



Reliability Analysis Update

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Transmission Expansion Advisory Committee

April 11, 2023

Changes to Existing Projects

Baseline Reliability Projects



ComEd Transmission Zone: Baseline Crete-St. John 345 kV Area Improvement

Process Stage: Recommended Solution

Criteria: Summer & Winter Generator Deliverability

Assumption Reference: 2027 RTEP assumption

Model Used for Analysis: 2027 RTEP Summer & Winter case

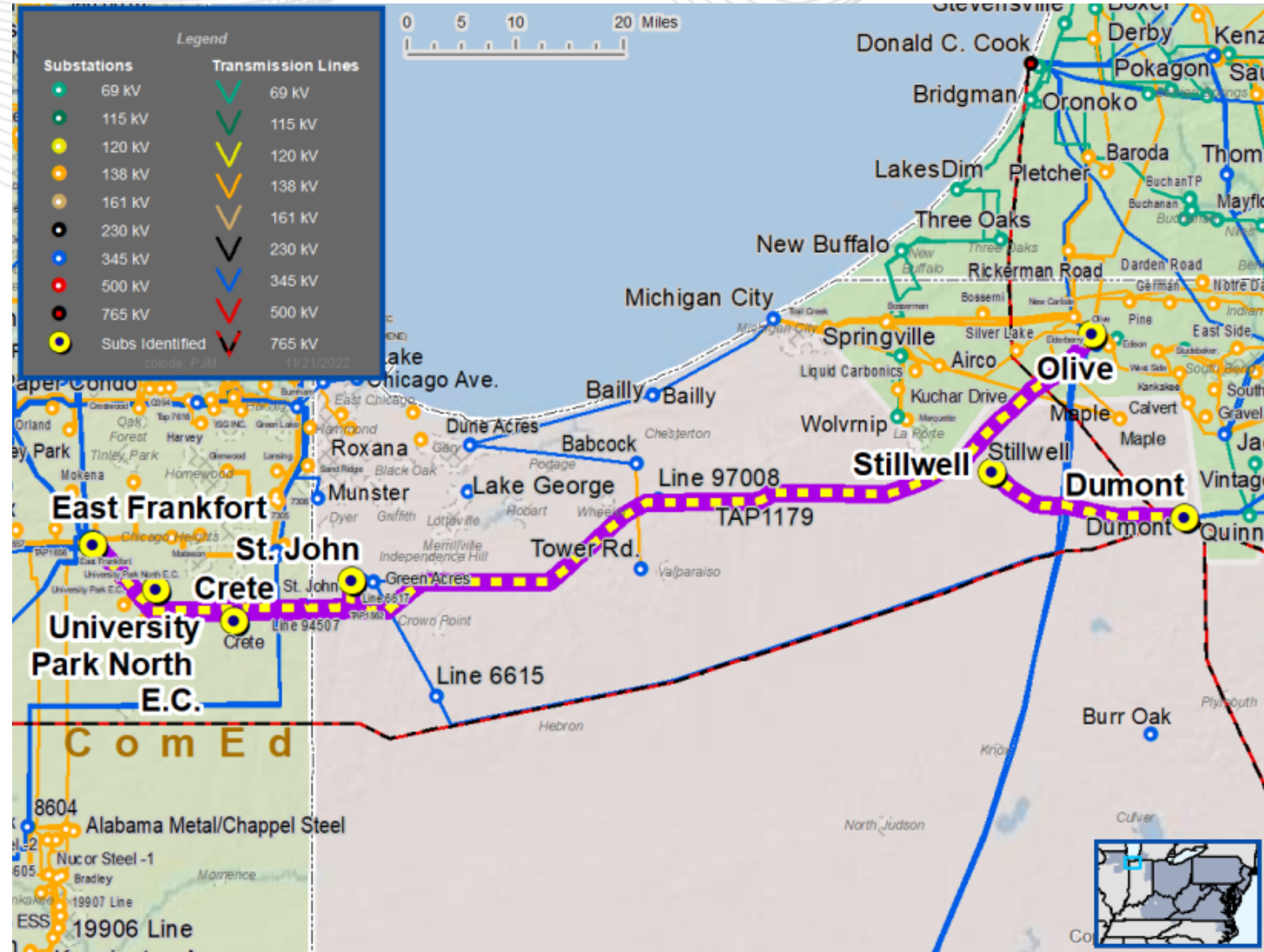
Proposal Window Exclusion: None

Problem Statement:

MDW1-GD-S1620, MDW1-GD-W172, MDW1-GD-W171, MDW1-GD-W188, MDW1-GD-W190, MDW1-GD-W185, MDW1-GD-W332, MDW1-GD-W331, MDW1-GD-W309, MDW1-GD-W404, MDW1-GD-W419, MDW1-GD-W392, MDW1-GD-W393; MDW1-ME-01, MDW1-ME-02, MDW1-ME-03, MDW1-ME-04

In 2027 RTEP summer case, the Stillwell-Dumont 345 kV line is overload for an N-2 outage. In the 2027 RTEP winter case, the Crete-St. John 345 kV line is overloaded for N-1 and N-2 outages, and the Crete-E. Frankfort and University Park N-Olive 345 kV lines are overloaded for N-1 outages.

Additionally, in the 2027 RTEP cases there was congestion identified on the Dumont-Stillwell 345 kV line, the E. Frankfort-Crete-St. John 345 kV line and University Park N-Olive 345 kV line.

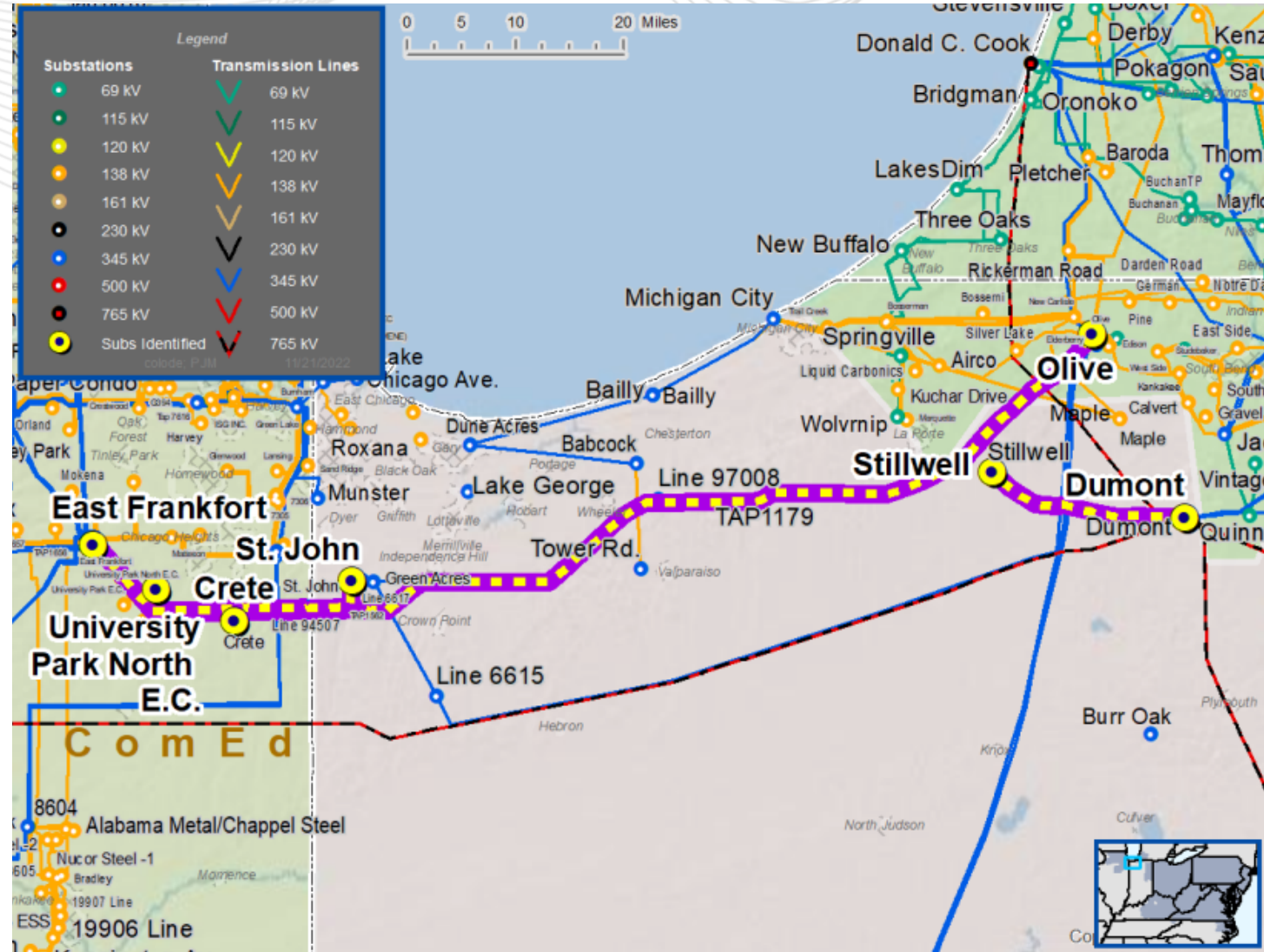


ComEd Transmission Zone: Baseline Crete-St. John 345 kV Area Improvement

Recommended Solution: Proposal 644 (modified) and proposal 908

- Outside of the Green Acres substation, swap the NIPSCO Green Acre Tap towers from the St. John-Green Acres-Olive 345 kV line to the University Park N-Olive 345 kV line to create a University Park N-Green Acres-Olive and St. John-Olive 345 kV lines. **(B3775.1)** – NEET (\$1.98 M)
- Reconductor NEET’s section of Crete(IN/IL border)-St. John 345 kV line (6.95 miles) (conversion of part of S2631). **(B3775.2)**– NEET (\$1.99 M)
- Rebuild ComEd’s section of 345 kV double circuit in IL from St. John to Crete (5 miles) with twin bundled 1277 ACAR conductor. **(B3775.3)** – ComEd (\$16.64 M)
- Rebuild 12.7 miles of 345 kV double circuit extending from Crete to E. Frankfort with twin bundled 1277 ACAR conductor. **(B3775.4)**– ComEd (\$42.28 M)
