



# Reliability Analysis Update

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PJM Transmission Planning

Transmission Expansion Advisory  
Committee  
October 8, 2024

- 2024 RTEP Window 1 Updates
- 2024 RTEP Window 1 – Breaker Replacements
  - 1st Read

# 2024 RTEP Window 1 Updates

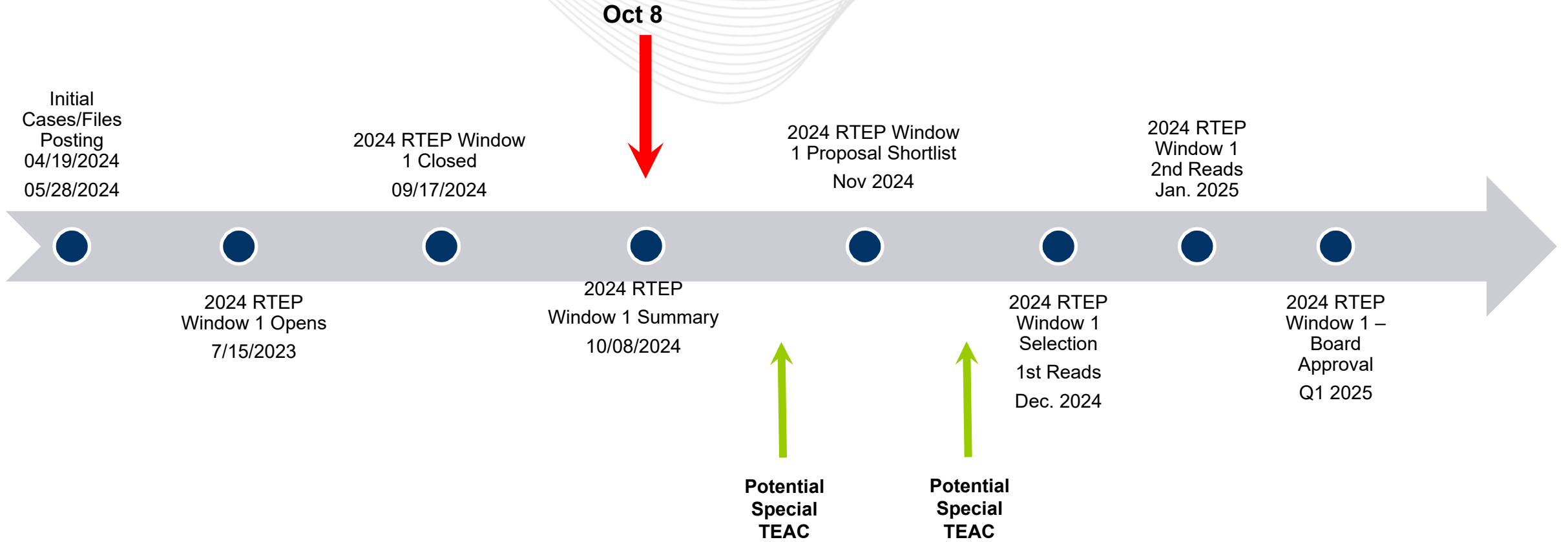
- Heavy transmission interface flows West-East driven by load increase in Dominion/East and sourced generation in both Western and Eastern PJM
- The need for additional West-East reinforcement, previously identified by PJM, is now materializing earlier than anticipated due to higher load growth in the MAAC/Dominion areas
- Proposed reinforcement through 2022W3 and 2023W1/W2 performing well
- The 8-year RTEP scenario mainly focuses on right sizing solutions
  - Of the 5-year RTEP needs
  - Long lead transmission needs
  - Check/confirm impact of “forecast” generation on transmission needs identified in the 5-year model





# 2024 RTEP W1

## Timeline and Status Update



- The 2024 RTEP Window 1 officially closed on Sept. 17, 2024.
- 94 Proposals were received from 16 entities.
- 48 projects are upgrades, 40 are greenfield, and six are joint proposals.
- Proposals range from simple upgrades to facilities, to new extra-high-voltage transmission lines and facilities.
- Total cost of solution package will depend on proposals selected.
- Several proposals have cost containment commitments.
- Targeting Q1 2025 Board approval – December and January for TEAC 1st and 2nd reads

- All proposals submitted to address West-East regional flows recommended 765 kV solutions:
  - Multiple proposals recommending variants of Joshua Falls/Axton-Morrisville area 765 kV development
  - One proposal recommending a northern, John Amos-Northern Virginia 765 kV development
  - West-East regional solutions will include at least one variant of these proposals for a 765 kV development, plus accompanying 500 kV and 765 kV upgrades.
- A number of proposals' performance will rely on the robustness of the regional solutions to be evaluated.
  - A number of reliability needs may be eliminated based on the to-be-selected regional solution.



# 2024 RTEP Window 1 – Proposal Summary (Competitive)

Proposing Entity	East	West	Transfers	Dominion	Local
<b>AEP</b>					<b>X</b>
<b>Dominion</b>			<b>X</b>	<b>X</b>	<b>X</b>
<b>Exelon</b>					<b>X</b>
<b>First Energy</b>			<b>X</b>		<b>X</b>
<b>LS Power</b>			<b>X</b>	<b>X</b>	
<b>NextEra</b>		<b>X</b>	<b>X</b>	<b>X</b>	
<b>PPL</b>	<b>X</b>				<b>X</b>
<b>PSEG</b>	<b>X</b>				
<b>Transource</b>		<b>X</b>		<b>X</b>	
<b>Joint Proposal: DOM/FE/Transource</b>		<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

- Individual proposal screening underway
- Baseline scenarios are being developed:
  - Includes all full solution proposals offered in all four need areas (East, West, Transfers, Dominion and Local)
  - Preliminary analysis shows good performance of a number of holistic proposals.
  - Scenarios will include all holistic proposals evaluated individually (in their own areas).
  - Based on individual proposal performance, PJM may develop scenarios with components from other proposals.
- More scenario details and evaluation results will be shared at the next TEAC.

- Scenarios with their associated proposed developments will be ranked based on:
  - Meeting the system needs of 2029 and 2032
  - Being scalable/flexible to address forecasted needs going forward (for right sizing and limiting disruption)
  - Utilization of existing ROWs and brownfield development/expansion (where possible and efficient)
  - Cost evaluation using third-party cost benchmarking metrics
  - Risk of individual components development

- Individual proposals and a number of scenarios were evaluated and more are being developed/underway.
  - Additional detail will be provided in the next TEAC update.
- Two rounds or more of PJM meetings with proposing entities
  - Discussions to clarify details of proposed developments, assumptions, rationale of proposed alternatives/variations.
    - First round started September 20, and second round commenced early October.
    - Focus on rationale of proposed alternatives/variants, proposal merits, preliminary routing detail, risk and cost assumptions/considerations



- Scenario evaluations to continue through November 2024
  - Scenario shortlist targeted for November 5 TEAC
  - Possible interim TEAC for scenario evaluation updates
- PJM will be conducting load deliverability evaluations for the short listed scenarios.
- Targeting to finalize technical and constructability evaluations by end of October 2024.
- PJM may schedule a special TEAC to walk through the window evaluation results before the December TEAC meeting.

# First Read – Short Circuit



# BGE Transmission Zone: Baseline Conastone 230 kV 2322 B5 CB Replacement

**Process Stage:** First Read

**Criteria:** Short Circuit

**Assumption Reference:** 2024 RTEP assumptions

**Model Used for Analysis:** 2029 RTEP Short Circuit base case

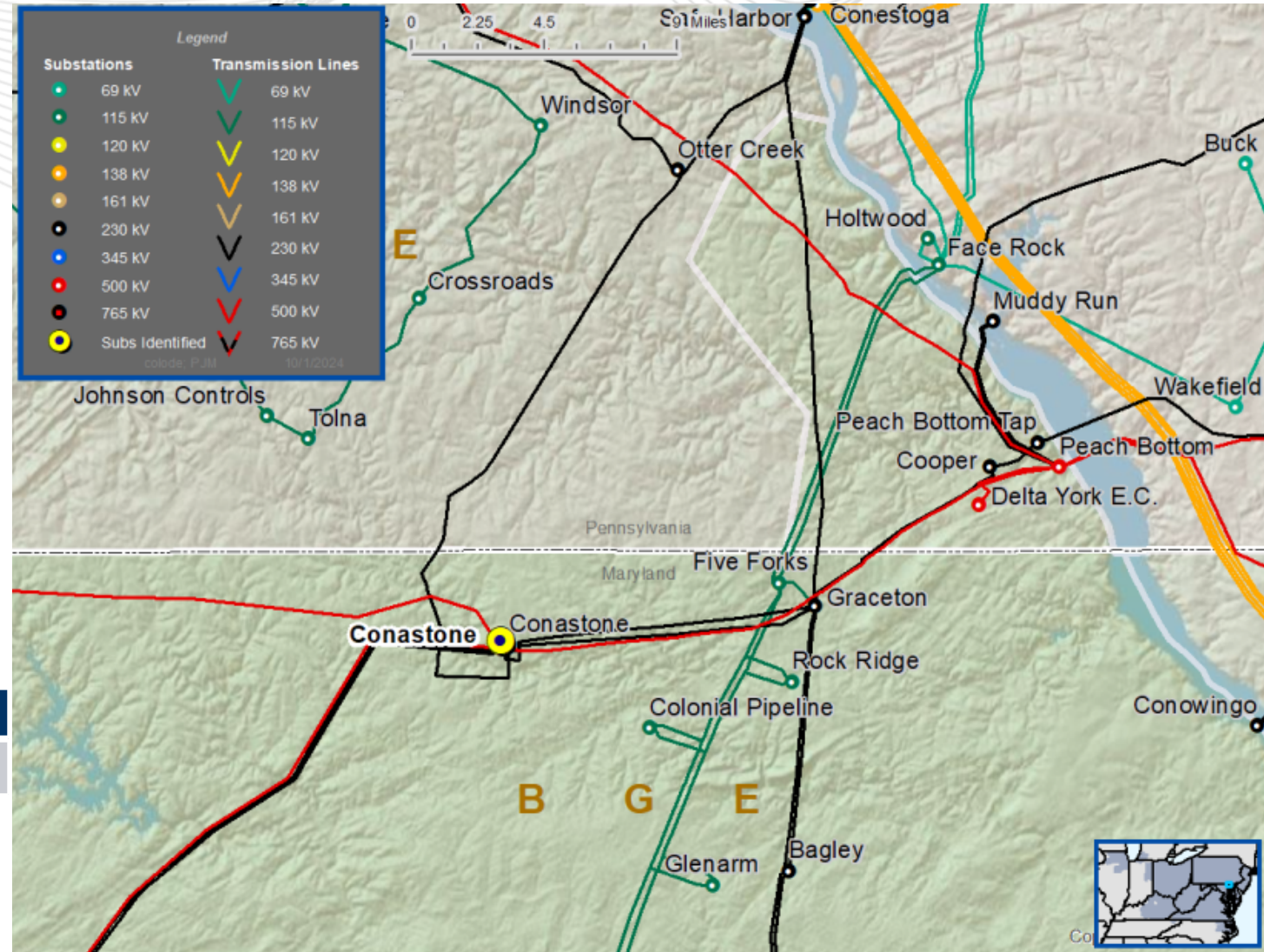
**Proposal Window Exclusion:** None

**Flowgate:** 2024W1-SC-26

**Problem Statement:**

In the 5-year 2028 RTEP Short Circuit base case, the Conastone 230 kV breaker 2322 B5 is identified as being over duty.

Circuit Breaker	Interrupting Rating (kA)
230kV breaker 2322 B5	50







# BGE Transmission Zone: Baseline Conastone 230 kV 2322 B5 CB Replacement

## Proposed Solution: b3857

- 1) Replace over duty Conastone 230 kV circuit breaker 2322 B5 with an interrupting rating of 63 kA.

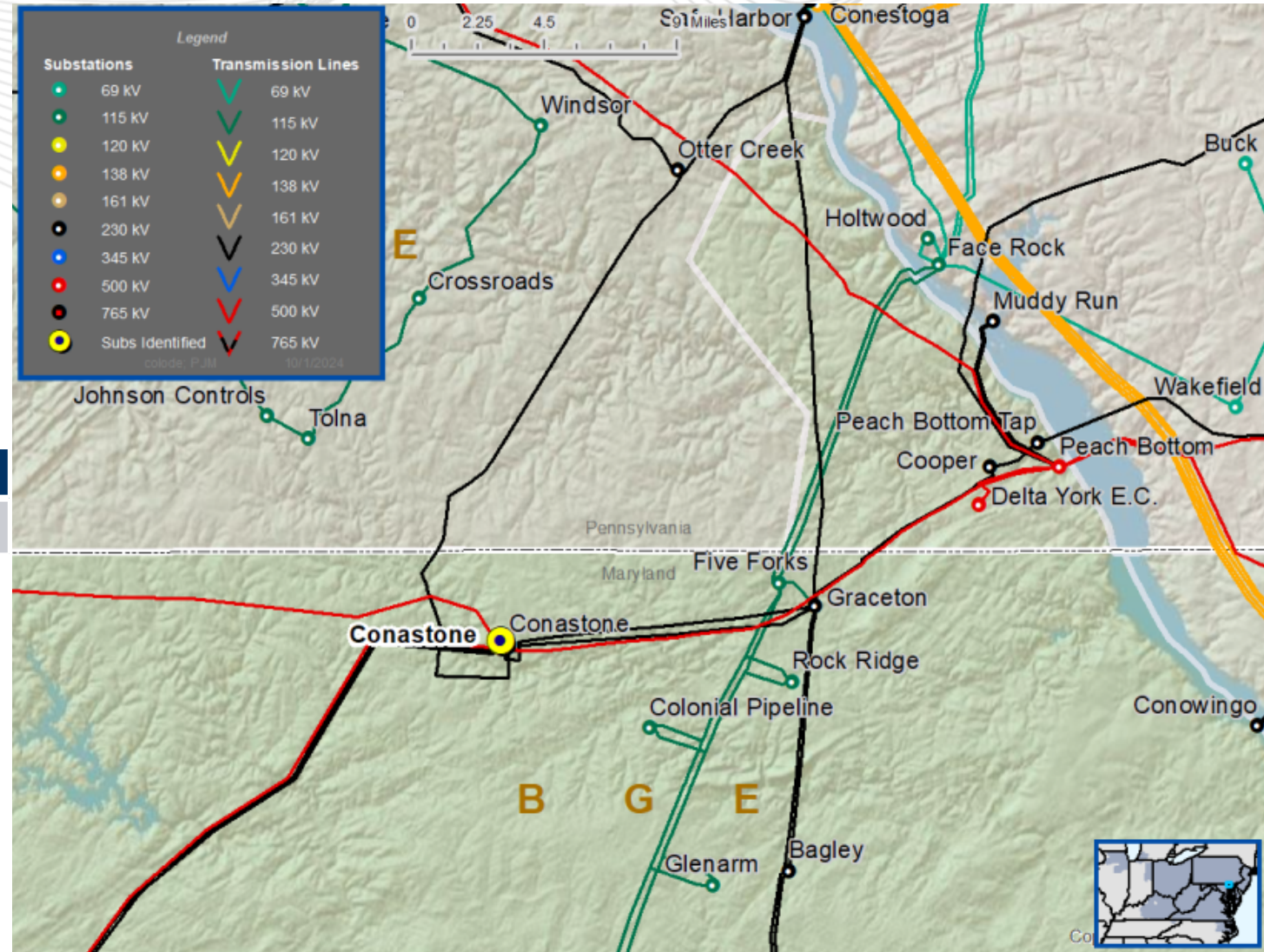
**Estimated Cost:** \$1.921M

## Preliminary Facility Rating:

Circuit Breaker	Interrupting Rating (kA)
230kV breaker 2322 B5	63

**Required IS Date:** 6/1/2029

**Projected IS Date:** 6/1/2029



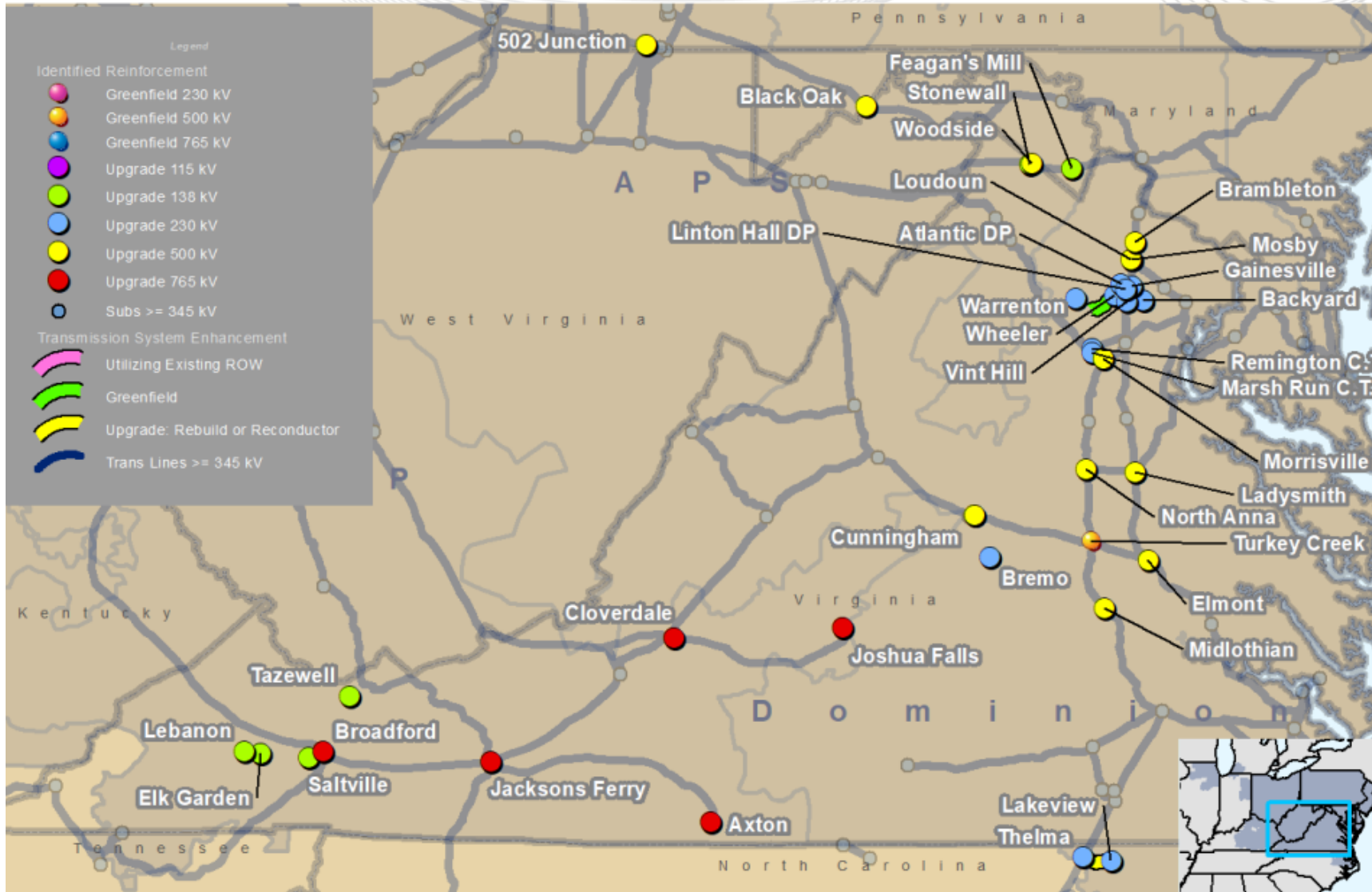
# 2024 RTEP W1

## Appendix – Major Proposal Maps

(All proposal maps are in draft form – Full maps will be available at the November TEAC)

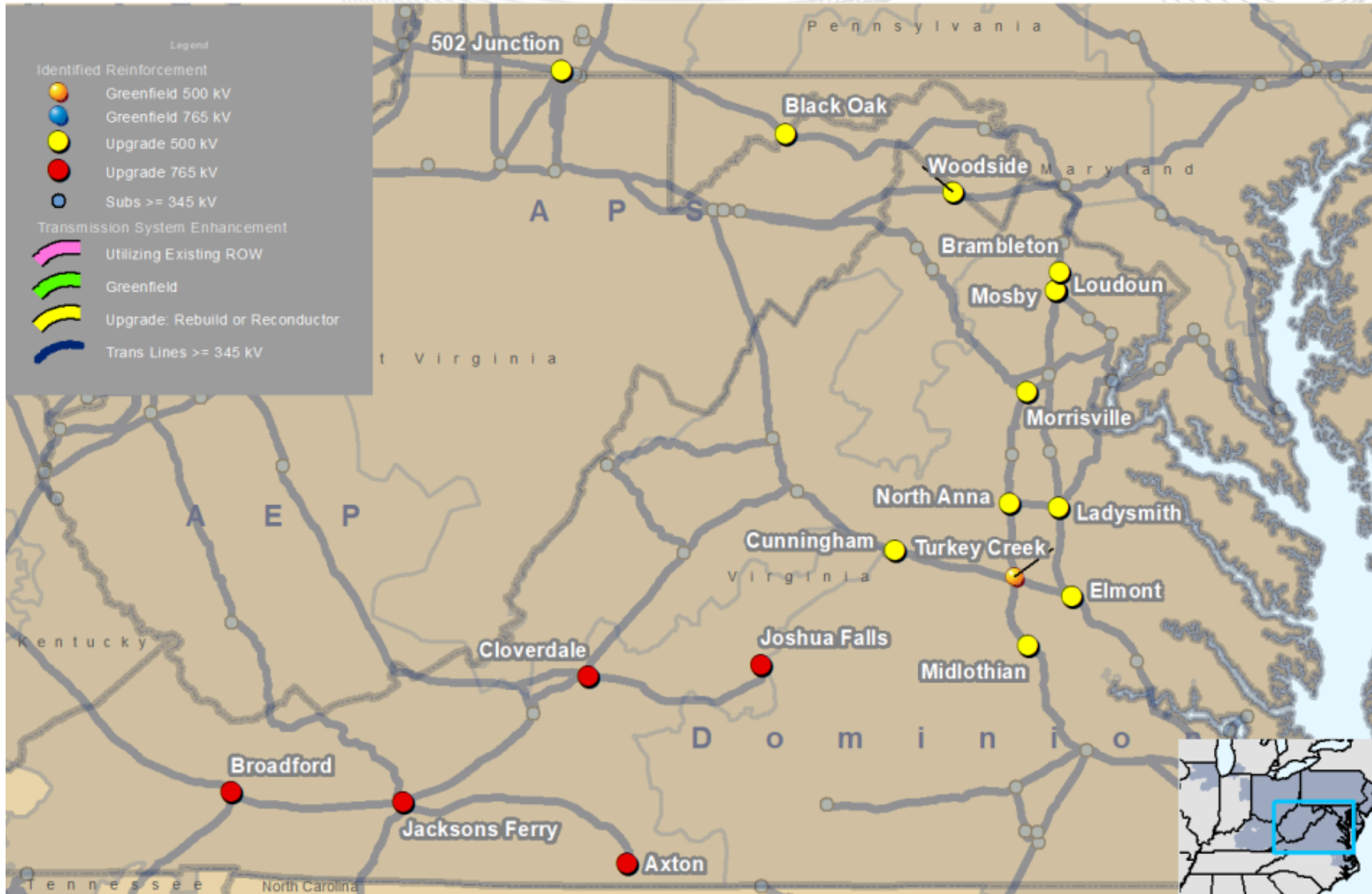


# CNTLTM Proposals



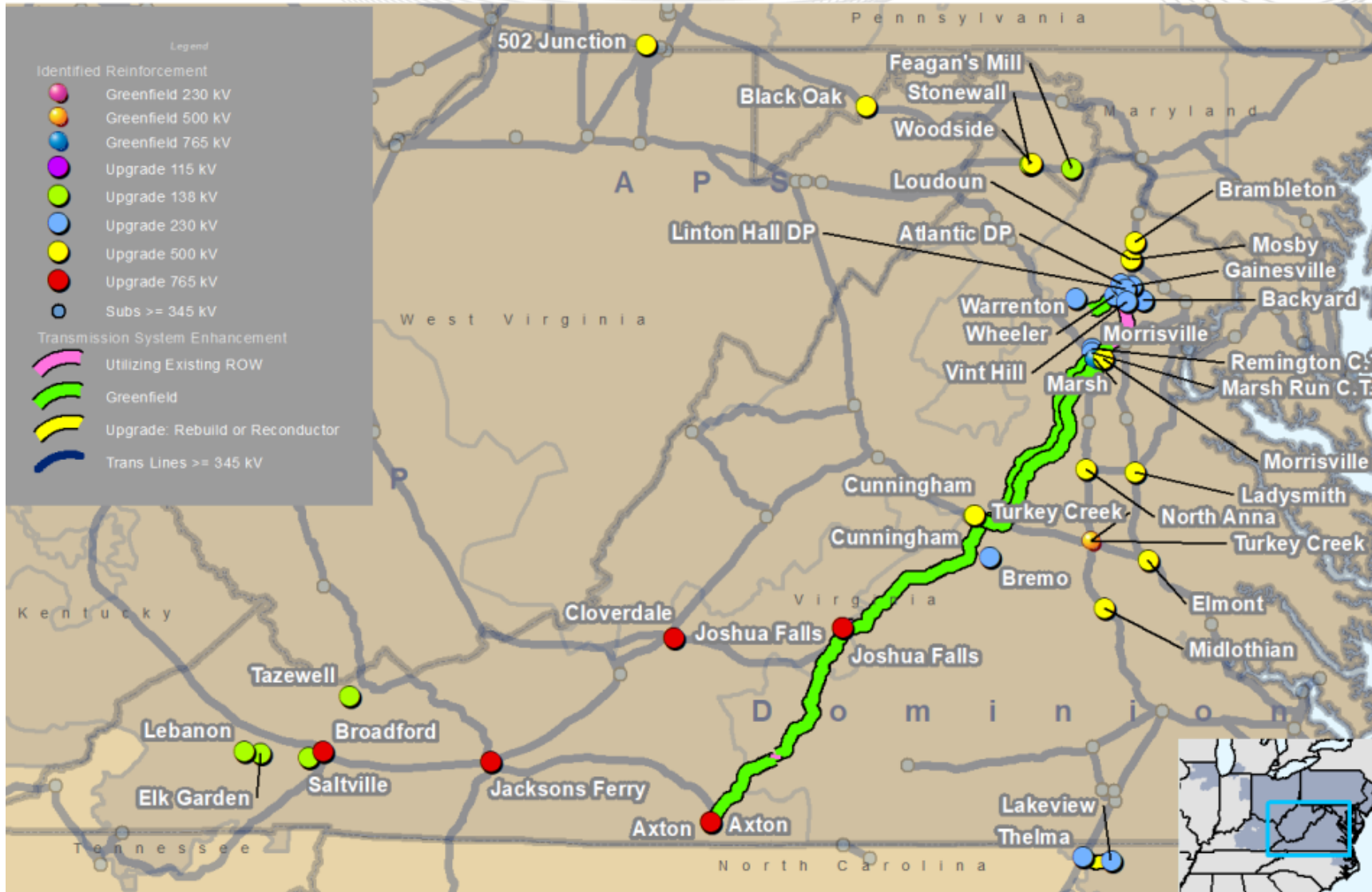
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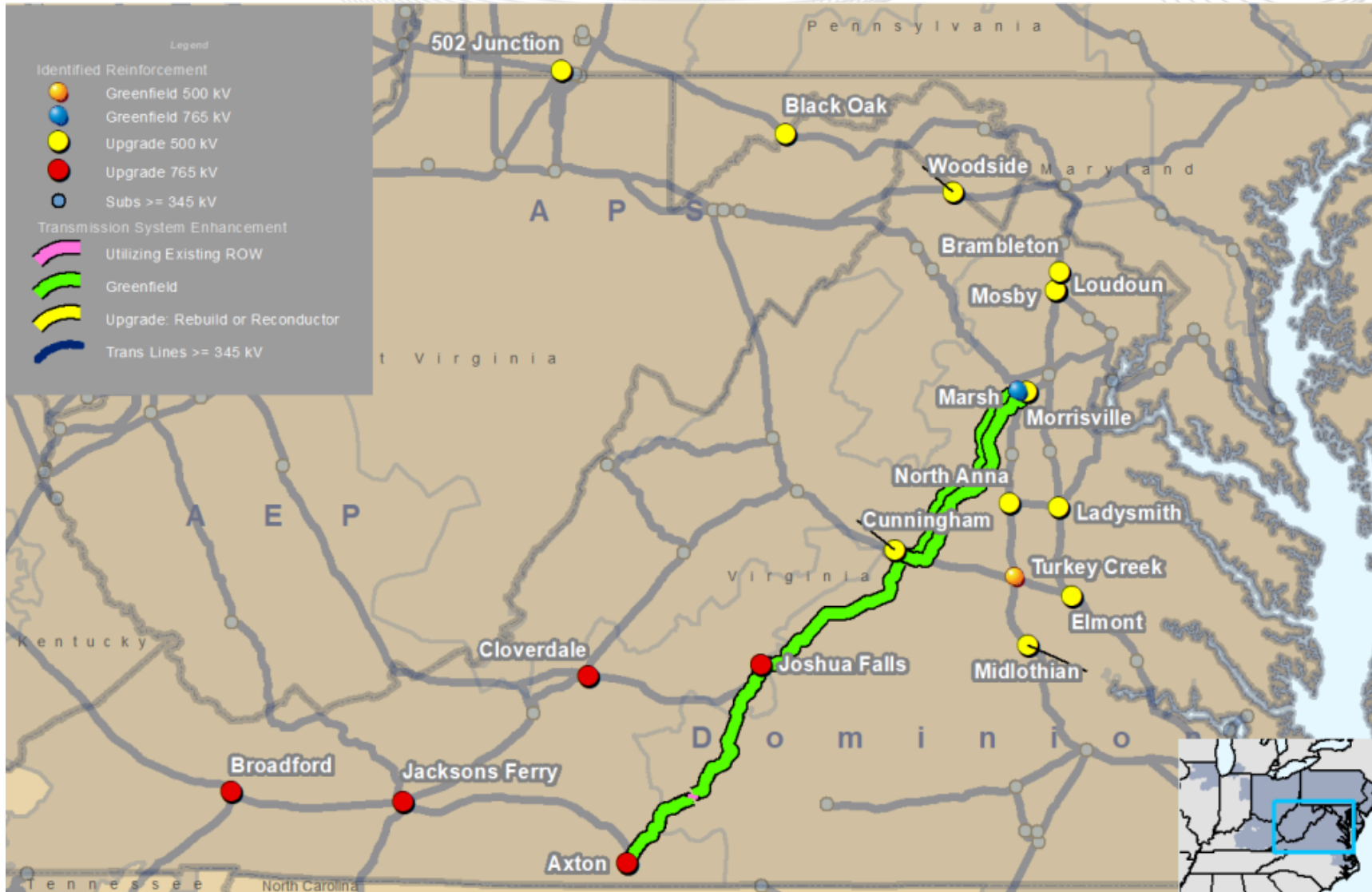


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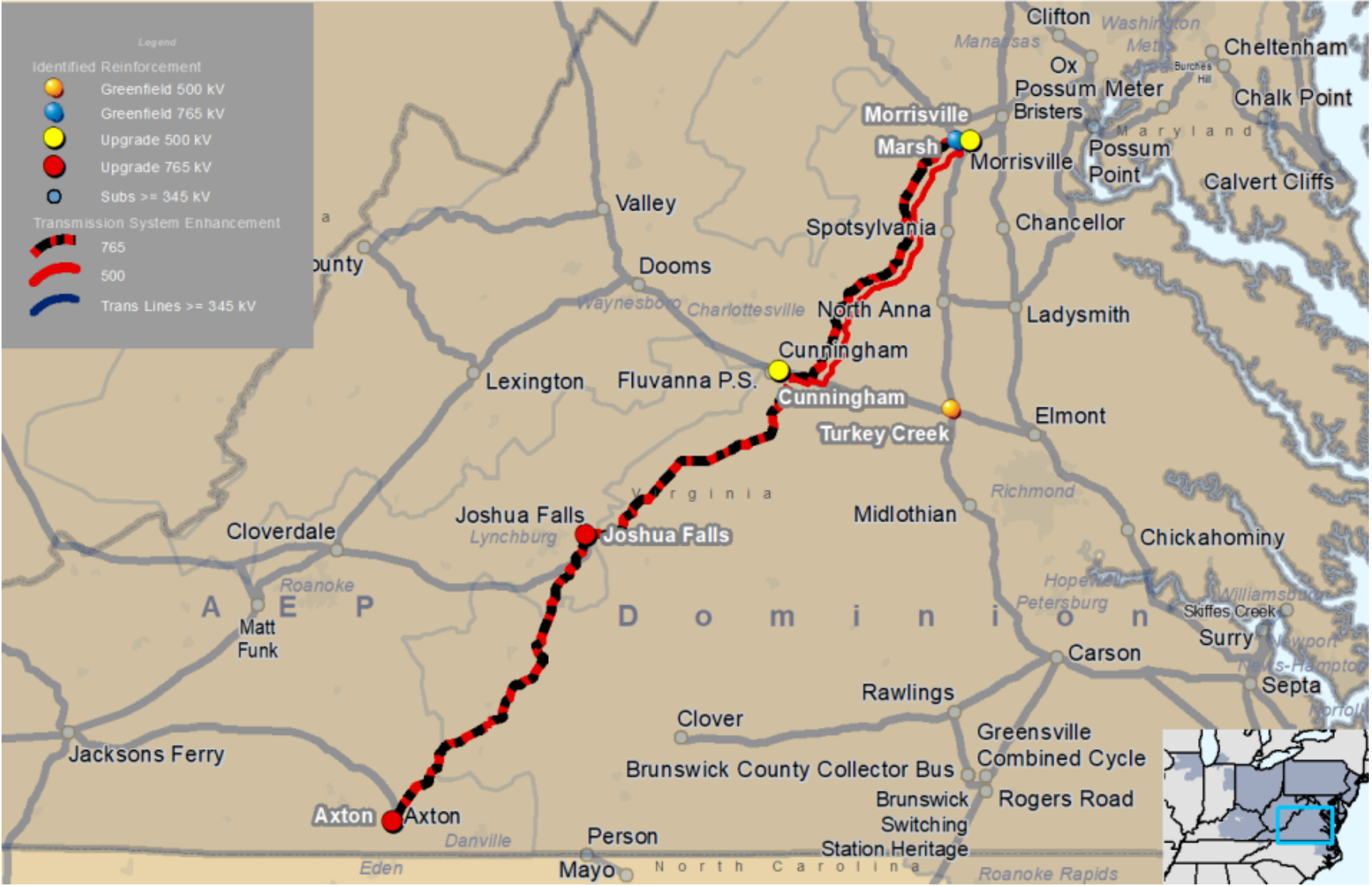




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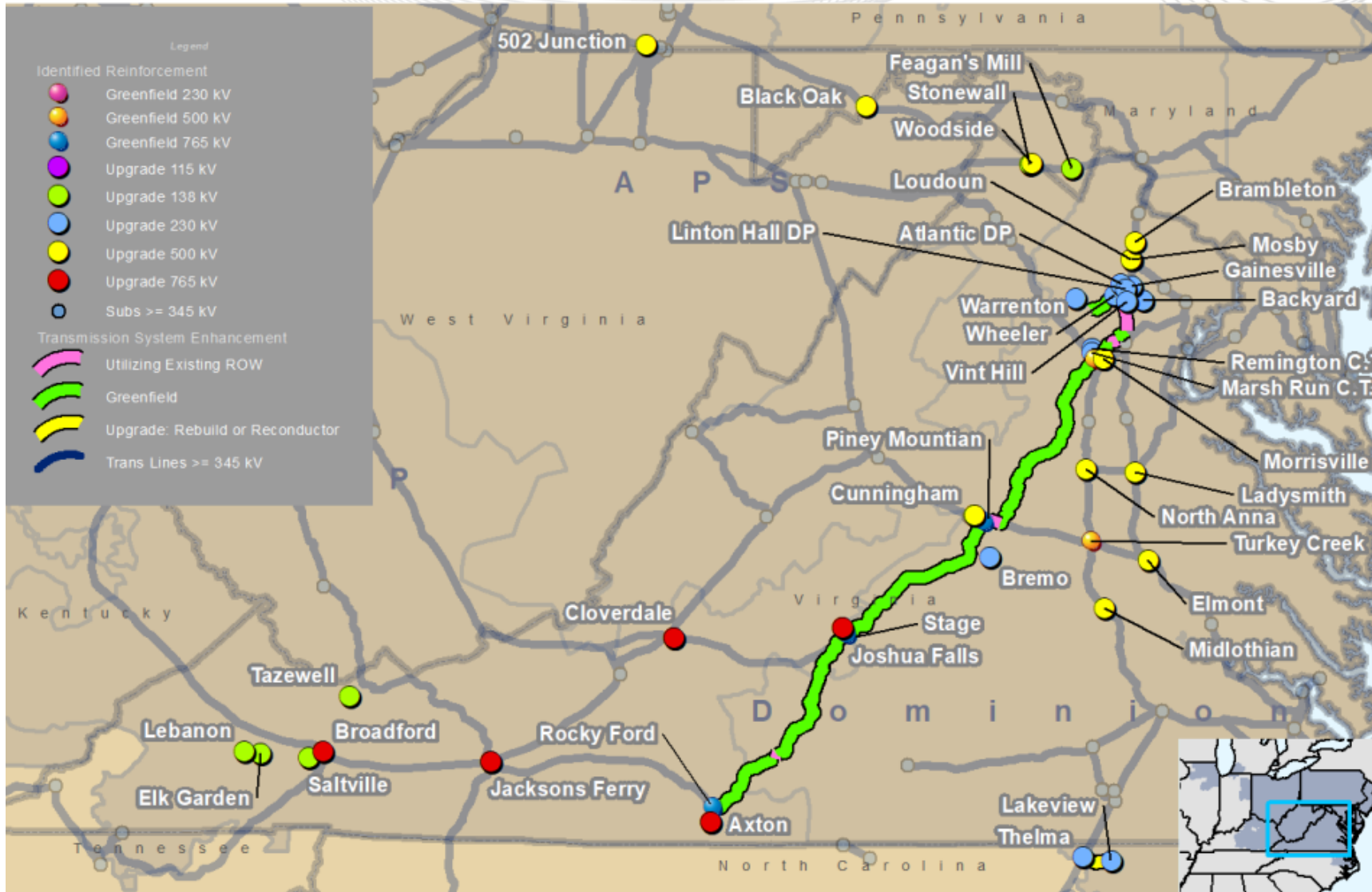


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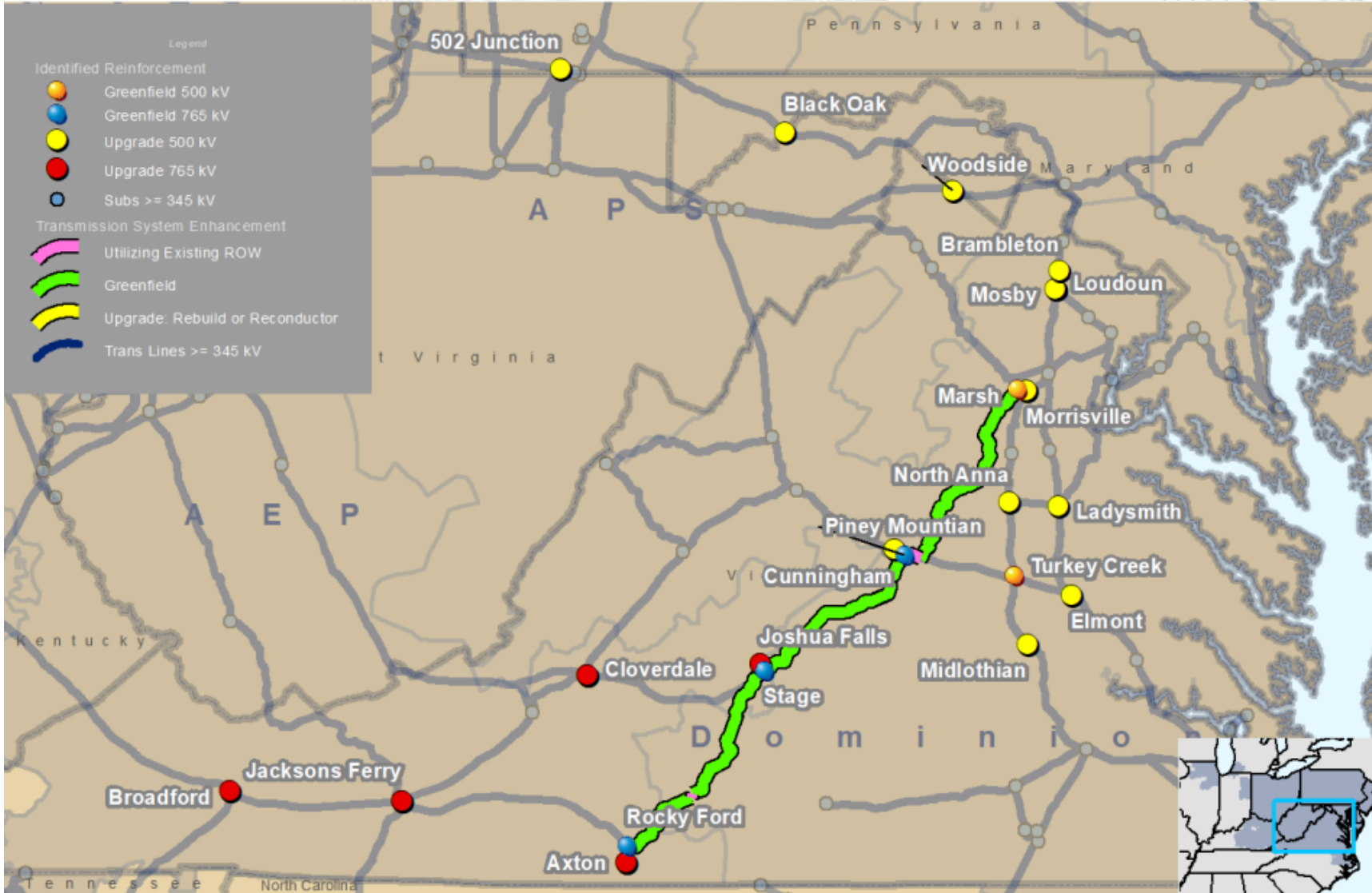


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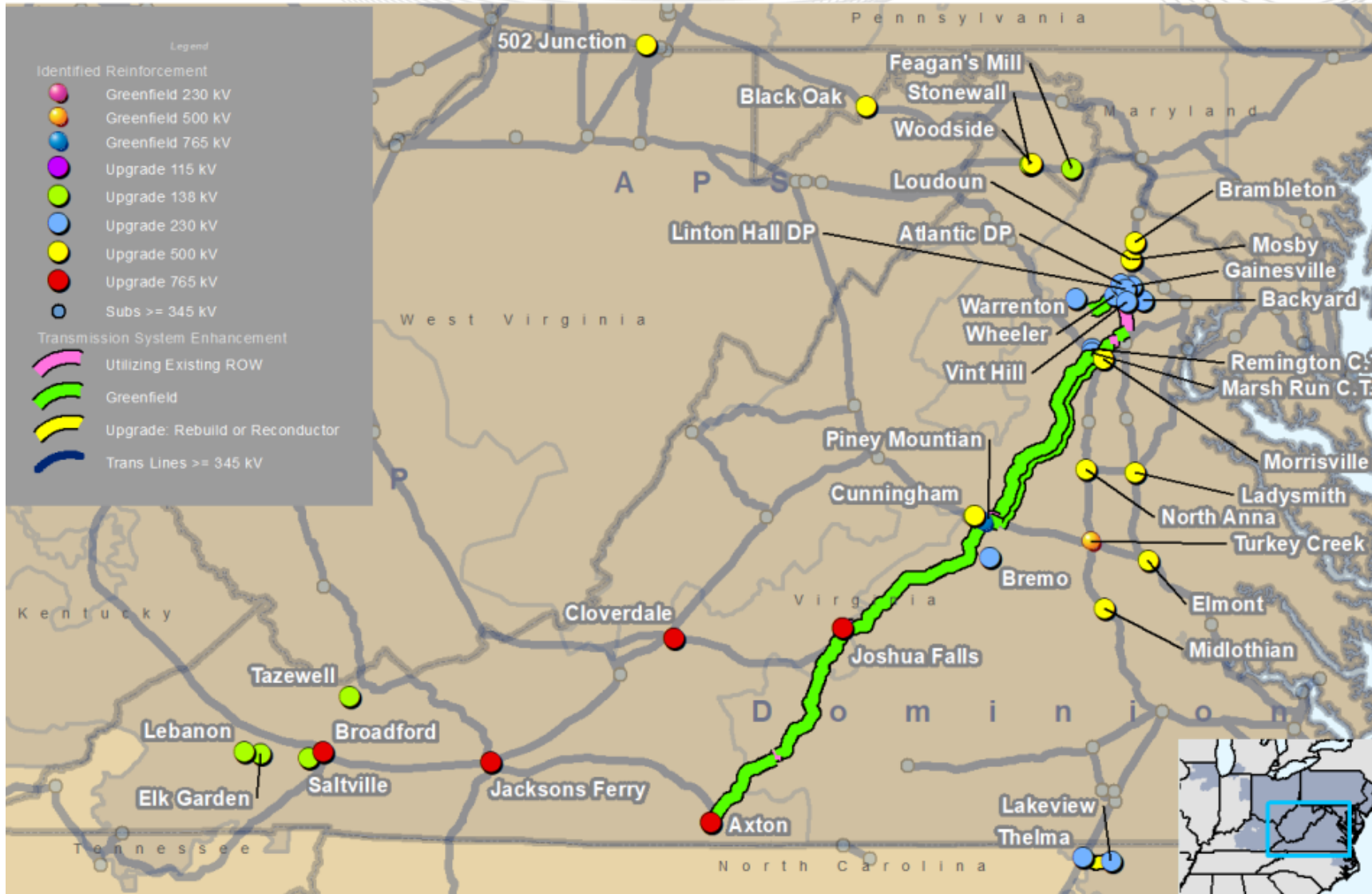


