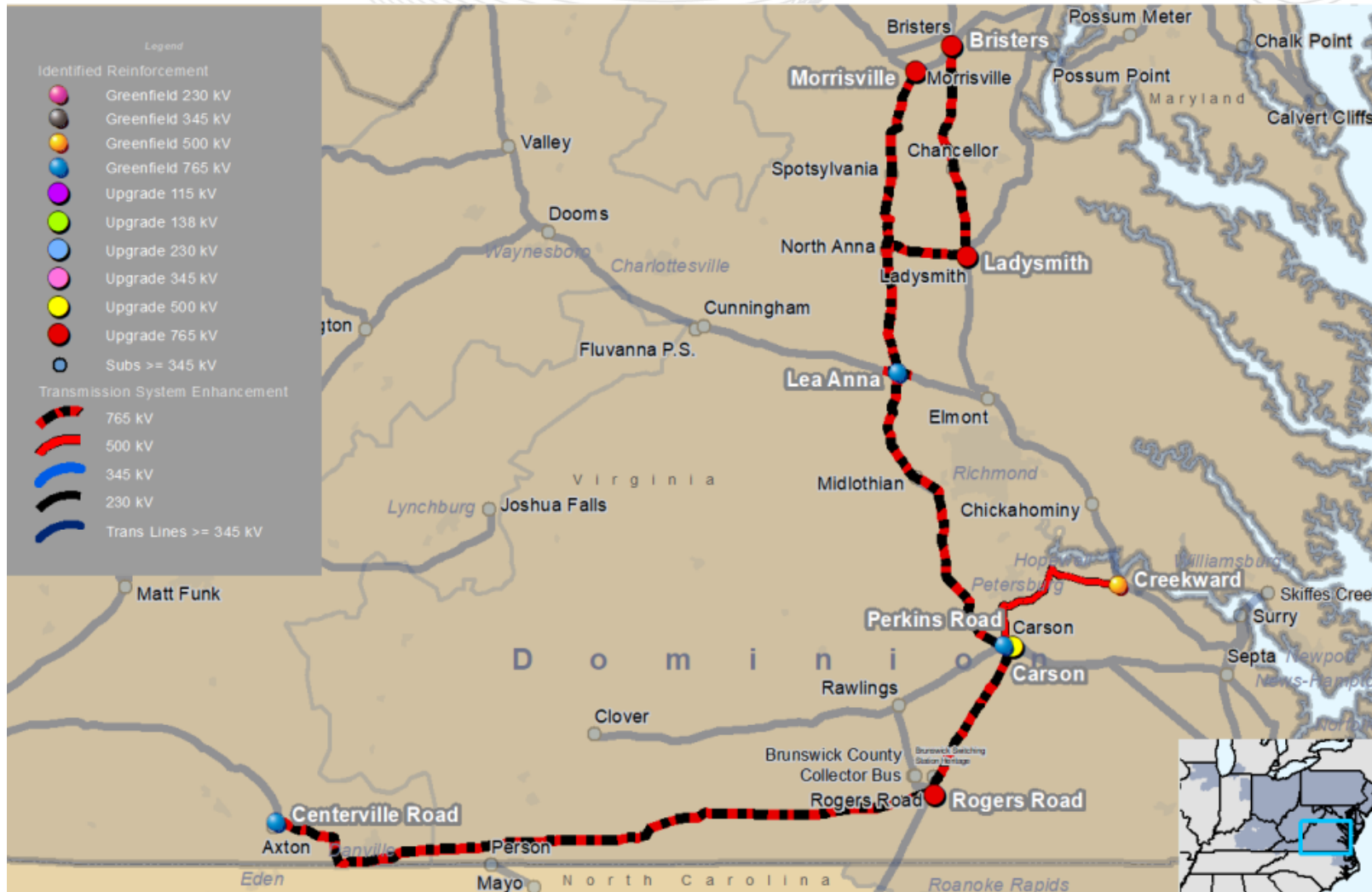
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# TRAIL (FirstEnergy)



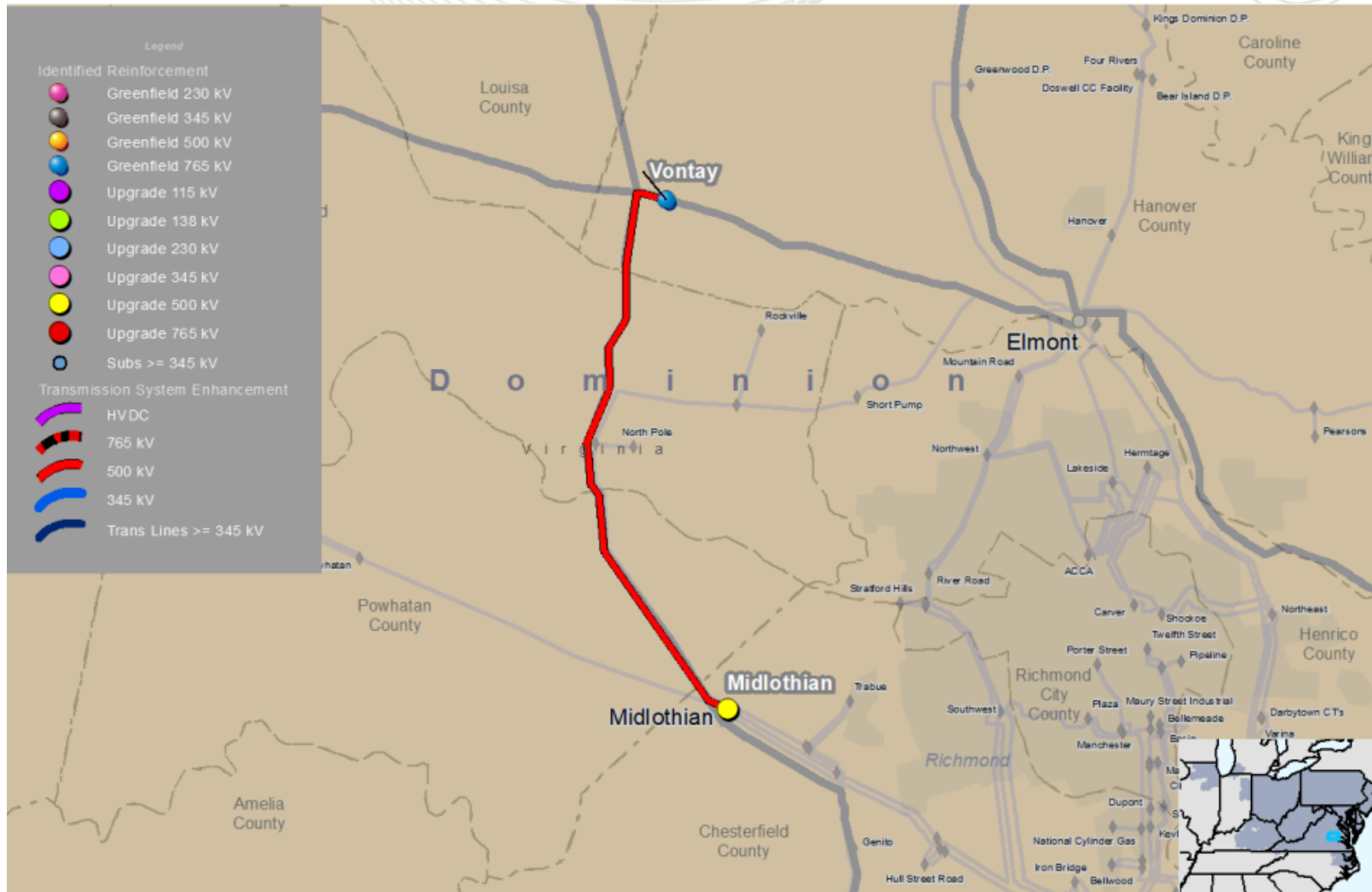
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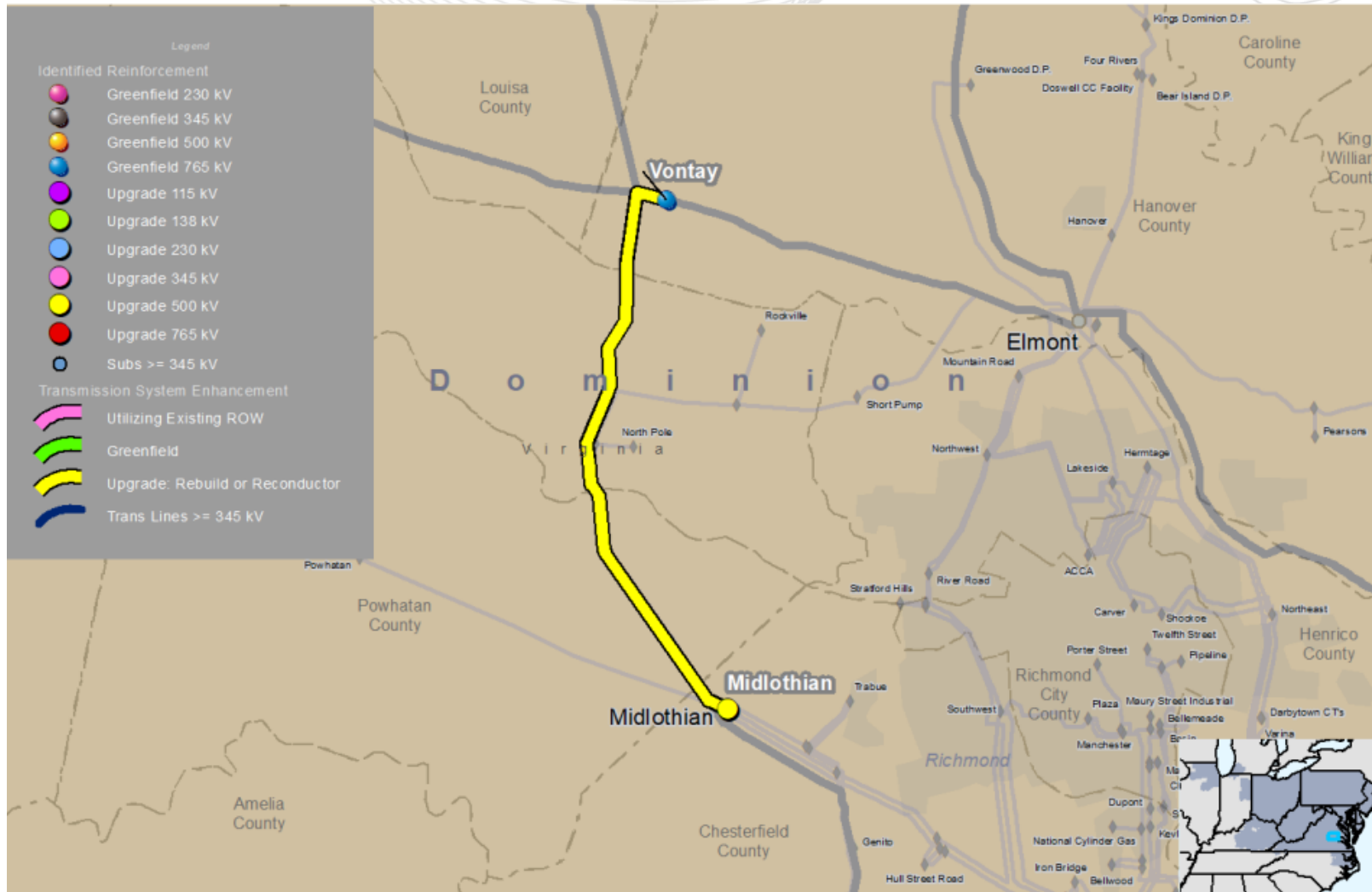
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# VEPCO (Dominion)

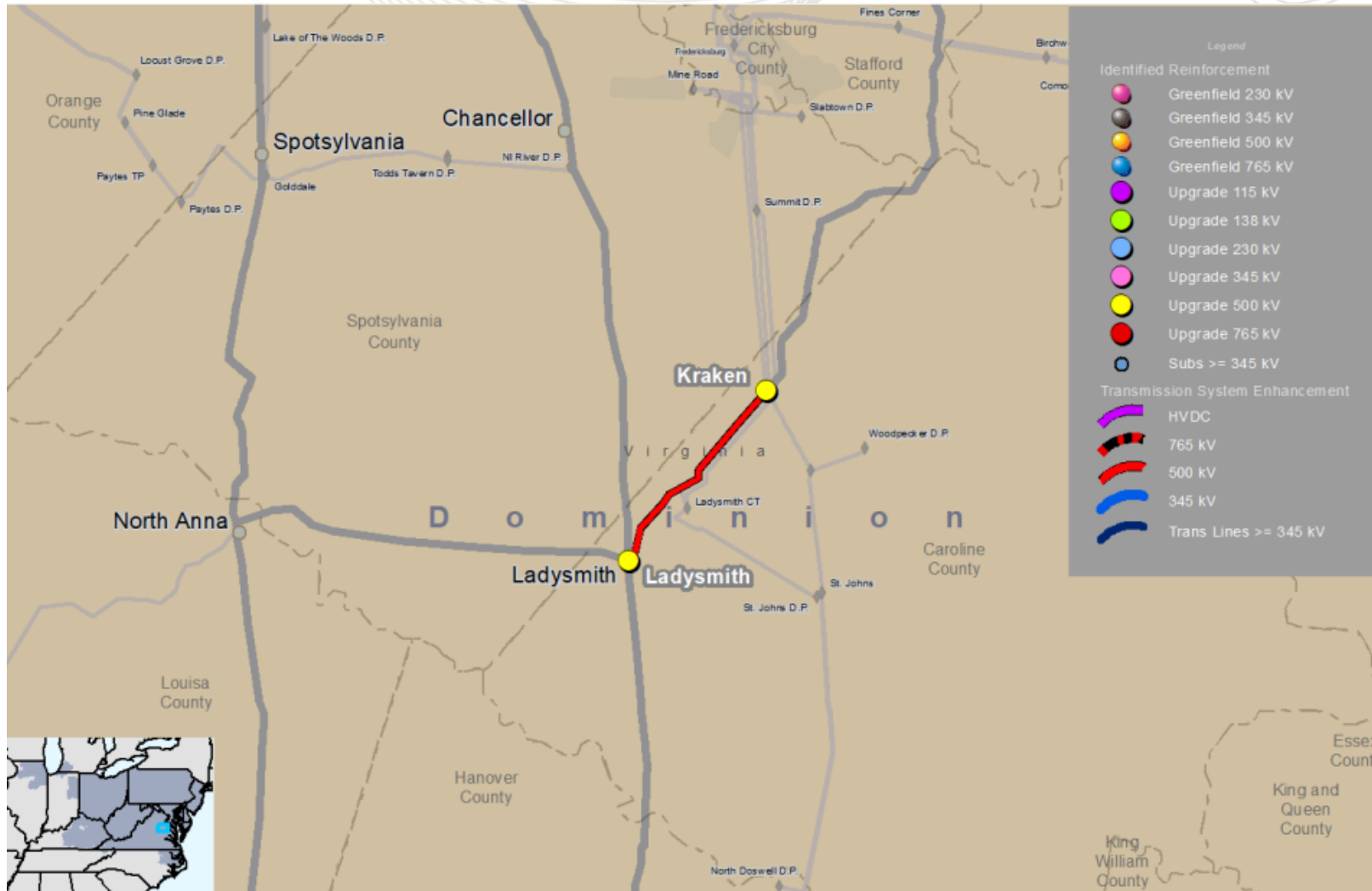




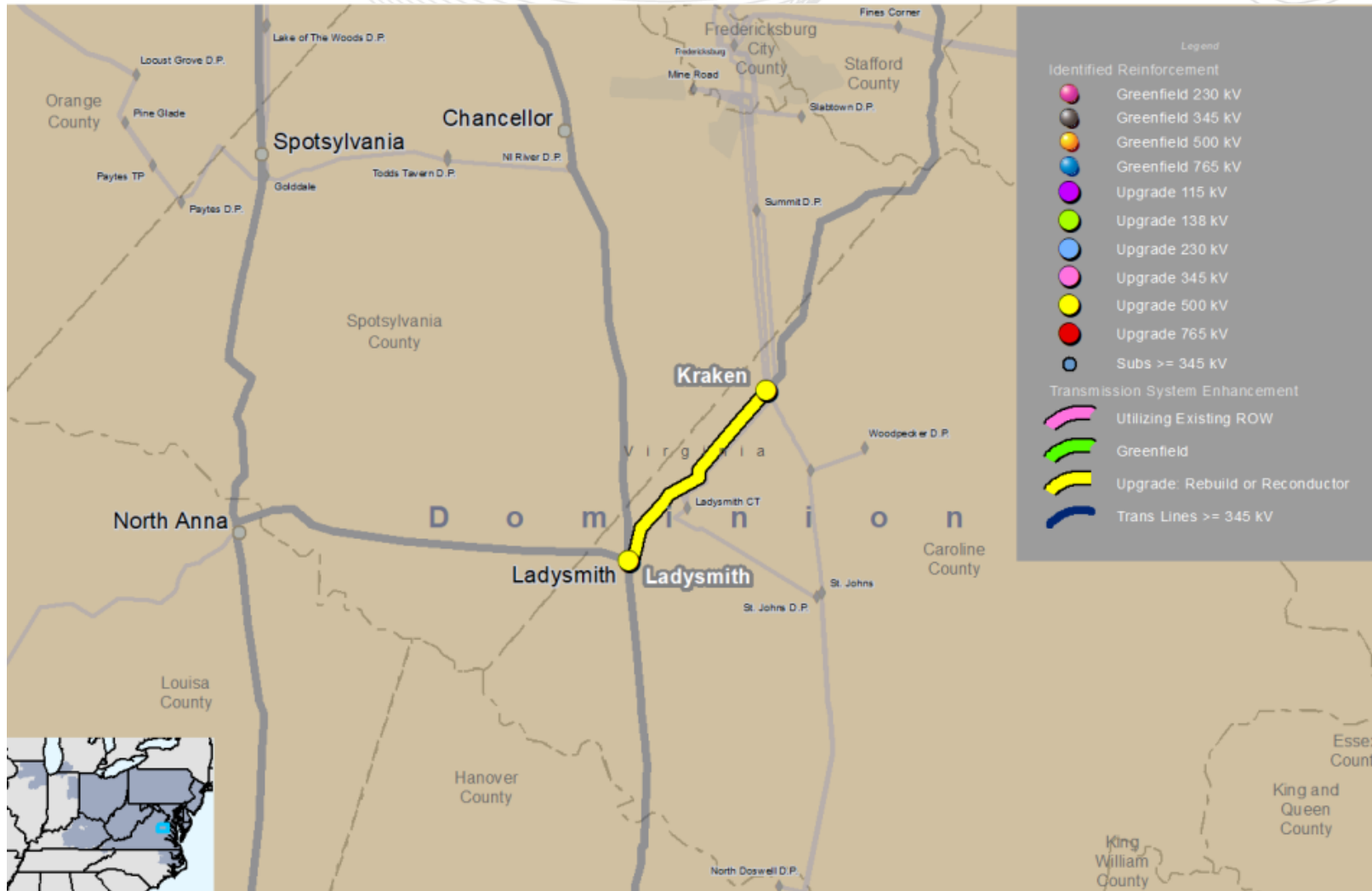
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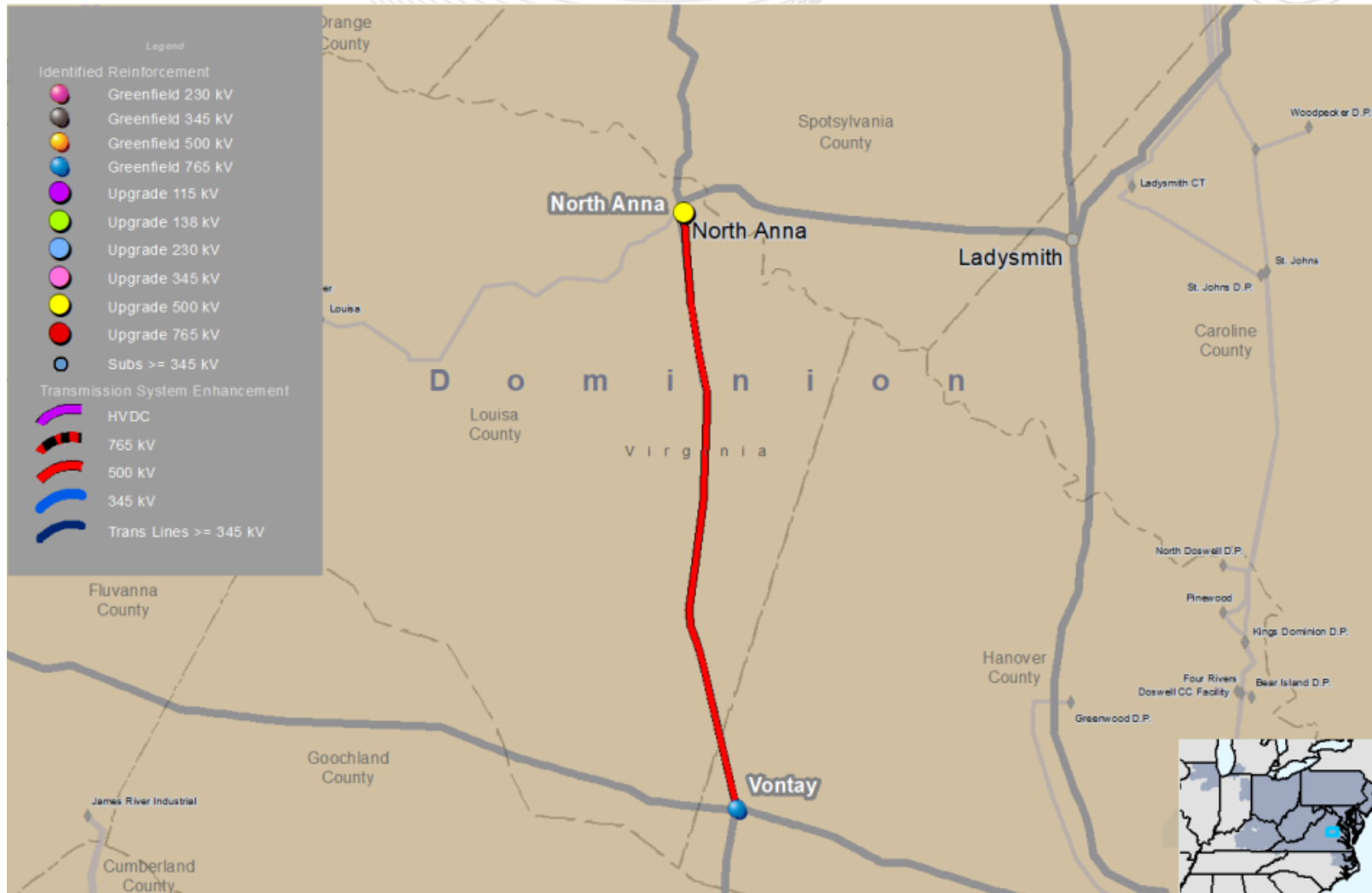
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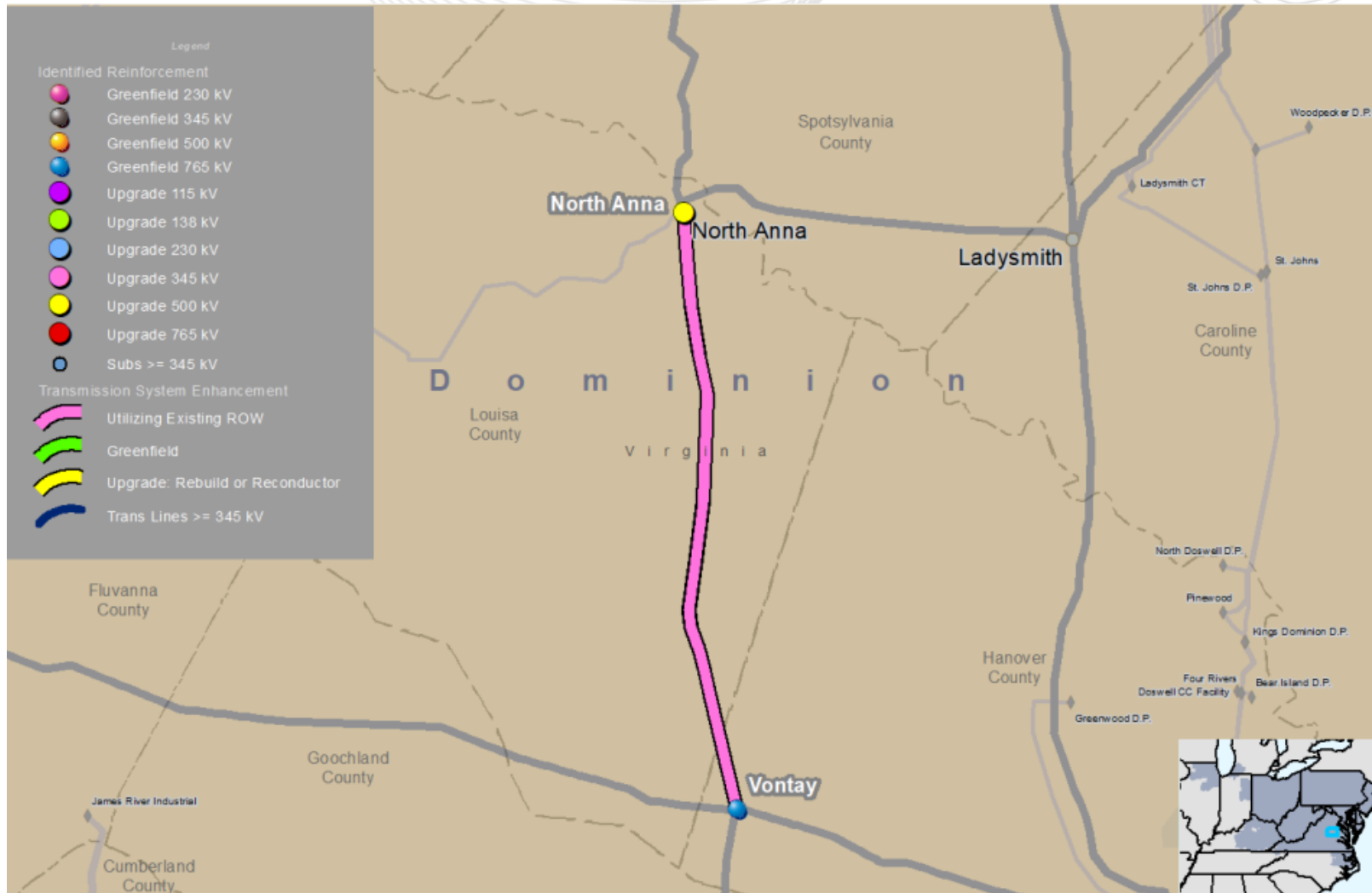


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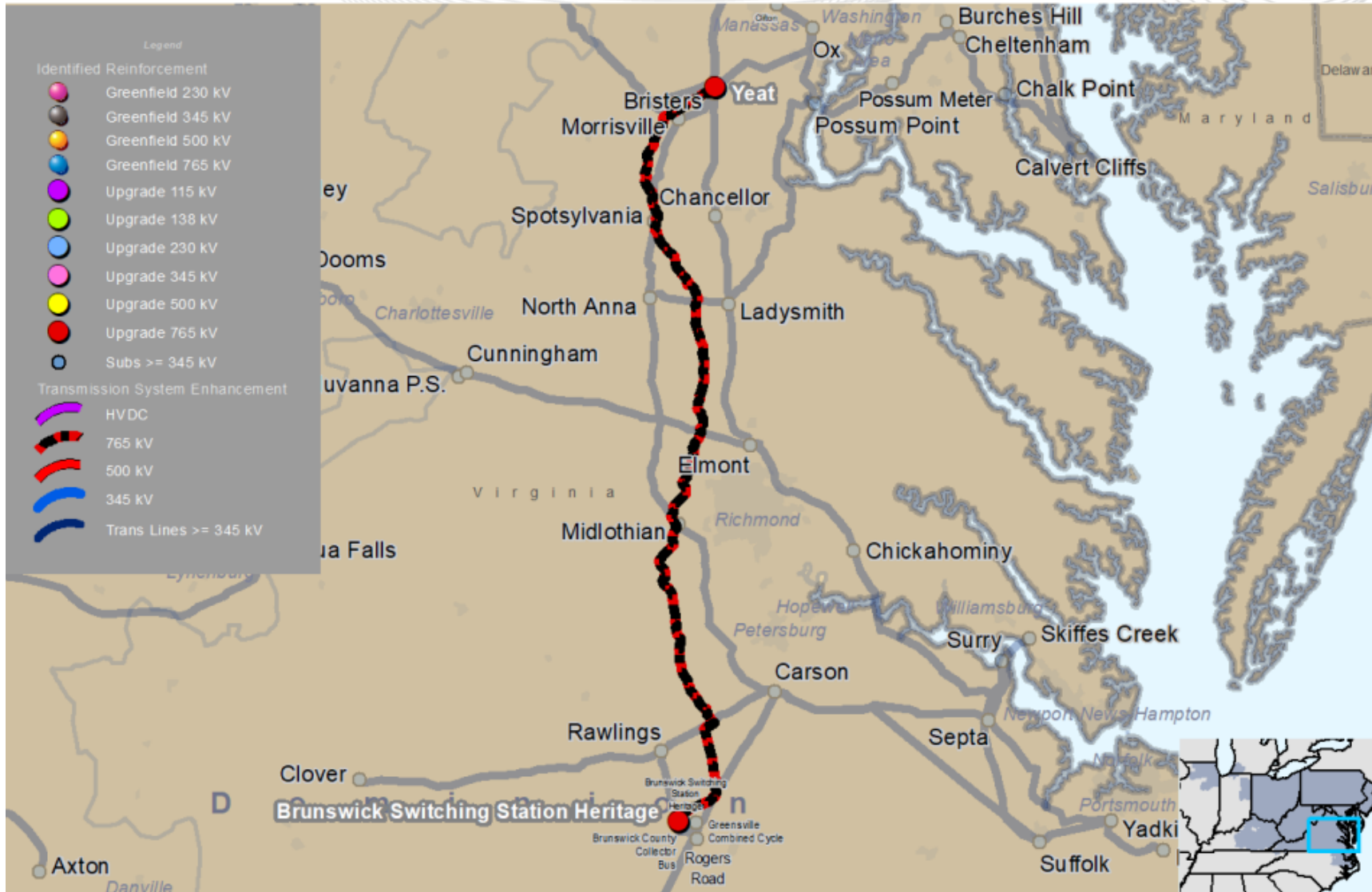