- Replace E. Frankfort 345 kV circuit breaker “9-14” with 3150A SF6 circuit breaker. **(B3775.5)**– ComEd (\$3.27 M)
- Perform sag study mitigation work on the Dumont-Stillwell 345 kV line (remove a center-pivot irrigation system from under the line allowing for the normal and emergency ratings of the line to increase, **replace two structures and modify a third structure**). **(B3775.6)**– AEP (\$0.22 M ~~\$2.22M~~ **\$2.22M**)
- Upgrade the limiting element at Stillwell or Dumont substation to increase the rating of the Stillwell-Dumont 345 kV line to match conductor rating. **(B3775.7)**– AEP (~~\$2 M~~ **\$1M**)

(continued on next slide)





ComEd Transmission Zone: Baseline Crete-St. John 345 kV Area Improvement

Recommended Solution: (continued from previous slide)

- Upgrade the existing terminal equipment (substation conductor) at St. John on the existing Crete to St. John 345 kV line with bundled 2x1590 ACSR Lapwing (B3775.8) – NIPSCO* (\$2 M)
- Upgrade the existing terminal equipment (substation conductor) at Green Acres on the existing St. John to Green Acres 345 kV line with bundled 2x1590 ACSR Lapwing (B3775.9) – NIPSCO* (\$2 M)
- Perform a sag study on the Olive – University Park 345kV line to increase the operating temperature to 225 F. Remediation work includes two tower replacements on the line. (B3775.10) – AEP (\$1.5 M)
- Upgrade the limiting element at Stillwell substation to increase the rating of the Stillwell-Dumont 345 kV line to match conductor rating. (B3775.11)– NIPSCO** (\$1.78M)

* NEET will be designated to coordinate with NIPSCO to construct the work required on NIPSCO

** AEP will be designated to coordinate with NIPSCO to construct the work required on NIPSCO

Market Efficiency Benefits:

- B/C Ratio: ~~1.99~~ 1.92
- Congestion solved: 87%
- 15-years Net Load Payment Savings: \$169.83 million
- 15-years PJM CO2 Decrease: 556,740 metric tons

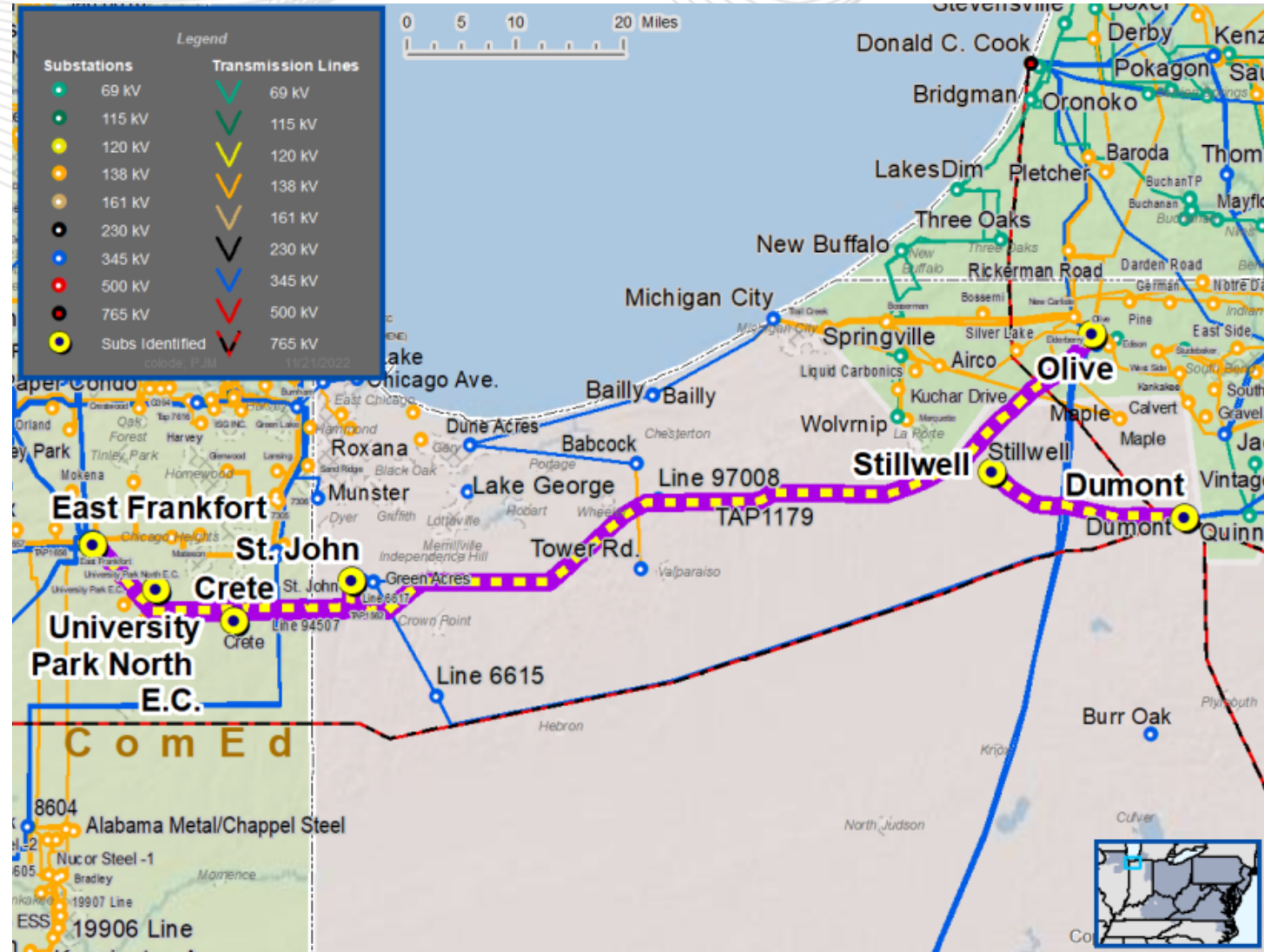
Additional Benefits: Addresses aging infrastructure on ComEd's section of Crete-St. John 345 kV double circuit (5 miles), NEET's section of Crete-St. John 345 kV line (6.95 miles) and ComEd's 345 kV double circuit extending from Crete to East Frankfort (12.7 miles).