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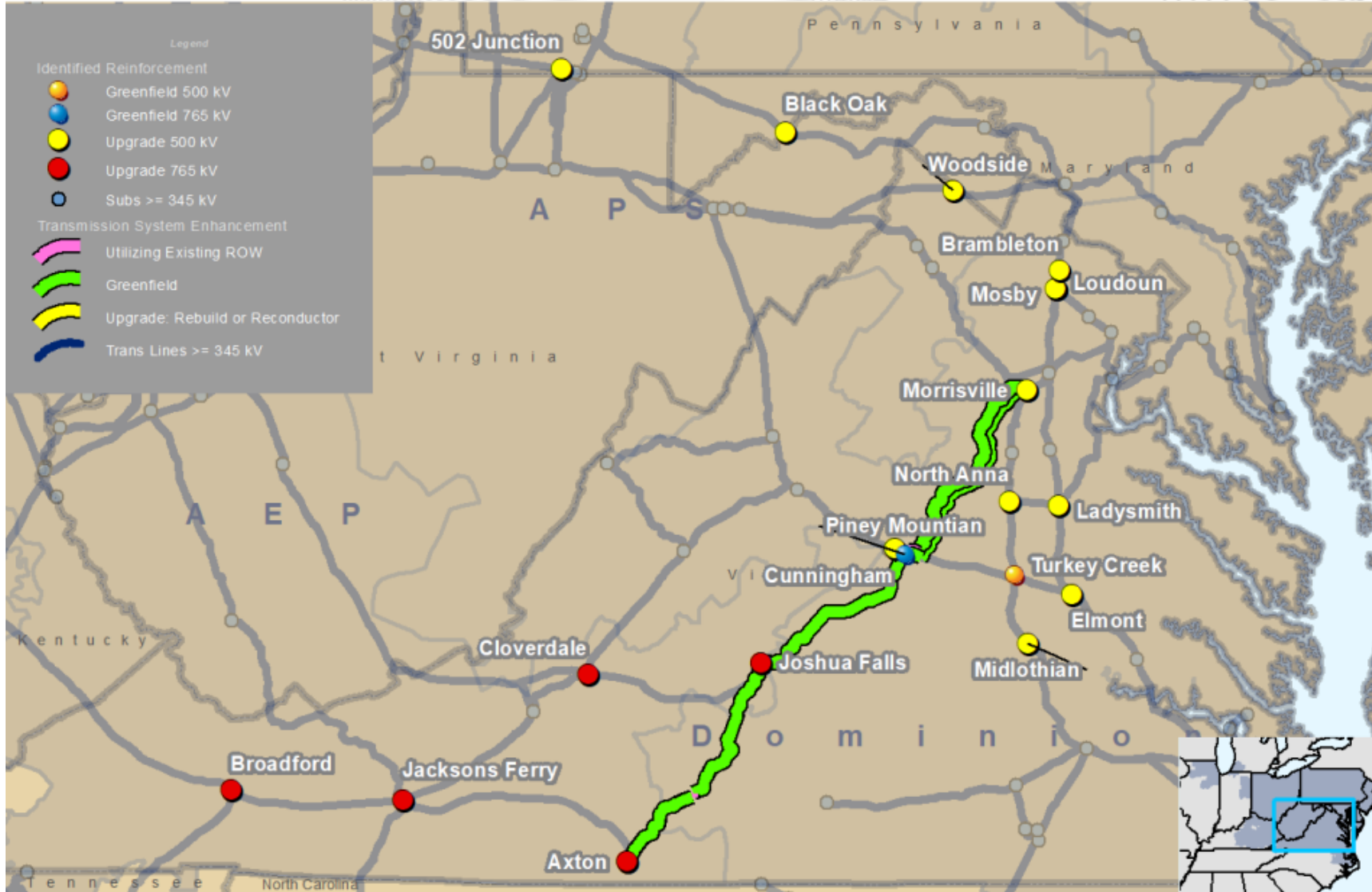


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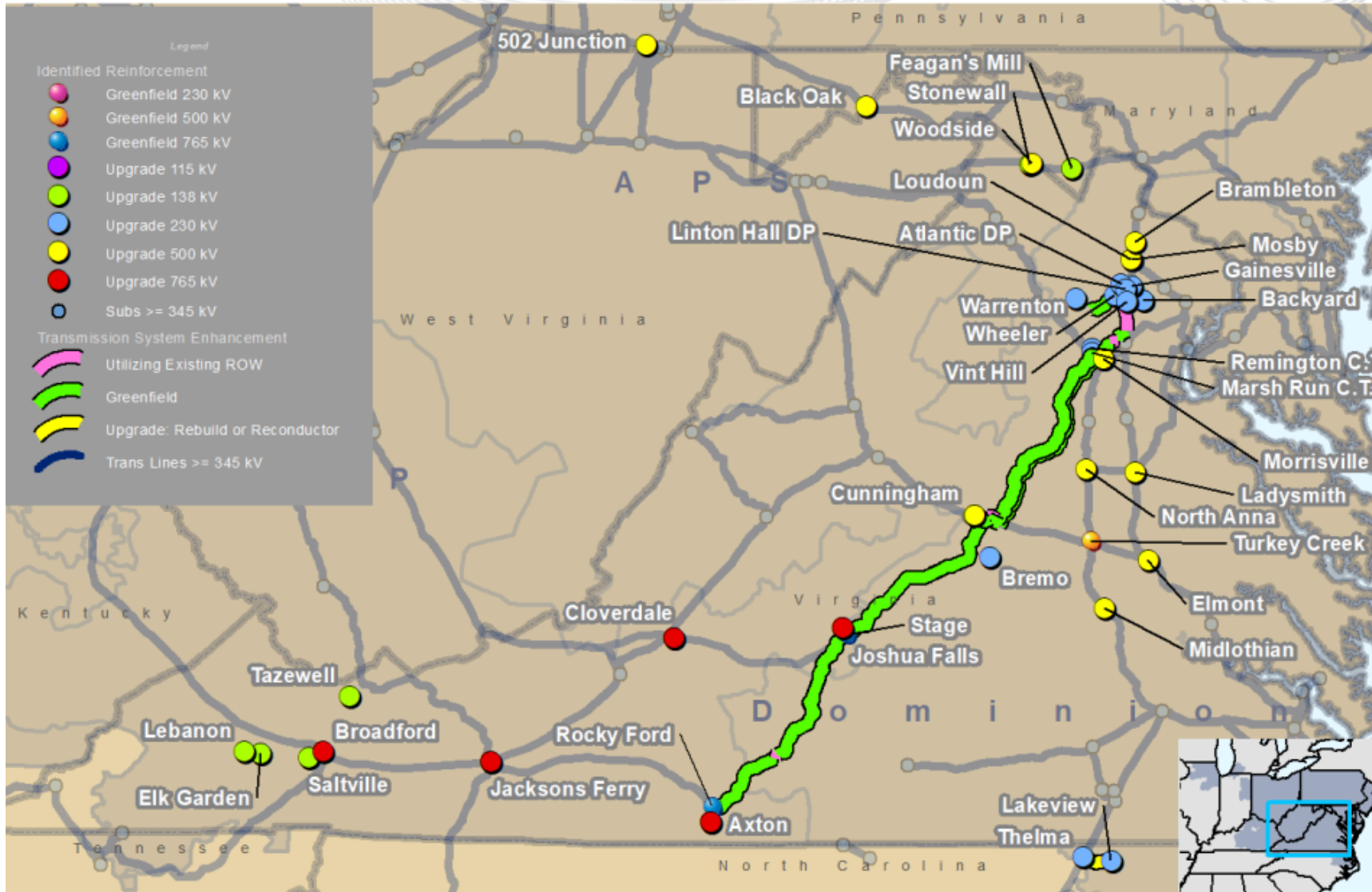


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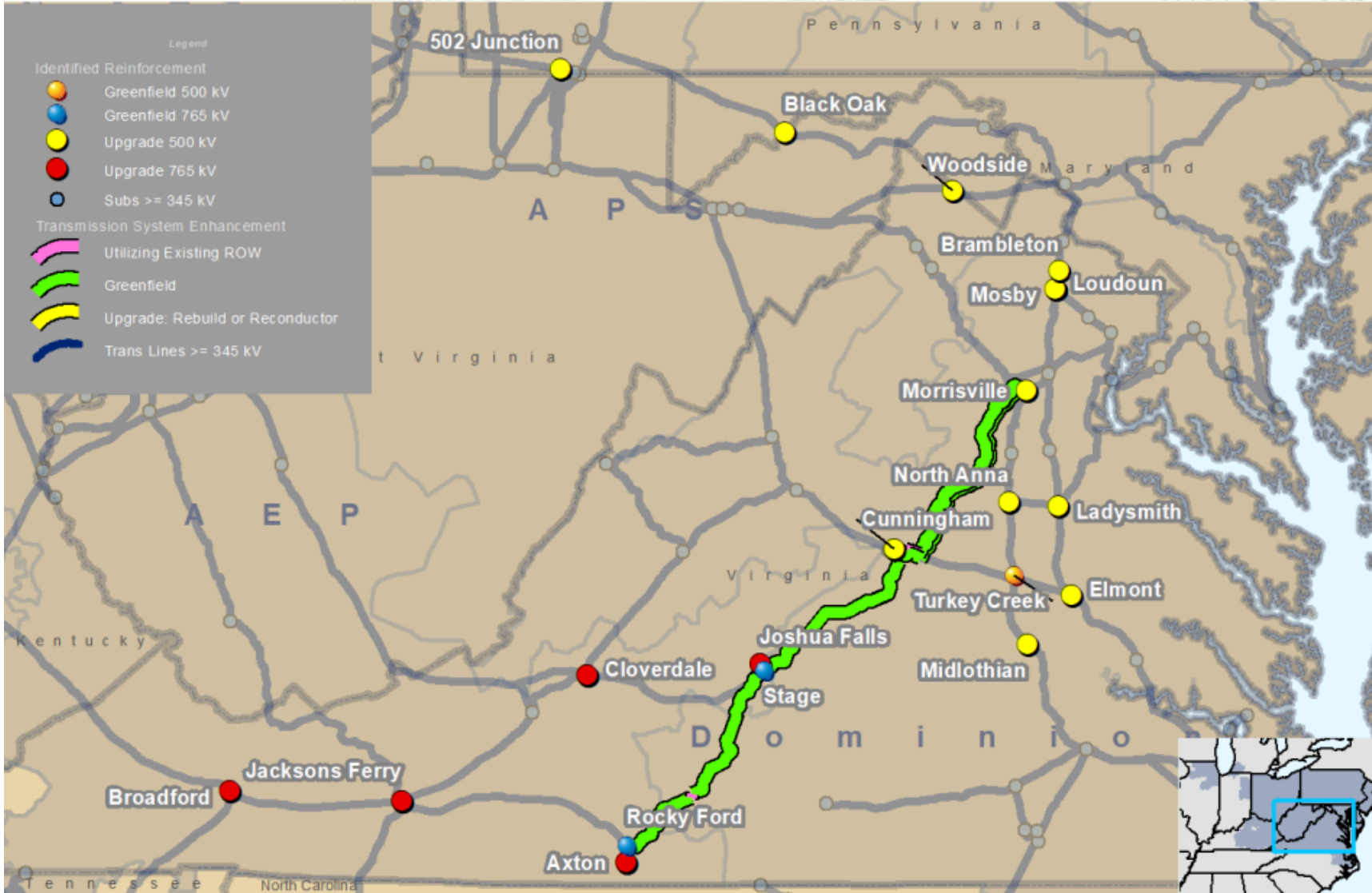




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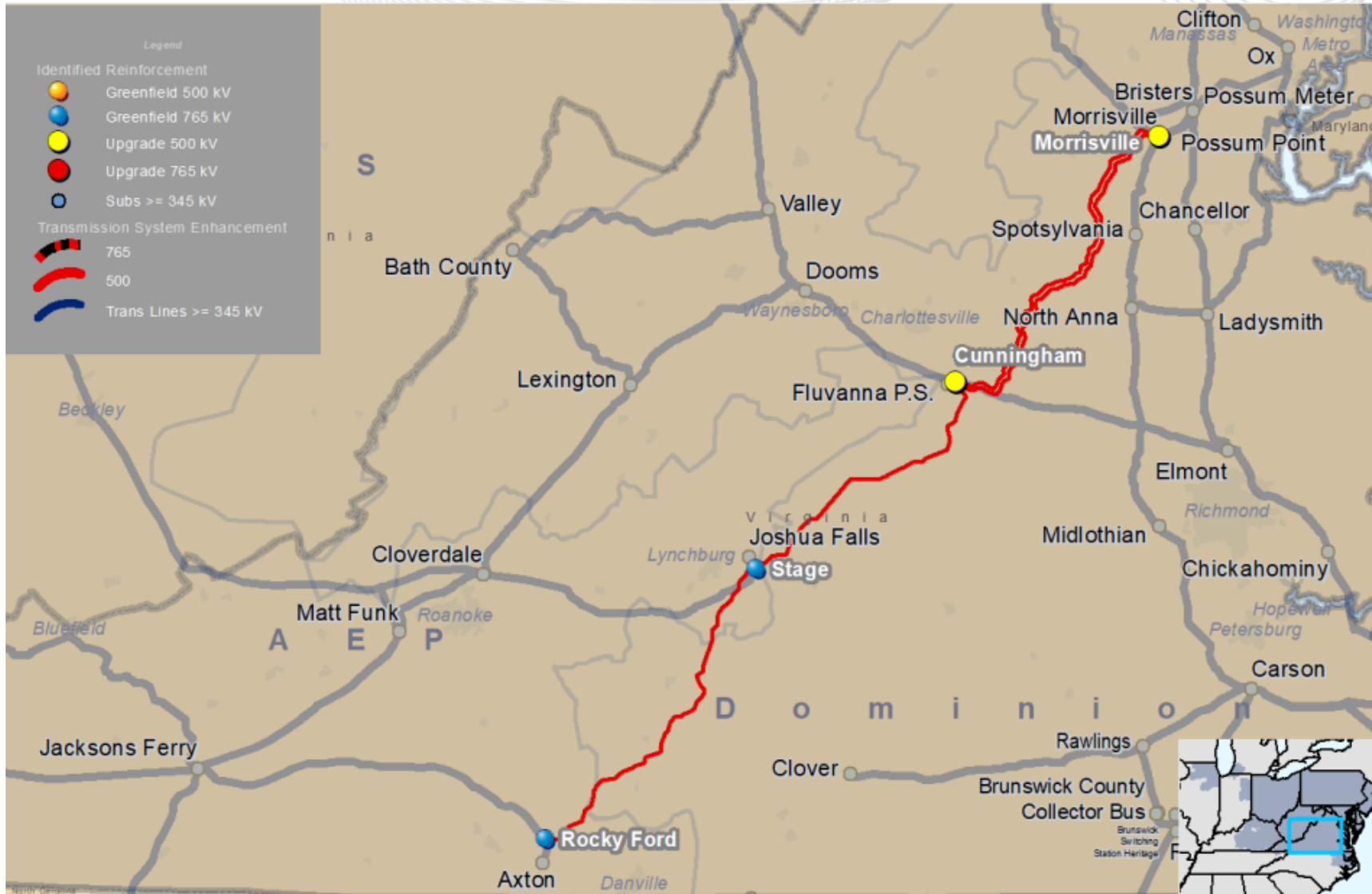


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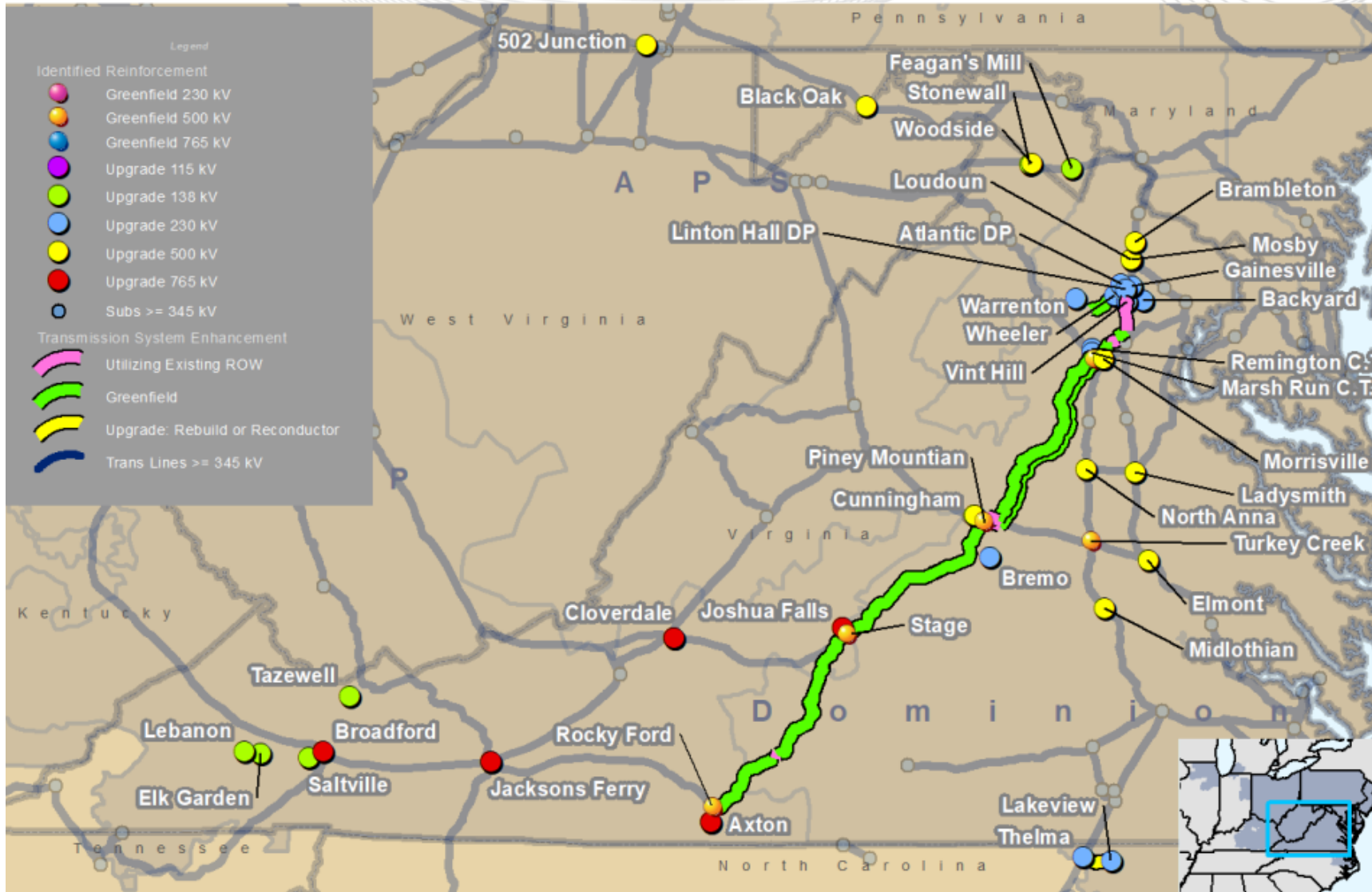


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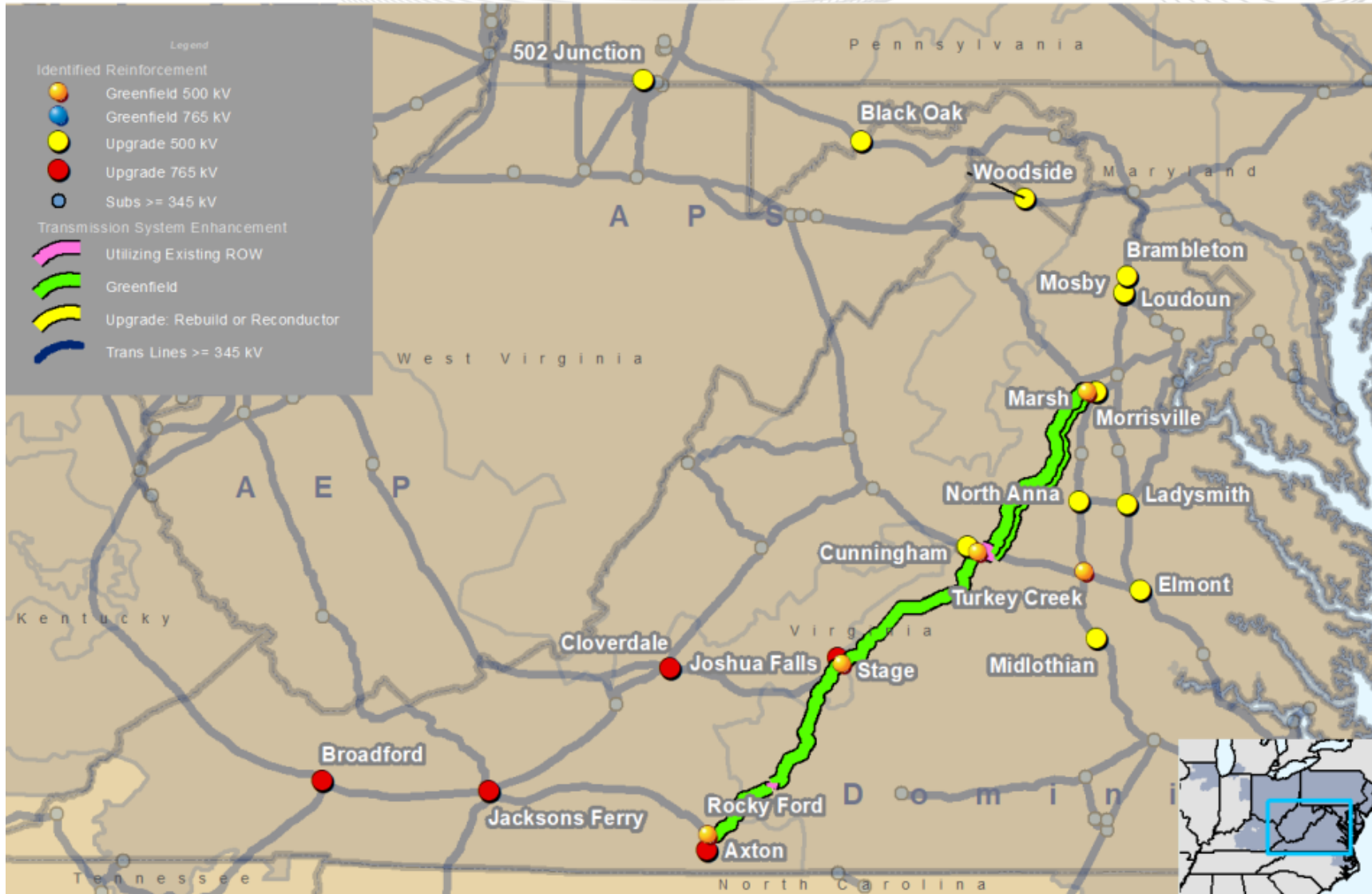




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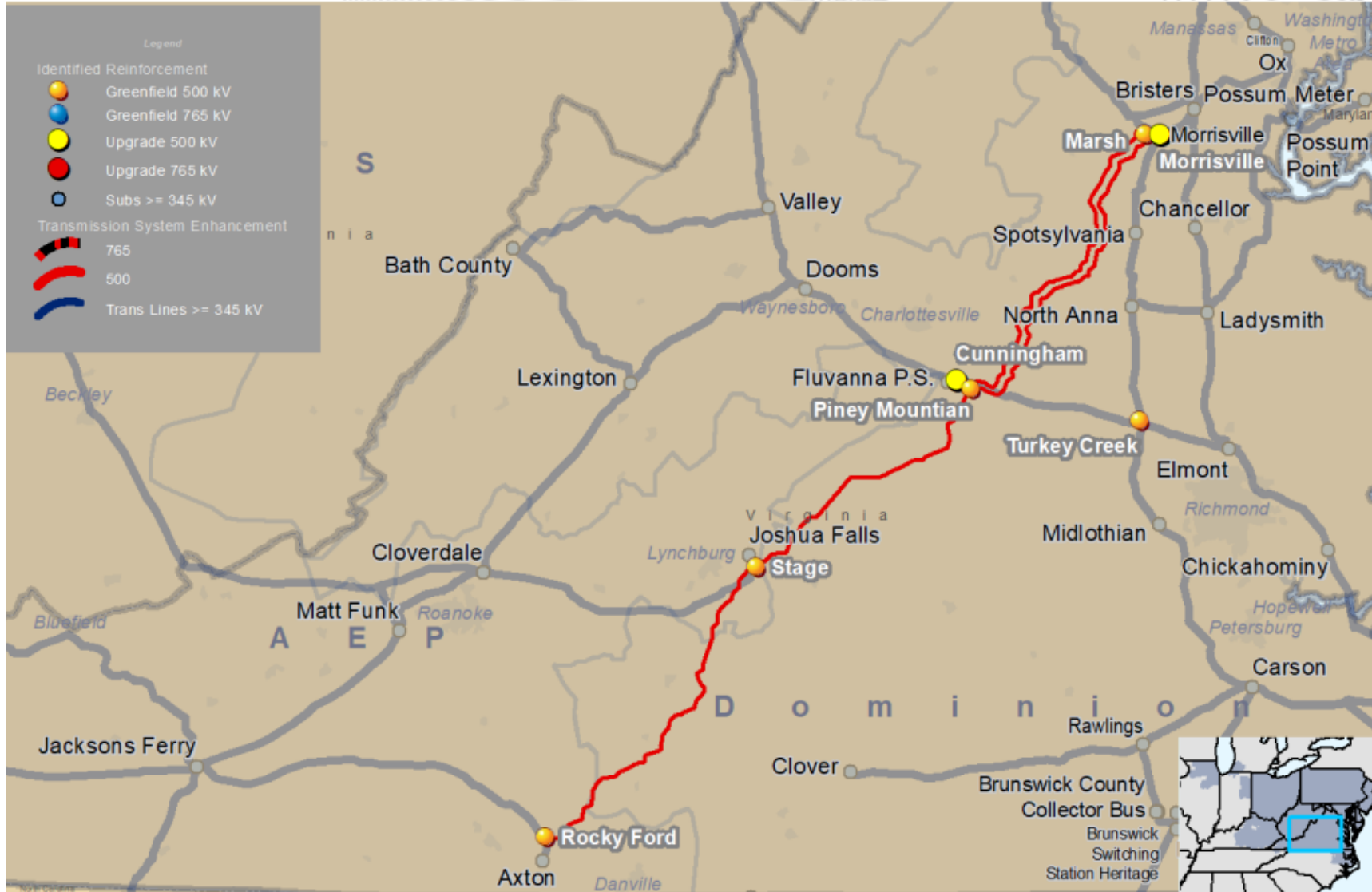


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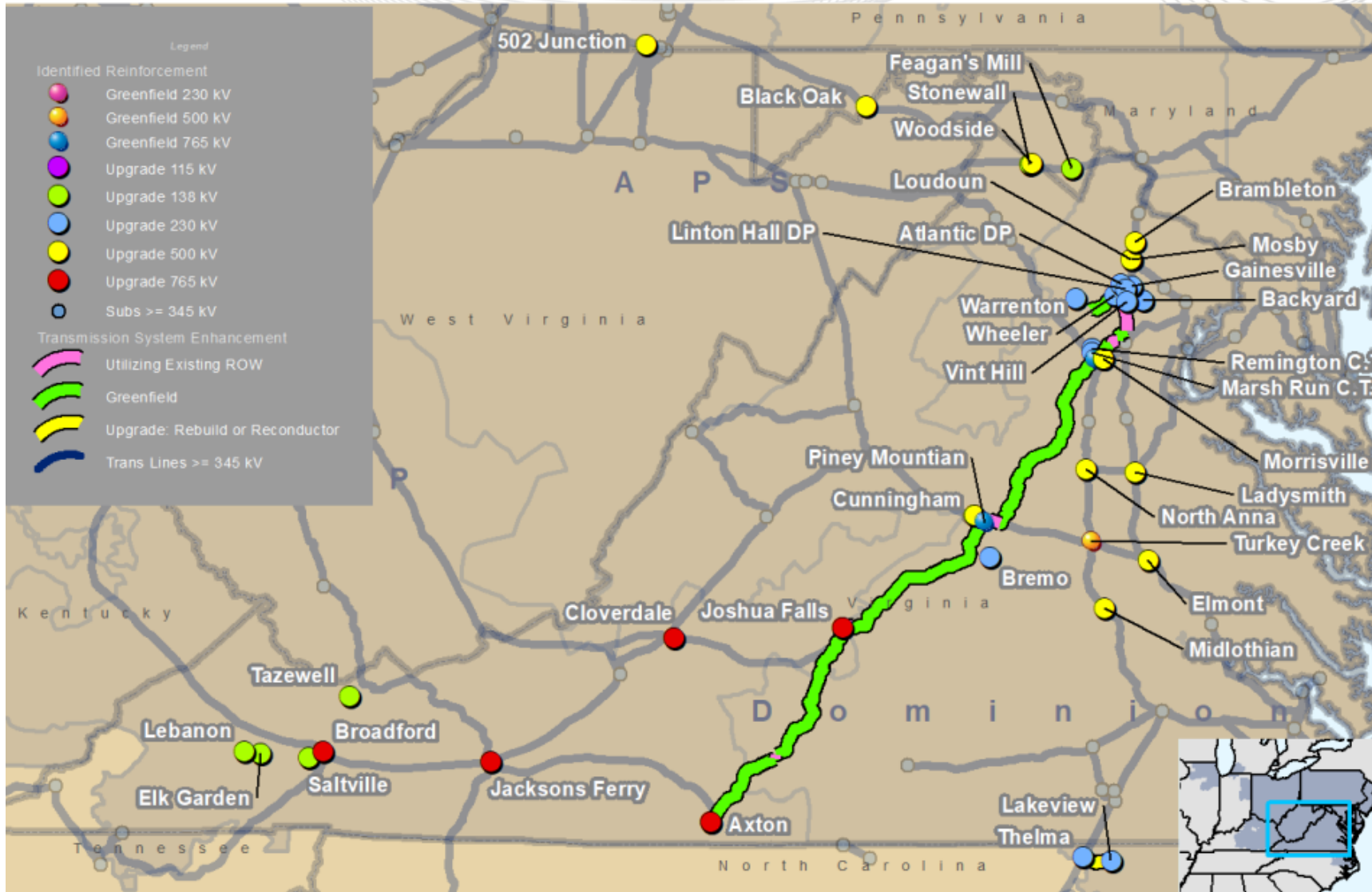


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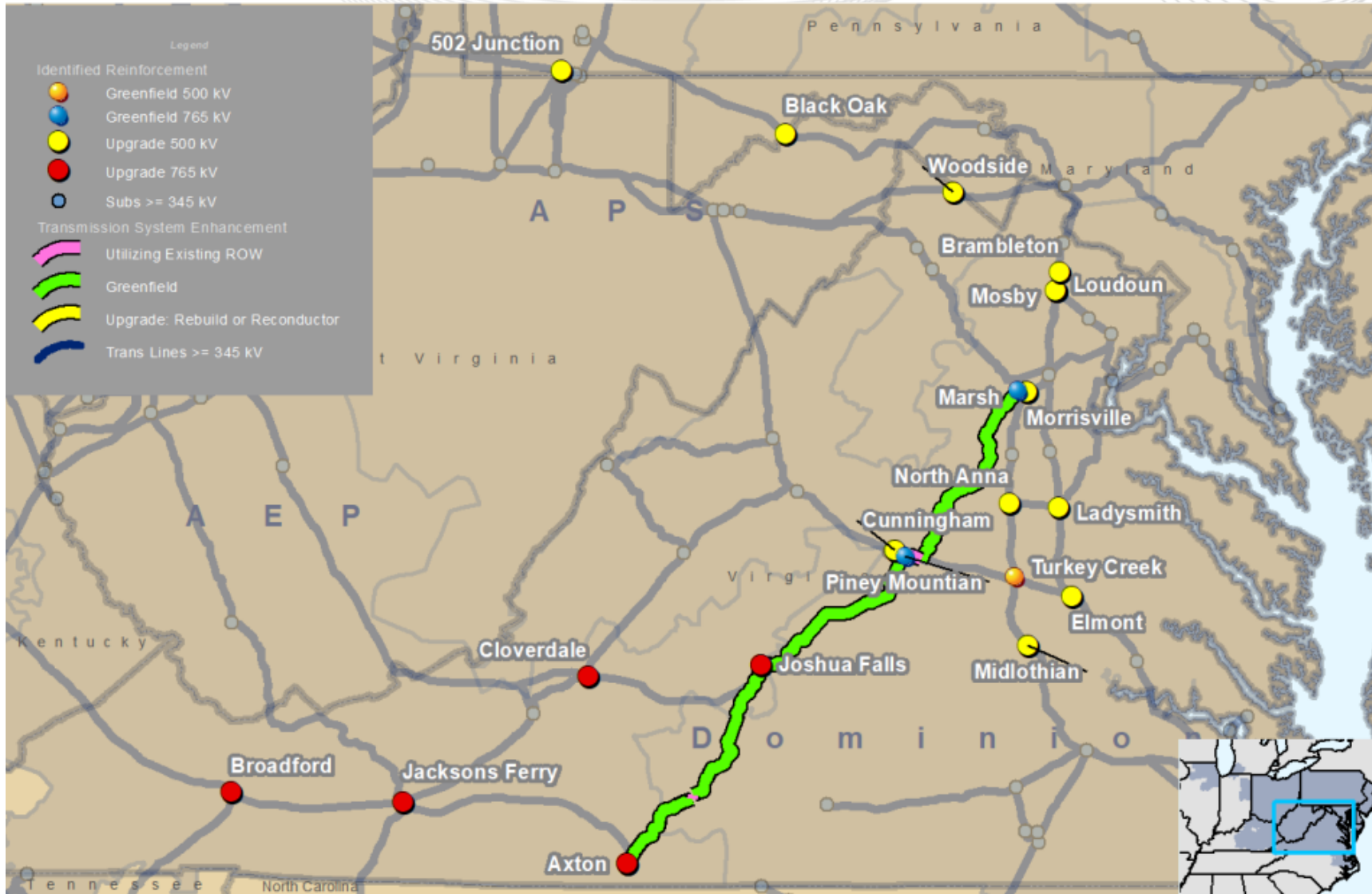


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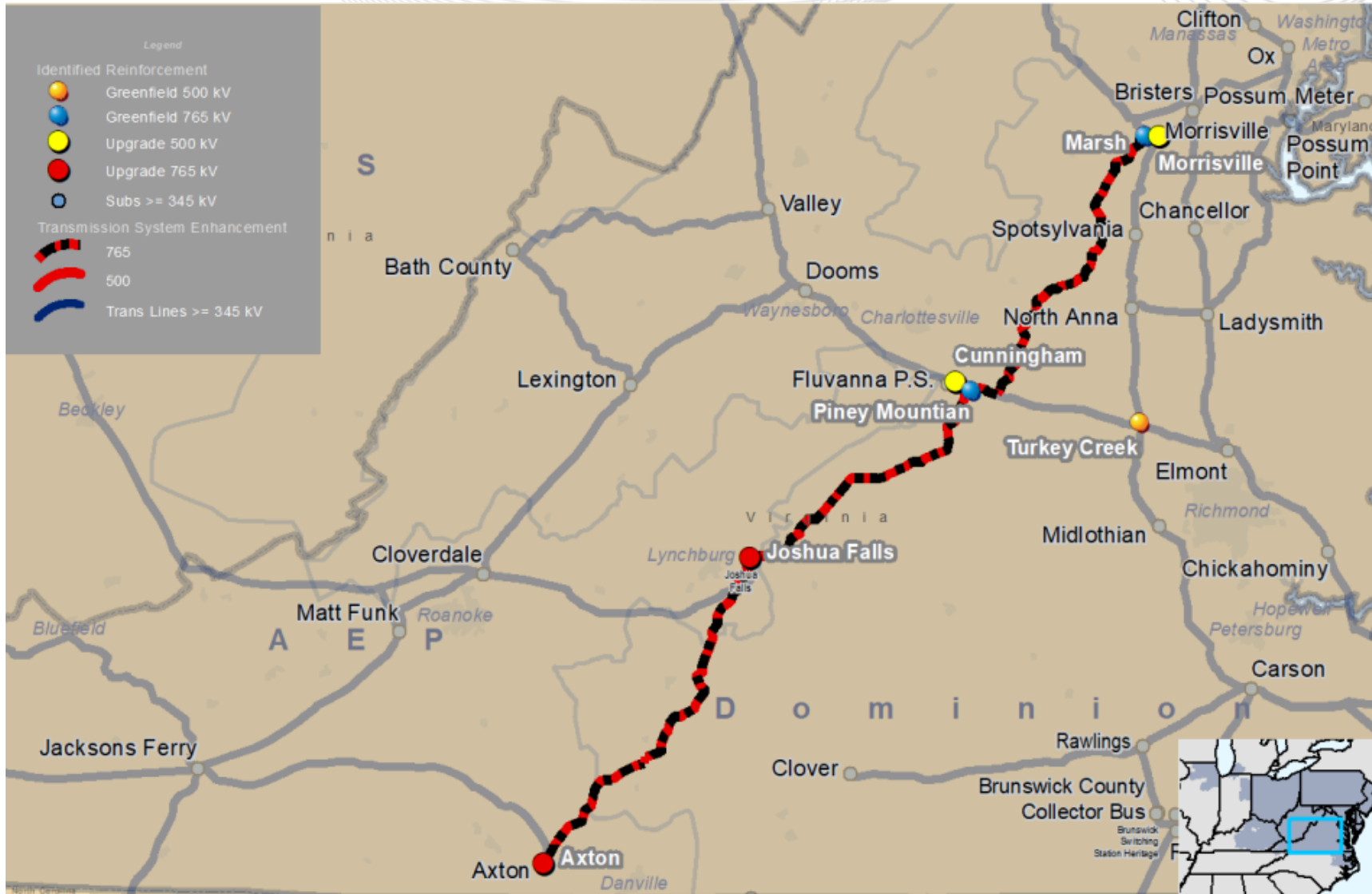


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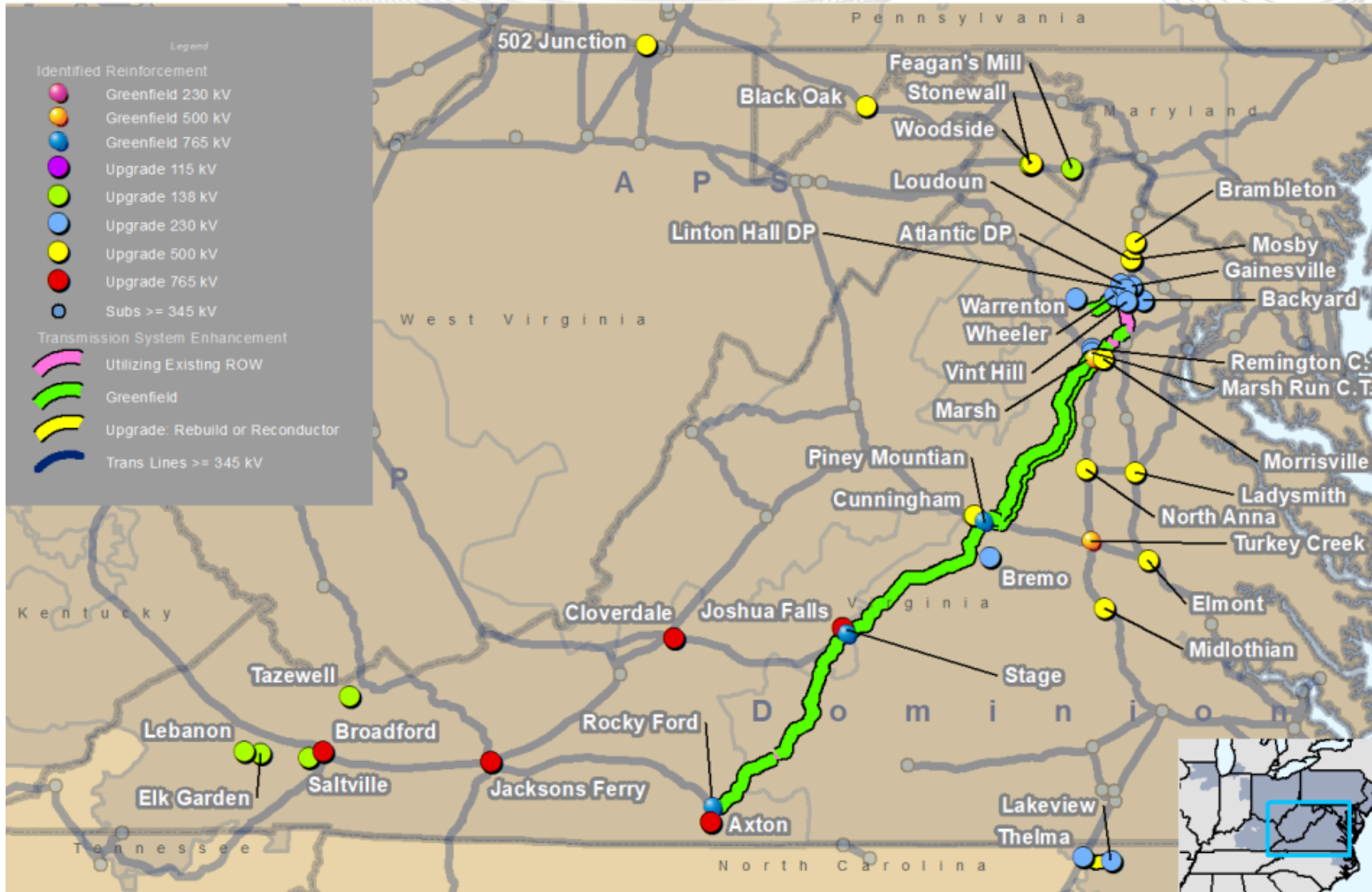




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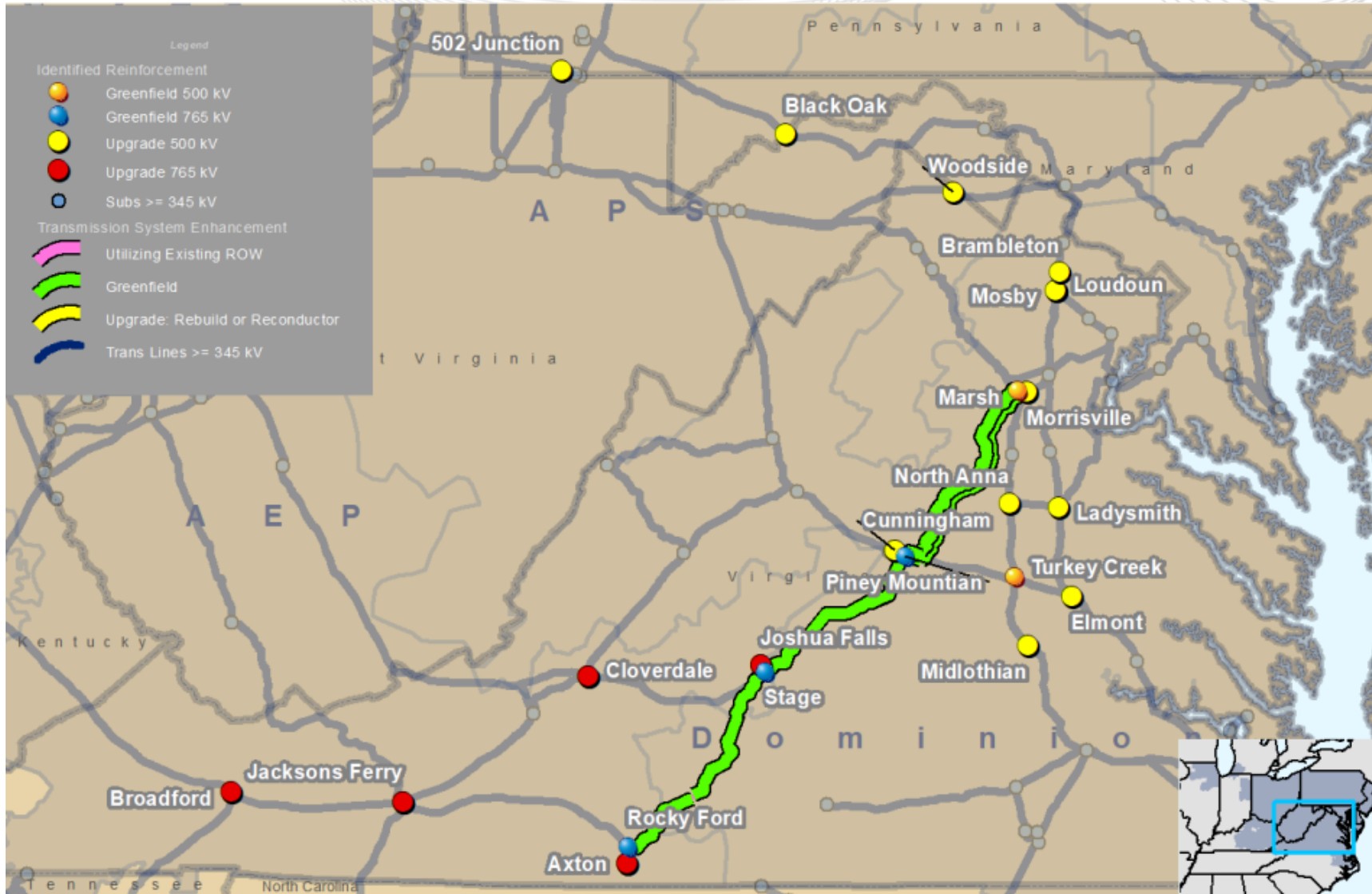