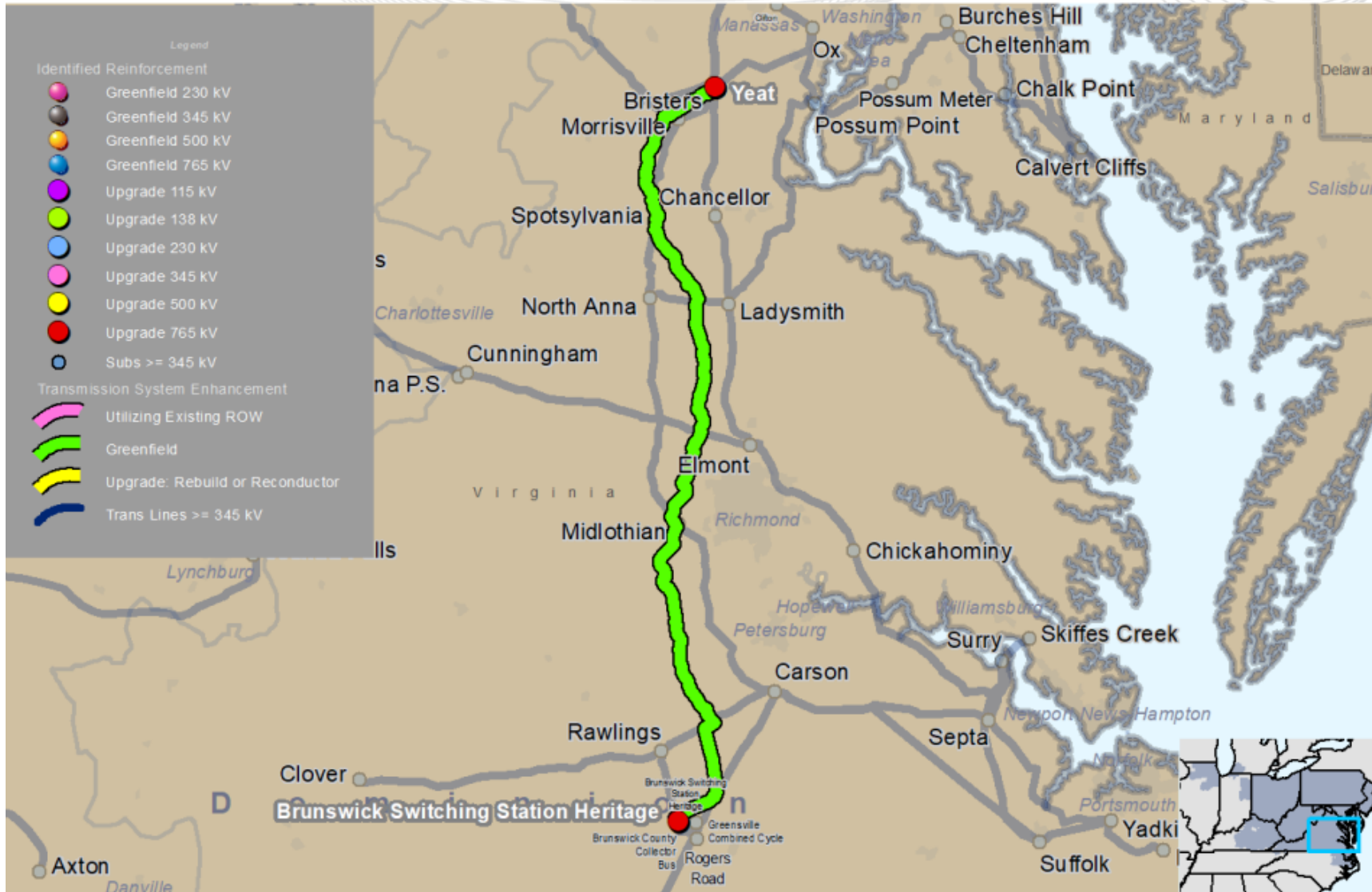
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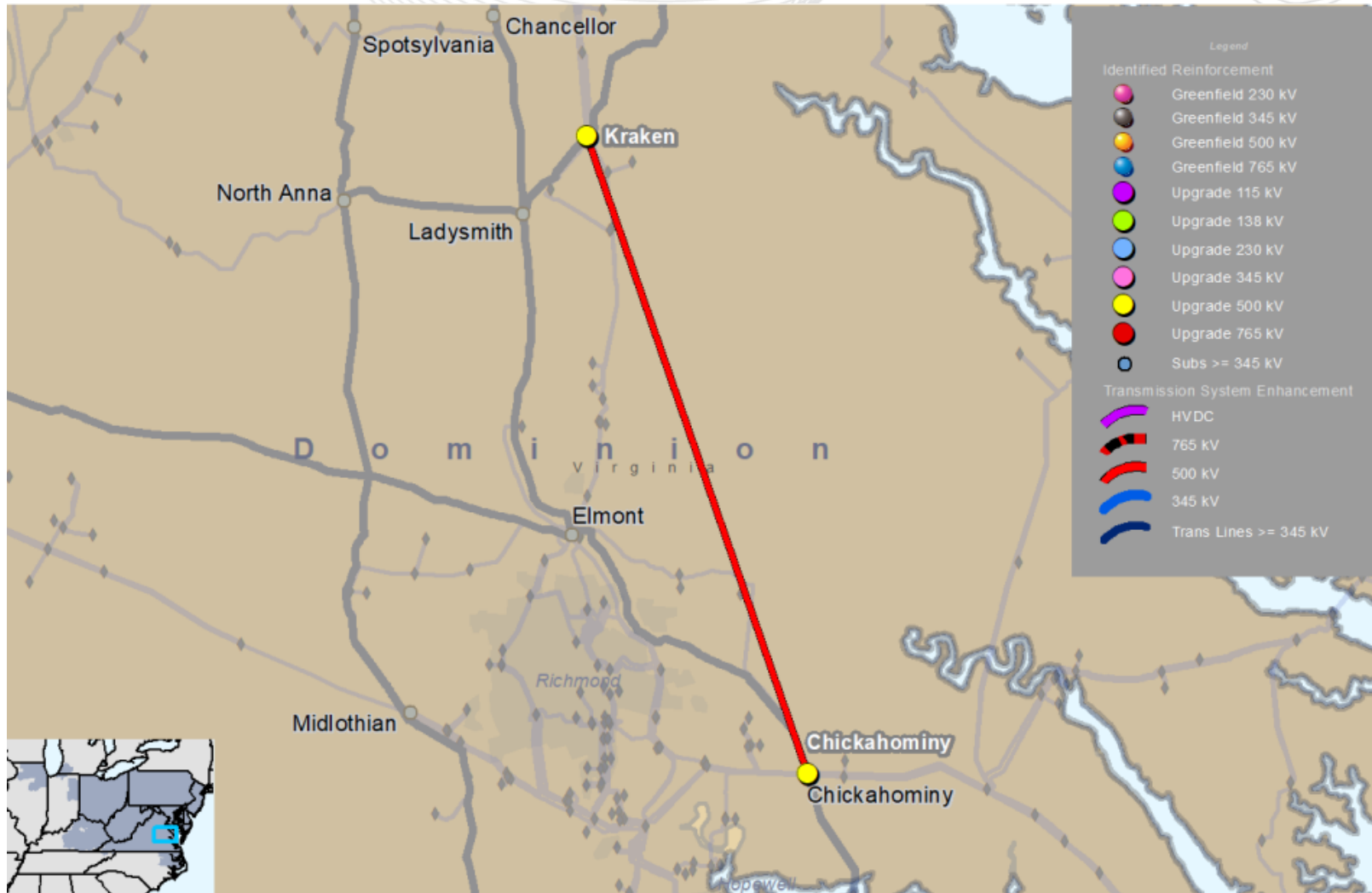




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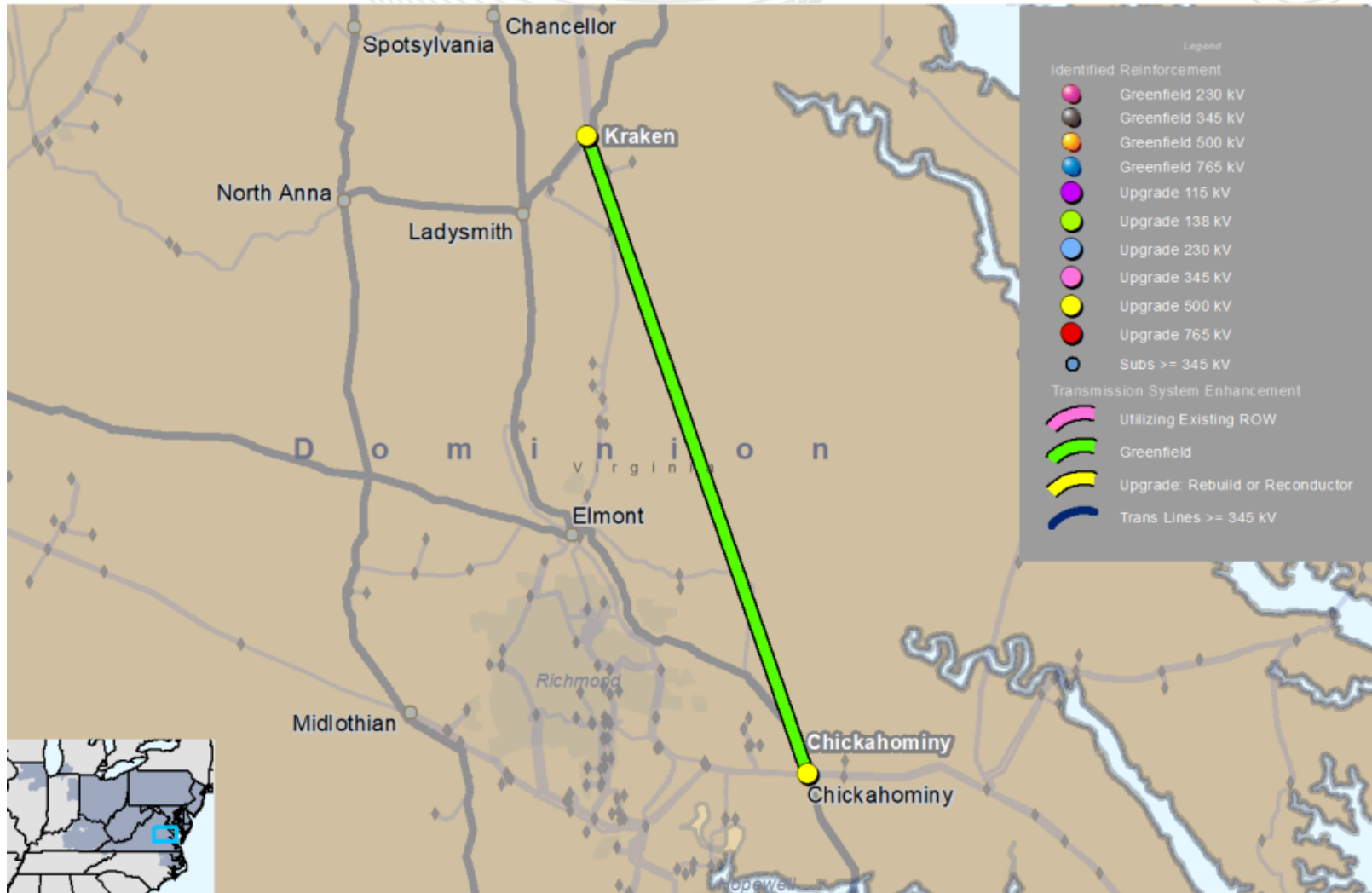






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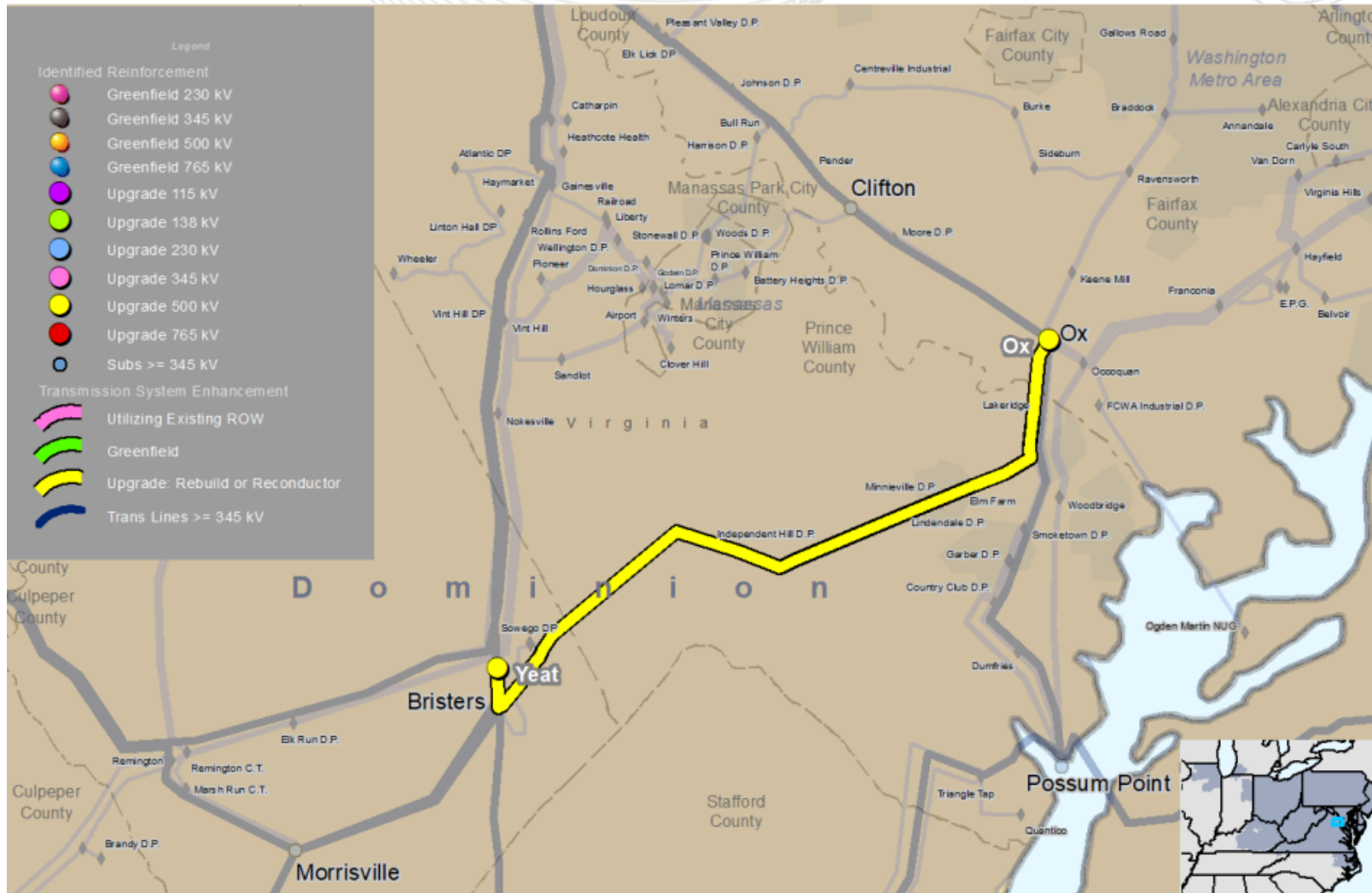


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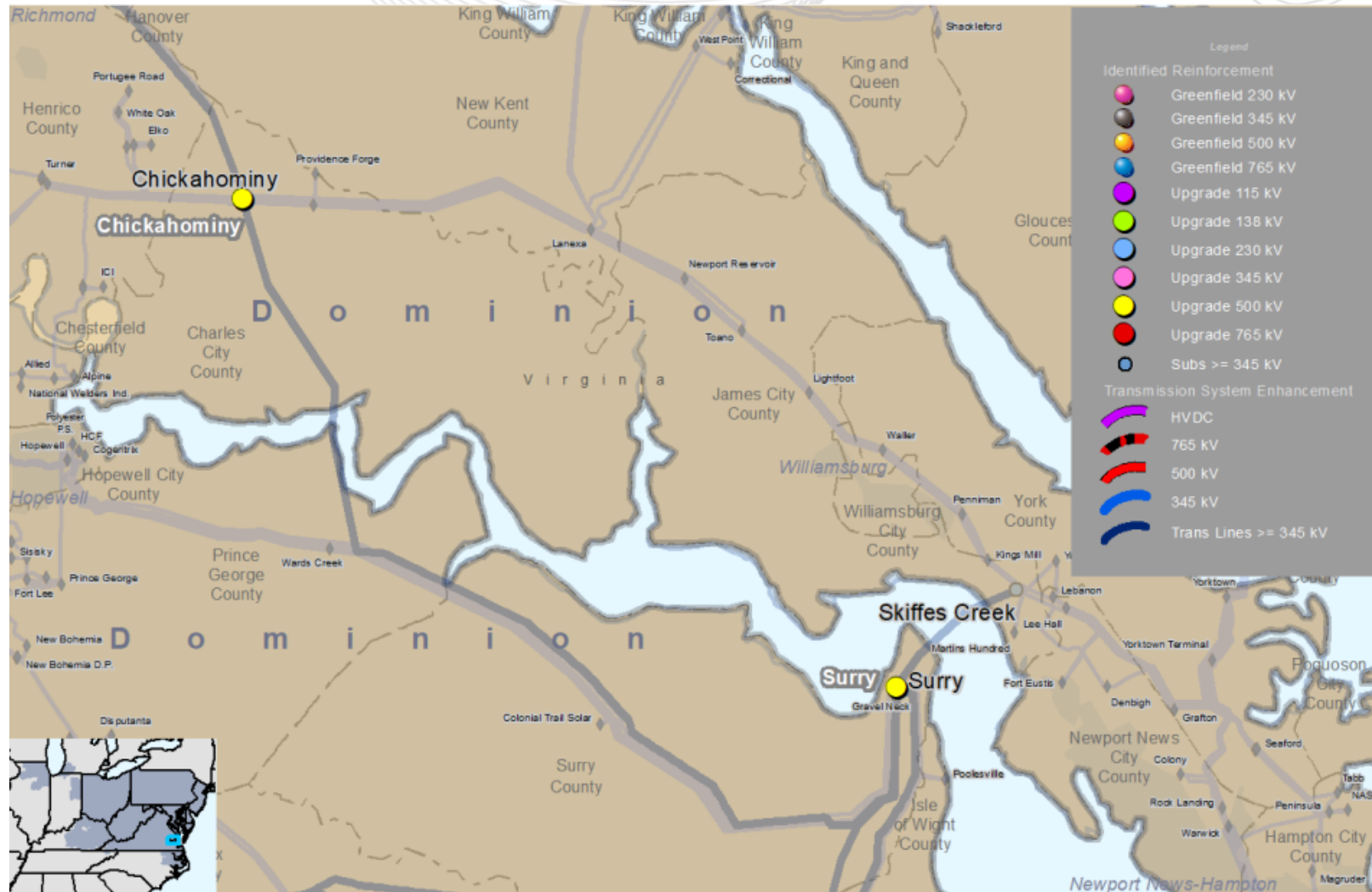




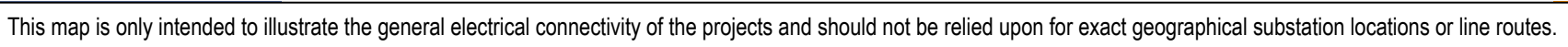
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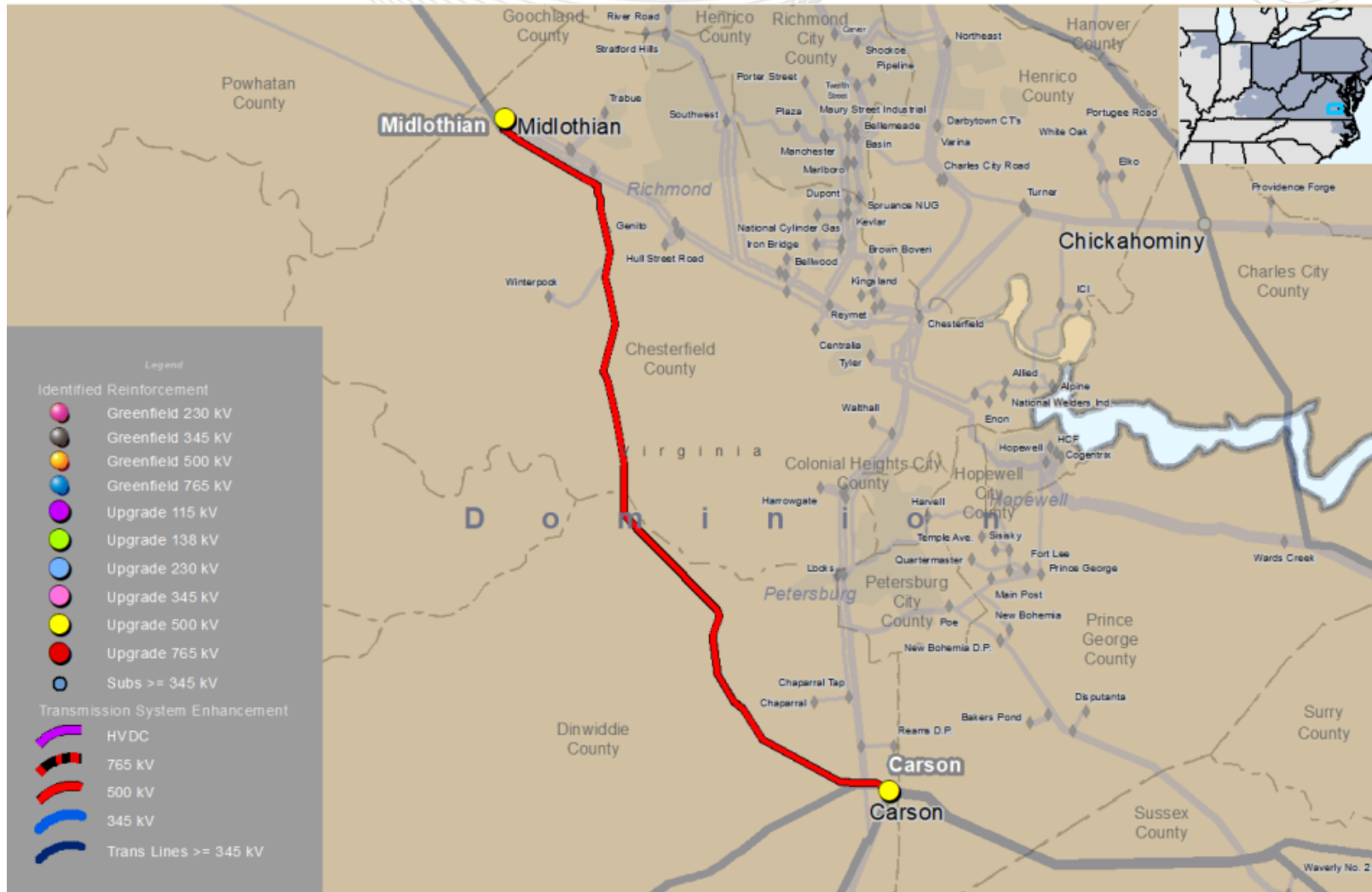
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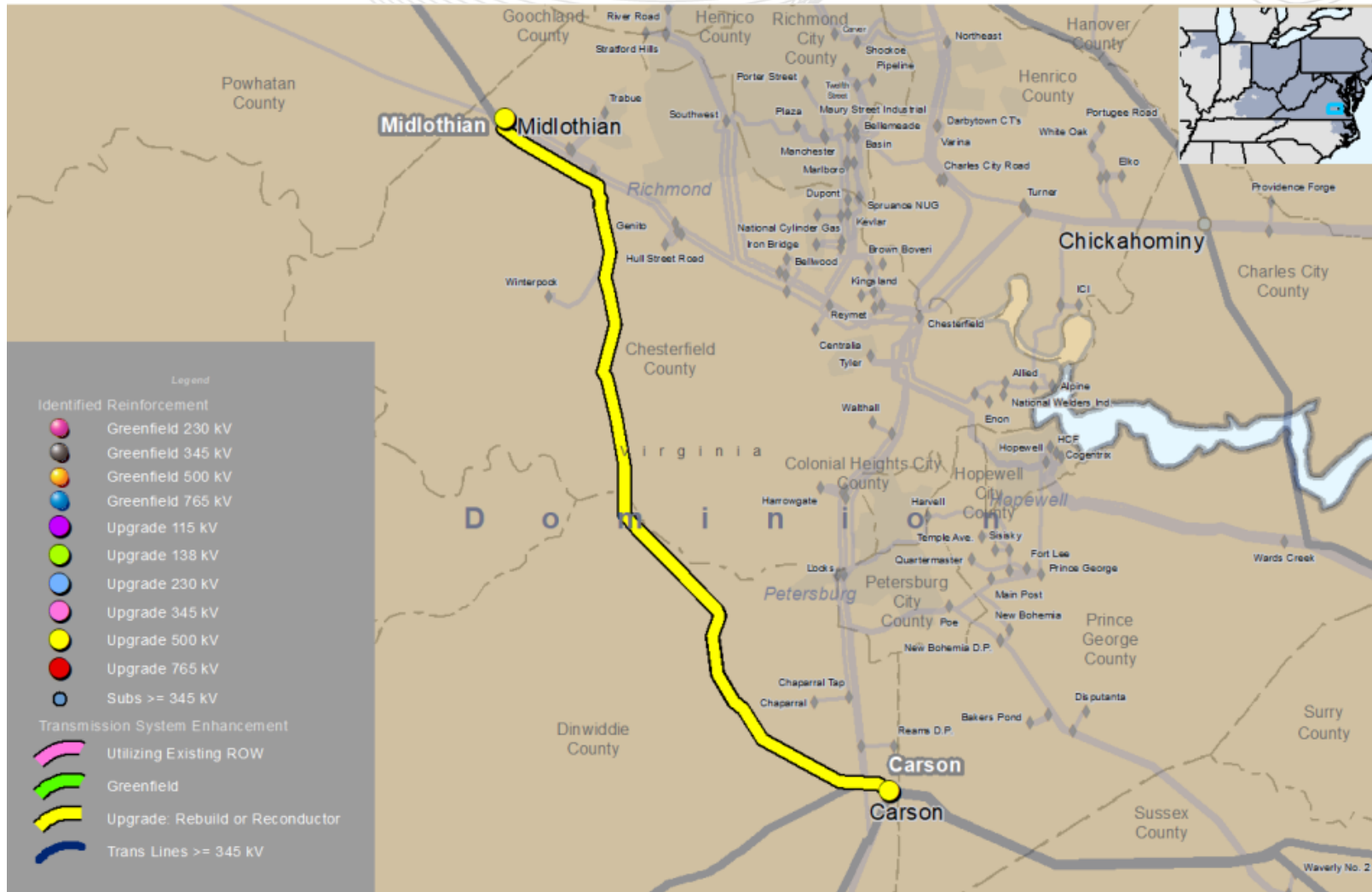






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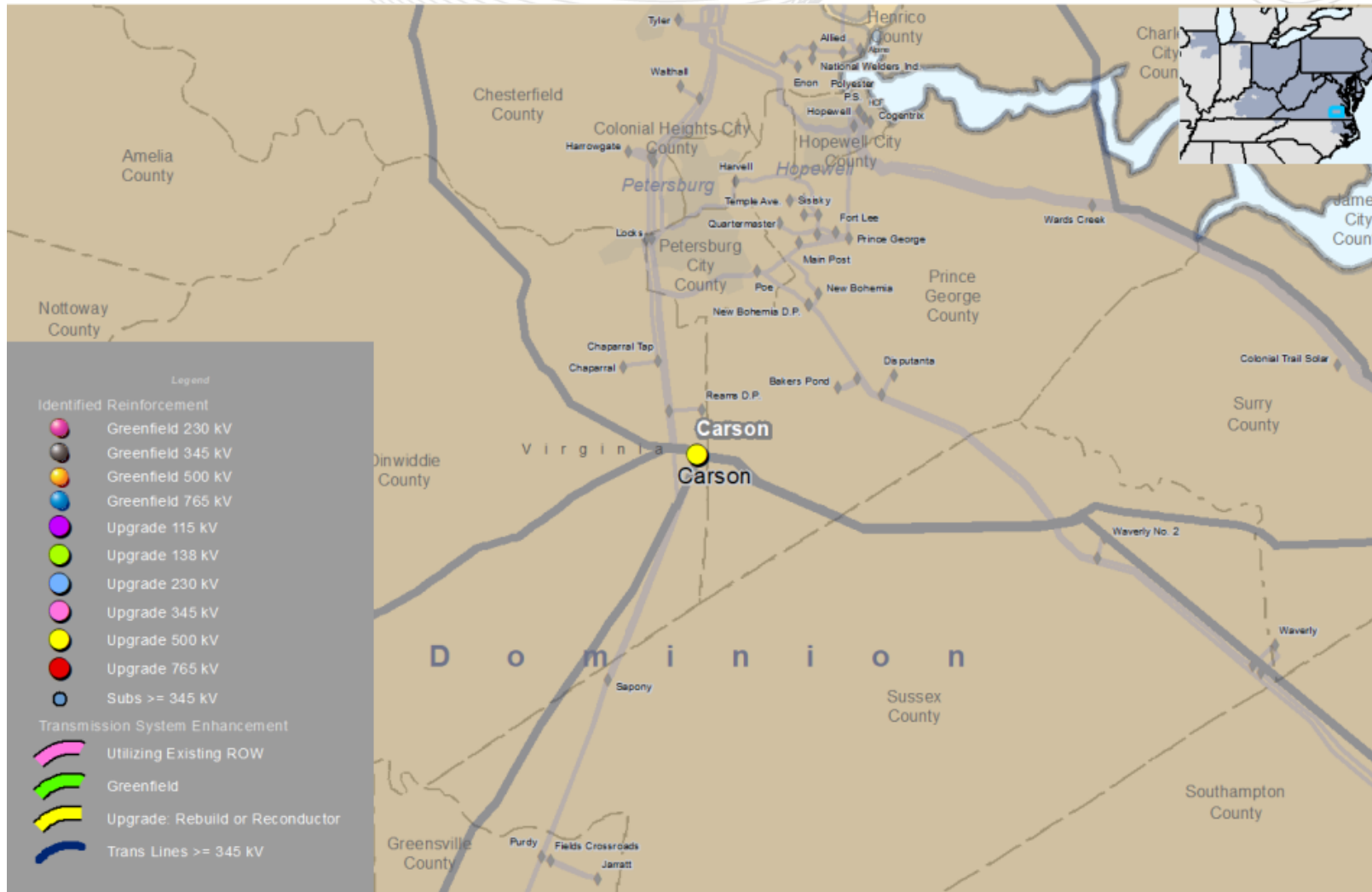