Total Estimated Cost: ~~\$73.88M~~ 76.66M

Required IS Date: 12/1/2026

Projected IS Date: 12/1/2026

Previously Presented: 12/6/2022





ComEd Transmission Zone: Baseline Crete-St. John 345 kV Area Improvement

SN/SE/WN/WE (MVA) Ratings

Facility	Existing	Preliminary
Stillwell-Dumont 345 kV	1075/1075/1532/1532	1408/1887 1832/1780/2443 2038

SN/SE/SSTE/SLD WN/WE/WSTE/WLD (MVA) Ratings

Facility	Existing	Preliminary
Crete-St. John 345 kV	1091/1399/1483/1508 1310/1557/1658/1772	1679/2058/2107/2280 2091/2381/2390/2390
E. Frankfort-Crete 345 kV	1091/1399/1483/1674 1310/1557/1658/1873	1679/2058/2107/2280 2091/2381/2445/2648
E. Frankfort-University Park N 345 kV	1091/1399/1483/1674 1310/1557/1658/1873	1679/2058/2107/2280 2091/2381/2445/2648
University Park N-Olive 345 kV	971/971/971/1001 1234/1234/1234/1272	N/A
St. John-Olive 345 kV	N/A	971/971/971/1001 1234/1234/1234/1272
University Park N - Green Acre Tap West 345 kV	N/A	1679/2004/2107/2280 1976/2142/2445/2648
Green Acre Tap West - Green Acre 345 kV	N/A	1958/2390/2390/2390 2239/2390/2390/2390
Green Acre-Green Acre Tap East 345 kV	N/A	1091/1091/1091/1195 1195/1195/1195/1195
Green Acre Tap East -Olive 345 kV	N/A	971/1079/1079/1112 1234/1310/1310/1350

NP* = Not Provided; **Note:** Ratings in table are as provided in modeling files.

Recommended Solution

Baseline Reliability Projects



Dominion Transmission Zone: Baseline Evergreen Mills - 300MW Load Drop Violation

Process Stage: Recommended Solution

Criteria: 300MW Load Loss

Assumption Reference: 2027 RTEP assumption

Model Used for Analysis: 2027 RTEP Summer & Winter cases

Proposal Window Exclusion: None

Problem Statement:

2022W2-N2-SLD1, 2022W2-N2-SLD2, 2022W2-N2-WLD1, 2022W2-N2-WLD2

In the 2027 RTEP Summer & Winter cases, a 300 MW load loss occurs under an N-1-1 scenario.





Dominion Transmission Zone: Baseline Evergreen Mills - 300MW Load Drop Violation

As part of the 2022 RTEP Window #2, the projects listed in the table below are proposed to address the following violations:
2022W2-N2-SLD1, 2022W2-N2-SLD2, 2022W2-N2-WLD1 & 2022W2-N2-WLD2

Proposal ID	Proposing Entity	Upgrade Description	Upgrade Cost (\$M)
648	Dominion	Cut existing 230kV Line #2183 (Brambleton - Poland Road) and extend double circuit 230kV lines creating new Line #2210 (Brambleton - Evergreen Mills) and Line #2183 (Evergreen Mills - Poland Road)	7.71

Recommended Solution: Proposal #2022_2-648

- Cut existing 230kV line #2183 and extend from Poland Road substation to Evergreen Mills substation. Approximately 0.59 miles of new line will be built from the cut-in to the Evergreen Mills substation. Cut and extend the existing 230kV line #2183 creating a new line #2210 from Brambleton substation to be terminated at Evergreen Mills substation. Approximately 0.59 miles of new line will be built from the cut-in to the Evergreen Mills substation. **(b3779)**

Total Estimated Cost: \$7.71M

Required IS Date: 6/1/2027

Projected IS Date: 6/1/2027

Previously Presented: 2/7/2023

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Reliability Analysis Update



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Version No.	Date	Description
1	Feb 3 rd 2023	<ul style="list-style-type: none">• Original slides posted

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