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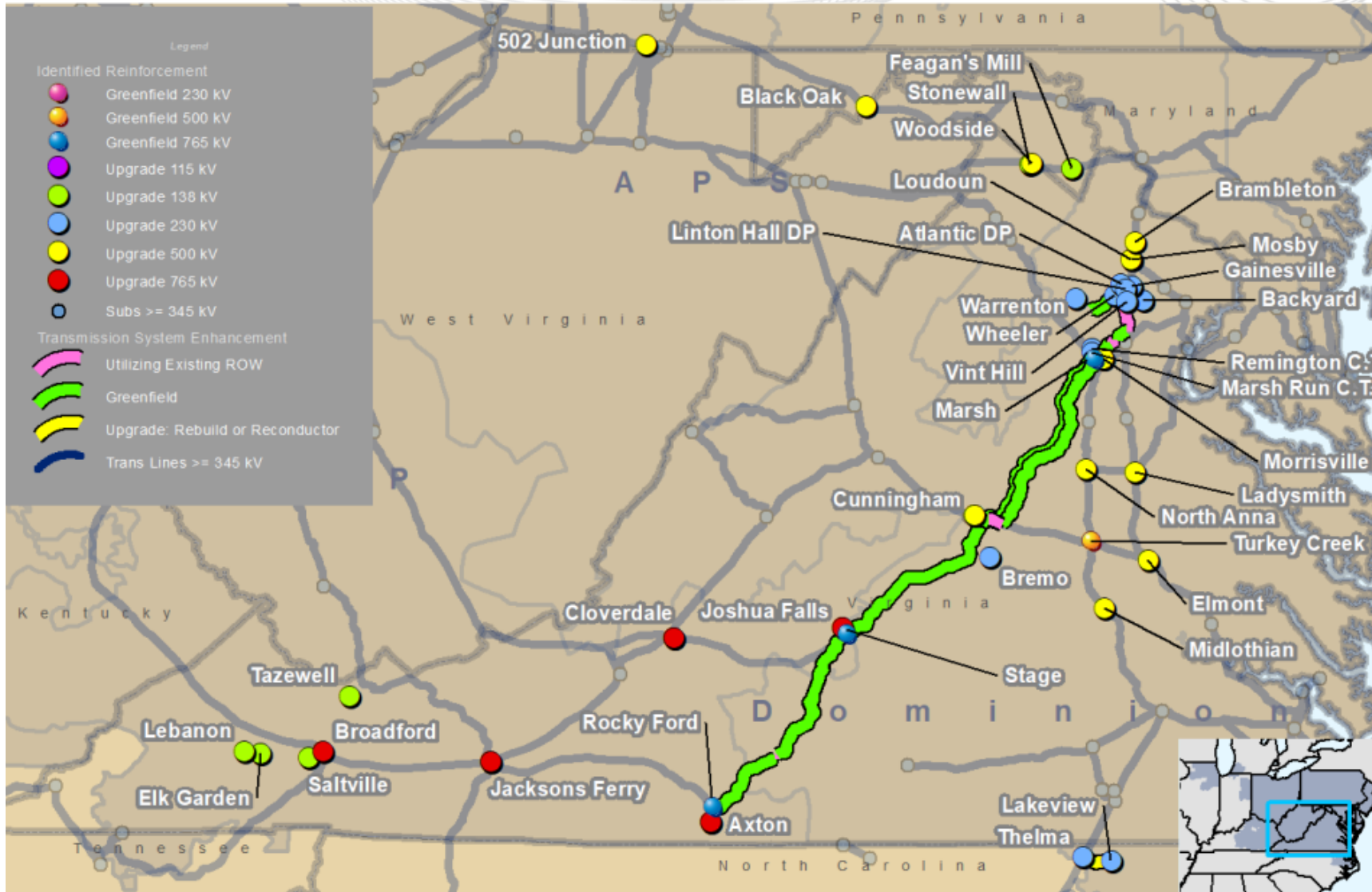




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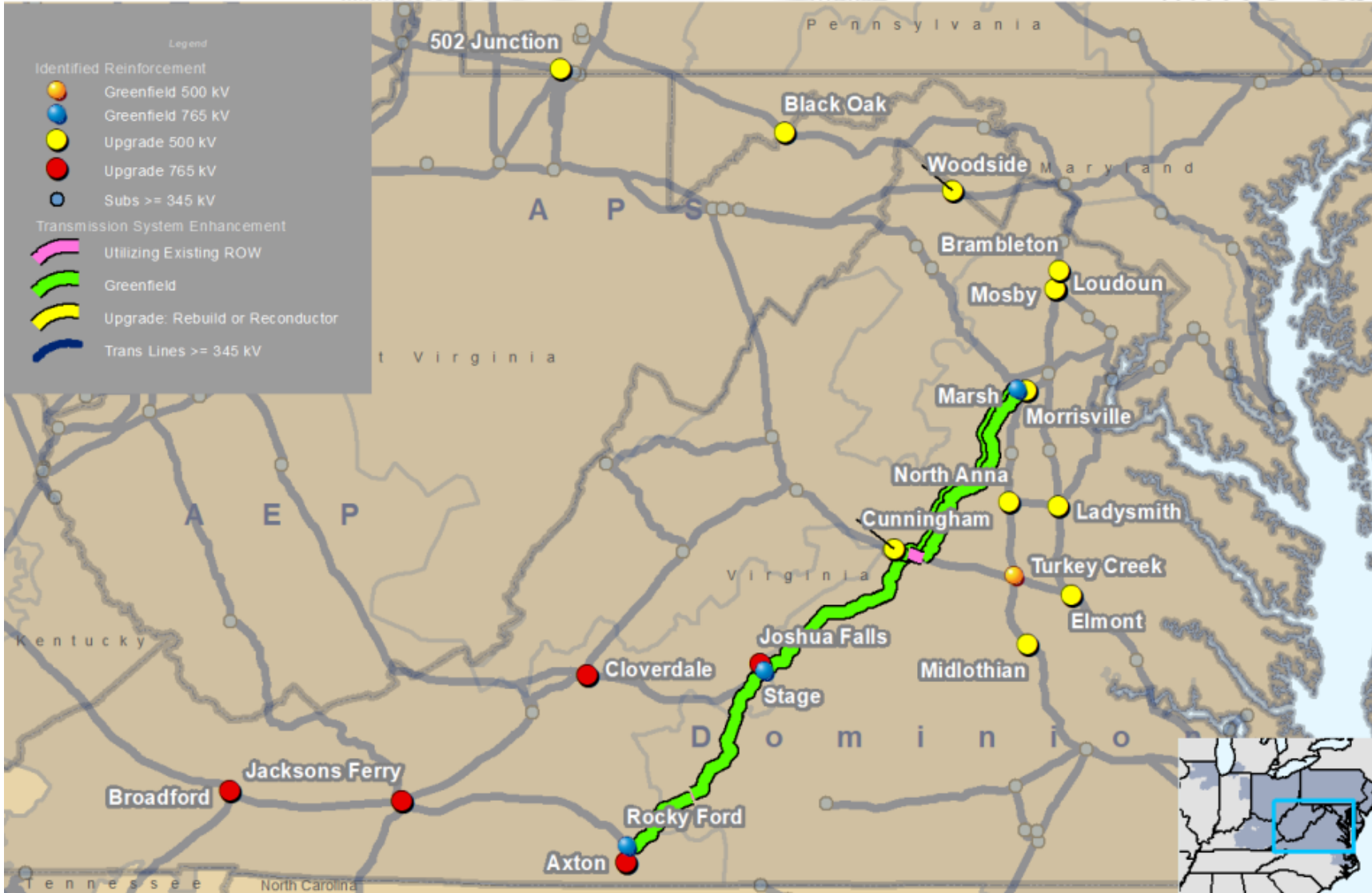


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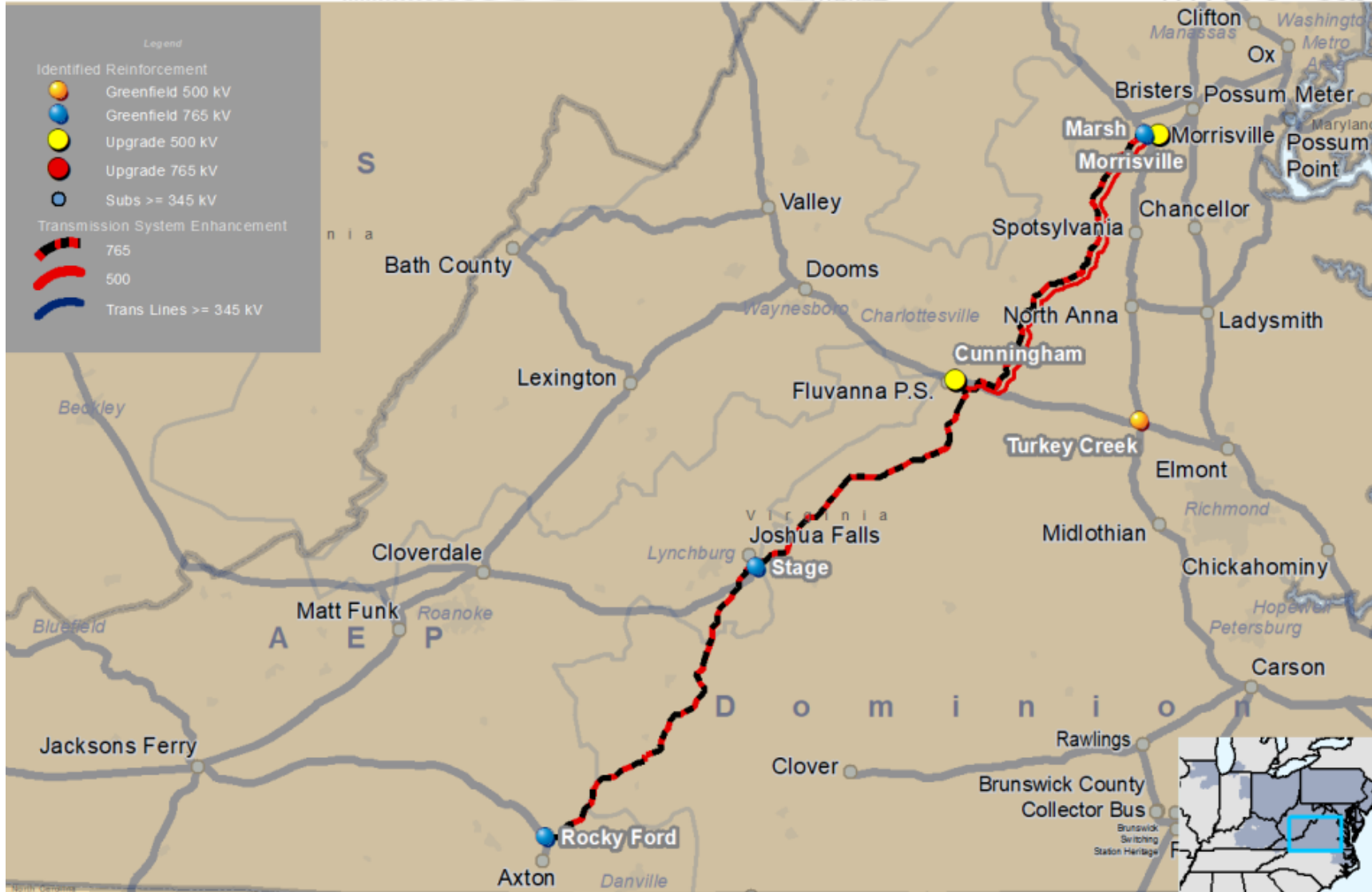


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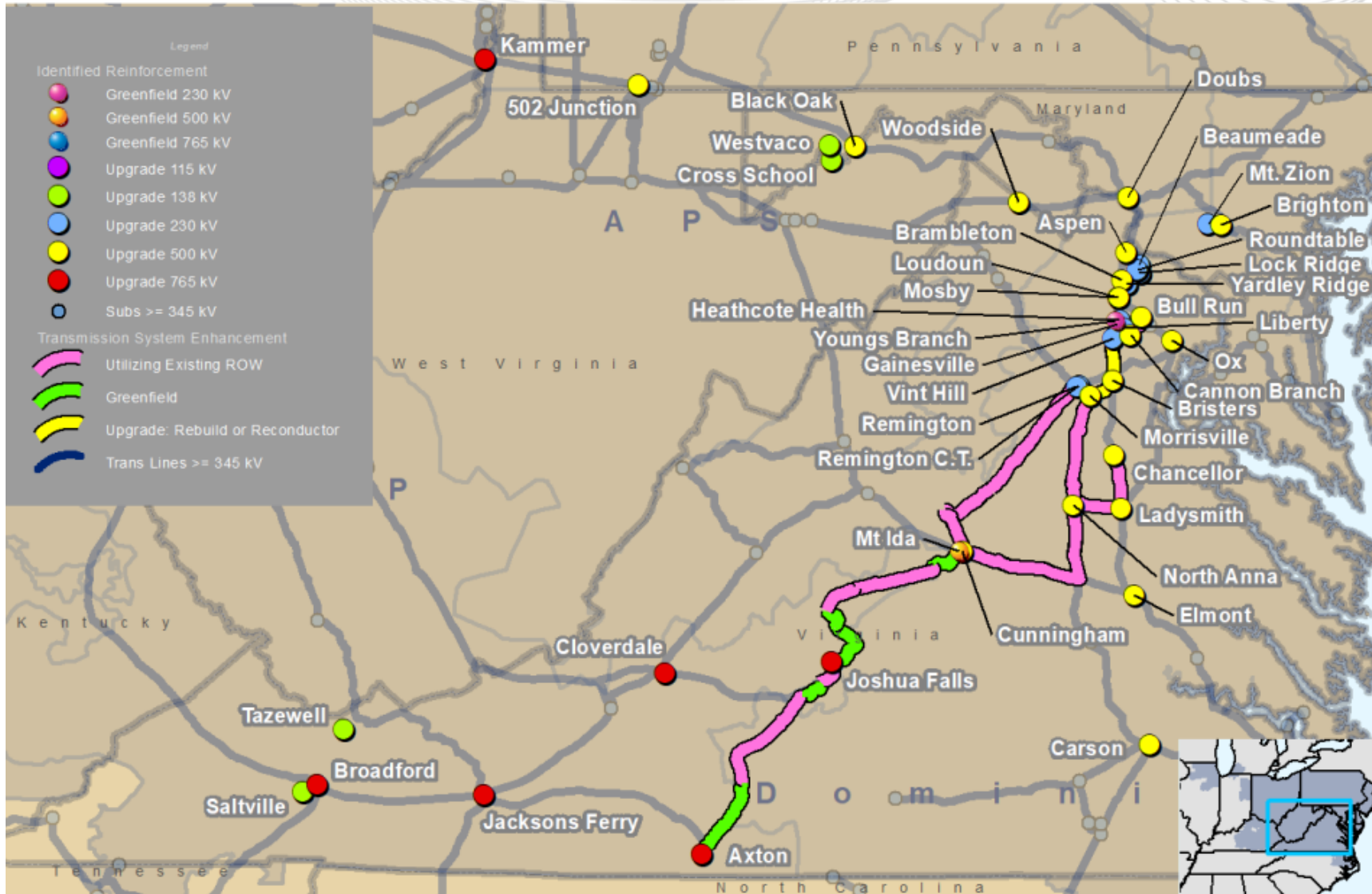


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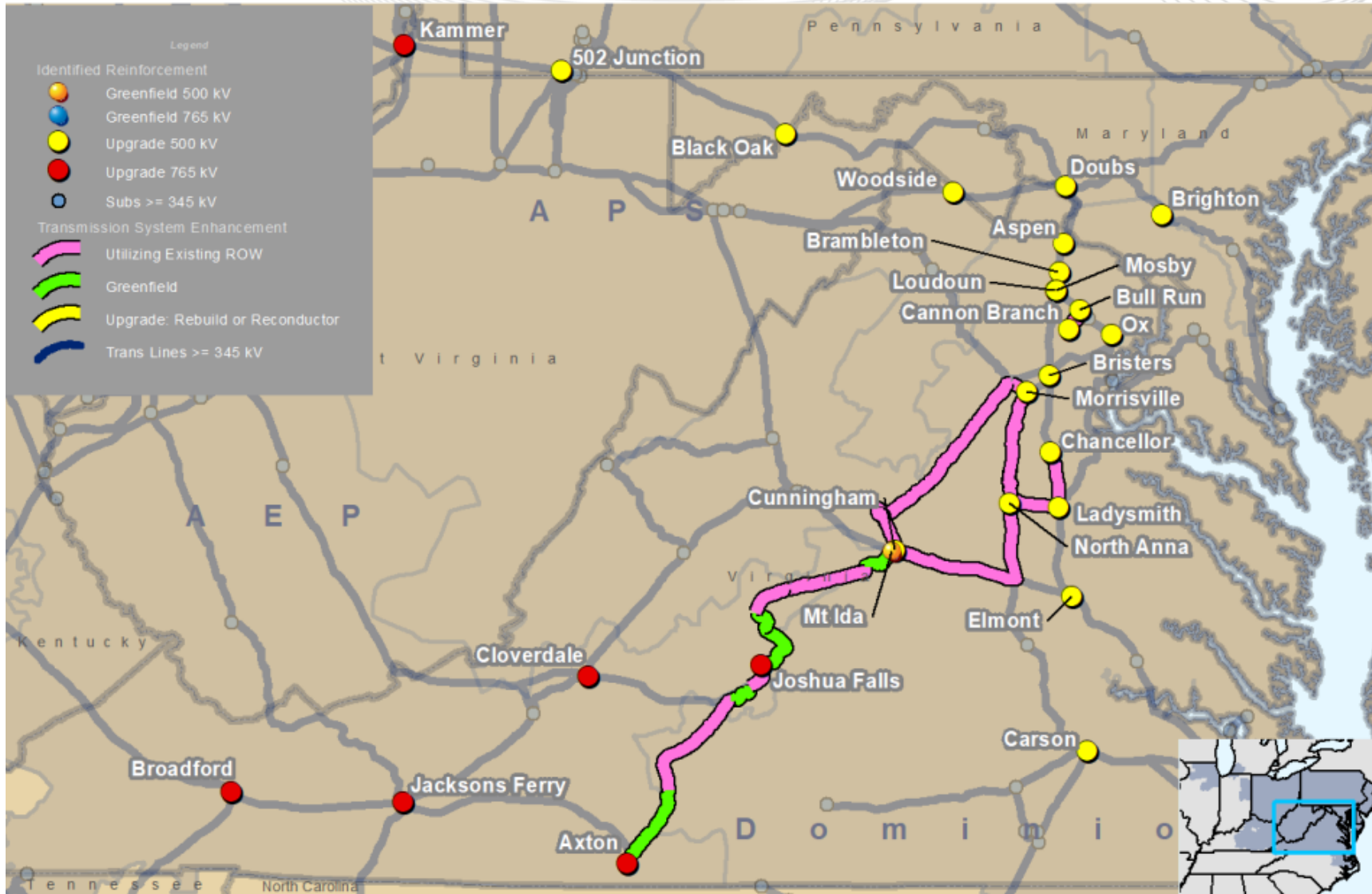




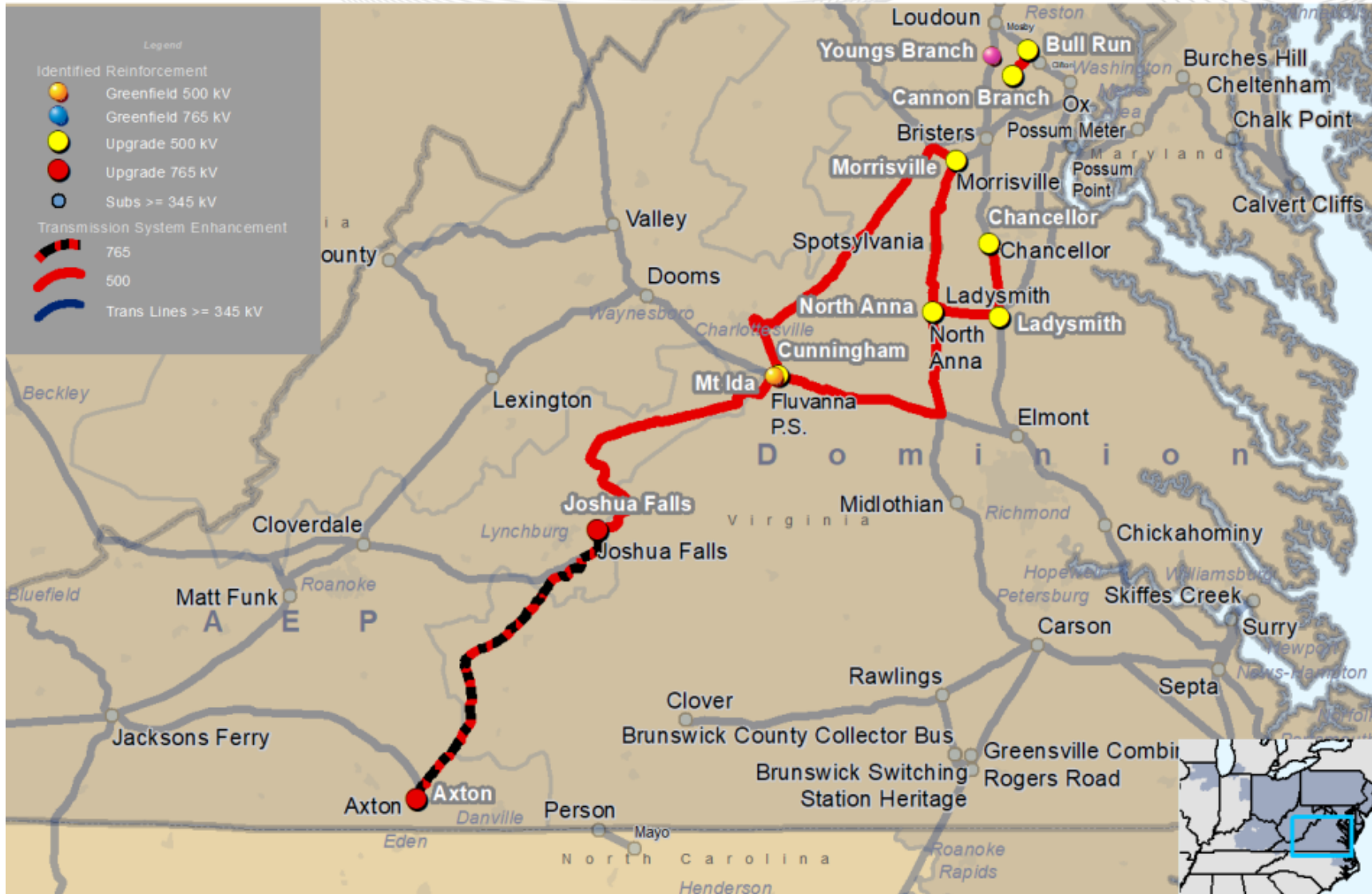
# NEETMH- Proposals



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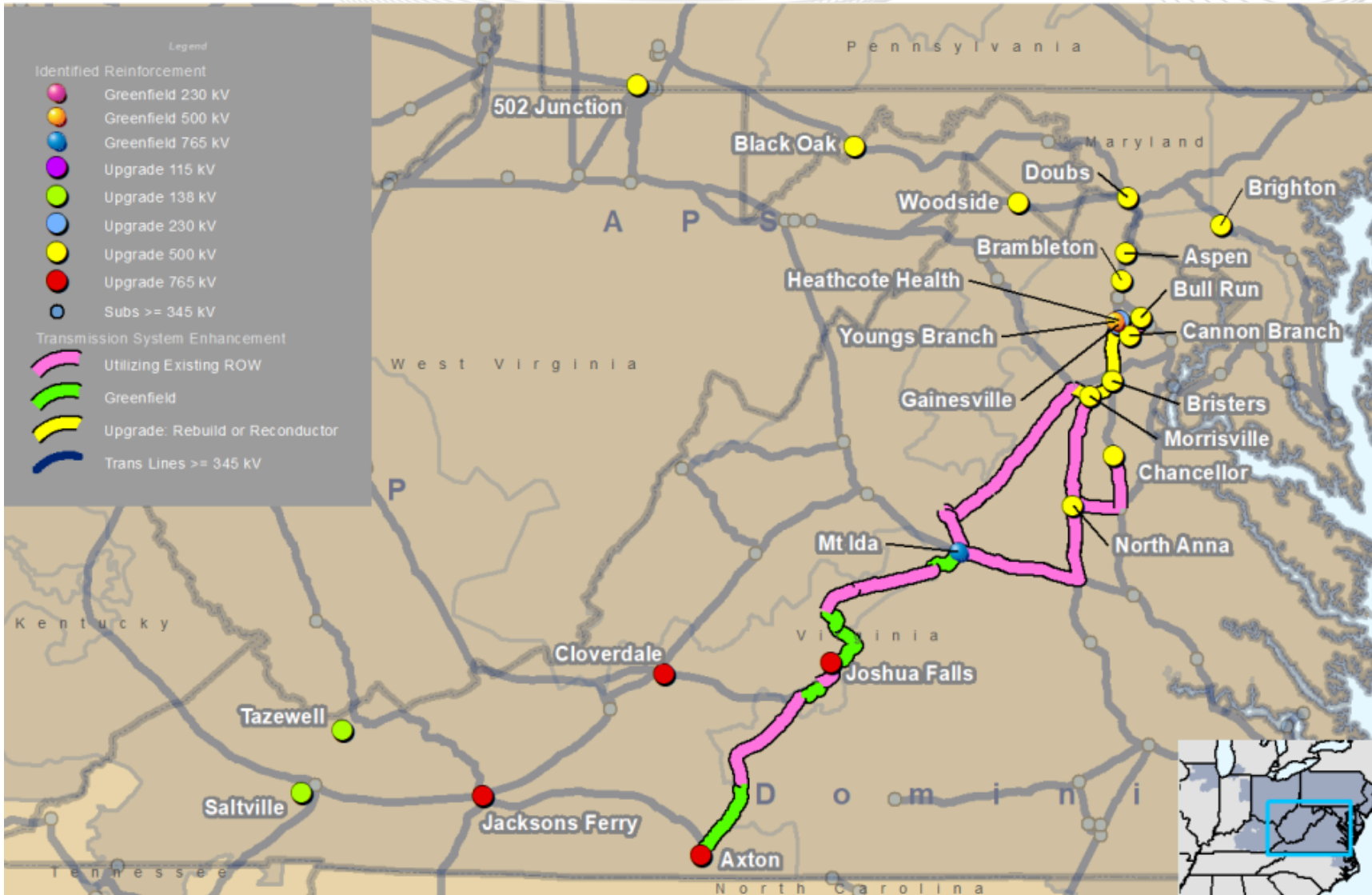


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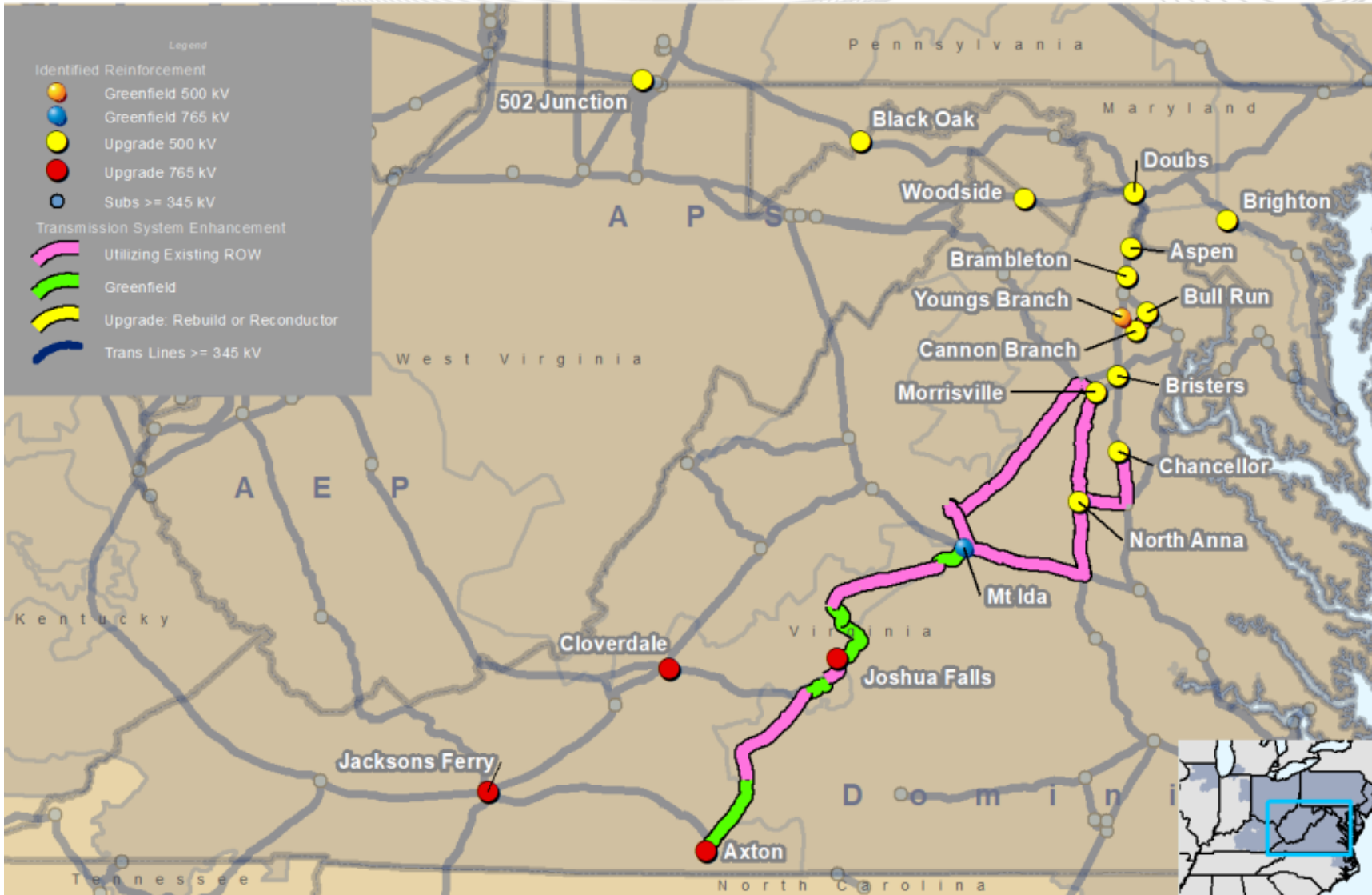


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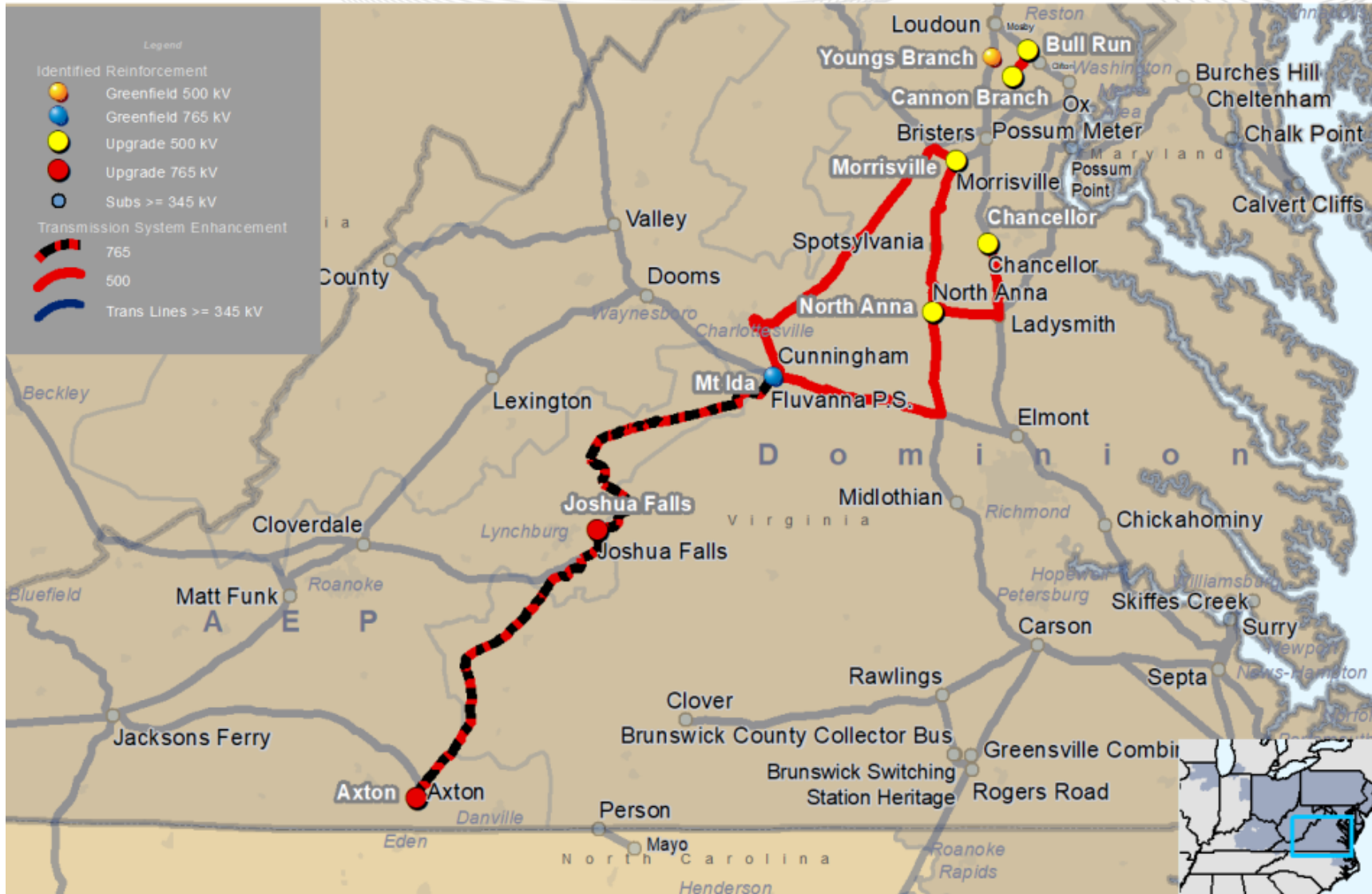


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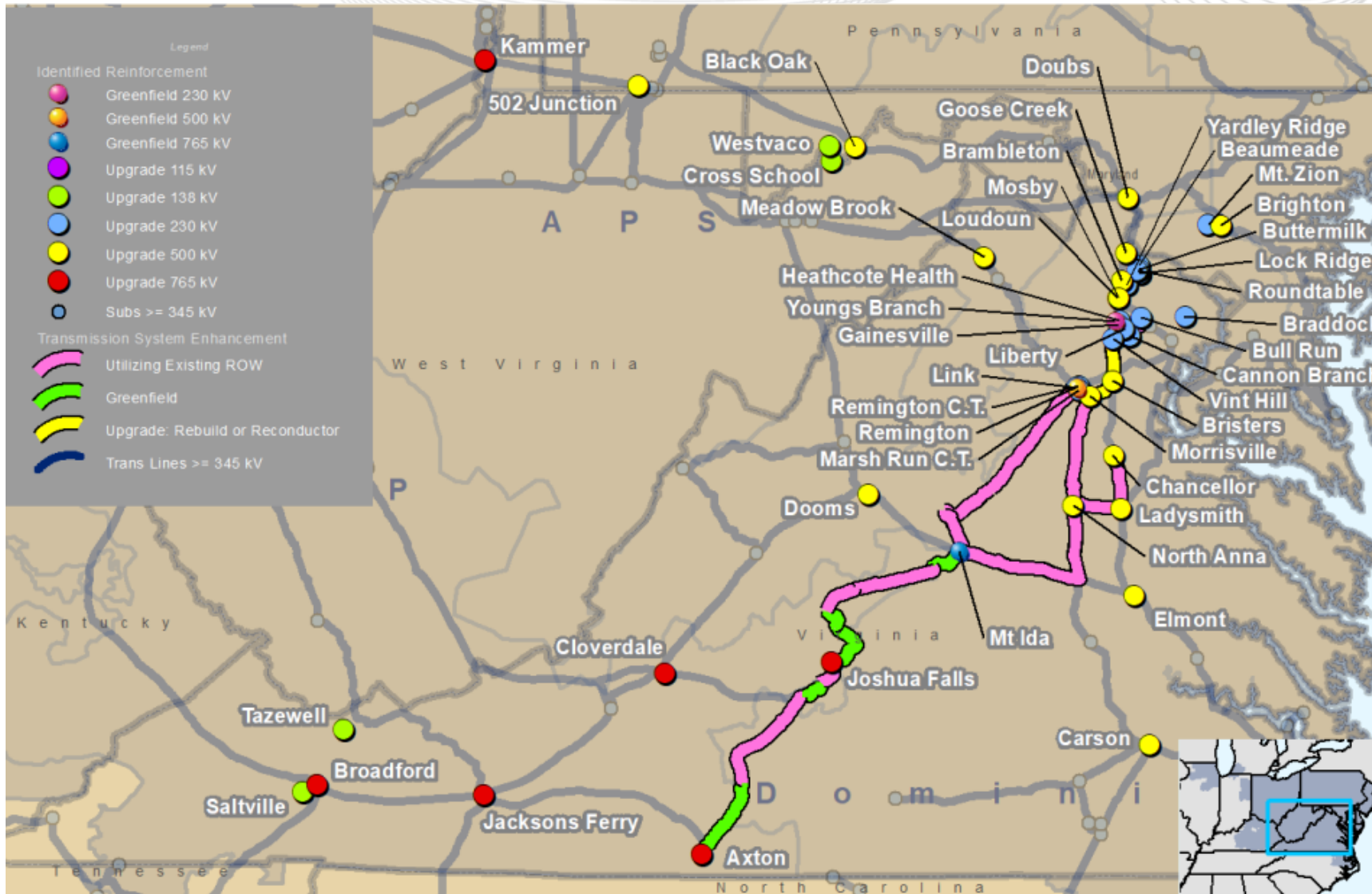


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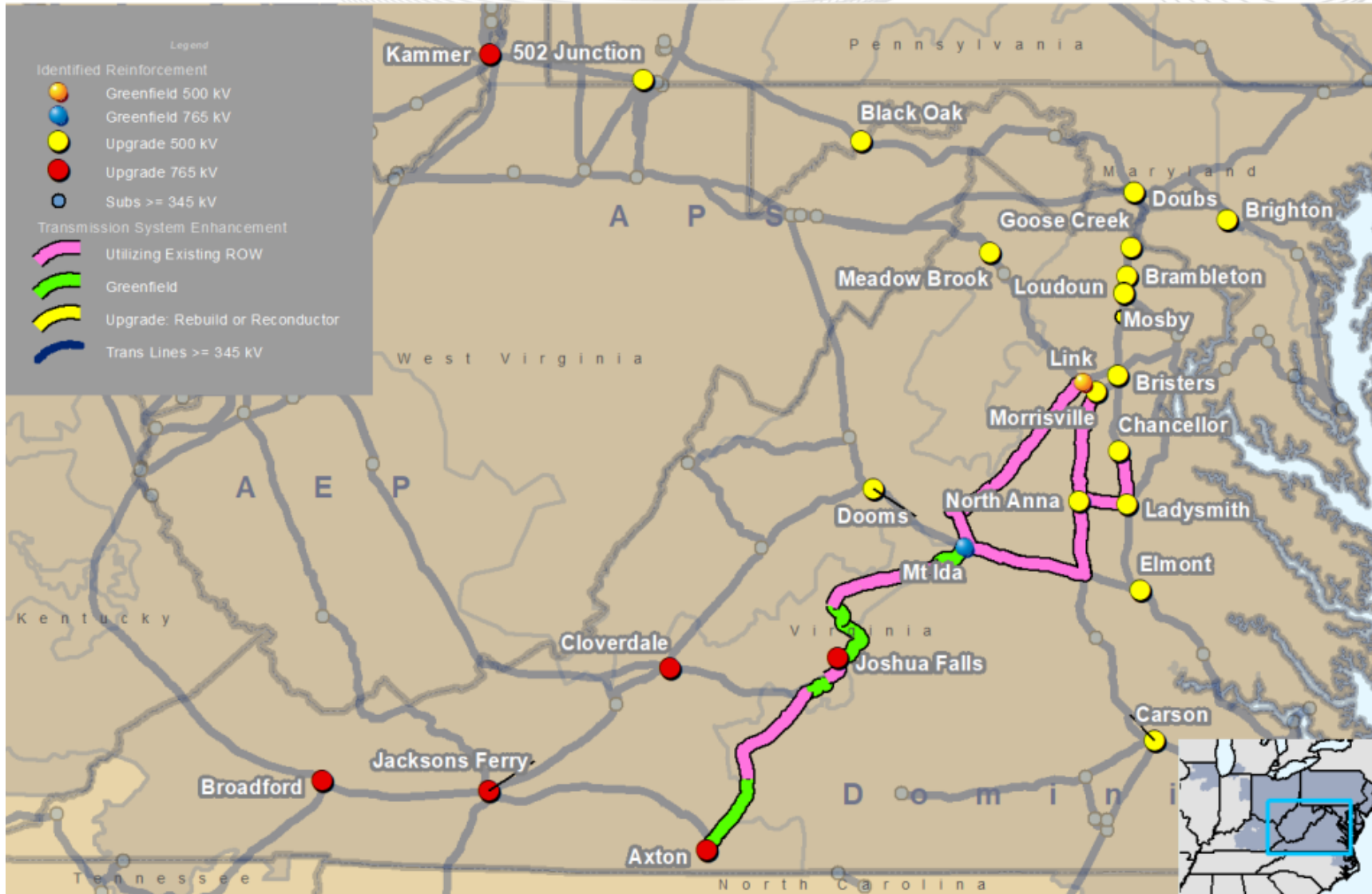




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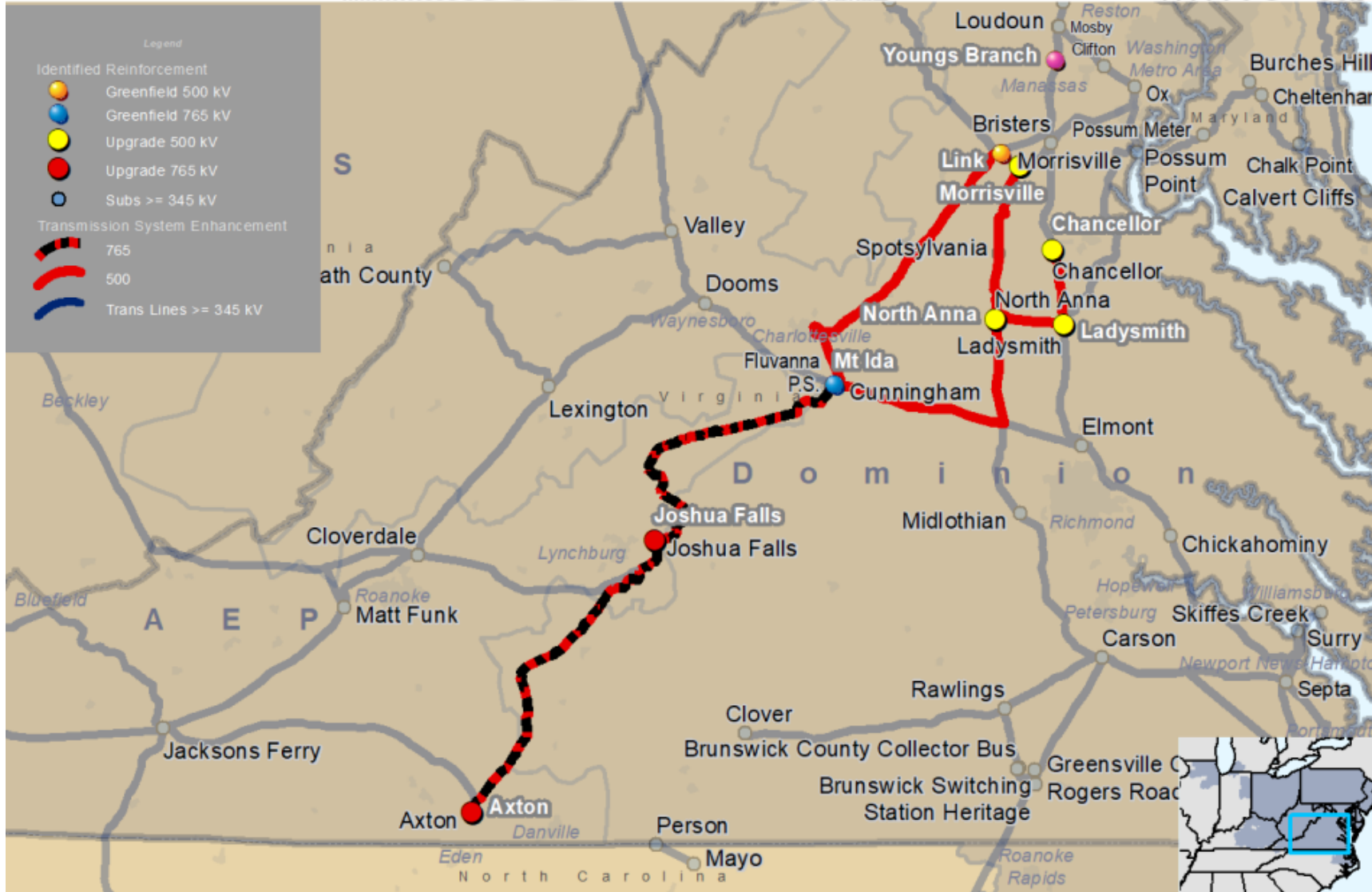