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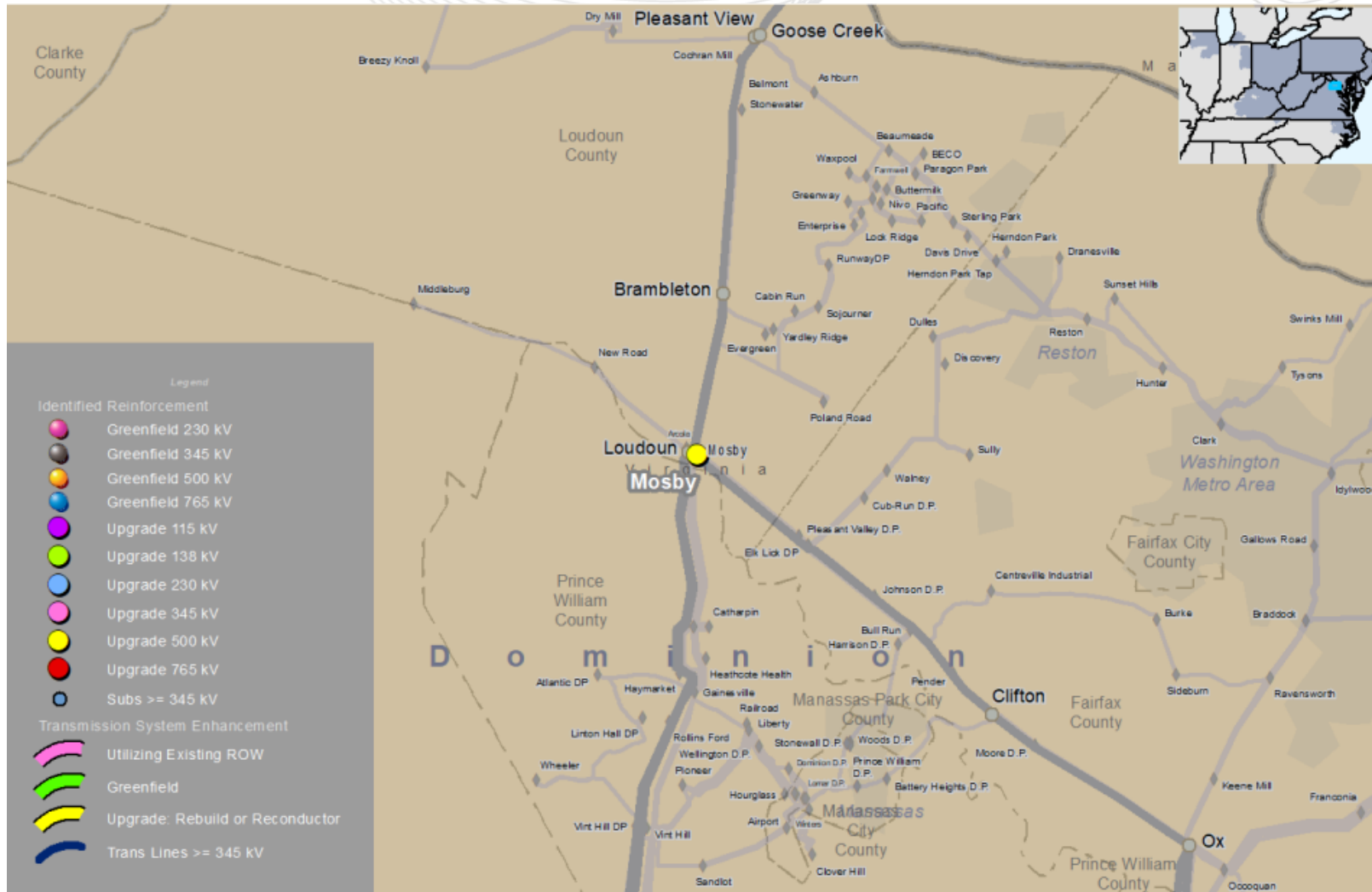
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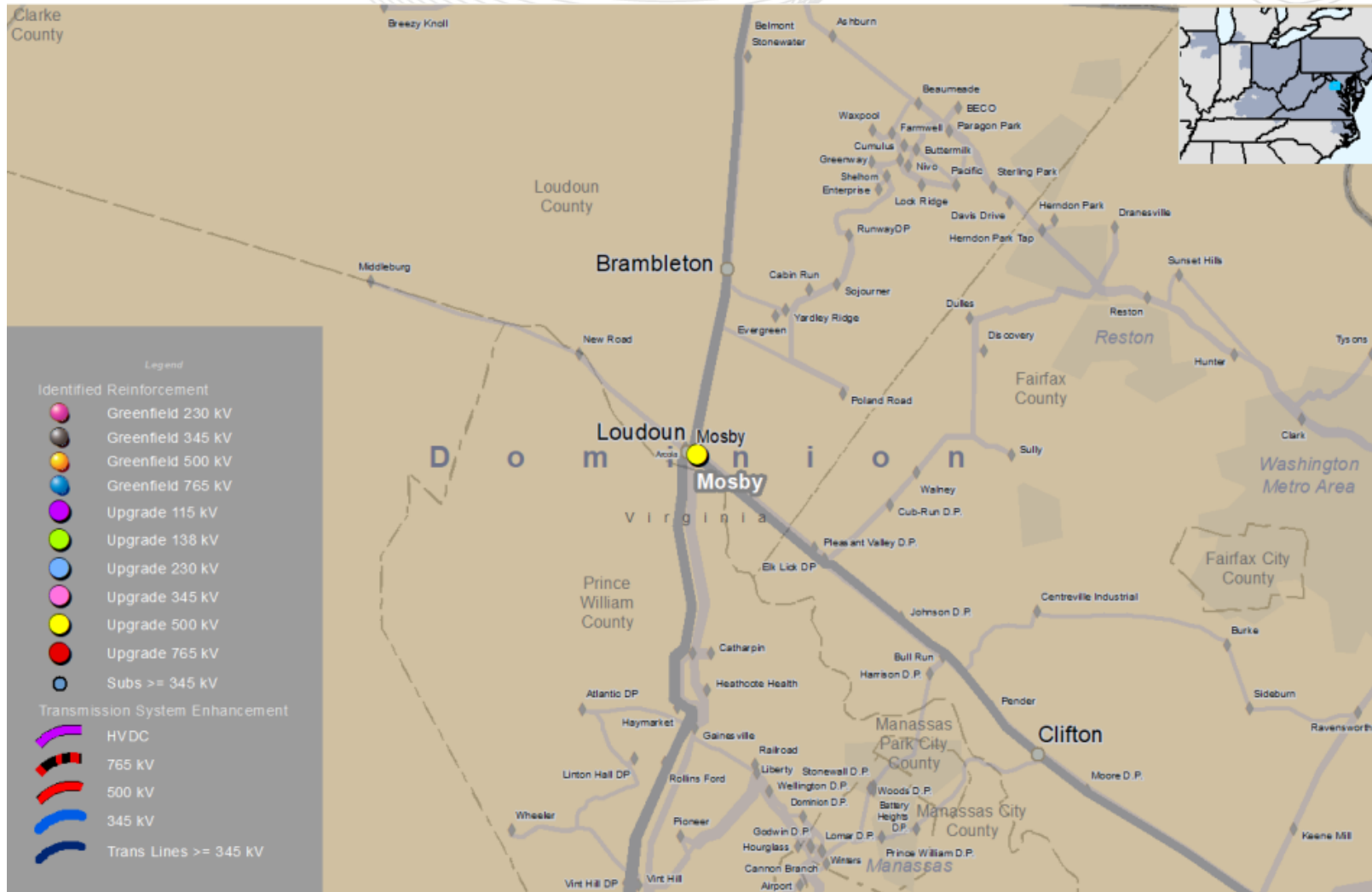




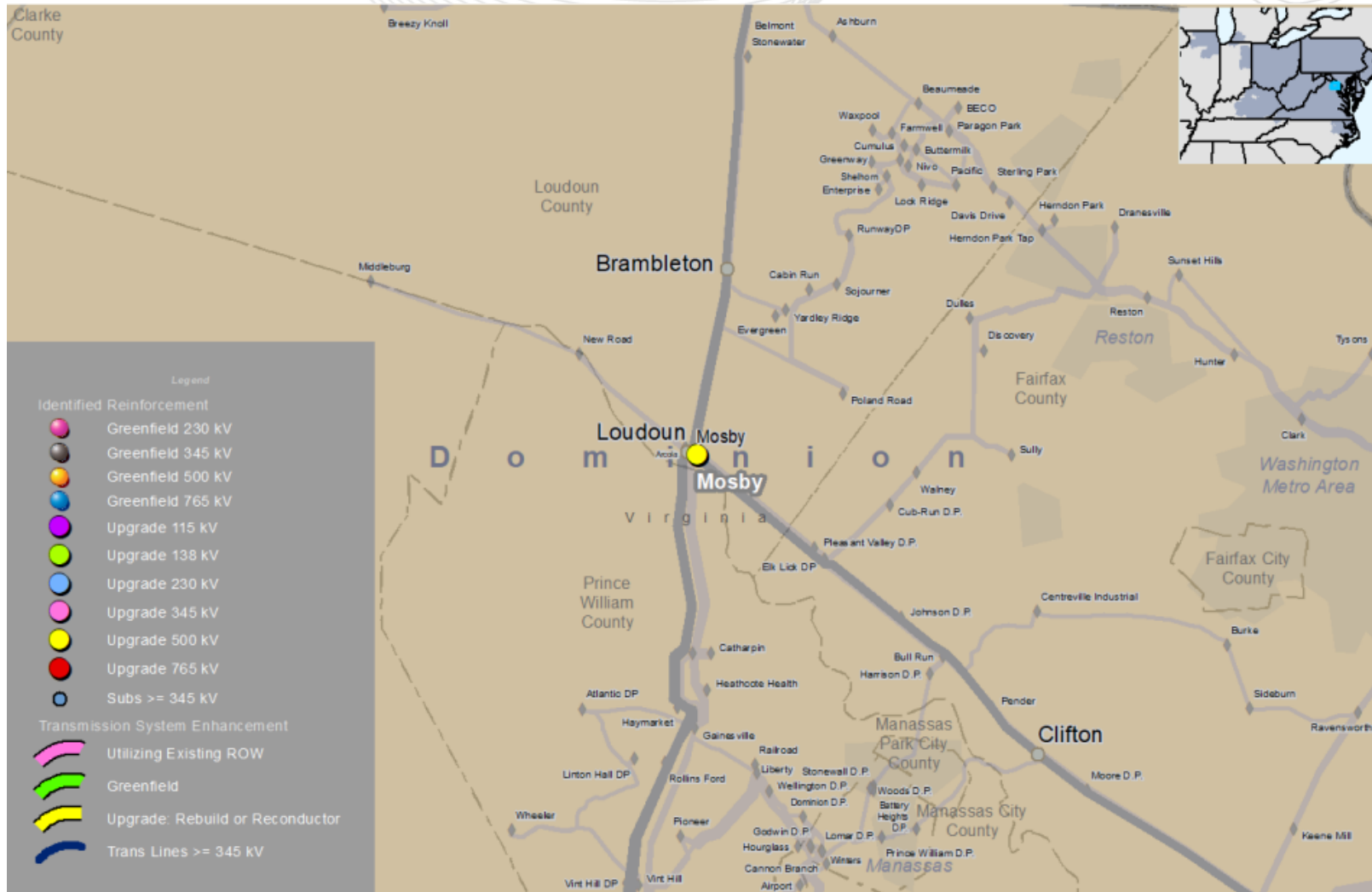
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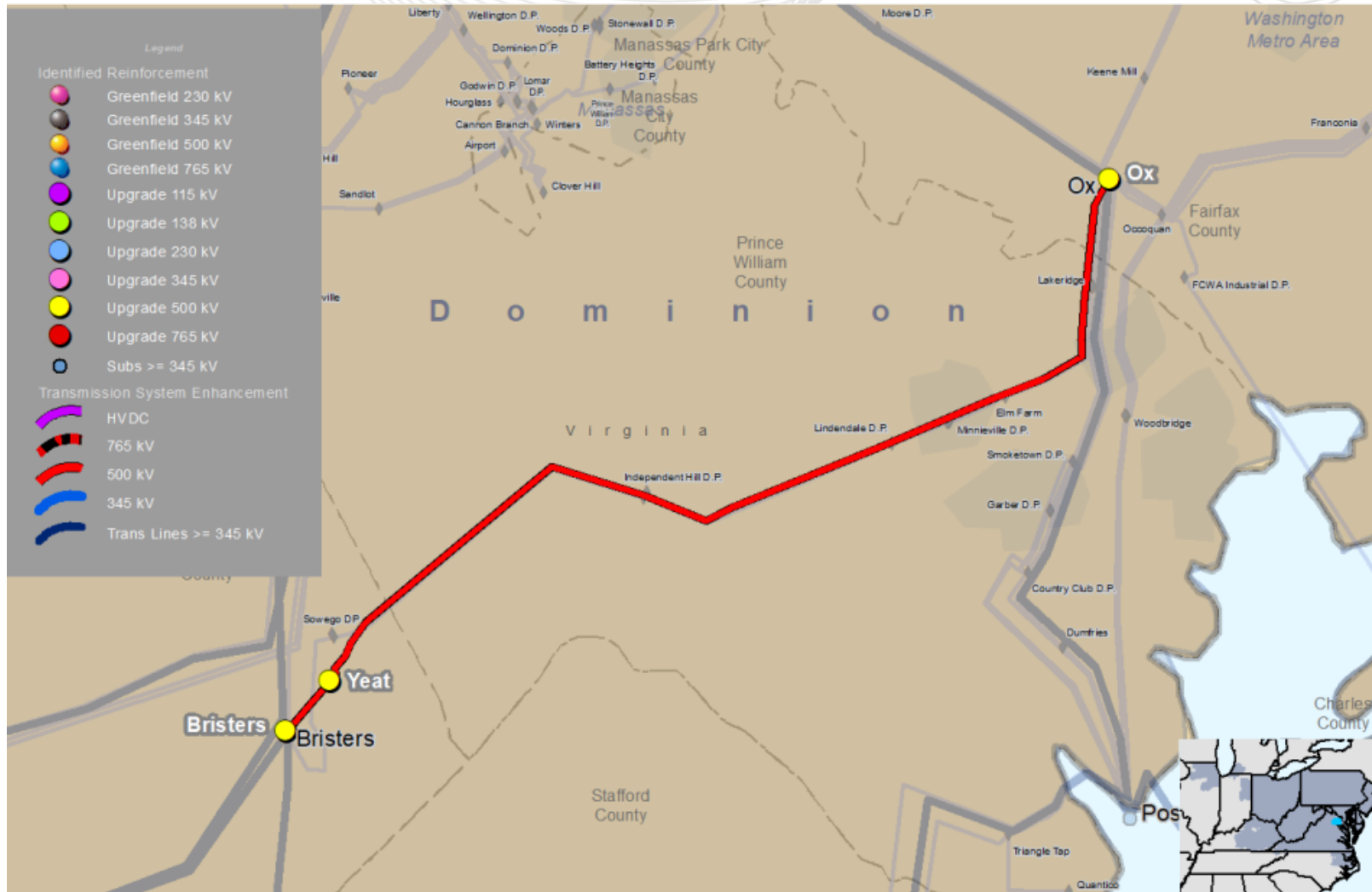
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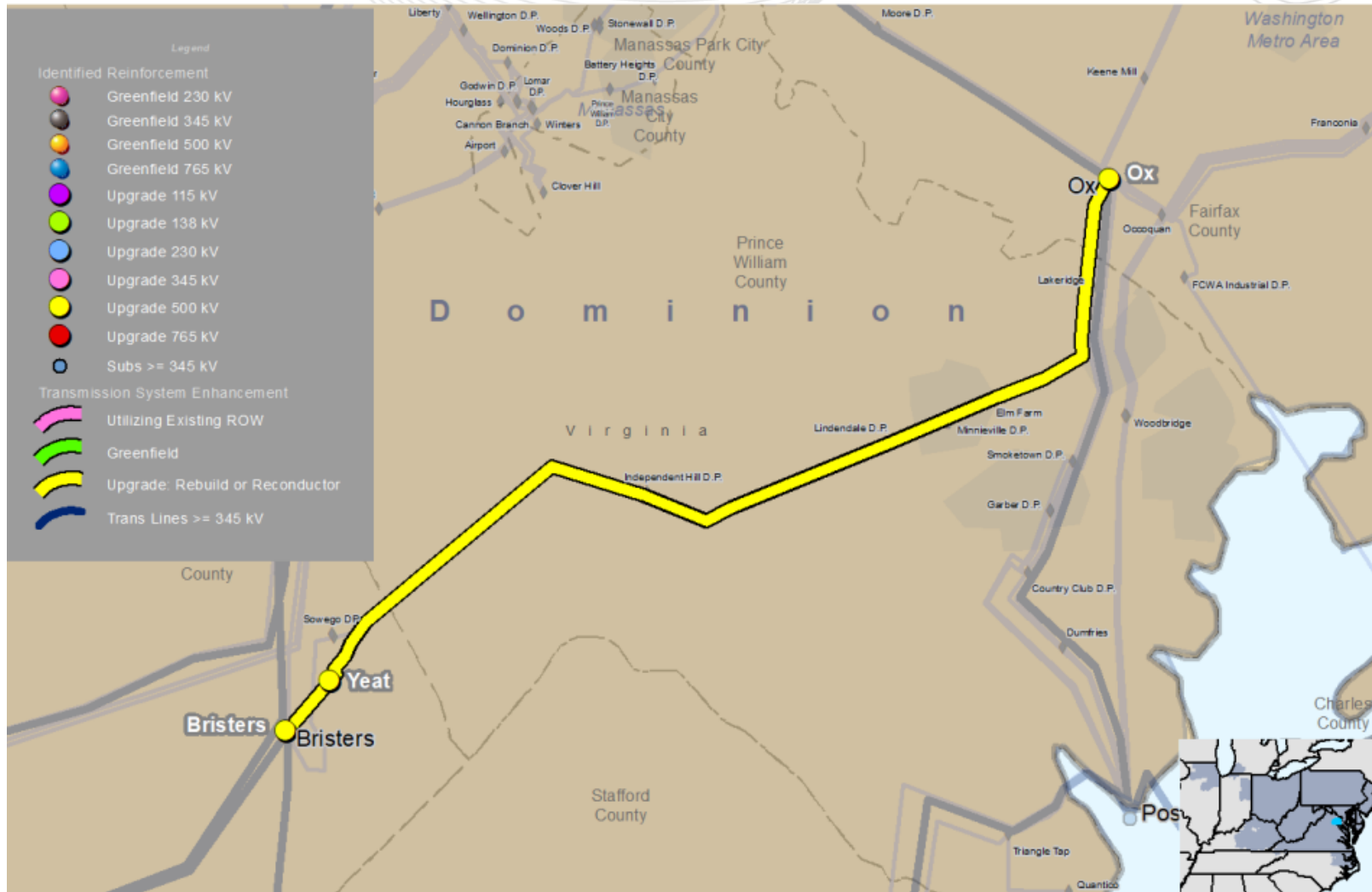


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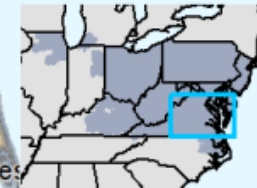


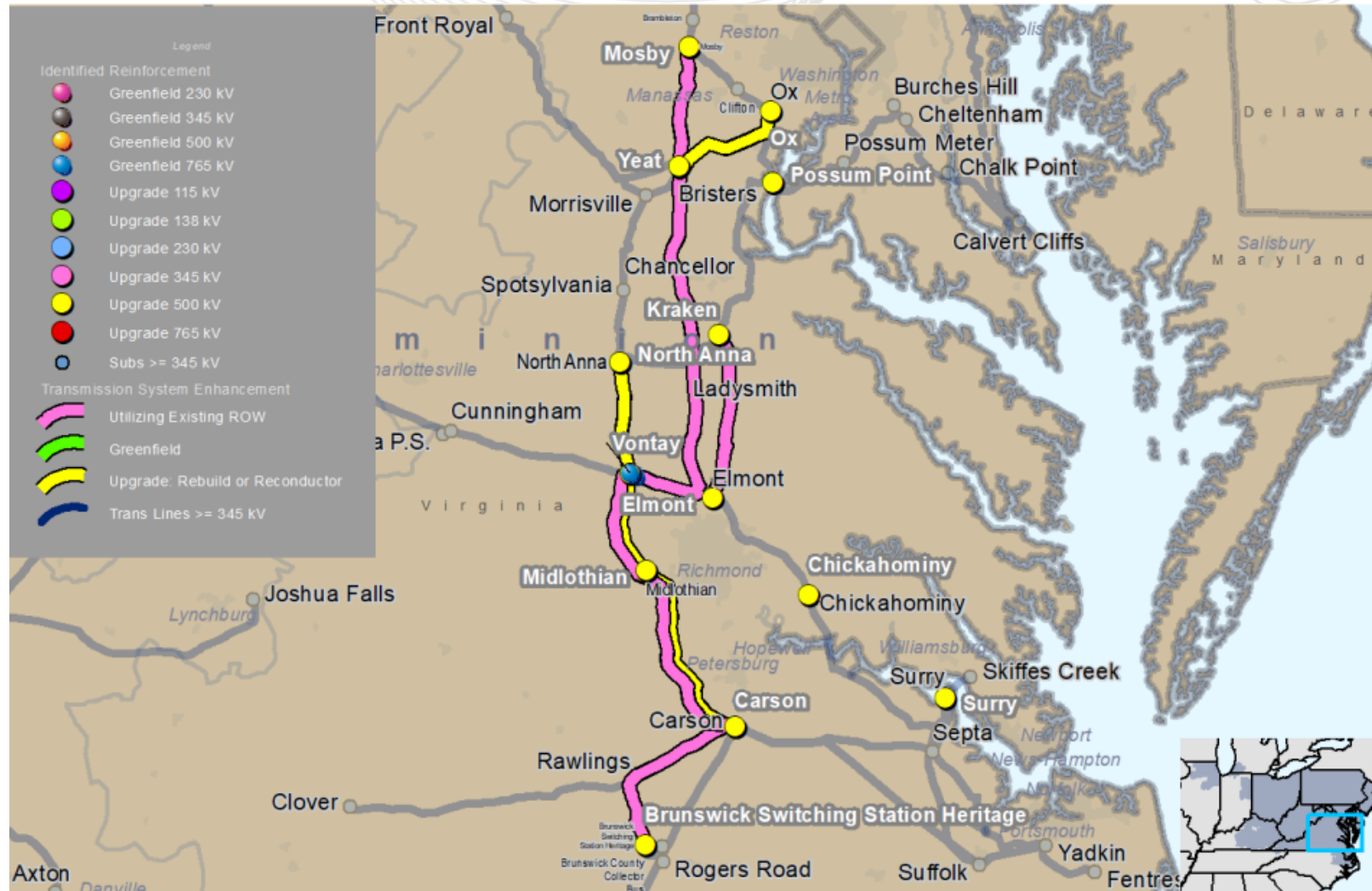
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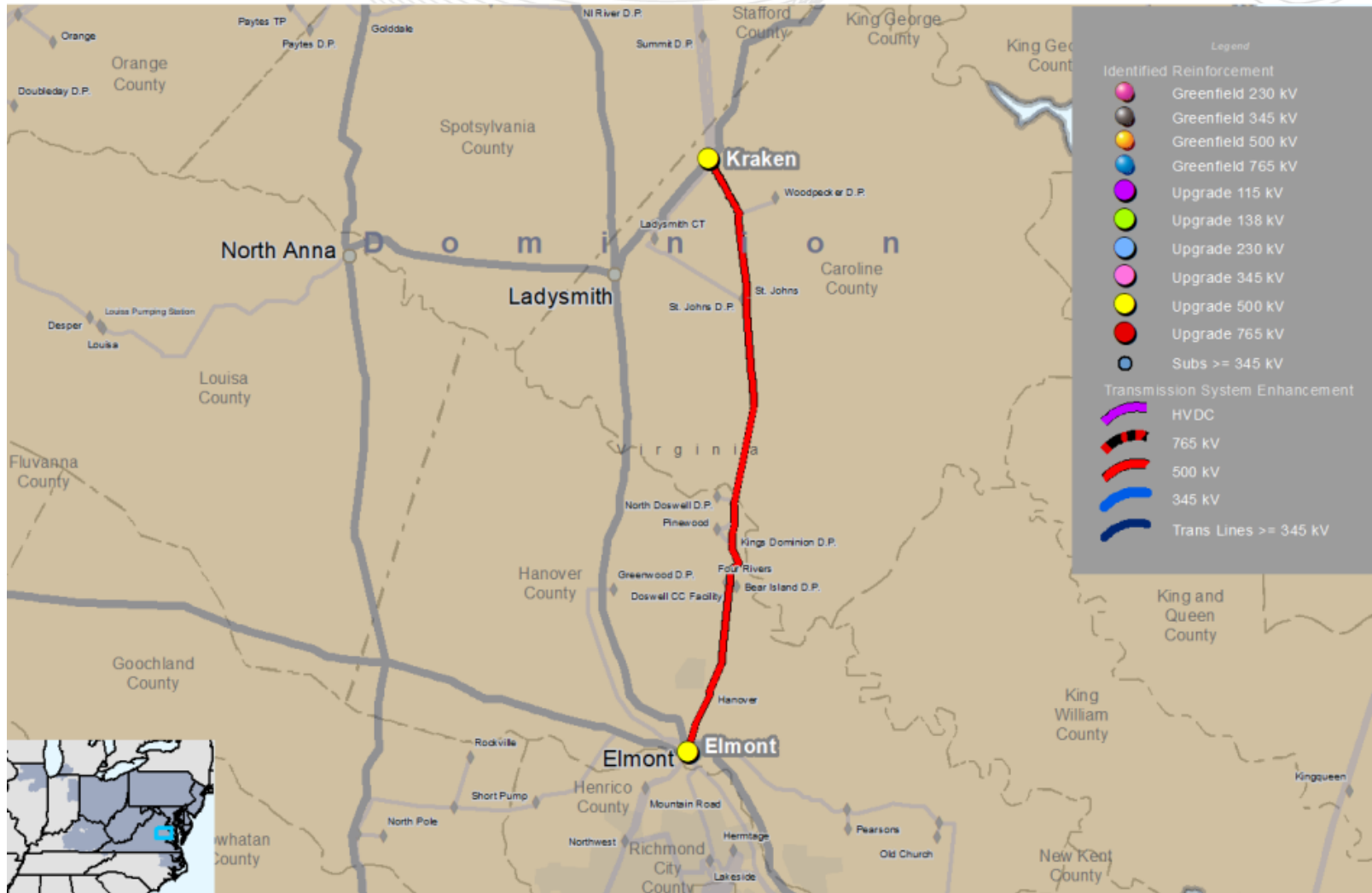
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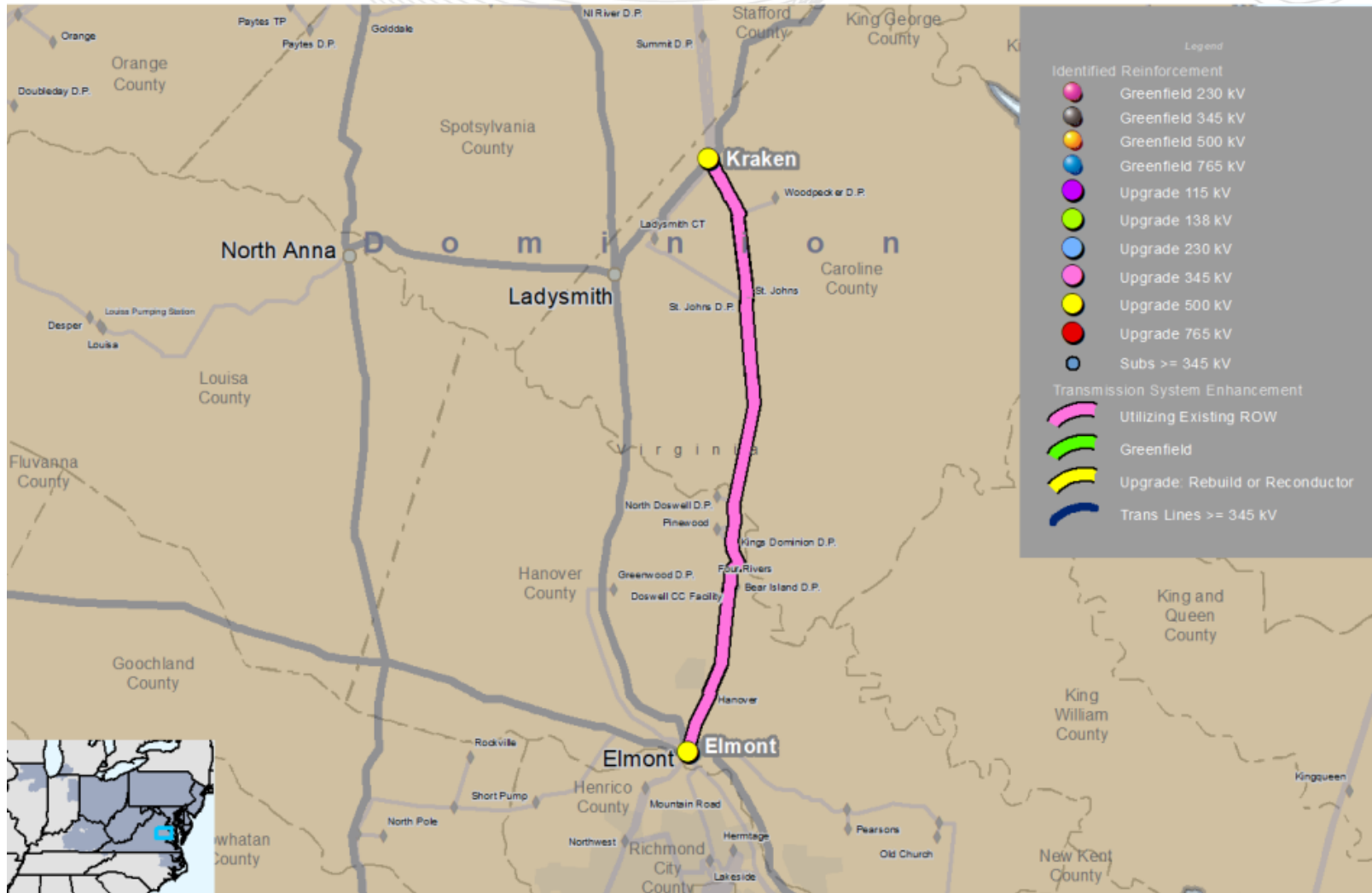