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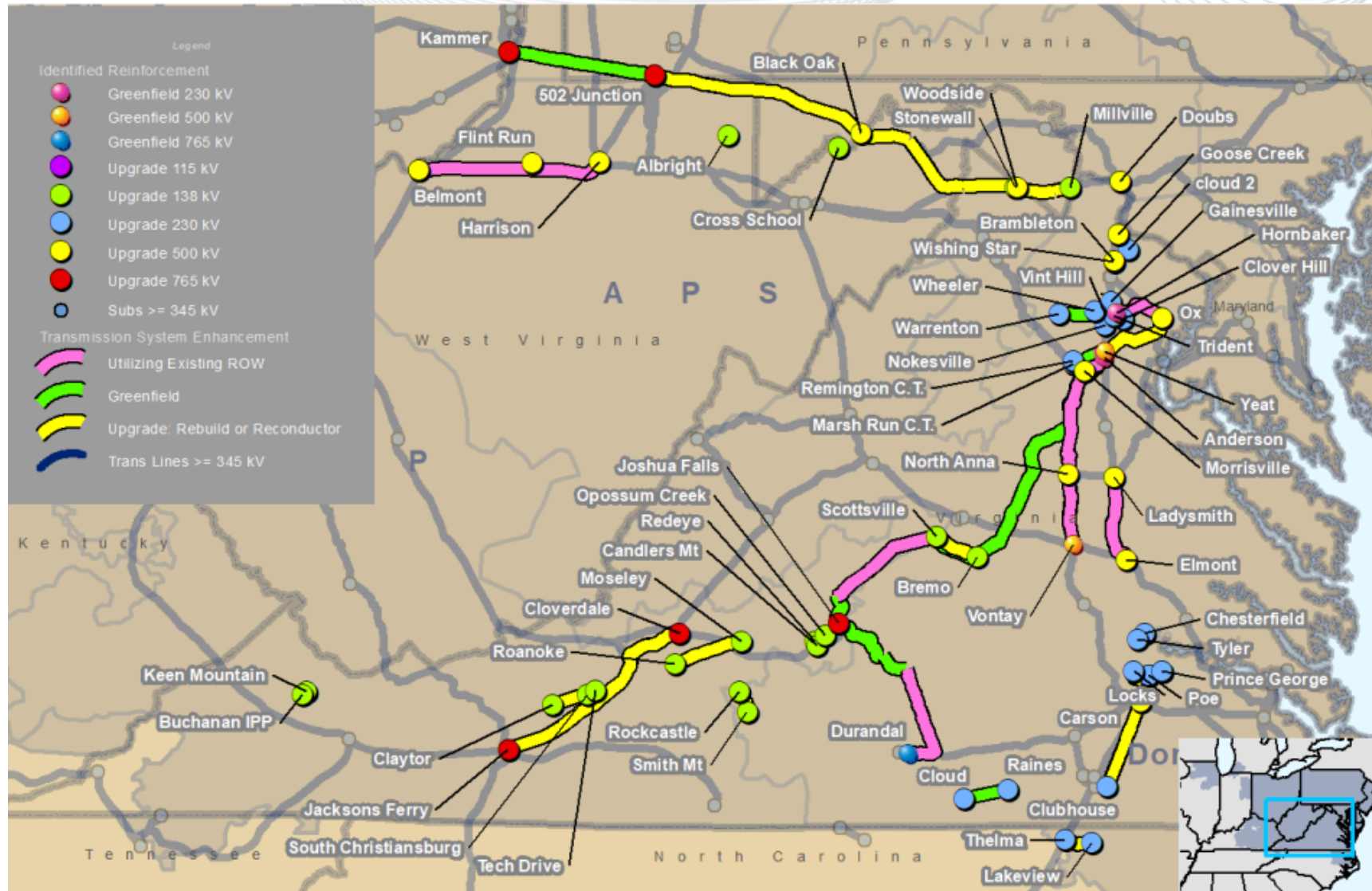
# Joint Proposals



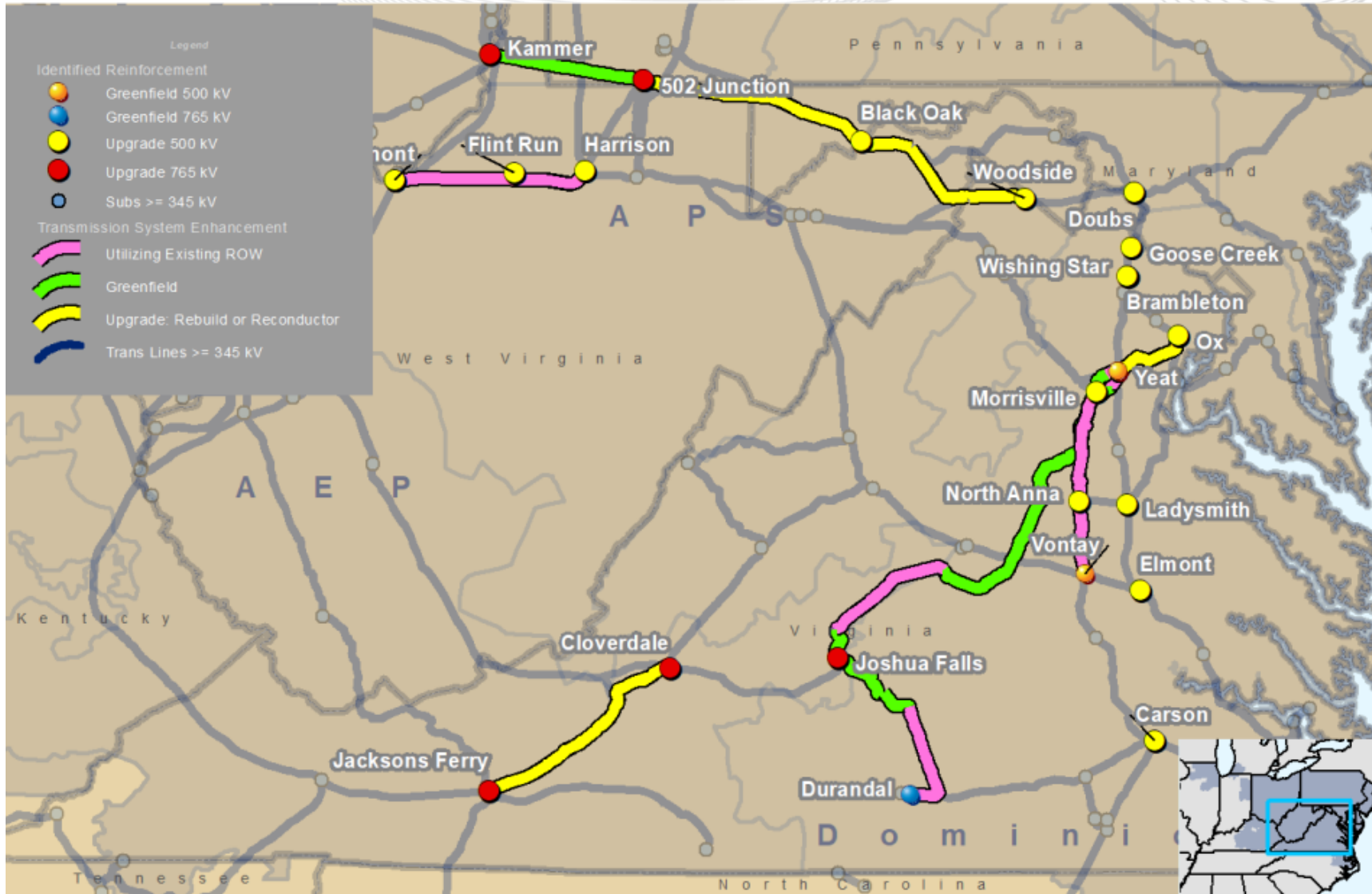


# Joint Proposal – 114

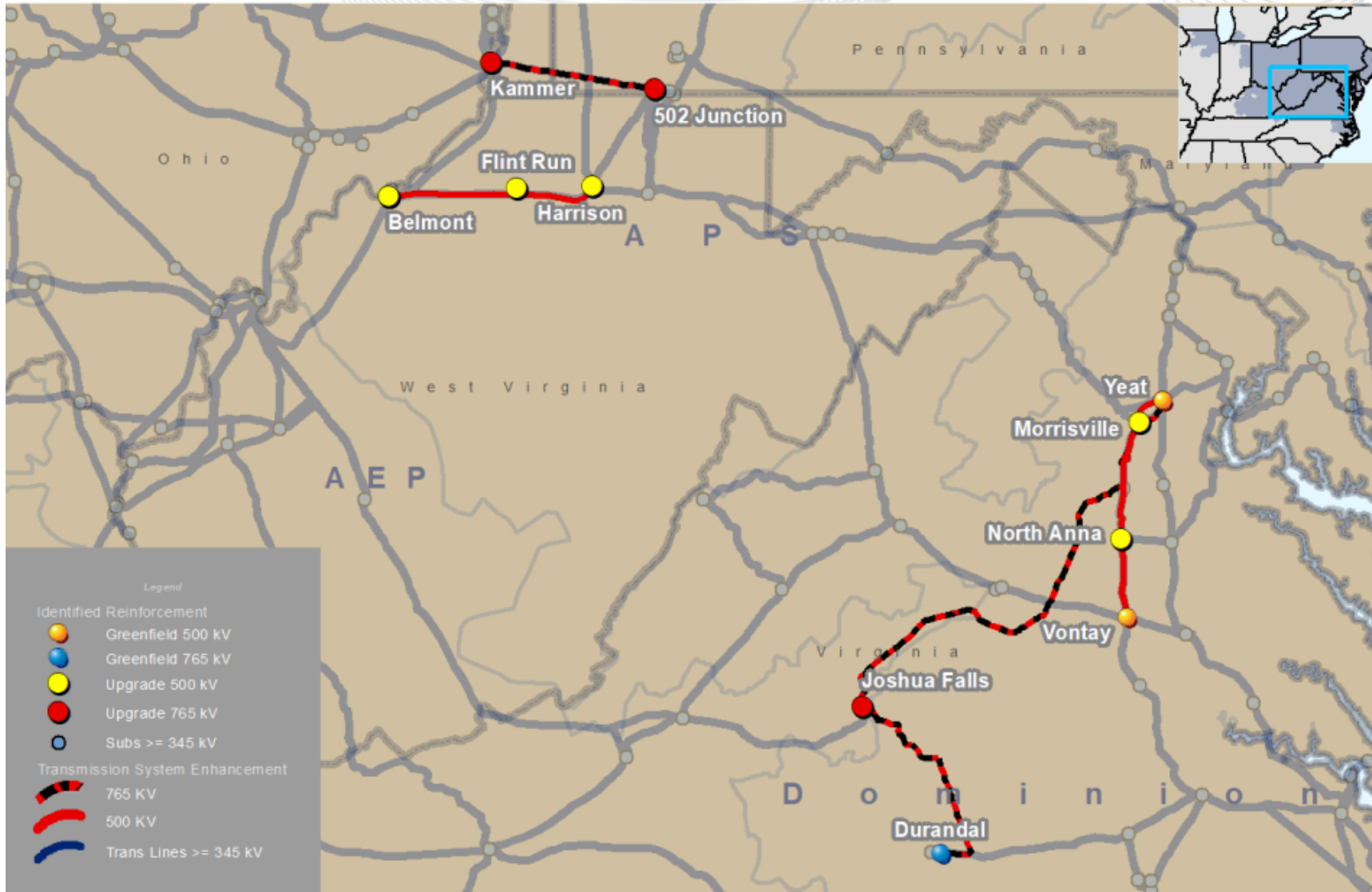
DOM / FE / Transource



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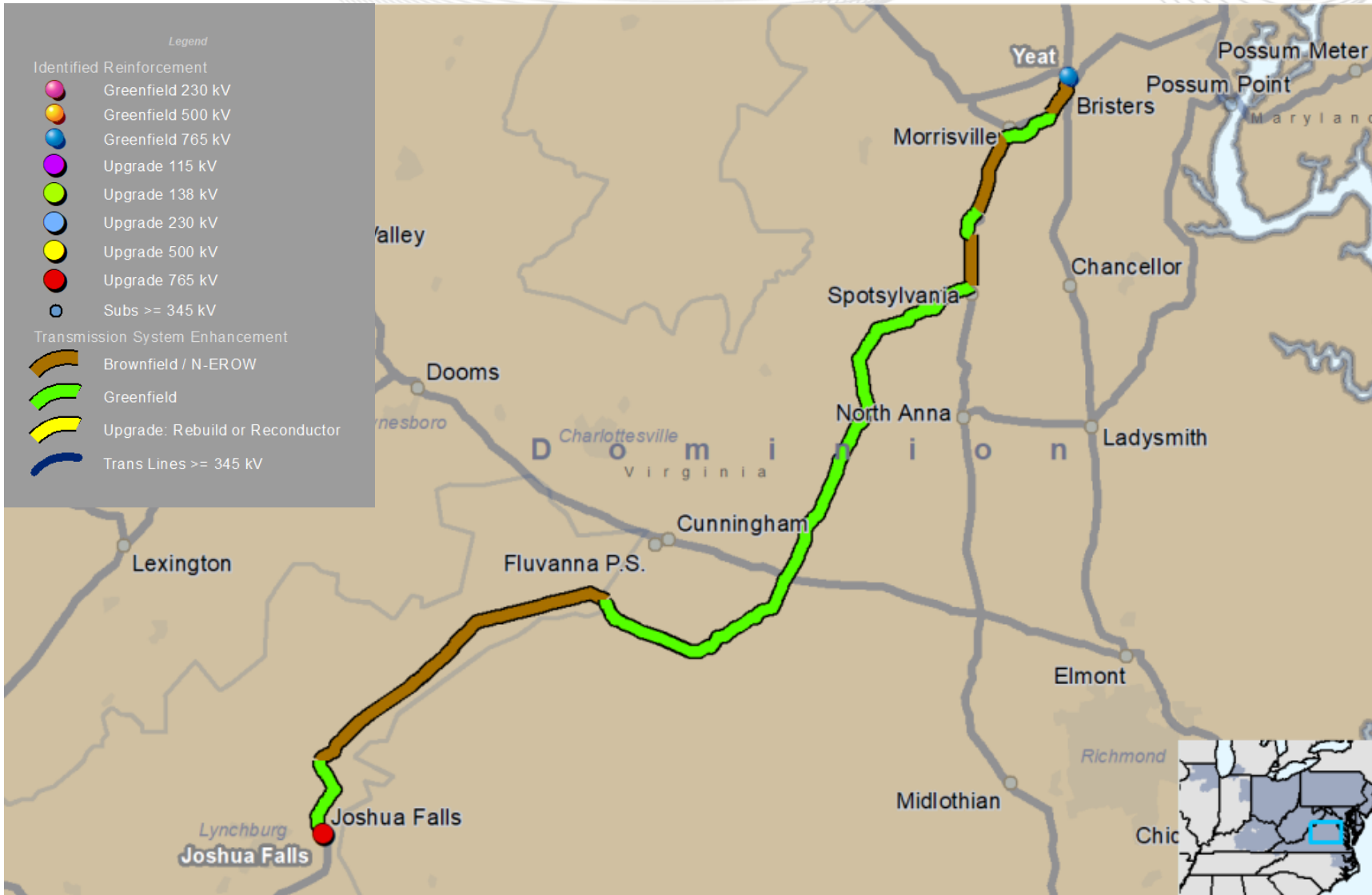




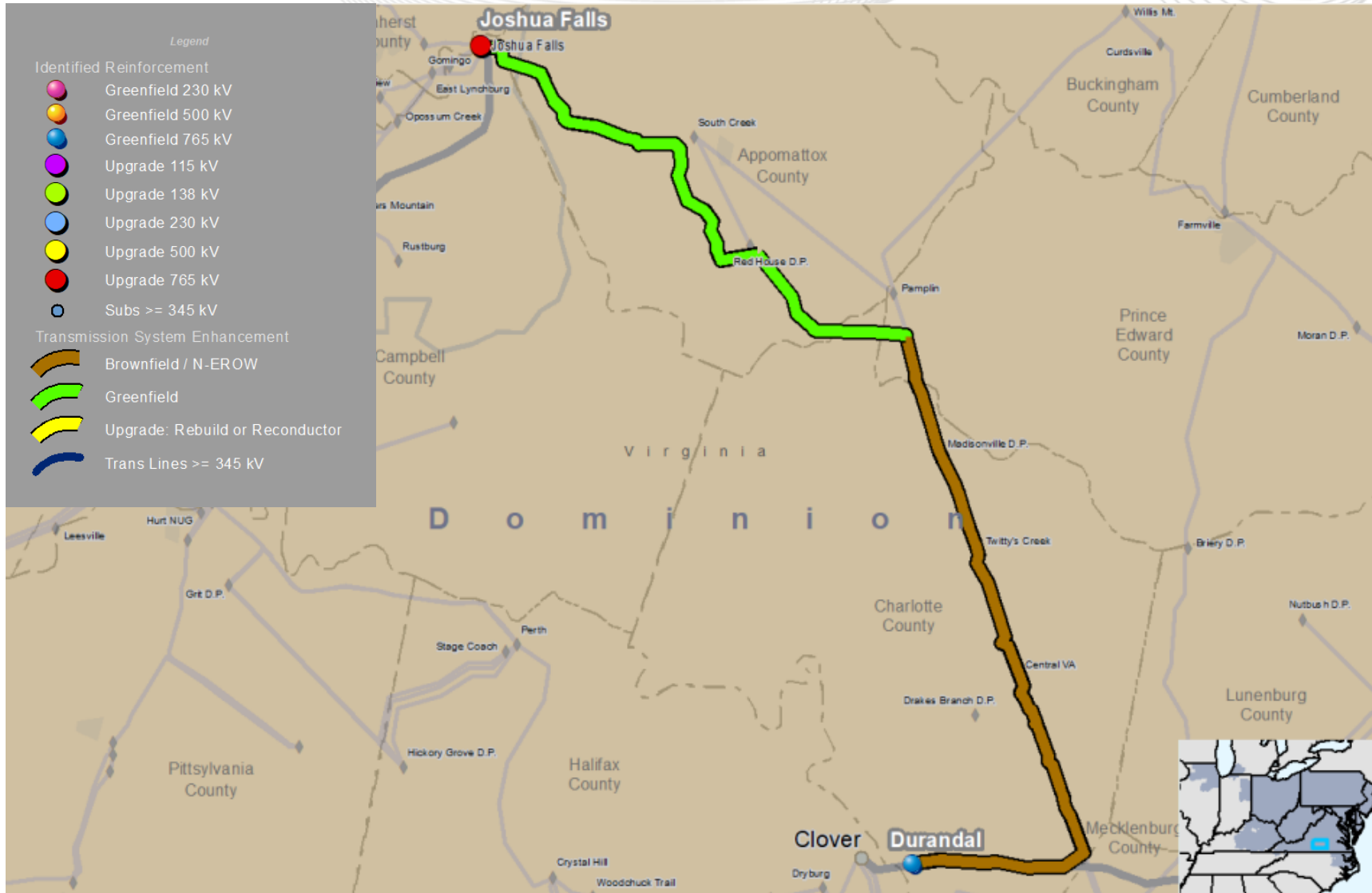
# This Portfolio contains the following Proposals

## Joint Proposal - 114

- 2024-W1-820 - Joshua Falls - Yeat w/ox - Bristers rebuild
- 2024-W1-286 - Joshua Falls - Durandal
- 2024-W1-300 - Yeat - Vontay
- 2024-W1-617 - AEP incumbent upgrades for Portfolio #4
- 2024-W1-885 - FirstEnergy Components for Portfolios 2,3, and 4
- 2024-W1-977 or
- 2024-W1-727 - Belmont - Harrison 500 kV Line or Kammer - 502Jct 765 kV line
- 2024-W1-551 - Woodside/Chanceford 500 kV Terminal Swap at Doubs
- 2024-W1-24 - Dominion Reinforcements 2024-W1-781 - Dominion Reinforcements"



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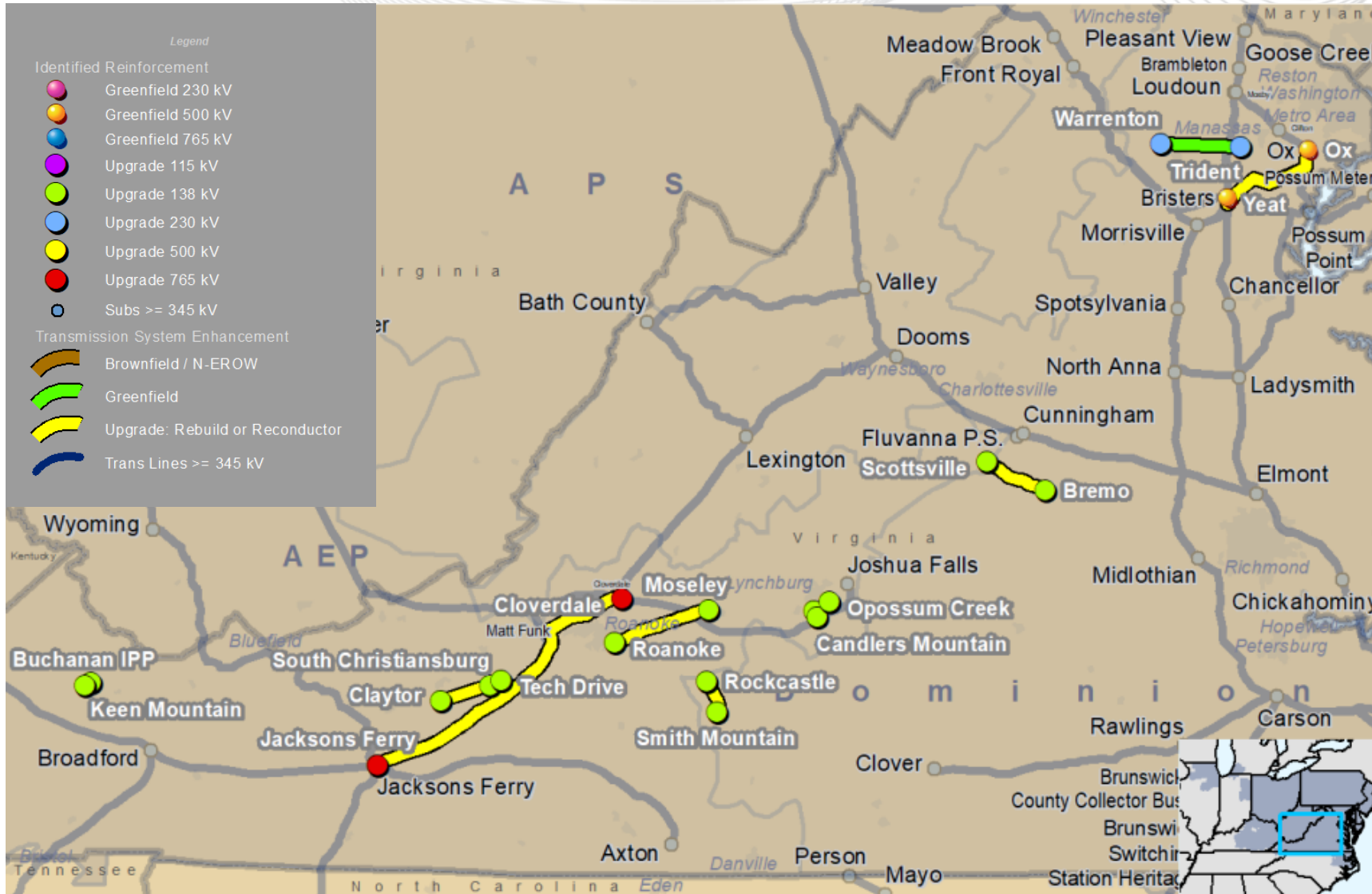


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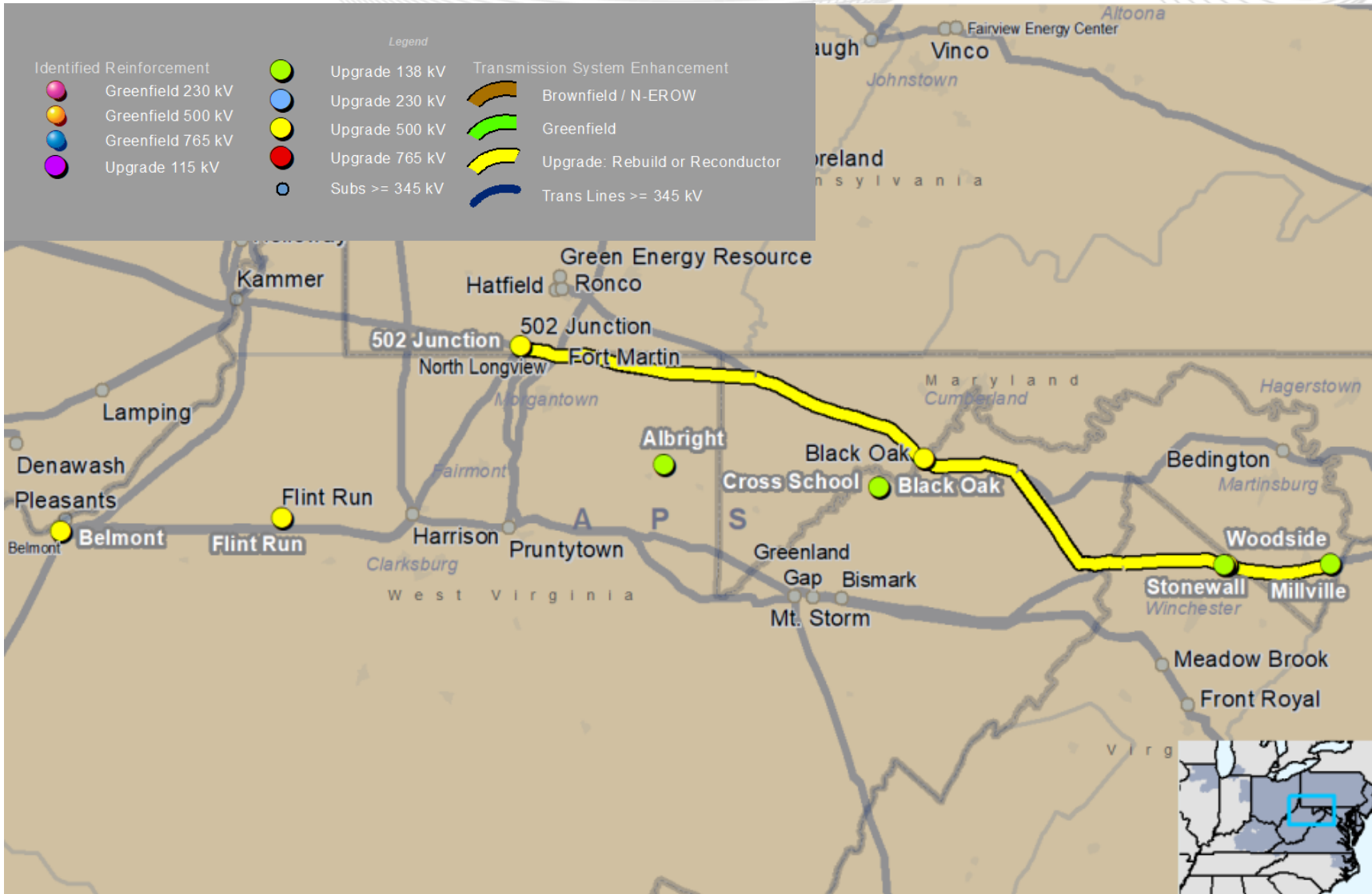


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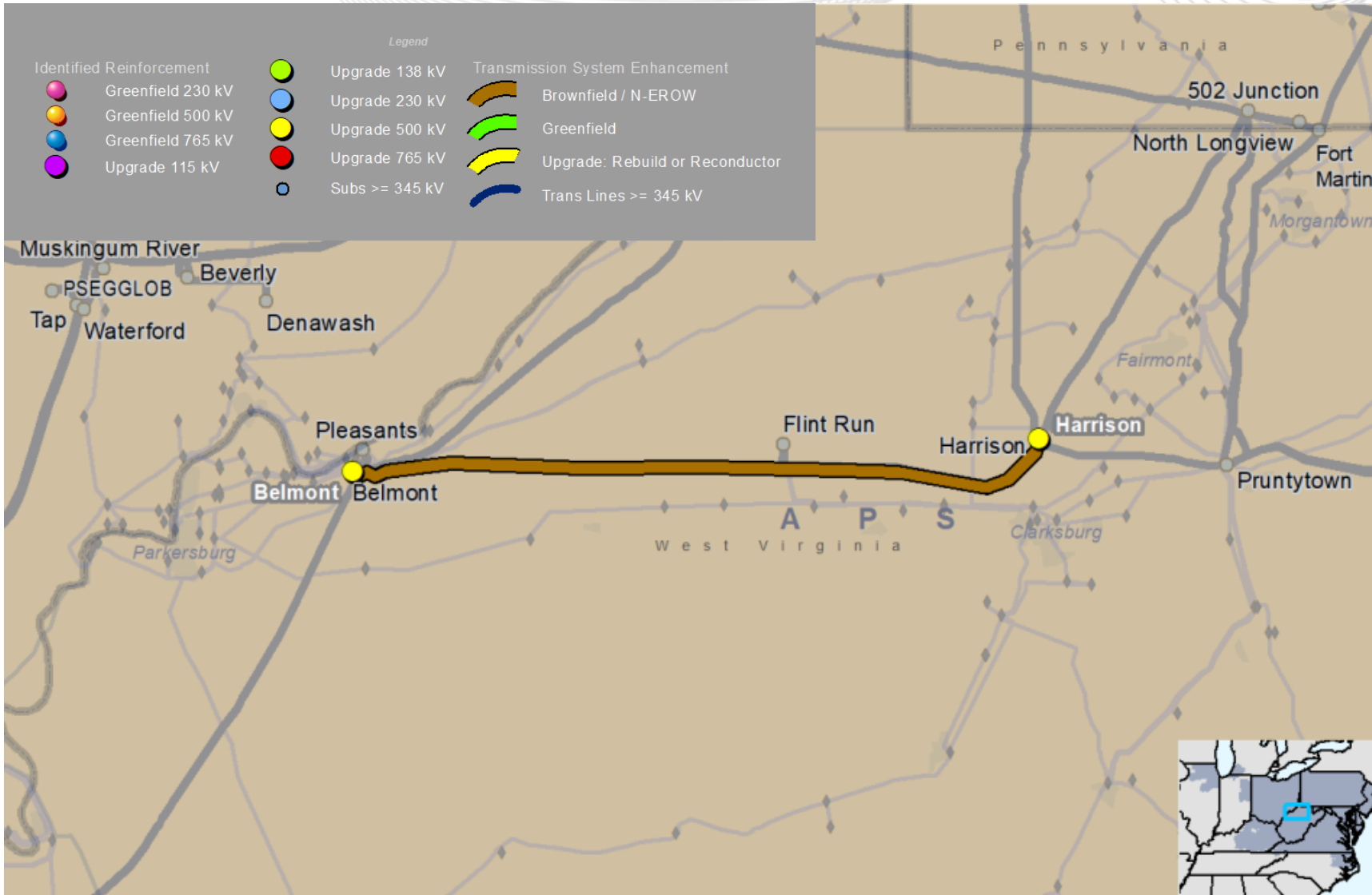




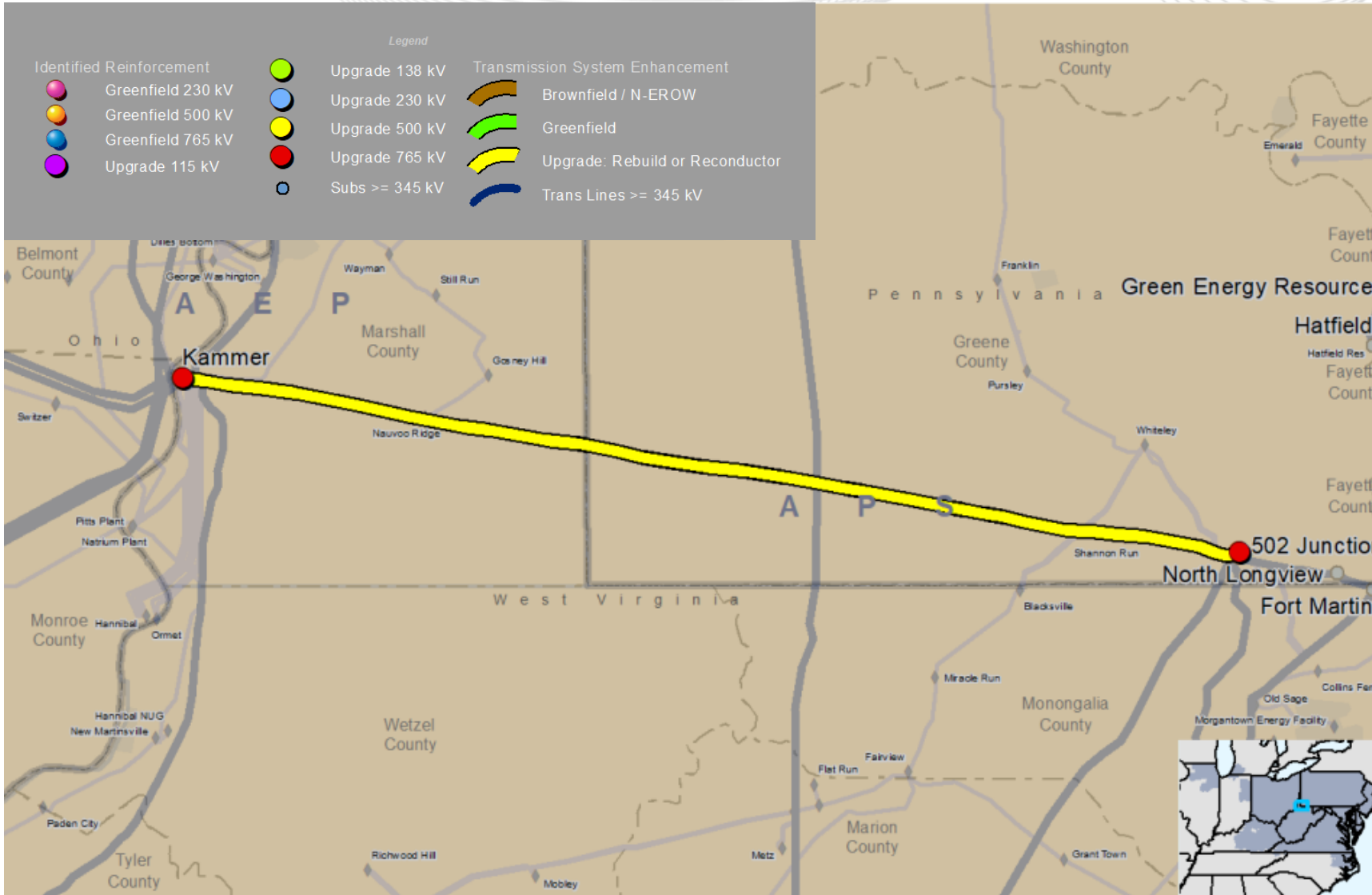
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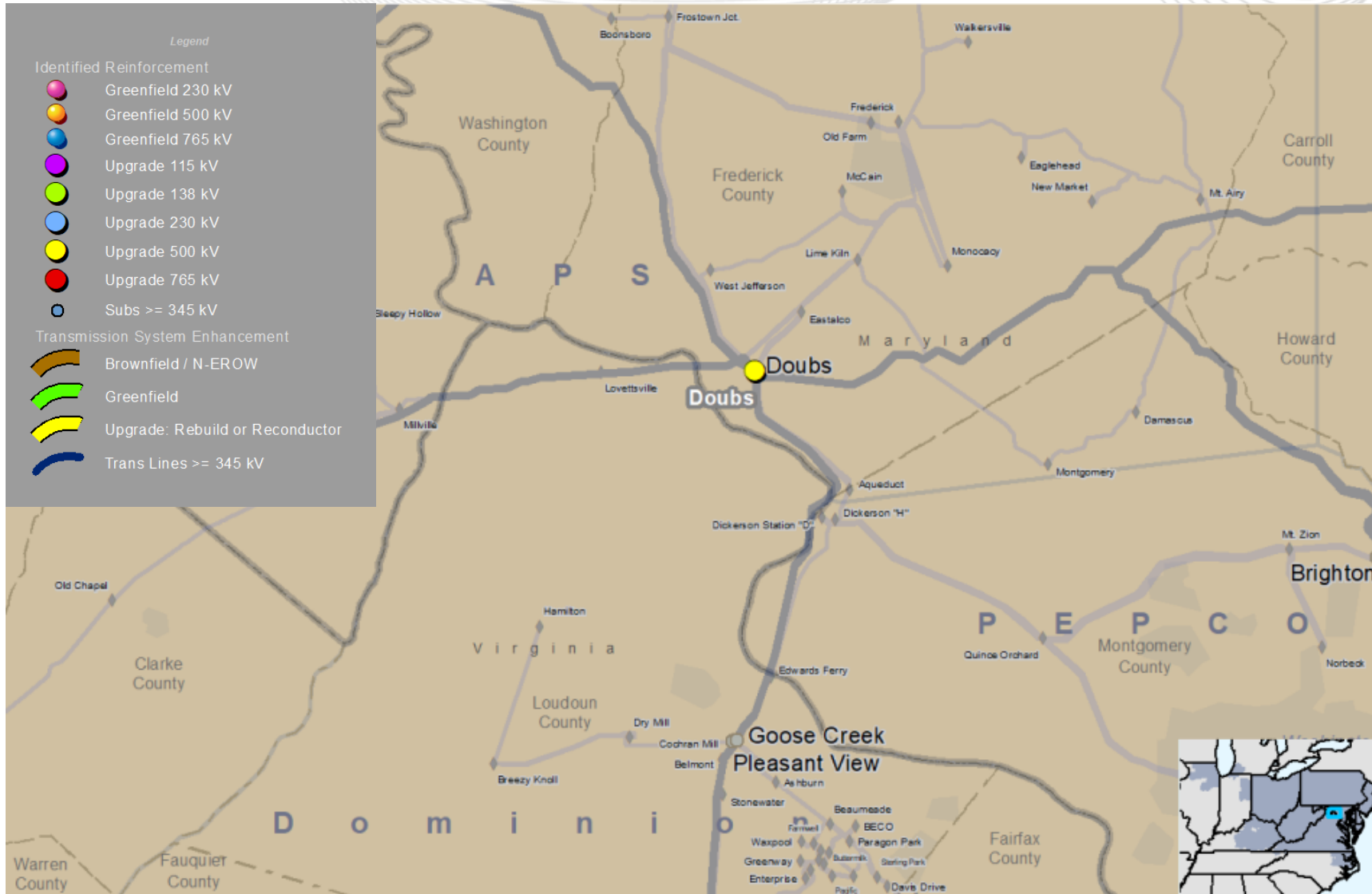


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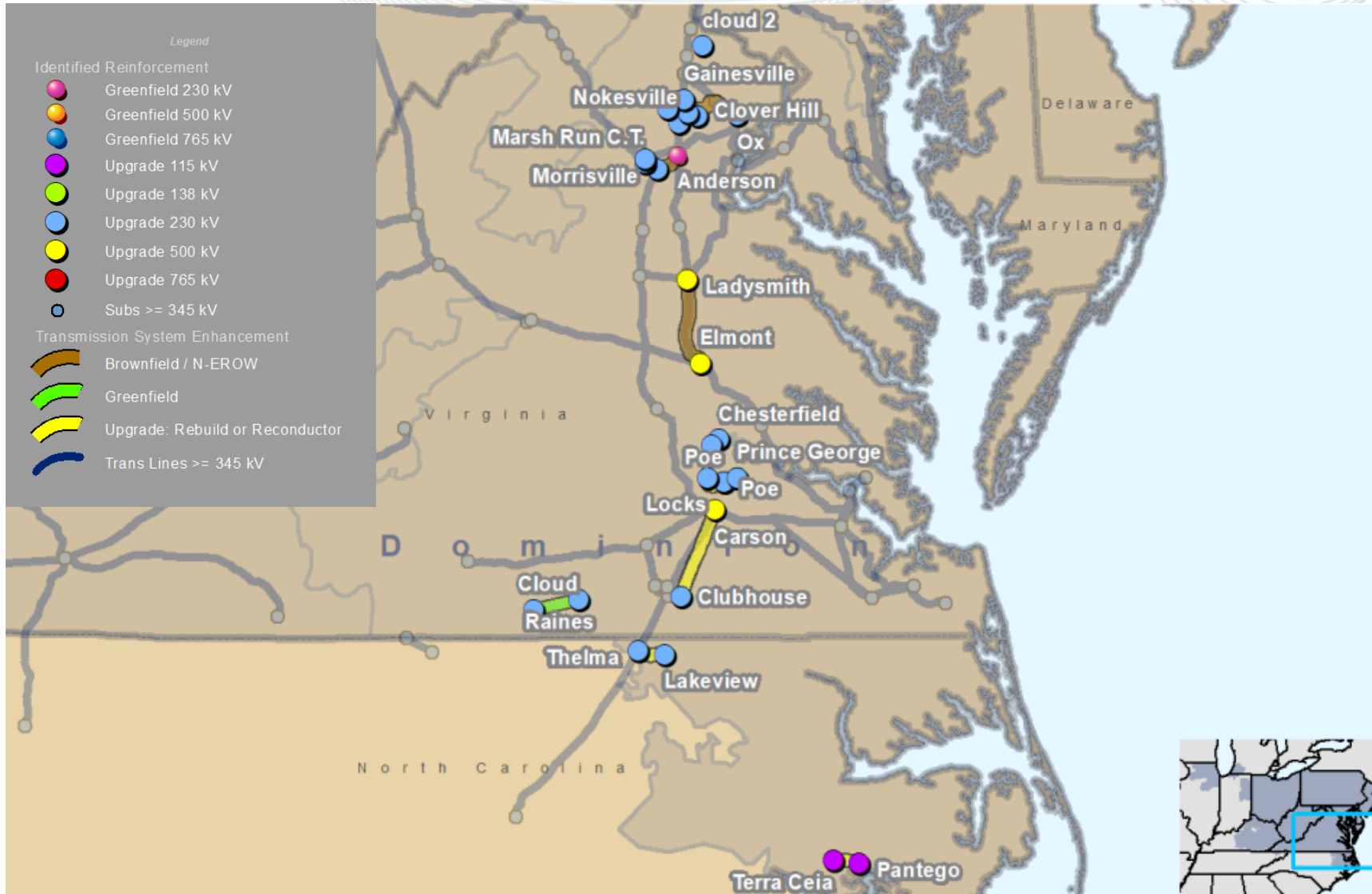


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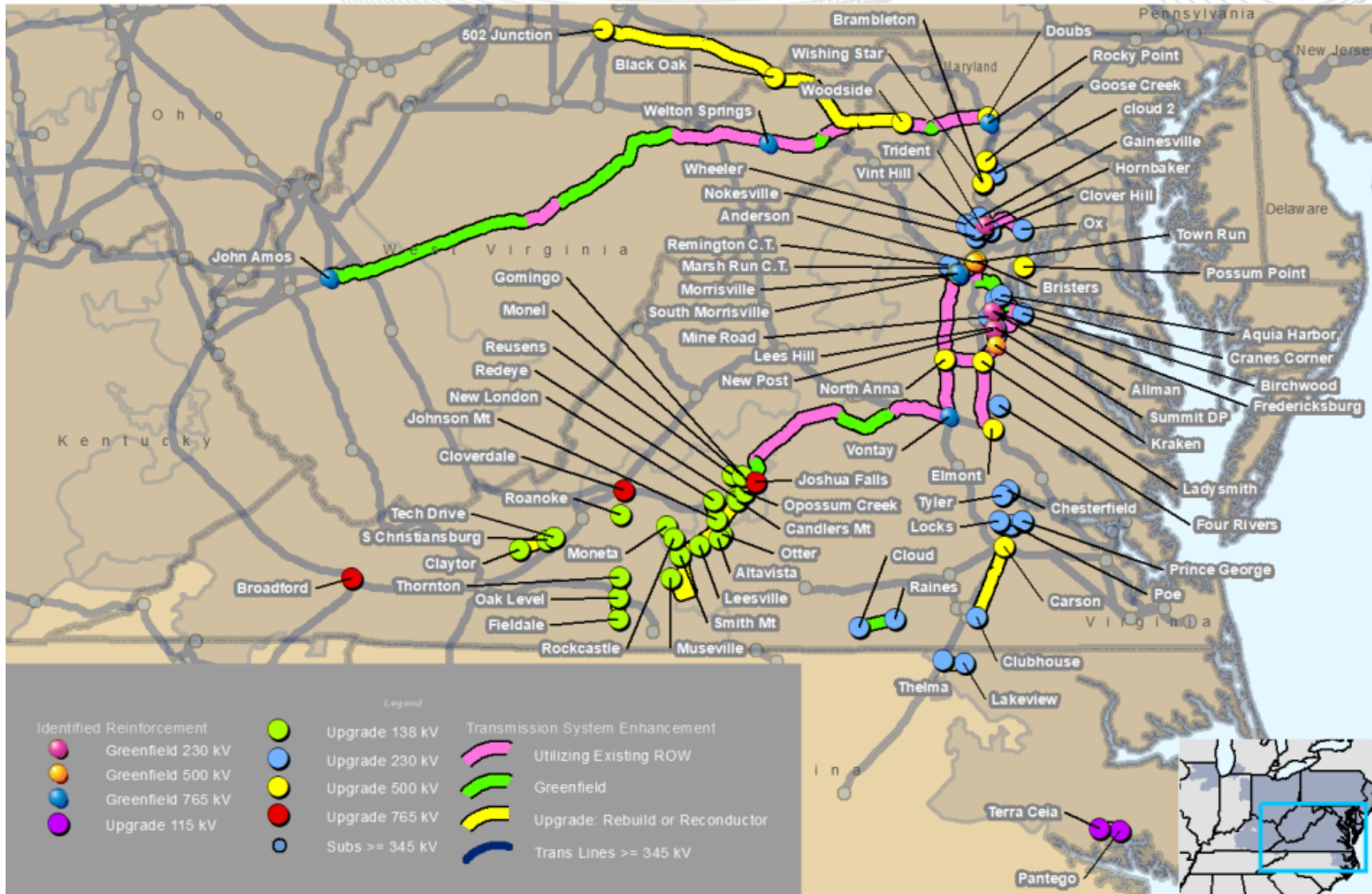
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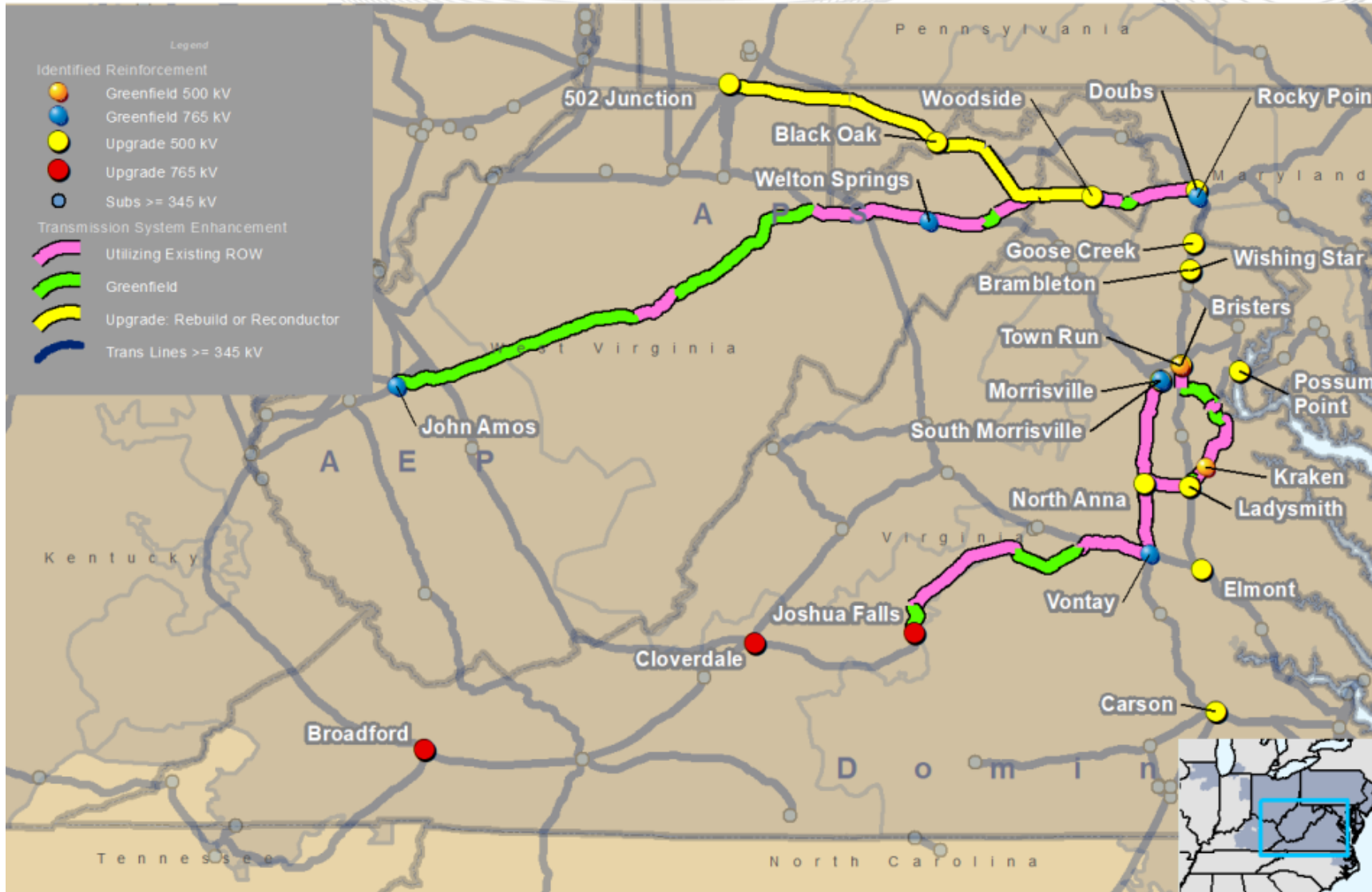
# Joint Proposal – 262