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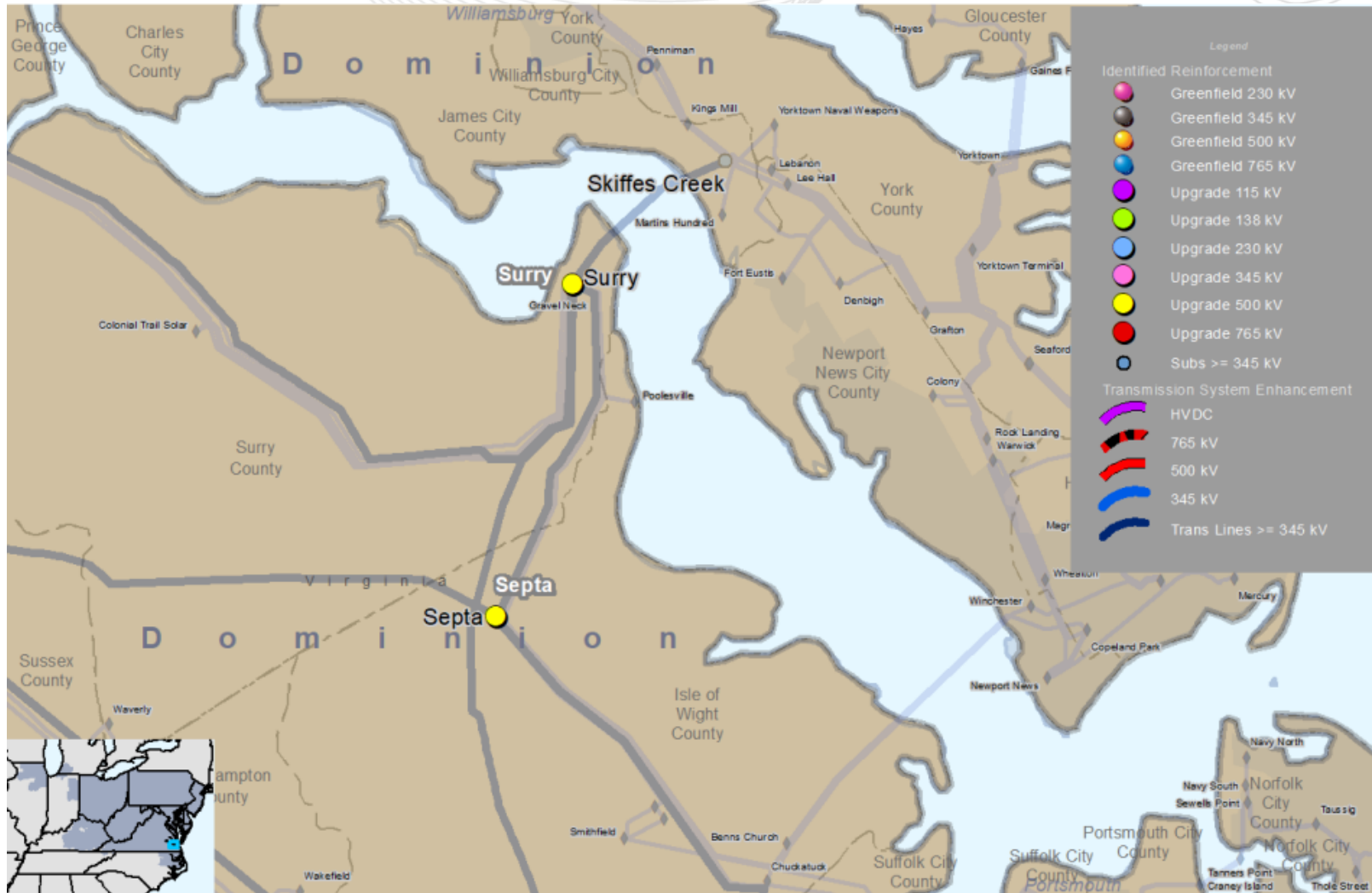




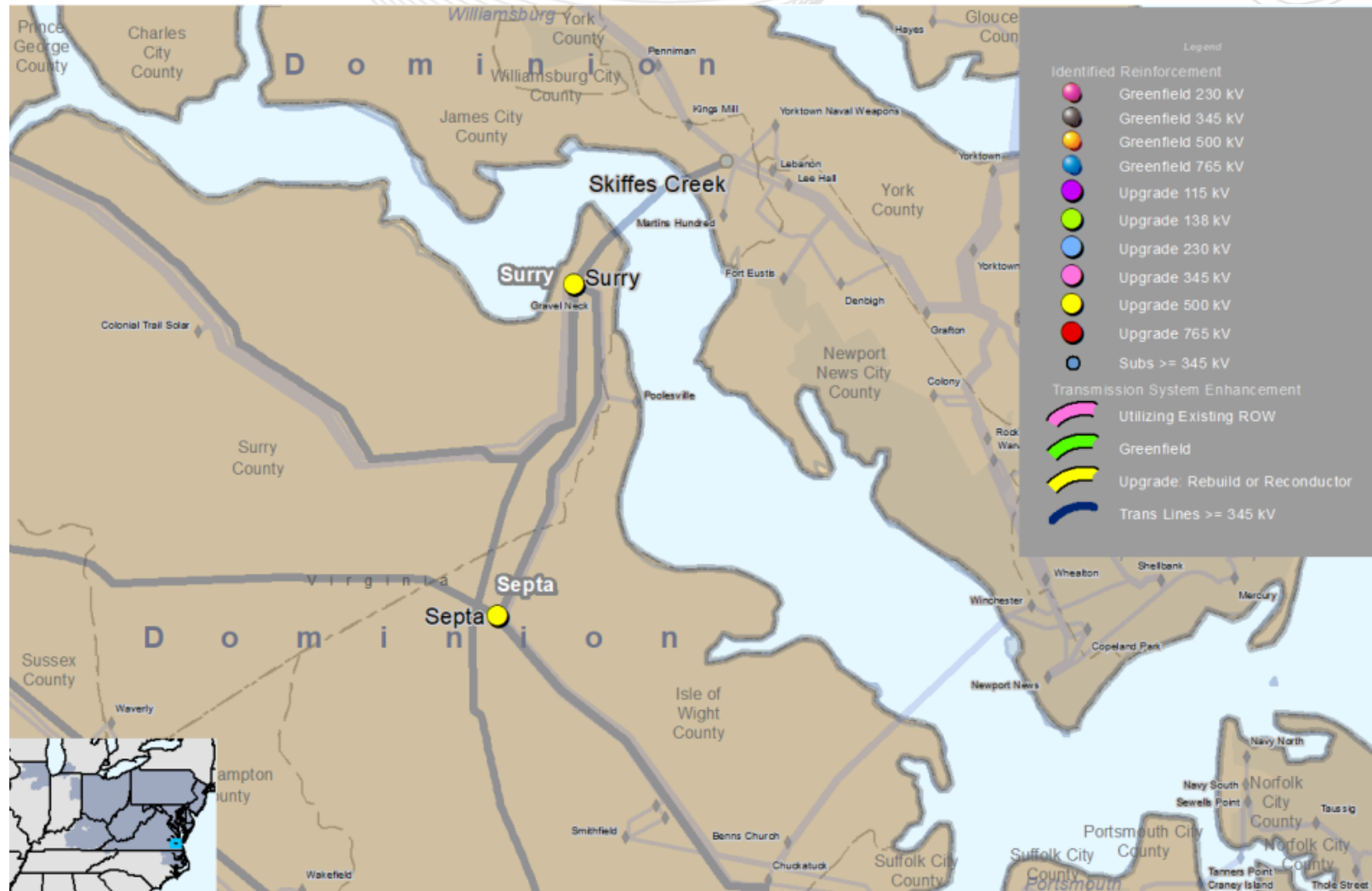
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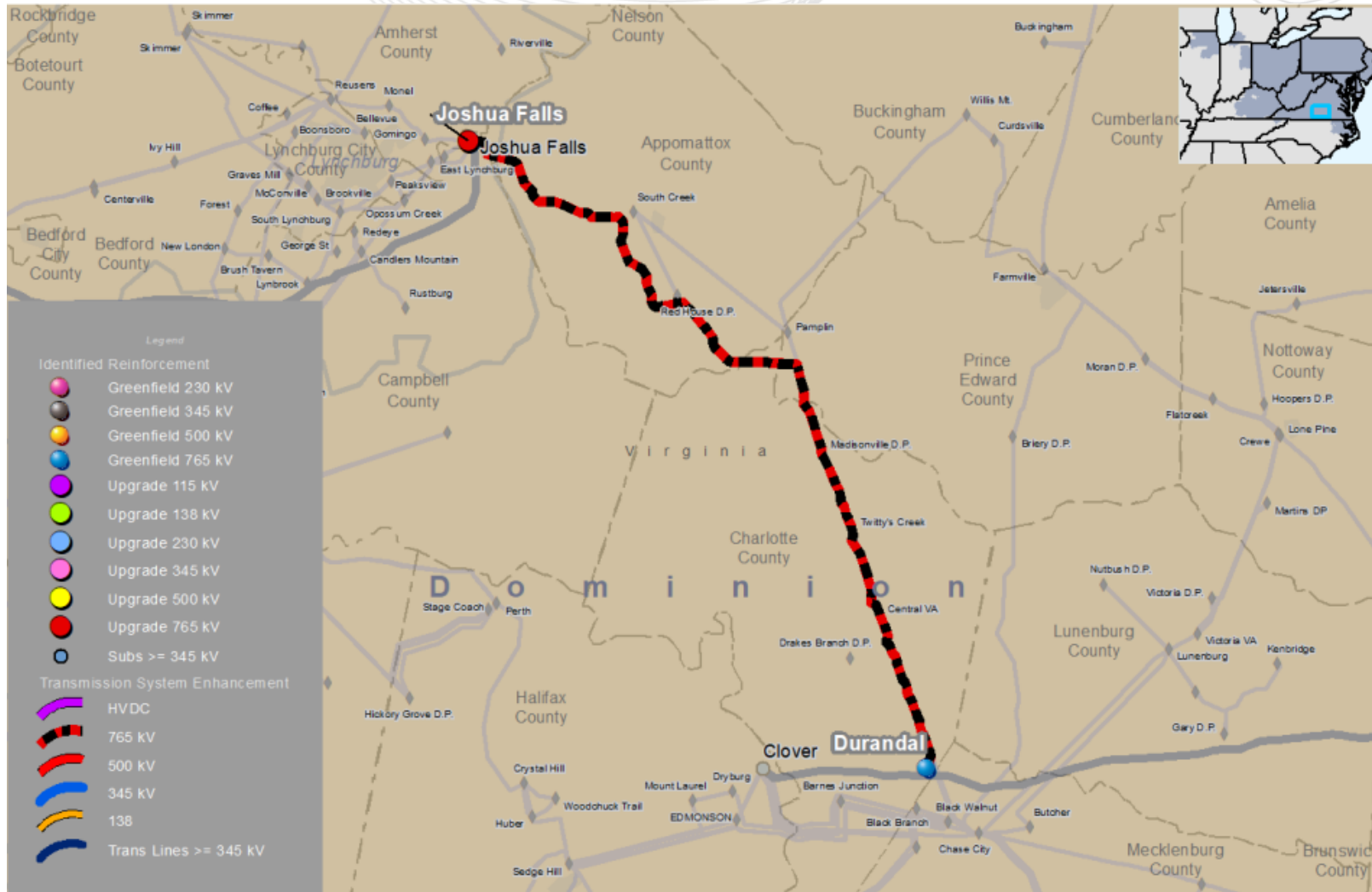
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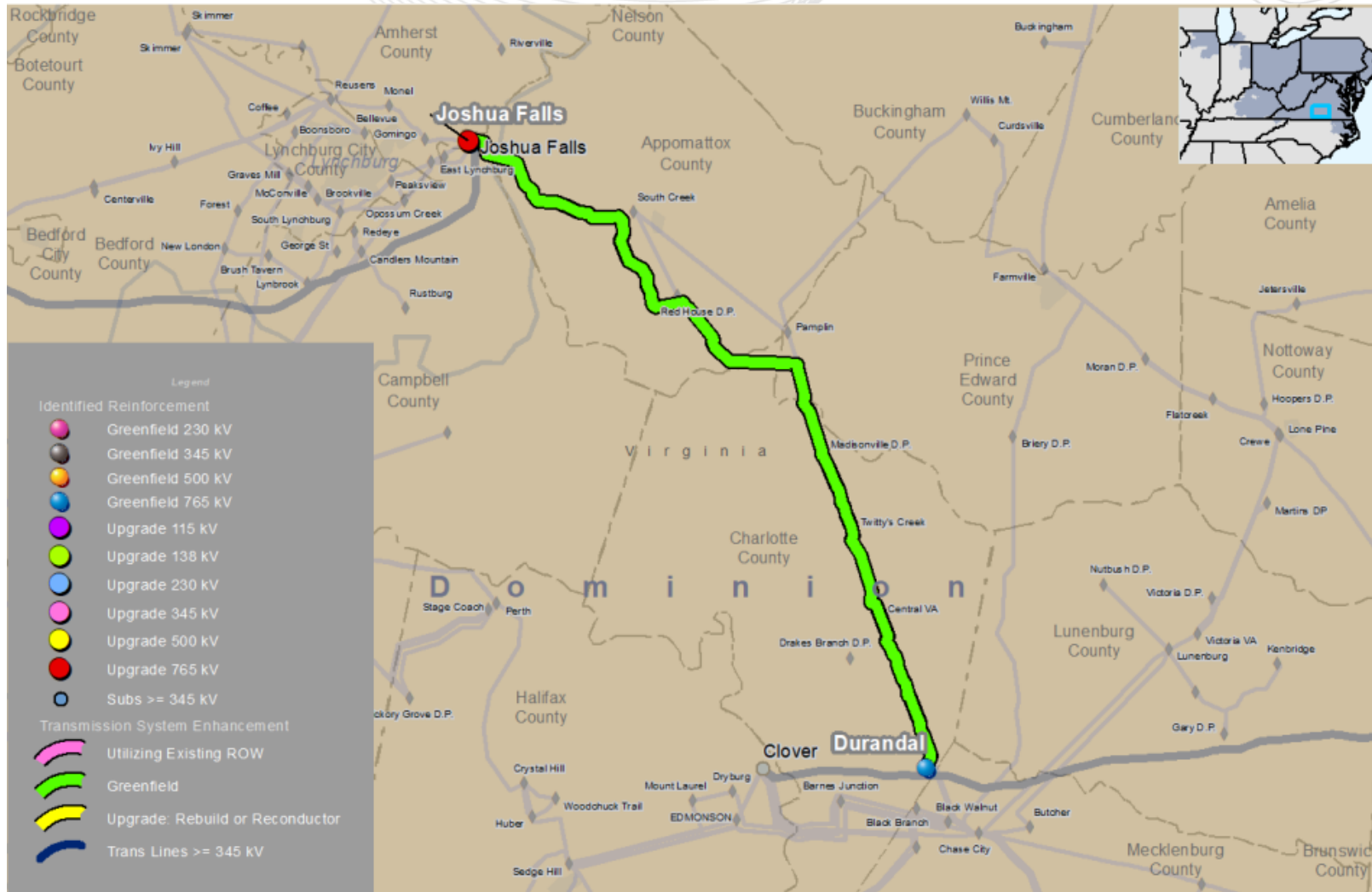


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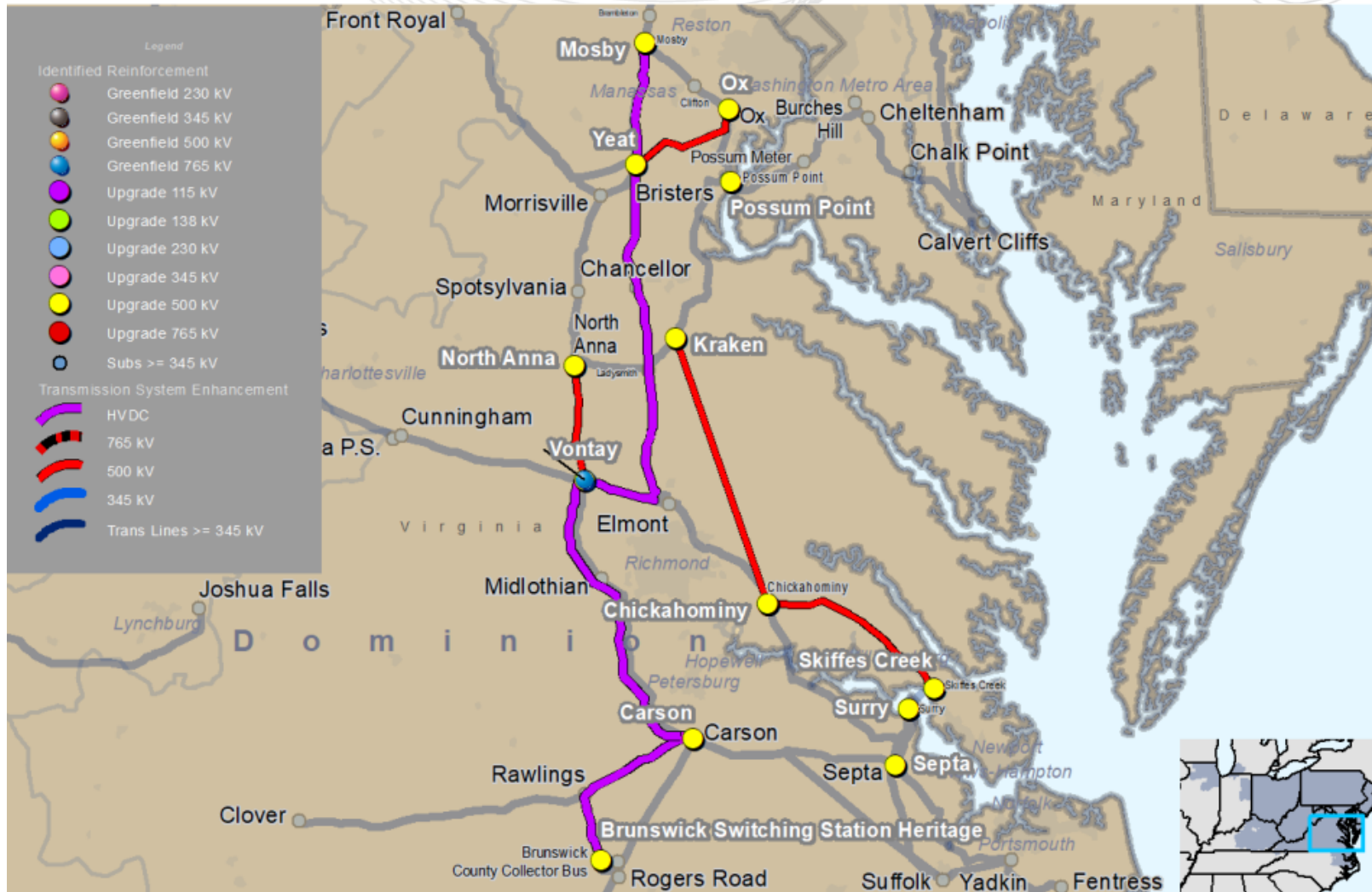


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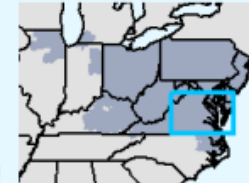




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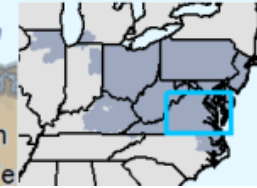
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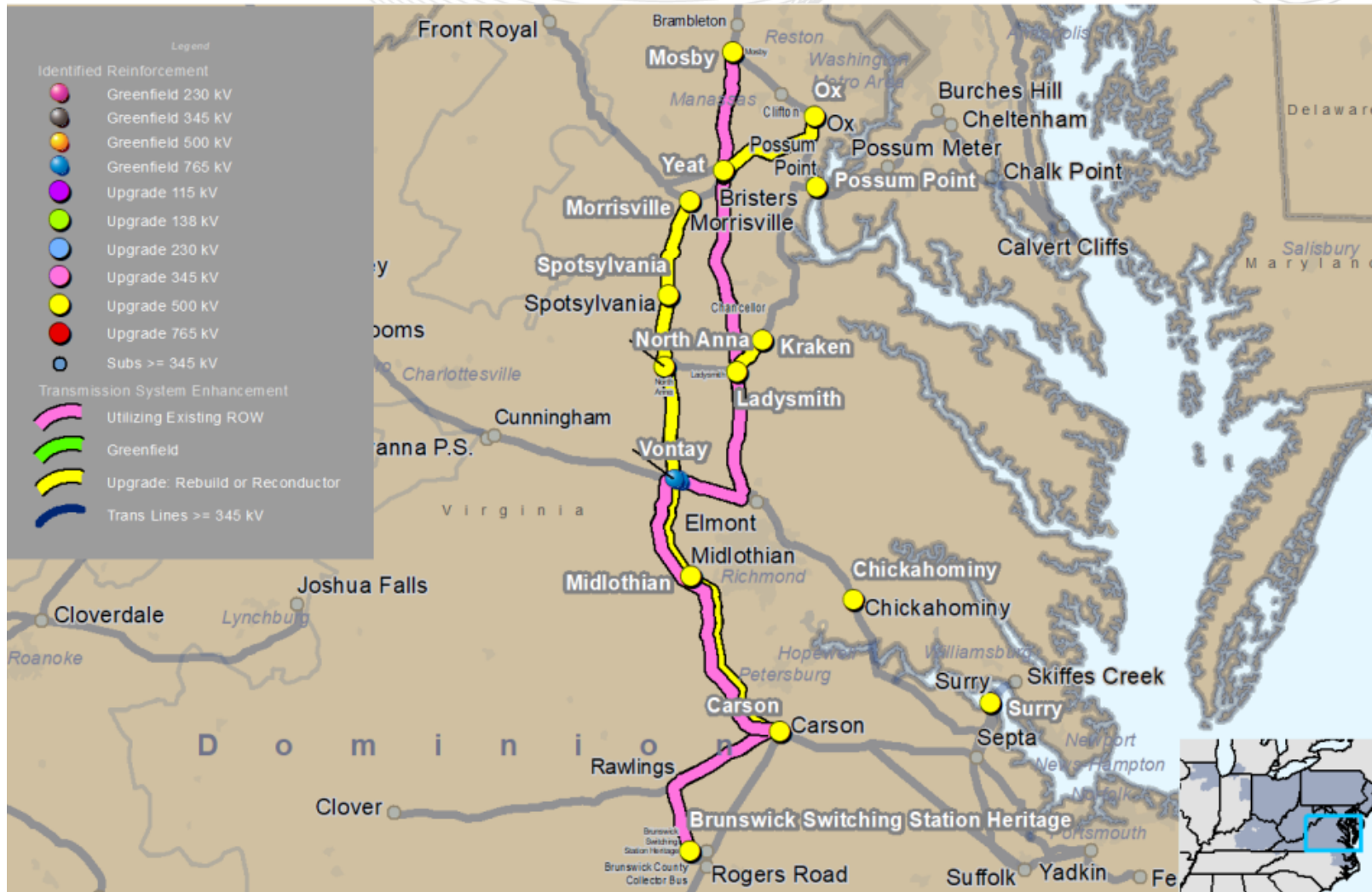




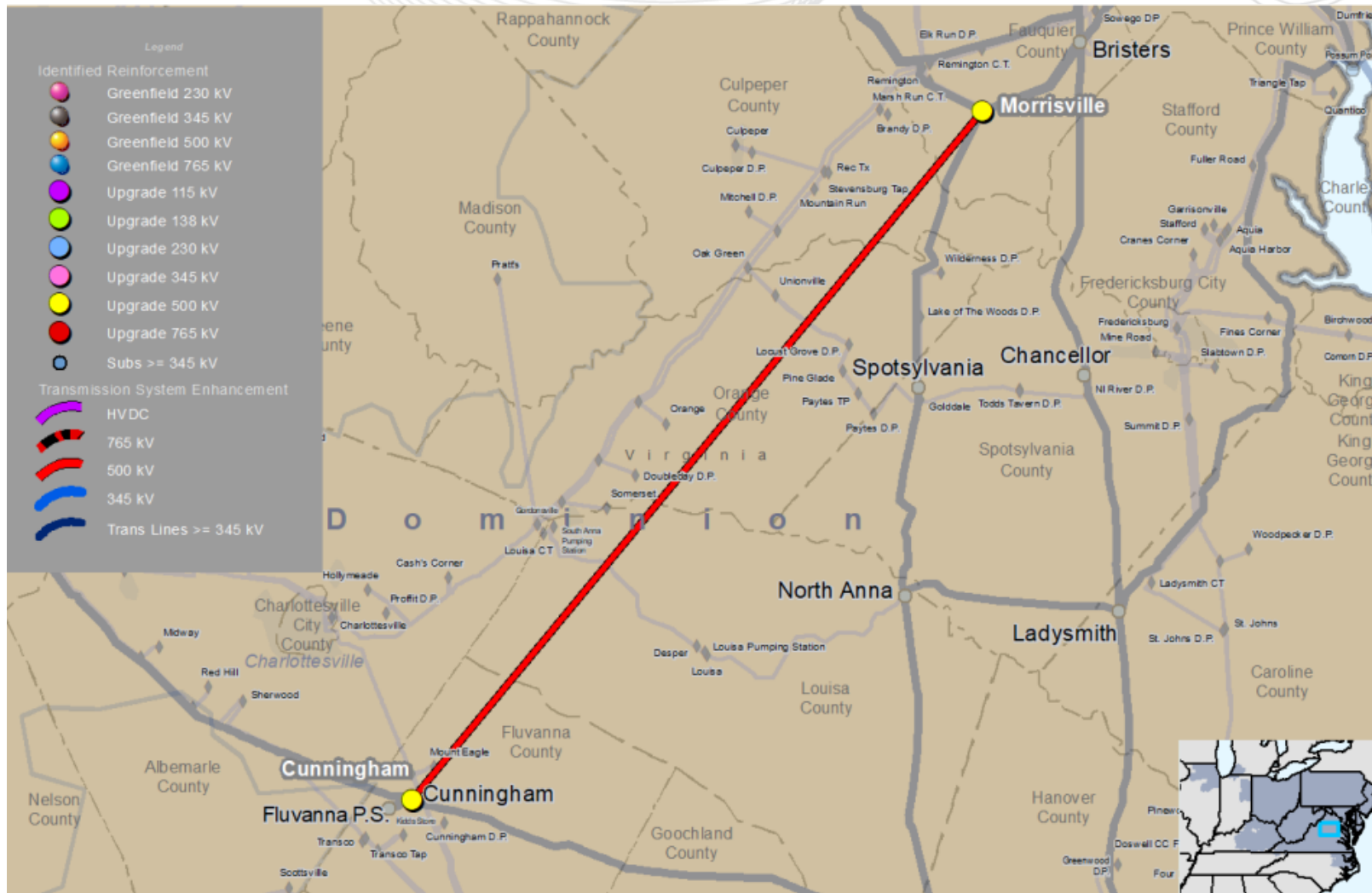
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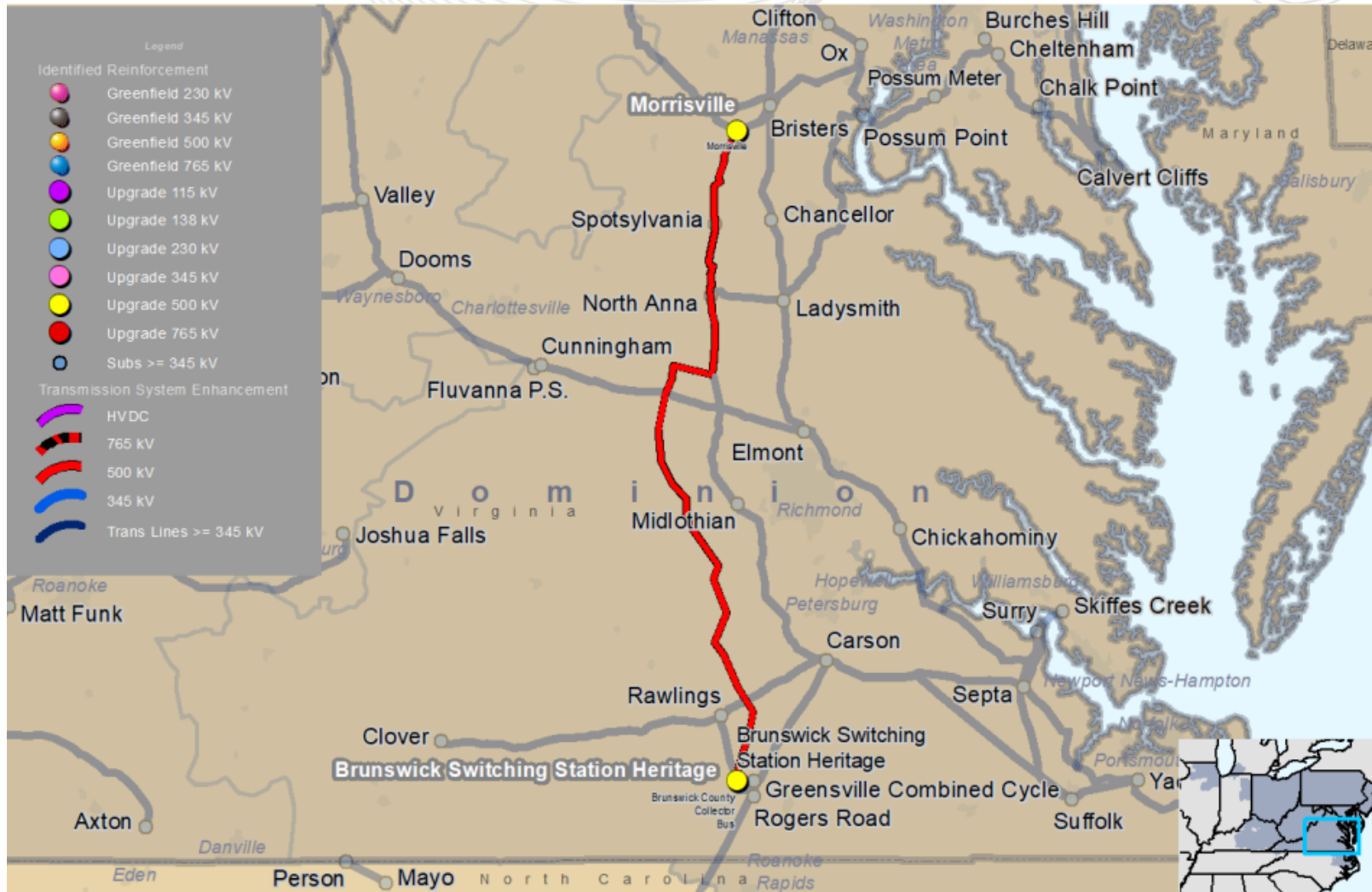