Dom / FE / Transource

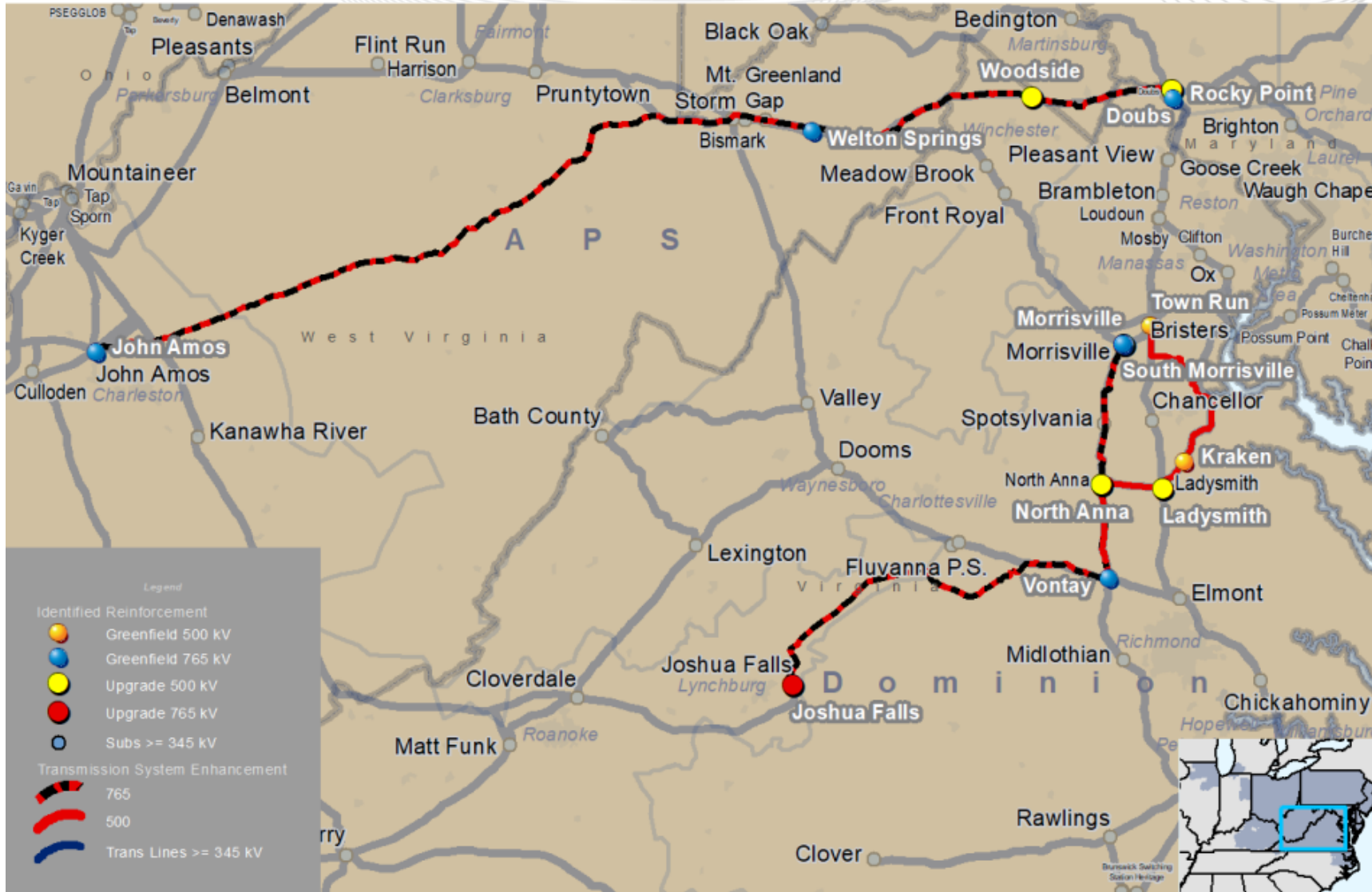


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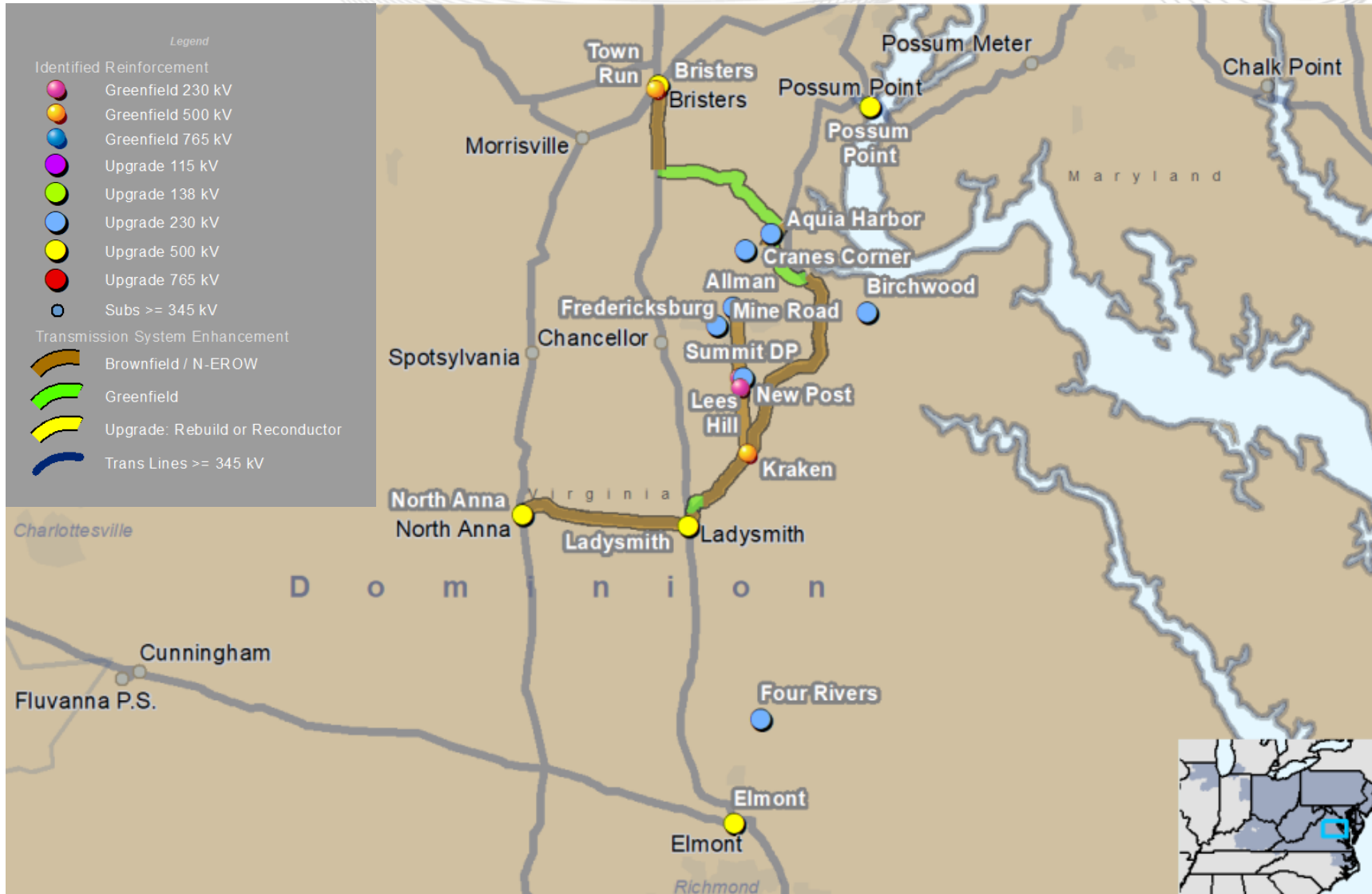
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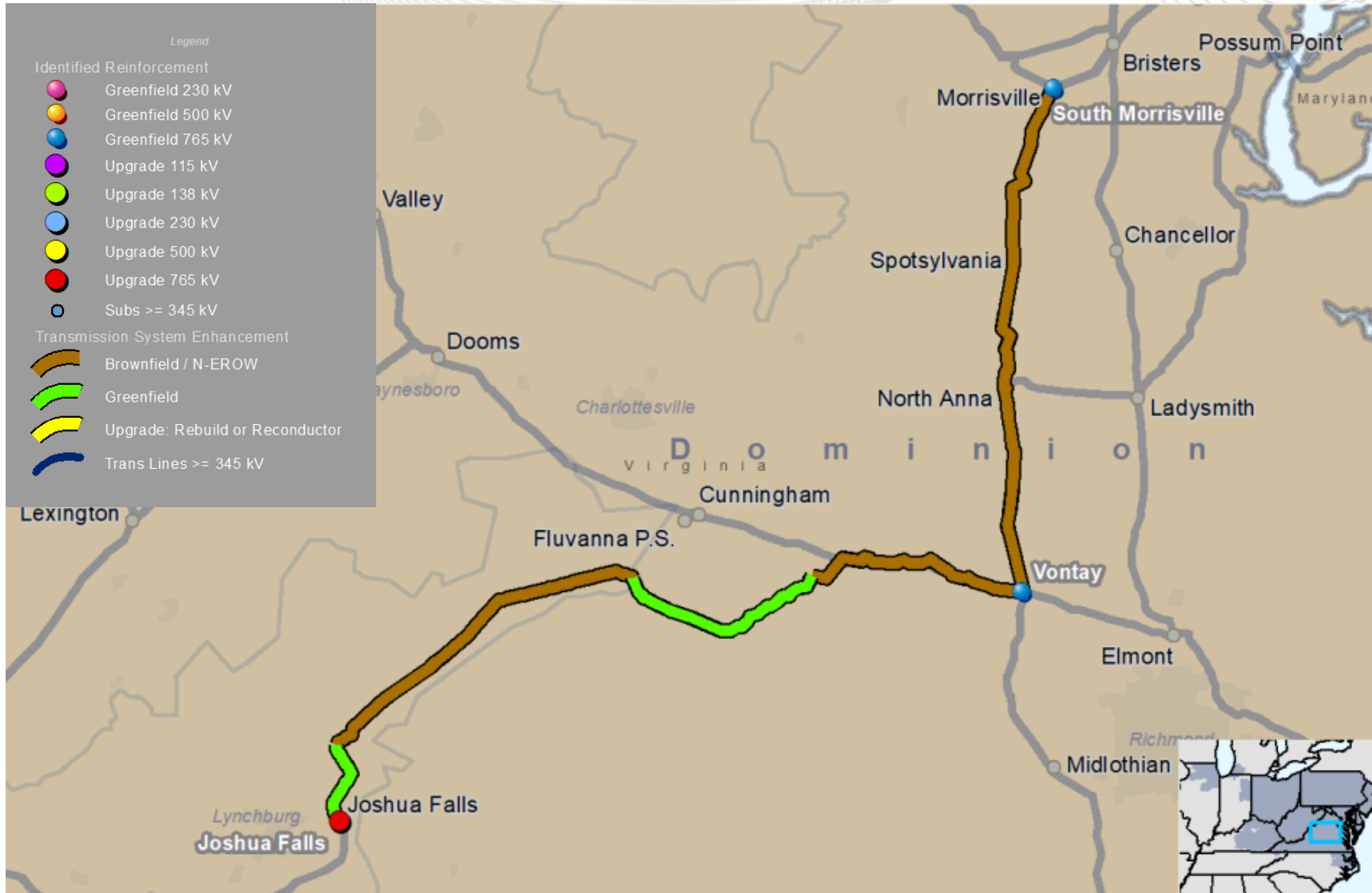
## Joint Proposal - 262

- 2024-W1-967-Kraken loop
- 2024-W1-665-Joshua Falls - Vontay - Morrisville South
- 2024-W1-708-Amos - Welton Springs - Point of Rocks
- 2024-W1-551-Woodside/Chanceford 500 kV Terminal Swap at Doubs
- 2024-W1-81-AEP incumbent upgrades for Portfolio #1, 2 & 3
- 2024-W1-24-Dominion Reinforcements
- 2024-W1-781-Dominion Reinforcements"

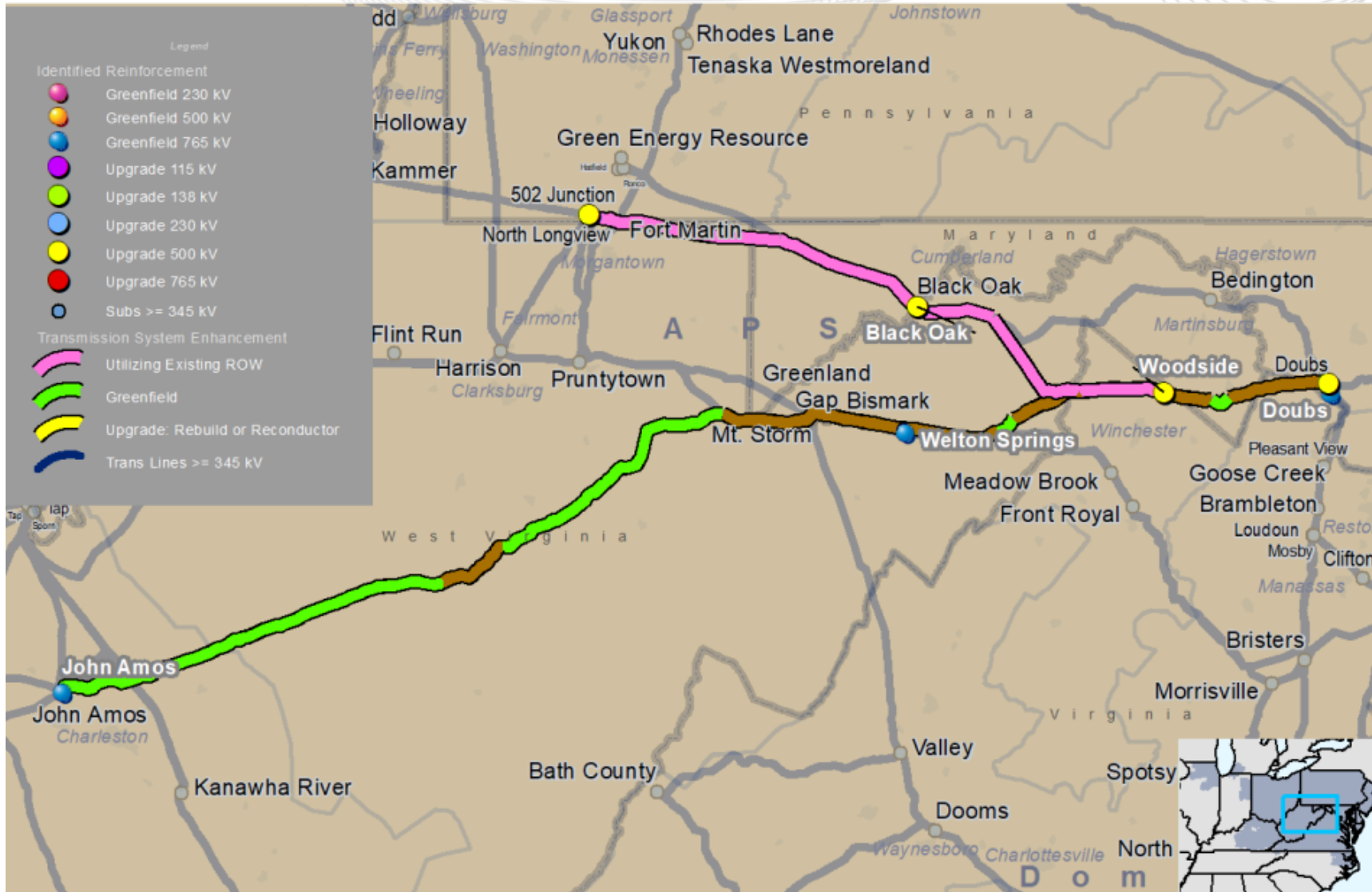


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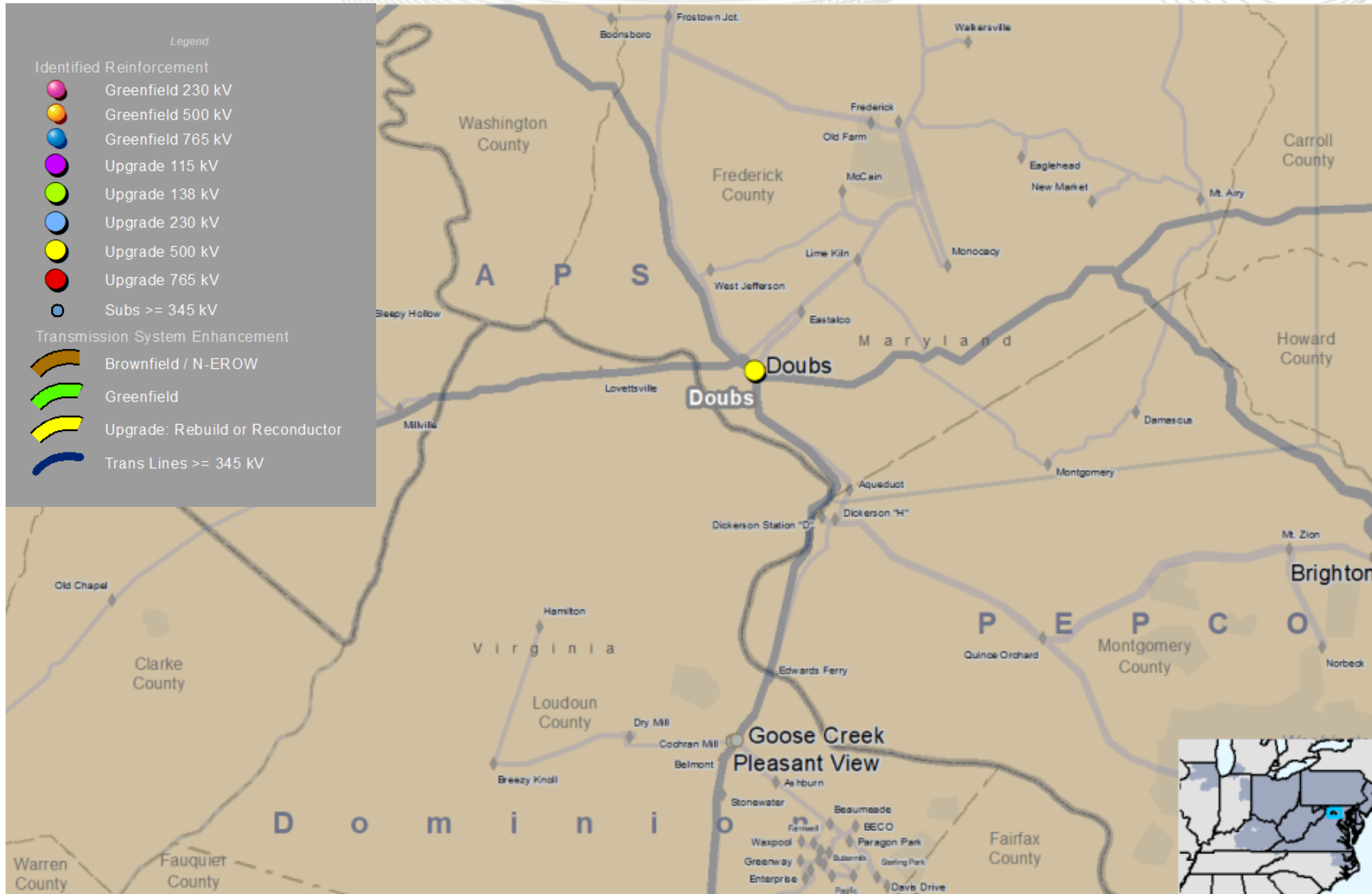




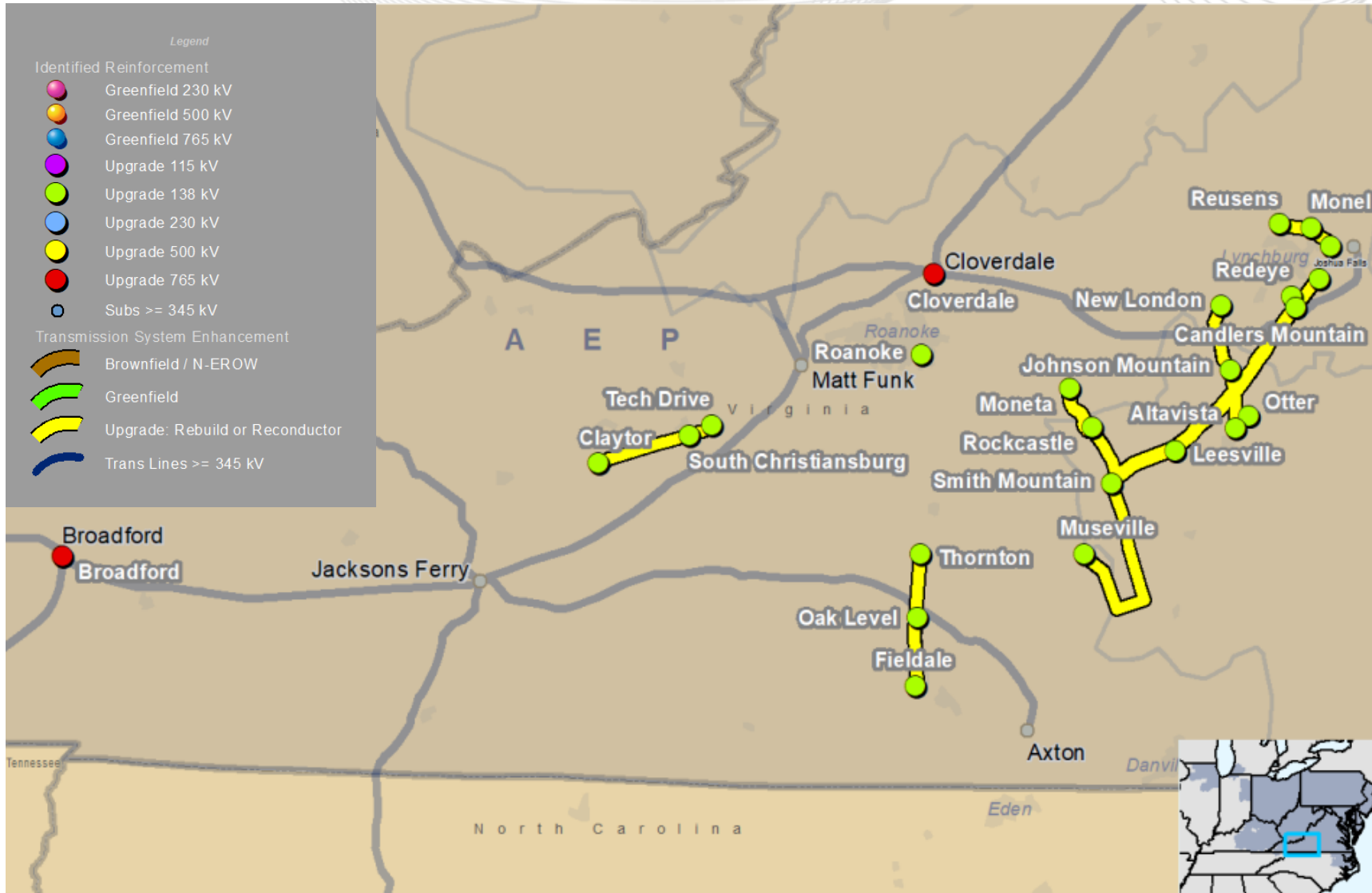
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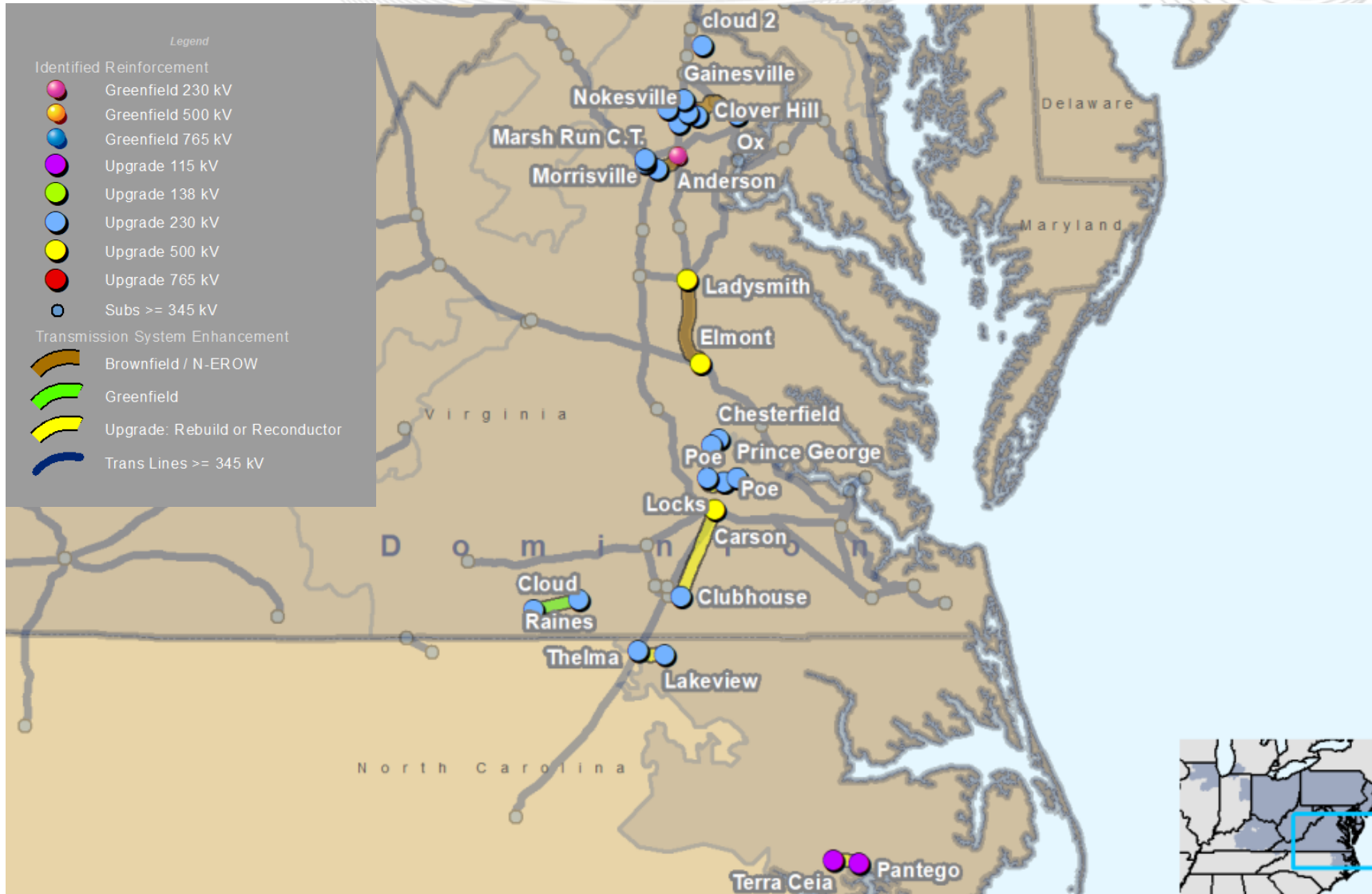


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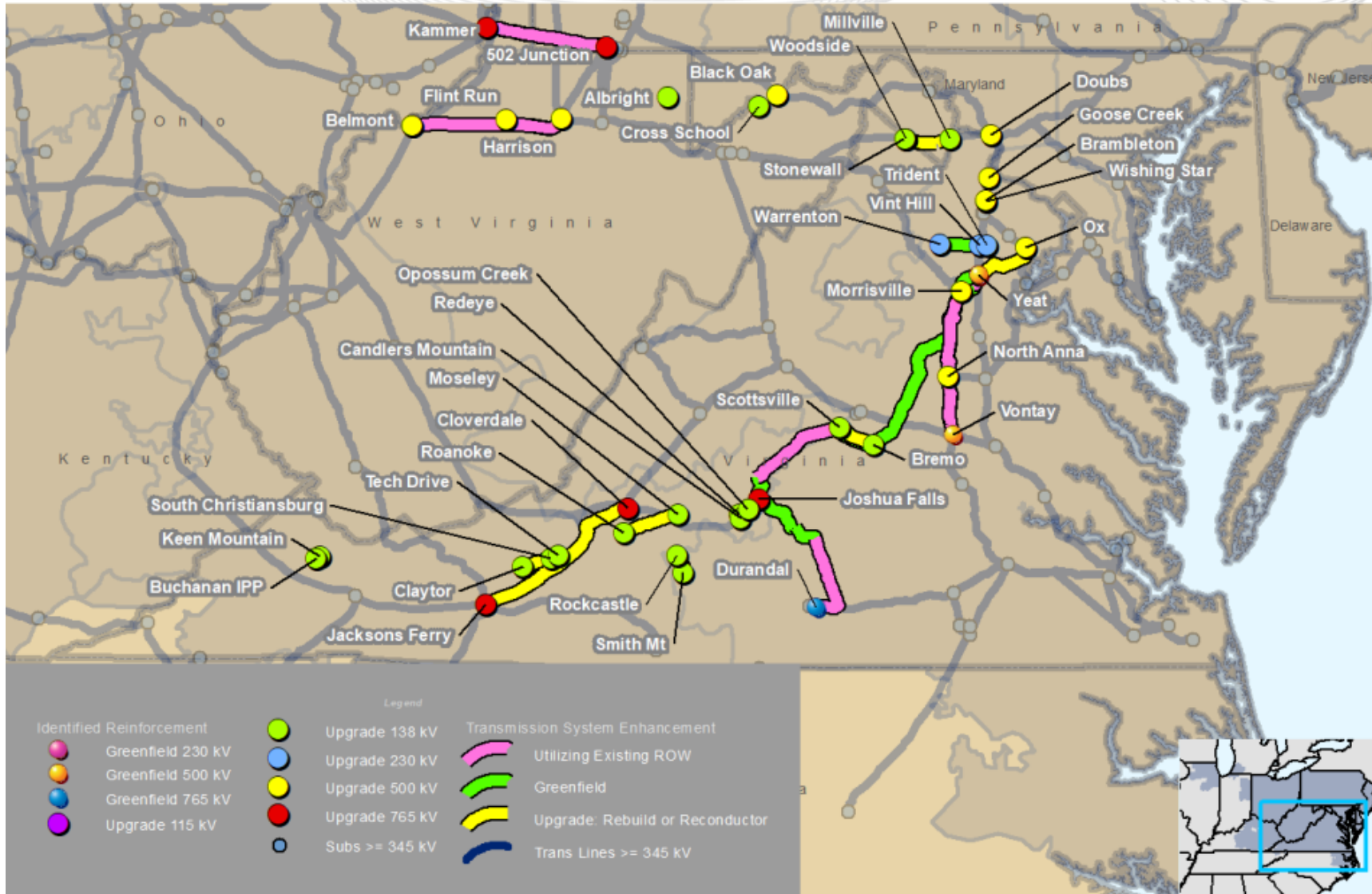
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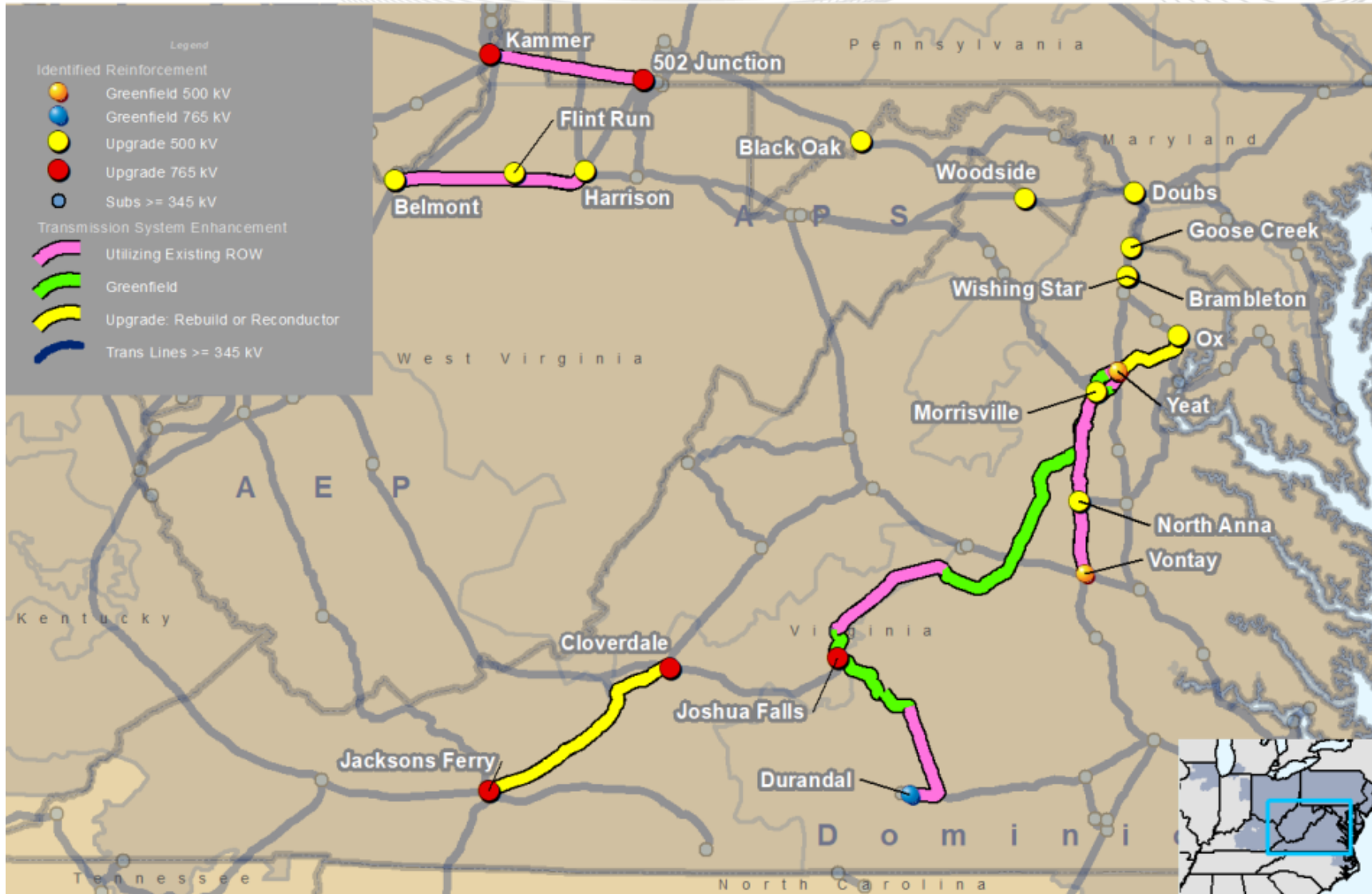
# Joint Proposal – 279

## DOM / FE / Transource

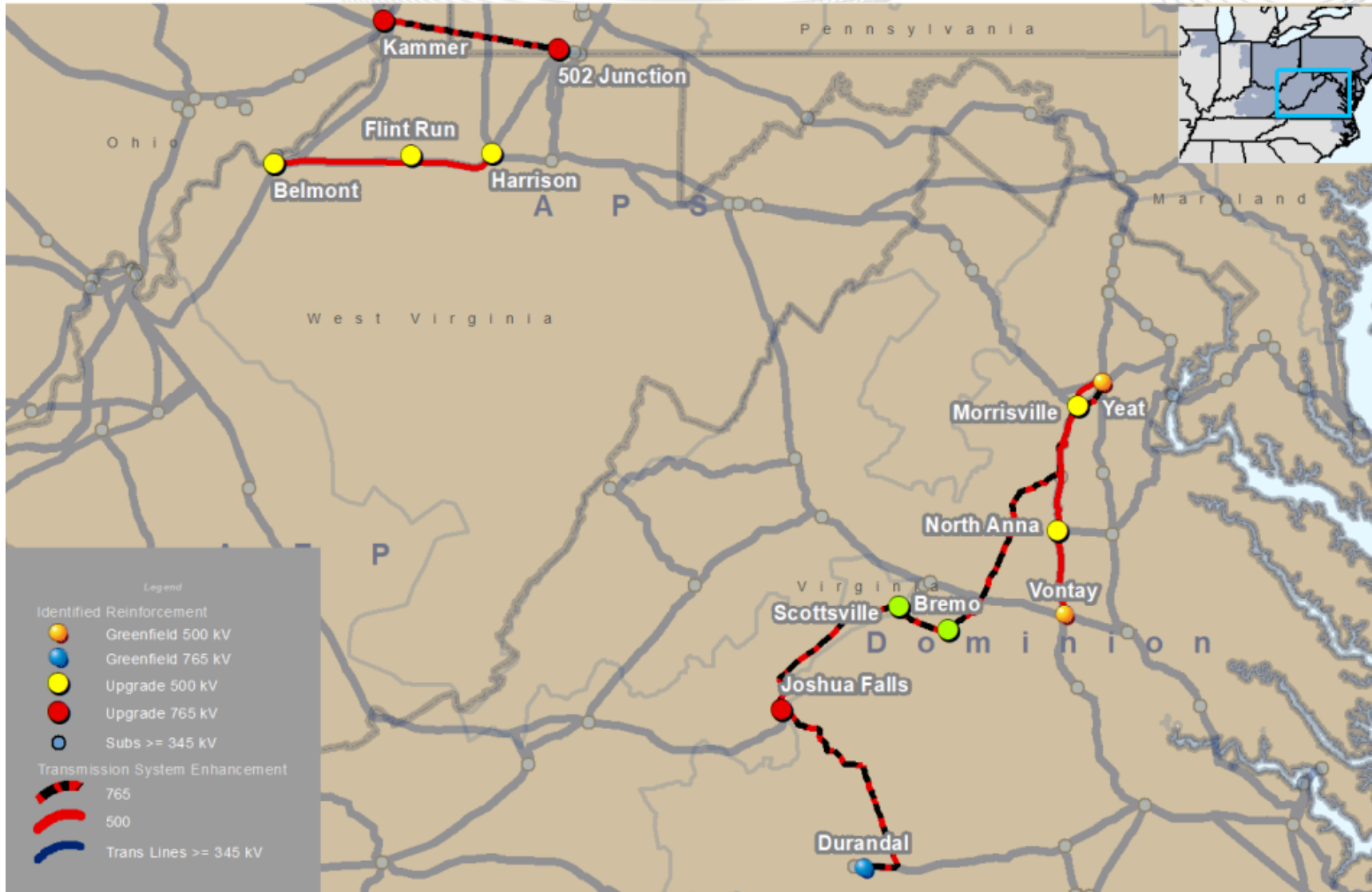


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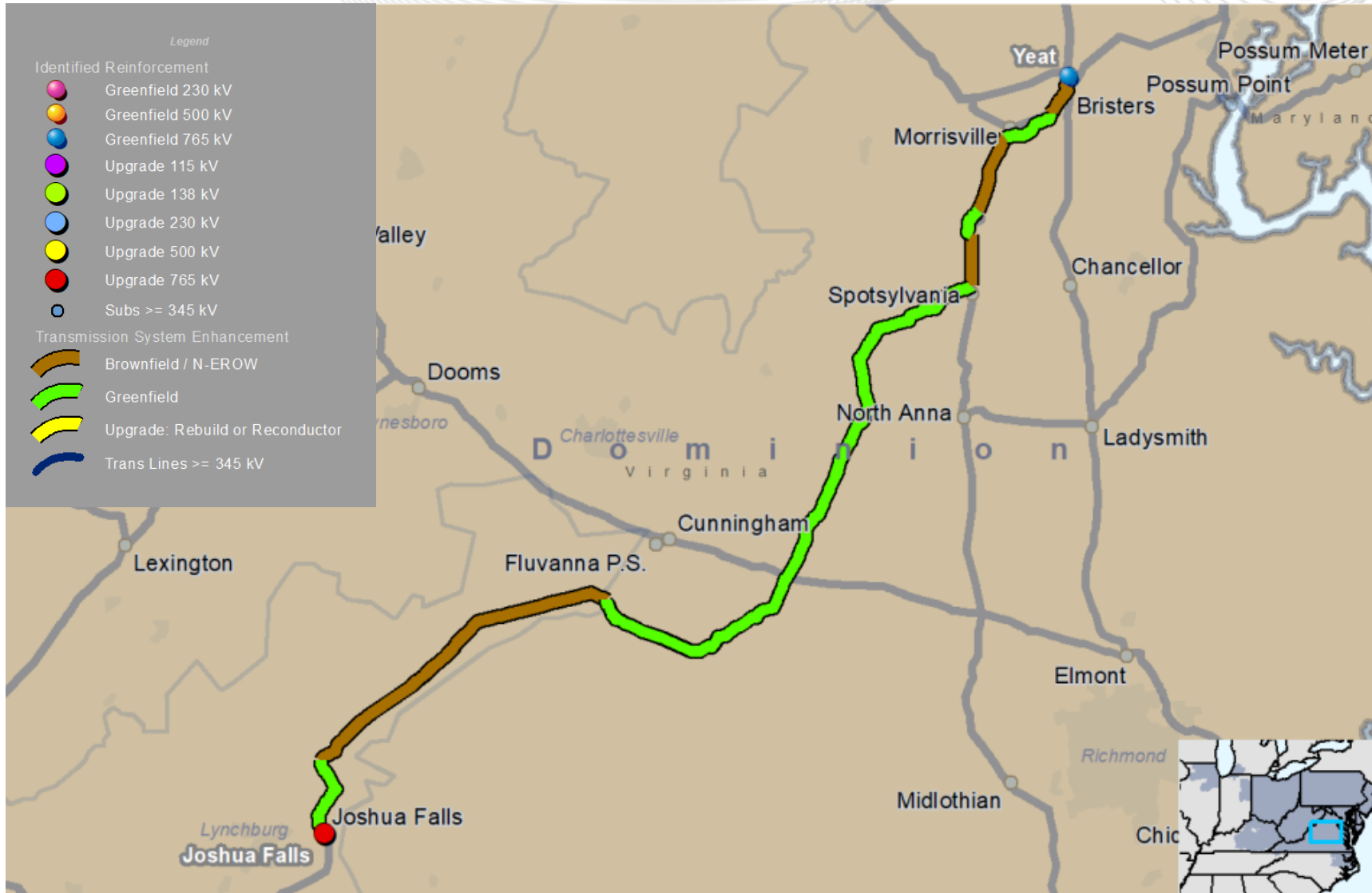
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# This Portfolio contains the following Proposals