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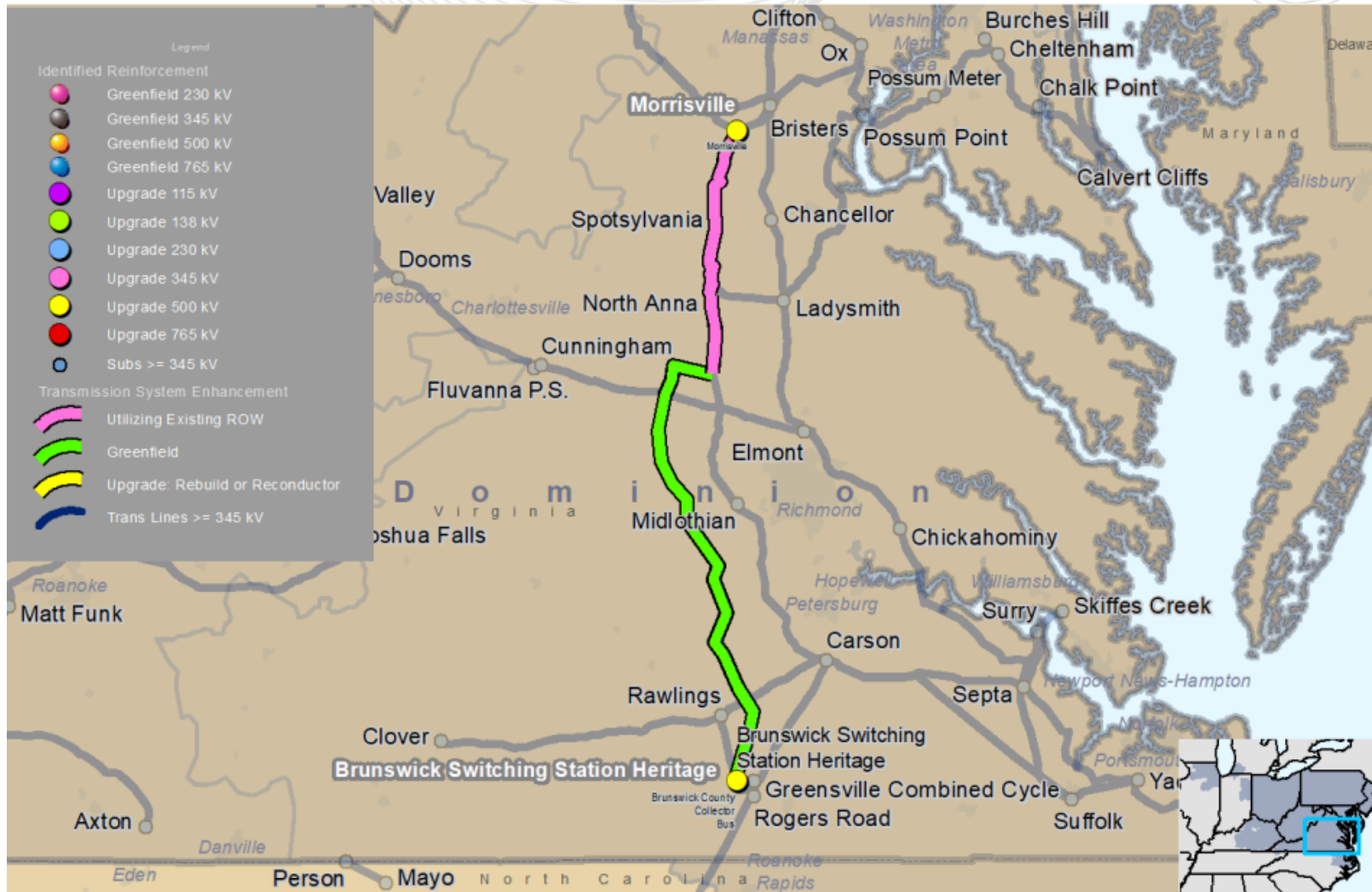


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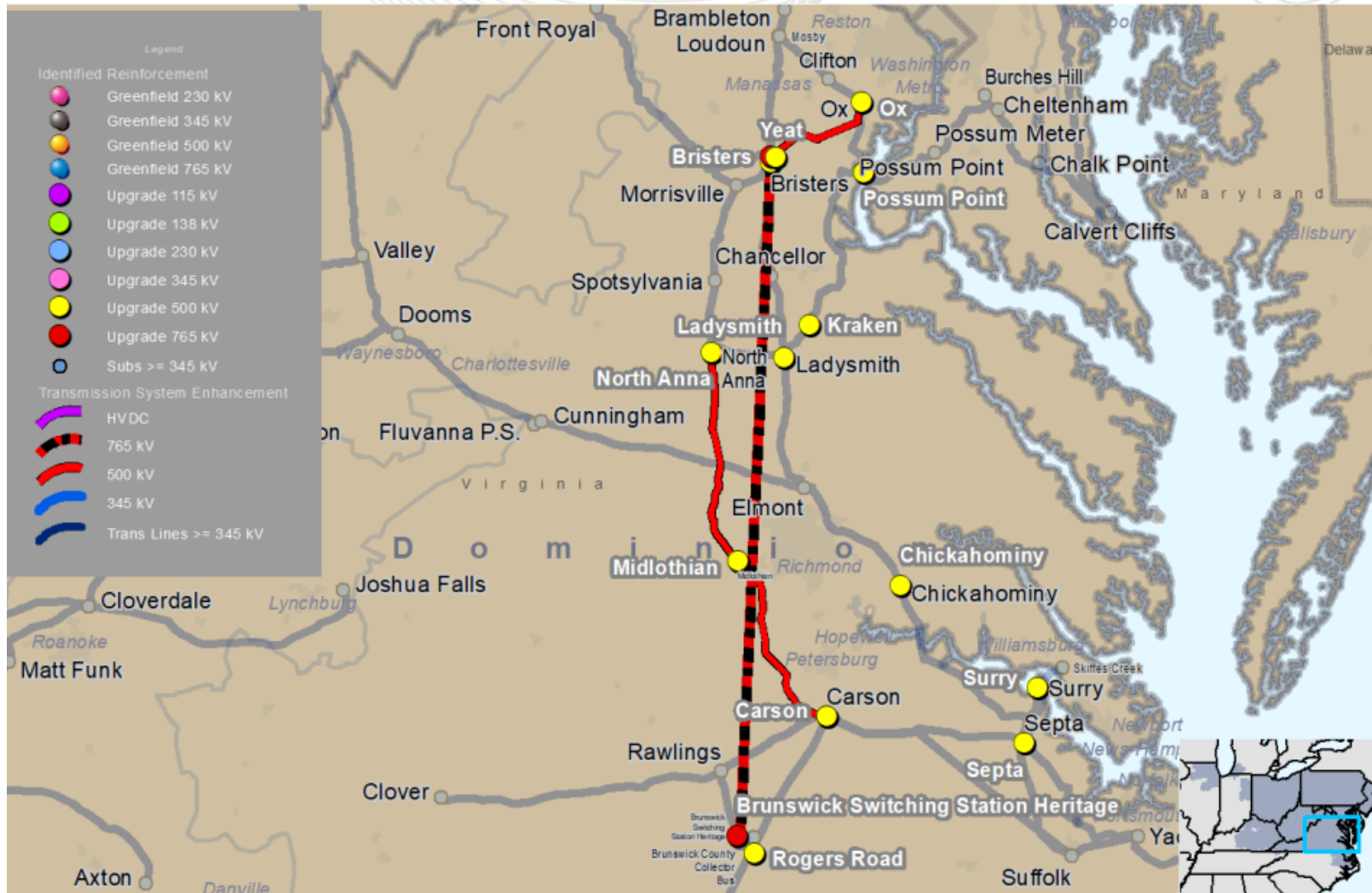


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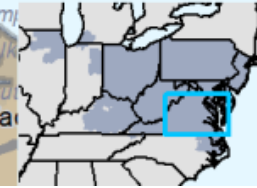




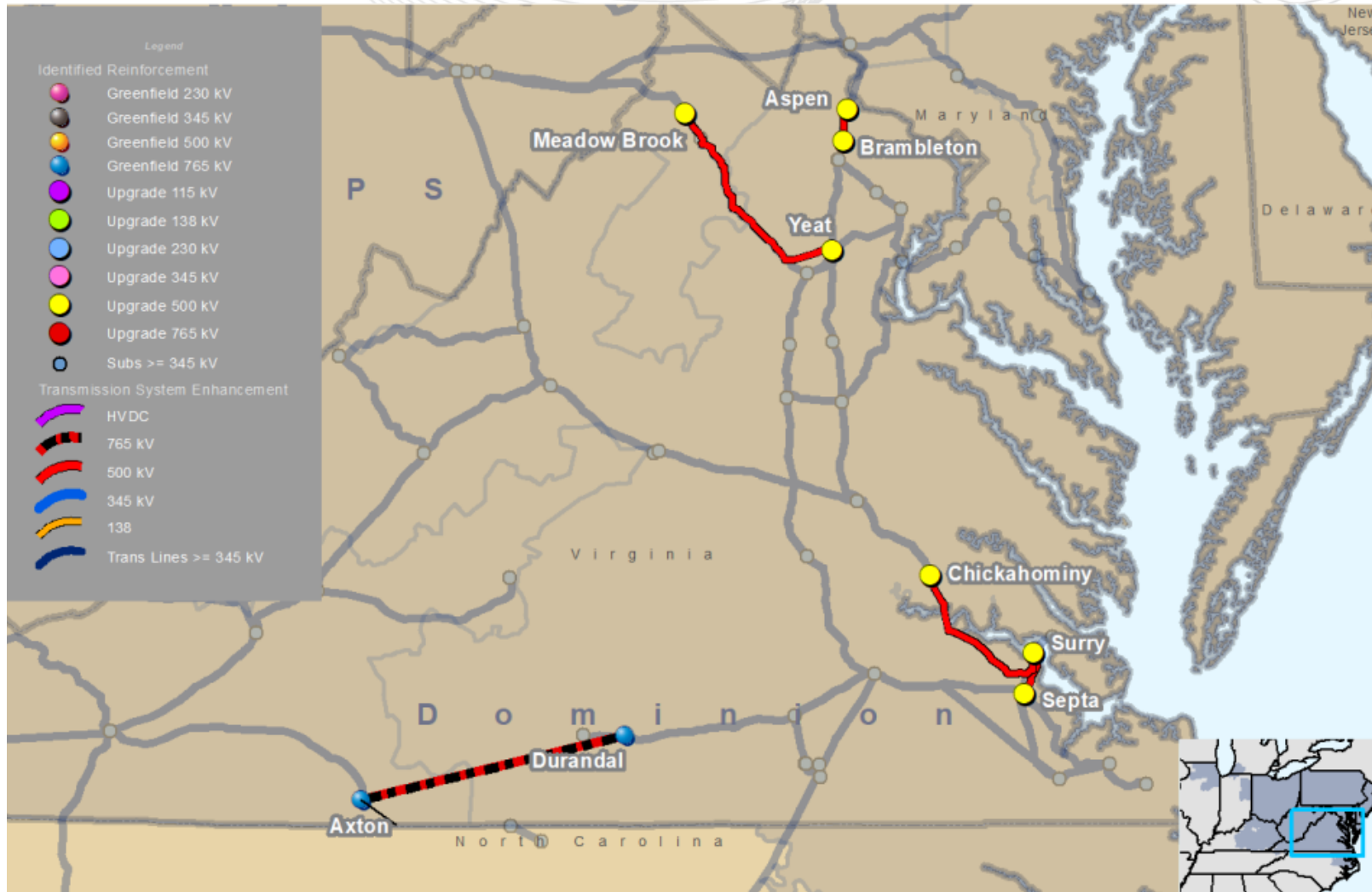
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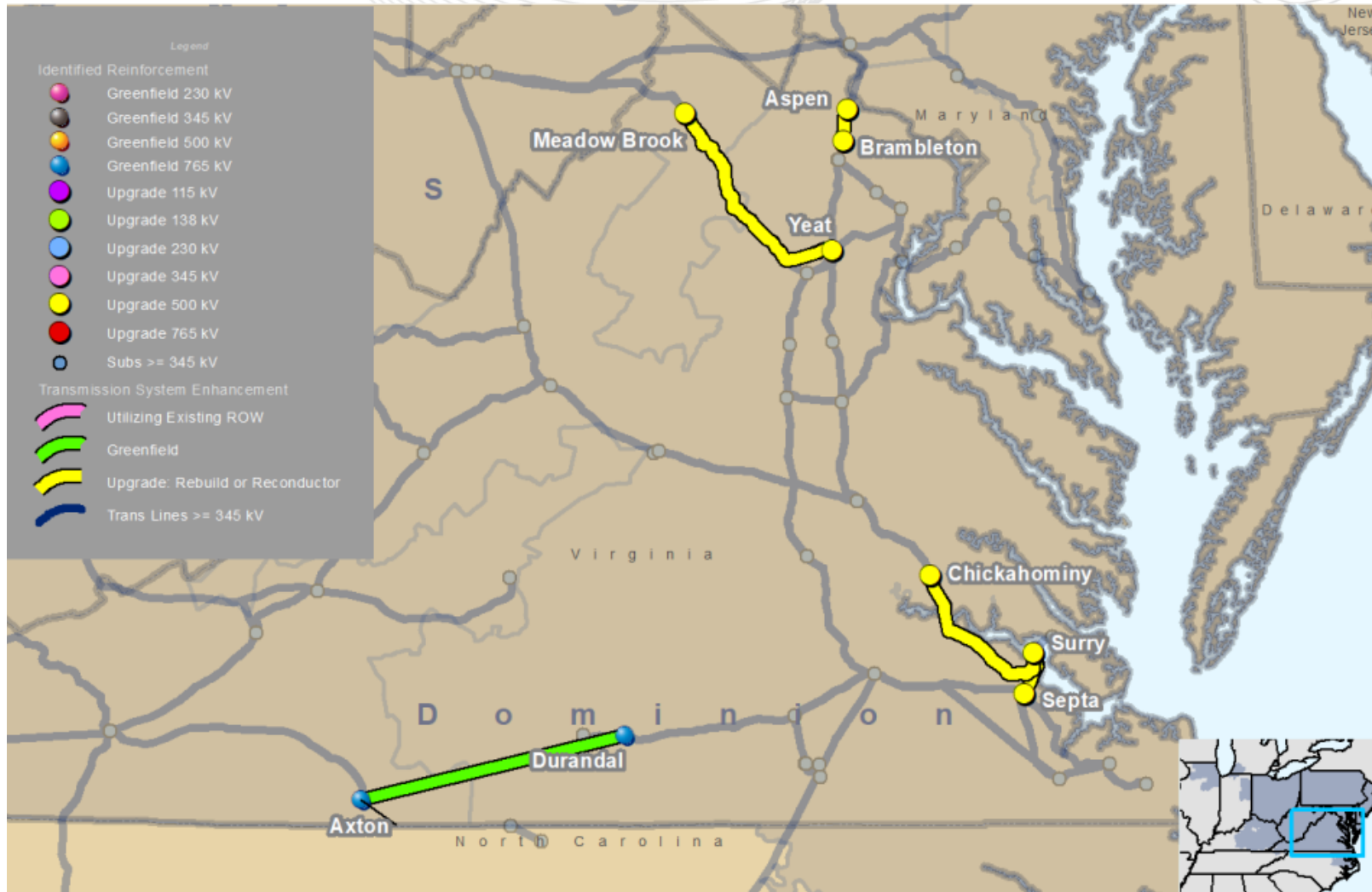
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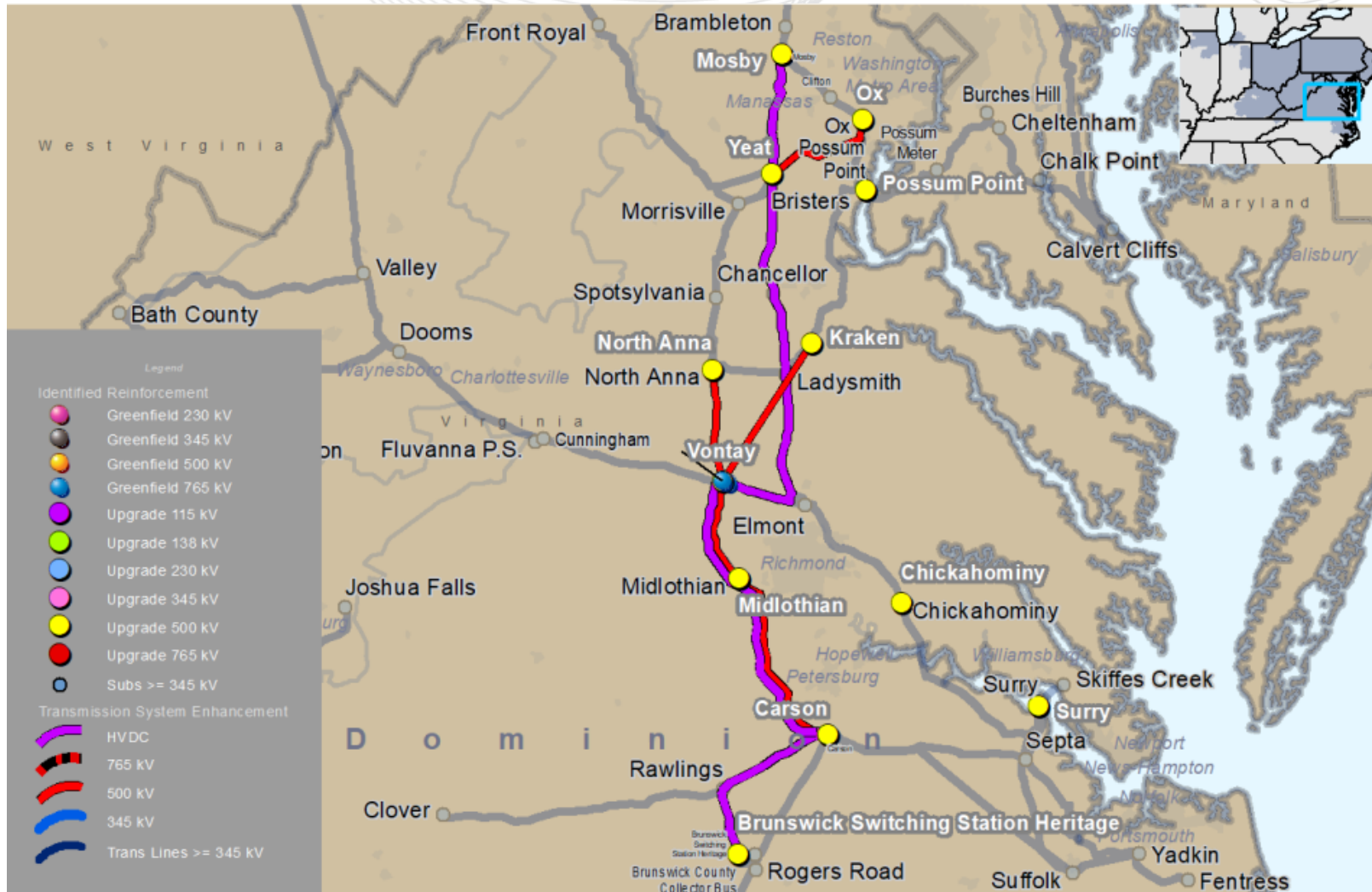


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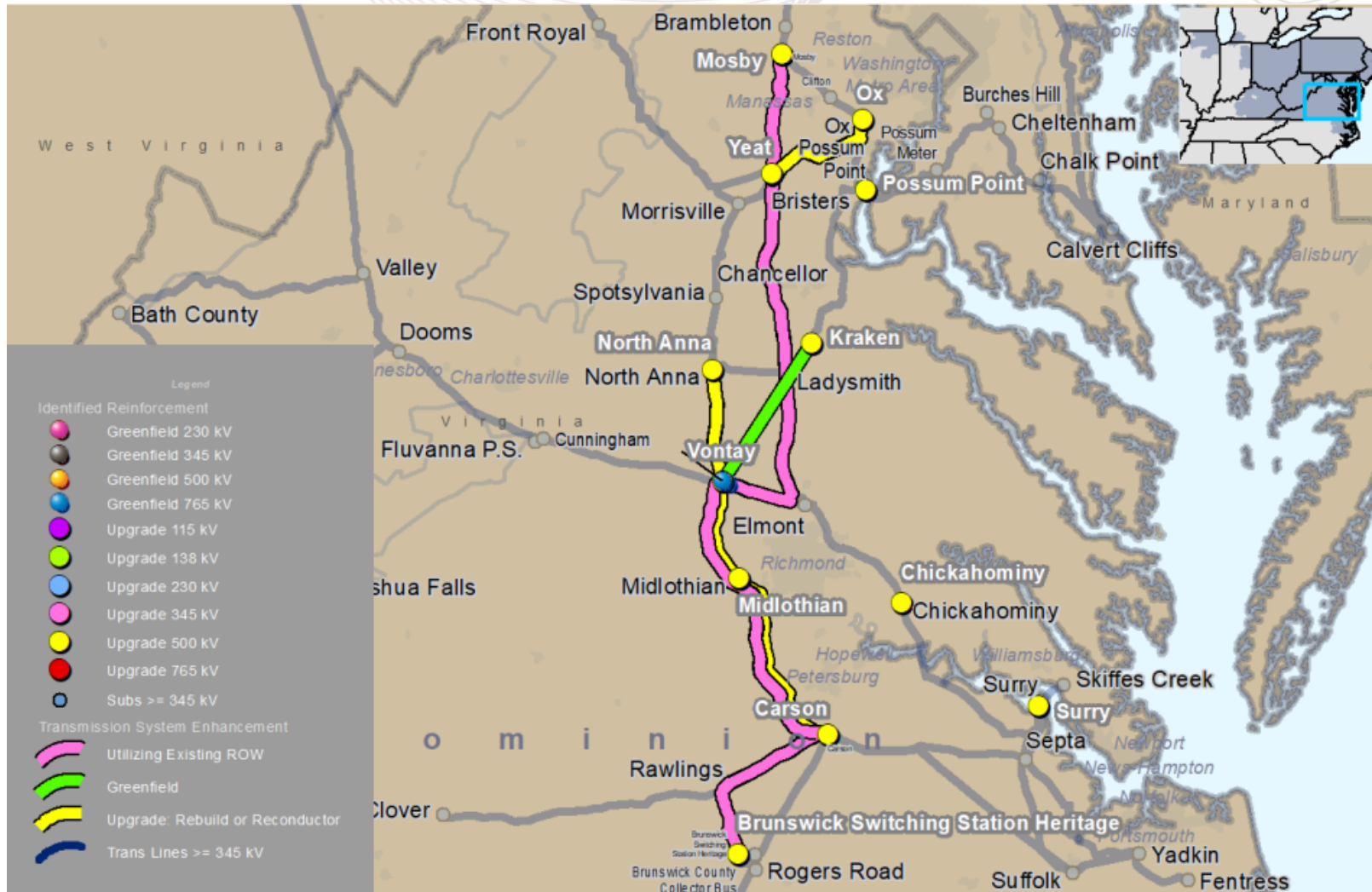


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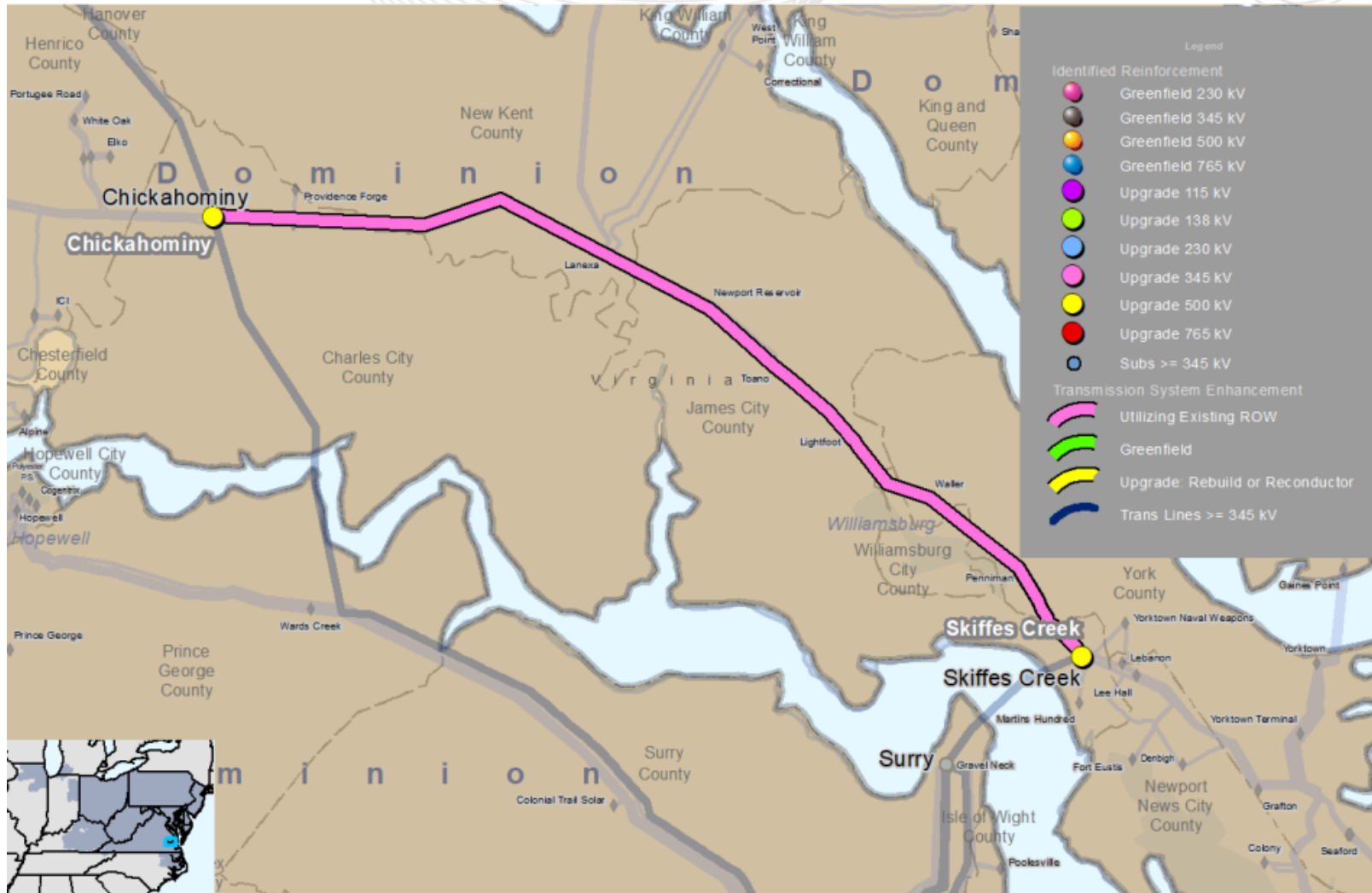


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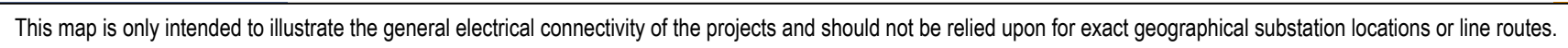


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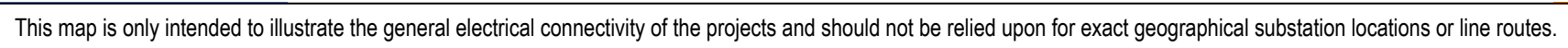


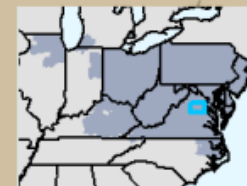


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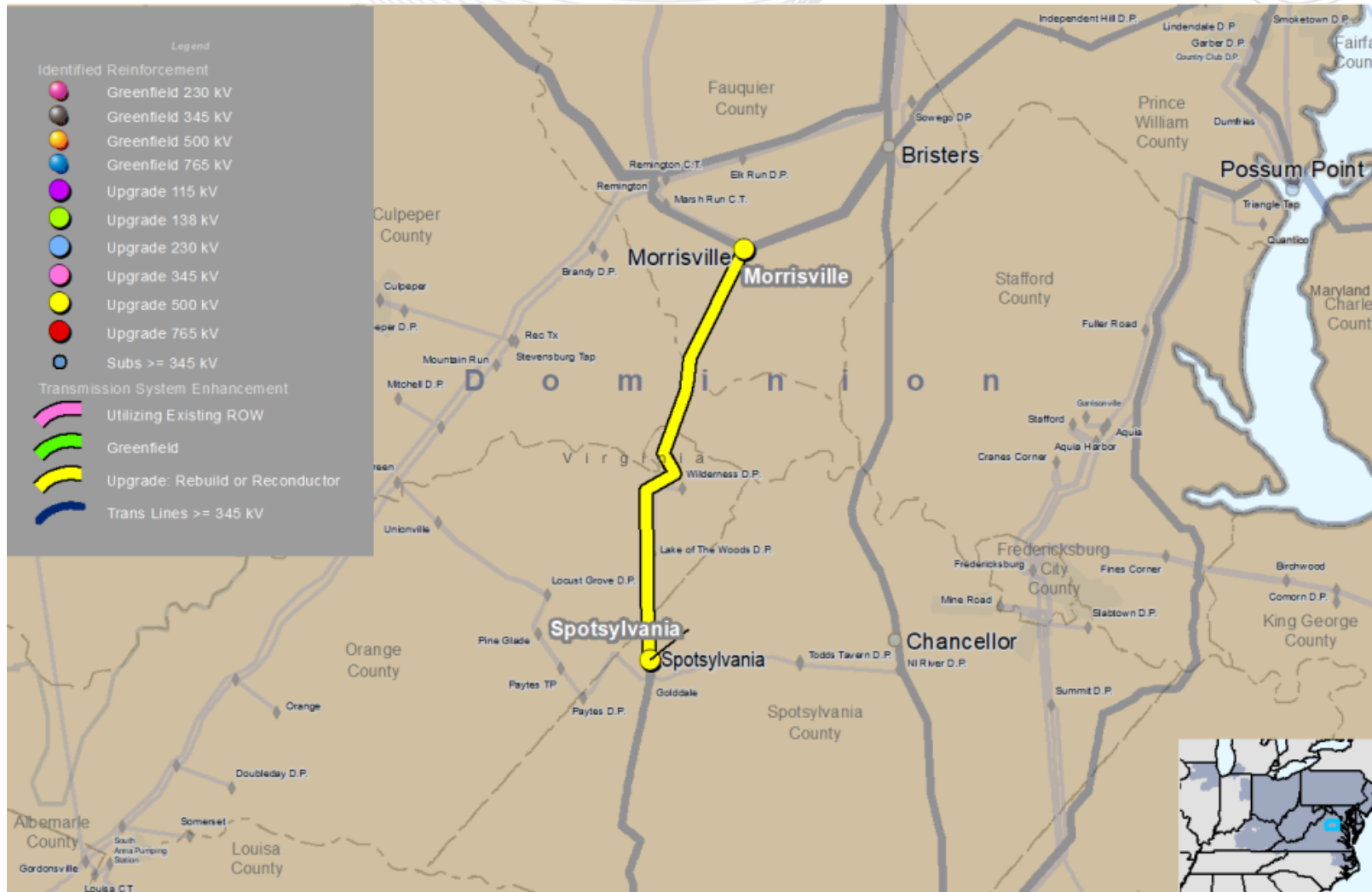