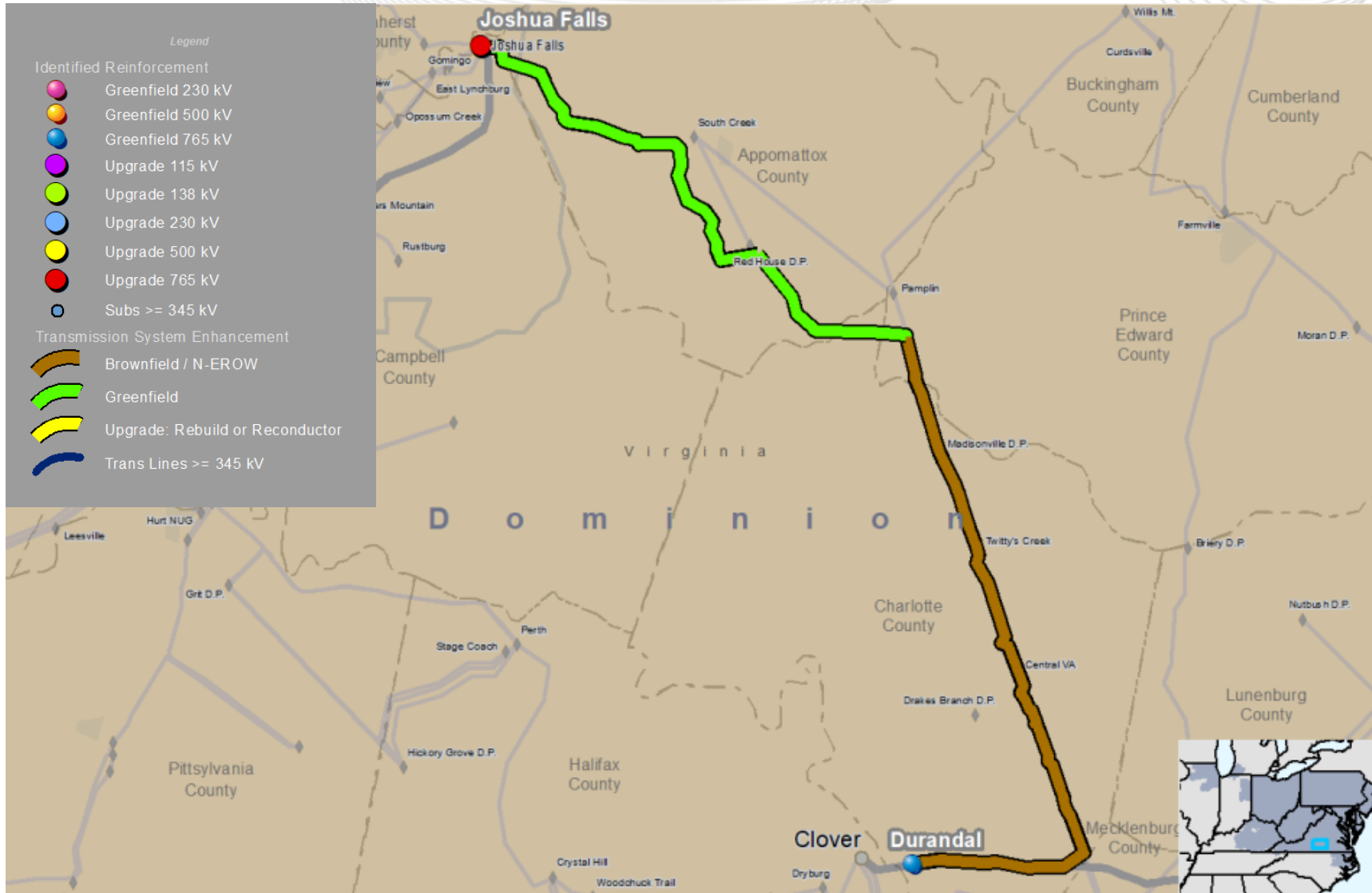
## Joint Proposal - 279

- 2024-W1-820 - Joshua Falls - Yeat w/warrenton – Trident
- 2024-W1-286 - Joshua Falls - Durandal
- 2024-W1-300 - Yeat - Vontay
- 2024-W1-617 - AEP incumbent upgrades for Portfolio #4
- 2024-W1-885 - FirstEnergy Components for Joint Venture Portfolios 2,3, and 4
- 2024-W1-977 or
- 2024-W1-727 - Belmont - Harrison 500 kV Line or Kammer - 502Jct 765 kV line
- 2024-W1-551 - Woodside/Chanceford 500 kV Terminal Swap at Doubs
- 2024-W1-781 - Dominion Reinforcements"



**NOTE:** 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.

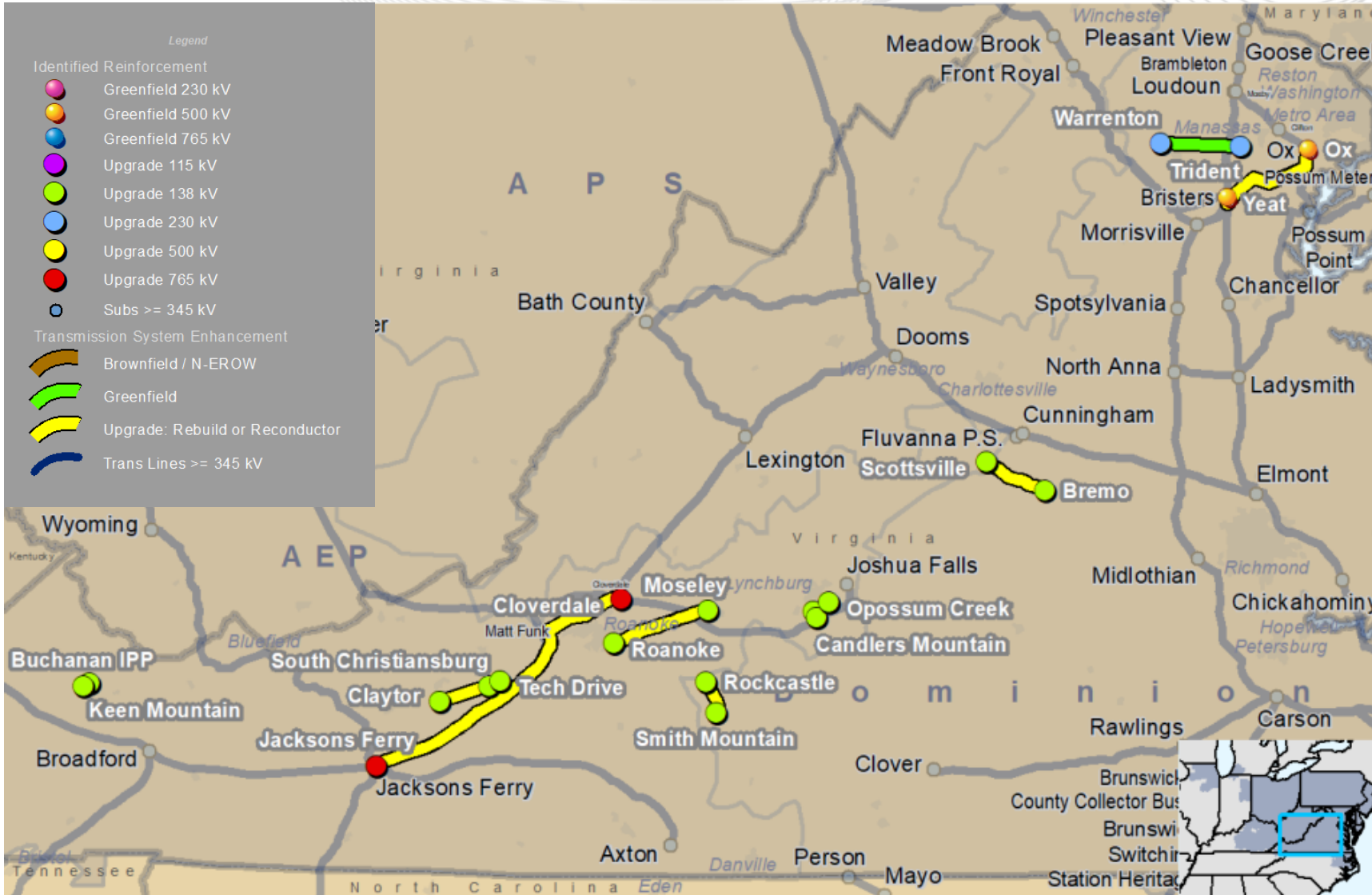




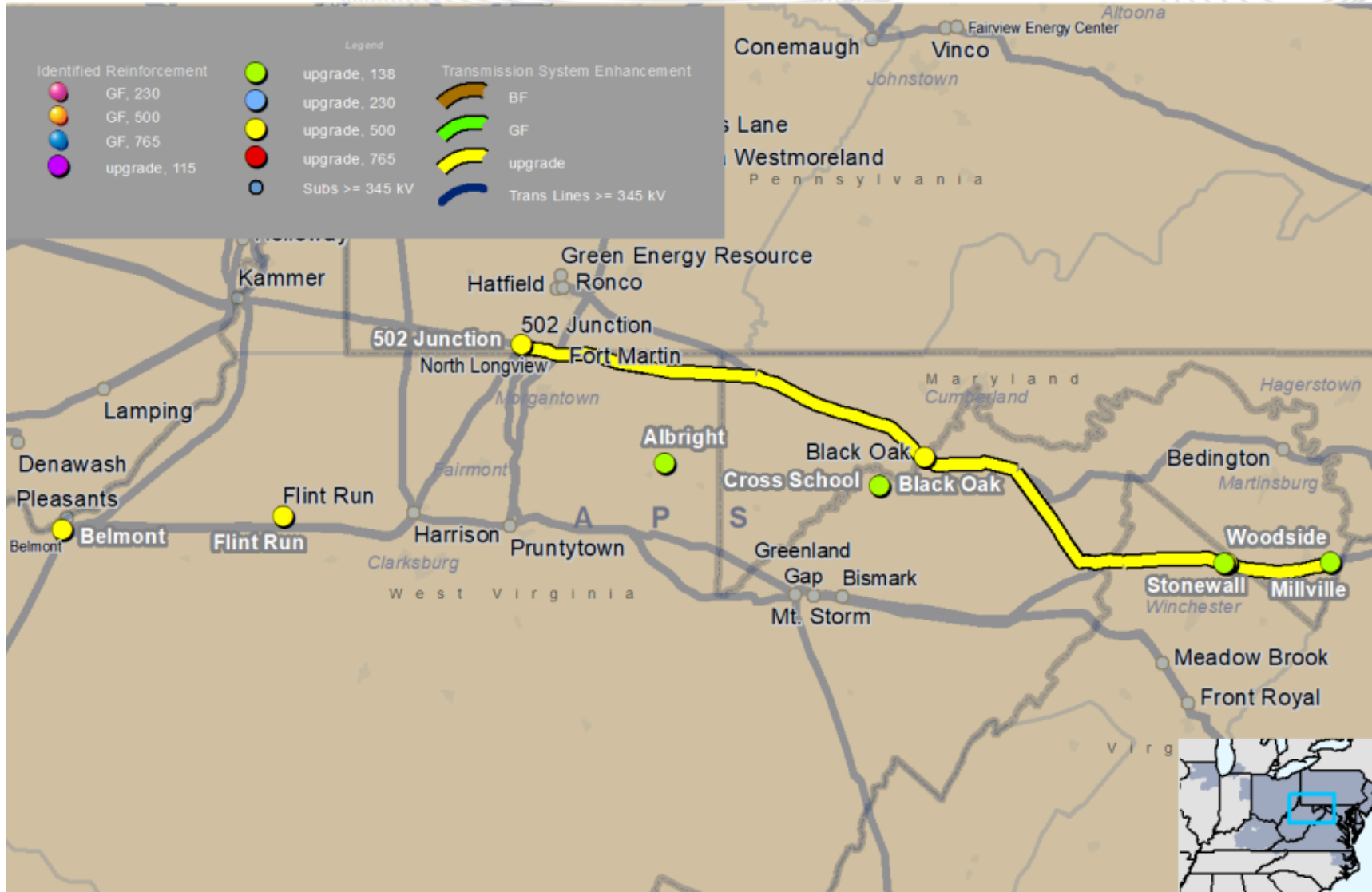
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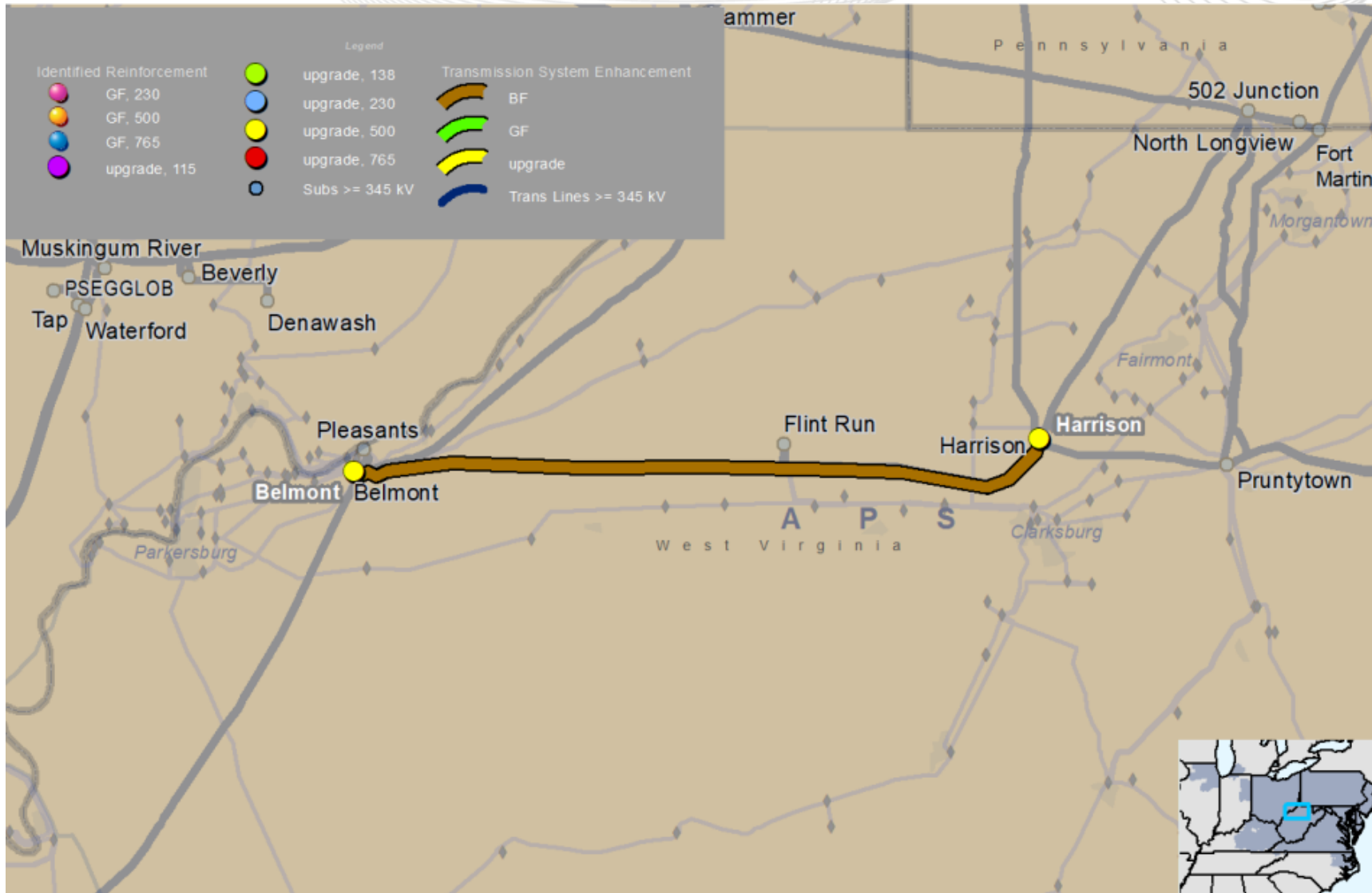


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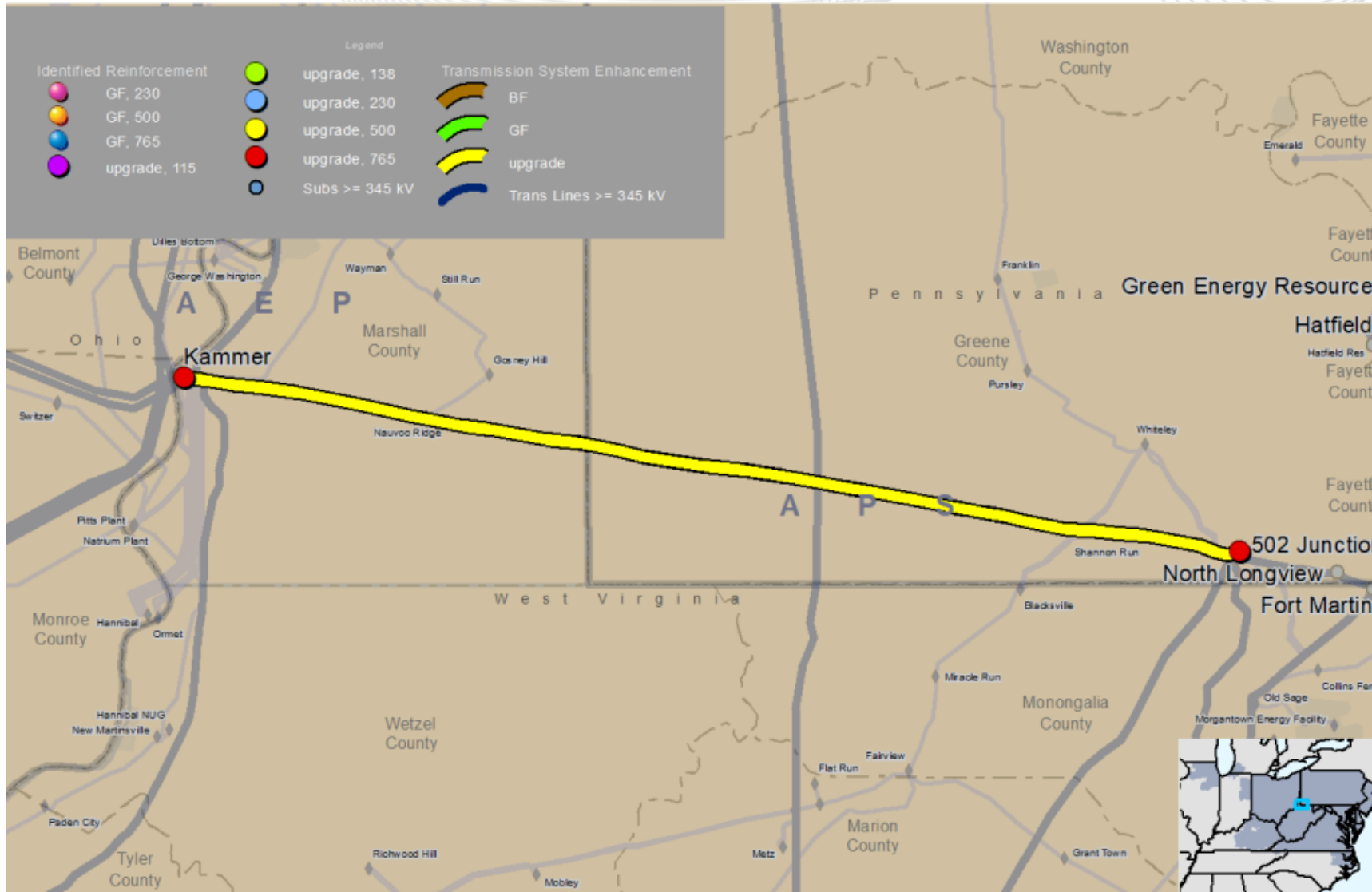


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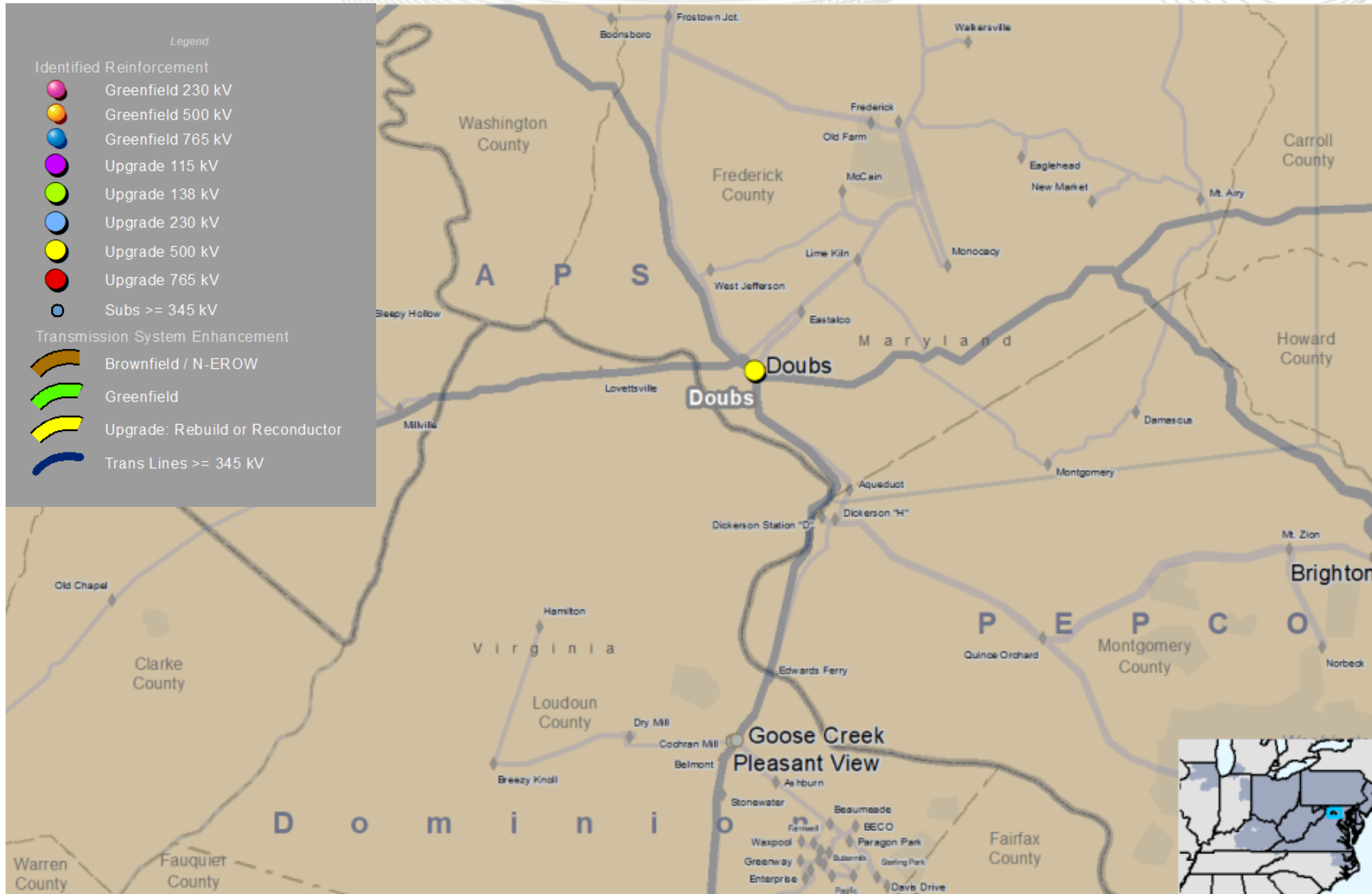




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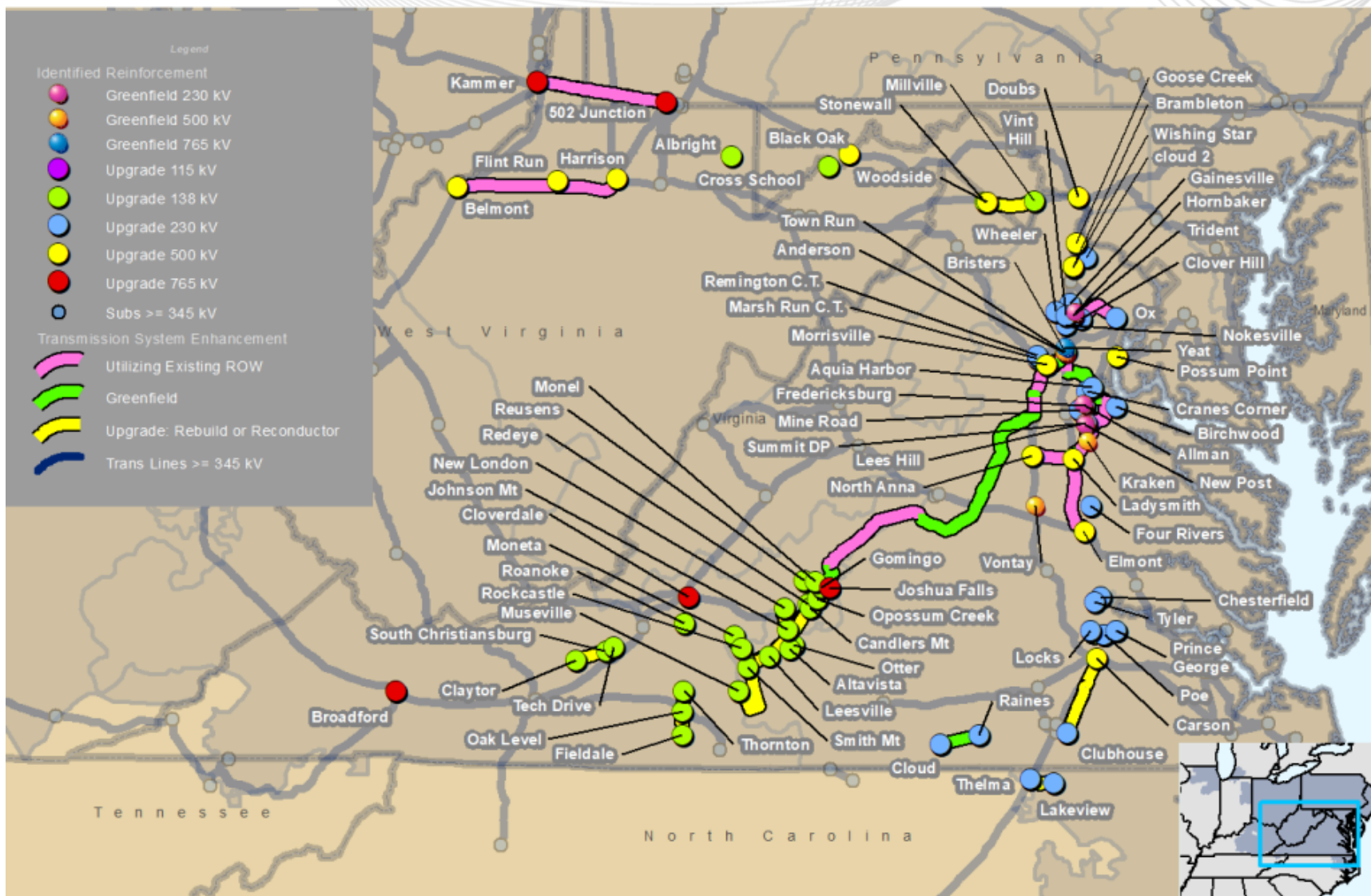


**NOTE:** This map is only intended to illustrate the general electrical connectivity of the projects, and should not be relied upon for exact geographical substation locations or line routes.

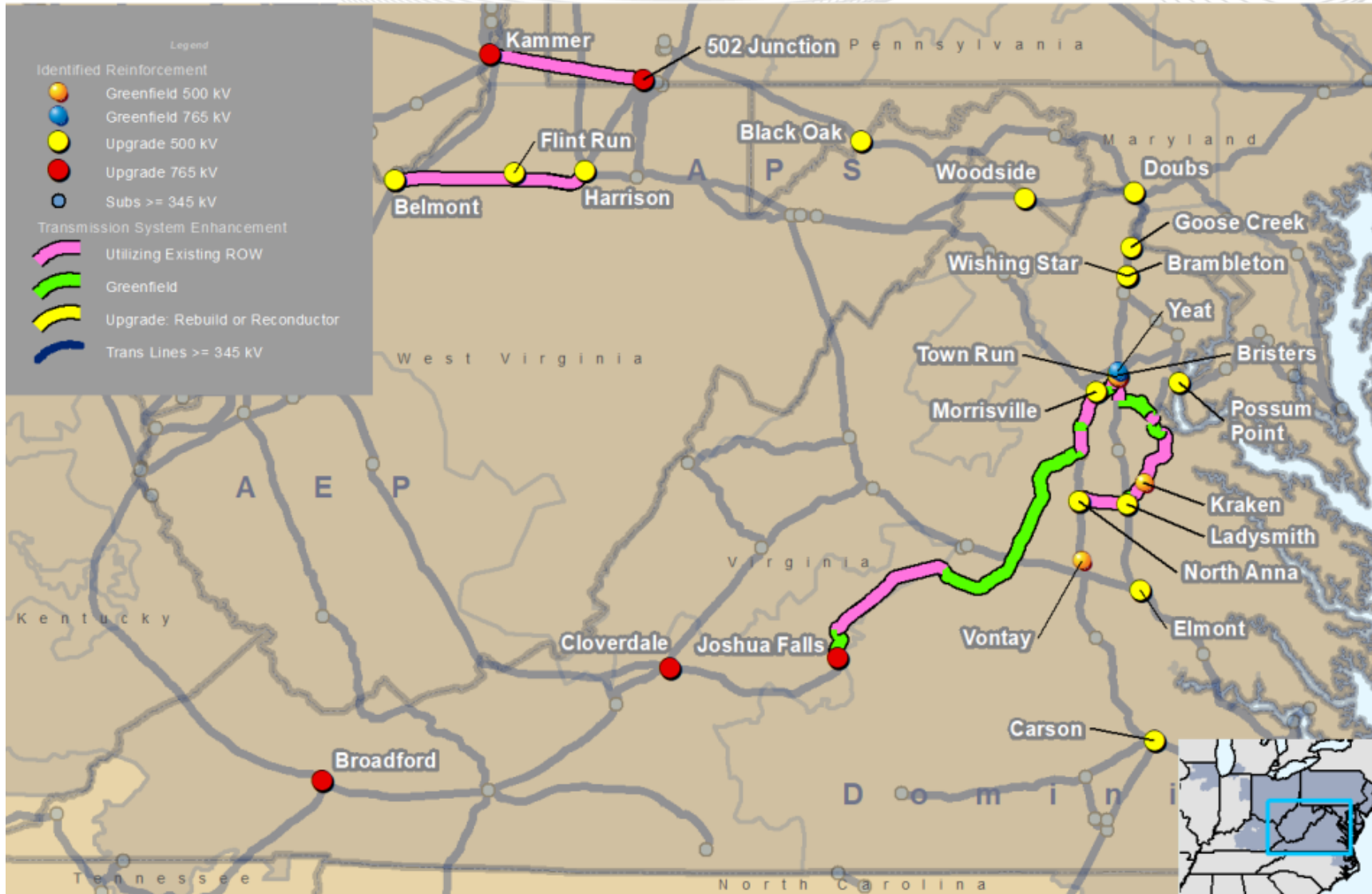


# Joint Proposal – 610

Dom / FE / Transource



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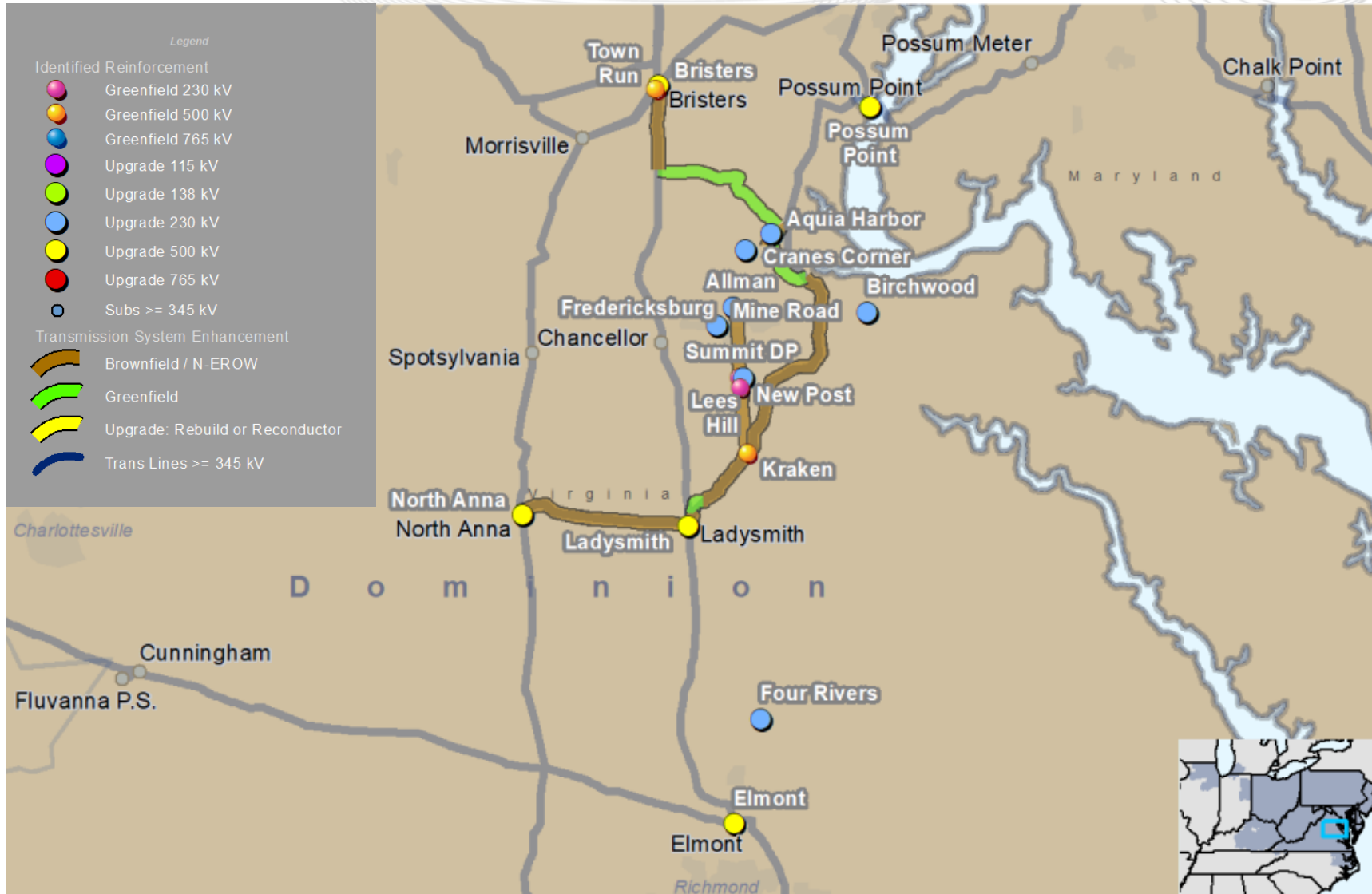




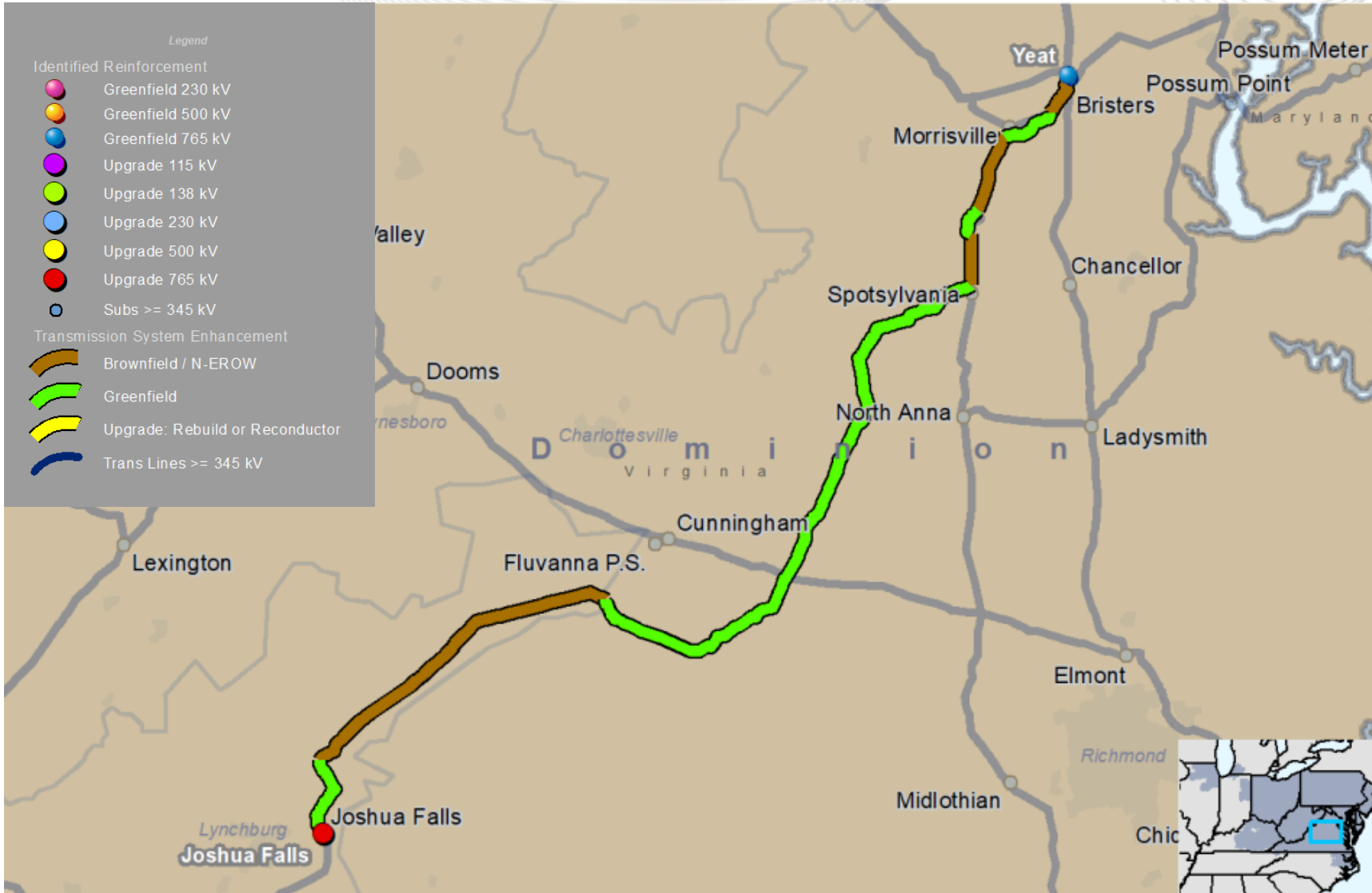
# This Portfolio contains the following Proposals

## Joint Proposal - 610

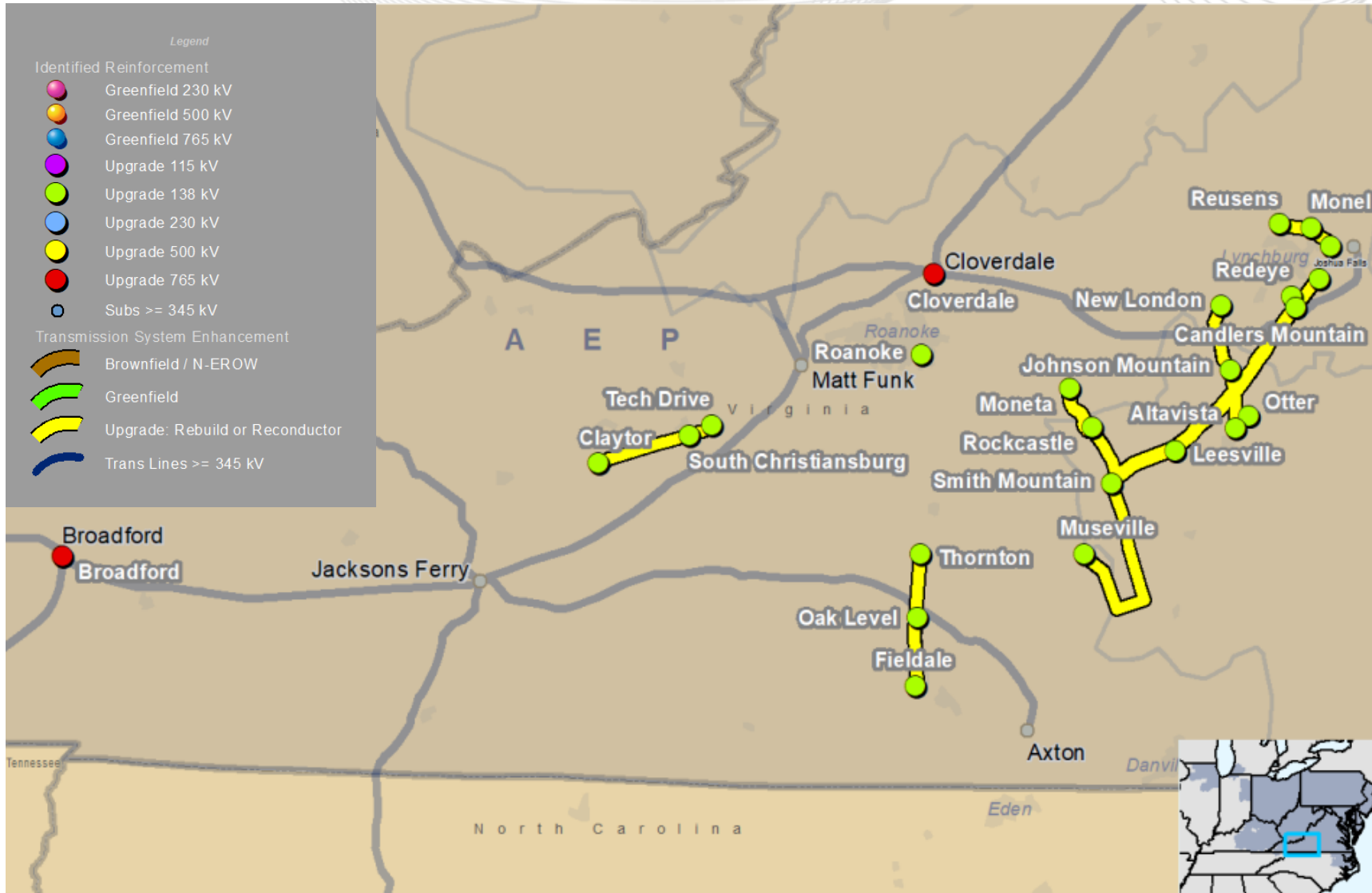
- 2024-W1-967 - Kraken loop
- 2024-W1-820 - Joshua Falls - Yeat
- 2024-W1-81 - AEP incumbent upgrades for Portfolio #1, 2 & 3
- 2024-W1-885 - FirstEnergy Components for Joint Venture Portfolios 2,3, and 4
- 2024-W1-977 - Belmont - Harrison 500 kV Line or
- 2024-W1-727 - Kammer - 502Jct 765 kV line
- 2024-W1-551 - Woodside/Chanceford 500 kV Terminal Swap at Doubs
- 2024-W1-24 - Dominion Reinforcements
- 2024-W1-781 - Dominion Reinforcements



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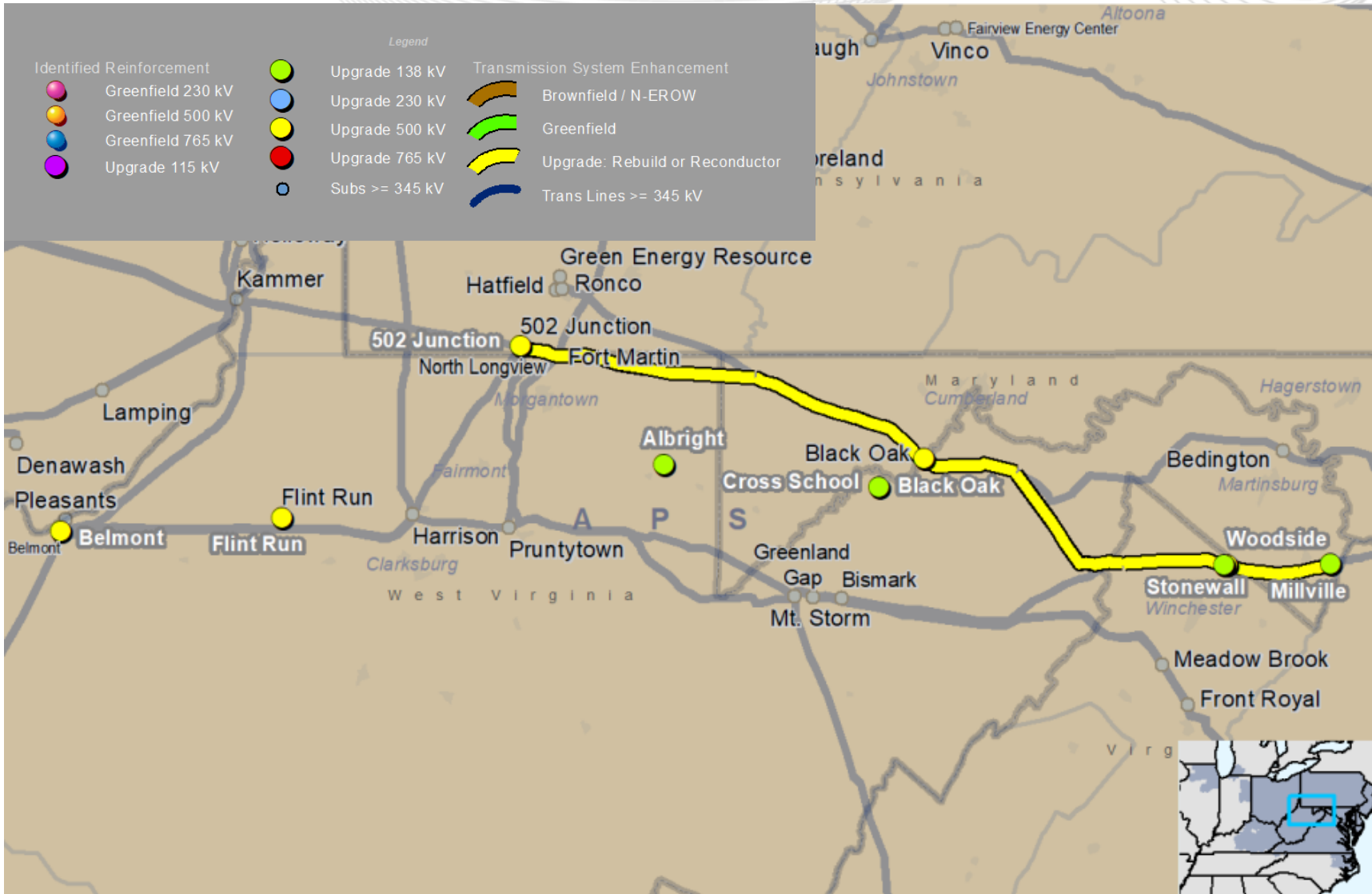