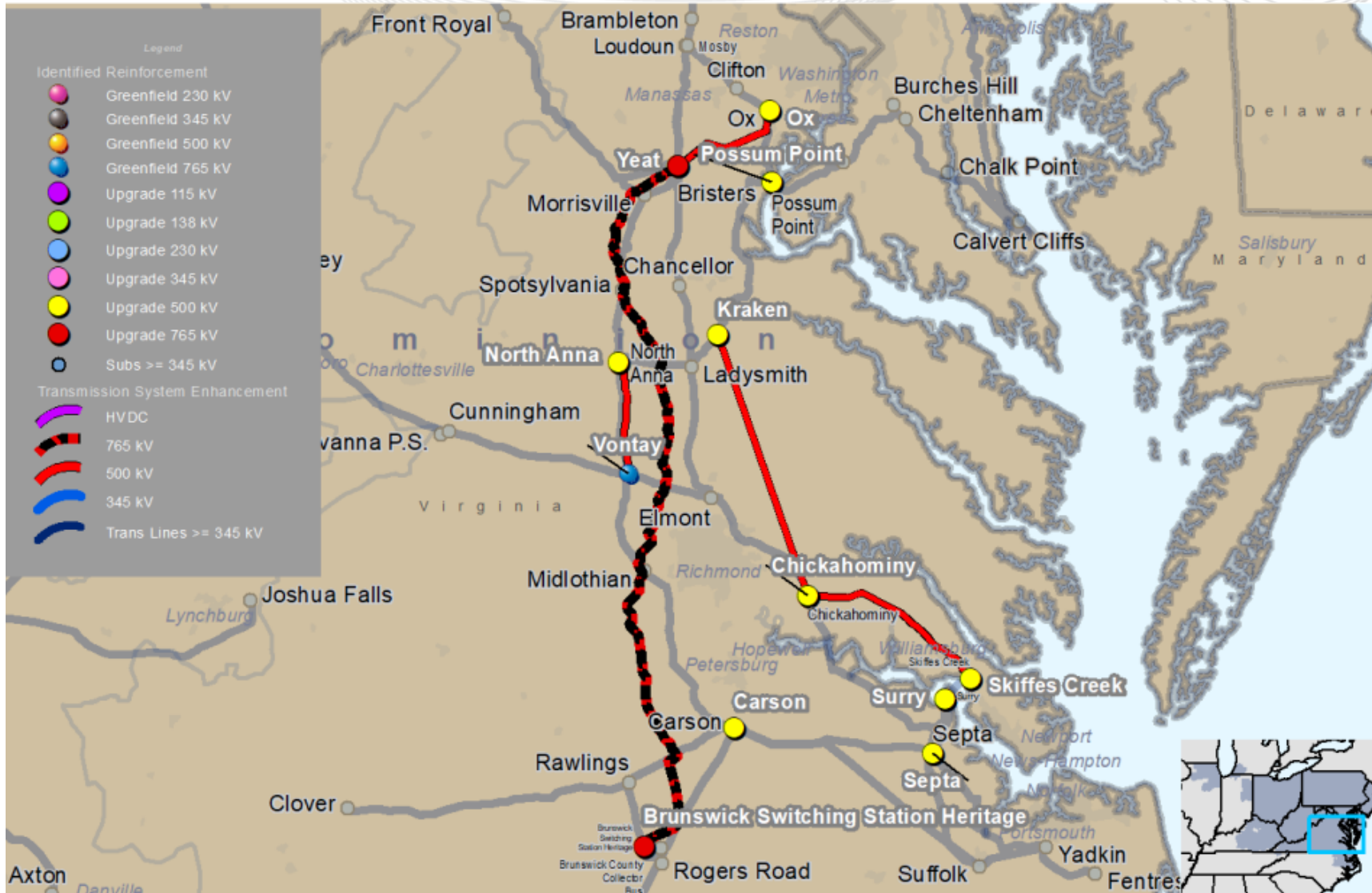




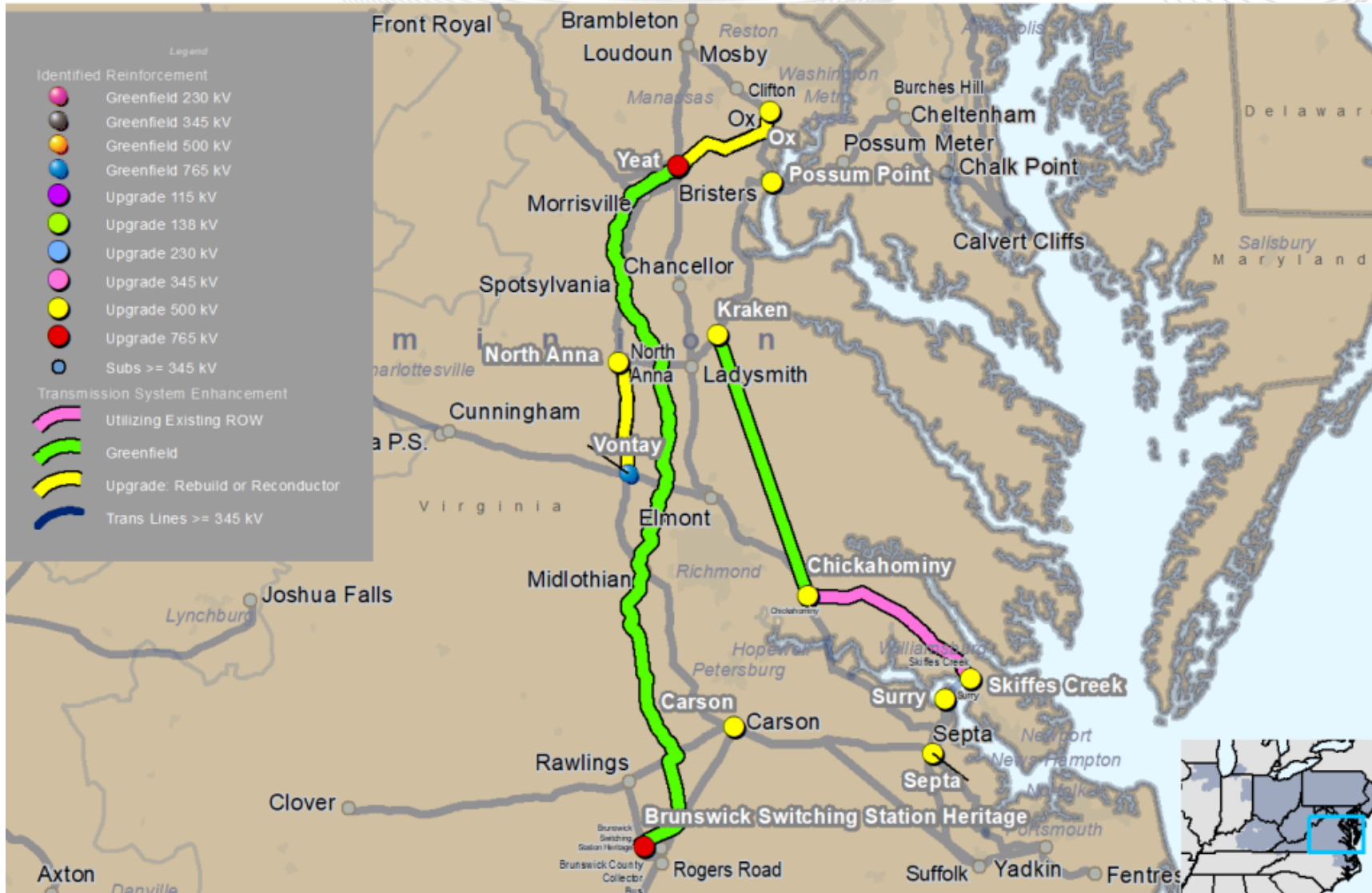
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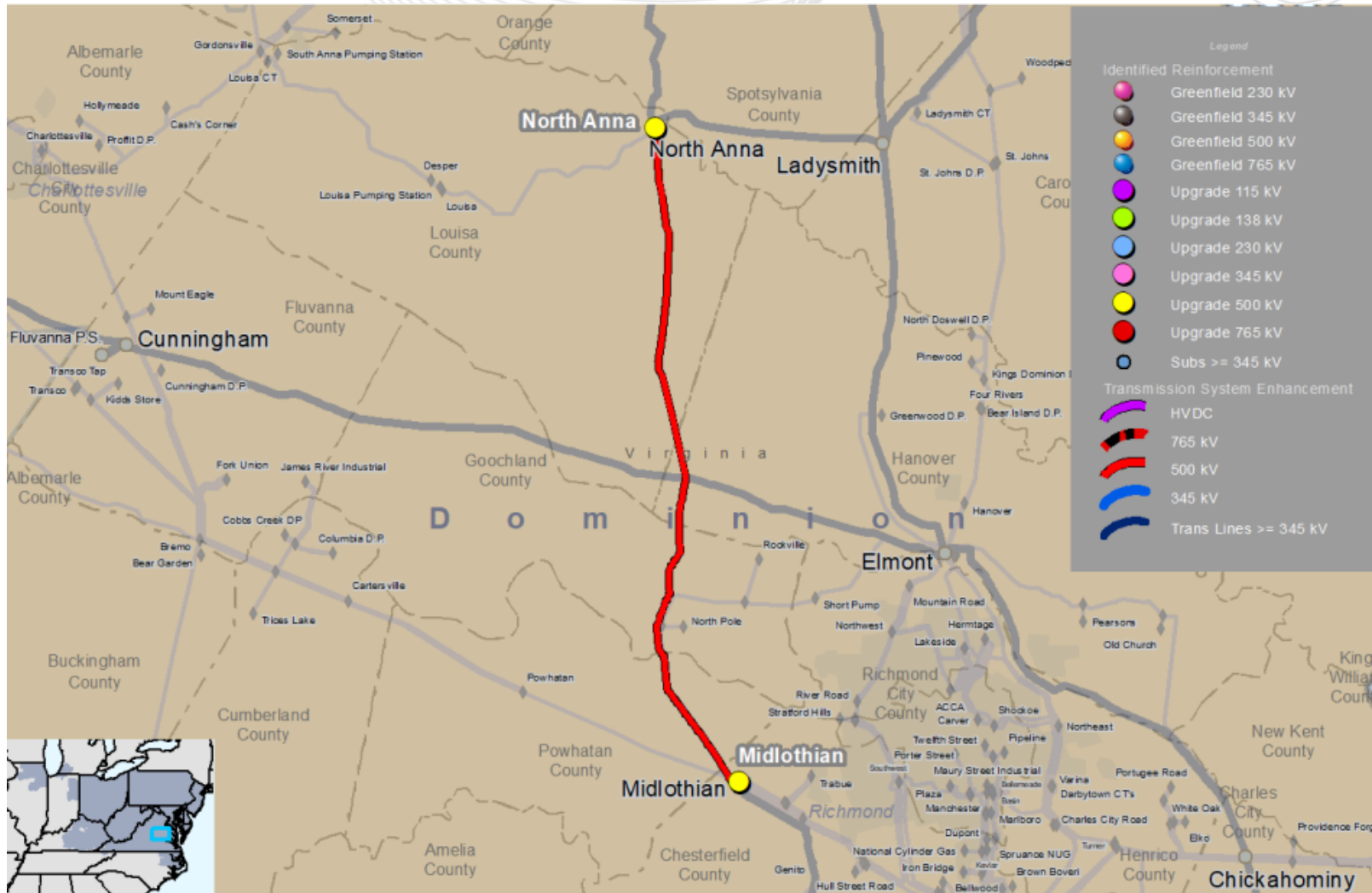
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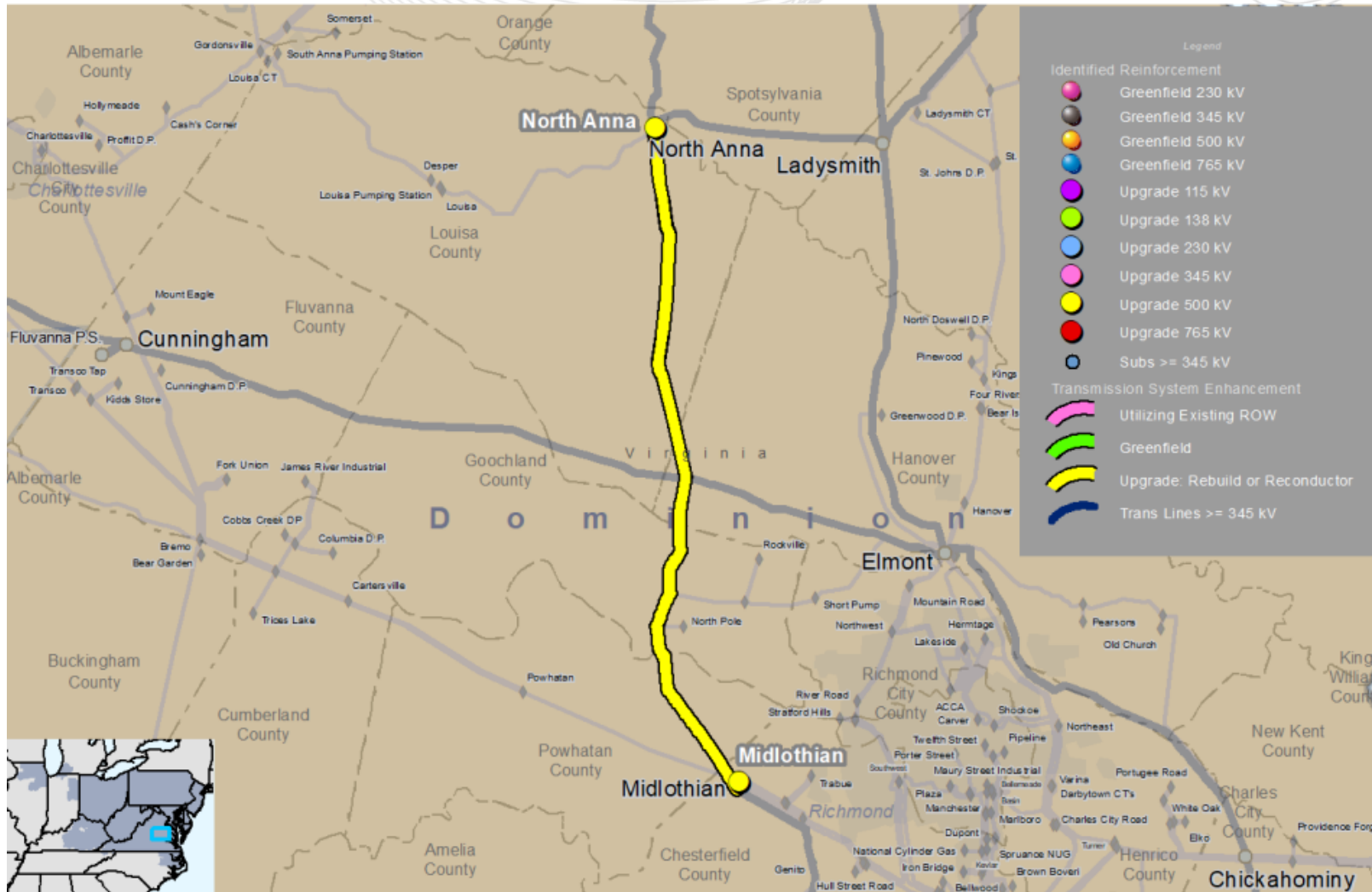




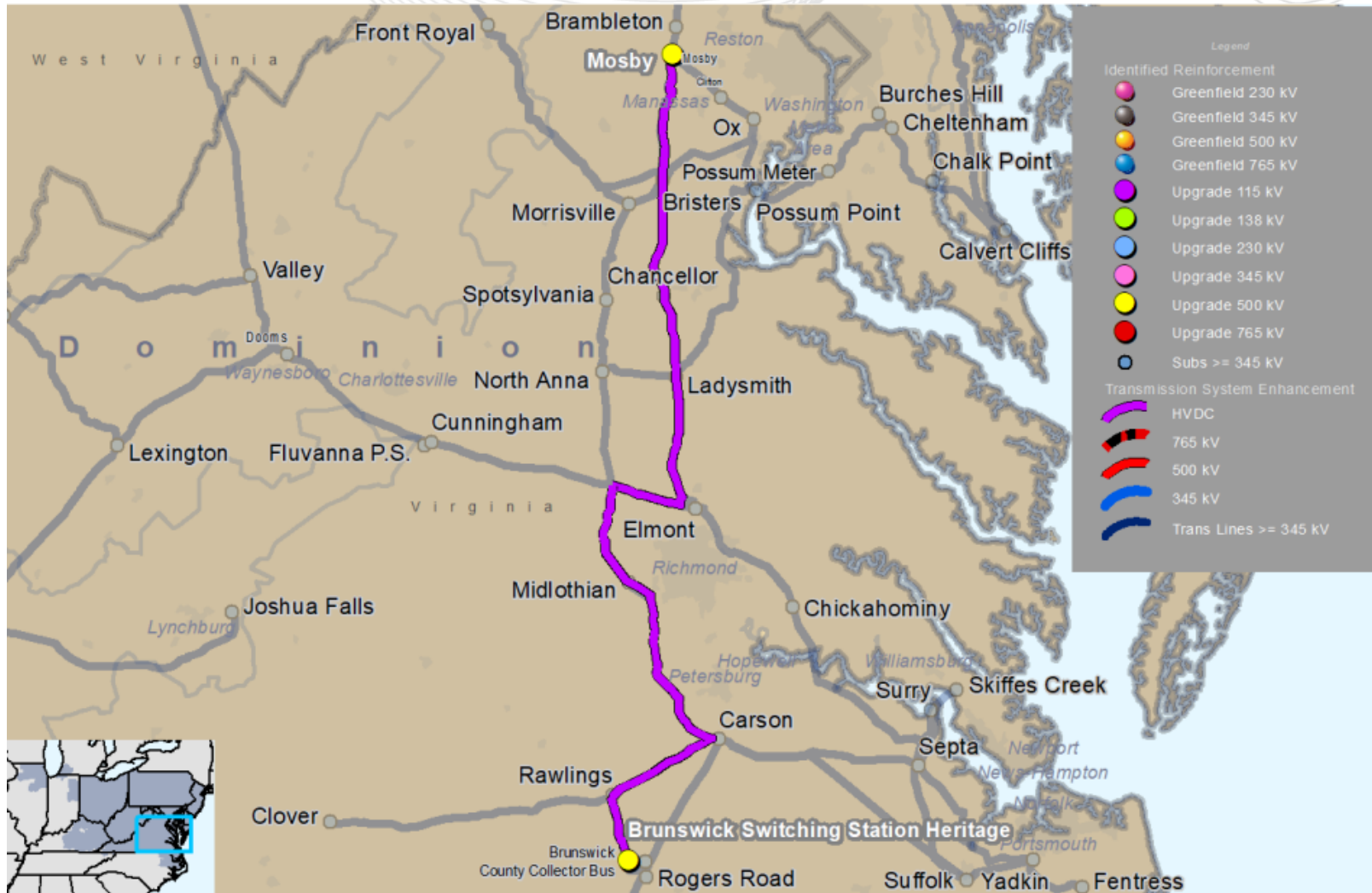




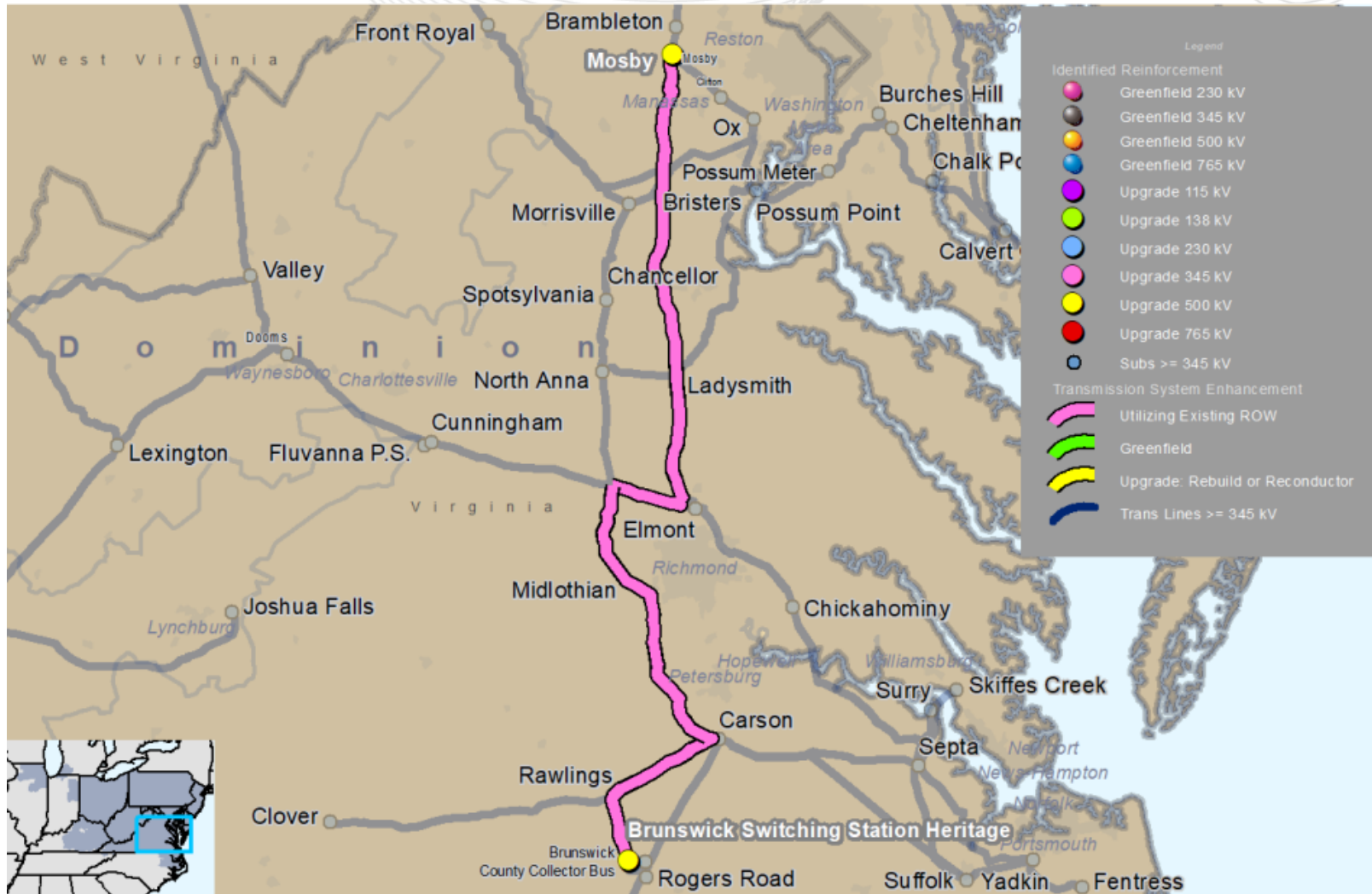
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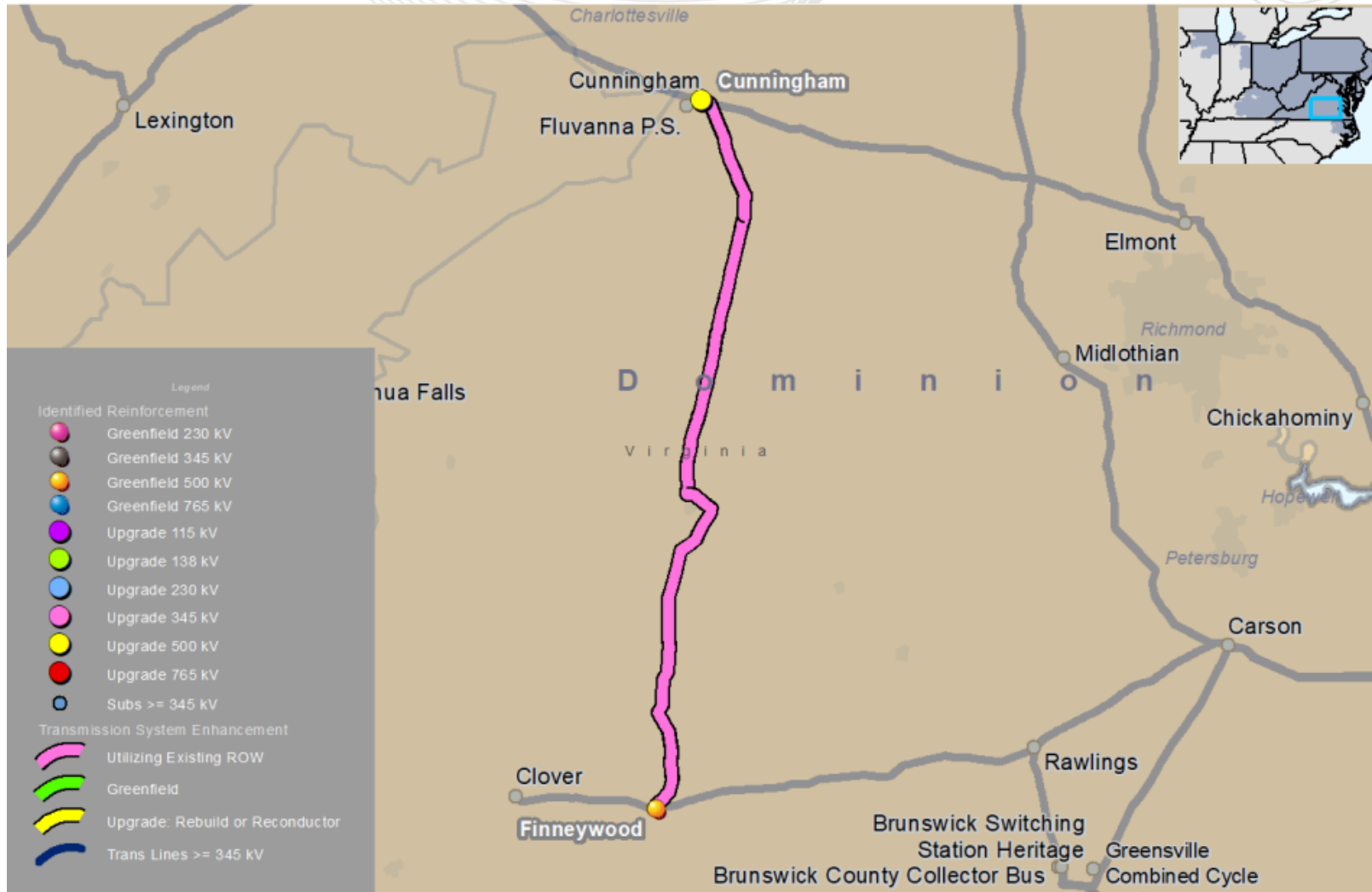
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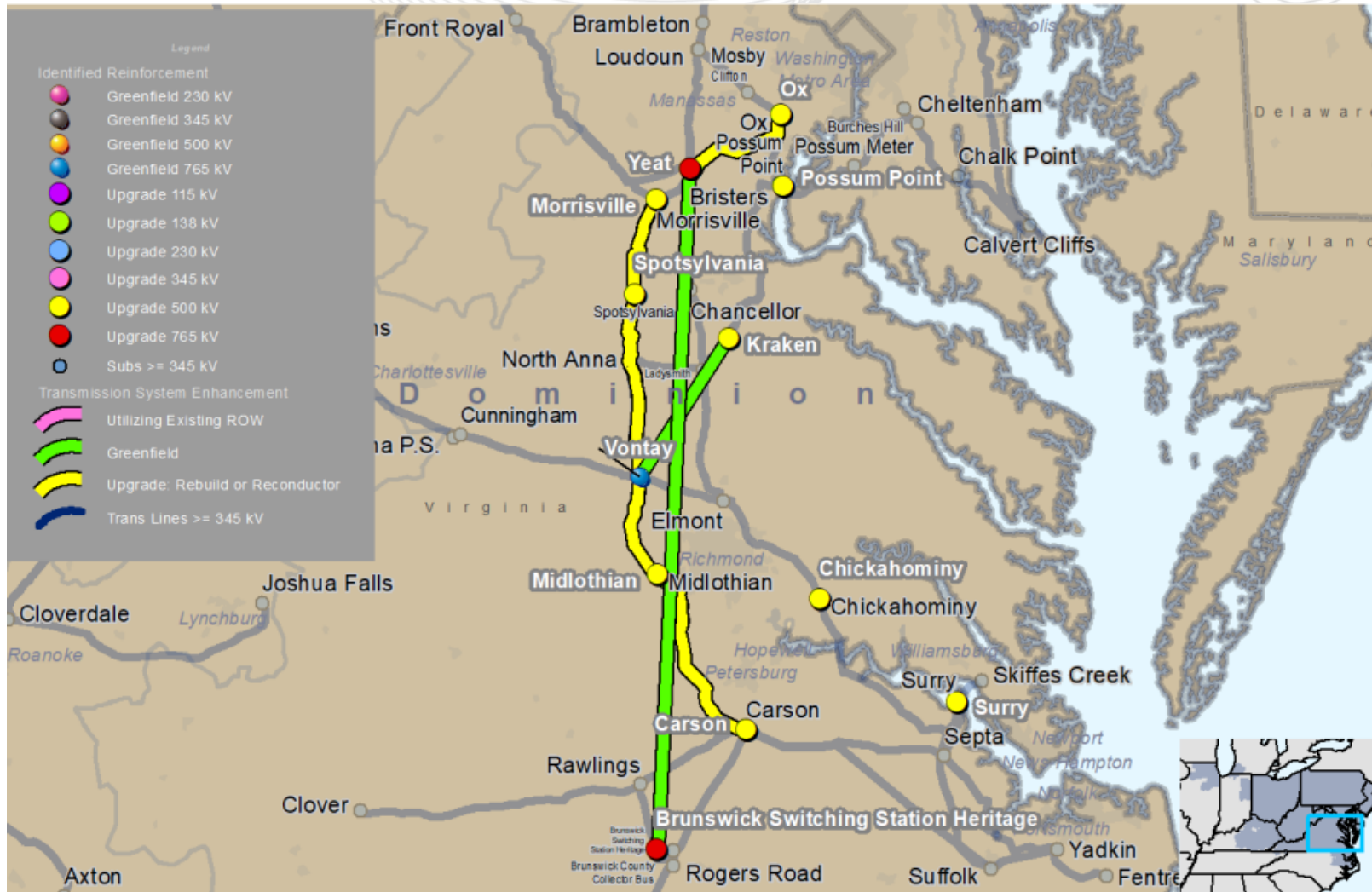