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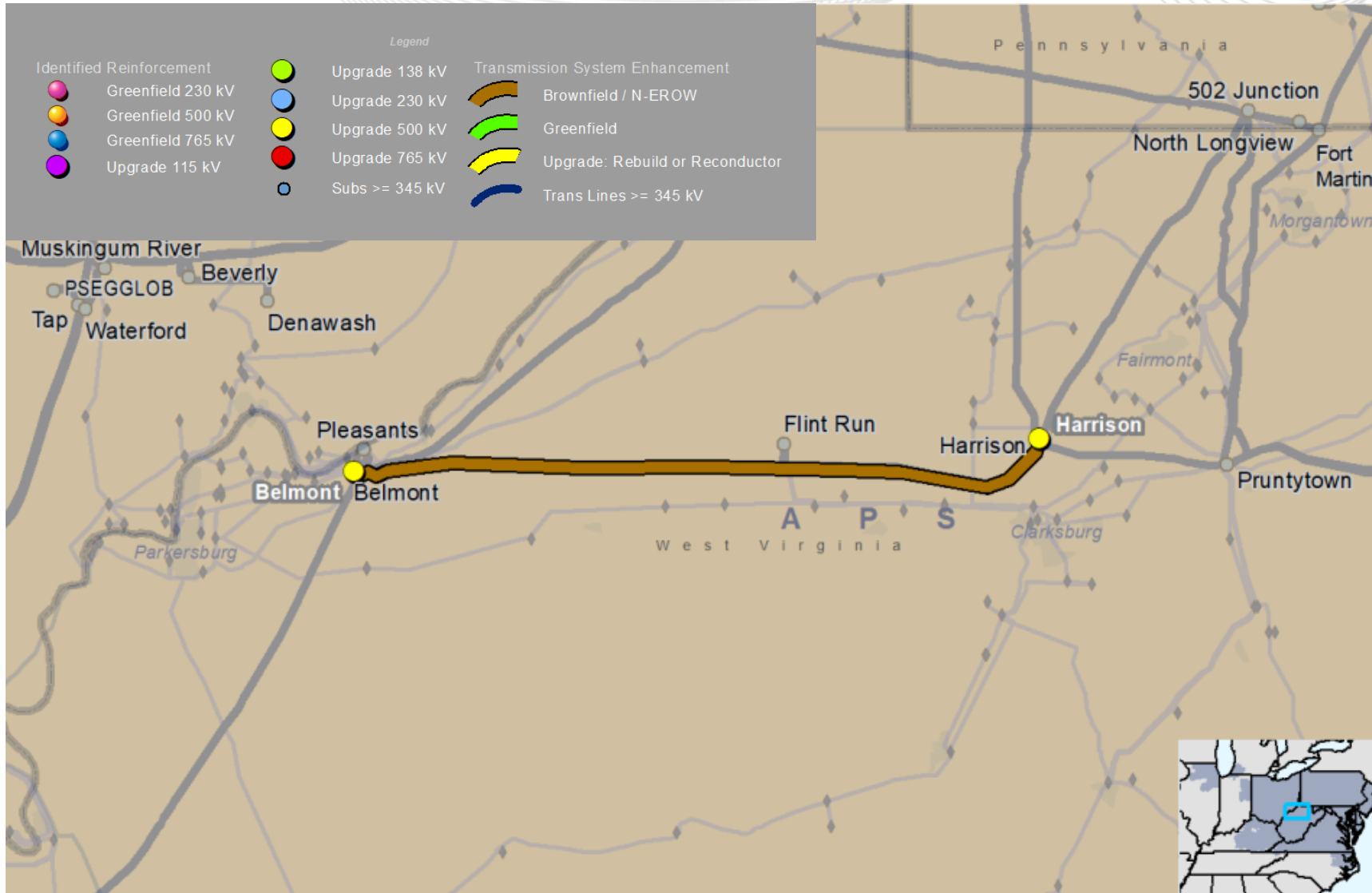


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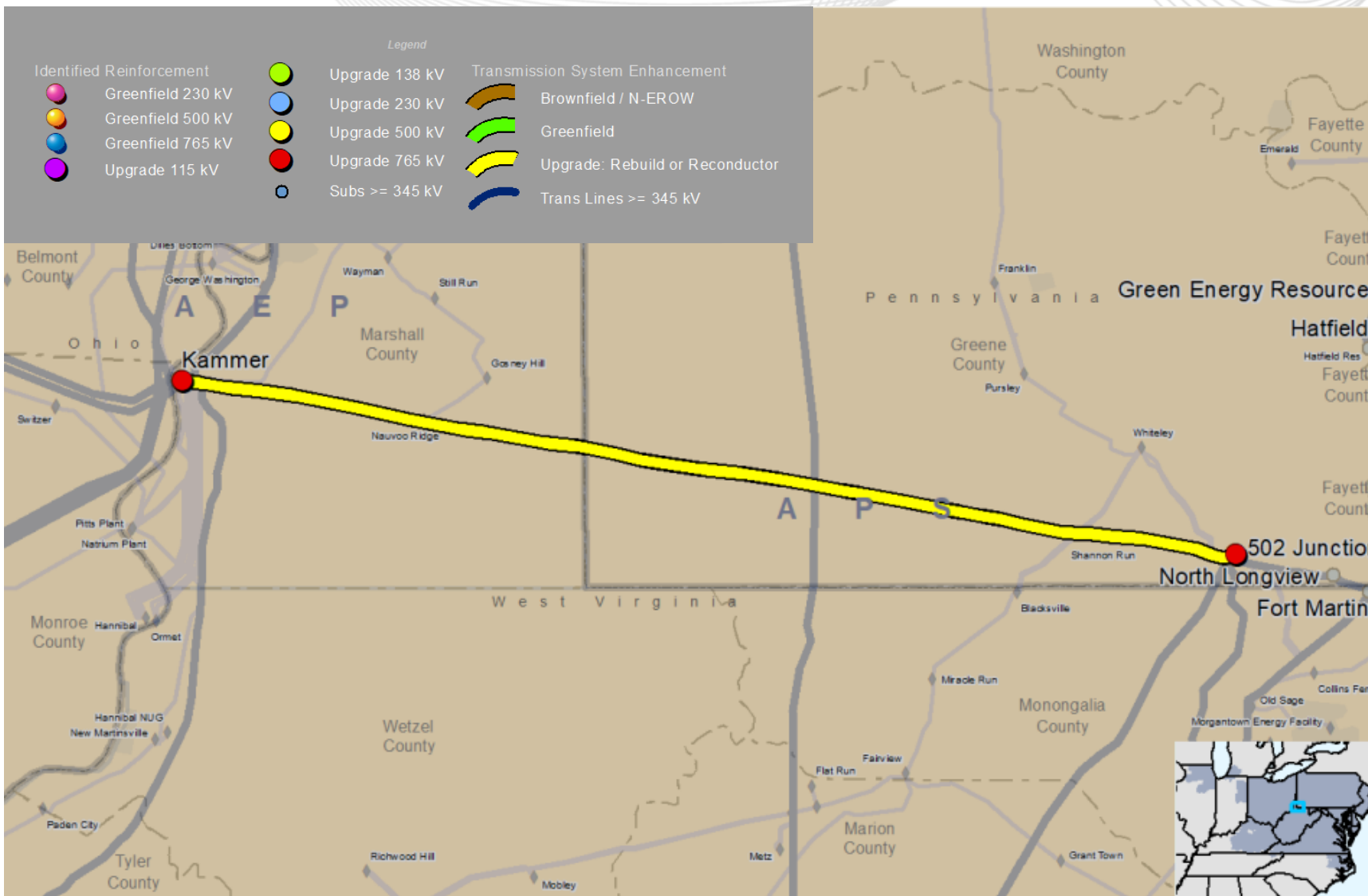




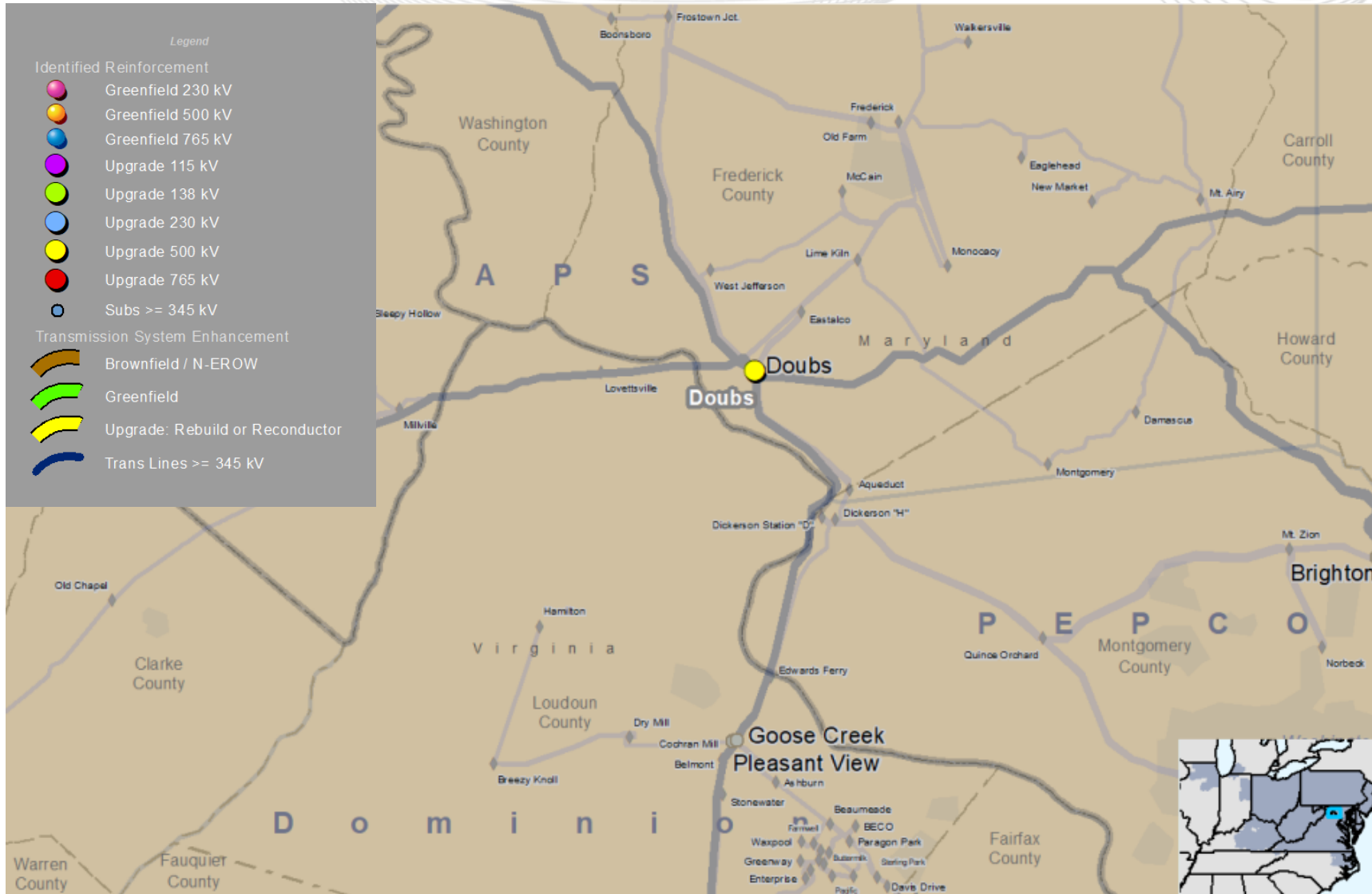
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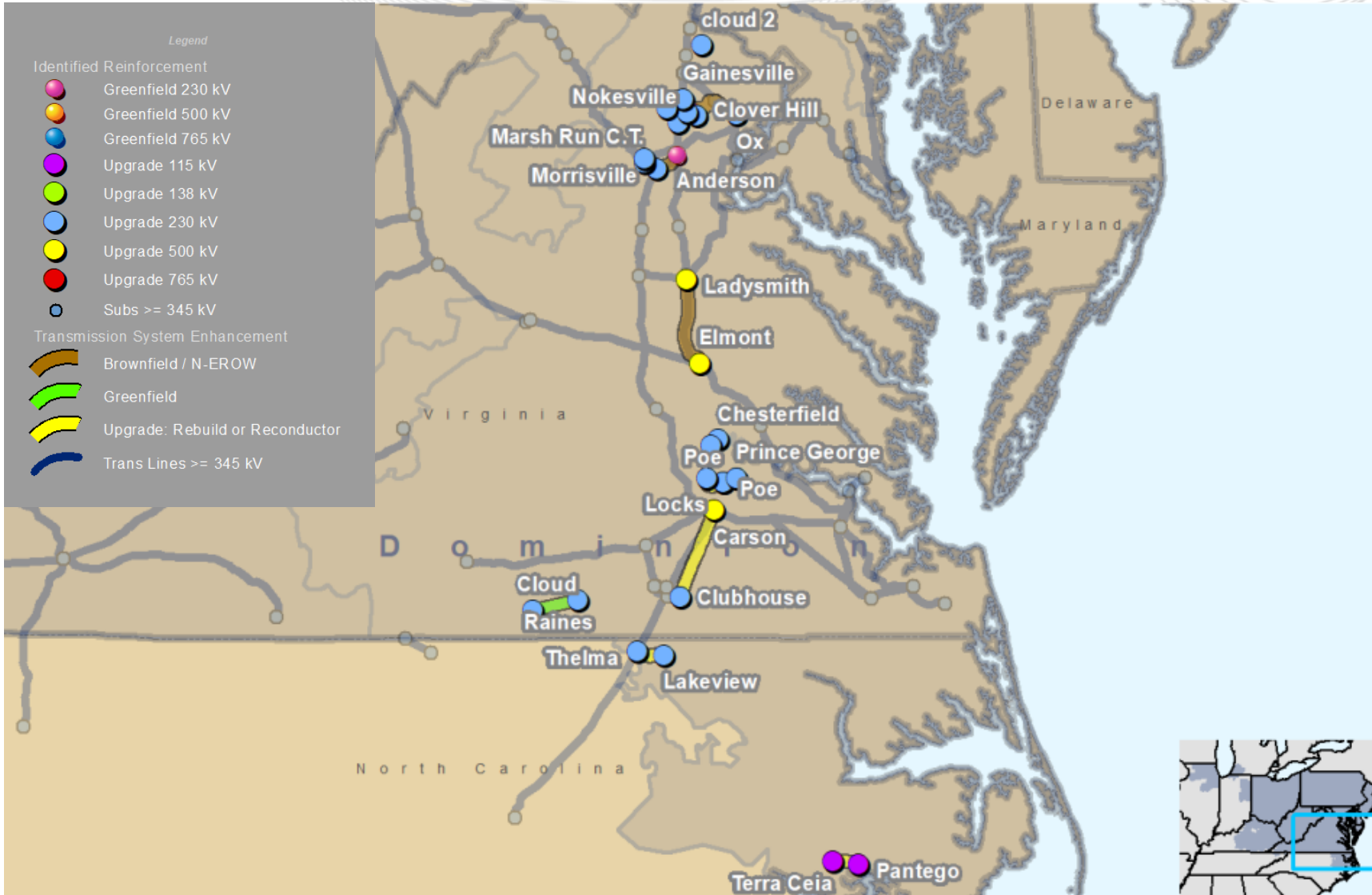


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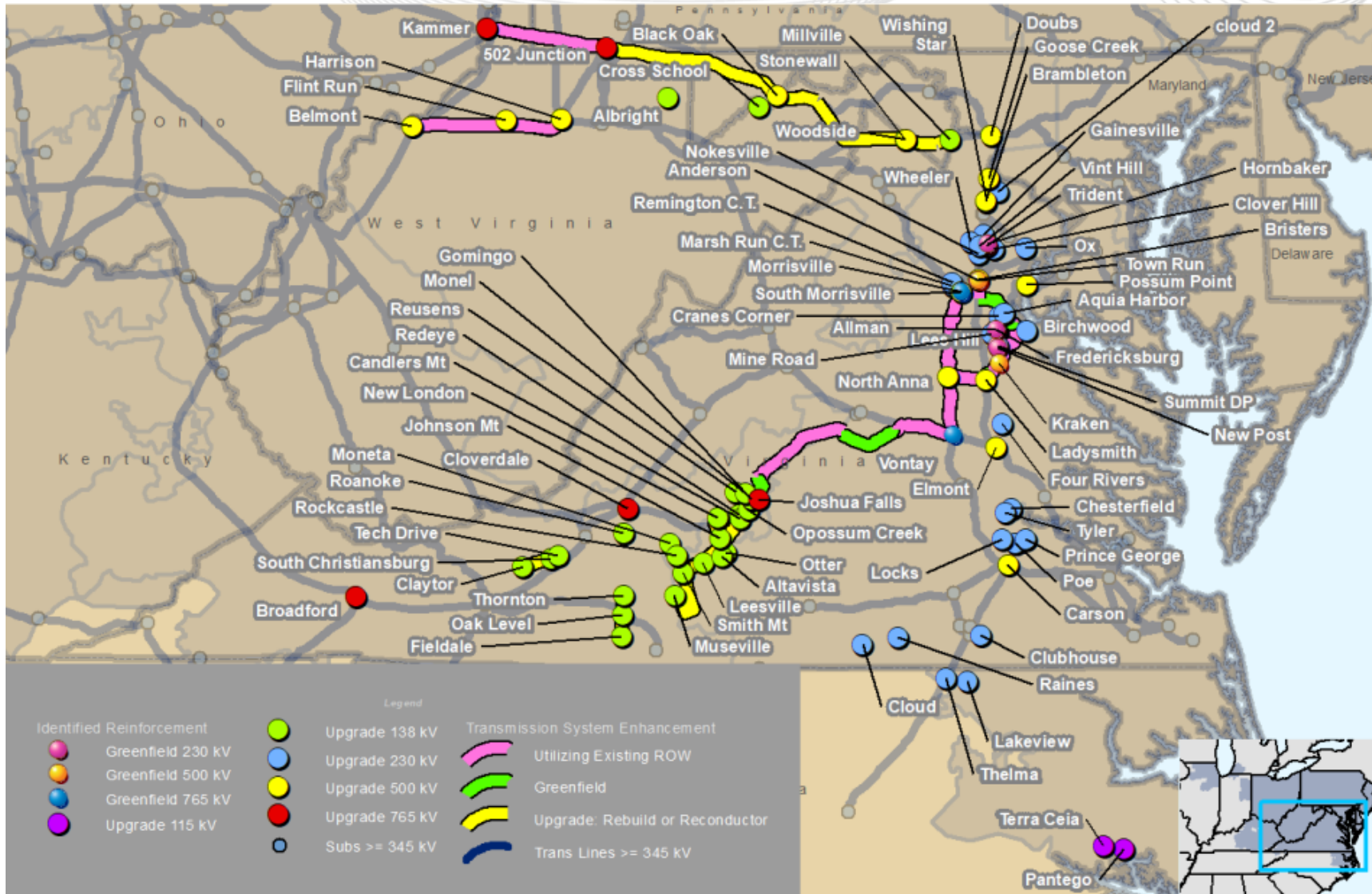
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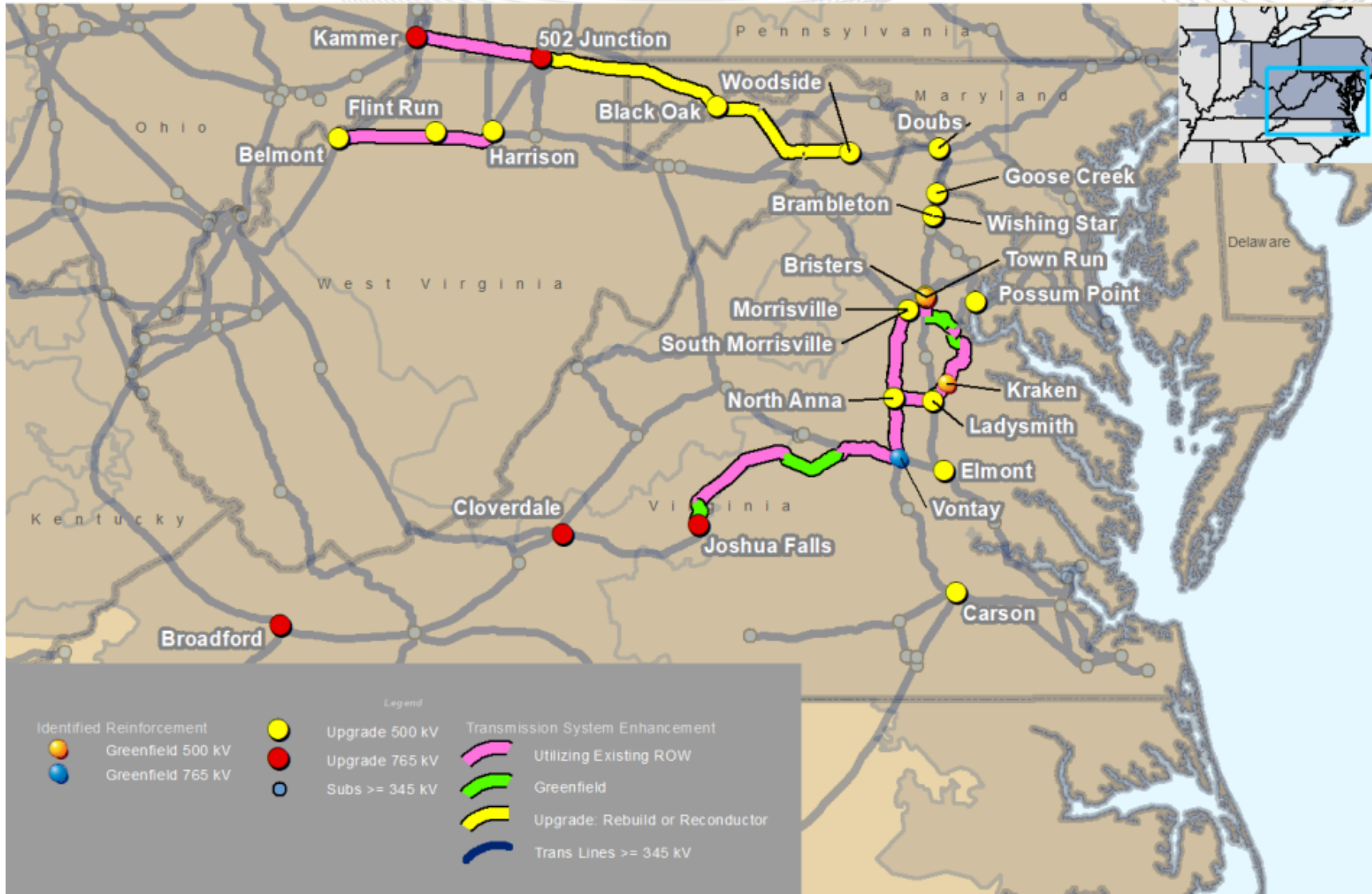
# Joint Proposal – 636

DOM / FE / Transource

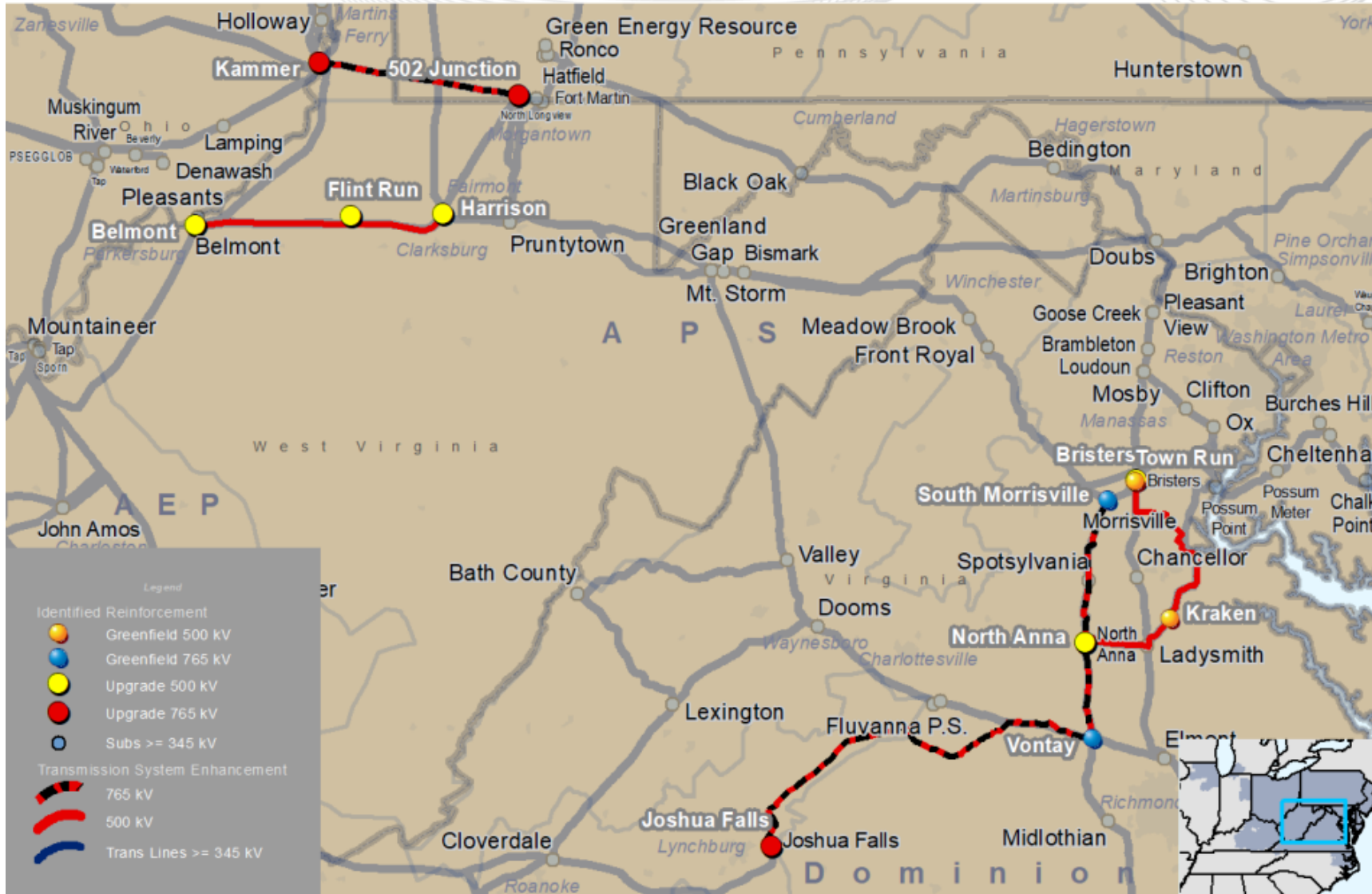


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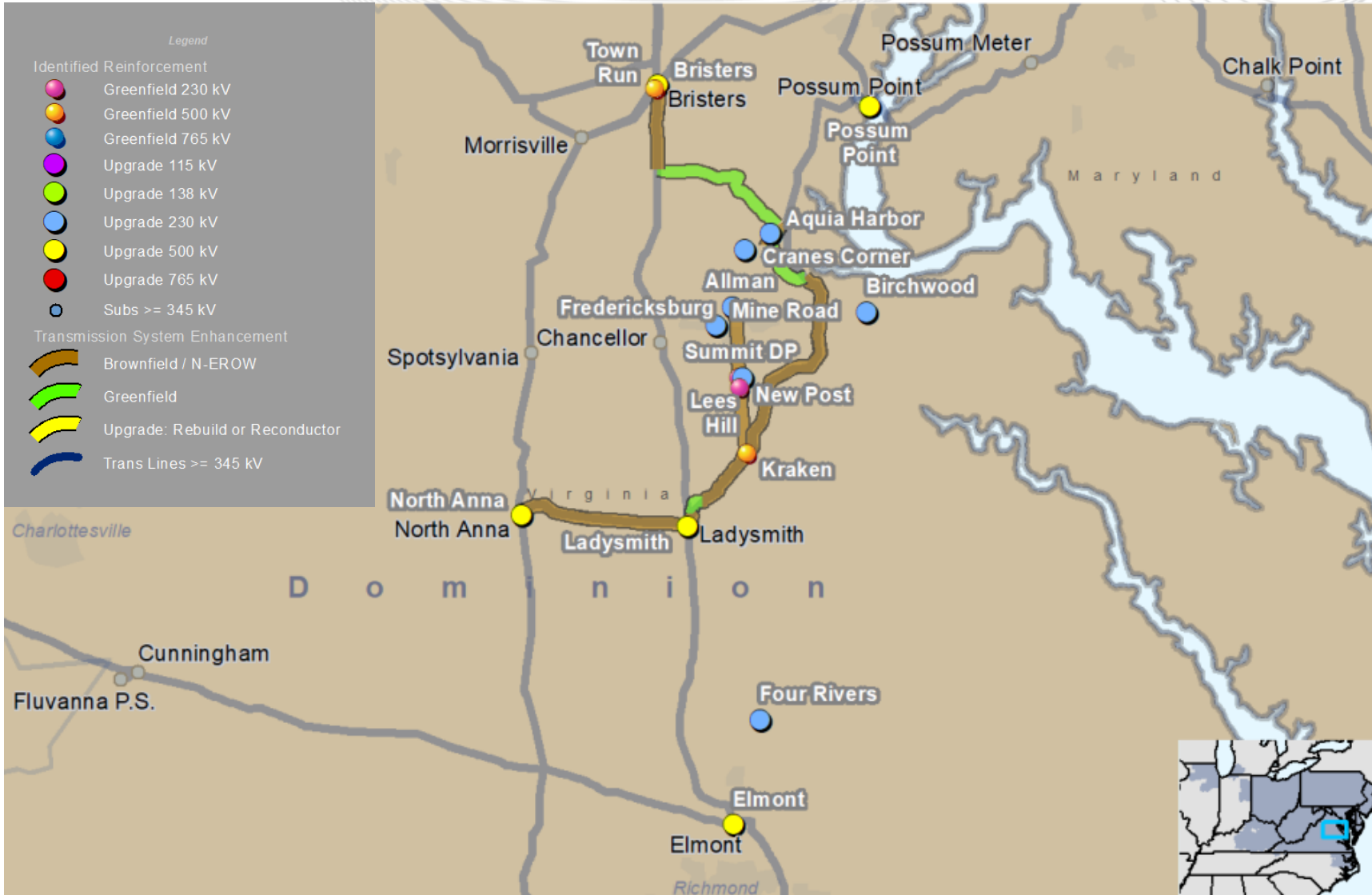
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# This Portfolio contains the following Proposals

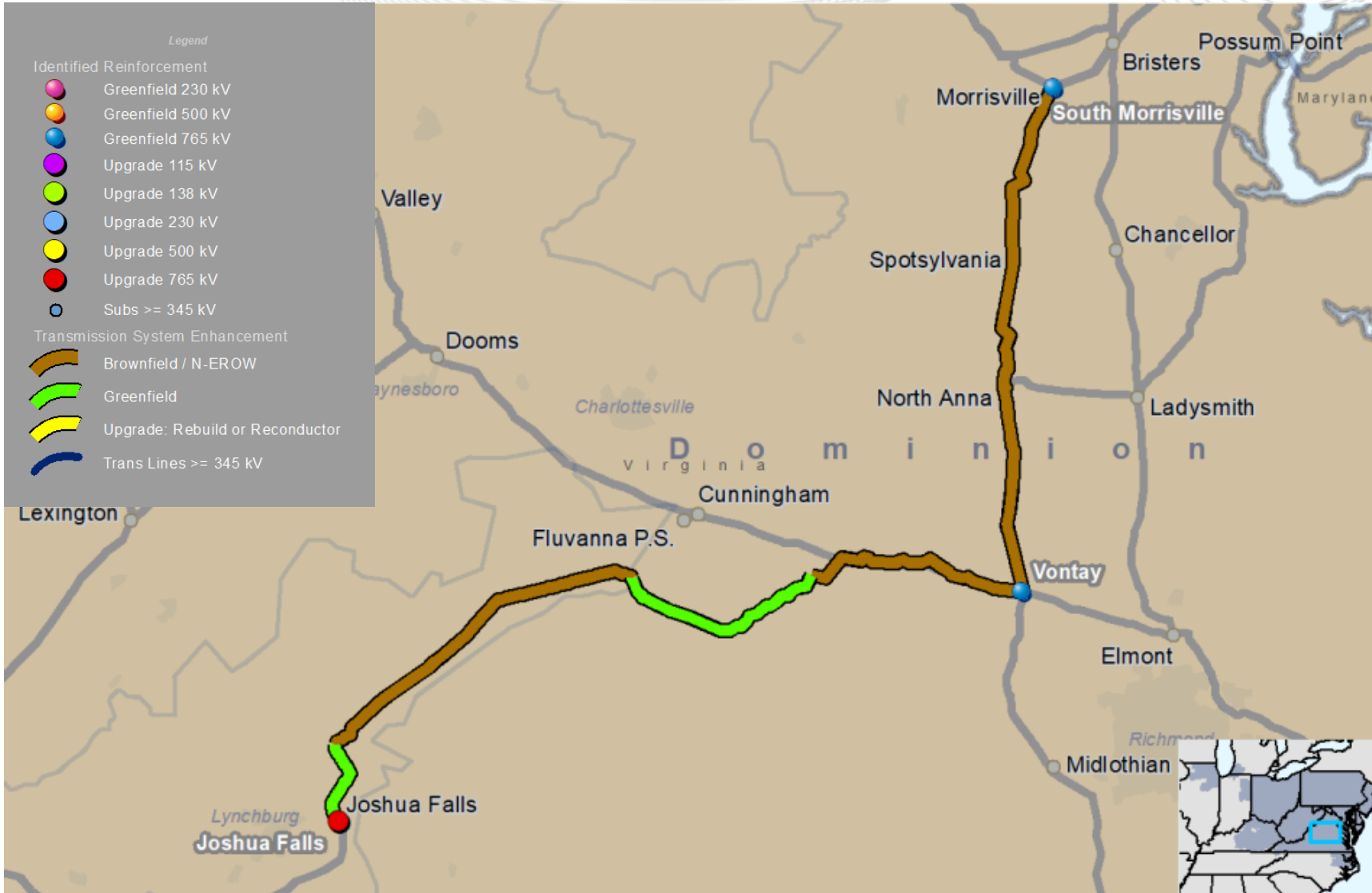
## Joint Proposal - 636

- 2024-W1-967-Kraken loop
- 2024-W1-665-Joshua Falls - Vontay - Morrisville South
- 2024-W1-81-AEP incumbent upgrades for Portfolio #1, 2 & 3
- 2024-W1-885-FirstEnergy Components for Joint Venture Portfolios 2,3, and 4
- 2024-W1-977 or
- 2024-W1-727 Belmont - Harrison 500 kV Line or Kammer - 502Jct 765 kV line
- 2024-W1-551-Woodside/Chanceford 500 kV Terminal Swap at Doubs
- 2024-W1-24-Dominion Reinforcements
- 2024-W1-781-Dominion Reinforcements"

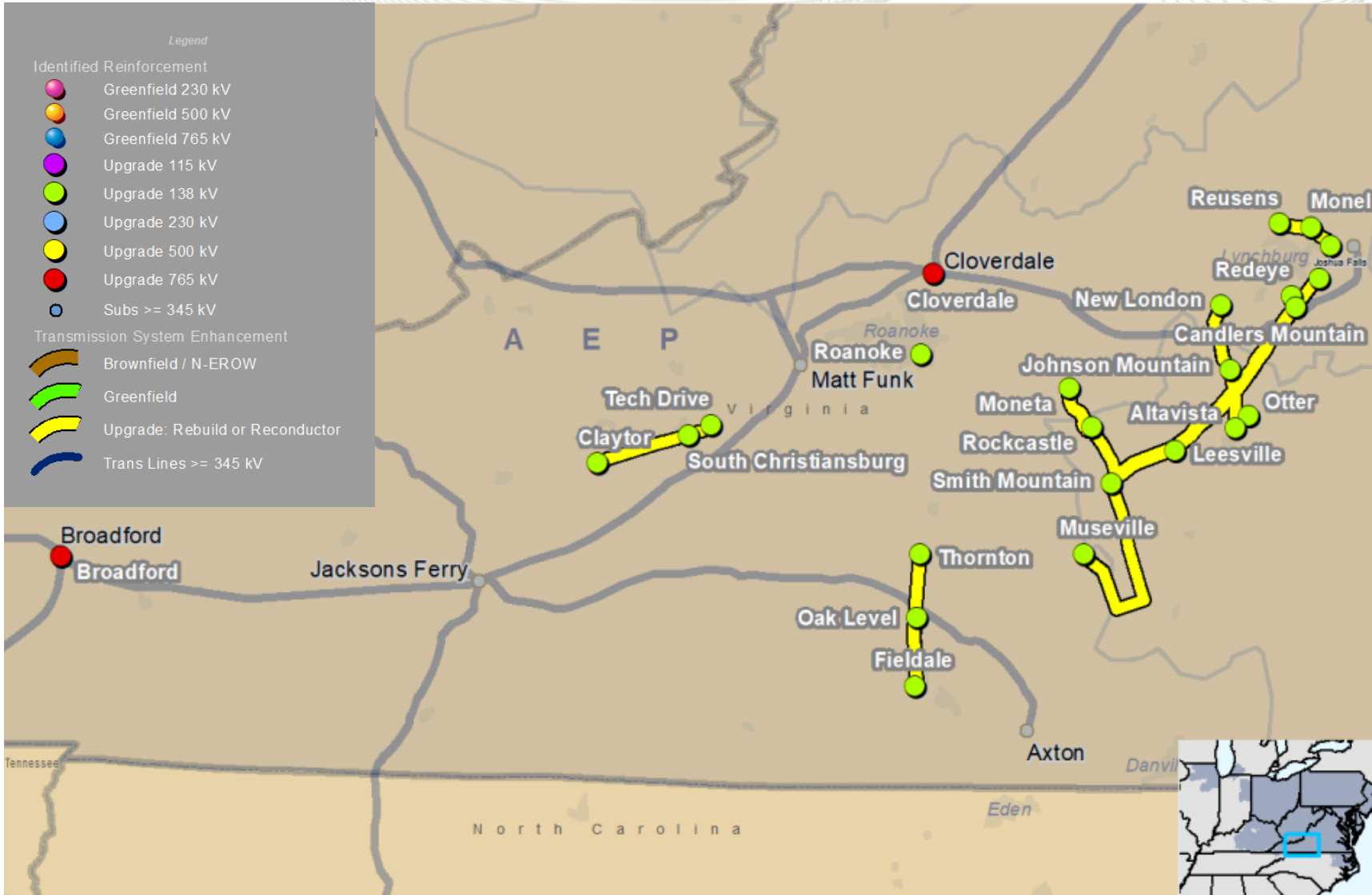


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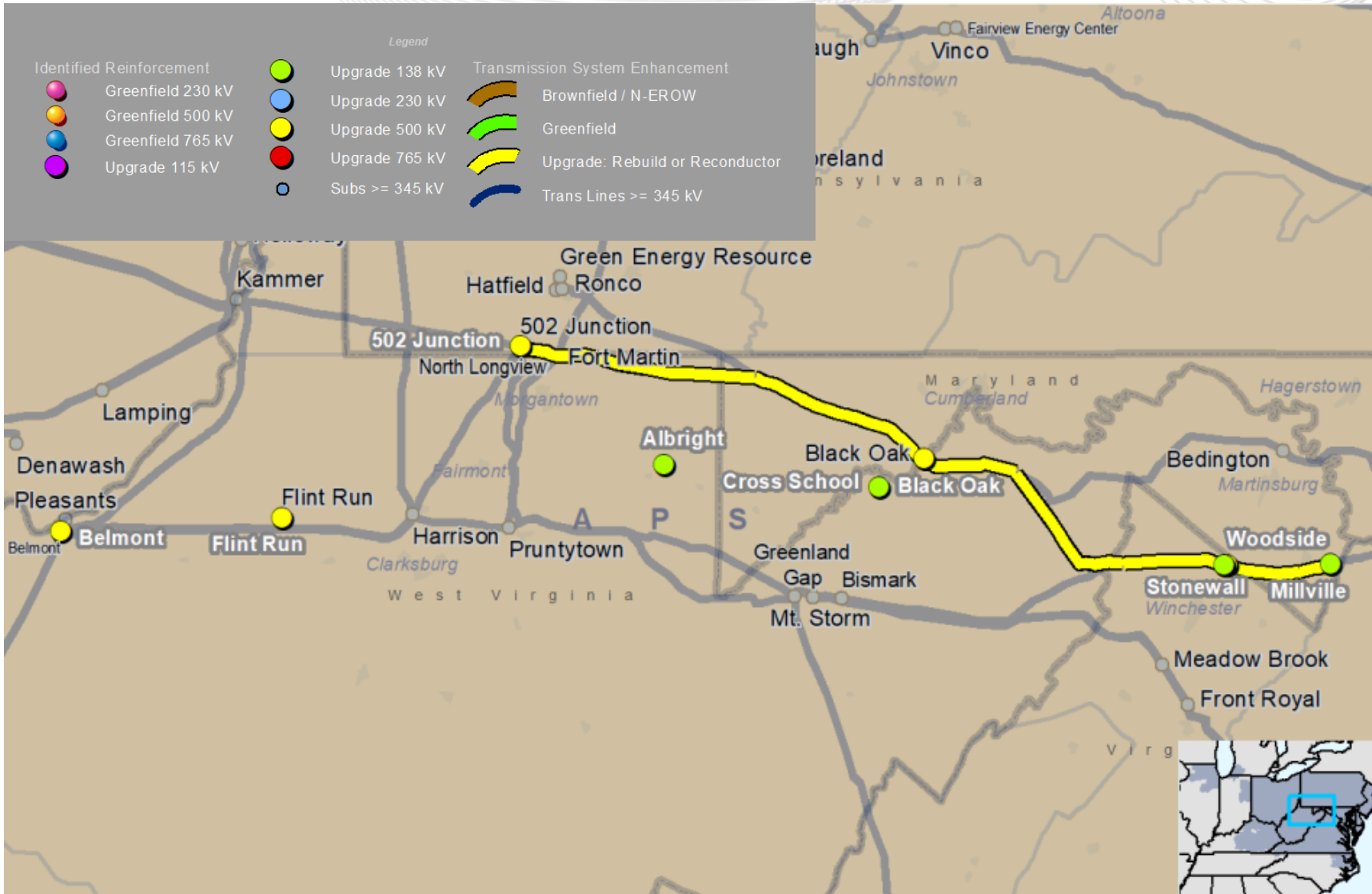




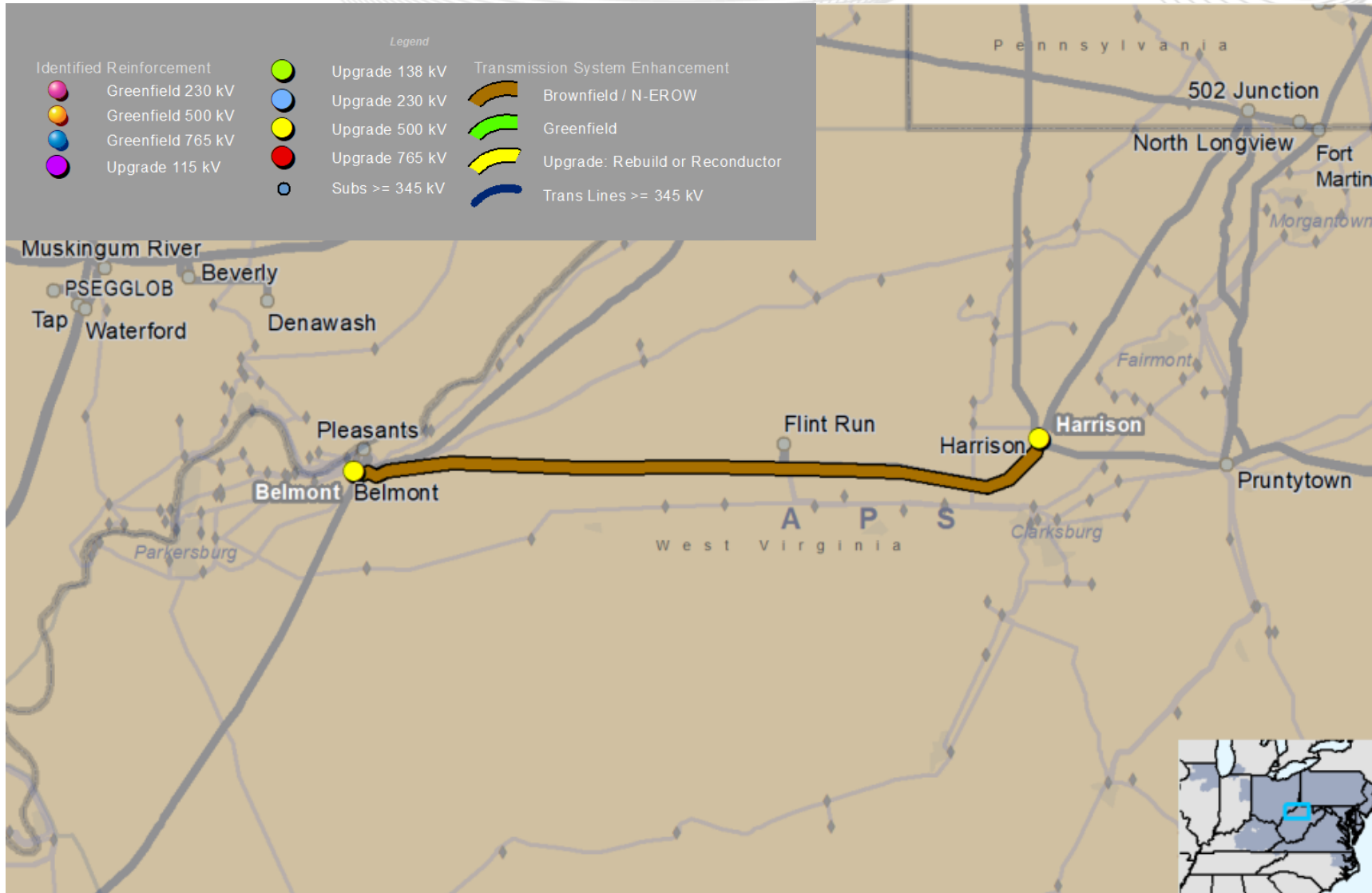
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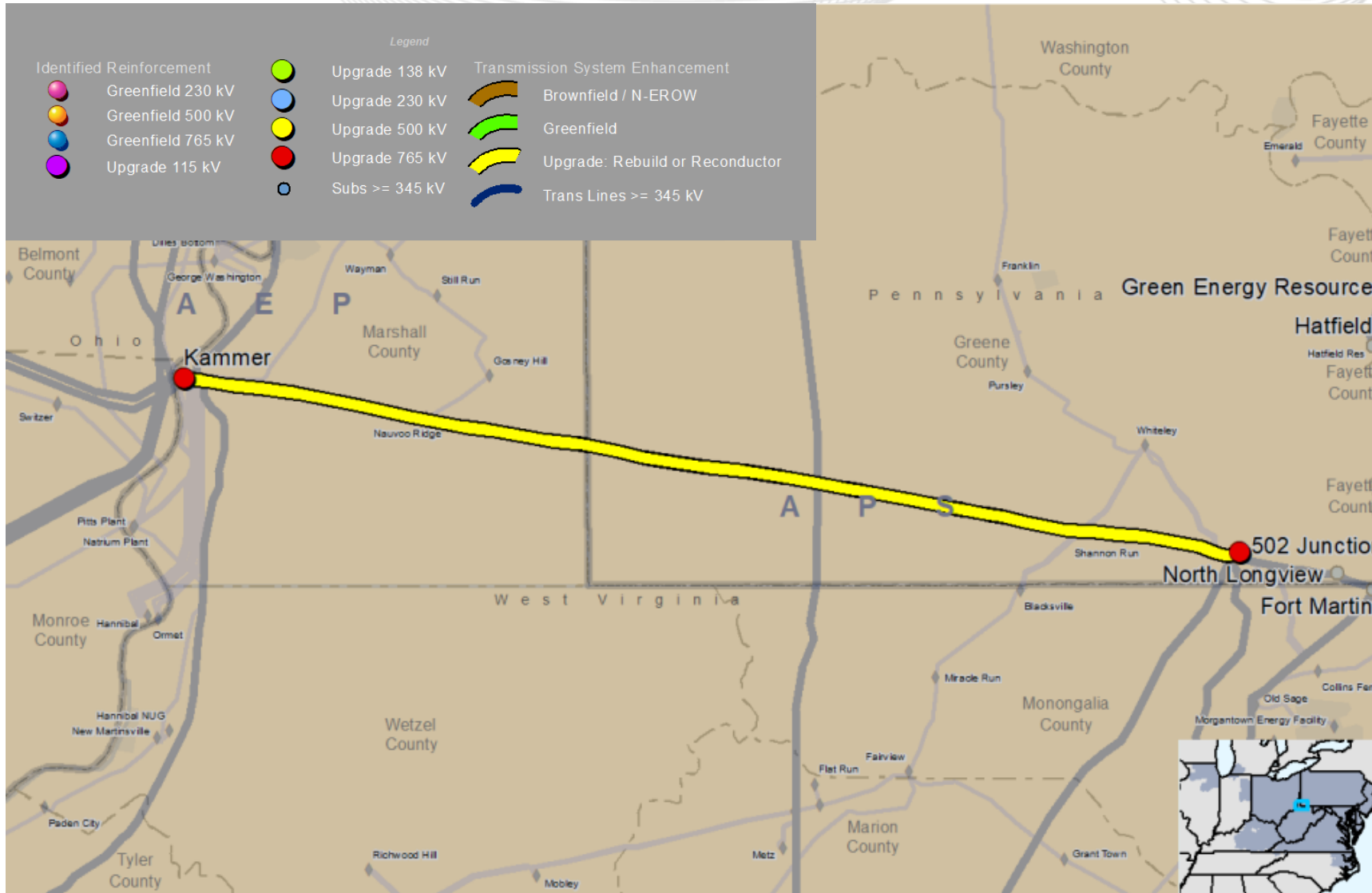