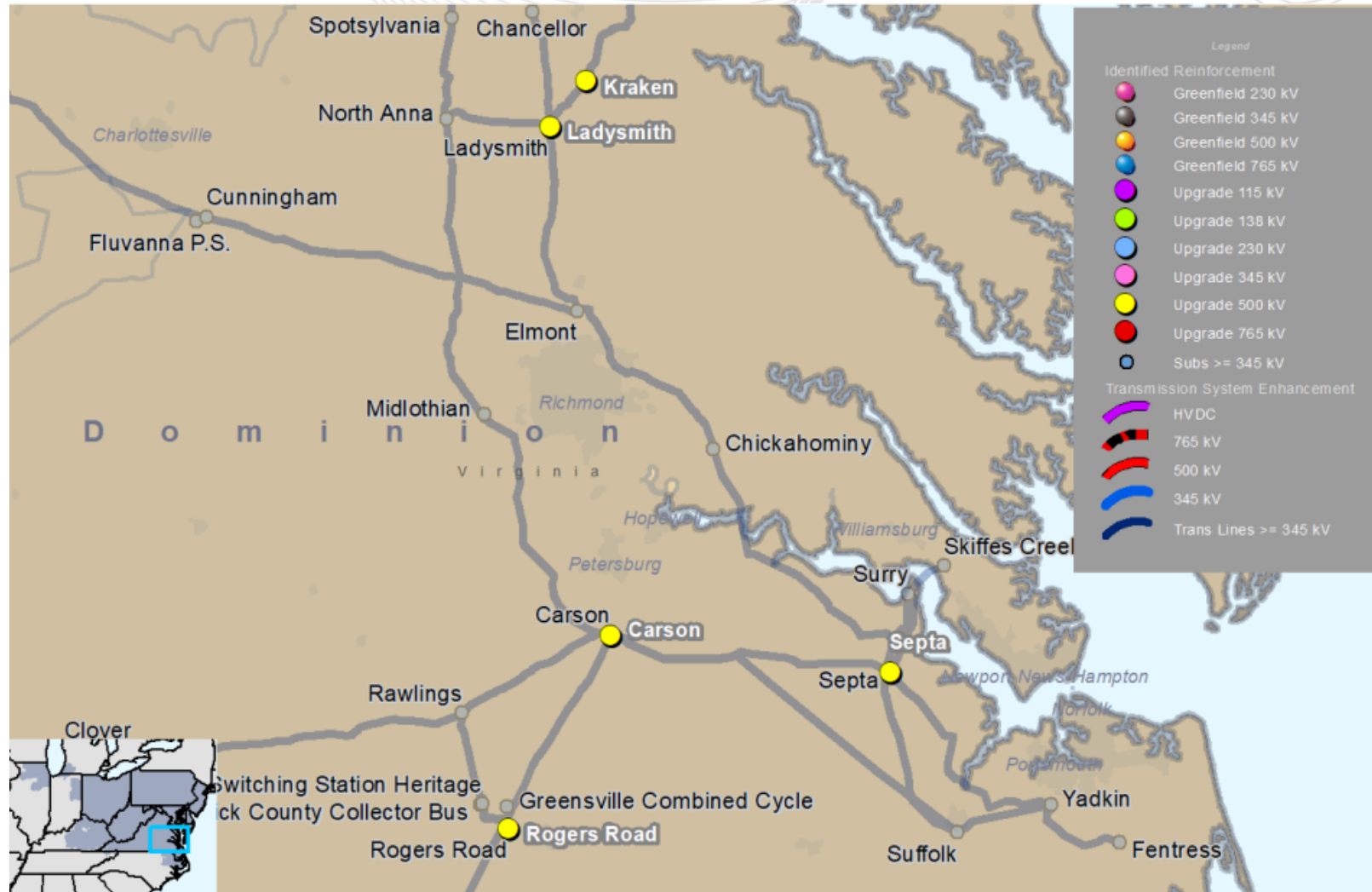
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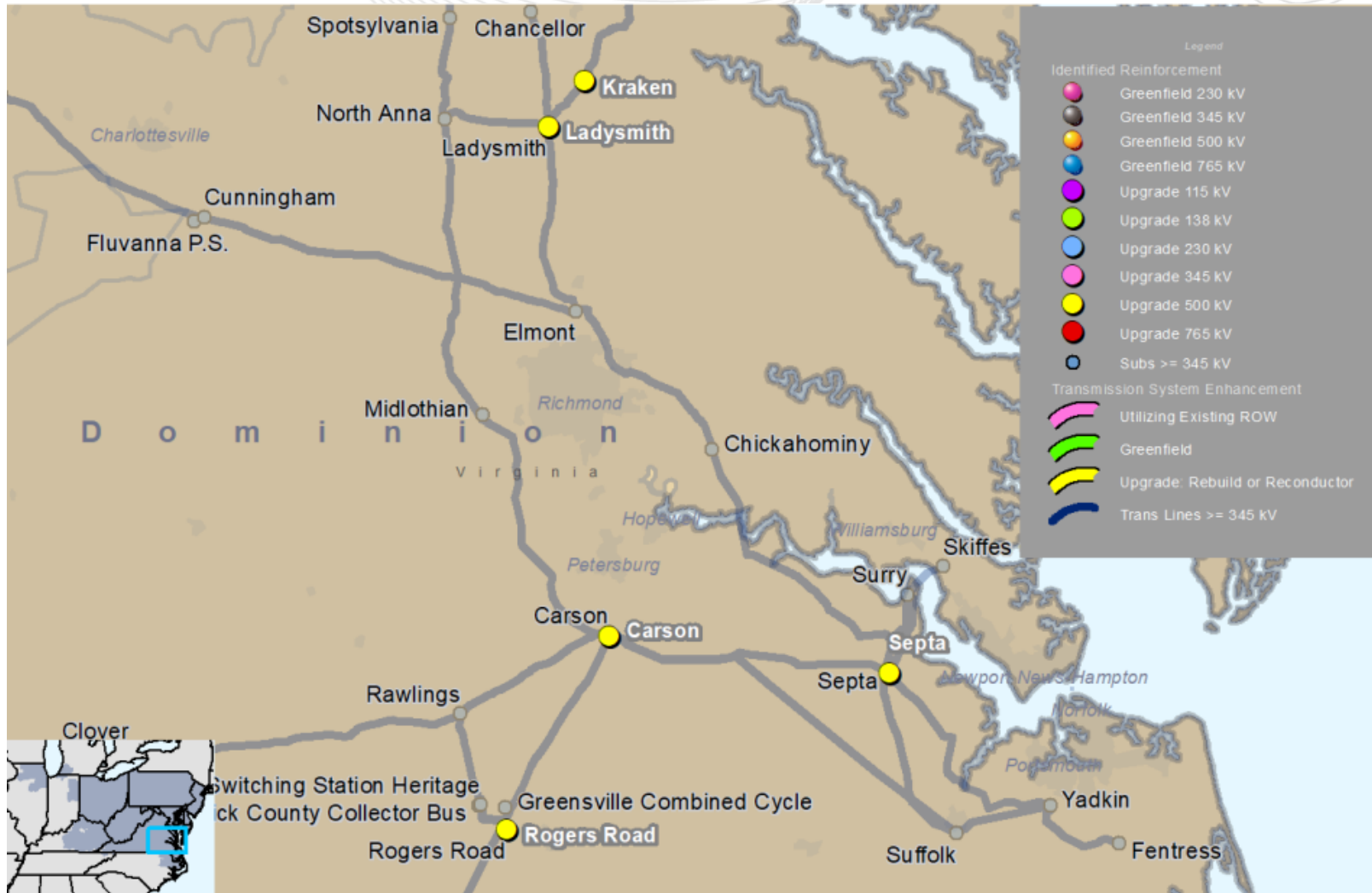


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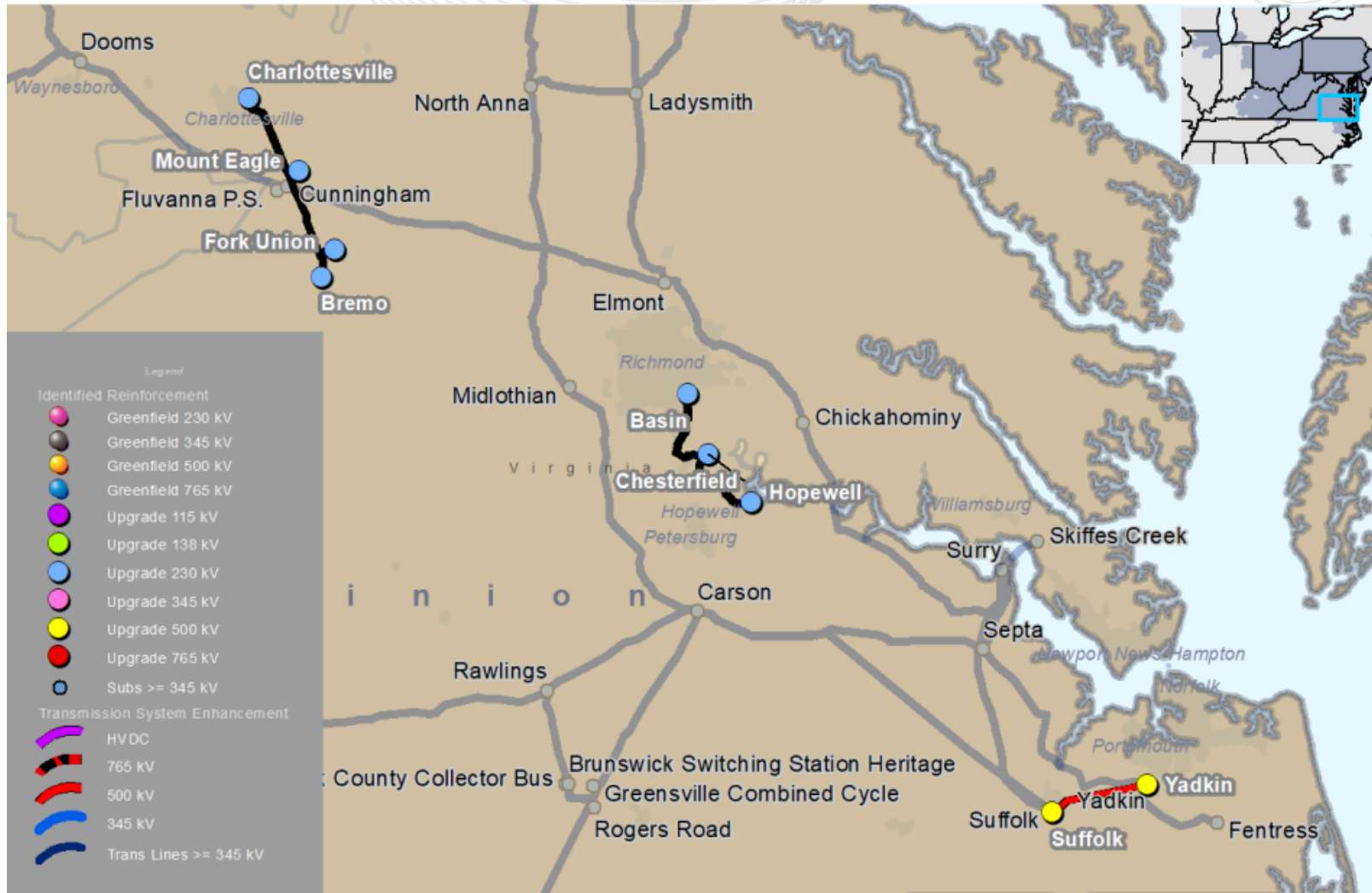
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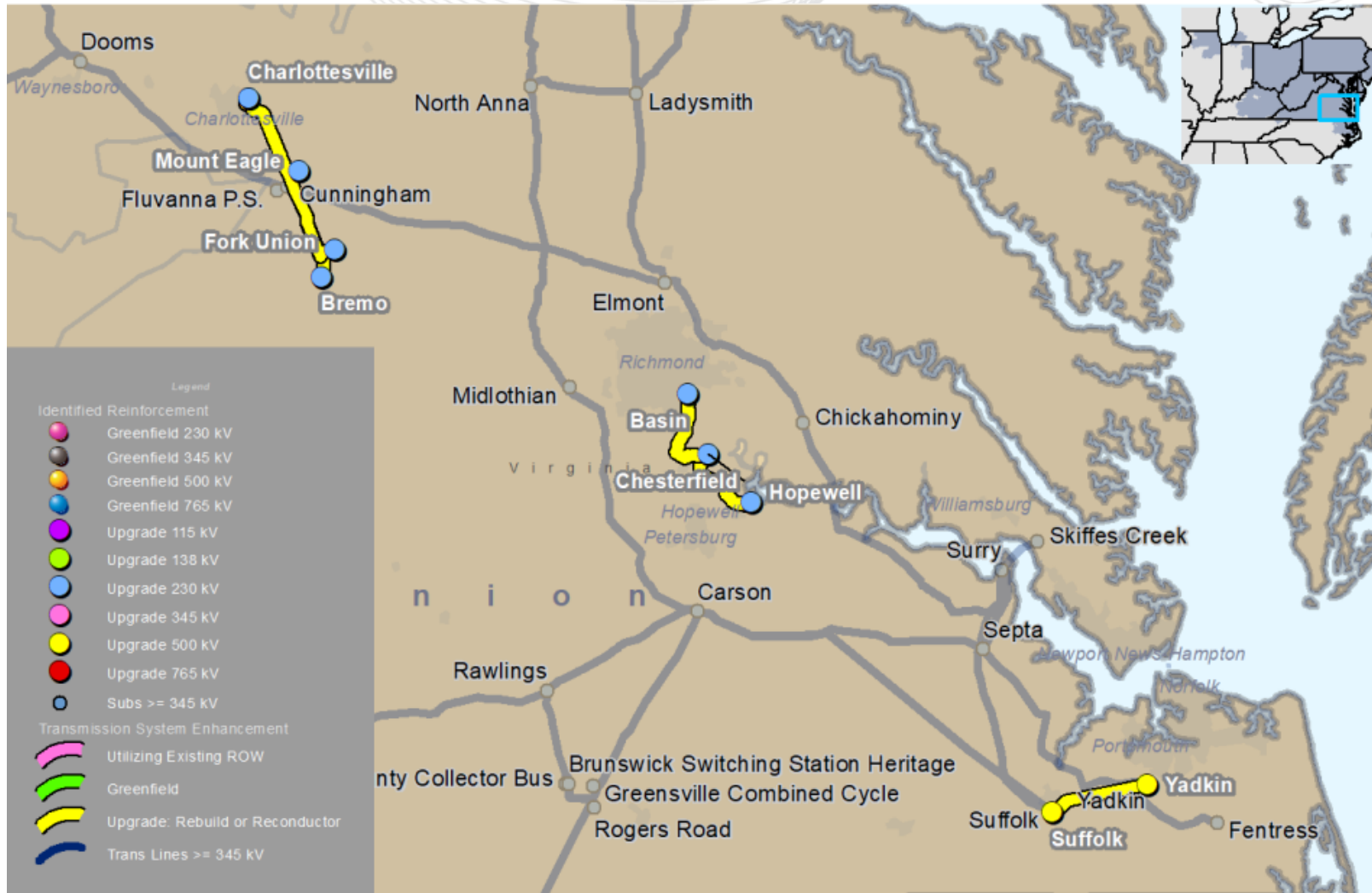


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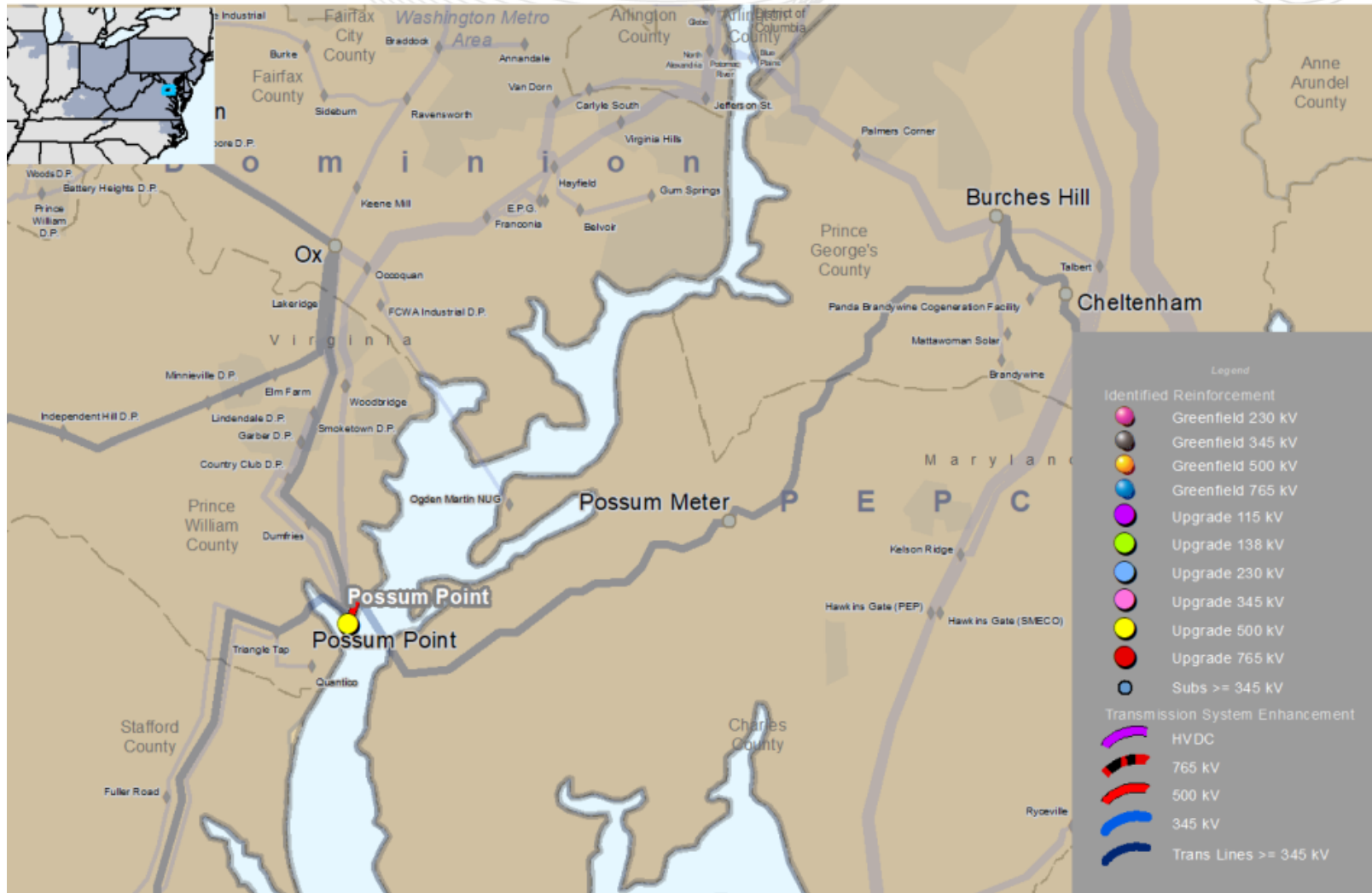




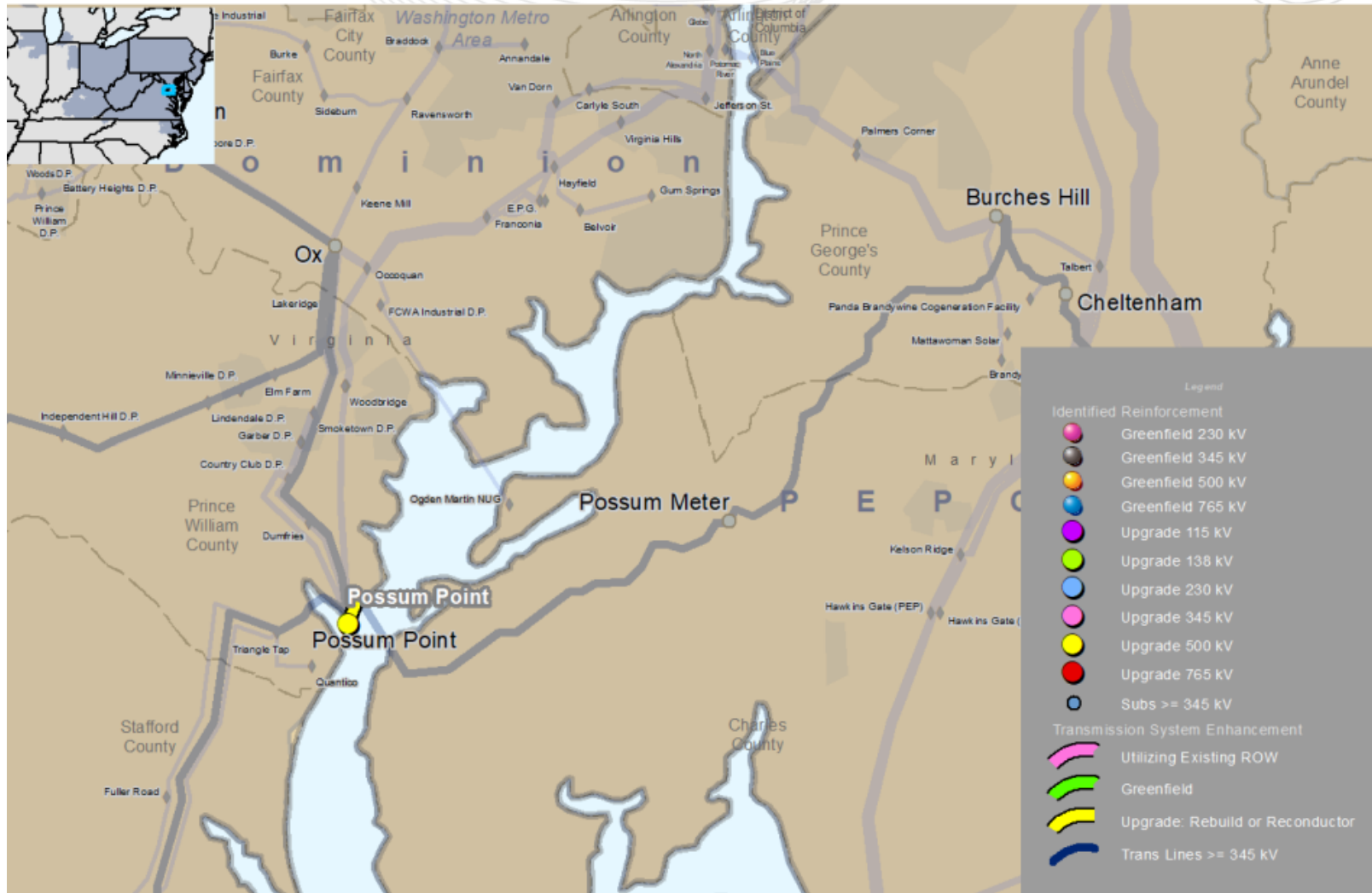
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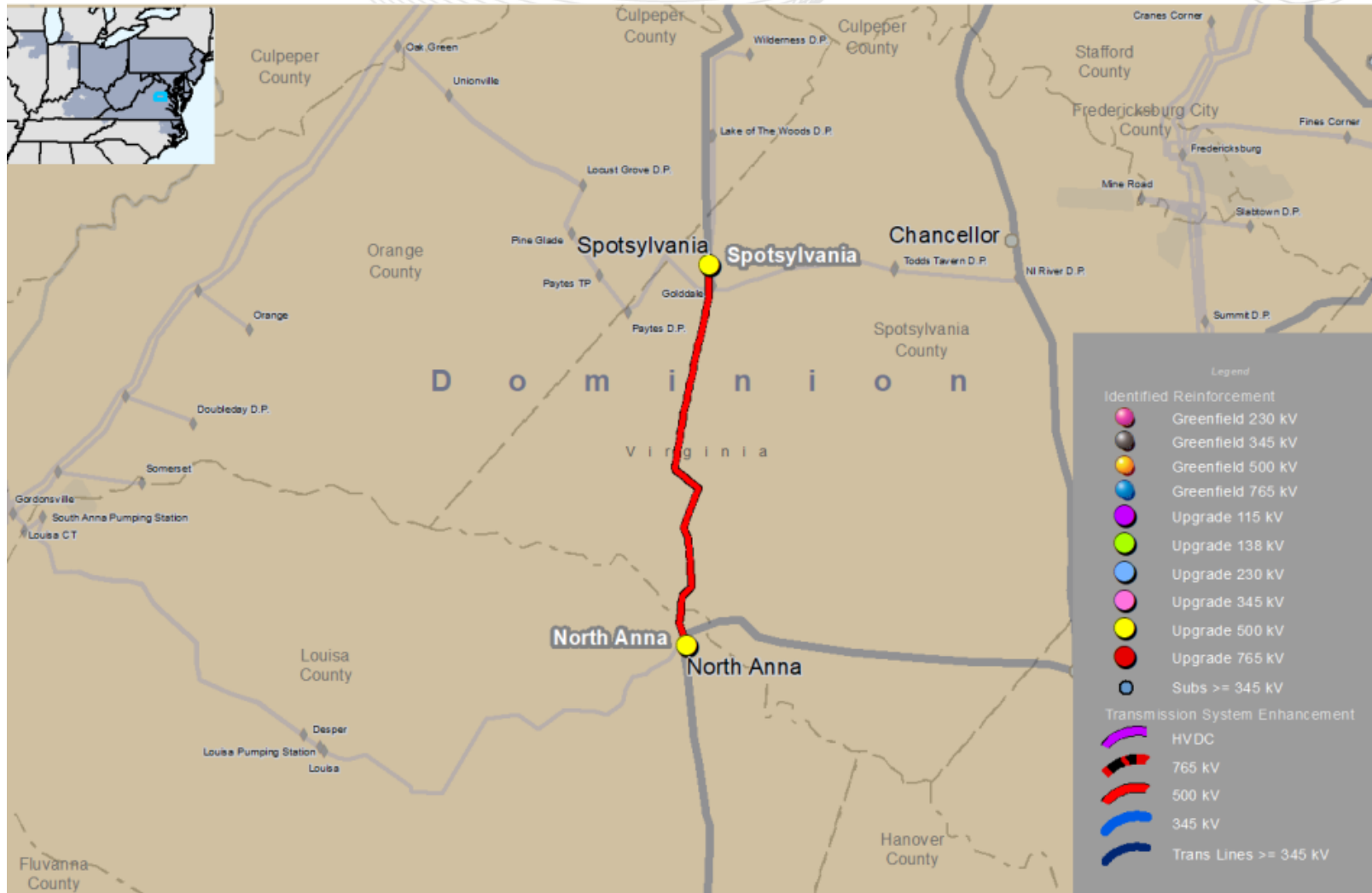