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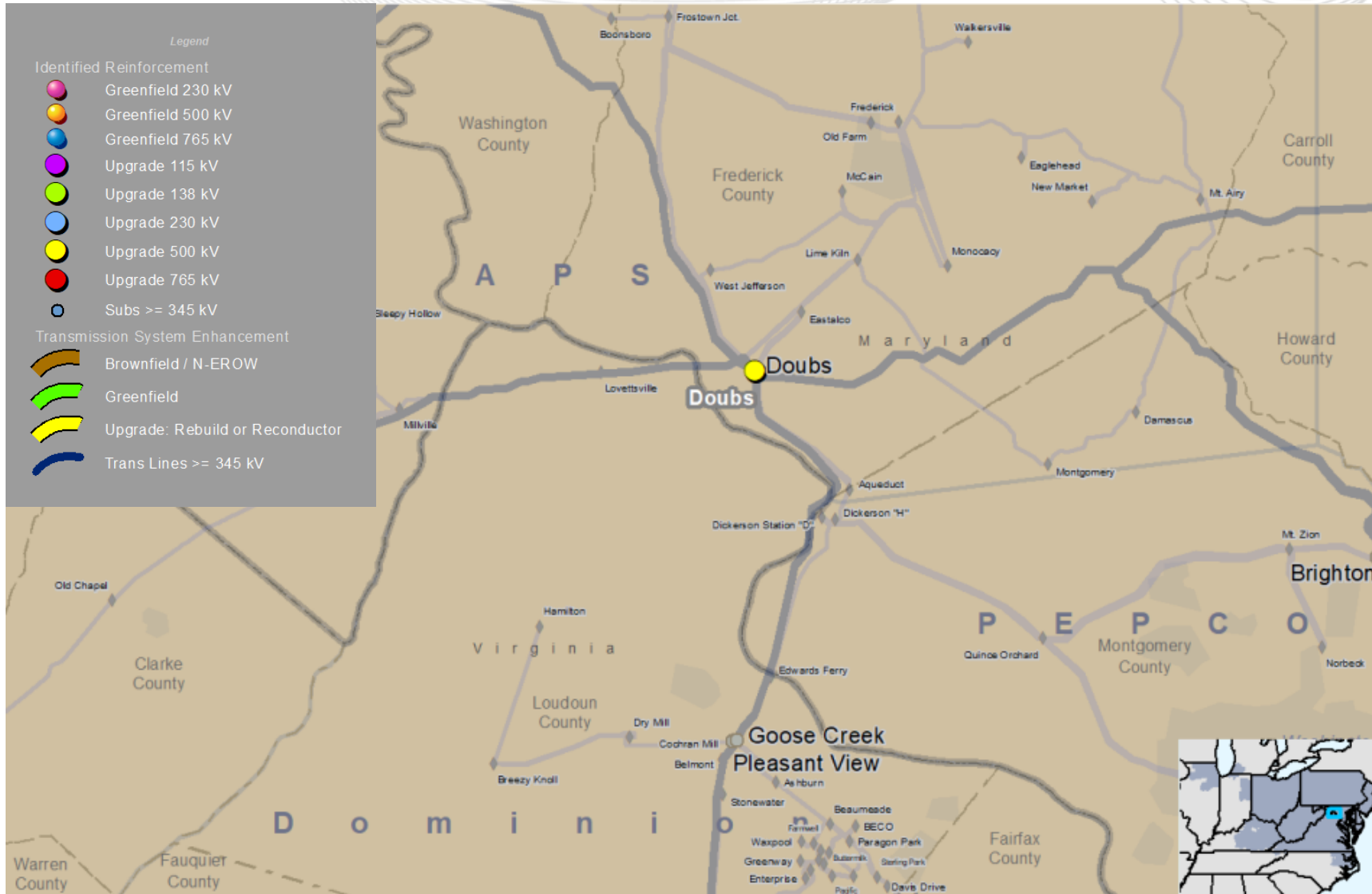


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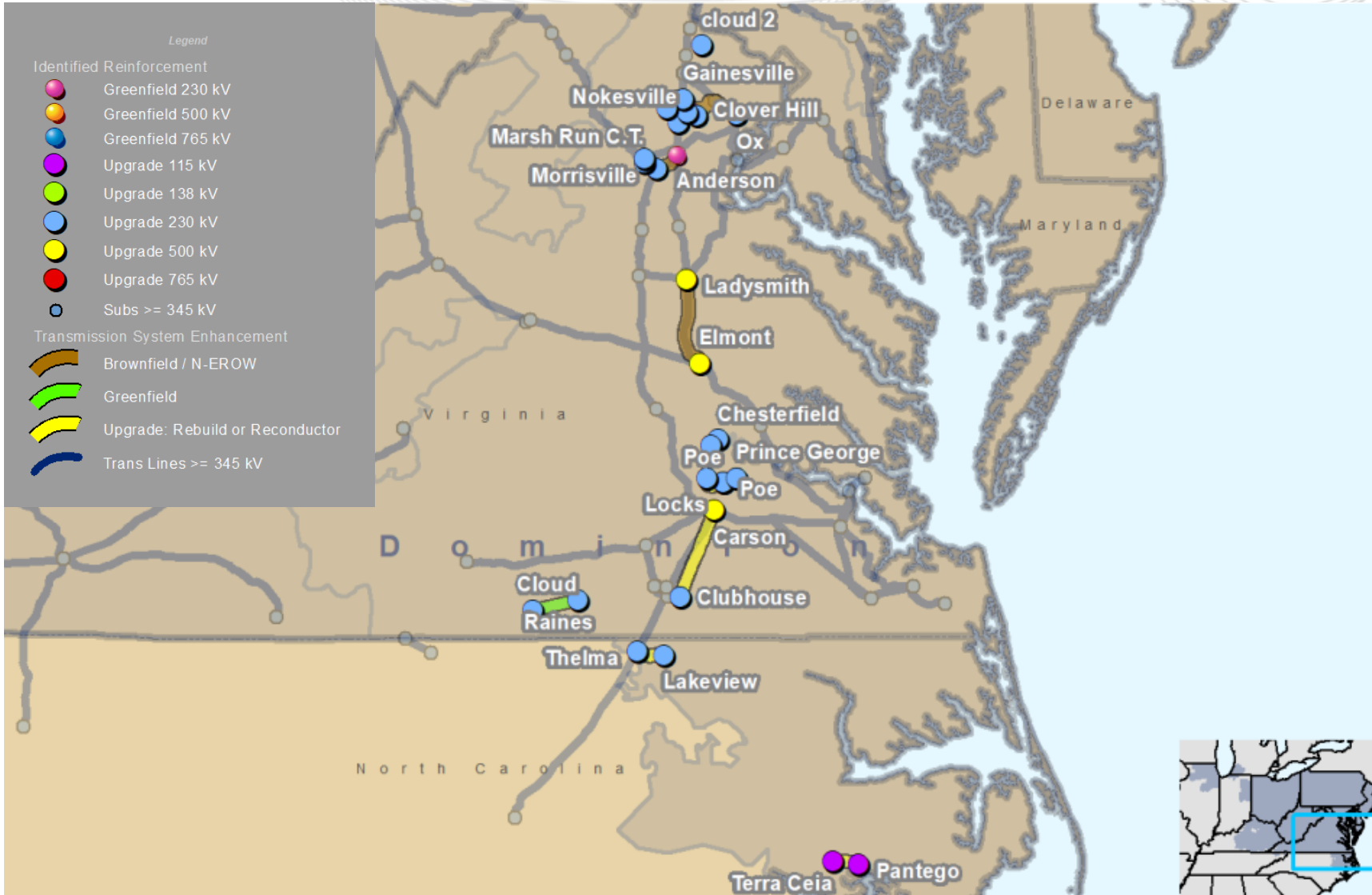




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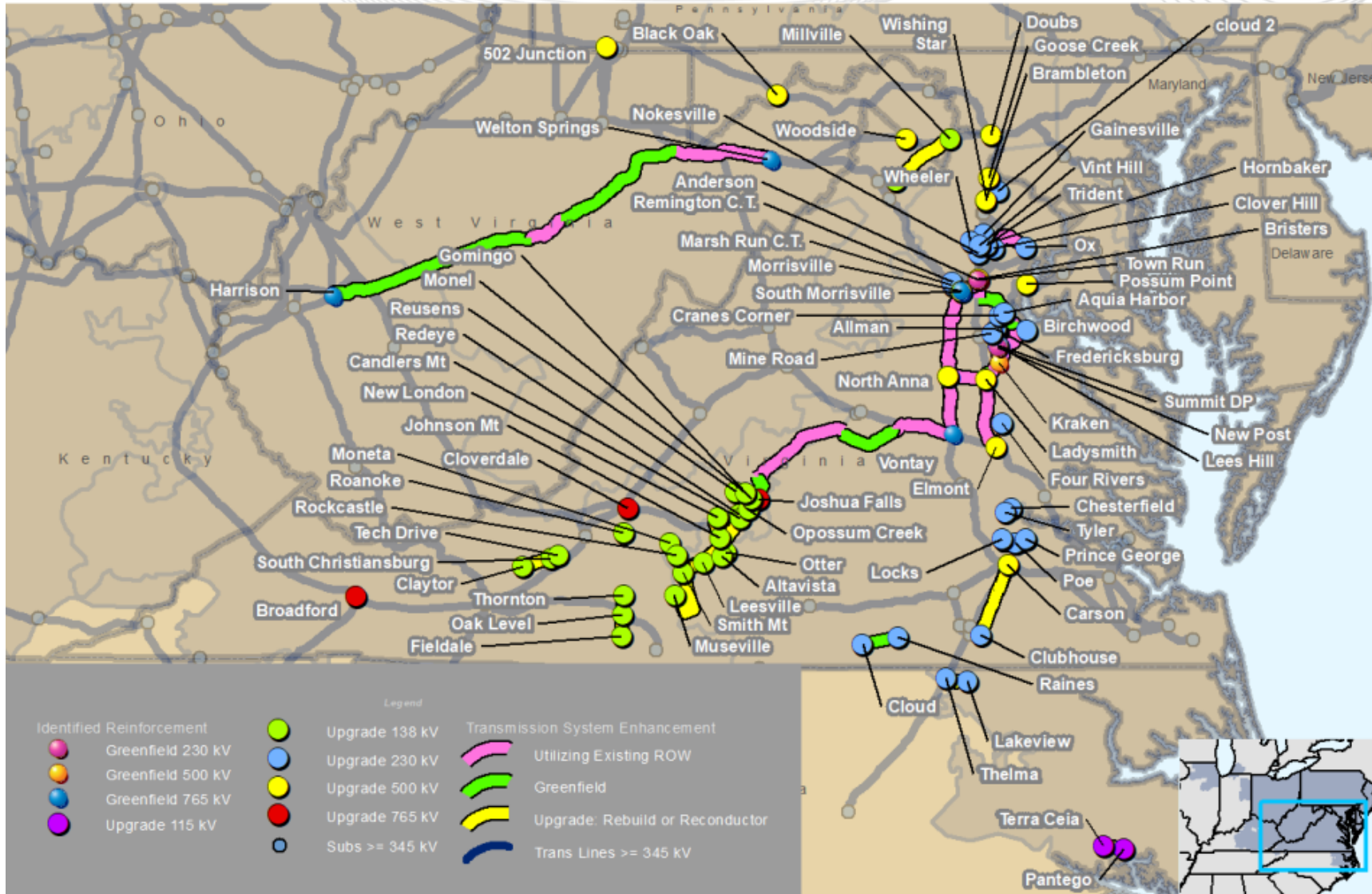


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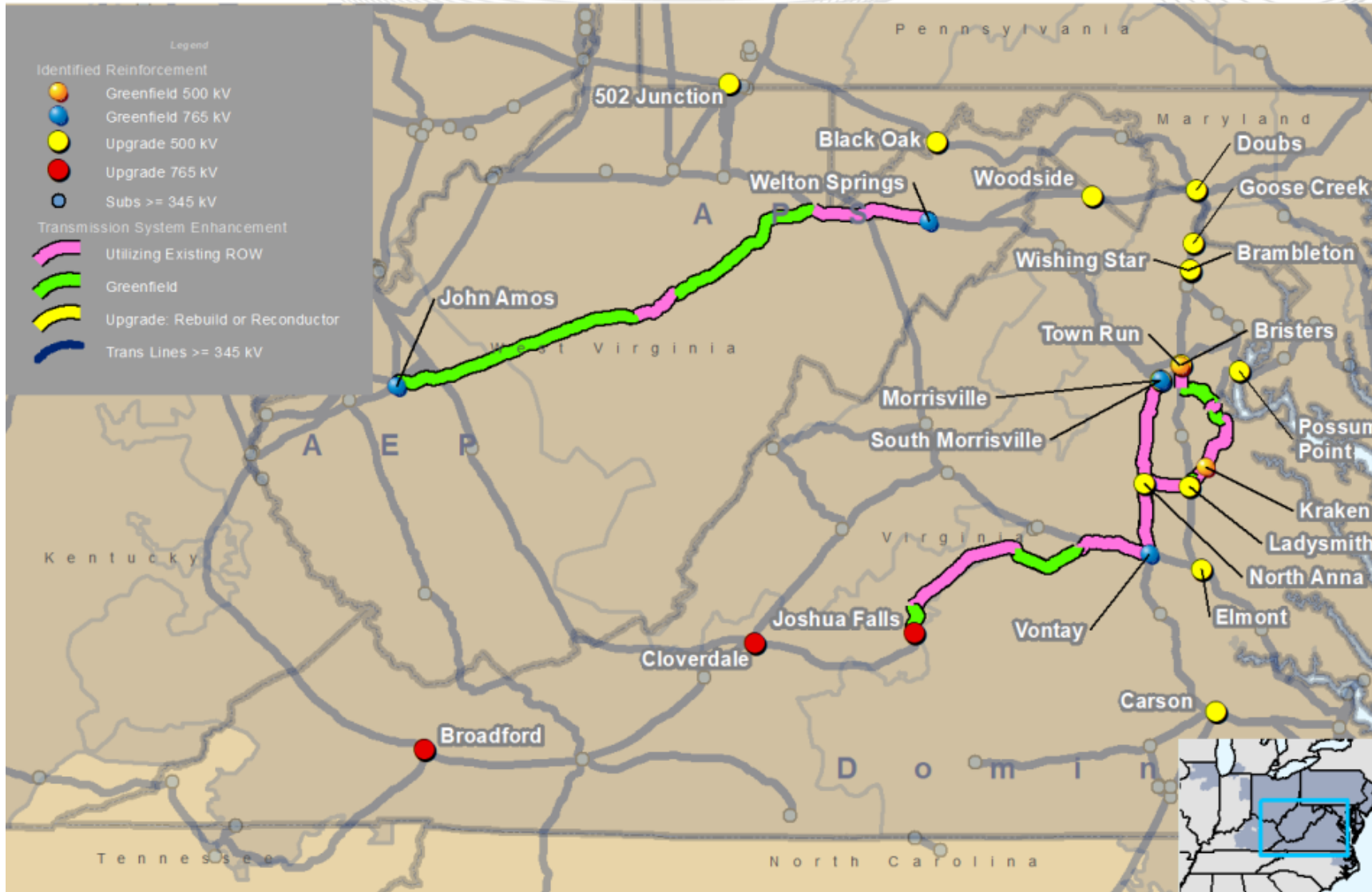


# Joint Proposal – 759

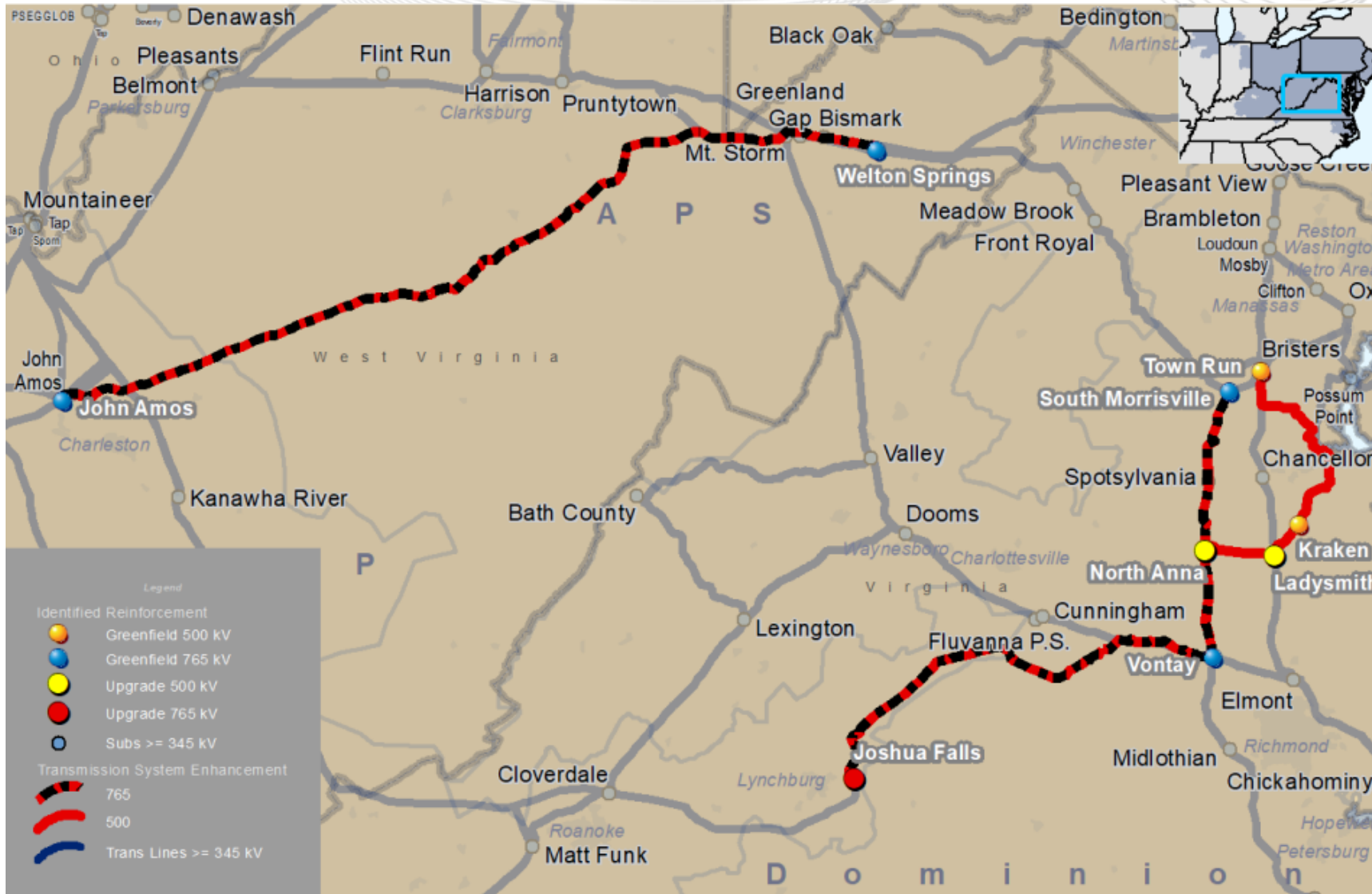
DOM / FE / Transource



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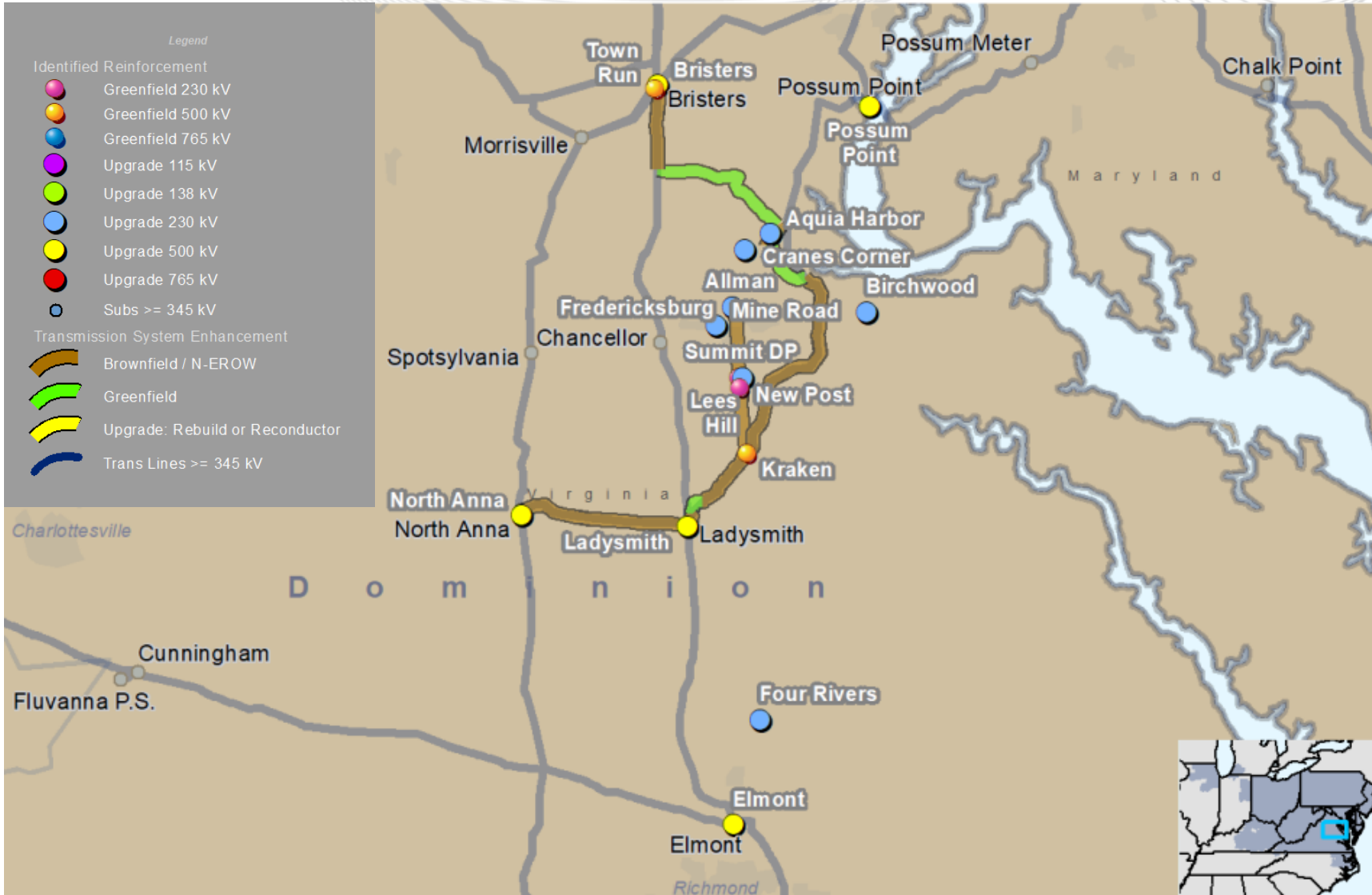




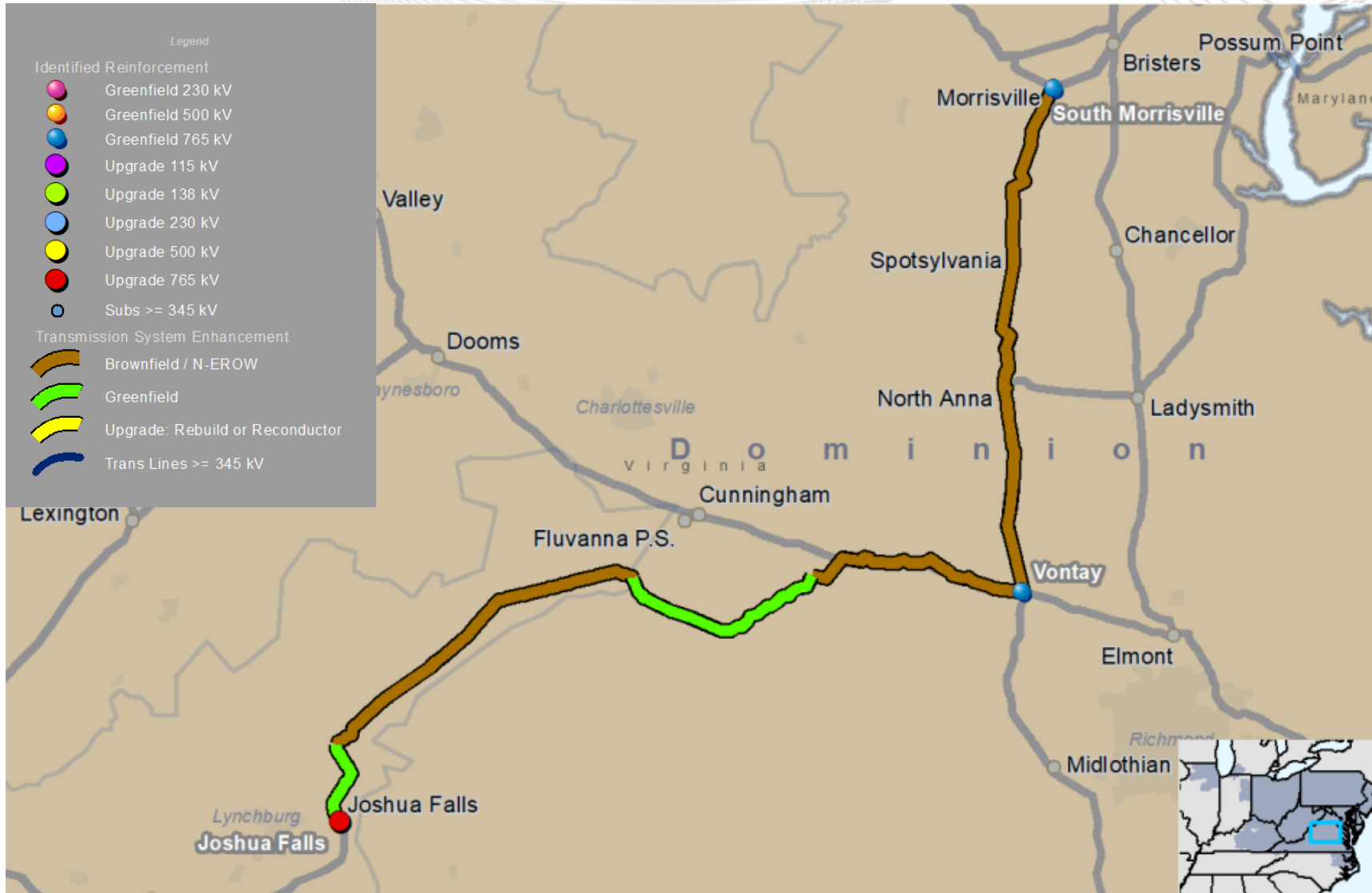
# This Portfolio contains the following Proposals

## Joint Proposal - 759

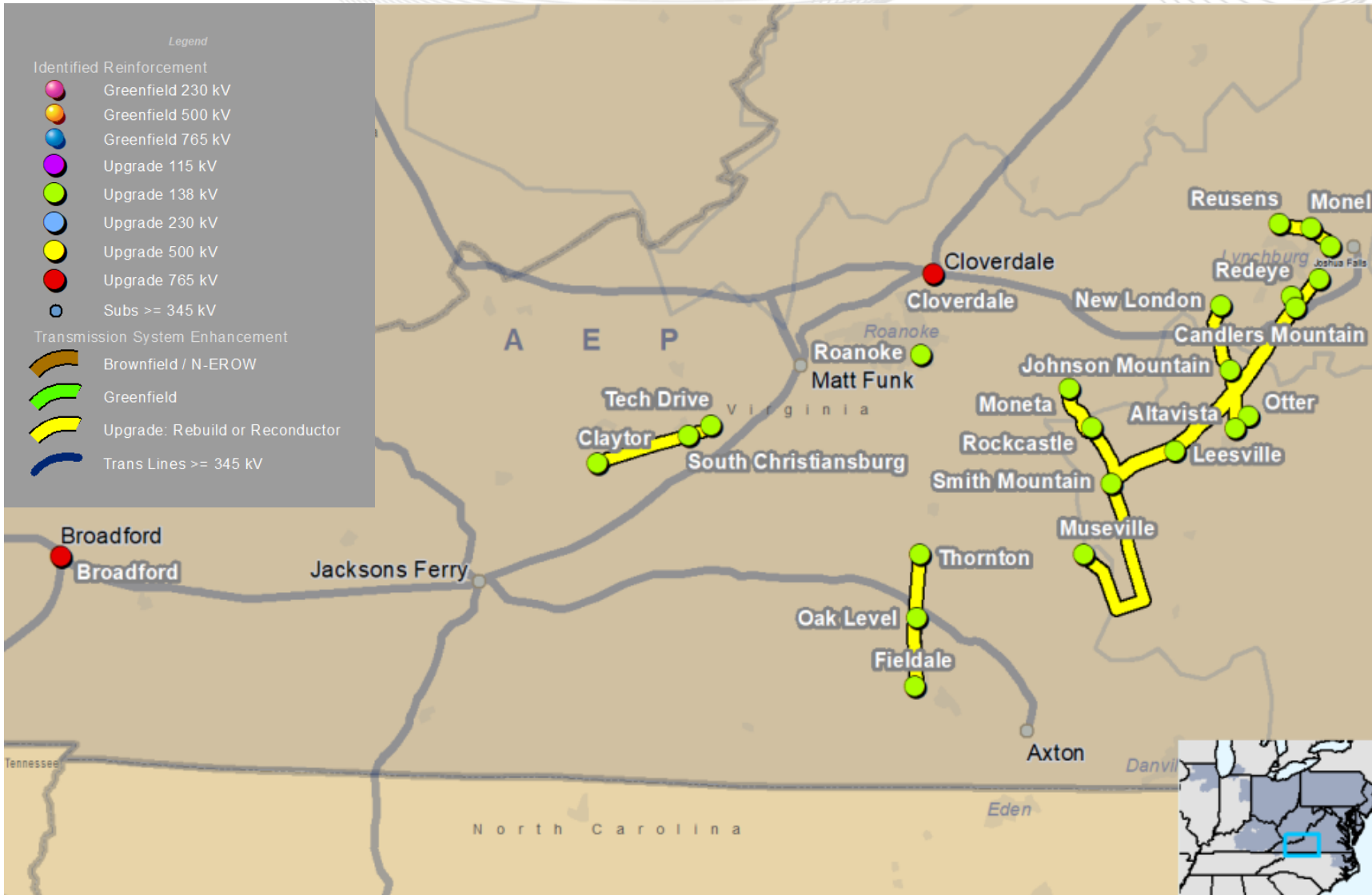
- 2024-W1-967-Kraken loop
- 2024-W1-665-Joshua Falls - Vontay - Morrisville South
- 2024-W1-81-AEP incumbent upgrades for Portfolio #1, 2 & 3
- 2024-W1-883-Amos - Welton Springs
- 2024-W1-551-Woodside/Chanceford 500 kV Terminal Swap at Doubs
- 2024-W1-24-Dominion Reinforcements
- 2024-W1-781-Dominion Reinforcements"



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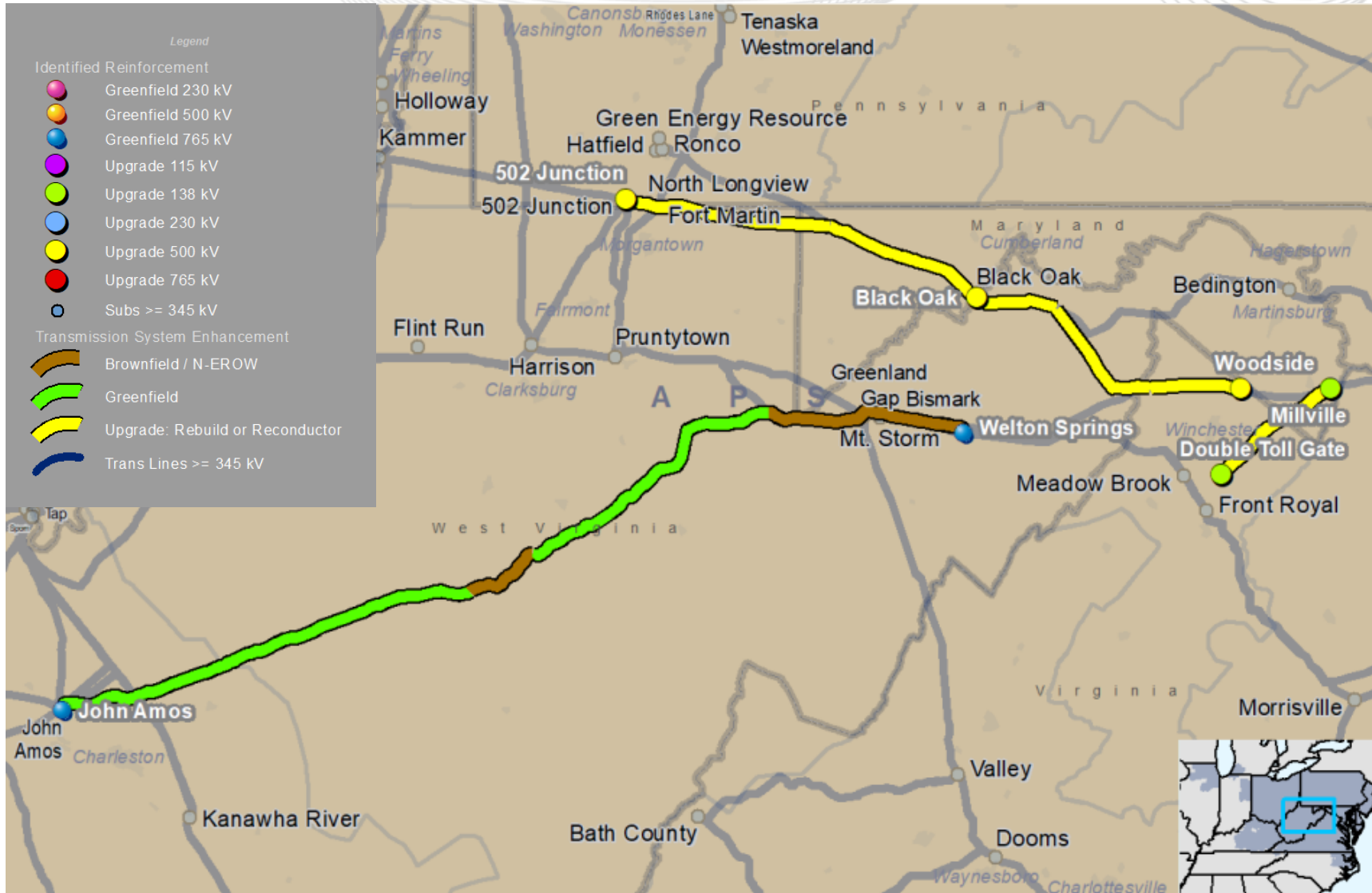


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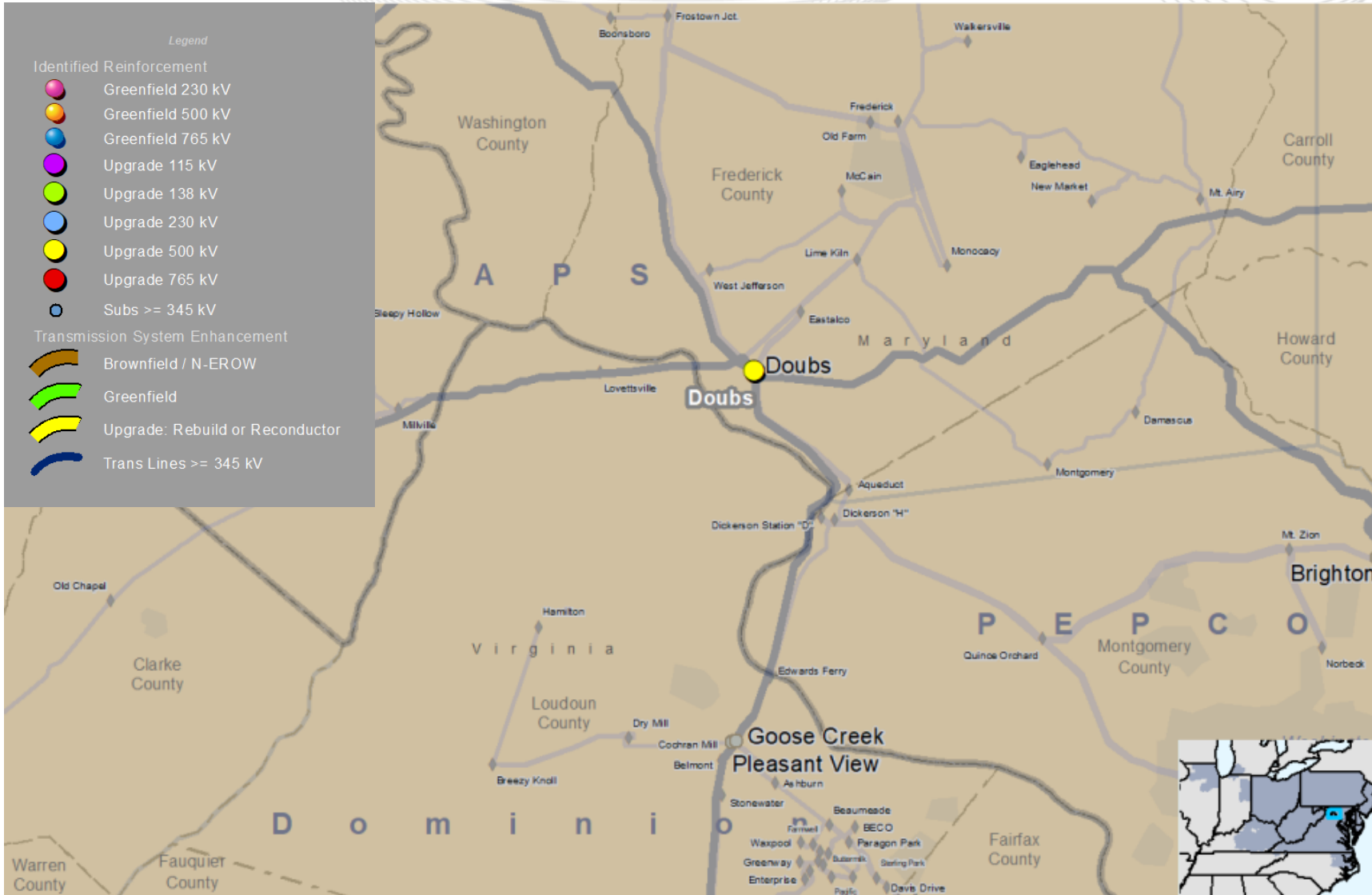


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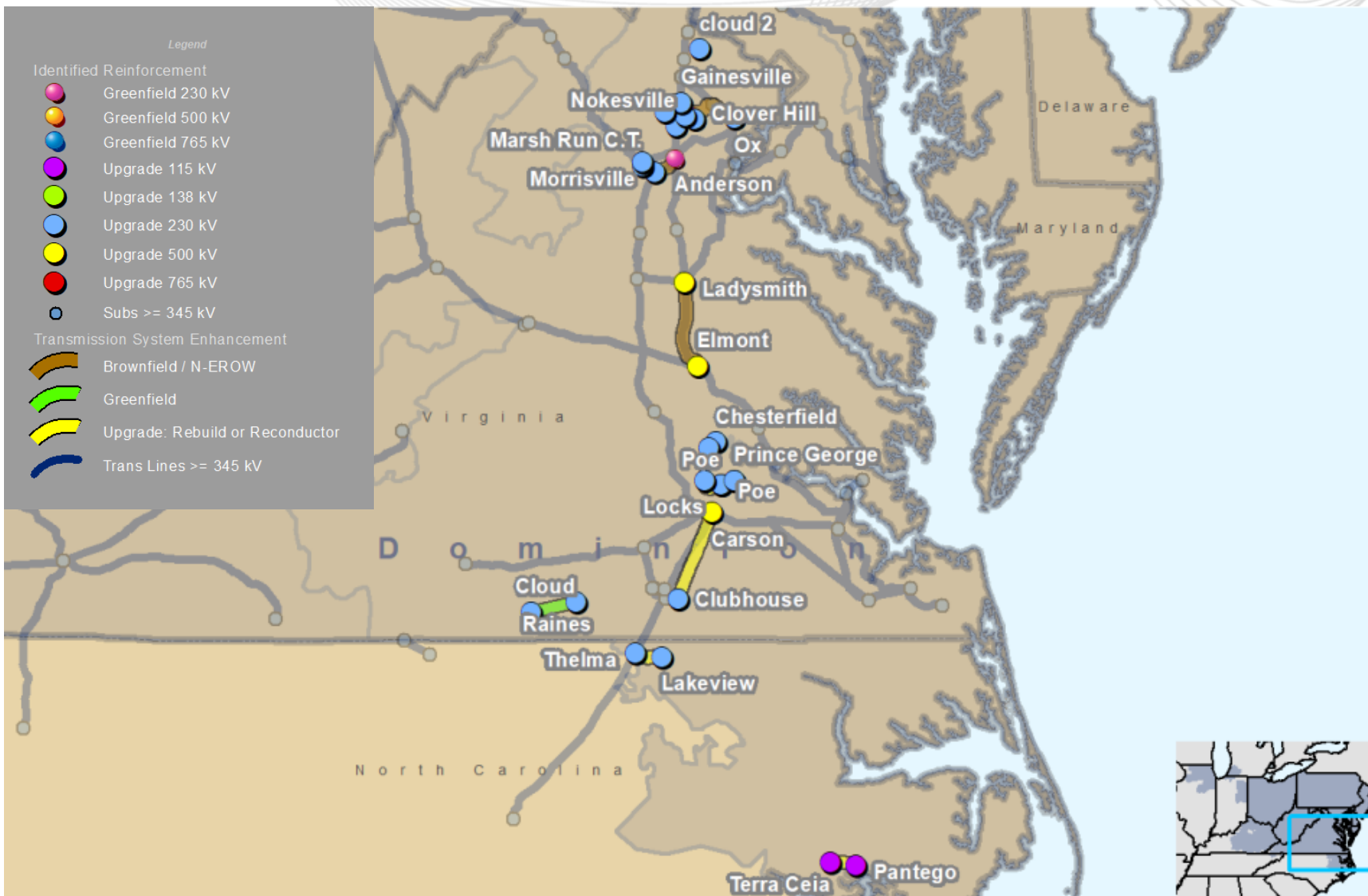




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Questions?

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**Reliability Analysis Update**



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Version No.	Date	Description
1	10/3/2024	<ul style="list-style-type: none"><li>• Original slides posted</li></ul>
2	10/4/2024	<ul style="list-style-type: none"><li>• Maps and minor slide format changes</li></ul>

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POWER GRID  
THINK BEFORE  
YOU CLICK!**



Be alert to  
malicious  
phishing emails.

**Report suspicious email activity to PJM.**  
(610) 666-2244 / [it\\_ops\\_ctr\\_shift@pjm.com](mailto:it_ops_ctr_shift@pjm.com)