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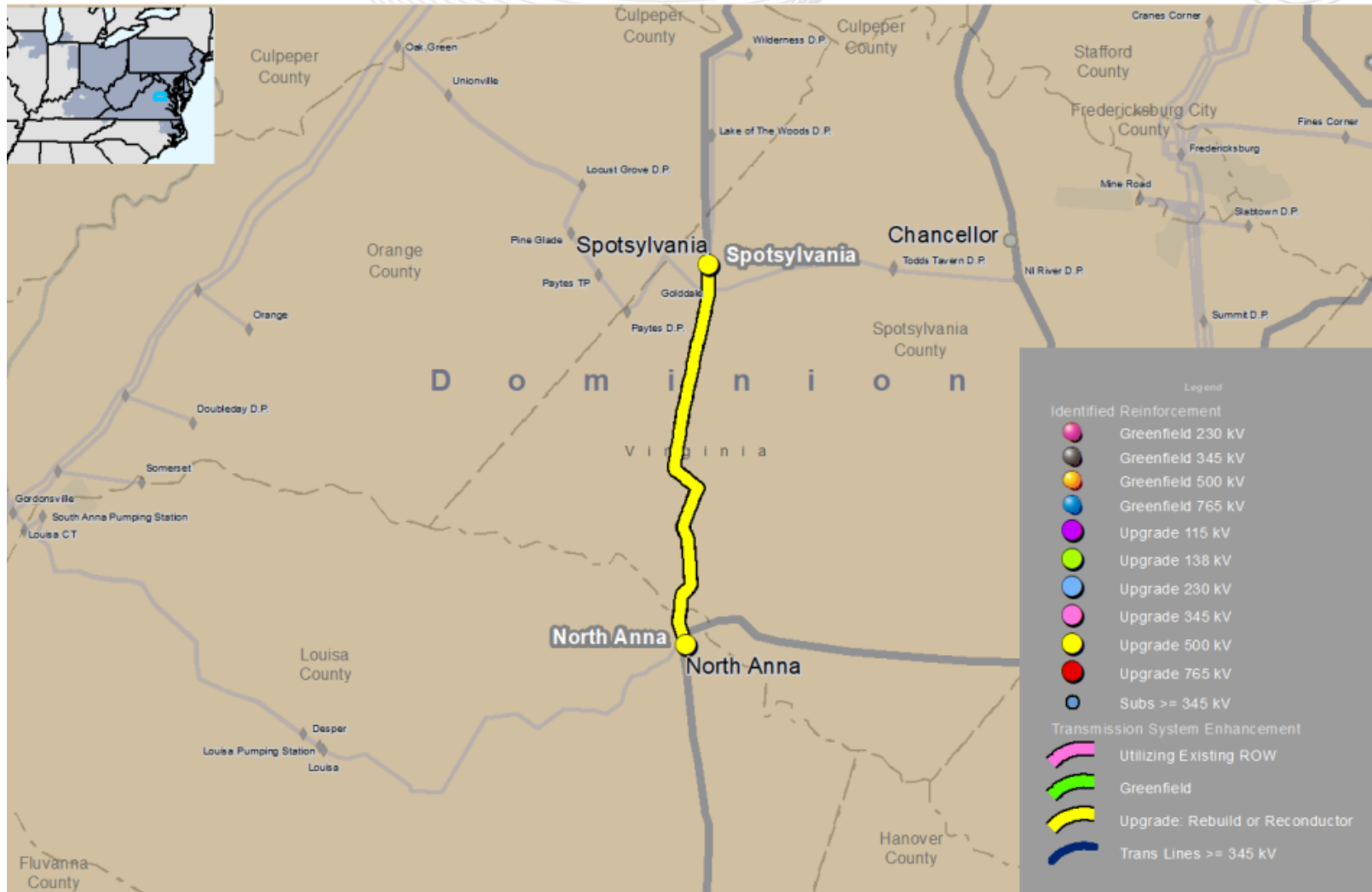
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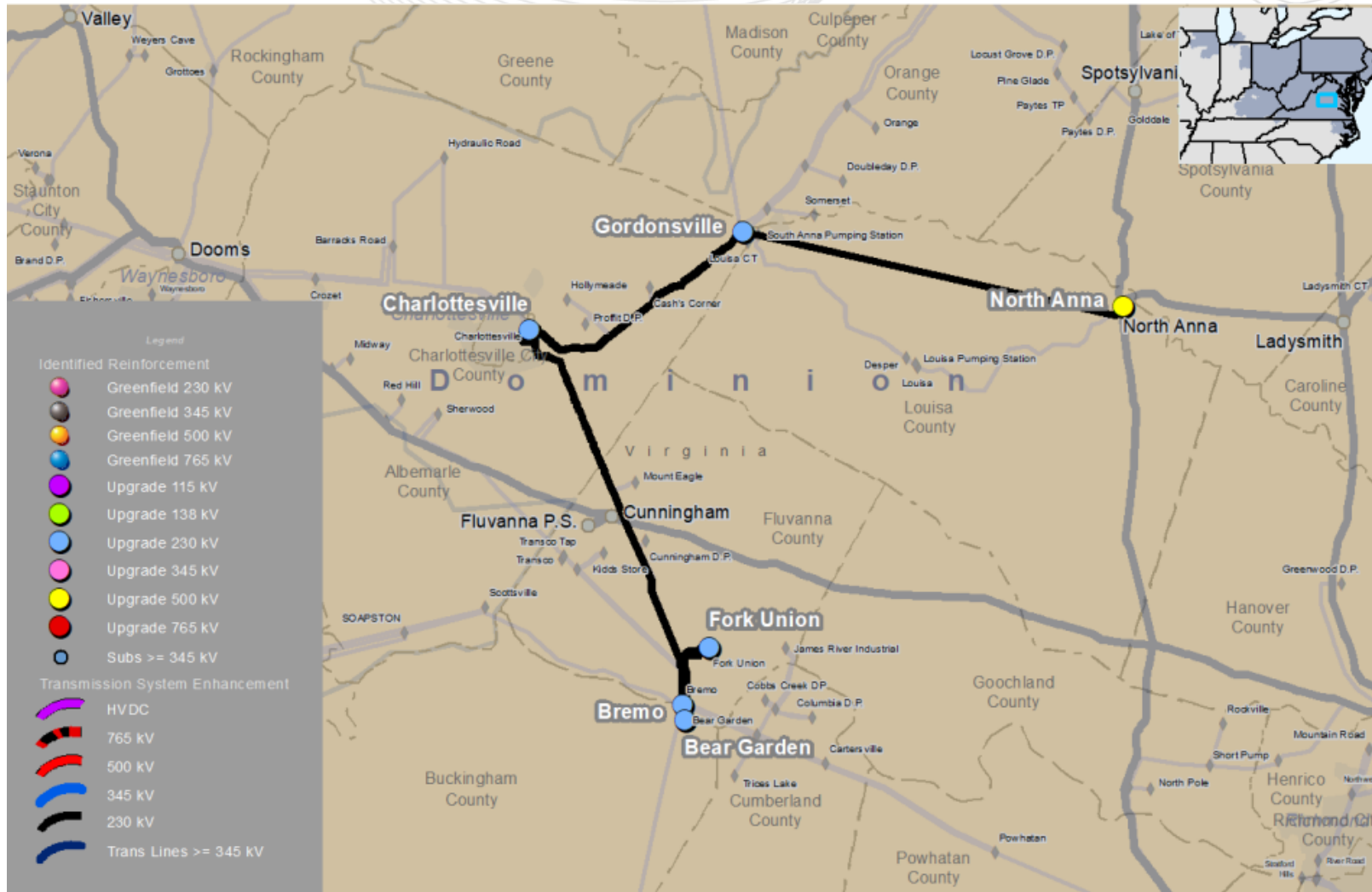


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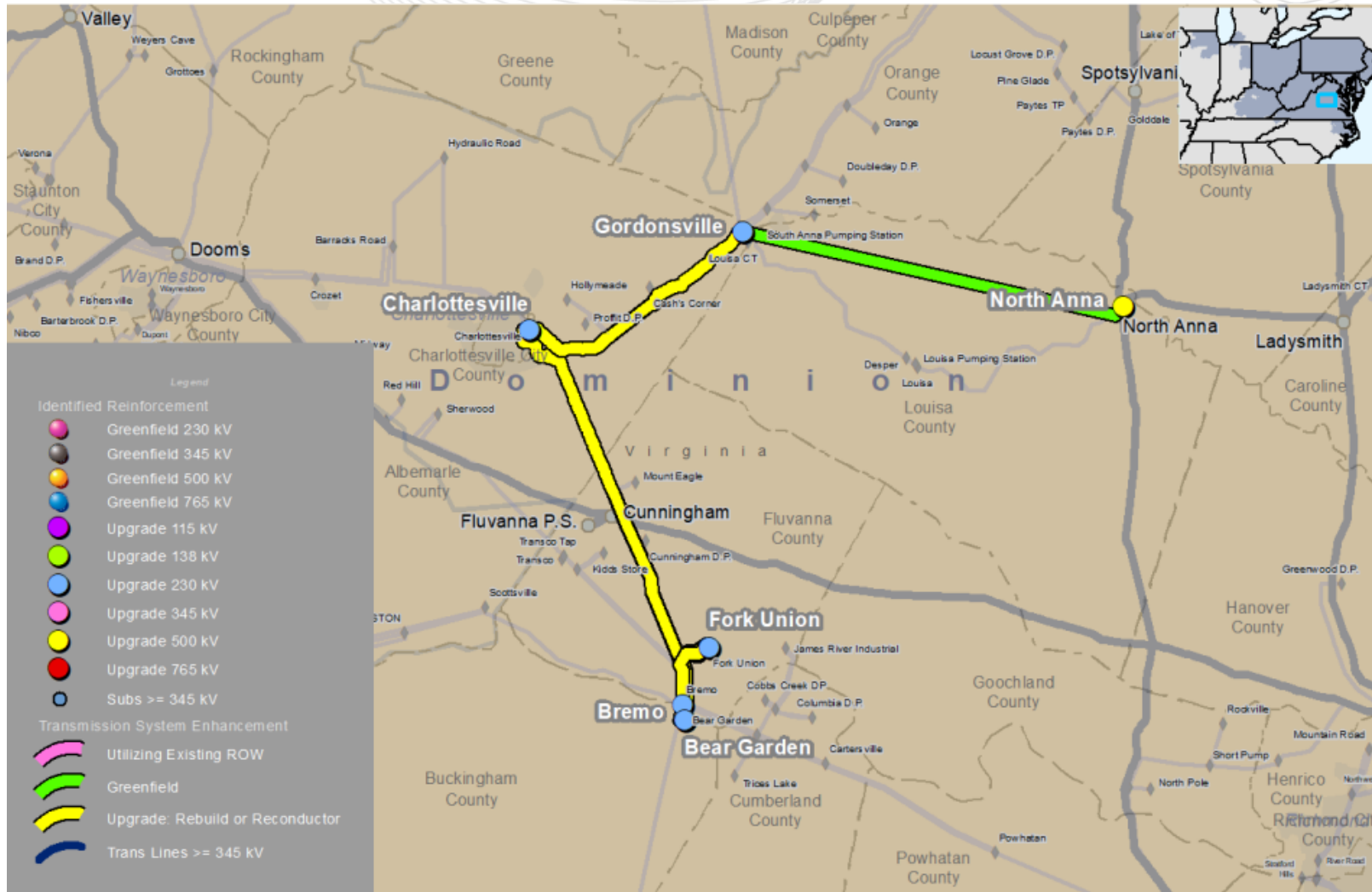




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# Appendix

## Scenario 5 and Scenario 6

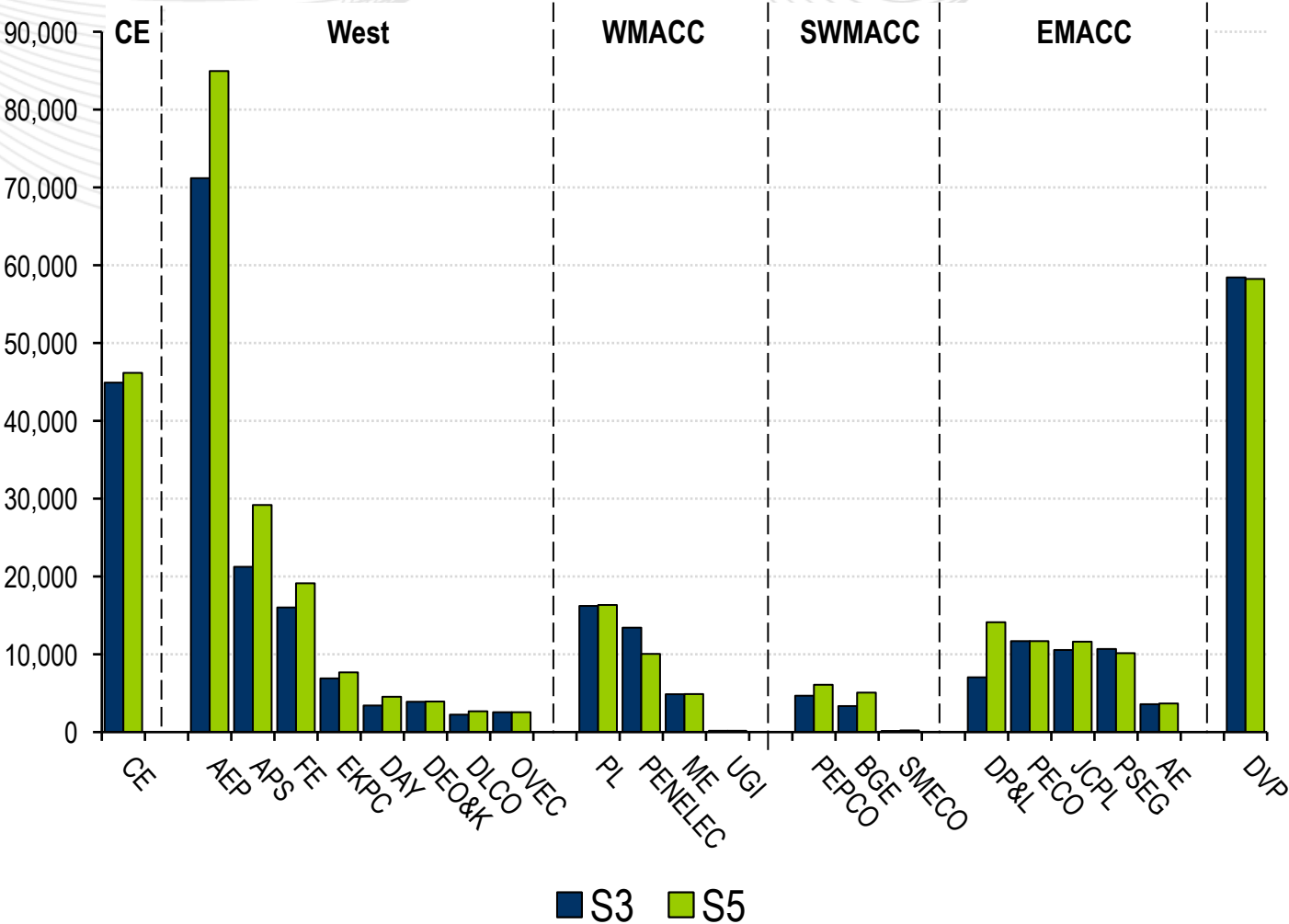




# Nameplate Capacity: S3 vs. S5

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 |

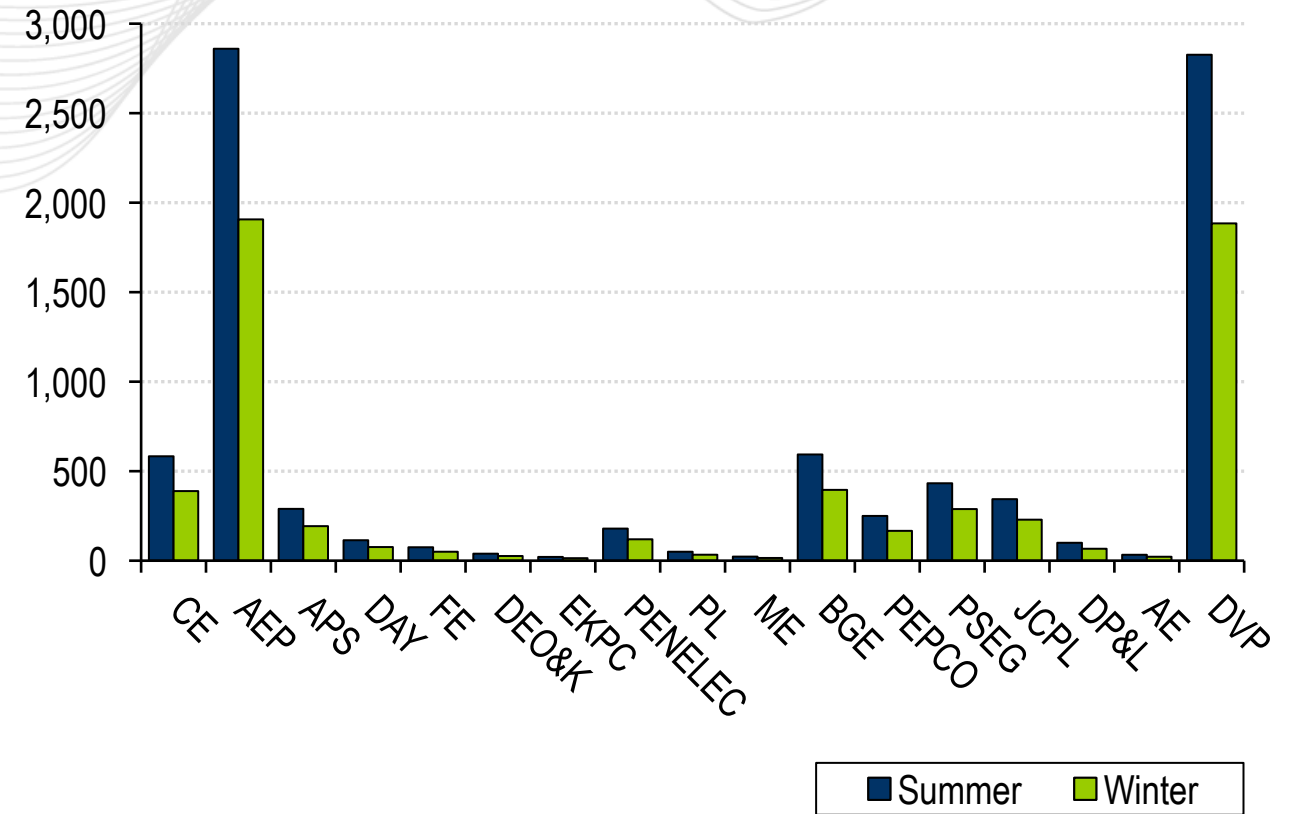


# 2032 Scenario 6: Battery Dispatched

Battery Dispatch (MW)

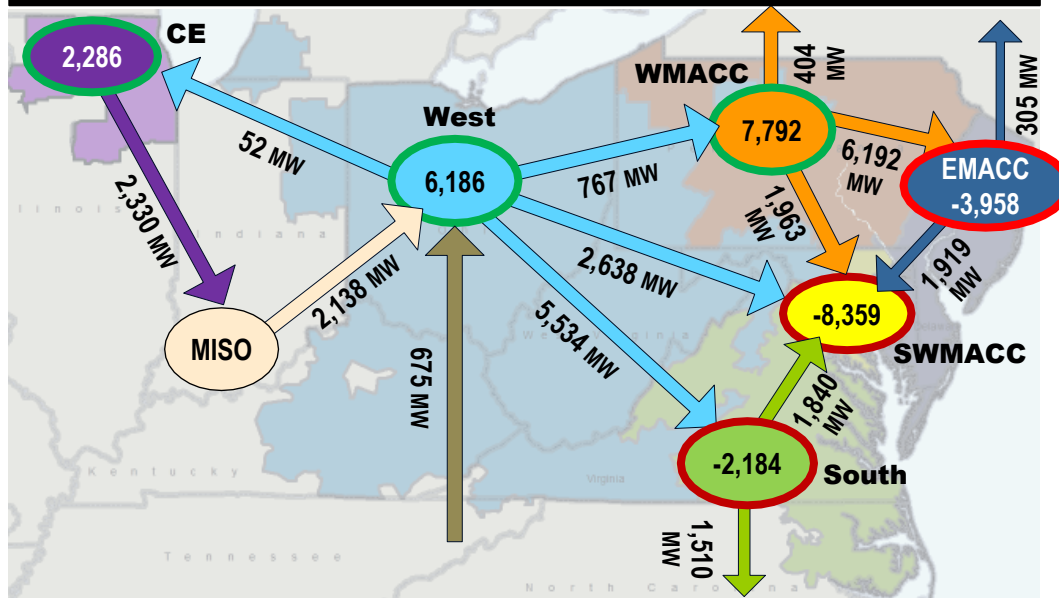
| Area Name          | Summer       | Winter       |
|--------------------|--------------|--------------|
| CE                 | 583          | 389          |
| AEP                | 2,860        | 1,907        |
| APS                | 289          | 193          |
| DAY                | 114          | 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        |
| <b>Grand Total</b> | <b>8,813</b> | <b>5,875</b> |

Battery Generation (GW)

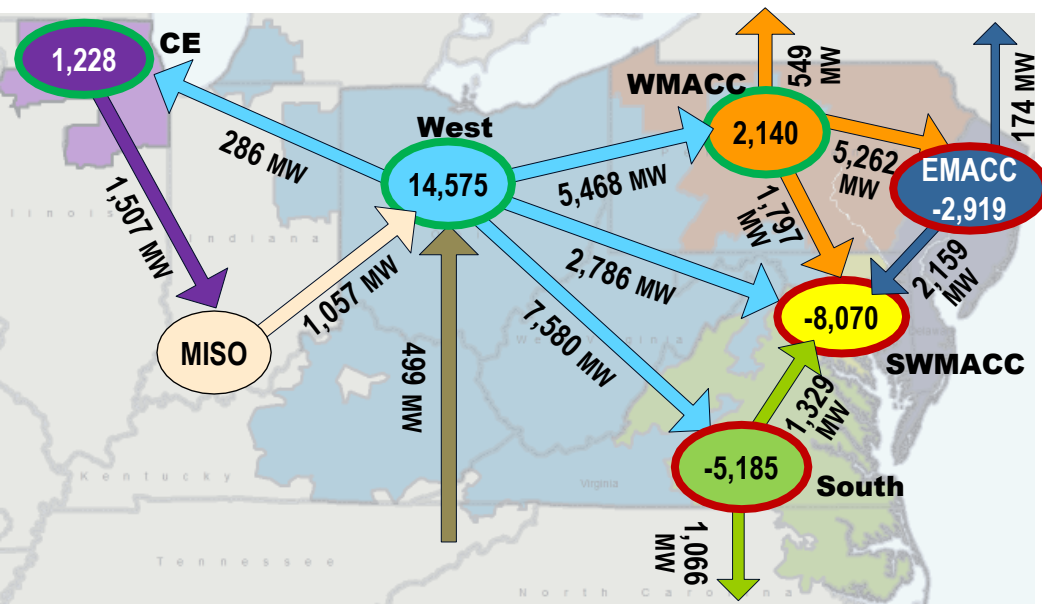


# Summer: Gen/Load Profile in S3/S5

2032 Scenario 3



2032 Scenario 5

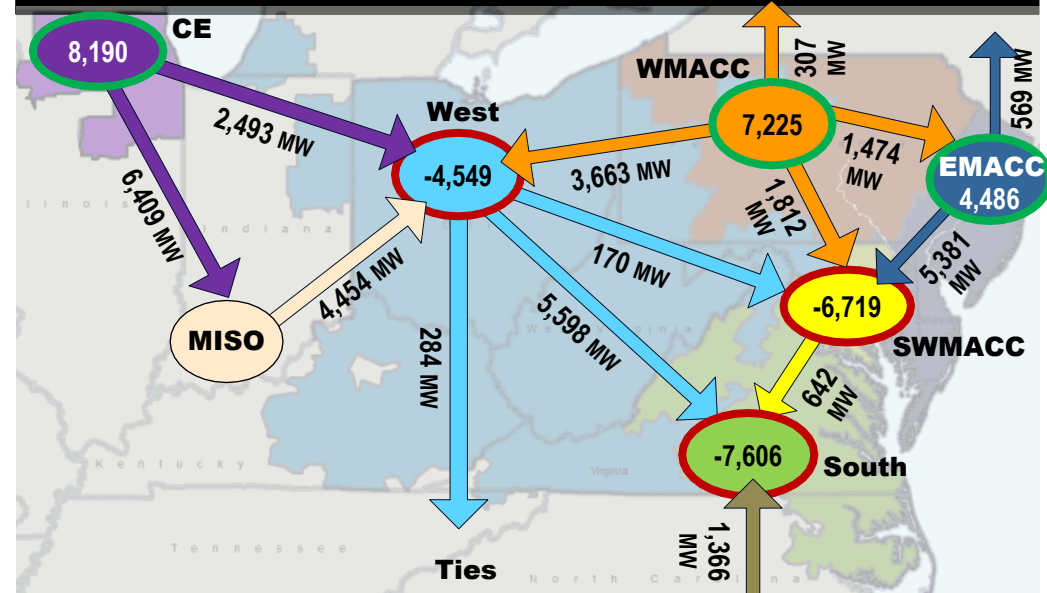


| Area    | Pgen (MW) |         | Load+Losses (MW) |         | Net (MW) |        |
|---------|-----------|---------|------------------|---------|----------|--------|
|         | S3        | S5      | S3               | S5      | S3       | S5     |
| APS     | 15,170    | 19,485  | 10,571           | 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  |

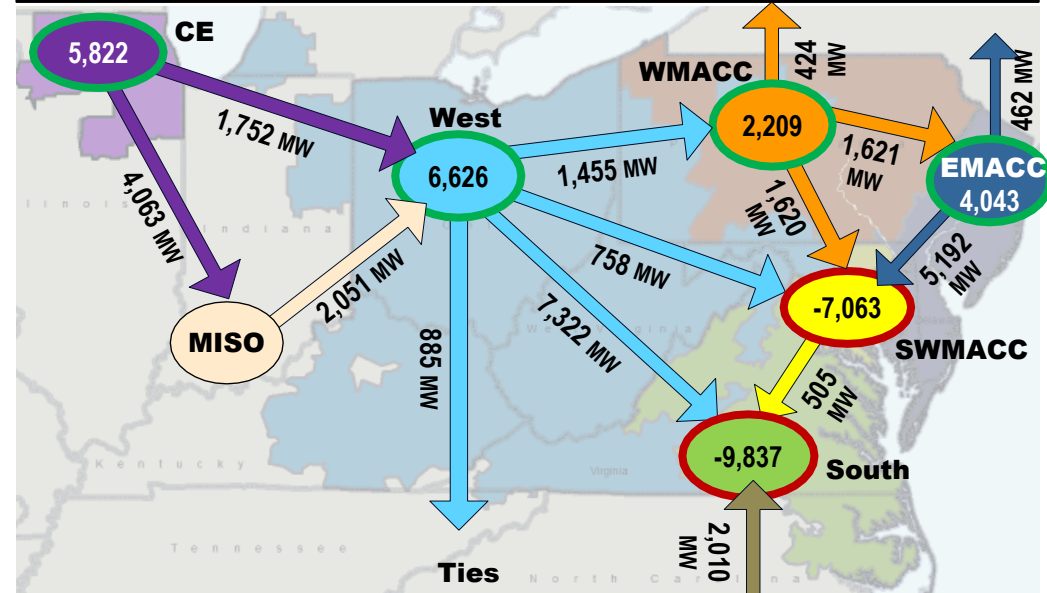
# WIN: Gen/Load Profile in S3/S5

| 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       |
|         | <b>198,765</b> | <b>199,384</b> | <b>196,989</b>   | <b>197,584</b> | <b>1,776</b> | <b>1,801</b> |

2032 Scenario 3

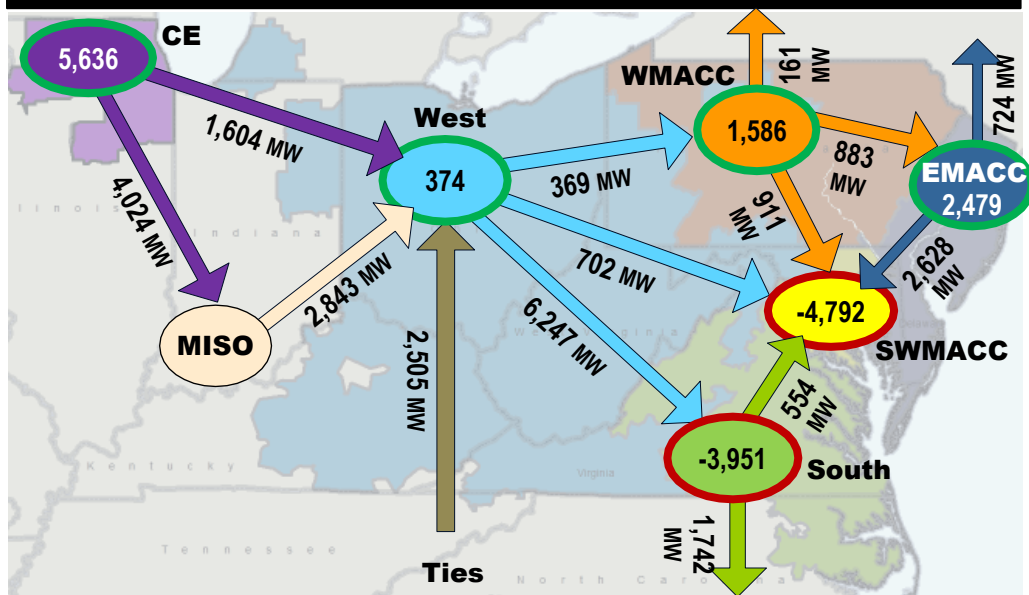


2032 Scenario 5

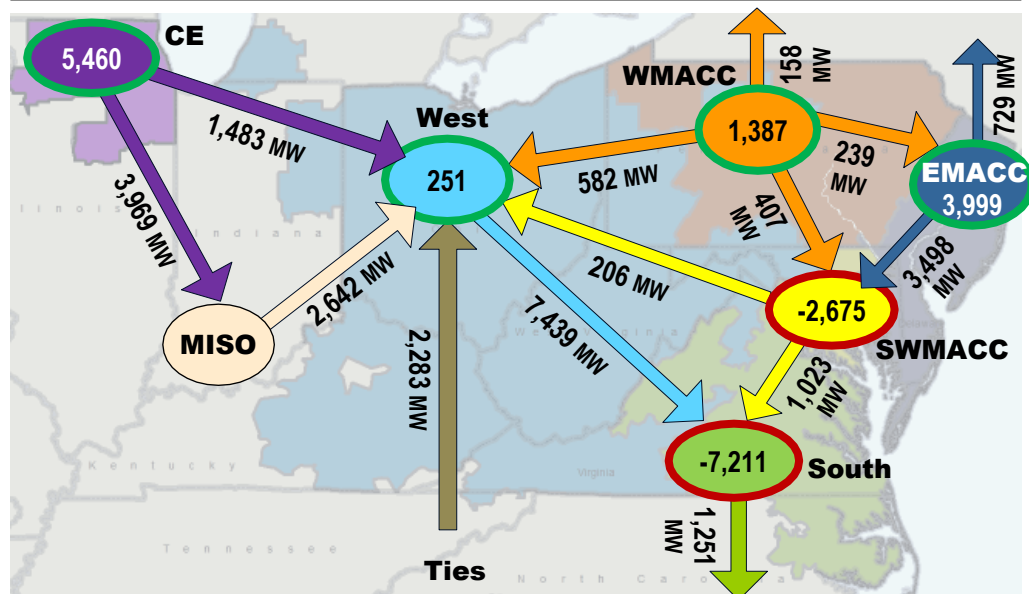




2032 Scenario 3



2032 Scenario 5



# LL: Gen/Load Profile in S3/S5

| 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 |
|         | 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        |
| <b>Total</b> | <b>173</b> | <b>0</b> | <b>18</b>  | <b>11</b> | <b>202</b> |

## 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        |
| <b>Total</b> | <b>275</b> | <b>0</b> | <b>53</b>  | <b>24</b> | <b>352</b> |

## 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         |
| <b>Total</b> | <b>102</b> | <b>0</b> | <b>35</b>  | <b>13</b> | <b>150</b> |

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        |
| <b>Total</b> | <b>75</b>  | <b>0</b> | <b>5</b>   | <b>9</b> | <b>89</b> |

## 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         |
| <b>Total</b> | <b>168</b> | <b>2</b> | <b>28</b>  | <b>18</b> | <b>216</b> |

## 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         |
| <b>Total</b> | <b>94</b>  | <b>2</b> | <b>23</b>  | <b>9</b> | <b>128</b> |

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         |
| <b>Total</b> | <b>98</b>  | <b>0</b> | <b>6</b>   | <b>8</b> | <b>112</b> |

## 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         |
| <b>Total</b> | <b>115</b> | <b>0</b> | <b>7</b>   | <b>11</b> | <b>133</b> |

## 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        |
| <b>Total</b> | <b>17</b>  | <b>0</b> | <b>1</b>   | <b>3</b> | <b>21</b> |